



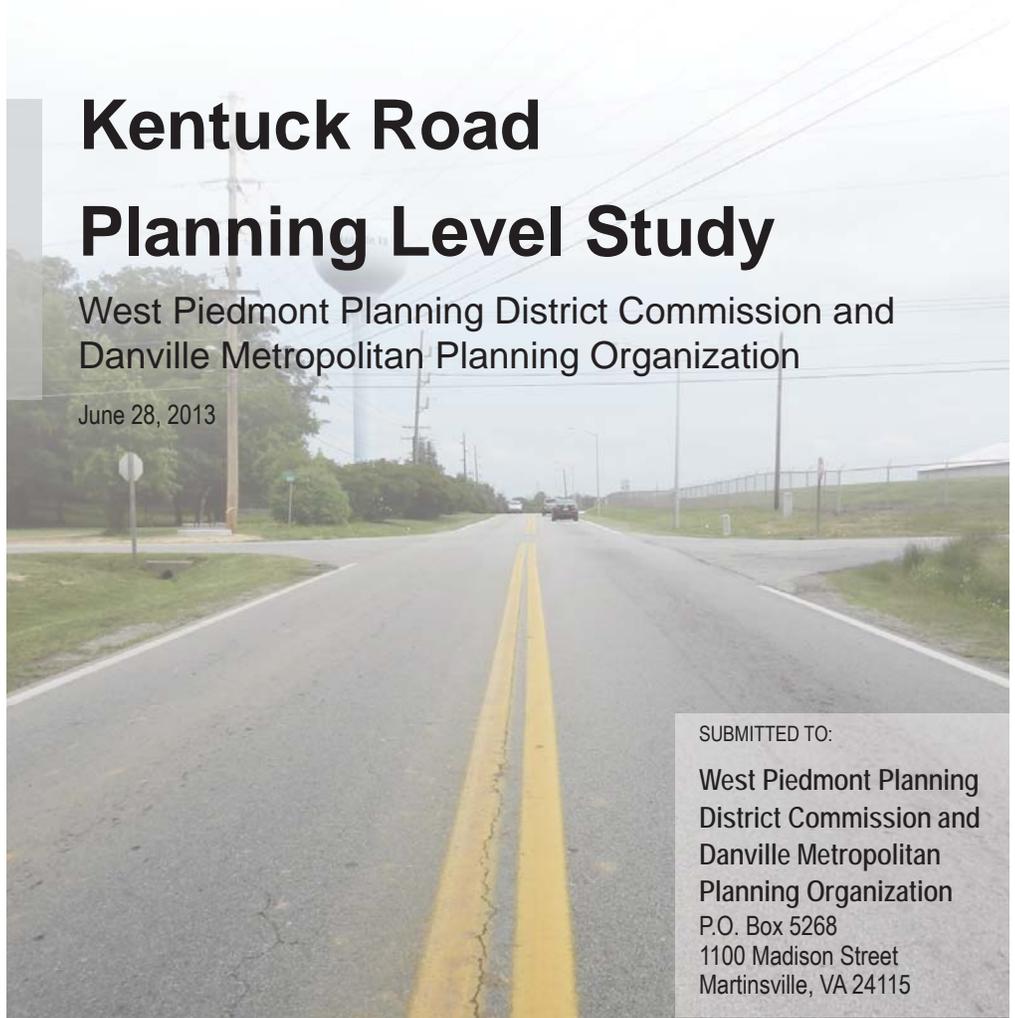
# Increasing Safety and Capacity



## Kentuck Road Planning Level Study

West Piedmont Planning District Commission and  
Danville Metropolitan Planning Organization

June 28, 2013



SUBMITTED TO:  
West Piedmont Planning  
District Commission and  
Danville Metropolitan  
Planning Organization  
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# Planning Level Study - Kentuck Road

FINAL REPORT

Pittsylvania County and Danville, Virginia

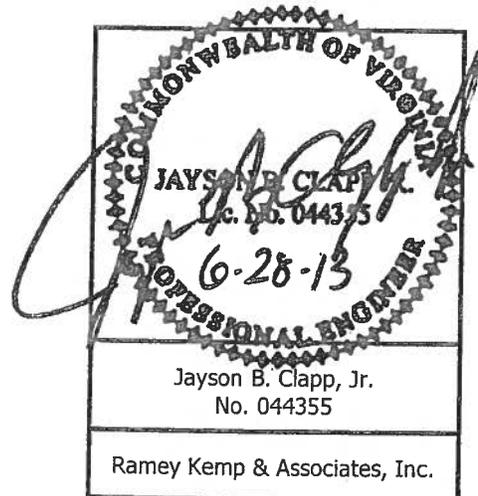
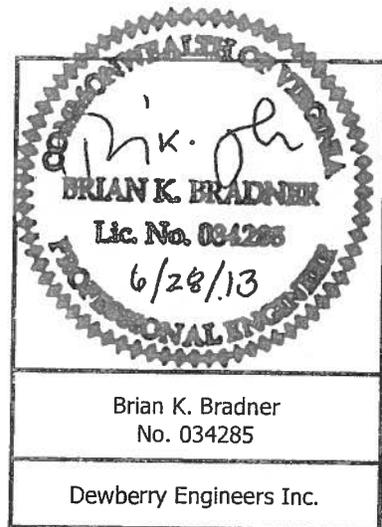
June 28, 2013

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

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## Executive Summary

Dewberry Engineers Inc. (Dewberry) and Ramey Kemp & Associates Inc. (RKA) have completed the Kentuck Road (Route 729) 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), the City of Danville, and Pittsylvania County. The intent of this study is to define the most advantageous locations for spot improvements along Kentuck Road between the intersections with South Boston Road (US 58) and Little Creek Road (Route 732), as well as to examine improvements to the existing signalized intersection at South Boston Road. 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 crash rates, improvements to the existing roadway and associated intersections should be identified.
2. To deal with these deficiencies, three (3) locations for spot improvements have been identified. For each location different improvement alternatives were identified. The locations and associated improvements are listed below:
  - a. The intersection of Kentuck Road and Halifax Road.
    - i. Addition of a 200 foot left turn lane on the northbound approach and a 100 foot left turn lane on the southbound approach.
    - ii. Addition of 100 foot left turn lanes on the northbound and southbound approaches as well as the installation of a traffic signal.
    - iii. Construction of a single lane roundabout with widened approaches of each leg.
  - b. The intersection of Kentuck Road and Eagle Springs Road.
    - i. Addition of a 100 foot right turn lane on the northbound approach.
    - ii. Remove northbound channelization and install right turn on the northbound and westbound approaches.
  - c. The intersection of Kentuck Road and Little Creek / Fall Creek Road.
    - i. Construction of a center-turn lane on Kentuck Road between Fall Creek Road and Little Creek Road in addition to the construction of a 150 foot right turn lane on the eastbound approach and extension of the right turn lane on the southbound approach to provide 100 feet of storage.
    - ii. Shifting the alignments of Little Creek Road and Fall Creek Road, the installation of a traffic signal, the construction of 100 foot left turn lanes on the northbound and southbound approaches, and a 100 foot left turn lane on the eastbound approach will be constructed.
    - iii. Shifting the alignments of Little Creek Road and Fall Creek Road and the construction of a single lane roundabout with widened approaches.
3. The alternatives for each location were evaluated using eight (8) criteria to determine the preferred alternative for the three spot improvements. The recommended spot improvements are listed below for each location.

- a. Location 1: The construction of a single lane roundabout with widened approaches of each leg based upon the current data.  
Note: As the time for implementation of this improvement approaches, the signal warrants should be reanalyzed. If a signal is warranted, the signalized intersection with the addition of 100 foot left turn lanes on the northbound and southbound approaches is the recommended alternative.
  - b. Location 2: Remove northbound channelization and install right turn on the northbound and westbound approaches.
  - c. Location 3: Shifting the alignments of Little Creek Road and Fall Creek Road, the installation of a traffic signal, the construction of 100 foot left turn lanes on the northbound and southbound approaches, and a 100 foot right turn lane on the eastbound approach will be included.
4. Through the implementation of these improvements, this segment of Kentuck Road will operate under capacity and with increased safety.

## KENTUCK ROAD – PLANNING LEVEL STUDY

### I. INTRODUCTION

Dewberry Engineers Inc. (Dewberry) and Ramey Kemp & Associates Inc. (RKA) have completed the Kentuck Road (Route 729) 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), the City of Danville, and Pittsylvania County. The intent of this study is to define the most advantageous locations for spot improvements along Kentuck Road between the intersections with South Boston Road (US 58) and Little Creek Road (Route 732), as well as examine improvements to the existing signalized intersection at South Boston Road.

This section of Kentuck Road is divided at the intersection of Wilkerson Road (Route 730), where Pittsylvania County is to the north and the City of Danville is to the south. See Figure 1 for the locations of Kentuck Road and the limits of the analysis. The section within the City of Danville between the intersections with South Boston Road and Wilkerson Road was identified for improvement within the *Year 2035 Long Range Transportation Plan*. The proposed improvements, listed within the Roadway Vision Plan, were to widen the existing road to four lanes, matching the proposed R4D typical section. Such projects listed within the Transportation Vision Plan were indicated as having a lesser priority as funding is not available based on the Expected Funding Stream. For the purposes of this study, it is anticipated that Kentuck Road will remain a two-lane rural roadway.

Also noted in Figure 1 is the approximate location of the potential alignment of the Route 730 Connector Road. The preferred alignment, as shown in the Route 730 to Route 29 Connector Study, connects Route 29 to Kentuck Road and intersects with Kentuck Road between the Ringgold Industrial Parkway and Little Creek Road. In addition, turn lanes along Kentuck Road will be required at this intersection, which should be analyzed upon further development of the Connector Road. This potential alignment has been shown on the figure, but for purposes of this planning level study, its impacts have not been included in the analysis.

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 Kentuck Road 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

From the improvement alternatives developed within this report, one preferred alternative will be recommended for future design and construction.

### II. EXISTING TRAFFIC CONDITIONS

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



KENTUCKY ROAD (RTE. 729) SITE VICINITY MAP AND PROJECT LIMITS  
 PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA

FIGURE  
**1**

**Kentuck Road (Route 729)** is classified as an Urban Minor Arterial within the Danville City limits and as a Rural Major Collector within Pittsylvania County. The posted speed limit along this road is 45 miles per hour (MPH). The typical road section includes two 11-foot lanes with no shoulders. The horizontal and vertical alignments follow the natural terrain with limited to no passing zones.

**South Boston Road (US 58)** is classified as an Urban Principal Arterial with a posted speed limit of 45 MPH. This road serves as the primary route between Danville and South Boston. The typical road section includes a four-lane divided roadway (two lanes in each direction) with lane widths of 12 feet. The horizontal alignment is primarily straight with subtle horizontal curves. The vertical alignment generally approximates the adjacent rolling terrain.

**Halifax Road (Route 655)** is a two-lane rural road with a posted speed limit of 45 MPH. The typical road section includes two 10-foot-wide lanes; and the shoulders along this road are limited. The horizontal alignment follows a winding path with multiple horizontal curves.

**Wilkerson Road (Route 730)** is classified as an Urban Collector with a posted speed limit of 45 MPH. This road serves as an east-west route for local traffic. The typical road section includes 11-foot-wide lanes. The horizontal alignment follows the natural terrain with a rolling vertical alignment.

**Fall Creek Road** is a two-lane rural road with a posted speed limit of 45 MPH. This road serves as an east-west route for local traffic in this area. The typical road section includes 10-foot lanes with limited or no shoulder. The horizontal and vertical alignments follow the natural terrain with limited to no passing zones.

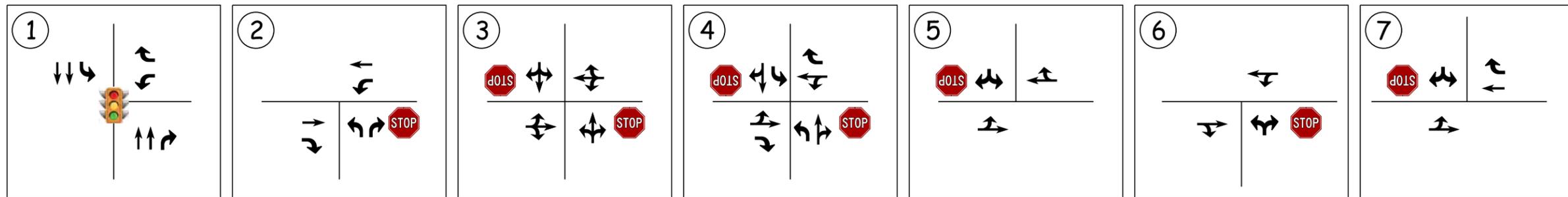
**Little Creek Road (Route 732)** is classified as a Rural Major Collector with a posted speed limit of 45 MPH. The typical road section includes 11-foot lanes with limited or no shoulder. This road serves as an east-west route for local traffic to the City of Danville.

#### Existing Roadway Volumes and Level of Service

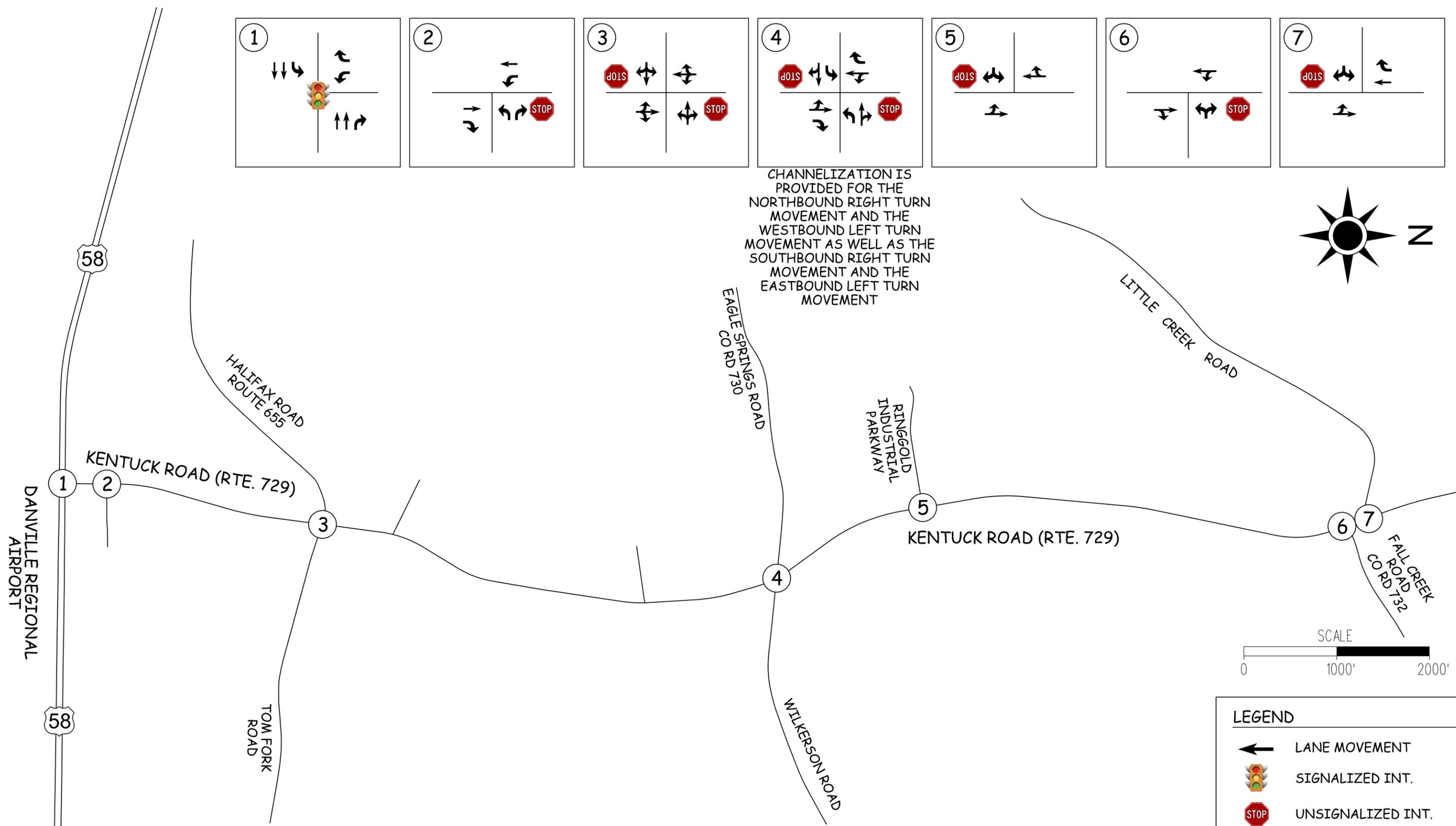
To determine the peak hour volumes within the study area, on February 6 and 7, 2013, Ramey Kemp & Associates conducted turning movement counts for the AM and PM peak periods. These are included in Appendix A for reference. A review of the traffic counts indicates the AM and PM peak hours occurred at different times at each intersection. It should be noted that for the purpose of this study, the peak hour volumes at each intersection were assumed to occur simultaneously. The turning movement counts were taken at the following intersections:

1. Kentuck Road and South Boston Road
2. Kentuck Road and Shopping Center Entrance
3. Kentuck Road and Halifax Road
4. Kentuck Road and Eagle Springs/Wilkerson Road
5. Kentuck Road and Ringgold Industrial Park
6. Kentuck Road and Fall Creek Road
7. Kentuck Road and Little Creek Road.

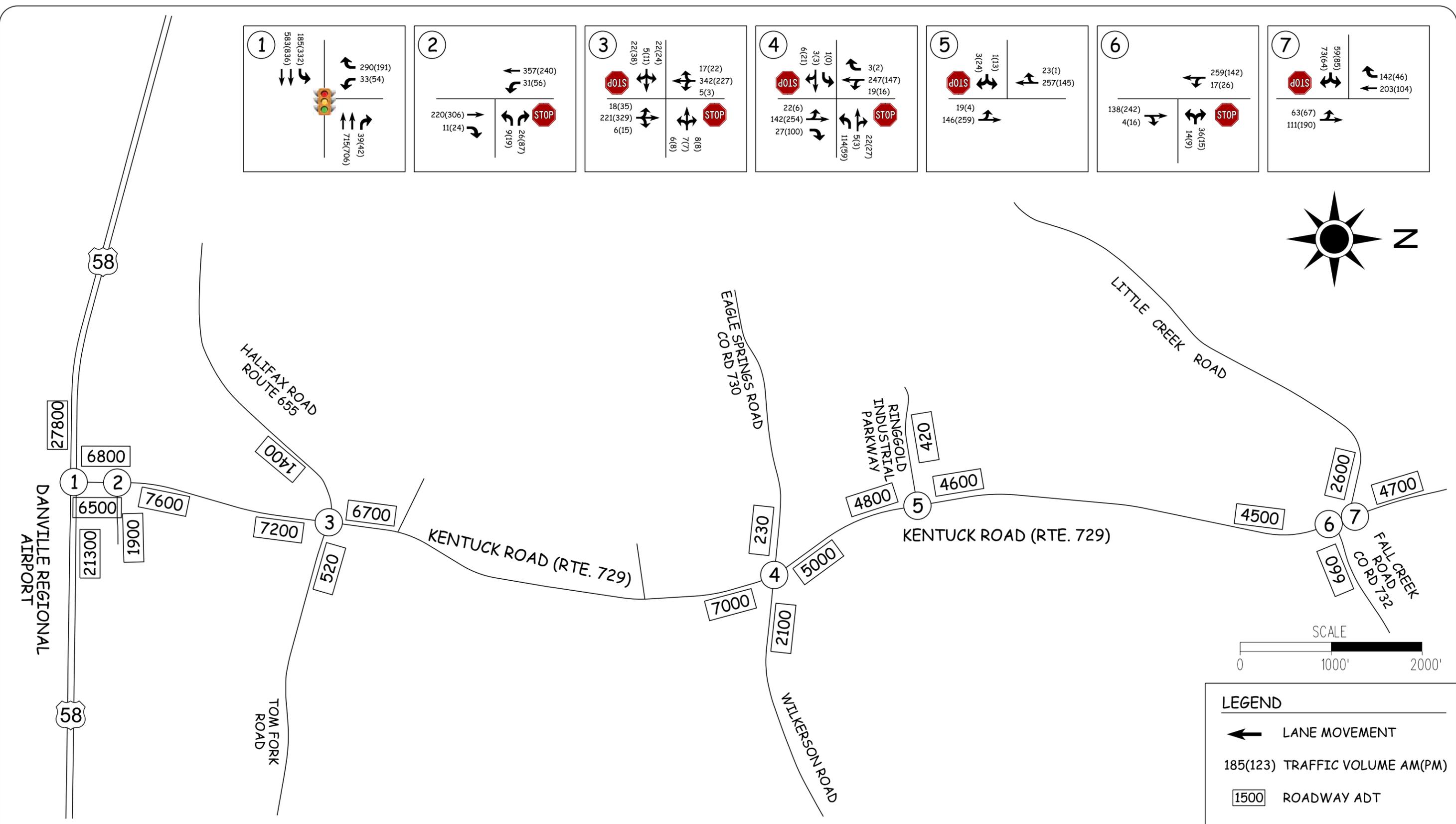
The existing intersection geometry and traffic control devices are presented in Figure 2; and the existing (2013) traffic volumes are presented in Figure 3. Using the existing traffic volumes shown in Figure 3, the existing levels of service were determined for each intersection.

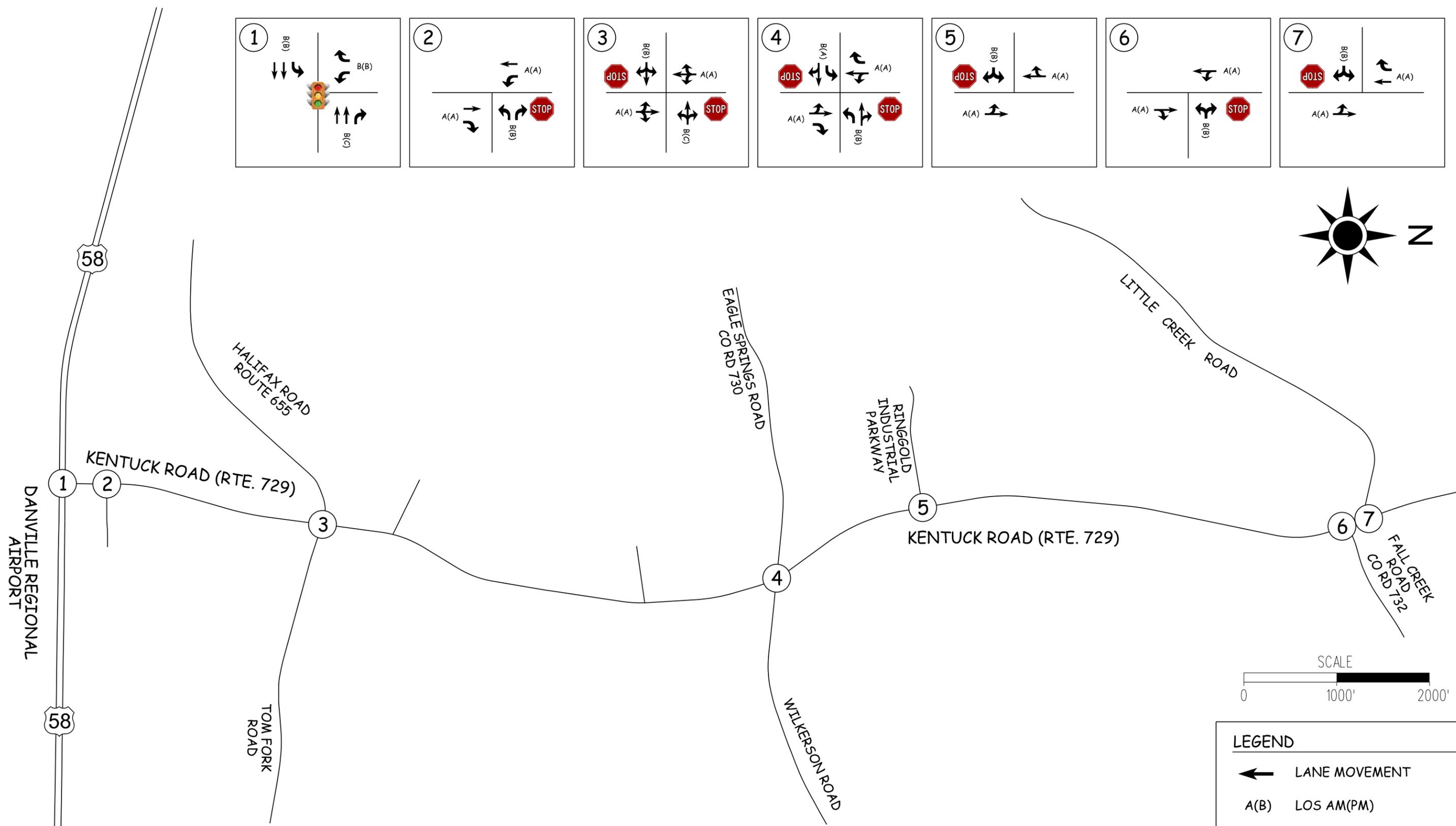
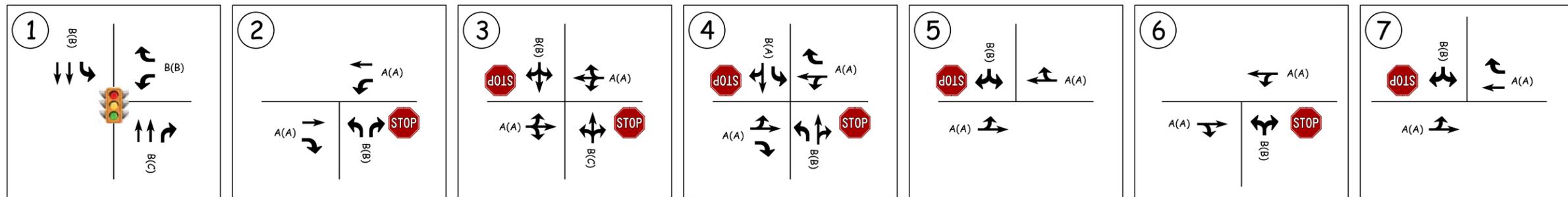


CHANNELIZATION IS PROVIDED FOR THE NORTHBOUND RIGHT TURN MOVEMENT AND THE WESTBOUND LEFT TURN MOVEMENT AS WELL AS THE SOUTHBOUND RIGHT TURN MOVEMENT AND THE EASTBOUND LEFT TURN MOVEMENT



LEGEND	
	LANE MOVEMENT
	SIGNALIZED INT.
	UNSIGNALIZED INT.





The levels of service (LOS) for each intersection are shown in Figure 4. As can be seen in this figure, all approaches currently operate at acceptable LOSs and only the westbound approaches at the intersections with South Boston Road (Route 58) and Halifax Road operate at LOS C in the p.m. peak hour. Table 1 below also shows the existing LOSs for each intersection.

Table 1  
Year 2013 – Existing Intersection Level of Service

INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	AM PEAK HOUR		PM PEAK HOUR	
			LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Kentuck Road and South Boston Road	Signalized	EB	B	12.4	B	14.0
		WB	B	19.7	C	24.5
		SB	B	14.0	B	17.5
Kentuck Road and Shopping Center Entrance	Unsignalized	WB	B	10.9	B	11.7
		NB	A	0.0	A	0.0
		SB	A	0.6	A	1.5
Kentuck Road and Halifax Road	Unsignalized	EB	B	14.4	B	14.3
		WB	B	13.8	C	15.1
		NB	A	0.6	A	0.7
		SB	A	0.1	A	0.1
Kentuck Road and Eagle Springs Road	Unsignalized	EB	B	12.2	A	9.8
		WB	B	13.5	B	13.1
		NB	A	1.1	A	0.2
		SB	A	0.5	A	0.8
Kentuck Road and Ringgold Industrial Park	Unsignalized	EB	B	10.8	B	10.4
		NB	A	0.9	A	0.1
		SB	A	0.0	A	0.0
Kentuck Road and Fall Creek Road	Unsignalized	WB	B	10.1	B	10.7
		NB	A	0.0	A	0.0
		SB	A	0.5	A	1.2
Kentuck Road and Little Creek Road	Unsignalized	EB	B	12.2	B	12.5
		NB	A	2.8	A	2.0
		SB	A	0.0	A	0.0

\* Please note that the LOSs 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 using the methodologies as defined in the Highway Capacity Manual (HCM). The measurement used to define the performance of an intersection is determined by LOS A through F. An 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.

Bicycle and Pedestrian Facilities

Currently Kentuck Road (Route 729) 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 Commonwealth Transportation Board’s (CTB) policy.

In review of the *West Piedmont Regional Bicycle Plan*, revised September 2007, Kentuck Road north of the Danville City Line is indicated as a possible bicycle route connecting to the proposed mixed-use route along the existing railroad bed leading to the Ringgold Depot Trail. Four 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 account for bicycle facilities along Kentuck Road.

Environmental Resources

This section describes the potential environmental resources within the proposed project area. Table 2 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 2  
Environmental Issues

Resources/Issue	Comments
Cultural Resources	A review of U.S. Geological Survey (USGS) topographic maps and aerial photographs identified a cemetery located approximately 1,500 feet south of Lewis Lane and 200 feet west of Kentuck Road; further review of this resource should be conducted. A review of the Virginia Department of Historic Resources Data Sharing System (VDHR DSS) online database noted no known or mapped resources within the project corridor. The absence of mapped resources does not mean resources are not present in the project corridor; it could be attributable to a lack of survey information. A Phase I survey should be conducted once an alternative is identified.
Waters of the U.S., including wetlands	A review of the National Wetland Inventory GIS online mapper noted no known or mapped wetlands within the project corridor. The absence of mapped wetlands does not mean resources are not present on site; a potential cause of the absence could be that a survey was never conducted. A Waters of the U.S. (WOUS)/Wetland delineation should be conducted once an alternative is identified. Three tributaries, Fall Creek and two unnamed tributaries to Cane Creek, are located within the project corridor. One of the tributaries of Fall Creek appears to originate at a culvert outfall under Kentuck Road. Further review of USGS topographic maps and aerial photographs indicate a few areas within the corridor, specifically adjacent to the road that could potentially contain jurisdictional waters/wetlands.

Table 2 (Cont.)  
Environmental Issues

Resources/Issue	Comments
Water Quality Permits	This roadway appears to follow a topographic ridge and as such, only minor drainage crossing and headwater wetland areas exist. Permitting scenarios will vary depending on verification of wetland and stream locations and the location of construction activities. In comparison to similar projects, impacts usually will fit general water quality permits from both the Department of Environmental Quality (DEQ) and the U.S. Army Corps of Engineers (USACE).
Agricultural and Forest Districts, Prime Farmland and Soil	The majority of the project corridor is classified as prime farmland or farmland of statewide importance by the Natural Resources Conservation Service (NRCS). However, a portion of the project corridor is classified by the U.S. Census Bureau as urbanized land and prime or state importance farmland does not apply. Urbanized land does not meet all the requirements set forth by governing bodies to be classified as prime or state important farmland. Coordination with NRCS may be necessary when an alternative is identified for areas classified as prime farmland or farmland of statewide importance located outside the urbanized land.
Threatened and Endangered Species/Wildlife and Waterfowl Refuges	The U.S. Fish and Wildlife Service database (IPaC), Virginia Department of Conservation and Recreation, and the Virginia Department of Game and Inland Fisheries did not note any mapped observations of Federal Endangered (FE), Federal Threatened (FT), State Endangered (SE) or State Threatened (ST) species within the project corridor. The absence of mapped species observation does not mean FE, FT, SE, or ST species are not present. The absence may be because a survey was never conducted. Additionally, the U.S. Fish and Wildlife Service did not list any designated critical habitat. No wildlife or waterfowl refuges are located within the project corridor. A search of the Department of Conservation and Recreation (DCR)'s Biotics Data System was submitted and resulted in the project not affecting any documented state-listed threatened plants or insects.
Hazardous Materials	A review of the Environmental Protection Agency "Enviro-mapper" and the Virginia DEQ website "What's in my Backyard" indicates that multiple known hazardous material sites exist within the project limits and are shown on Figure 5. Acquisitions of land that contains hazardous material will require, at a minimum, a Phase I Environmental Site Assessment (ESA) Report. Multiple Phase I ESA Reports should be anticipated as a result of the past and current use of existing properties and observation of many areas currently being used as trash dump sites. Additionally, acquisition of residential or commercial buildings with lead-based paint and/or asbestos-containing, and/or Recognized Environmental Condition (REC) building materials would be considered an issue for the project and further investigation would be required.

Table 2 (Cont.)  
Environmental Issues

Resources/Issue	Comments
FEMA	There are no FEMA floodplains within the project corridor. An adjacent tributary, Cane Creek, has a FEMA-Mapped Floodplain but does not encroach into the corridor.
Well and Septic	Well and septic locations within the project corridor are not known at this time. A request for records of locations should be submitted to the health department once an alternative is identified. There is a potential for a complete parcel take if a septic system is required to be removed, and an alternative field and/or public utilities hookup cannot be provided.

### Traffic Safety/Crash Data Analysis

Crash data from the most recent 3-year period (2008 to 2010) for the corridor were provided by VDOT. After review of the data, the results identified three locations along the 2.73-mile-long segment of Kentuck Road where numerous crashes occurred, which are identified below:

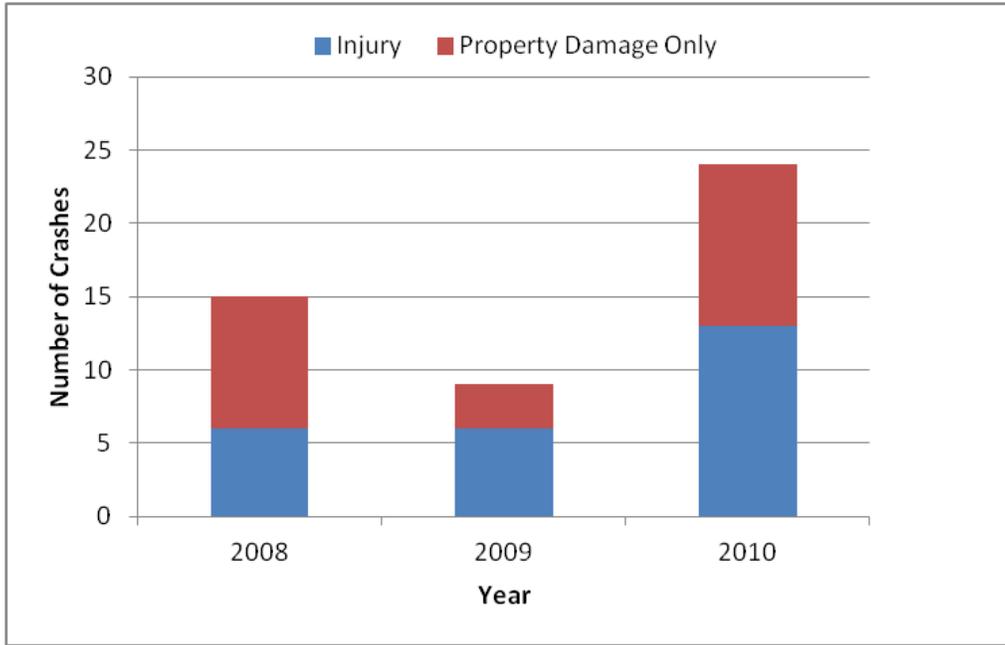
1. Intersection of Kentuck Road and South Boston Road;
2. Intersection of Kentuck Road and the Shopping Center Entrance; and
3. Intersection of Kentuck Road and Halifax Road.

During this period, 48 reported crashes occurred along the study corridor. Of the 48 total reported crashes, 23 resulted in property damage only (PDO) and 25 involved at least one injury. No fatalities were reported. The locations of all individual accidents along this section of roadway are shown in Figure 6. This figure also indicates whether the crash was a PDO or if it resulted in an injury. Figure 7 graphically summarizes the Kentuck Road crash history by year and severity. Appendix F contains the crash data summary sheet.



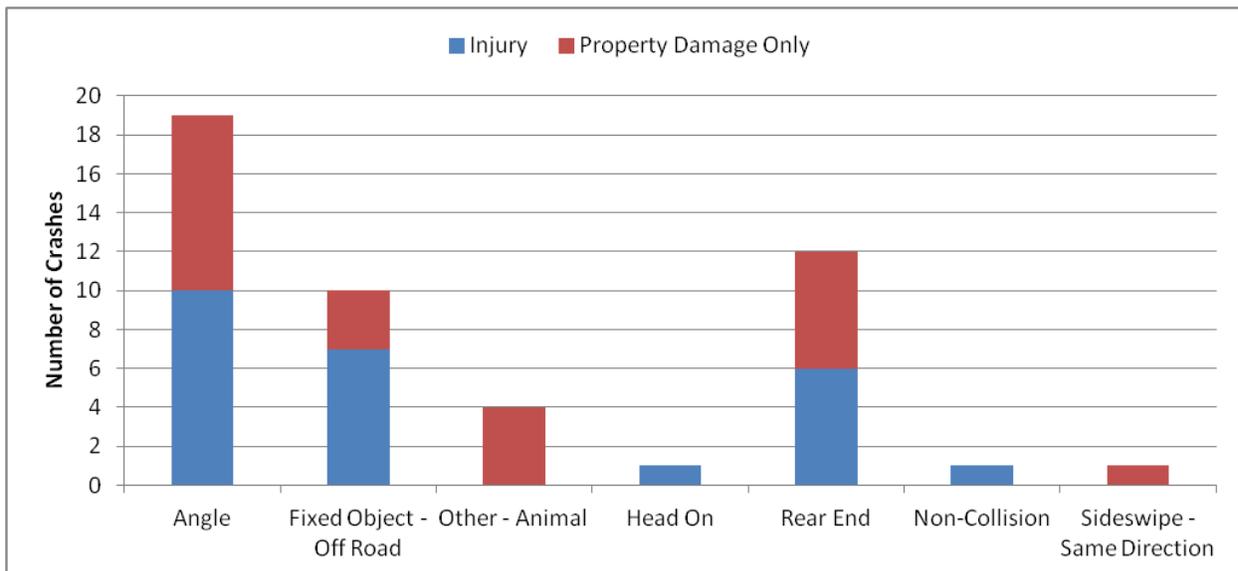


Figure 7  
Severity of Crashes per Year



As displayed in Figure 7 above, more crashes were reported in 2010 than either 2008 or 2009 and both years combined. In addition to the crash severity and total number of crashes, the type and location of accidents were also analyzed. Figure 8 shows the type and severity of the 48 crashes that occurred between 2008 and 2010.

Figure 8  
Type and Severity of Crashes



As displayed in Figure 8 on the previous page, 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 contributing factors worth examining are installation of signalized intersections, appropriate warning signage, and/or paved shoulders and roadway widening.

As part of the safety analysis, the Kentuck Road corridor was studied as two segments, and more specifically at seven intersections. The segments along the corridor include (1) South Boston Road to the City Limit and (2) the City Limit to Route 732. The segments were created based on the classification of the roadway. The crash rates for these segments are listed below:

1. South Boston Road to City Limit: 276.1 per 100 million (100M) vehicle miles traveled
2. City Limit to Route 732: 145 per 100M vehicle miles traveled

The crash rates per the listed segments along Kentuck Road can be compared to the statewide average crash rate of 185 per 100M vehicle miles traveled. The majority of the corridor, from South Boston Road to the City Limit, has a significantly higher crash rate, while the remainder of the corridor from the City Limit to Route 732 is slightly lower compared to the statewide average. Because of the higher crash rate along most of the corridor, further consideration to improve existing conditions is necessary.

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, 15 of the 48 reported accidents were at existing intersections. Of those 15 accidents, eight occurred at the intersection of Halifax Road and Kentuck Road. This intersection currently features two-way stop control. Because of the high number of accidents taking place at this intersection, improvements are required to increase traffic safety.

### III. FUTURE NO-BUILD ALTERNATIVE (YEAR 2035)

Using information obtained from the regional traffic model received from VDOT for this area, Ramey Kemp & 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 average daily traffic (ADT) data. If ADT data was not available, or decreased in the future year, a 1-percent growth rate was assumed.

#### Intersection of Kentuck Road and South Boston Road

Eastbound through movement on South Boston Road and southbound right-turn movement on Kentuck Road: 1.0 percent.

All remaining movements on South Boston Road and Kentuck Road: 1.1 percent.

#### Intersection of Kentuck Road and Shopping Center

All movements on Kentuck Road and Shopping Center: 1.0 percent.

#### Intersection of Kentuck Road and Halifax Road

All movements on Kentuck Road and Halifax Road: 1.0 percent.

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Northbound right-turn movement and southbound left-turn movement on Kentuck Road as well as eastbound through movement and all westbound movements on Halifax Road also included half of the anticipated traffic that could be generated by a light-industrial site employing 111.

Intersection of Kentuck Road and Eagle Springs Road/Wilkerson Road

All movements on Kentuck Road, Eagle Springs Road, and Wilkerson Road: 1.0 percent.

Intersection of Kentuck Road and Ringgold Industrial Parkway

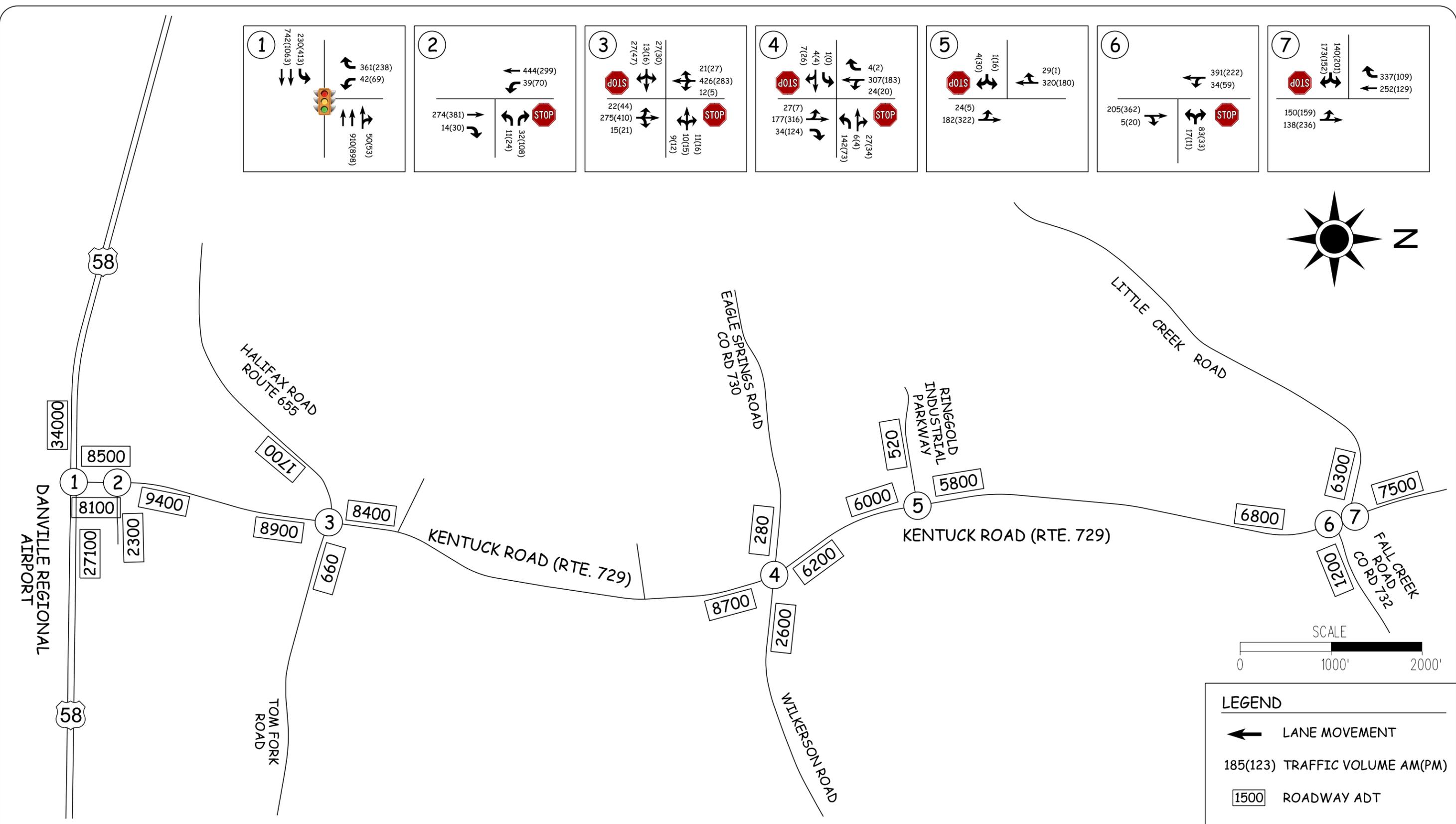
All movements on Kentuck Road and Ringgold Industrial Parkway: 1.0 percent.

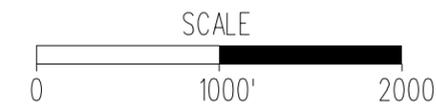
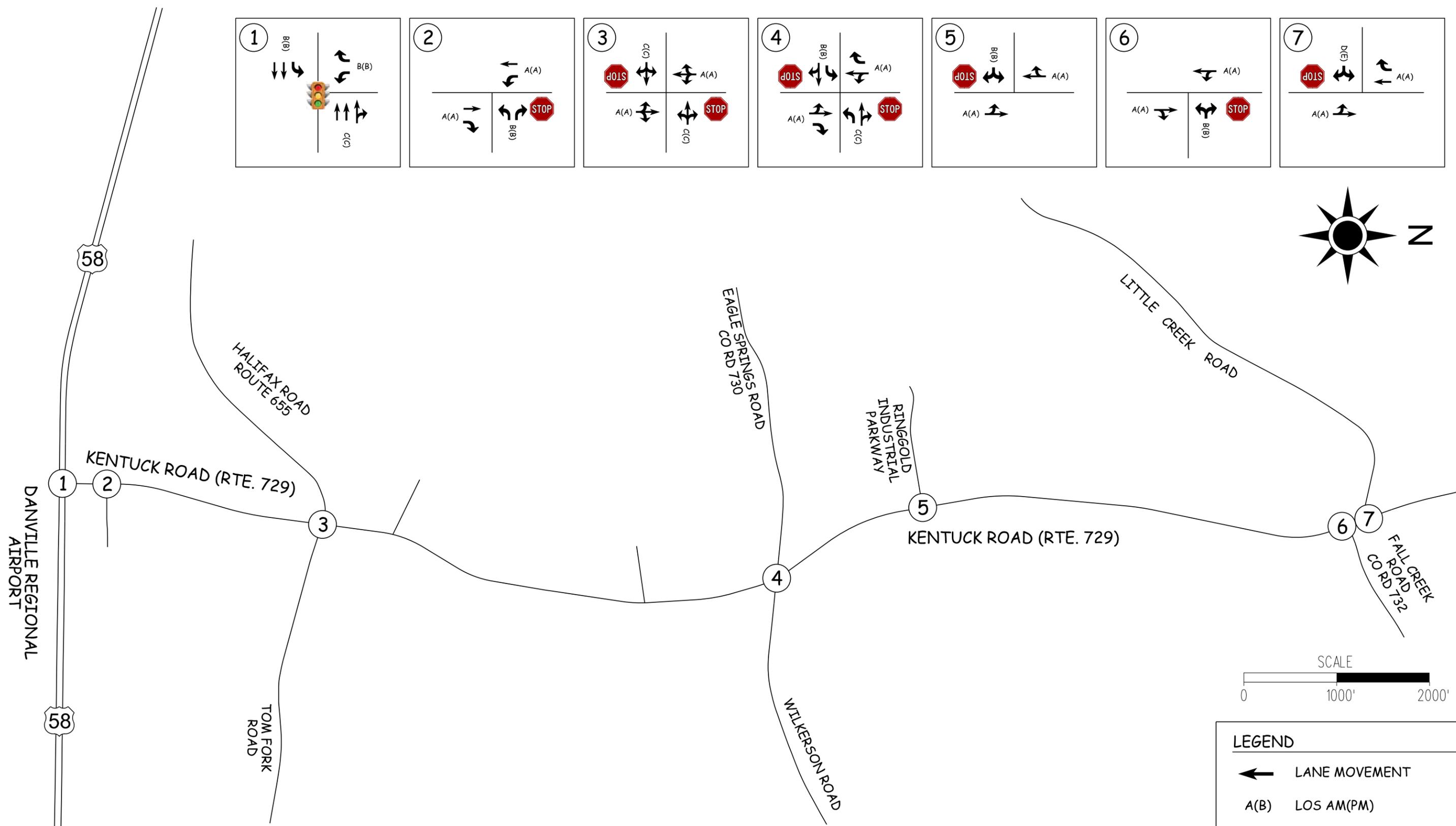
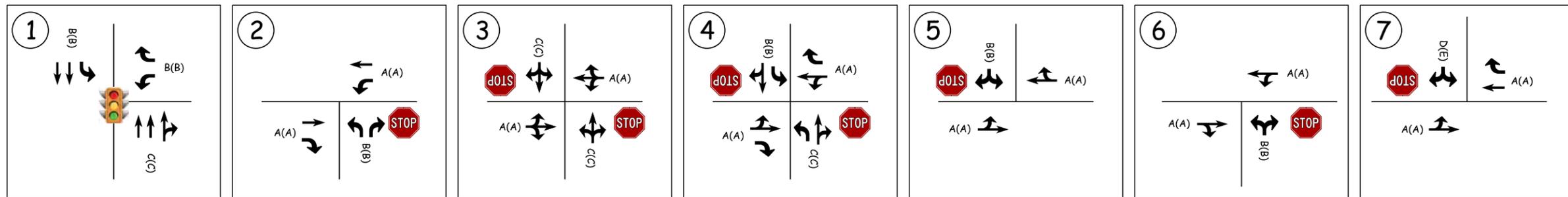
Intersections of Kentuck Road and Little Creek Road and Fall Creek Road

Northbound left-turn movement and southbound right-turn movement on Kentuck Road as well as all eastbound movements on Little Creek Road and the westbound through movement on Fall Creek Road: 4.0 percent.

All remaining movements on Kentuck Road and Fall Creek Road: 1.0 percent.

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





LEGEND	
	LANE MOVEMENT
A(B)	LOS AM(PM)

As shown in Figure 10 on the previous page, the LOSs for some approaches will deteriorate to unacceptable levels (LOS D and below) at several intersections. The LOSs for the no-build alternative are also shown in Table 3 below.

Table 3  
Year 2035 – Future No-Build Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and South Boston Road	Signalized	EB	B	13.0	B	15.2
		WB	C	21.6	C	28.0
		SB	B	14.0	B	18.9
Kentuck Road and Shopping Center Entrance	Unsignalized	WB	B	11.9	B	13.3
		NB	A	0.0	A	0.0
		SB	A	0.6	A	1.6
Kentuck Road and Halifax Road	Unsignalized	EB	C	19.1	C	19.3
		WB	C	17.3	C	19.3
		NB	A	0.6	A	0.8
		SB	A	0.2	A	0.1
Kentuck Road and Eagle Springs Road	Unsignalized	EB	B	13.5	B	10.3
		WB	C	16.5	C	15.4
		NB	A	1.1	A	0.2
		SB	A	0.6	A	0.8
Kentuck Road and Ringgold Industrial Park	Unsignalized	EB	B	11.5	B	11.1
		NB	A	0.9	A	0.1
		SB	A	0.0	A	0.0
Kentuck Road and Fall Creek Road	Unsignalized	WB	B	11.4	B	12.6
		NB	A	0.0	A	0.0
		SB	A	0.6	A	1.7
Kentuck Road and Little Creek Road	Unsignalized	EB	D	31.3	E	48.6
		NB	A	4.3	A	3.2
		SB	A	0.0	A	0.0

\* Please note that the LOSs are reported in accordance with the HCM designations.

The complete LOS analysis for the future no-build condition is included in Appendix G for reference.

The most severe deterioration is forecast to occur at Little Creek Road. Poor service levels are expected as a result of the increase in predicted traffic volumes along Kentuck Road. Reduced frequency of adequate gaps between vehicles may increase delays for motorists on secondary street approaches before they can safely enter the traffic stream. As shown by this analysis, improvements to these intersections are required if acceptable LOSs are planned for 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 Kentuck Road Evaluation of Improvements Study is based on addressing the following issues:

1. LOSs at intersections, within the study limits, are anticipated to decrease 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 Kentuck Road to adhere to the 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 Kentuck Road will be analyzed within this study. Evaluation criteria were developed to determine which alternative best meets the needs of this section of roadway. Eight factors were rated by importance on a scale of 1 to 5, with 5 being the most important. These criteria are shown in Table 4 below.

Table 4  
Evaluation Criteria

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

Based on the findings of the future no-build capacity analysis, most intersections will meet adequate capacity requirements and operate at acceptable LOSs, except for the intersection with Little Creek Road. In addition to the capacity analysis, the need for auxiliary turn lanes were evaluated using turn lane warrants contained within Appendix F of the VDOT Roadway Design Manual. Based on the capacity analysis and turn lane warrants, it was determined that no improvements are needed at the intersections of South Boston Road, the Shopping Center, and Ringgold Industrial Parkway on Kentuck Road. A review of the crash data was also completed and many accidents have occurred just north of the South Boston Intersection and at the intersections of Halifax Road and Eagle Springs Road. Given the number of accidents that have occurred along Kentuck Road, just north of South Boston Road, this area should be monitored and if accidents increase or become more severe, measures may need to be taken to restrict movements, such as constructing channelized islands within driveways, a median island on Kentuck Road, or even driveway closure. Three locations for alternative spot improvements have been identified along this corridor and are shown in Figure 11.



These alternative improvements shown in Figure 11 are broken up into three locations. The first area is at the intersection of Kentuck Road and Halifax Road. The second spot is at the intersection of Kentuck Road and Eagle Springs Road. The last location is at the intersection of Kentuck Road and Fall Creek Road/Little Creek Road. Through the implementation of these improvements, the safety and capacity along this stretch of road will be increased.

Intersection of Kentuck and Halifax Road Improvement Alternatives

As identified on Figure 11, three alternatives for improvements at the intersection of Kentuck Road and Halifax Road were developed. Alternative 1 consists of the addition of a 200-foot left-turn lane on the northbound approach and a 100-foot left-turn lane on the southbound approach. Because of the addition of these turn lanes, Kentuck Road will be widened to the east. These improvements are shown in Figure 12. As a result of the widening of Kentuck Road, there are existing power utility poles in conflict, which will have to be relocated in conjunction with these improvements. The addition of turn lanes will reduce delays and improve operation on the stop-controlled approaches, but the eastbound and westbound approaches of Halifax Road will still operate at LOS C in both the AM and PM peak hours. The intersection LOSs are shown in Table 5 below.

Table 5  
Year 2035 – Kentuck and Halifax Alternative 1 Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and Halifax Road	Unsignalized	EB	C	17.7	C	18.3
		WB	C	16.3	C	18.7
		NB	A	0.6	A	0.8
		SB	A	0.1	A	0.1

\* Please note that the LOSs are reported in accordance with the HCM designations.

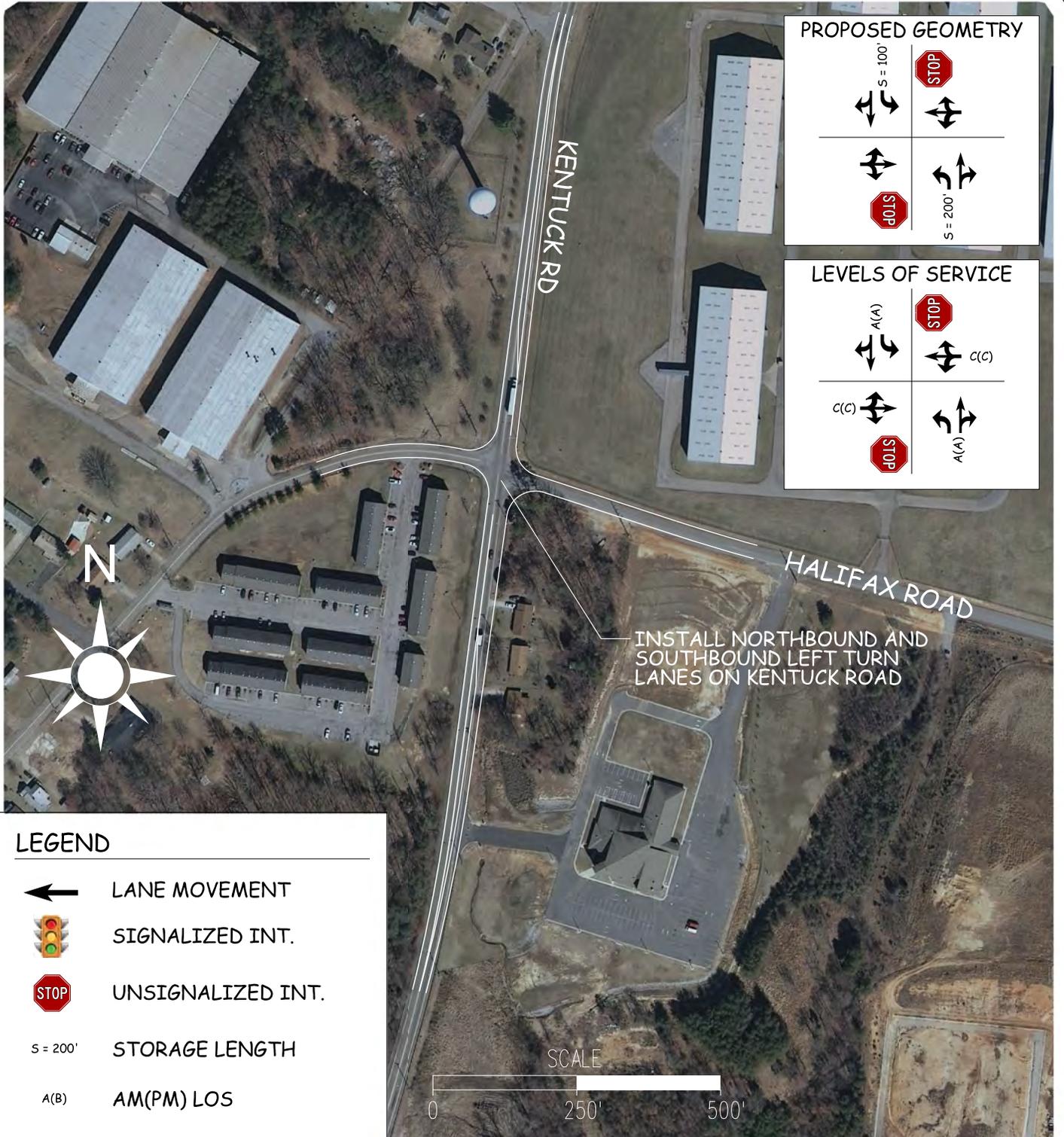
The preliminary estimate of probable cost indicates that these improvements could cost approximately \$927,000 to design and construct. A more detailed breakdown of the cost is included in Appendix H.

Alternative 2 consists of the addition of 100-foot left-turn lanes on the northbound and southbound approaches as well as the installation of a traffic signal. However, based on an evaluation of the Manual on Uniform Traffic Control Devices (MUTCD) Traffic Signal Warrants and four-hour traffic data, no warrants are met at this location. The traffic signal warrant analysis is included in Appendix I for reference. These improvements are shown in Figure 13. The improvements will raise the LOSs for both the eastbound and westbound approaches to LOS B. The intersection LOSs resulting from these improvements are shown in Table 6 below.

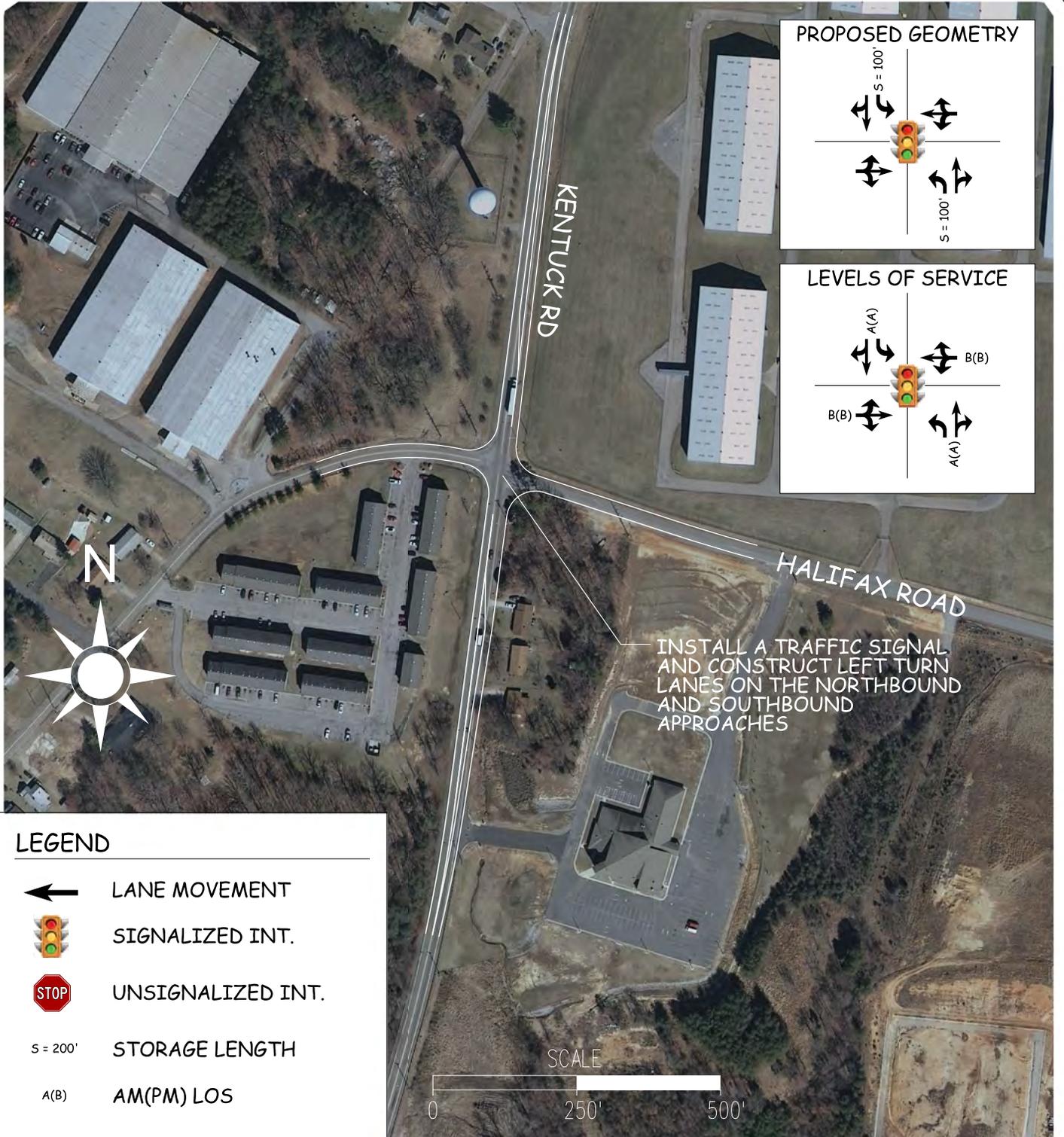
Table 6  
Year 2035 – Kentuck and Halifax Alternative 2 Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and Halifax Road	Signalized	EB	B	10.0	B	10.3
		WB	B	11.2	B	11.3
		NB	A	4.4	A	8.0
		SB	A	5.1	A	6.9

\* Please note that the LOSs are reported in accordance with the HCM designations.



KENTUCKY ROAD AND HALIFAX ROAD  
 INTERSECTION ALTERNATIVE 1 IMPROVEMENTS  
 PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA



KENTUCK ROAD AND HALIFAX ROAD  
 INTERSECTION ALTERNATIVE 2 IMPROVEMENTS  
 PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA



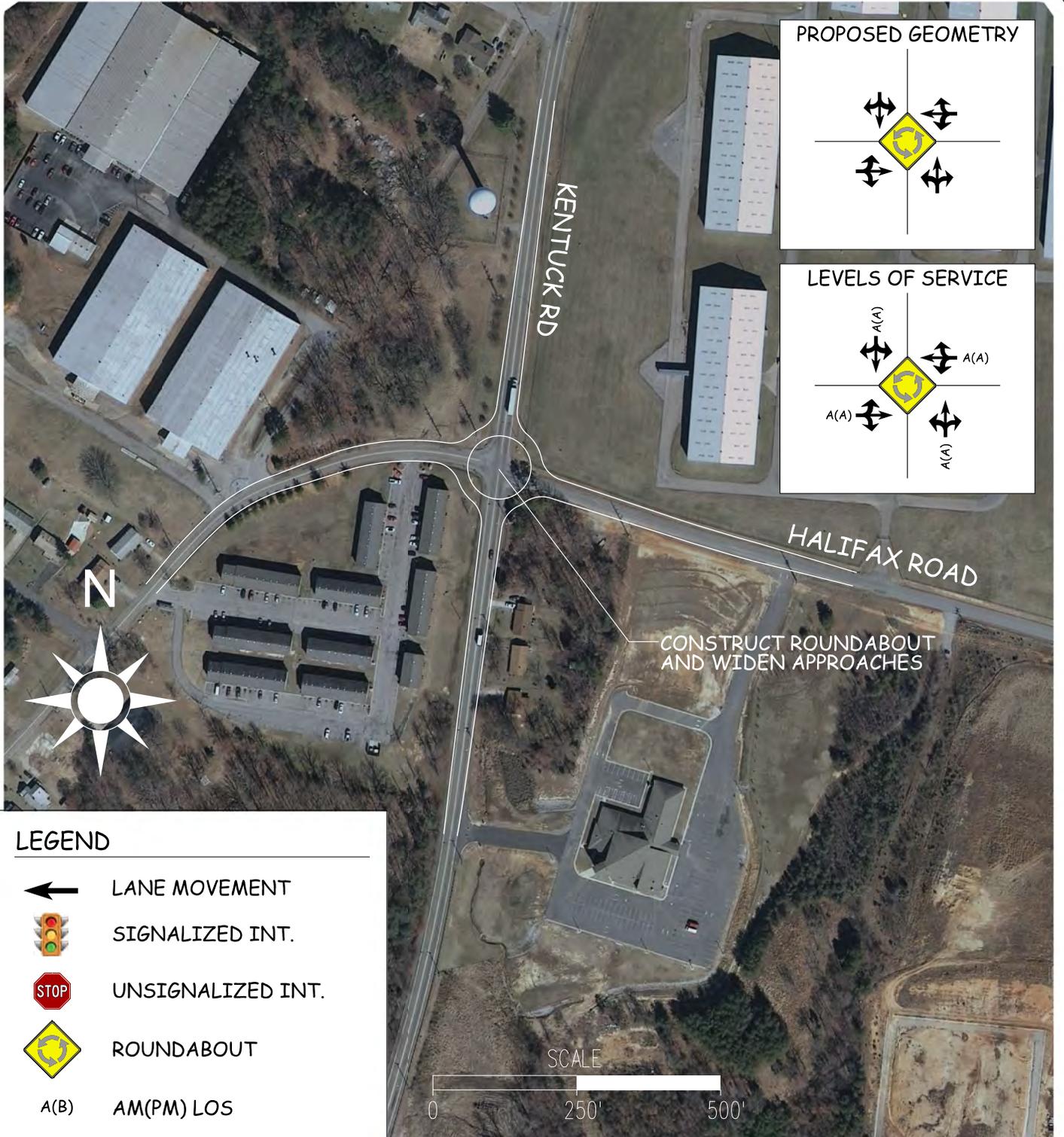
**Dewberry**



**RAMEY KEMP  
 &  
 ASSOCIATES**  
 TRANSPORTATION ENGINEERS

FIGURE

13



KENTUCK ROAD AND HALIFAX ROAD  
 INTERSECTION ALTERNATIVE 3 IMPROVEMENTS  
 PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA

As can be seen in Table 6, the addition of a traffic signal will increase the delay along the major route, Kentuck Road, but will raise the level of services for both the eastbound and westbound approaches. The preliminary estimate of probable cost indicates that these improvements could cost approximately \$1,159,000 to design and construct. A more detailed breakdown of the cost is included in Appendix H.

Alternative 3 consists of the construction of a single-lane roundabout with widened approaches of each leg. Figure 14 shows the improvements for this alternative. As a result of the construction of a roundabout, many conflicts with existing utilities will arise. The main conflicts exist with the overhead electric utility poles, but impacts to the underground water, gas or fiber optic lines could also occur. With these improvements, the LOSs for all approaches will be LOS A. These LOSs are shown in Table 7 below.

Table 7  
Year 2035 – Kentuck and Halifax Alternative 3 Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and Halifax Road	Roundabout	EB	A	6.5	A	5.8
		WB	A	5.3	A	6.3
		NB	A	7.2	A	9.6
		SB	A	9.1	A	7.2

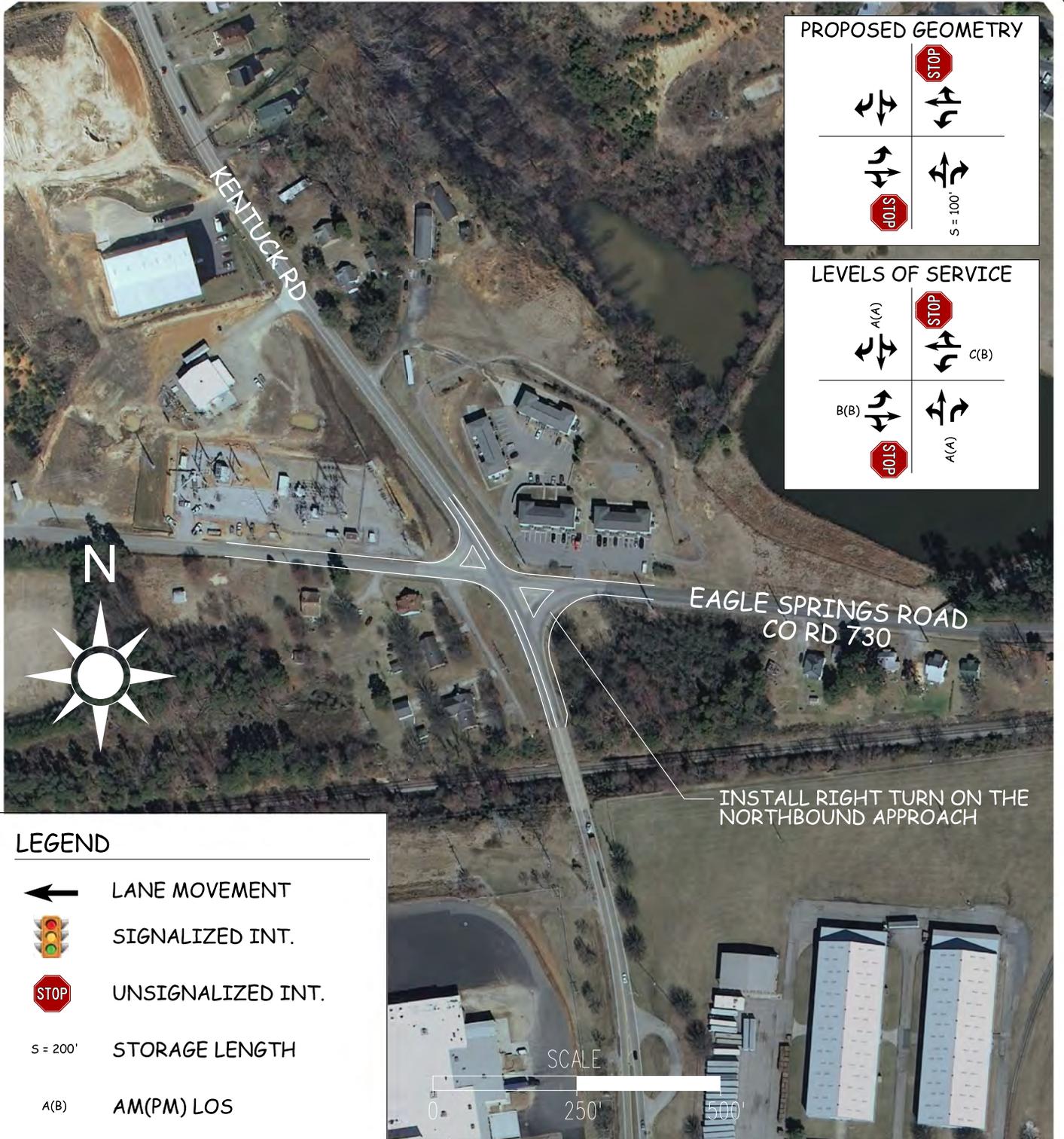
\* Please note that the LOSs are reported in accordance with the HCM designations.

The construction of a roundabout will not only increase the LOSs at this intersection (as can be seen in Table 7) but should also help to reduce the frequency and severity of crashes. The preliminary estimate of probable cost indicates that these improvements could cost approximately \$2,539,000 to design and construct. A more detailed breakdown of the cost is included in Appendix H.

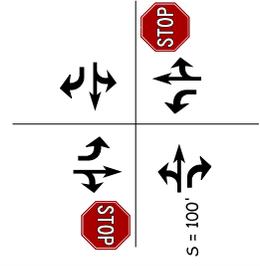
In review of these three alternatives described above, all will increase the capacity of the intersection but to different levels. Using the Evaluation Criteria identified in Table 4, the three alternatives were compared to determine the preferred alternative, and this comparison is shown in greater detail in Section VI of this report.

Intersection of Kentuck and Eagle Springs Road Improvement Alternatives

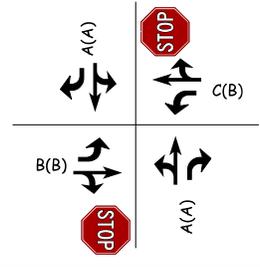
As identified on Figure 11, two alternatives for improvements at the intersection of Kentuck Road and Eagle Springs Road were developed. Alternative 1 consists of the addition of a 100-foot right-turn lane on the northbound approach. These improvements are shown in Figure 15. Because of this widening, the existing power utility poles that are in conflict will need to be relocated. These improvements will help reduce delays and improve operation on the stop-controlled approaches. The intersection LOSs are shown in Table 8.



PROPOSED GEOMETRY



LEVELS OF SERVICE



LEGEND

- LANE MOVEMENT
- SIGNALIZED INT.
- UNSIGNALIZED INT.
- S = 200' STORAGE LENGTH
- A(B) AM(PM) LOS

KENTUCK ROAD AND EAGLE SPRINGS ROAD INTERSECTION ALTERNATIVE 1 IMPROVEMENTS PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA



**Dewberry**



**RAMEY KEMP & ASSOCIATES**  
TRANSPORTATION ENGINEERS

FIGURE

15

**Table 8**  
Year 2035 – Kentuck and Eagle Springs Alternative 1 Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and Eagle Springs Road	Unsignalized	EB	B	13.5	B	10.3
		WB	C	16.1	B	14.3
		NB	A	1.1	A	0.2
		SB	A	0.6	A	0.8

\* Please note that the LOSs are reported in accordance with the HCM designations.

The preliminary estimate of probable cost indicates that these improvements could cost approximately \$212,000 to design and construct. A more detailed breakdown of the cost is included in Appendix J.

Alternative 2 consists of the removal of the northbound channelization and the addition of a 100-foot right-turn lane on the northbound approach and a 100-foot right-turn lane on the westbound approach. These improvements are shown in Figure 16. Because of the addition of these turn lanes, the existing power utility poles that are in conflict will have to be relocated. The additions of these turn lanes will help reduce delays and improve operation on the stop-controlled approaches. The intersection LOSs are shown in Table 9.

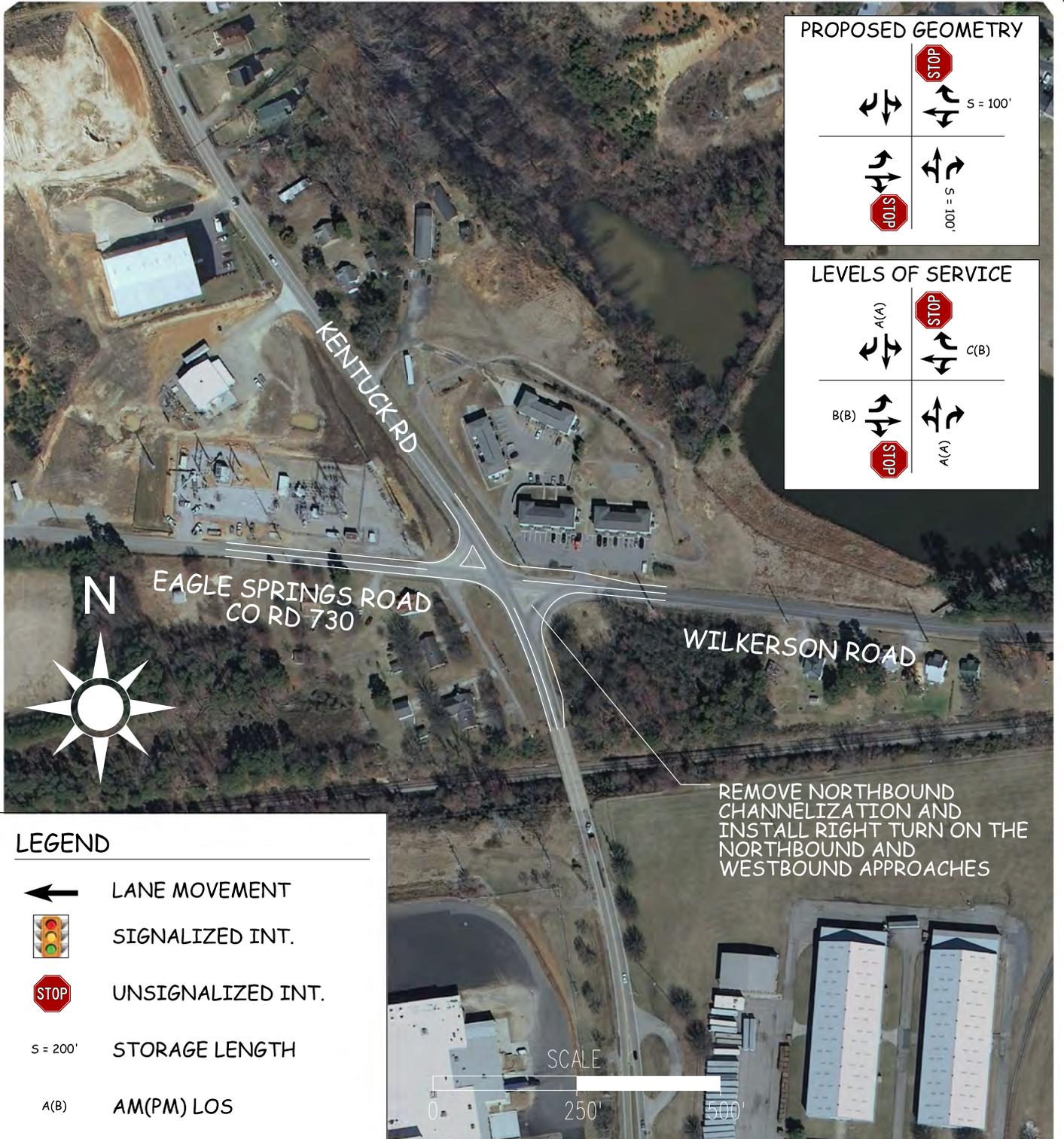
**Table 9**  
Year 2035 – Kentuck and Eagle Springs Alternative 2 Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and Eagle Springs Road	Unsignalized	EB	B	13.5	B	10.3
		WB	C	17.4	B	14.7
		NB	A	0.9	A	0.1
		SB	A	0.6	A	0.8

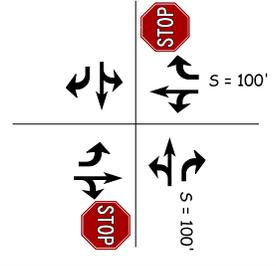
\* Please note that the LOSs are reported in accordance with the HCM designations.

The preliminary estimate of probable cost indicates that these improvements could cost approximately \$267,000 to design and construct. A more detailed breakdown of the cost is included in Appendix J.

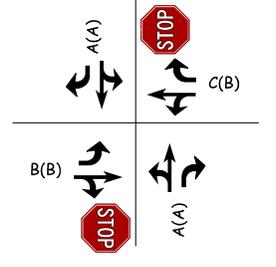
In review of these two alternatives described above, both will increase the capacity and safety of the intersection but to different levels. Using the Evaluation Criteria identified in Table 4, the two alternatives were compared to determine the preferred alternative, and this comparison is shown in greater detail in Section VI of this report.



**PROPOSED GEOMETRY**



**LEVELS OF SERVICE**



**LEGEND**

- LANE MOVEMENT
- SIGNALIZED INT.
- UNSIGNALIZED INT.
- $S = 200'$  STORAGE LENGTH
- $A(B)$  AM(PM) LOS

**KENTUCK ROAD AND EAGLE SPRINGS ROAD INTERSECTION ALTERNATIVE 2 IMPROVEMENTS PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA**



**Dewberry**



**RAMEY KEMP & ASSOCIATES**  
TRANSPORTATION ENGINEERS

FIGURE

**16**

Intersection of Kentuck and Fall Creek/Little Creek Road Improvement Alternatives

As identified on Figure 11, three alternatives for improvements at the intersection of Kentuck Road and Fall Creek Road/Little Creek Road were developed. Alternative 1 consists of the construction of a center-turn lane on Kentuck Road between Fall Creek Road and Little Creek Road in addition to construction of a 150-foot right-turn lane on the eastbound approach and extension of the right-turn lane on the southbound approach to provide 100 feet of storage. Because of the addition of this center-turn lane, Kentuck Road will be widened to the east. These improvements are shown in Figure 17. As a result of the widening of Kentuck Road, the existing power utility poles that are in conflict will have to be relocated. The addition of these turn lanes will help reduce delays and improve operation on the stop-controlled approaches. The intersection LOSs are shown in Table 10 below.

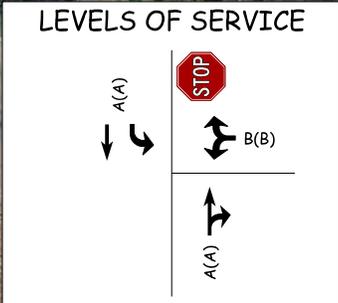
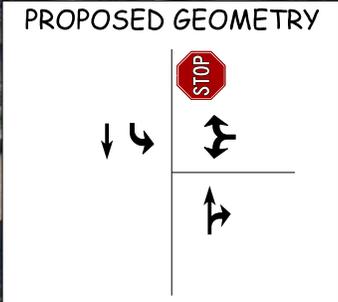
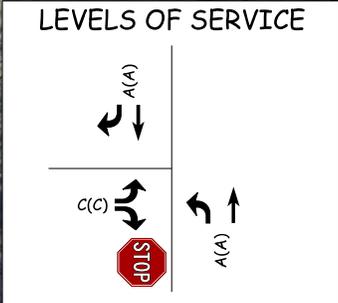
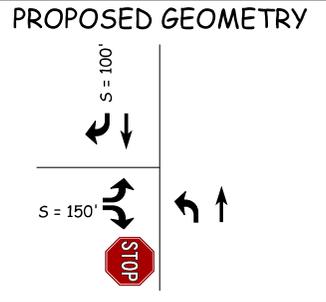
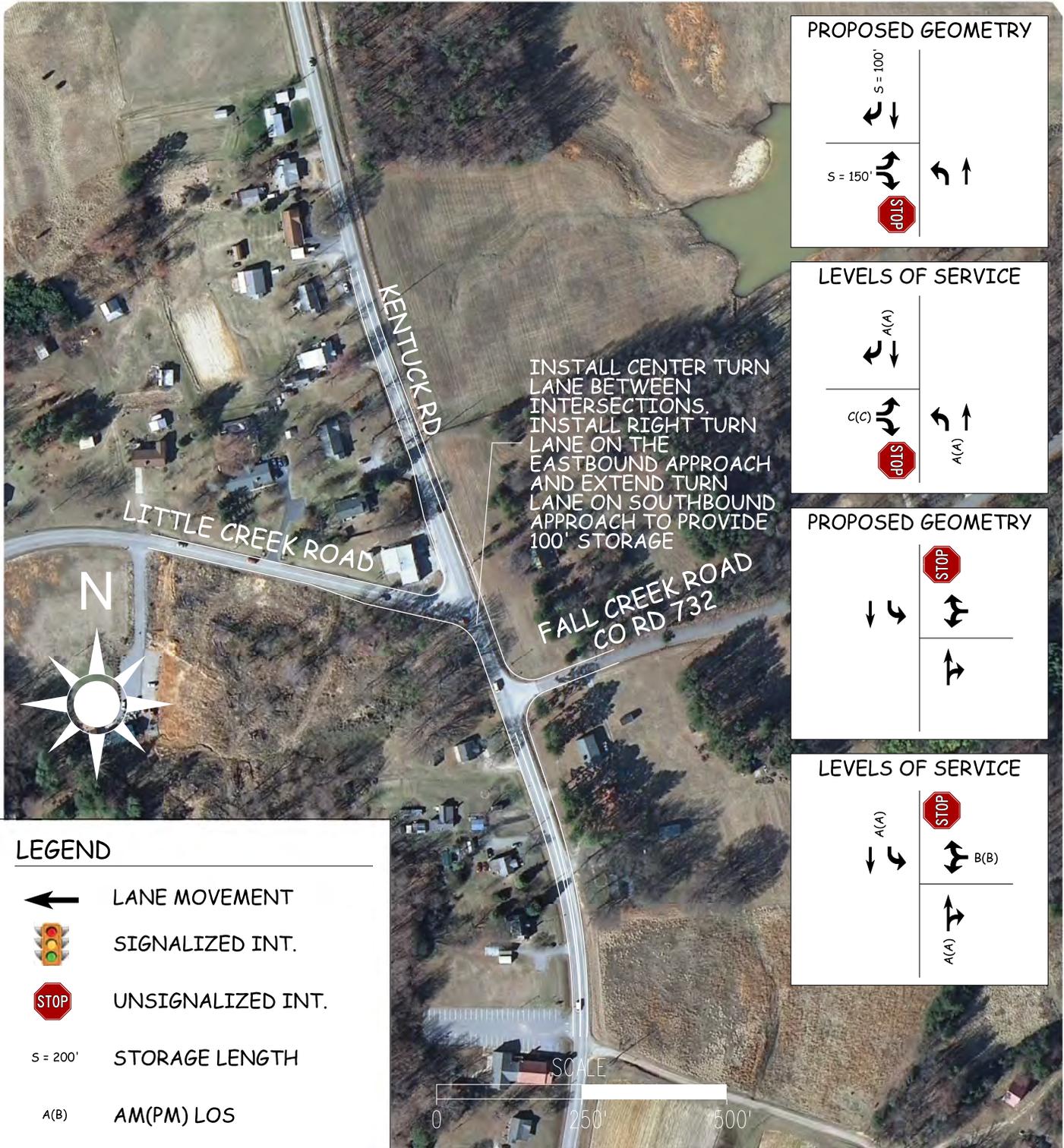
Table 10  
Year 2035 – Kentuck and Fall Creek/Little Creek Alternative 1 Intersection Level of Service

INTERSECTION	TYPE OF CONTROL	MOVEMENT APPROACH	AM PEAK HOUR		PM PEAK HOUR	
			LEVEL OF SERVICE*	DELAY (SEC/VEH)	LEVEL OF SERVICE*	DELAY (SEC/VEH)
Kentuck Road and Fall Creek Road	Unsignalized	WB	B	11.3	B	12.5
		NB	A	0.0	A	0.0
		SB	A	0.6	A	1.7
Kentuck Road and Little Creek Road	Unsignalized	EB	C	17.8	C	24.8
		NB	A	4.3	A	3.2
		SB	A	0.0	A	0.0

\* Please note that the LOSs are reported in accordance with the HCM designations.

The preliminary estimate of probable cost indicates that these improvements could cost approximately \$1,318,000 to design and construct. A more detailed breakdown of the cost is included in Appendix L.

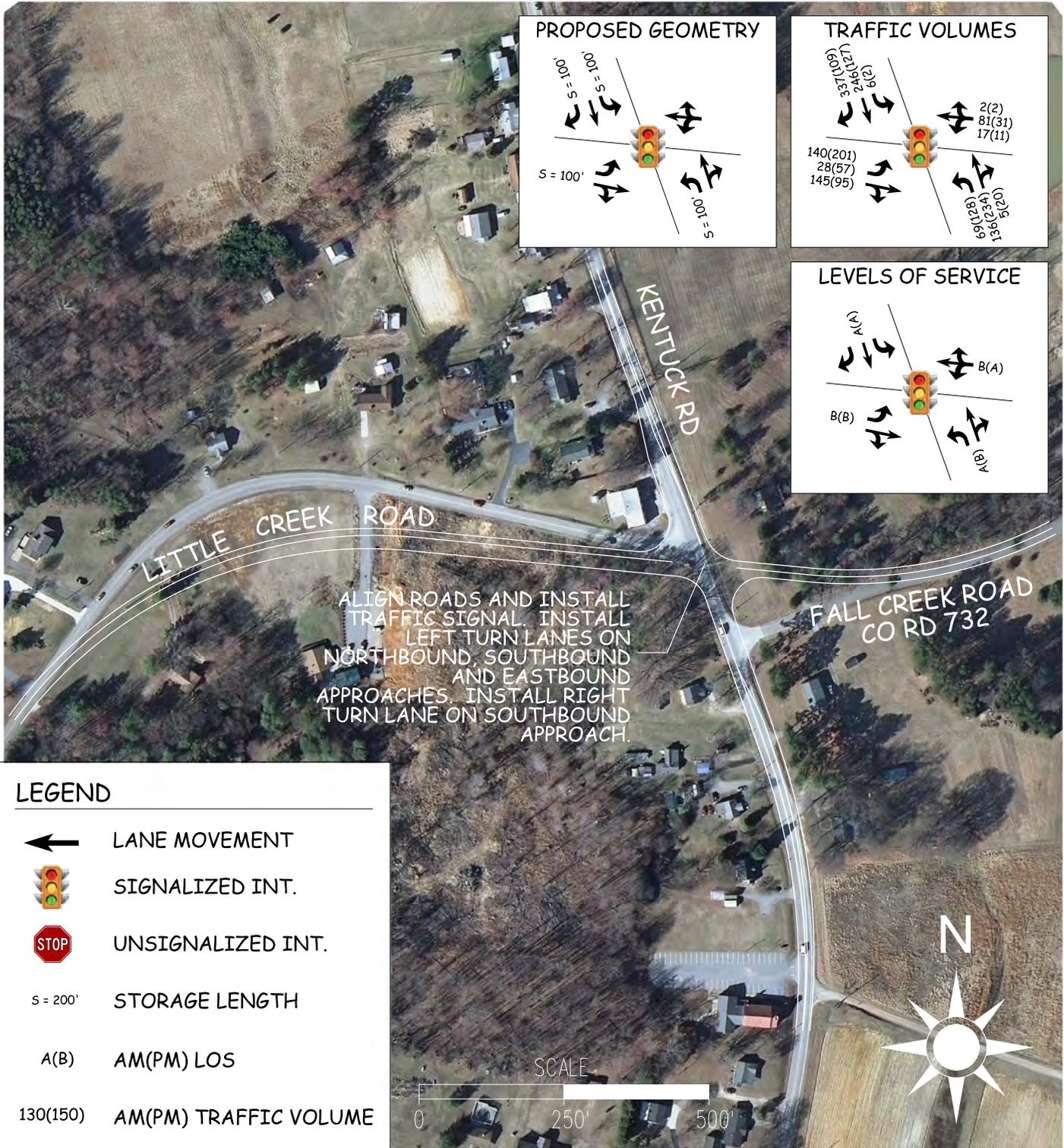
Alternative 2 consists of shifting the alignments of Little Creek Road and Fall Creek Road and the installation of a traffic signal. Based on an evaluation of the MUTCD Traffic Signal Warrants and four-hour traffic data, Warrants 2 (Four-Hour Vehicular Volume) and 3B (Peak Hour) are met at this location. The traffic signal warrant analysis is included in Appendix I for reference. In addition, the construction of 100-foot left-turn lanes on the northbound and southbound approaches as well as a 100-foot left-turn lane on the eastbound approach will be included. These improvements are shown in Figure 18. As a result of the widening of Kentuck Road and relocation of Little Creek Road and Fall Creek Road, many conflicts will arise with existing utilities and right-of-way acquisition. The addition of the turn lanes and a traffic signal will significantly reduce delays and improve operation at this intersection, while also increasing the safety along this section of roadway. The intersection LOSs are shown in Table 11.



**LEGEND**

- ← LANE MOVEMENT
- SIGNALIZED INT.
- UNSIGNALIZED INT.
- S = 200' STORAGE LENGTH
- A(B) AM(PM) LOS

**KENTUCKY ROAD AND LITTLE CREEK/FALL CREEK ROAD INTERSECTION ALTERNATIVE 1 IMPROVEMENTS PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA**



KENTUCK ROAD AND LITTLE CREEK/FALL CREEK ROAD INTERSECTIONS ALTERNATIVE 2 IMPROVEMENTS PITTSYLVANIA COUNTY AND DANVILLE, VIRGINIA



**Table 11**  
 Year 2035 – Kentuck and Fall Creek/Little Creek Alternative 2 Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and Fall Creek/Little Creek Road	Signalized	EB	B	10.0	B	11.7
		WB	B	11.7	A	9.1
		NB	A	9.2	B	12.4
		SB	A	6.4	A	7.4

\* Please note that the LOSs are reported in accordance with the HCM designations.

The preliminary estimate of probable cost indicates that these improvements could cost approximately \$2,553,000 to design and construct. A more detailed breakdown of the cost is included in Appendix L.

Alternative 3 consists of shifting the alignments of Little Creek Road and Fall Creek Road and construction of a single-lane roundabout with widened approaches. These improvements are shown in Figure 19. The roundabout will help reduce delays and improve operation at this intersection, while also increasing the safety along this section of roadway. The intersection LOSs are shown in Table XII.

**Table 12**  
 Year 2035 – Kentuck and Fall Creek/Little Creek Alternative 3 Intersection Level of Service

<u>INTERSECTION</u>	<u>TYPE OF CONTROL</u>	<u>MOVEMENT APPROACH</u>	<u>AM PEAK HOUR</u>		<u>PM PEAK HOUR</u>	
			<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>	<u>LEVEL OF SERVICE*</u>	<u>DELAY (SEC/VEH)</u>
Kentuck Road and Fall Creek/Little Creek Road	Roundabout	EB	A	9.4	A	8.4
		WB	A	6.2	A	6.9
		NB	A	6.5	B	11.2
		SB	C	16.1	A	6.8

\* Please note that the LOSs are reported in accordance with the HCM designations.

The preliminary estimate of probable cost indicates that these improvements could cost approximately \$3,016,000 to design and construct. A more detailed breakdown of the cost is included in Appendix L.

In review of these three alternatives described above, all will increase the capacity and safety of the intersection but to different levels. Using the Evaluation Criteria identified in Table 4, the three alternatives were compared to determine the preferred alternative, and this comparison is shown in greater detail in Section VI of this report.

**VI. PREFERRED SPOT IMPROVEMENTS AND RECOMMENDATIONS**

Three locations along this segment of Kentuck Road have been identified for improvement as a result of safety and capacity issues. The first area is at the intersection of Kentuck Road and Halifax Road. The second spot is at the intersection of Kentuck Road and Eagle Springs Road. The last location is at the intersection of Kentuck Road and Little Creek/Fall Creek Roads. Three alternative improvements were analyzed for the first location, two alternative improvements were discussed for the second location, and three alternative improvements were shown for the last location. As described in the previous section, the alternatives will vary in cost and benefit to the roadway and intersection.

Beginning with Location 1, all of the alternatives will increase capacity and safety. The alternative selected should provide the greatest benefit in traffic flow and public safety based upon the most recent traffic data and design guidelines at the time of selection. Based upon the data and analysis included within this report, the recommended alternative is the installation of a single lane roundabout with widened approaches on each leg (Alternative 3). This improvement will increase the capacity of the intersection and enhance the safety along this section of road. The installation of a traffic signal with turn lanes (Alternative 2) is not recommended at this time because the signal is not warranted per VDOT criteria. However, as the time for implementation of improvements approaches, new accident data and traffic volumes can be collected to determine if signal warrants are met based on this new data. If a signal is warranted then Alternative 2 is recommended. The alternative improvements at Location 2 are also focused on increasing the capacity and bringing the future no-build LOSs up to the acceptable range.

Both alternatives for Location 2 will increase the capacity of the intersection but to differing levels and costs. Dewberry Engineers, Inc. and Ramey Kemp & Associates, Inc. recommend that Alternative 2 (Figure 16) be selected for the Preferred Alternative. This alternative includes the removal of the northbound channelization and the addition of a 100-foot right-turn lane on the northbound approach and a 100-foot right-turn lane on the westbound approach. These improvements will help reduce delays and improve operation on the stop-controlled approaches, specifically adding capacity on the left-turn movement on the westbound approach. The final recommendations along this segment of Kentuck Road are at the intersection of Kentuck Road and Little Creek Road and Fall Creek Road.

All three alternatives will increase the capacity and safety of this intersection, but not all will bring the LOSs to the acceptable range. Dewberry Engineers Inc. and Ramey Kemp & Associates Inc. recommend that Alternative 2 (Figure 18) be selected for the Preferred Alternative. These improvements will provide for the greatest increase in capacity and safety of this intersection while attempting to minimize the impacts to the adjacent property owners.

With the implementation of these alternative improvements at the three locations, not only will the safety along this segment of Kentuck Road be improved, but each intersection will operate at acceptable LOSs in the Year 2035.

APPENDIX A  
MANUAL TRAFFIC COUNTS

# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&LittleCreekAM  
Site Code : 00000000  
Start Date : 2/7/2013  
Page No : 1

## Groups Printed- All Vehicles

Start Time	Kentuck Road From North				Fall Creek Road From East				Kentuck Road From South				Little Creek Road From West				Int. Total
	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	
07:00 AM	14	22	1	0	0	5	2	0	1	14	8	0	14	0	3	0	84
07:15 AM	20	21	0	0	0	7	1	0	1	22	9	0	16	1	16	0	114
07:30 AM	26	33	1	0	0	12	3	0	2	11	4	0	10	0	13	0	115
07:45 AM	33	54	2	1	2	12	7	0	2	53	13	0	26	5	19	0	229
Total	93	130	4	1	2	36	13	0	6	100	34	0	66	6	51	0	542
08:00 AM	43	54	1	0	0	7	2	0	0	26	4	0	18	6	13	0	174
08:15 AM	40	57	1	0	0	3	2	0	0	19	8	1	7	1	14	0	153
08:30 AM	25	26	0	1	2	4	4	0	0	12	6	0	3	1	9	0	93
08:45 AM	25	24	1	1	1	7	1	0	2	11	7	0	4	3	4	0	91
Total	133	161	3	2	3	21	9	0	2	68	25	1	32	11	40	0	511
Grand Total	226	291	7	3	5	57	22	0	8	168	59	1	98	17	91	0	1053
Apprch %	42.9	55.2	1.3	0.6	6	67.9	26.2	0	3.4	71.2	25	0.4	47.6	8.3	44.2	0	
Total %	21.5	27.6	0.7	0.3	0.5	5.4	2.1	0	0.8	16	5.6	0.1	9.3	1.6	8.6	0	

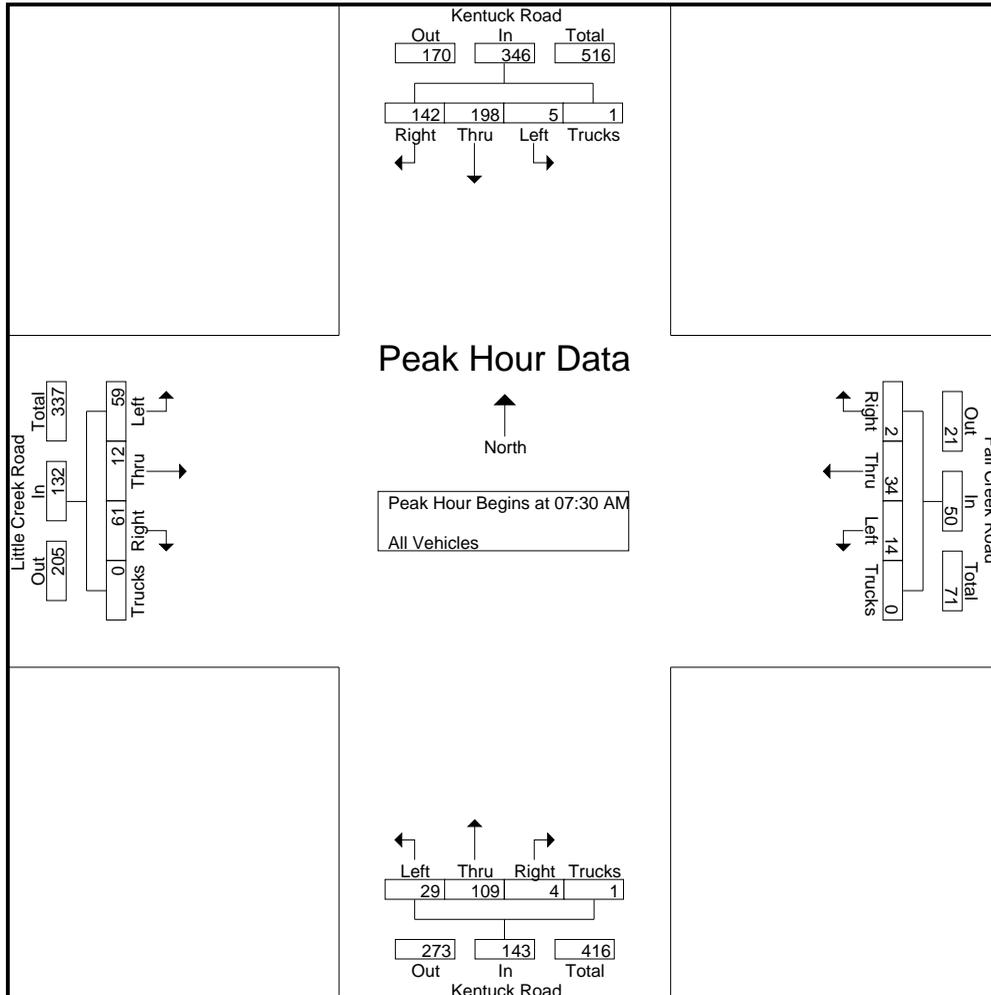
# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
 Winston-Salem, North Carolina 27103  
 336-725-5470

File Name : Kentuck&LittleCreekAM  
 Site Code : 00000000  
 Start Date : 2/7/2013  
 Page No : 2

Start Time	Kentuck Road From North					Fall Creek Road From East					Kentuck Road From South					Little Creek Road From West					Int. Total
	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	
07:30 AM	26	33	1	0	60	0	12	3	0	15	2	11	4	0	17	10	0	13	0	23	115
07:45 AM	33	54	2	1	90	2	12	7	0	21	2	53	13	0	68	26	5	19	0	50	229
08:00 AM	43	54	1	0	98	0	7	2	0	9	0	26	4	0	30	18	6	13	0	37	174
08:15 AM	40	57	1	0	98	0	3	2	0	5	0	19	8	1	28	7	1	14	0	22	153
Total Volume	142	198	5	1	346	2	34	14	0	50	4	109	29	1	143	61	12	59	0	132	671
% App. Total																					
PHF	.826	.868	.625	.250	.883	.250	.708	.500	.000	.595	.500	.514	.558	.250	.526	.587	.500	.776	.000	.660	.733

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 07:30 AM



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&LittleCreekPM  
Site Code : 00000000  
Start Date : 2/6/2013  
Page No : 1

## Groups Printed- All Vehicles

Start Time	Kentuck Road From North				Fall Creek Road From East				Kentuck Road From South				Little Creek Road From West				Int. Total
	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	
04:00 PM	11	23	2	1	0	1	1	0	1	37	23	0	10	5	11	1	127
04:15 PM	11	14	3	0	0	0	1	0	2	43	14	0	5	8	17	0	118
04:30 PM	8	16	1	0	0	1	1	0	2	53	20	0	11	7	17	1	138
04:45 PM	15	21	0	0	0	4	3	0	4	37	9	1	10	4	17	1	126
Total	45	74	6	1	0	6	6	0	9	170	66	1	36	24	62	3	509
05:00 PM	10	27	1	0	0	2	1	0	2	37	16	1	8	2	19	0	126
05:15 PM	9	20	1	0	0	5	1	0	4	59	18	0	11	13	27	1	169
05:30 PM	12	34	0	0	2	2	4	0	6	55	11	1	11	5	22	0	165
05:45 PM	6	20	1	0	0	1	3	0	4	34	10	0	10	5	13	0	107
Total	37	101	3	0	2	10	9	0	16	185	55	2	40	25	81	1	567
Grand Total	82	175	9	1	2	16	15	0	25	355	121	3	76	49	143	4	1076
Apprch %	30.7	65.5	3.4	0.4	6.1	48.5	45.5	0	5	70.4	24	0.6	27.9	18	52.6	1.5	
Total %	7.6	16.3	0.8	0.1	0.2	1.5	1.4	0	2.3	33	11.2	0.3	7.1	4.6	13.3	0.4	

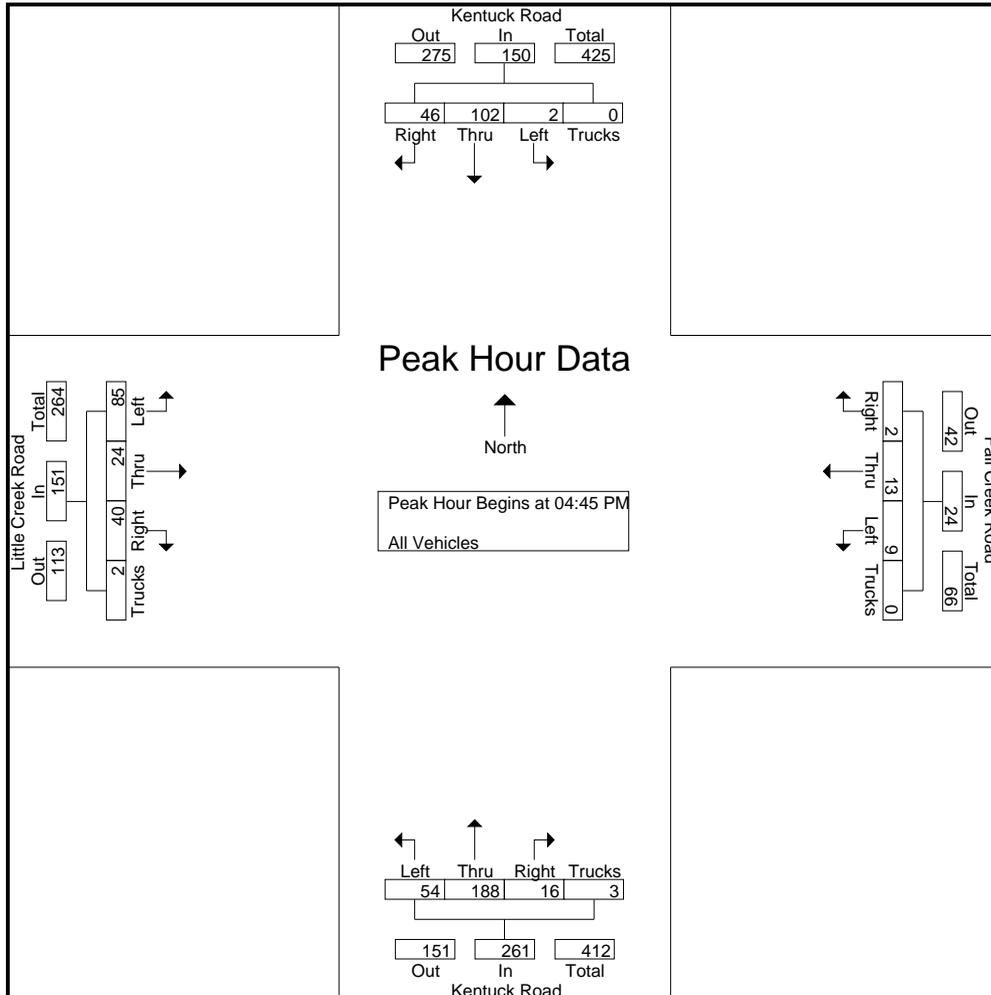
# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
 Winston-Salem, North Carolina 27103  
 336-725-5470

File Name : Kentuck&LittleCreekPM  
 Site Code : 00000000  
 Start Date : 2/6/2013  
 Page No : 2

Start Time	Kentuck Road From North					Fall Creek Road From East					Kentuck Road From South					Little Creek Road From West					Int. Total
	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	
04:45 PM	15	21	0	0	36	0	4	3	0	7	4	37	9	1	51	10	4	17	1	32	126
05:00 PM	10	27	1	0	38	0	2	1	0	3	2	37	16	1	56	8	2	19	0	29	126
05:15 PM	9	20	1	0	30	0	5	1	0	6	4	59	18	0	81	11	13	27	1	52	169
05:30 PM	12	34	0	0	46	2	2	4	0	8	6	55	11	1	73	11	5	22	0	38	165
Total Volume	46	102	2	0	150	2	13	9	0	24	16	188	54	3	261	40	24	85	2	151	586
% App. Total																					
PHF	.767	.750	.500	.000	.815	.250	.650	.563	.000	.750	.667	.797	.750	.750	.806	.909	.462	.787	.500	.726	.867

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 04:45 PM



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&RinggoldAM  
Site Code : 00044444  
Start Date : 2/7/2013  
Page No : 1

## Groups Printed- Vehicles

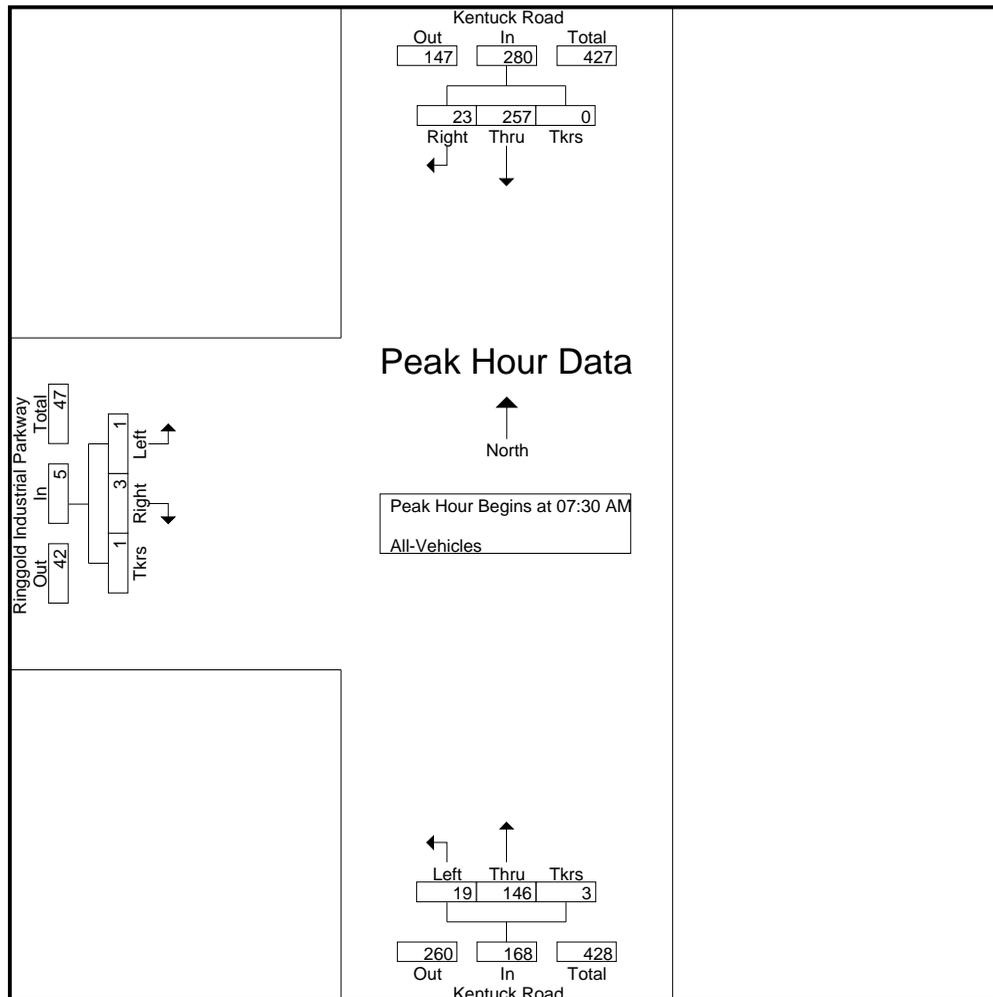
Start Time	Kentuck Road From North			Kentuck Road From South			Ringgold Industrial Parkway From West			Int. Total
	Right	Thru	Tkrs	Thru	Left	Tkrs	Right	Left	Tkrs	
07:00 AM	6	30	0	13	2	0	0	17	0	68
07:15 AM	3	37	0	24	1	0	0	6	0	71
07:30 AM	3	41	0	36	4	0	0	1	0	85
07:45 AM	11	79	0	57	8	0	0	0	0	155
Total	23	187	0	130	15	0	0	24	0	379
08:00 AM	6	67	0	28	3	1	2	0	0	107
08:15 AM	3	70	0	25	4	2	1	0	1	106
08:30 AM	0	30	1	16	3	0	1	0	1	52
08:45 AM	0	34	0	23	3	1	1	0	0	62
Total	9	201	1	92	13	4	5	0	2	327
Grand Total	32	388	1	222	28	4	5	24	2	706
Apprch %	7.6	92.2	0.2	87.4	11	1.6	16.1	77.4	6.5	
Total %	4.5	55	0.1	31.4	4	0.6	0.7	3.4	0.3	

# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&RinggoldAM  
Site Code : 00044444  
Start Date : 2/7/2013  
Page No : 2

Start Time	Kentuck Road From North				Kentuck Road From South				Ringgold Industrial Parkway From West				Int. Total
	Right	Thru	Tkrs	App. Total	Thru	Left	Tkrs	App. Total	Right	Left	Tkrs	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	3	41	0	44	36	4	0	40	0	1	0	1	85
07:45 AM	11	79	0	90	57	8	0	65	0	0	0	0	155
08:00 AM	6	67	0	73	28	3	1	32	2	0	0	2	107
08:15 AM	3	70	0	73	25	4	2	31	1	0	1	2	106
Total Volume	23	257	0	280	146	19	3	168	3	1	1	5	453
% App. Total	8.2	91.8	0		86.9	11.3	1.8		60	20	20		
PHF	.523	.813	.000	.778	.640	.594	.375	.646	.375	.250	.250	.625	.731



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
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336-725-5470

File Name : Kentuck&RinggoldPM  
Site Code : 00044444  
Start Date : 2/6/2013  
Page No : 1

## Groups Printed- Vehicles

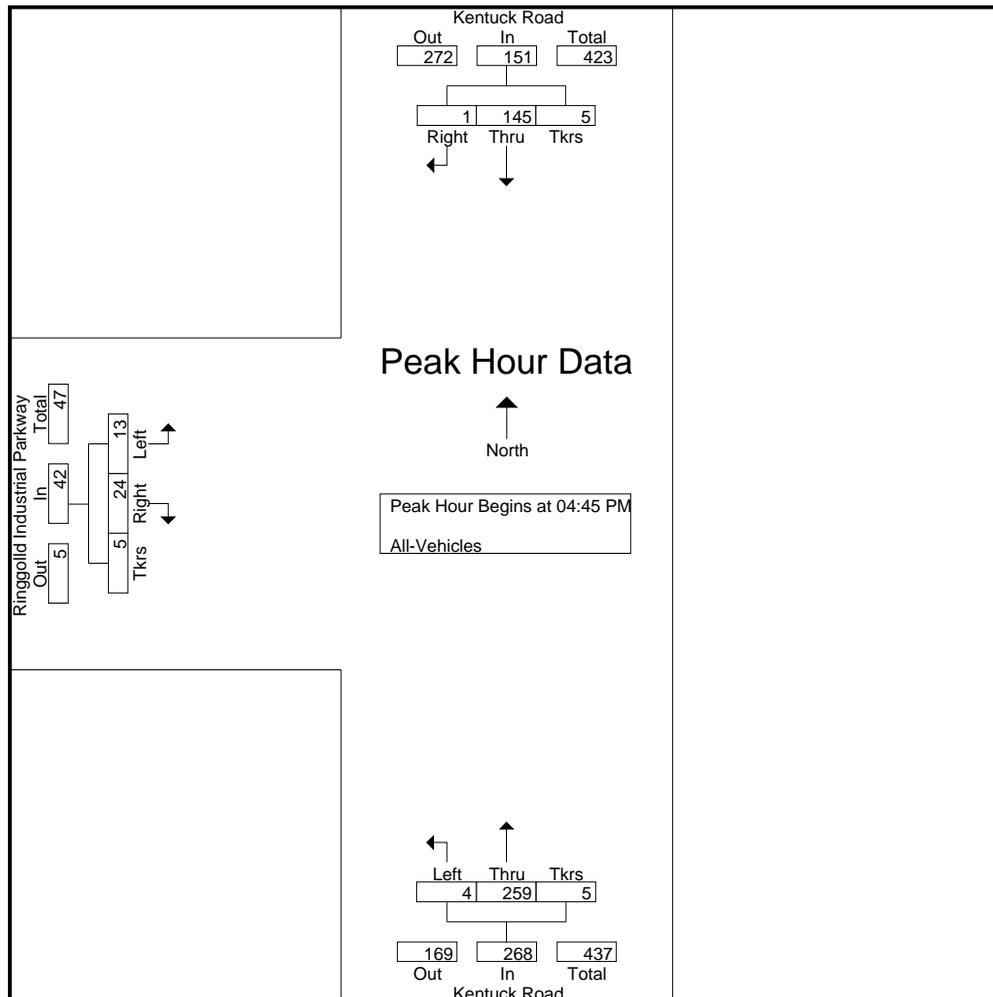
Start Time	Kentuck Road From North			Kentuck Road From South			Ringgolld Industrial Parkway From West			Int. Total
	Right	Thru	Tkrs	Thru	Left	Tkrs	Right	Left	Tkrs	
04:00 PM	1	38	3	59	1	4	9	9	0	124
04:15 PM	0	22	1	64	3	1	4	2	0	97
04:30 PM	0	27	1	62	8	5	8	5	1	117
04:45 PM	1	34	2	54	0	1	0	2	1	95
Total	2	121	7	239	12	11	21	18	2	433
05:00 PM	0	33	2	60	3	3	10	3	2	116
05:15 PM	0	30	1	81	1	1	9	5	1	129
05:30 PM	0	48	0	64	0	0	5	3	1	121
05:45 PM	0	34	0	42	3	1	4	1	3	88
Total	0	145	3	247	7	5	28	12	7	454
Grand Total	2	266	10	486	19	16	49	30	9	887
Apprch %	0.7	95.7	3.6	93.3	3.6	3.1	55.7	34.1	10.2	
Total %	0.2	30	1.1	54.8	2.1	1.8	5.5	3.4	1	

# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
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 336-725-5470

File Name : Kentuck&RinggoldPM  
 Site Code : 00044444  
 Start Date : 2/6/2013  
 Page No : 2

Start Time	Kentuck Road From North				Kentuck Road From South				Ringgold Industrial Parkway From West				Int. Total
	Right	Thru	Tkrs	App. Total	Thru	Left	Tkrs	App. Total	Right	Left	Tkrs	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	1	34	2	37	54	0	1	55	0	2	1	3	95
05:00 PM	0	33	2	35	60	3	3	66	10	3	2	15	116
05:15 PM	0	30	1	31	81	1	1	83	9	5	1	15	129
05:30 PM	0	48	0	48	64	0	0	64	5	3	1	9	121
Total Volume	1	145	5	151	259	4	5	268	24	13	5	42	461
% App. Total	0.7	96	3.3		96.6	1.5	1.9		57.1	31	11.9		
PHF	.250	.755	.625	.786	.799	.333	.417	.807	.600	.650	.625	.700	.893



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&EagleSpringsAM  
Site Code : 00020713  
Start Date : 2/7/2013  
Page No : 1

## Groups Printed- All Vehicles

Start Time	Kentuck Road From North				Wilkerson Road From East				Kentuck Road From South				Eagle Springs Road From West				Int. Total
	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	
07:00 AM	0	29	3	0	3	1	13	0	8	16	2	0	12	2	1	0	90
07:15 AM	1	28	5	0	3	1	16	0	12	21	1	0	7	0	0	0	95
07:30 AM	0	50	5	0	5	3	33	1	6	42	5	1	2	1	1	1	156
07:45 AM	0	69	10	0	9	1	32	1	7	46	6	0	2	2	0	1	186
Total	1	176	23	0	20	6	94	2	33	125	14	1	23	5	2	2	527
08:00 AM	1	67	4	0	5	1	28	0	4	33	4	2	1	0	0	1	151
08:15 AM	2	61	0	1	3	0	21	0	10	21	7	6	1	0	0	0	133
08:30 AM	0	31	1	2	3	0	16	2	6	19	3	1	3	0	0	0	87
08:45 AM	1	45	0	0	2	1	9	1	6	28	1	3	6	0	0	2	105
Total	4	204	5	3	13	2	74	3	26	101	15	12	11	0	0	3	476
Grand Total	5	380	28	3	33	8	168	5	59	226	29	13	34	5	2	5	1003
Apprch %	1.2	91.3	6.7	0.7	15.4	3.7	78.5	2.3	18	69.1	8.9	4	73.9	10.9	4.3	10.9	
Total %	0.5	37.9	2.8	0.3	3.3	0.8	16.7	0.5	5.9	22.5	2.9	1.3	3.4	0.5	0.2	0.5	

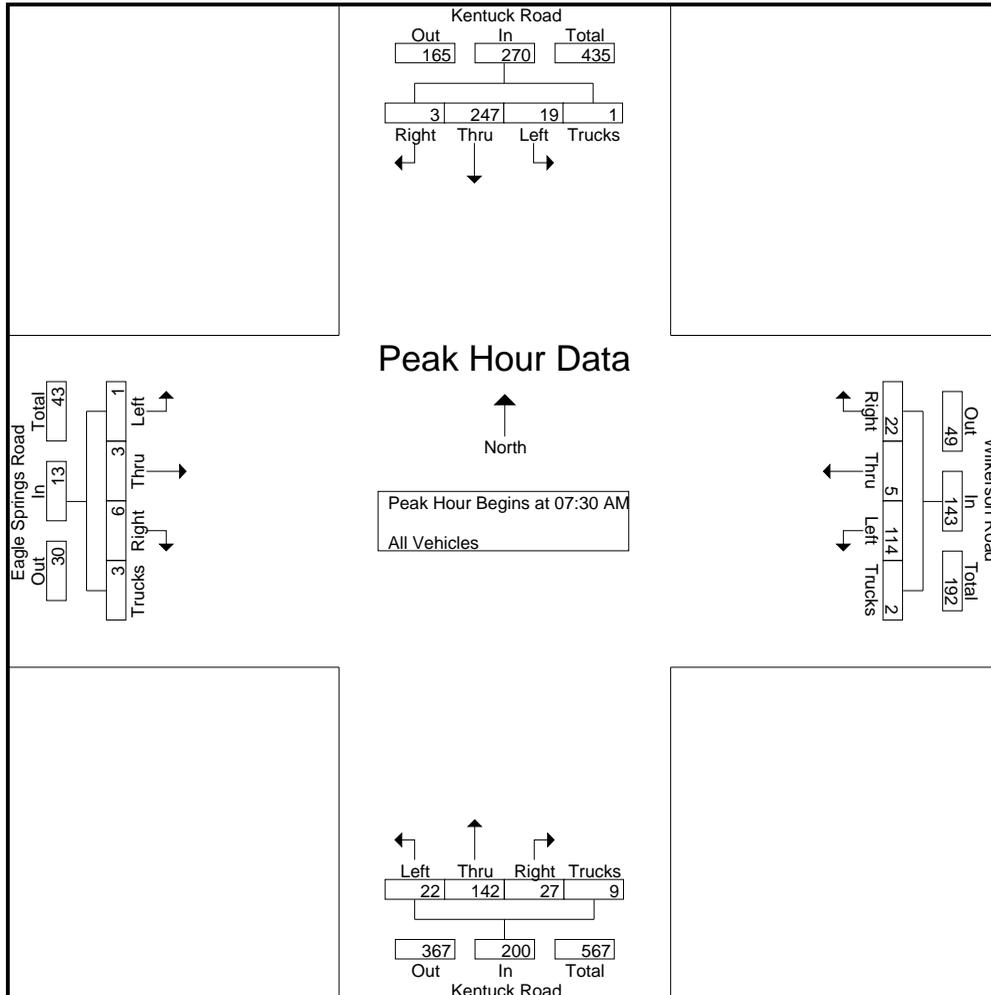
# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
 Winston-Salem, North Carolina 27103  
 336-725-5470

File Name : Kentuck&EagleSpringsAM  
 Site Code : 00020713  
 Start Date : 2/7/2013  
 Page No : 2

Start Time	Kentuck Road From North					Wilkerson Road From East					Kentuck Road From South					Eagle Springs Road From West					Int. Total
	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	
07:30 AM	0	50	5	0	55	5	3	33	1	42	6	42	5	1	54	2	1	1	1	5	156
07:45 AM	0	69	10	0	79	9	1	32	1	43	7	46	6	0	59	2	2	0	1	5	186
08:00 AM	1	67	4	0	72	5	1	28	0	34	4	33	4	2	43	1	0	0	1	2	151
08:15 AM	2	61	0	1	64	3	0	21	0	24	10	21	7	6	44	1	0	0	0	1	133
Total Volume	3	247	19	1	270	22	5	114	2	143	27	142	22	9	200	6	3	1	3	13	626
% App. Total																					
PHF	.375	.895	.475	.250	.854	.611	.417	.864	.500	.831	.675	.772	.786	.375	.847	.750	.375	.250	.750	.650	.841

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 07:30 AM



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&EagleSpringsPM  
Site Code : 00020613  
Start Date : 2/6/2013  
Page No : 1

## Groups Printed- All Vehicles

Start Time	Kentuck Road From North				Wilkerson Road From East				Kentuck Road From South				Eagle Springs Road From West				Int. Total
	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	
04:00 PM	0	40	6	0	7	2	20	0	27	57	2	7	3	3	1	1	176
04:15 PM	1	23	3	1	8	0	19	0	19	61	1	1	2	0	0	0	139
04:30 PM	1	40	4	2	9	1	20	1	27	61	1	6	9	0	0	0	182
04:45 PM	1	35	3	3	4	2	10	0	22	49	1	2	2	1	0	0	135
Total	3	138	16	6	28	5	69	1	95	228	5	16	16	4	1	1	632
05:00 PM	0	35	5	1	7	0	17	1	19	64	0	2	6	1	0	0	158
05:15 PM	0	37	4	2	7	0	12	0	32	80	4	3	4	1	0	2	188
05:30 PM	0	50	4	0	1	1	13	1	21	63	2	2	3	1	0	1	163
05:45 PM	0	39	3	3	4	0	10	1	24	43	2	1	0	0	1	0	131
Total	0	161	16	6	19	1	52	3	96	250	8	8	13	3	1	3	640
Grand Total	3	299	32	12	47	6	121	4	191	478	13	24	29	7	2	4	1272
Apprch %	0.9	86.4	9.2	3.5	26.4	3.4	68	2.2	27.1	67.7	1.8	3.4	69	16.7	4.8	9.5	
Total %	0.2	23.5	2.5	0.9	3.7	0.5	9.5	0.3	15	37.6	1	1.9	2.3	0.6	0.2	0.3	

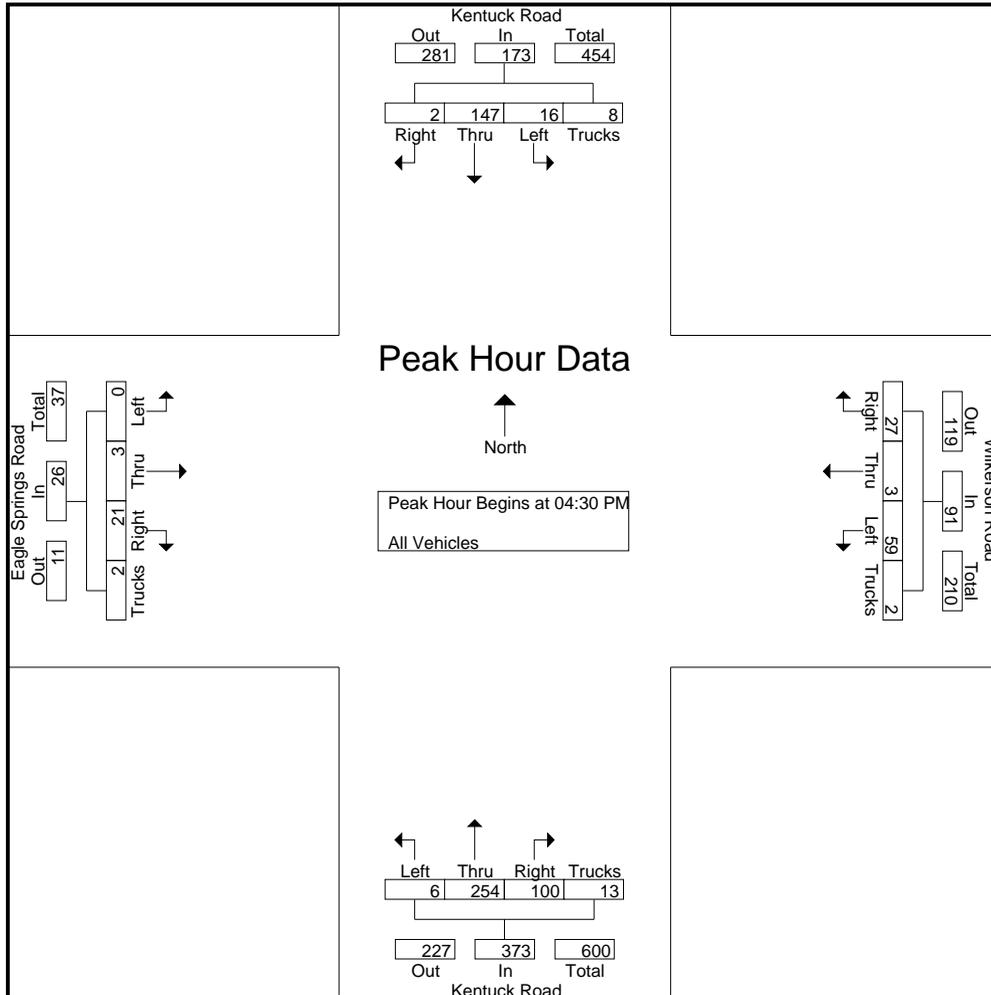
# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
 Winston-Salem, North Carolina 27103  
 336-725-5470

File Name : Kentuck&EagleSpringsPM  
 Site Code : 00020613  
 Start Date : 2/6/2013  
 Page No : 2

Start Time	Kentuck Road From North					Wilkerson Road From East					Kentuck Road From South					Eagle Springs Road From West					Int. Total
	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	
04:30 PM	1	40	4	2	47	9	1	20	1	31	27	61	1	6	95	9	0	0	0	9	182
04:45 PM	1	35	3	3	42	4	2	10	0	16	22	49	1	2	74	2	1	0	0	3	135
05:00 PM	0	35	5	1	41	7	0	17	1	25	19	64	0	2	85	6	1	0	0	7	158
05:15 PM	0	37	4	2	43	7	0	12	0	19	32	80	4	3	119	4	1	0	2	7	188
Total Volume	2	147	16	8	173	27	3	59	2	91	100	254	6	13	373	21	3	0	2	26	663
% App. Total																					
PHF	.500	.919	.800	.667	.920	.750	.375	.738	.500	.734	.781	.794	.375	.542	.784	.583	.750	.000	.250	.722	.882

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 04:30 PM



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&HalifaxAM  
Site Code : 02071303  
Start Date : 2/7/2013  
Page No : 1

## Groups Printed- Vehicles

Start Time	Kentuck Road From North				Halifax Road From East				Kentuck Road From South				Halifax Road From West				Int. Total
	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	
07:00 AM	2	46	1	1	4	3	2	0	2	30	0	5	1	2	2	0	101
07:15 AM	4	48	1	2	0	1	1	0	2	46	2	4	3	0	2	0	116
07:30 AM	6	63	0	1	4	1	0	0	3	63	4	3	5	3	4	0	160
07:45 AM	2	95	0	4	2	1	2	1	1	72	3	2	9	0	5	0	199
Total	14	252	2	8	10	6	5	1	8	211	9	14	18	5	13	0	576
08:00 AM	3	100	2	3	1	2	2	0	1	51	8	4	6	2	8	0	193
08:15 AM	6	84	3	4	1	3	2	0	1	35	3	6	2	0	5	0	155
08:30 AM	3	50	2	4	0	2	0	0	3	30	4	1	3	1	1	0	104
08:45 AM	1	37	1	7	1	5	0	0	3	35	2	5	6	1	2	0	106
Total	13	271	8	18	3	12	4	0	8	151	17	16	17	4	16	0	558
Grand Total	27	523	10	26	13	18	9	1	16	362	26	30	35	9	29	0	1134
Apprch %	4.6	89.2	1.7	4.4	31.7	43.9	22	2.4	3.7	83.4	6	6.9	47.9	12.3	39.7	0	
Total %	2.4	46.1	0.9	2.3	1.1	1.6	0.8	0.1	1.4	31.9	2.3	2.6	3.1	0.8	2.6	0	

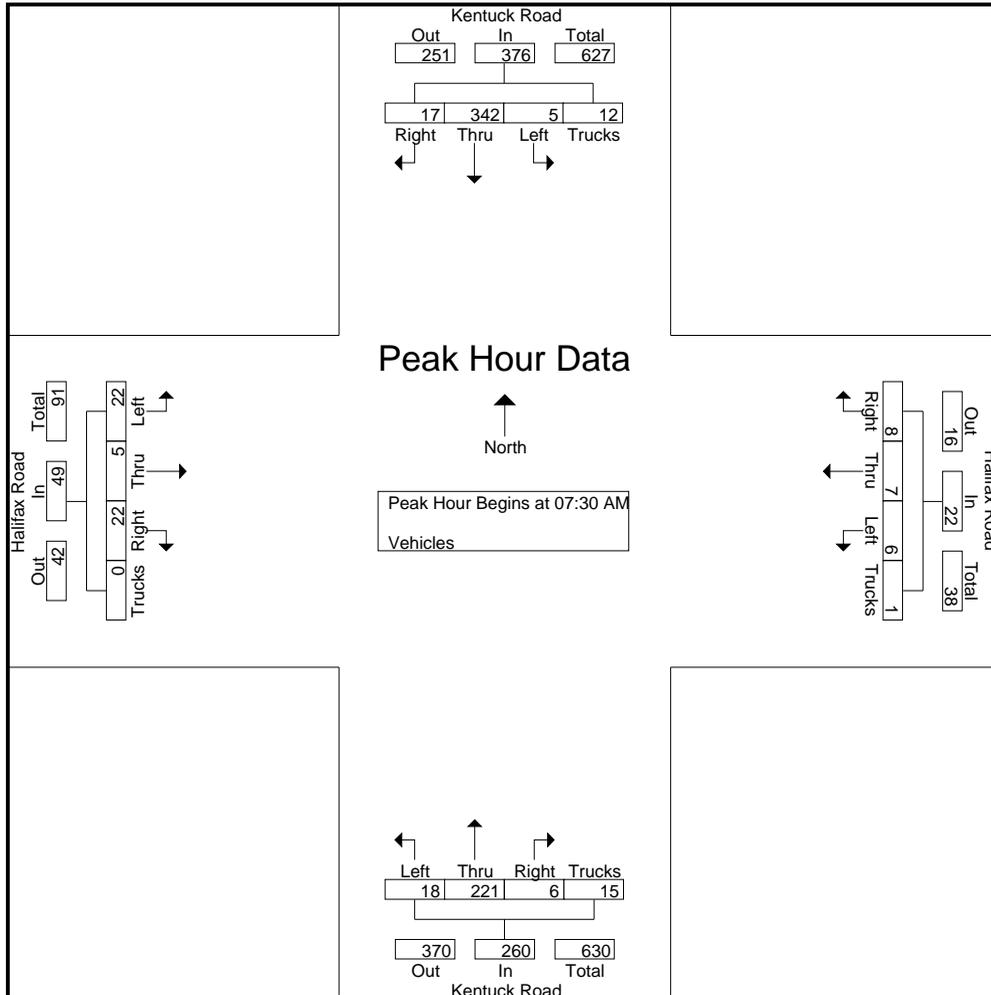
# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
 Winston-Salem, North Carolina 27103  
 336-725-5470

File Name : Kentuck&HalifaxAM  
 Site Code : 02071303  
 Start Date : 2/7/2013  
 Page No : 2

Start Time	Kentuck Road From North					Halifax Road From East					Kentuck Road From South					Halifax Road From West					Int. Total
	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	
07:30 AM	6	63	0	1	70	4	1	0	0	5	3	63	4	3	73	5	3	4	0	12	160
07:45 AM	2	95	0	4	101	2	1	2	1	6	1	72	3	2	78	9	0	5	0	14	199
08:00 AM	3	100	2	3	108	1	2	2	0	5	1	51	8	4	64	6	2	8	0	16	193
08:15 AM	6	84	3	4	97	1	3	2	0	6	1	35	3	6	45	2	0	5	0	7	155
Total Volume	17	342	5	12	376	8	7	6	1	22	6	221	18	15	260	22	5	22	0	49	707
% App. Total																					
PHF	.708	.855	.417	.750	.870	.500	.583	.750	.250	.917	.500	.767	.563	.625	.833	.611	.417	.688	.000	.766	.888

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 07:30 AM



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&HalifaxPM  
Site Code : 02061303  
Start Date : 2/6/2013  
Page No : 1

## Groups Printed- Vehicles

Start Time	Kentuck Road From North				Halifax Road From East				Kentuck Road From South				Halifax Road From West				Int. Total
	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	Right	Thru	Left	Trucks	
04:00 PM	5	74	4	3	1	2	1	0	3	75	4	7	3	1	6	0	189
04:15 PM	1	48	0	2	2	2	3	0	2	71	5	3	9	5	5	0	158
04:30 PM	6	66	1	3	3	1	2	0	1	76	10	3	12	4	5	0	193
04:45 PM	5	48	1	0	0	1	2	0	4	74	9	5	10	1	5	0	165
Total	17	236	6	8	6	6	8	0	10	296	28	18	34	11	21	0	705
05:00 PM	7	65	0	5	1	0	1	0	6	83	4	1	7	2	5	0	187
05:15 PM	4	48	1	2	4	5	3	0	4	96	12	3	9	4	9	0	204
05:30 PM	6	65	3	2	1	1	3	0	4	76	6	2	7	4	6	0	186
05:45 PM	4	50	1	6	0	1	2	0	0	61	8	1	6	2	4	0	146
Total	21	228	5	15	6	7	9	0	14	316	30	7	29	12	24	0	723
Grand Total	38	464	11	23	12	13	17	0	24	612	58	25	63	23	45	0	1428
Apprch %	7.1	86.6	2.1	4.3	28.6	31	40.5	0	3.3	85.1	8.1	3.5	48.1	17.6	34.4	0	
Total %	2.7	32.5	0.8	1.6	0.8	0.9	1.2	0	1.7	42.9	4.1	1.8	4.4	1.6	3.2	0	

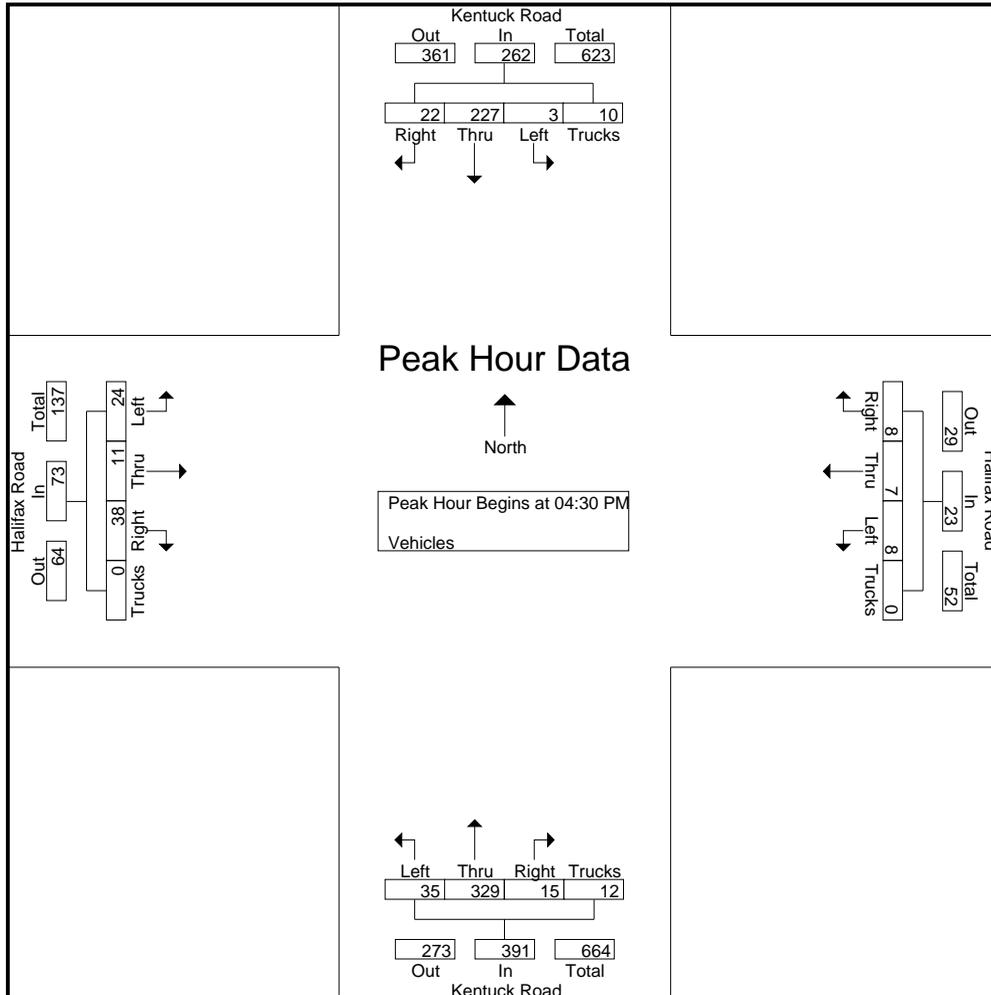
# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
 Winston-Salem, North Carolina 27103  
 336-725-5470

File Name : Kentuck&HalifaxPM  
 Site Code : 02061303  
 Start Date : 2/6/2013  
 Page No : 2

Start Time	Kentuck Road From North					Halifax Road From East					Kentuck Road From South					Halifax Road From West					Int. Total
	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	Right	Thru	Left	Trucks	App. Total	
04:30 PM	6	66	1	3	76	3	1	2	0	6	1	76	10	3	90	12	4	5	0	21	193
04:45 PM	5	48	1	0	54	0	1	2	0	3	4	74	9	5	92	10	1	5	0	16	165
05:00 PM	7	65	0	5	77	1	0	1	0	2	6	83	4	1	94	7	2	5	0	14	187
05:15 PM	4	48	1	2	55	4	5	3	0	12	4	96	12	3	115	9	4	9	0	22	204
Total Volume	22	227	3	10	262	8	7	8	0	23	15	329	35	12	391	38	11	24	0	73	749
% App. Total																					
PHF	.786	.860	.750	.500	.851	.500	.350	.667	.000	.479	.625	.857	.729	.600	.850	.792	.688	.667	.000	.830	.918

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 04:30 PM



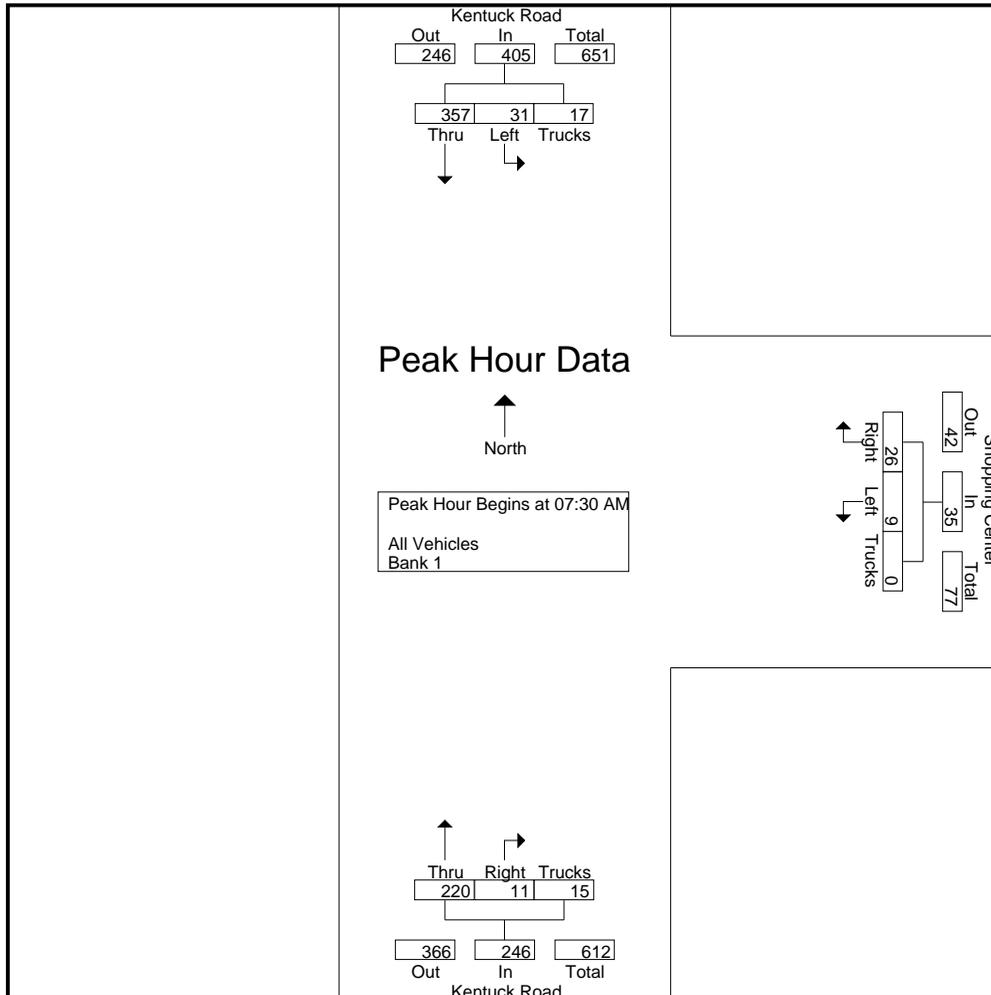


# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
 Winston-Salem, North Carolina 27103  
 336-725-5470

File Name : Kentuck&ShoppingCenterAM  
 Site Code : 00020713  
 Start Date : 2/7/2013  
 Page No : 2

Start Time	Kentuck Road From North				Shopping Center From East				Kentuck Road From South				Int. Total
	Thru	Left	Trucks	App. Total	Right	Left	Trucks	App. Total	Right	Thru	Trucks	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	68	6	2	76	7	1	0	8	3	63	4	70	154
07:45 AM	92	9	6	107	8	1	0	9	3	74	1	78	194
08:00 AM	101	12	4	117	4	6	0	10	4	52	5	61	188
08:15 AM	96	4	5	105	7	1	0	8	1	31	5	37	150
Total Volume	357	31	17	405	26	9	0	35	11	220	15	246	686
% App. Total	88.1	7.7	4.2		74.3	25.7	0		4.5	89.4	6.1		
PHF	.884	.646	.708	.865	.813	.375	.000	.875	.688	.743	.750	.788	.884



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : Kentuck&ShoppingCenterPM  
Site Code : 00020613  
Start Date : 2/6/2013  
Page No : 1

## Groups Printed- All Vehicles

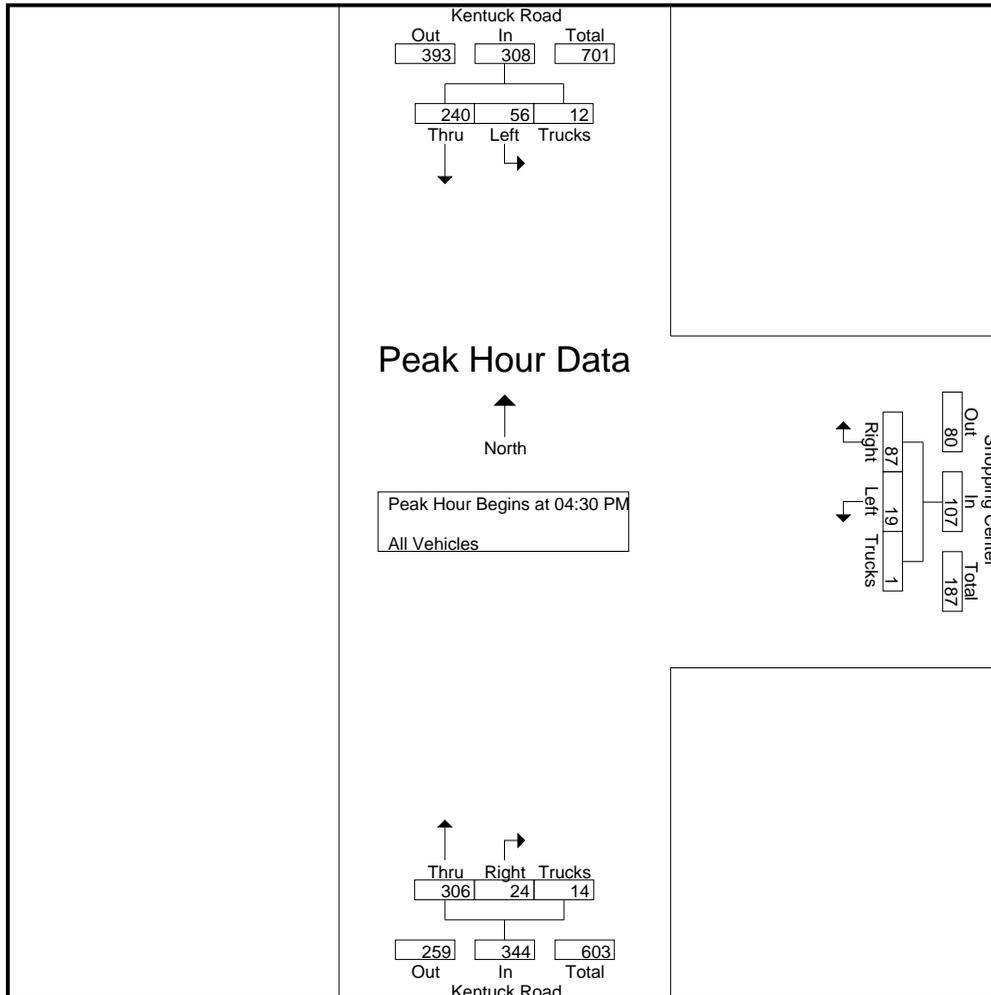
Start Time	Kentuck Road From North			Shopping Center From East			Kentuck Road From South			Int. Total
	Thru	Left	Trucks	Right	Left	Trucks	Right	Thru	Trucks	
04:00 PM	66	15	4	13	6	0	4	74	6	188
04:15 PM	60	9	2	22	13	0	4	57	3	170
04:30 PM	71	12	4	18	6	0	4	74	5	194
04:45 PM	57	10	1	24	3	1	4	72	3	175
Total	254	46	11	77	28	1	16	277	17	727
05:00 PM	58	19	5	25	5	0	8	77	3	200
05:15 PM	54	15	2	20	5	0	8	83	3	190
05:30 PM	66	15	3	16	4	0	9	74	2	189
05:45 PM	45	8	5	19	3	0	8	61	1	150
Total	223	57	15	80	17	0	33	295	9	729
Grand Total	477	103	26	157	45	1	49	572	26	1456
Apprch %	78.7	17	4.3	77.3	22.2	0.5	7.6	88.4	4	
Total %	32.8	7.1	1.8	10.8	3.1	0.1	3.4	39.3	1.8	

# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
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336-725-5470

File Name : Kentuck&ShoppingCenterPM  
Site Code : 00020613  
Start Date : 2/6/2013  
Page No : 2

Start Time	Kentuck Road From North				Shopping Center From East				Kentuck Road From South				Int. Total
	Thru	Left	Trucks	App. Total	Right	Left	Trucks	App. Total	Right	Thru	Trucks	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	71	12	4	87	18	6	0	24	4	74	5	83	194
04:45 PM	57	10	1	68	24	3	1	28	4	72	3	79	175
05:00 PM	58	19	5	82	25	5	0	30	8	77	3	88	200
05:15 PM	54	15	2	71	20	5	0	25	8	83	3	94	190
Total Volume	240	56	12	308	87	19	1	107	24	306	14	344	759
% App. Total	77.9	18.2	3.9		81.3	17.8	0.9		7	89	4.1		
PHF	.845	.737	.600	.885	.870	.792	.250	.892	.750	.922	.700	.915	.949



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
Winston-Salem, North Carolina 27103  
336-725-5470

File Name : South Boston&KentuckAM  
Site Code : 00013013  
Start Date : 2/7/2013  
Page No : 1

## Groups Printed- Vehicles

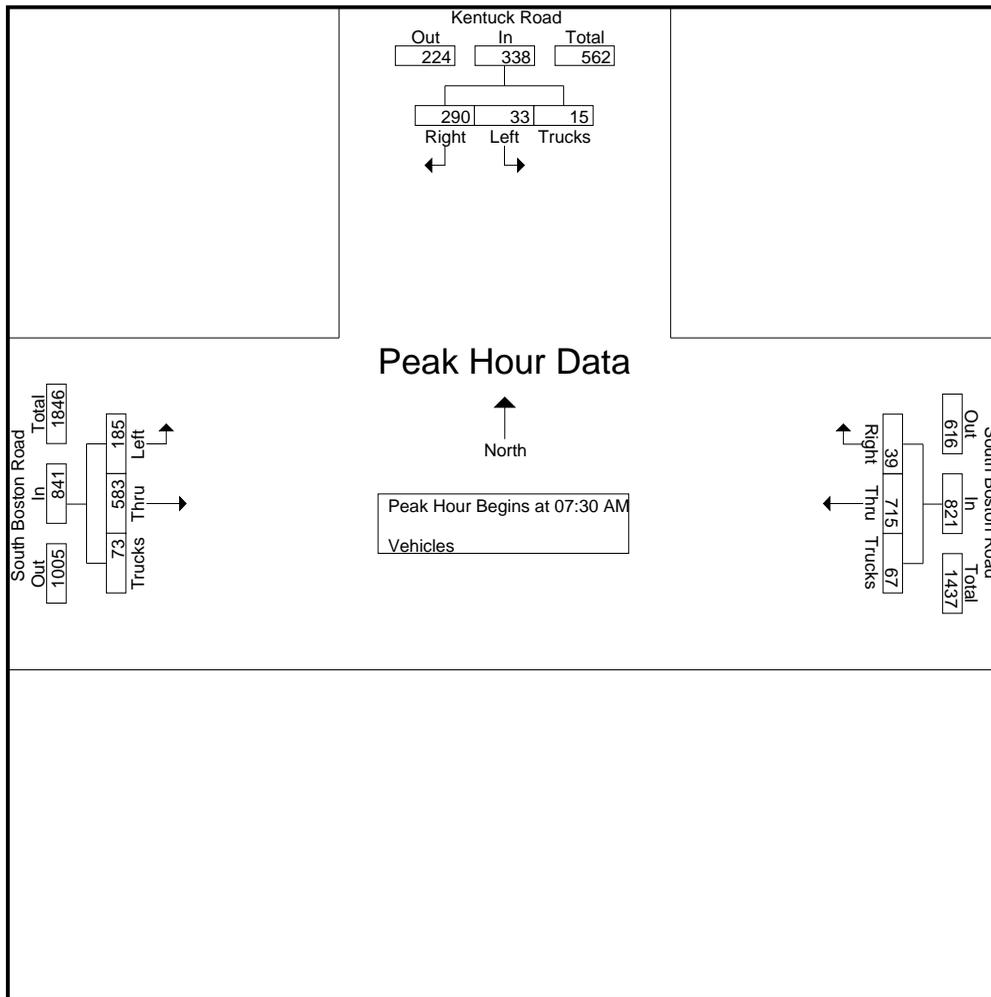
Start Time	Kentuck Road From North			South Boston Road From East			South Boston Road From West			Int. Total
	Right	Left	Trucks	Right	Thru	Trucks	Thru	Left	Trucks	
07:00 AM	40	6	1	9	160	10	122	29	18	395
07:15 AM	38	4	3	9	154	11	127	44	8	398
07:30 AM	56	7	1	12	220	19	132	55	12	514
07:45 AM	85	6	6	15	201	21	156	59	12	561
Total	219	23	11	45	735	61	537	187	50	1868
08:00 AM	76	8	4	7	144	15	145	45	28	472
08:15 AM	73	12	4	5	150	12	150	26	21	453
08:30 AM	39	6	5	11	155	10	106	26	17	375
08:45 AM	42	8	7	8	138	18	124	31	5	381
Total	230	34	20	31	587	55	525	128	71	1681
Grand Total	449	57	31	76	1322	116	1062	315	121	3549
Apprch %	83.6	10.6	5.8	5	87.3	7.7	70.9	21	8.1	
Total %	12.7	1.6	0.9	2.1	37.2	3.3	29.9	8.9	3.4	

# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
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 336-725-5470

File Name : South Boston&KentuckAM  
 Site Code : 00013013  
 Start Date : 2/7/2013  
 Page No : 2

Start Time	Kentuck Road From North				South Boston Road From East				South Boston Road From West				Int. Total
	Right	Left	Trucks	App. Total	Right	Thru	Trucks	App. Total	Thru	Left	Trucks	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	56	7	1	64	12	220	19	251	132	55	12	199	514
07:45 AM	85	6	6	97	15	201	21	237	156	59	12	227	561
08:00 AM	76	8	4	88	7	144	15	166	145	45	28	218	472
08:15 AM	73	12	4	89	5	150	12	167	150	26	21	197	453
Total Volume	290	33	15	338	39	715	67	821	583	185	73	841	2000
% App. Total	85.8	9.8	4.4		4.8	87.1	8.2		69.3	22	8.7		
PHF	.853	.688	.625	.871	.650	.813	.798	.818	.934	.784	.652	.926	.891



# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
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336-725-5470

File Name : South Boston&KentuckPM  
Site Code : 00013013  
Start Date : 2/6/2013  
Page No : 1

## Groups Printed- Vehicles

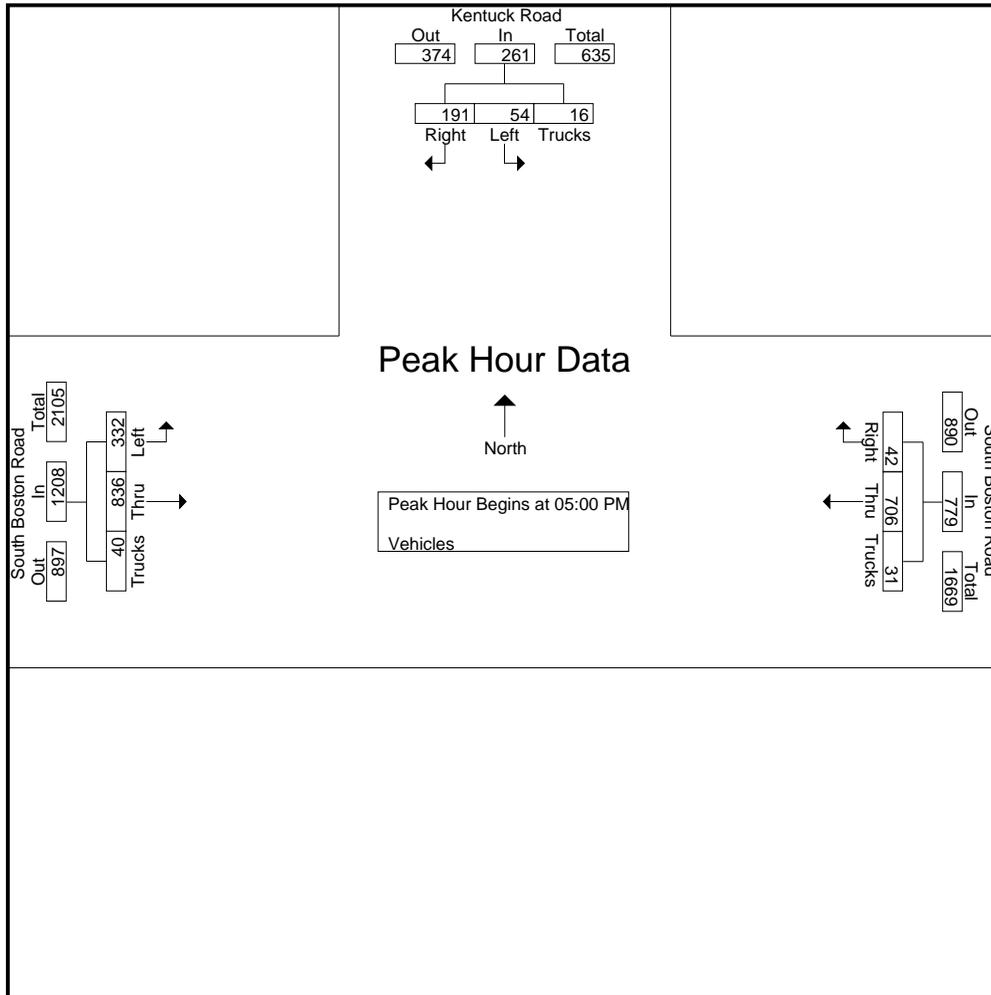
Start Time	Kentuck Road From North			South Boston Road From East			South Boston Road From West			Int. Total
	Right	Left	Trucks	Right	Thru	Trucks	Thru	Left	Trucks	
04:00 PM	55	15	5	16	234	10	197	74	21	627
04:15 PM	53	10	2	7	196	14	181	54	13	530
04:30 PM	65	7	3	19	162	16	155	72	16	515
04:45 PM	50	8	0	16	142	12	177	73	17	495
Total	223	40	10	58	734	52	710	273	67	2167
05:00 PM	51	17	5	15	159	7	245	87	7	593
05:15 PM	43	17	2	10	153	8	213	97	17	560
05:30 PM	55	11	3	8	175	9	196	70	10	537
05:45 PM	42	9	6	9	219	7	182	78	6	558
Total	191	54	16	42	706	31	836	332	40	2248
Grand Total	414	94	26	100	1440	83	1546	605	107	4415
Apprch %	77.5	17.6	4.9	6.2	88.7	5.1	68.5	26.8	4.7	
Total %	9.4	2.1	0.6	2.3	32.6	1.9	35	13.7	2.4	

# RAMEY KEMP & ASSOCIATES, INC.

621 Jonestown Road, Suite 221  
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336-725-5470

File Name : South Boston&KentuckPM  
Site Code : 00013013  
Start Date : 2/6/2013  
Page No : 2

Start Time	Kentuck Road From North				South Boston Road From East				South Boston Road From West				Int. Total
	Right	Left	Trucks	App. Total	Right	Thru	Trucks	App. Total	Thru	Left	Trucks	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	51	17	5	73	15	159	7	181	245	87	7	339	593
05:15 PM	43	17	2	62	10	153	8	171	213	97	17	327	560
05:30 PM	55	11	3	69	8	175	9	192	196	70	10	276	537
05:45 PM	42	9	6	57	9	219	7	235	182	78	6	266	558
Total Volume	191	54	16	261	42	706	31	779	836	332	40	1208	2248
% App. Total	73.2	20.7	6.1		5.4	90.6	4		69.2	27.5	3.3		
PHF	.868	.794	.667	.894	.700	.806	.861	.829	.853	.856	.588	.891	.948



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 while SIDRA INTERSECTION 5.1 was utilized for roundabout analysis.

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 as well as roundabouts. 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	Roundabouts
<b>A</b>	≤ 10	0-10	0-10
<b>B</b>	> 10-20	> 10-15	> 10-15
<b>C</b>	> 20-35	> 15-25	> 15-25
<b>D</b>	> 35-55	> 25-35	> 25-35
<b>E</b>	> 55-80	> 35-50	> 35-50
<b>F</b>	> 80	> 50	> 50

APPENDIX C  
EXISTING (YEAR 2013)  
INTERSECTION LEVEL OF SERVICE ANALYSIS

Kentuck Road Study  
1: Kentuck Road & Little Creek Road

Existing (2013) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh 3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	59	73	63	111	203	142
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	-	-	-	-	90
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	66	81	70	123	226	158

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	489	226	226	0	-	0
Stage 1	226	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Follow-up Headway	3.5	3.3	2.209	-	-	-
Pot Capacity-1 Maneuver	542	818	1348	-	-	-
Stage 1	816	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	512	818	1348	-	-	-
Mov Capacity-2 Maneuver	512	-	-	-	-	-
Stage 1	816	-	-	-	-	-
Stage 2	742	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	2.8	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1348	-	646	-	-
HCM Lane V/C Ratio	0.052	-	0.227	-	-
HCM Control Delay (s)	7.817	0	12.2	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.164	-	0.869	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 2: Kentuck Road & Fall Creek Road

Existing (2013) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	14	36	138	4	17	259
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	16	40	153	4	19	288

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	482	156	0	0	158	0
Stage 1	156	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.209	-
Pot Capacity-1 Maneuver	547	895	-	-	1428	-
Stage 1	877	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	538	895	-	-	1428	-
Mov Capacity-2 Maneuver	538	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	724	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	10.1		0		0.5
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	755	1428	-
HCM Lane V/C Ratio	-	-	0.074	0.013	-
HCM Control Delay (s)	-	-	10.1	7.555	0
HCM Lane LOS			B	A	A
HCM 95th %tile Q(veh)	-	-	0.238	0.04	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 3: Kentuck Road & Ringgold Industrial Parkway

Existing (2013) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	3	19	146	257	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	25	25	2	2	0	0
Mvmt Flow	1	3	21	162	286	26

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	502	298	311	0	-	0
Stage 1	298	-	-	-	-	-
Stage 2	204	-	-	-	-	-
Follow-up Headway	3.725	3.525	2.218	-	-	-
Pot Capacity-1 Maneuver	490	690	1249	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	481	690	1249	-	-	-
Mov Capacity-2 Maneuver	481	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	764	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.9	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1249	-	622	-	-
HCM Lane V/C Ratio	0.017	-	0.007	-	-
HCM Control Delay (s)	7.932	0	10.8	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.052	-	0.022	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
4: Kentuck Road & Eagle Springs Road/Wilkerson Road

Existing (2013) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	3	6	0	5	22	22	142	0	19	247	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	30	30	1	1	1	5	5	0	1	1	0
Mvmt Flow	0	3	7	0	6	24	24	158	0	21	274	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	539	524	274	529	524	158	274	0	0	158	0	0
Stage 1	317	317	-	207	207	-	-	-	-	-	-	-
Stage 2	222	207	-	322	317	-	-	-	-	-	-	-
Follow-up Headway	3.5	4.27	3.57	3.509	4.009	3.309	2.245	-	-	2.209	-	-
Pot Capacity-1 Maneuver	456	421	702	462	460	890	1272	-	-	1428	-	-
Stage 1	698	607	-	797	732	-	-	-	-	-	-	-
Stage 2	785	681	-	692	656	-	-	-	-	-	-	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	427	405	702	442	443	890	1272	-	-	1428	-	-
Mov Capacity-2 Maneuver	427	405	-	442	443	-	-	-	-	-	-	-
Stage 1	683	597	-	780	717	-	-	-	-	-	-	-
Stage 2	742	667	-	670	645	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	11.5			10			1.1			0.5		
HCM LOS	B			B								

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1272	-	-	564	750	1428	-	-
HCM Lane V/C Ratio	0.019	-	-	0.018	0.04	0.015	-	-
HCM Control Delay (s)	7.886	0	-	11.5	10	7.559	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.059	-	-	0.054	0.125	0.045	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
5: Eagle Springs Road & Kentuck Road

Existing (2013) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh	0					
Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	0	164	266	3	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	1	1	30	0
Mvmt Flow	0	182	296	3	1	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	299	0	-	0	479	297
Stage 1	-	-	-	-	297	-
Stage 2	-	-	-	-	182	-
Follow-up Headway	2.2	-	-	-	3.77	3.3
Pot Capacity-1 Maneuver	1274	-	-	-	498	747
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	786	-
Time blocked-Platoon, %	-	-	-	-	-	-
Mov Capacity-1 Maneuver	1274	-	-	-	498	747
Mov Capacity-2 Maneuver	-	-	-	-	498	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	786	-

Approach	NB		SB		NE
HCM Control Delay, s	0		0		12.2
HCM LOS					B

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	498	1274	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-
HCM Control Delay (s)	12.2	0	-	-	-
HCM Lane LOS	B	A			
HCM 95th %tile Q(veh)	0.007	0	-	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
7: Kentuck Road & Wilkerson Road

Existing (2013) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh 2.8

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Vol, veh/h	164	27	0	253	114	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	0	2	1	0
Mvmt Flow	182	30	0	281	127	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	212
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	-	-	2.2
Pot Capacity-1 Maneuver	-	-	1370
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	1370
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

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

Minor Lane / Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	1370	-	548
HCM Lane V/C Ratio	-	-	-	-	0.231
HCM Control Delay (s)	-	-	0	-	13.5
HCM Lane LOS			A		B
HCM 95th %tile Q(veh)	-	-	0	-	0.887

Notes

- : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 9: Kentuck Road & Halifax Road

Existing (2013) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	22	5	22	6	7	8	18	221	6	5	342	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	5	5	5	6	6	6	3	3	3
Mvmt Flow	24	6	24	7	8	9	20	246	7	6	380	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	698	693	389	705	699	249	399	0	0	252	0	0
Stage 1	401	401	-	289	289	-	-	-	-	-	-	-
Stage 2	297	292	-	416	410	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.545	4.045	3.345	2.254	-	-	2.227	-	-
Pot Capacity-1 Maneuver	358	369	664	347	360	782	1138	-	-	1307	-	-
Stage 1	630	604	-	712	668	-	-	-	-	-	-	-
Stage 2	716	675	-	608	590	-	-	-	-	-	-	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	341	359	664	324	351	782	1138	-	-	1307	-	-
Mov Capacity-2 Maneuver	341	359	-	324	351	-	-	-	-	-	-	-
Stage 1	617	600	-	698	655	-	-	-	-	-	-	-
Stage 2	685	662	-	577	586	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.4	-	-	13.8	-	-	0.6	-	-	0.1	-	-
HCM LOS	B	-	-	B	-	-	-	-	-	-	-	-

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1138	-	-	439	431	1307	-	-
HCM Lane V/C Ratio	0.018	-	-	0.124	0.054	0.004	-	-
HCM Control Delay (s)	8.22	0	-	14.4	13.8	7.766	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.054	-	-	0.421	0.171	0.013	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 10: Kentuck Road & Shopping Center

Existing (2013) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	9	26	220	11	31	357
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	-	210	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	6	6	4	4
Mvmt Flow	10	29	244	12	34	397

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	710	244	0	0	244	0
Stage 1	244	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.236	-
Pot Capacity-1 Maneuver	403	800	-	-	1311	-
Stage 1	801	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	393	800	-	-	1311	-
Mov Capacity-2 Maneuver	393	-	-	-	-	-
Stage 1	801	-	-	-	-	-
Stage 2	620	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	10.9		0		0.6
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	393	800	1311	-
HCM Lane V/C Ratio	-	-	0.025	0.036	0.026	-
HCM Control Delay (s)	-	-	14.4	9.7	7.82	-
HCM Lane LOS			B	A	A	
HCM 95th %tile Q(veh)	-	-	0.078	0.112	0.081	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
11: South Boston Road & Kentuck Road

Existing (2013) Traffic Conditions  
AM Peak

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Volume (vph)	185	583	715	39	33	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	470			1000	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	165				50	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1586	3172	3312	1482	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1586	3172	3312	1482	1719	1538
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				43		322
Link Speed (mph)		45	45		45	
Link Distance (ft)		1265	1521		454	
Travel Time (s)		19.2	23.0		6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	10%	9%	9%	5%	5%
Adj. Flow (vph)	206	648	794	43	37	322
Shared Lane Traffic (%)						
Lane Group Flow (vph)	206	648	794	43	37	322
Turn Type	Prot	NA	NA	pt+ov	NA	Perm
Protected Phases	1	6	2	2 3	3	
Permitted Phases						3
Detector Phase	1	6	2	2 3	3	3
Switch Phase						
Minimum Initial (s)	7.0	20.0	20.0		7.0	7.0
Minimum Split (s)	13.0	27.0	27.0		22.0	22.0
Total Split (s)	26.0	66.0	40.0		24.0	24.0
Total Split (%)	28.9%	73.3%	44.4%		26.7%	26.7%
Yellow Time (s)	4.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0		6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	14.6	47.8	27.0	42.2	9.0	9.0
Actuated g/C Ratio	0.21	0.68	0.39	0.60	0.13	0.13
v/c Ratio	0.63	0.30	0.62	0.05	0.17	0.68
Control Delay	36.0	5.0	20.6	2.3	32.0	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	5.0	20.6	2.3	32.0	12.0
LOS	D	A	C	A	C	B
Approach Delay		12.4	19.7		14.0	
Approach LOS		B	B		B	
Queue Length 50th (ft)	77	41	133	0	14	0

Kentuck Road Study  
 11: South Boston Road & Kentuck Road

Existing (2013) Traffic Conditions  
 AM Peak

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 95th (ft)	172	91	247	11	44	71
Internal Link Dist (ft)		1185	1441		374	
Turn Bay Length (ft)	470			1000	225	
Base Capacity (vph)	465	2701	1604	1101	454	643
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	0.44	0.24	0.50	0.04	0.08	0.50

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 70.1  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 15.7  
 Intersection Capacity Utilization 51.7%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 11: South Boston Road & Kentuck Road



Kentuck Road Study  
1: Kentuck Road & Little Creek Road

Existing (2013) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	85	64	67	190	104	46
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	-	-	-	-	90
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	94	71	74	211	116	51

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	476	116	116	0	-	0
Stage 1	116	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Follow-up Headway	3.509	3.309	2.209	-	-	-
Pot Capacity-1 Maneuver	549	939	1479	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	708	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	518	939	1479	-	-	-
Mov Capacity-2 Maneuver	518	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	668	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1479	-	642	-	-
HCM Lane V/C Ratio	0.05	-	0.258	-	-
HCM Control Delay (s)	7.563	0	12.5	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.159	-	1.025	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 2: Kentuck Road & Fall Creek Road

Existing (2013) Traffic Conditions  
 PM Peak

Intersection

Intersection Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	9	15	242	16	26	142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	10	17	269	18	29	158

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	494	278	0	0	287	0
Stage 1	278	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.2	-
Pot Capacity-1 Maneuver	538	766	-	-	1287	-
Stage 1	774	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Time blocked-Platoon, %			-	-		
Mov Capacity-1 Maneuver	525	766	-	-	1287	-
Mov Capacity-2 Maneuver	525	-	-	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	804	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	10.7		0		1.2
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	654	1287	-
HCM Lane V/C Ratio	-	-	0.041	0.022	-
HCM Control Delay (s)	-	-	10.7	7.861	0
HCM Lane LOS			B	A	A
HCM 95th %tile Q(veh)	-	-	0.127	0.069	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 3: Kentuck Road & Ringgold Industrial Parkway

Existing (2013) Traffic Conditions

PM Peak

Intersection

Intersection Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	13	24	4	259	145	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	14	14	2	2	3	3
Mvmt Flow	14	27	4	288	161	1

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	459	162	162	0	-	0
Stage 1	162	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Follow-up Headway	3.626	3.426	2.218	-	-	-
Pot Capacity-1 Maneuver	539	852	1417	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	537	852	1417	-	-	-
Mov Capacity-2 Maneuver	537	-	-	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	725	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1417	-	706	-	-
HCM Lane V/C Ratio	0.003	-	0.058	-	-
HCM Control Delay (s)	7.549	0	10.4	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.009	-	0.185	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 4: Kentuck Road & Eagle Springs Road/Wilkerson Road

Existing (2013) Traffic Conditions  
 PM Peak

Intersection

Intersection Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	3	21	0	3	27	6	254	0	16	147	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	8	8	0	2	2	4	4	0	5	5	0
Mvmt Flow	0	3	23	0	3	30	7	282	0	18	163	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	511	495	163	508	495	282	163	0	0	282	0	0
Stage 1	199	199	-	296	296	-	-	-	-	-	-	-
Stage 2	312	296	-	212	199	-	-	-	-	-	-	-
Follow-up Headway	3.5	4.072	3.372	3.5	4.018	3.318	2.236	-	-	2.245	-	-
Pot Capacity-1 Maneuver	476	467	866	479	476	757	1404	-	-	1263	-	-
Stage 1	807	725	-	717	668	-	-	-	-	-	-	-
Stage 2	703	658	-	795	736	-	-	-	-	-	-	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	447	457	866	456	466	757	1404	-	-	1263	-	-
Mov Capacity-2 Maneuver	447	457	-	456	466	-	-	-	-	-	-	-
Stage 1	802	713	-	713	664	-	-	-	-	-	-	-
Stage 2	668	654	-	758	724	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.8			10.3			0.2			0.8		
HCM LOS	A			B								

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	779	713	1263	-	-
HCM Lane V/C Ratio	0.005	-	-	0.034	0.047	0.014	-	-
HCM Control Delay (s)	7.576	0	-	9.8	10.3	7.891	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0.014	-	-	0.106	0.147	0.043	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
5: Eagle Springs Road & Kentuck Road

Existing (2013) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 0

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	0	281	163	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	5	5	0	0
Mvmt Flow	0	312	181	2	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	183	0	182
Stage 1	-	-	182
Stage 2	-	-	312
Follow-up Headway	2.2	-	3.3
Pot Capacity-1 Maneuver	1404	-	866
Stage 1	-	-	854
Stage 2	-	-	747
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1404	-	866
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	854
Stage 2	-	-	747

Approach	NB	SB	NE
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	0	1404	-	-	-
HCM Lane V/C Ratio	+	-	-	-	-
HCM Control Delay (s)	0	0	-	-	-
HCM Lane LOS	A	A	-	-	-
HCM 95th %tile Q(veh)	+	0	-	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
7: Kentuck Road & Wilkerson Road

Existing (2013) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 1.3

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Vol, veh/h	260	100	0	168	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	4	0	5	2	0
Mvmt Flow	289	111	0	187	66	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	400
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	-	-	2.2
Pot Capacity-1 Maneuver	-	-	1170
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	1170
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	13.1
HCM LOS			B

Minor Lane / Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	1170	-	509
HCM Lane V/C Ratio	-	-	-	-	0.129
HCM Control Delay (s)	-	-	0	-	13.1
HCM Lane LOS			A		B
HCM 95th %tile Q(veh)	-	-	0	-	0.44

Notes

- : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
9: Kentuck Road & Halifax Road

Existing (2013) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	24	11	38	8	7	8	35	329	15	3	227	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	4	4	4
Mvmt Flow	27	12	42	9	8	9	39	366	17	3	252	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	731	731	264	750	735	374	277	0	0	382	0	0
Stage 1	271	271	-	452	452	-	-	-	-	-	-	-
Stage 2	460	460	-	298	283	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.5	4	3.3	2.227	-	-	2.236	-	-
Pot Capacity-1 Maneuver	340	351	780	330	349	677	1280	-	-	1166	-	-
Stage 1	739	689	-	591	574	-	-	-	-	-	-	-
Stage 2	585	569	-	715	681	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	319	336	780	294	334	677	1280	-	-	1166	-	-
Mov Capacity-2 Maneuver	319	336	-	294	334	-	-	-	-	-	-	-
Stage 1	710	687	-	568	552	-	-	-	-	-	-	-
Stage 2	547	547	-	662	679	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.3			15.1			0.7			0.1		
HCM LOS	B			C								

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1280	-	-	466	383	1166	-	-
HCM Lane V/C Ratio	0.03	-	-	0.174	0.067	0.003	-	-
HCM Control Delay (s)	7.901	0	-	14.3	15.1	8.096	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.094	-	-	0.624	0.213	0.009	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 10: Kentuck Road & Shopping Center

Existing (2013) Traffic Conditions  
 PM Peak

Intersection

Intersection Delay, s/veh 2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	19	87	306	24	56	240
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	-	210	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	4	4	4	4
Mvmt Flow	21	97	340	27	62	267

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	731	340	0	0	340	0
Stage 1	340	-	-	-	-	-
Stage 2	391	-	-	-	-	-
Follow-up Headway	3.509	3.309	-	-	2.236	-
Pot Capacity-1 Maneuver	390	705	-	-	1208	-
Stage 1	723	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	370	705	-	-	1208	-
Mov Capacity-2 Maneuver	370	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	651	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	11.7		0		1.5
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	370	705	1208	-
HCM Lane V/C Ratio	-	-	0.057	0.137	0.052	-
HCM Control Delay (s)	-	-	15.3	10.9	8.142	-
HCM Lane LOS			C	B	A	
HCM 95th %tile Q(veh)	-	-	0.181	0.474	0.163	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
11: South Boston Road & Kentuck Road

Existing (2013) Traffic Conditions  
PM Peak

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Volume (vph)	332	836	706	42	54	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	470			1000	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	165				50	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1694	3388	3471	1553	1687	1509
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1694	3388	3471	1553	1687	1509
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				47		212
Link Speed (mph)		45	45		45	
Link Distance (ft)		1265	1521		454	
Travel Time (s)		19.2	23.0		6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	4%	4%	7%	7%
Adj. Flow (vph)	369	929	784	47	60	212
Shared Lane Traffic (%)						
Lane Group Flow (vph)	369	929	784	47	60	212
Turn Type	Prot	NA	NA	pt+ov	NA	Perm
Protected Phases	1	6	2	2 3	3	
Permitted Phases						3
Detector Phase	1	6	2	2 3	3	3
Switch Phase						
Minimum Initial (s)	7.0	20.0	20.0		7.0	7.0
Minimum Split (s)	13.0	27.0	27.0		22.0	22.0
Total Split (s)	34.0	68.0	34.0		22.0	22.0
Total Split (%)	37.8%	75.6%	37.8%		24.4%	24.4%
Yellow Time (s)	4.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0		6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	21.1	52.0	24.8	39.8	8.9	8.9
Actuated g/C Ratio	0.28	0.70	0.33	0.54	0.12	0.12
v/c Ratio	0.77	0.39	0.68	0.05	0.30	0.58
Control Delay	36.3	5.1	25.7	3.4	36.3	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	5.1	25.7	3.4	36.3	12.2
LOS	D	A	C	A	D	B
Approach Delay		14.0	24.5		17.5	
Approach LOS		B	C		B	
Queue Length 50th (ft)	158	71	158	0	27	0

Kentuck Road Study  
 11: South Boston Road & Kentuck Road

Existing (2013) Traffic Conditions  
 PM Peak

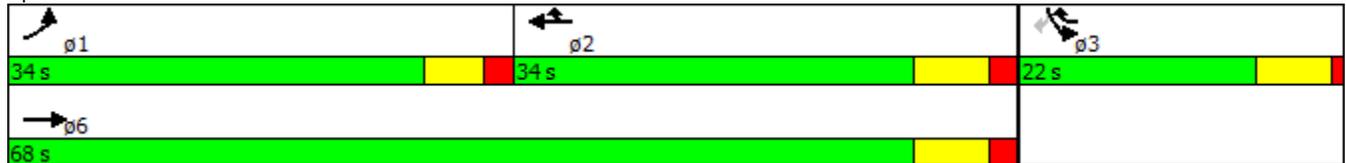
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 95th (ft)	273	124	266	15	65	60
Internal Link Dist (ft)		1185	1441		374	
Turn Bay Length (ft)	470			1000	225	
Base Capacity (vph)	652	2824	1290	995	371	497
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.33	0.61	0.05	0.16	0.43

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 74.1  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 18.0  
 Intersection Capacity Utilization 59.6%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 11: South Boston Road & Kentuck Road

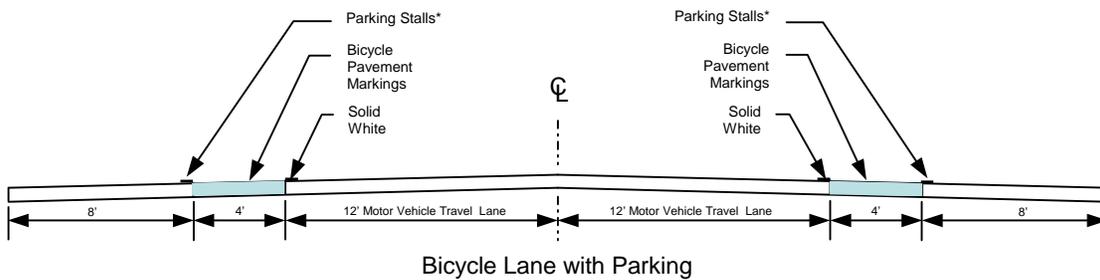
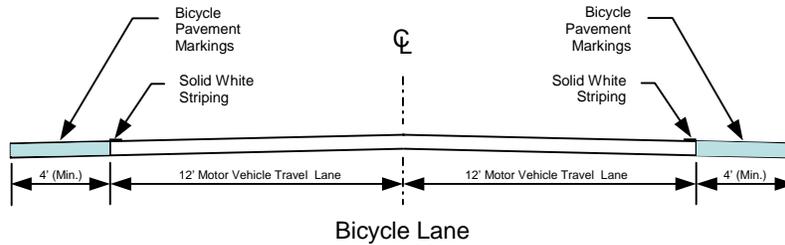


APPENDIX D  
ROADWAY TYPICAL SECTIONS TO SUPPORT BIKE FACILITIES  
(TAKEN FROM *WEST PIEDMONT REGIONAL BICYCLE PLAN*, REVISED SEPT. 2007)

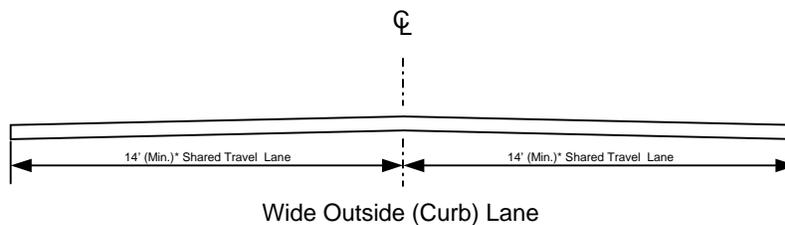


## APPENDIX I – SAMPLE BICYCLE FACILITY CROSS-SECTIONS

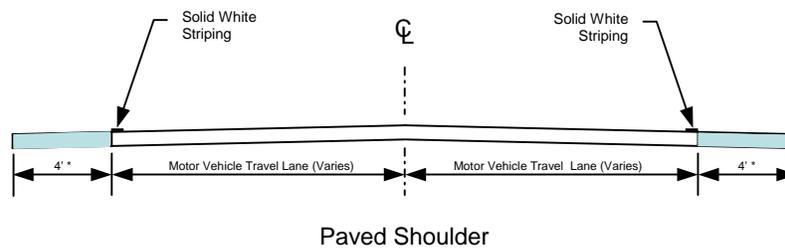
(Note: Cross-sections shown below have been adapted from those shown in the *Virginia Bicycle Facility Resource Guide*, 2002. Sections are not to scale. It is recommended that the designer consult the most current VDOT and AASHTO standards prior to initiating design of typical sections.)



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



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



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

APPENDIX E  
CRASH DATA SUMMARY

**Route 729 - Route 58 to Route 732 (2.73 miles)**

Document Number	Jurisdiction	Route Number	Crash Date	Crash Time	Day Of Week	Collision Type	Crash Severity	At Intersection ?	Roadway Alignment Type	Light Condition	Roadway Surface Cond Type	Weather Condition Type	Crash Location
80635274	Pittsylvania County	729	1/9/2008	18:50	Wed	2. Angle	property damage crash		1. Straight - Level	5. Darkness - Road Not Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.2 miles North of Rt 730
80705121	City of Danville	3769	1/23/2008	23:50	Wed	9. Fixed Object - Off Road	injury crash		1. Straight - Level	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	5 feet South of City Limits
81065341	City of Danville	3769	2/8/2008	16:04	Fri	1. Rear End	injury crash		1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	50 feet South of Halifax Rd
80935280	Pittsylvania County	729	2/15/2008	23:30	Fri	9. Fixed Object - Off Road	injury crash		3. Grade - Straight	5. Darkness - Road Not Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	200 feet South of Rt 732
81075211	Pittsylvania County	729	2/28/2008	12:00	Thu	2. Angle	injury crash		1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Rt 730
81305320	City of Danville	3769	3/7/2008	14:00	Fri	2. Angle	property damage crash		1. Straight - Level	2. Daylight	2. Wet	5. Rain	at South Boston Rd
82835154	City of Danville	3769	5/7/2008	8:00	Wed	2. Angle	property damage crash		1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at 140 Kentuck Rd
83375253	City of Danville	3769	5/22/2008	21:47	Thu	9. Fixed Object - Off Road	property damage crash		4. Grade - Curve	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.25 miles North of Halifax Rd
90545360	City of Danville	3769	7/18/2008	21:15	Fri	10. Deer	property damage crash		1. Straight - Level	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	250 feet North of Lorillard Cir
90695297	City of Danville	3769	7/26/2008	4:03	Sat	9. Fixed Object - Off Road	injury crash		4. Grade - Curve	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.25 miles North of Lorillard Cir
91195291	Pittsylvania County	729	9/20/2008	5:50	Sat	10. Deer	property damage crash		3. Grade - Straight	5. Darkness - Road Not Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.6 miles South of Rt 732
91330863	City of Danville	3769	10/17/2008	17:25	Fri	4. Sideswipe - Same Direction	property damage crash		1. Straight - Level	2. Daylight	2. Wet	5. Rain	280 feet North of South Boston Rd
91350213	City of Danville	3769	10/22/2008	4:37	Wed	1. Rear End	property damage crash		1. Straight - Level	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.5 miles South of Lorillard Cir
91600642	City of Danville	3769	11/30/2008	14:00	Sun	2. Angle	injury crash		1. Straight - Level	2. Daylight	2. Wet	5. Rain	50 feet North of South Boston Rd
91690311	City of Danville	3769	12/20/2008	17:55	Sat	2. Angle	property damage crash		1. Straight - Level	4. Darkness - Road Lighted	2. Wet	4. Mist	at Halifax Rd
92610507	Pittsylvania County	729	5/11/2009	11:20	Mon	1. Rear End	property damage crash	No	1. Straight - Level	2. Daylight	2. Wet	5. Rain	.5 miles South of Rt 732
100221002	City of Danville	3769	5/21/2009	18:00	Thu	2. Angle	property damage crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	100 feet North of South Boston Rd
100220678	City of Danville	3769	5/25/2009	3:36	Mon	3. Head On	injury crash	No	2. Curve - Level	3. Dusk	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.3 miles North of Lorillard Cir
100430156	City of Danville	3769	7/25/2009	14:47	Sat	1. Rear End	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Halifax Rd
100530331	City of Danville	3769	8/13/2009	15:23	Thu	8. Non-Collision	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	500 feet North of South Boston Rd
100530897	City of Danville	3769	10/23/2009	13:27	Fri	2. Angle	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Halifax Rd
100530931	City of Danville	3769	11/7/2009	13:29	Sat	2. Angle	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Halifax Rd
100530934	City of Danville	3769	11/9/2009	13:08	Mon	2. Angle	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Halifax Rd
100560346	City of Danville	3769	12/22/2009	11:50	Tue	2. Angle	property damage crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	150 feet North of South Boston Rd
100960855	Pittsylvania County	729	1/12/2010	14:52	Tue	1. Rear End	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Rt 730
102110544	City of Danville	3769	2/3/2010	15:10	Wed	1. Rear End	property damage crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at South Boston Rd
102110661	City of Danville	3769	4/3/2010	23:20	Sat	9. Fixed Object - Off Road	injury crash	Yes	2. Curve - Level	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	
102110668	City of Danville	3769	4/4/2010	15:41	Sun	1. Rear End	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Halifax Rd
101441162	Pittsylvania County	729	4/4/2010	9:35	Sun	2. Angle	injury crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.5 miles North of Wilkerson Rd
102110672	City of Danville	3769	4/6/2010	17:20	Tue	9. Fixed Object - Off Road	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Halifax Rd
101470319	Pittsylvania County	729	4/16/2010	23:35	Fri	9. Fixed Object - Off Road	injury crash	No	2. Curve - Level	5. Darkness - Road Not Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.1 miles South of Rt 732
101550833	Pittsylvania County	729	5/9/2010	2:20	Sun	9. Fixed Object - Off Road	injury crash	No	4. Grade - Curve	5. Darkness - Road Not Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	50 feet South of Rt 732
103190075	City of Danville	3769	6/7/2010	16:52	Mon	2. Angle	injury crash	No	4. Grade - Curve	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	200 feet North of Lorillard Cir
103190107	City of Danville	3769	6/18/2010	6:52	Fri	2. Angle	injury crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	20 feet East of 525 Kentuck Rd
103190167	City of Danville	3769	7/15/2010	12:30	Thu	2. Angle	property damage crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Halifax Rd
103190166	City of Danville	3769	7/15/2010	13:00	Thu	2. Angle	injury crash	Yes	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Bright Leaf Rd
103190224	City of Danville	3769	8/12/2010	18:51	Thu	2. Angle	injury crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	25 feet East of 1411 South Boston Rd
110100018	City of Danville	3769	8/23/2010	11:30	Mon	9. Fixed Object - Off Road	property damage crash	No	2. Curve - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.2 miles North of Halifax Rd
110100034	City of Danville	3769	9/6/2010	14:31	Mon	9. Fixed Object - Off Road	property damage crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	1 mile South of Lorillard Cir
110100069	City of Danville	3769	9/23/2010	16:30	Thu	1. Rear End	property damage crash	Yes	3. Grade - Straight	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	at Lorillard Cir
103270618	Pittsylvania County	729	9/30/2010	18:55	Thu	2. Angle	property damage crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	1 mile North of Rt 730
110340404	Pittsylvania County	729	10/5/2010	6:50	Tue	10. Deer	property damage crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.1 miles North of Rt 1270
103430701	Pittsylvania County	729	10/10/2010	14:55	Sun	1. Rear End	injury crash	No	3. Grade - Straight	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.1 miles North of Rt 730
110100090	City of Danville	3769	10/11/2010	15:35	Mon	2. Angle	property damage crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	100 feet South of South Boston Rd
110120522	Pittsylvania County	729	11/1/2010	16:05	Mon	1. Rear End	injury crash	No	1. Straight - Level	2. Daylight	1. Dry	1. No Adverse Condition (Clear/Cloudy)	.2 miles North of Rt 1270
103205099	City of Danville	3769	11/16/2010	9:05	Tue	1. Rear End	property damage crash	No	1. Straight - Level	2. Daylight	2. Wet	5. Rain	800 feet South of Bright Leaf Rd
103605053	City of Danville	3769	12/26/2010	18:13	Sun	1. Rear End	property damage crash	No	1. Straight - Level	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	500 feet North of South Boston Rd
103625000	City of Danville	3769	12/27/2010	22:10	Mon	10. Deer	property damage crash	No	1. Straight - Level	4. Darkness - Road Lighted	1. Dry	1. No Adverse Condition (Clear/Cloudy)	100 feet South of Lorillard Cir

South Boston Road to City Limit	Crash Rate = 276.1 per 100M miles traveled
City Limit to Rt 732	Crash Rate = 145 per 100M miles traveled
2008 Statewide Average	Crash Rate = 185 per 100M miles traveled

APPENDIX F  
FUTURE NO BUILD (YEAR 2035)  
INTERSECTION LEVEL OF SERVICE ANALYSIS

Kentuck Road Study  
1: Kentuck Road & Little Creek Road

Future (2035) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh 9.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	140	173	150	138	252	337
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	-	-	-	-	90
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	156	192	167	153	280	374

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	767	280	280	0	-	0
Stage 1	280	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Follow-up Headway	3.5	3.3	2.209	-	-	-
Pot Capacity-1 Maneuver	373	764	1288	-	-	-
Stage 1	772	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	320	764	1288	-	-	-
Mov Capacity-2 Maneuver	320	-	-	-	-	-
Stage 1	772	-	-	-	-	-
Stage 2	534	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.3	4.3	0
HCM LOS	D		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1288	-	471	-	-
HCM Lane V/C Ratio	0.129	-	0.738	-	-
HCM Control Delay (s)	8.21	0	31.3	-	-
HCM Lane LOS	A	A	D		
HCM 95th %tile Q(veh)	0.444	-	6.073	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
2: Kentuck Road & Fall Creek Road

Future (2035) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh 1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	17	83	205	5	34	391
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	19	92	228	6	38	434

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	741	231	0	0	233	0
Stage 1	231	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.209	-
Pot Capacity-1 Maneuver	387	813	-	-	1340	-
Stage 1	812	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	373	813	-	-	1340	-
Mov Capacity-2 Maneuver	373	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	585	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	11.4		0		0.6
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	677	1340	-
HCM Lane V/C Ratio	-	-	0.164	0.028	-
HCM Control Delay (s)	-	-	11.4	7.764	0
HCM Lane LOS			B	A	A
HCM 95th %tile Q(veh)	-	-	0.584	0.087	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 3: Kentuck Road & Ringgold Industrial Parkway

Future (2035) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	4	24	182	320	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	25	25	2	2	0	0
Mvmt Flow	1	4	27	202	356	32

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	628	372	388	0	-	0
Stage 1	372	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Follow-up Headway	3.725	3.525	2.218	-	-	-
Pot Capacity-1 Maneuver	412	626	1170	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	401	626	1170	-	-	-
Mov Capacity-2 Maneuver	401	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	717	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.9	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1170	-	563	-	-
HCM Lane V/C Ratio	0.023	-	0.01	-	-
HCM Control Delay (s)	8.149	0	11.5	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.07	-	0.03	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 4: Kentuck Road & Eagle Springs Road/Wilkerson Road

Future (2035) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	4	7	0	6	27	27	177	0	24	307	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	30	30	1	1	1	5	5	0	1	1	0
Mvmt Flow	0	4	8	0	7	30	30	197	0	27	341	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	669	651	341	658	651	197	341	0	0	197	0	0
Stage 1	394	394	-	257	257	-	-	-	-	-	-	-
Stage 2	275	257	-	401	394	-	-	-	-	-	-	-
Follow-up Headway	3.5	4.27	3.57	3.509	4.009	3.309	2.245	-	-	2.209	-	-
Pot Capacity-1 Maneuver	374	354	642	379	389	847	1202	-	-	1382	-	-
Stage 1	635	559	-	750	697	-	-	-	-	-	-	-
Stage 2	736	646	-	628	607	-	-	-	-	-	-	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	342	336	642	356	369	847	1202	-	-	1382	-	-
Mov Capacity-2 Maneuver	342	336	-	356	369	-	-	-	-	-	-	-
Stage 1	617	546	-	729	677	-	-	-	-	-	-	-
Stage 2	683	628	-	601	592	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.7	-	-	10.5	-	-	1.1	-	-	0.6	-	-
HCM LOS	B	-	-	B	-	-	-	-	-	-	-	-

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	482	686	1382	-	-
HCM Lane V/C Ratio	0.025	-	-	0.025	0.053	0.019	-	-
HCM Control Delay (s)	8.072	0	-	12.7	10.5	7.656	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.077	-	-	0.078	0.169	0.059	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
5: Eagle Springs Road & Kentuck Road

Future (2035) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh 0

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	0	204	331	4	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	1	1	30	0
Mvmt Flow	0	227	368	4	1	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	372	0	370
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	2.2	-	3.3
Pot Capacity-1 Maneuver	1198	-	680
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1198	-	680
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

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

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	423	1198	-	-	-
HCM Lane V/C Ratio	0.003	-	-	-	-
HCM Control Delay (s)	13.5	0	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.008	0	-	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
7: Kentuck Road & Wilkerson Road

Future (2035) Traffic Conditions  
AM Peak

Intersection

Intersection Delay, s/veh 3.4

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Vol, veh/h	204	34	0	314	142	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	0	2	1	0
Mvmt Flow	227	38	0	349	158	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	264
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	-	-	2.2
Pot Capacity-1 Maneuver	-	-	1312
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	1312
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	16.5
HCM LOS			C

Minor Lane / Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	1312	-	469
HCM Lane V/C Ratio	-	-	-	-	0.336
HCM Control Delay (s)	-	-	0	-	16.5
HCM Lane LOS			A		C
HCM 95th %tile Q(veh)	-	-	0	-	1.466

Notes

- : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	27	13	27	9	10	11	22	275	15	12	426	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	5	5	5	6	6	6	3	3	3
Mvmt Flow	30	14	30	10	11	12	24	306	17	13	473	23

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	886	883	485	897	886	314	497	0	0	322	0	0
Stage 1	512	512	-	363	363	-	-	-	-	-	-	-
Stage 2	374	371	-	534	523	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.545	4.045	3.345	2.254	-	-	2.227	-	-
Pot Capacity-1 Maneuver	267	287	586	257	280	719	1047	-	-	1232	-	-
Stage 1	548	540	-	650	619	-	-	-	-	-	-	-
Stage 2	651	623	-	524	526	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	246	275	586	227	268	719	1047	-	-	1232	-	-
Mov Capacity-2 Maneuver	246	275	-	227	268	-	-	-	-	-	-	-
Stage 1	533	532	-	632	602	-	-	-	-	-	-	-
Stage 2	611	606	-	476	518	-	-	-	-	-	-	-

Approach	EB		WB			NB		SB				
HCM Control Delay, s	19.1		17.3			0.6				0.2		
HCM LOS	C		C									

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1047	-	-	330	325	1232	-	-
HCM Lane V/C Ratio	0.023	-	-	0.226	0.103	0.011	-	-
HCM Control Delay (s)	8.521	0	-	19.1	17.3	7.954	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.072	-	-	0.851	0.34	0.033	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 10: Kentuck Road & Shopping Center

Future (2035) Traffic Conditions  
 AM Peak

Intersection

Intersection Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	11	32	274	14	39	444
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	-	210	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	6	6	4	4
Mvmt Flow	12	36	304	16	43	493

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	884	304	0	0	304	0
Stage 1	304	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.236	-
Pot Capacity-1 Maneuver	318	740	-	-	1246	-
Stage 1	753	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	307	740	-	-	1246	-
Mov Capacity-2 Maneuver	307	-	-	-	-	-
Stage 1	753	-	-	-	-	-
Stage 2	545	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	11.9		0		0.6
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	307	740	1246	-
HCM Lane V/C Ratio	-	-	0.04	0.048	0.035	-
HCM Control Delay (s)	-	-	17.2	10.1	7.993	-
HCM Lane LOS			C	B	A	
HCM 95th %tile Q(veh)	-	-	0.124	0.151	0.108	-

Notes

- : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 11: South Boston Road & Kentuck Road

Future (2035) Traffic Conditions  
 AM Peak

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	  			
Volume (vph)	230	742	910	50	42	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	470			1000	225	0
Storage Lanes	1			0	1	1
Taper Length (ft)	165				50	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Frt			0.992			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1586	3172	4721	0	1719	1538
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1586	3172	4721	0	1719	1538
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			10			401
Link Speed (mph)		45	45		45	
Link Distance (ft)		1265	1521		454	
Travel Time (s)		19.2	23.0		6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	10%	9%	9%	5%	5%
Adj. Flow (vph)	256	824	1011	56	47	401
Shared Lane Traffic (%)						
Lane Group Flow (vph)	256	824	1067	0	47	401
Turn Type	Prot	NA	NA		NA	Perm
Protected Phases	1	6	2		3	
Permitted Phases						3
Detector Phase	1	6	2		3	3
Switch Phase						
Minimum Initial (s)	7.0	20.0	20.0		7.0	7.0
Minimum Split (s)	13.0	27.0	27.0		22.0	22.0
Total Split (s)	29.0	63.0	34.0		27.0	27.0
Total Split (%)	32.2%	70.0%	37.8%		30.0%	30.0%
Yellow Time (s)	4.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0		6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	16.6	48.2	25.5		9.4	9.4
Actuated g/C Ratio	0.23	0.68	0.36		0.13	0.13
v/c Ratio	0.69	0.38	0.63		0.21	0.73
Control Delay	36.2	5.8	21.6		31.2	12.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	36.2	5.8	21.6		31.2	12.0
LOS	D	A	C		C	B
Approach Delay		13.0	21.6		14.0	
Approach LOS		B	C		B	
Queue Length 50th (ft)	101	58	128		19	0

Kentuck Road Study  
 11: South Boston Road & Kentuck Road

Future (2035) Traffic Conditions  
 AM Peak



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 95th (ft)	201	132	234		50	78
Internal Link Dist (ft)		1185	1441		374	
Turn Bay Length (ft)	470				225	
Base Capacity (vph)	524	2555	1839		519	744
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	0.49	0.32	0.58		0.09	0.54

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 70.9  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 16.7  
 Intersection Capacity Utilization 53.1%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 11: South Boston Road & Kentuck Road



Kentuck Road Study  
1: Kentuck Road & Little Creek Road

Future (2035) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 18.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	201	152	159	236	129	109
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	-	-	-	-	90
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	223	169	177	262	143	121

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	759	143	143	0	-	0
Stage 1	143	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Follow-up Headway	3.509	3.309	2.209	-	-	-
Pot Capacity-1 Maneuver	376	907	1446	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	322	907	1446	-	-	-
Mov Capacity-2 Maneuver	322	-	-	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	464	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.6	3.2	0
HCM LOS	E		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1446	-	446	-	-
HCM Lane V/C Ratio	0.122	-	0.879	-	-
HCM Control Delay (s)	7.836	0	48.6	-	-
HCM Lane LOS	A	A	E		
HCM 95th %tile Q(veh)	0.416	-	9.224	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
2: Kentuck Road & Fall Creek Road

Future (2035) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	11	33	362	20	59	222
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	12	37	402	22	66	247

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	791	413	0	0	424	0
Stage 1	413	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.2	-
Pot Capacity-1 Maneuver	361	643	-	-	1146	-
Stage 1	672	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	337	643	-	-	1146	-
Mov Capacity-2 Maneuver	337	-	-	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	650	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	12.6		0		1.7
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	524	1146	-
HCM Lane V/C Ratio	-	-	0.093	0.057	-
HCM Control Delay (s)	-	-	12.6	8.332	0
HCM Lane LOS			B	A	A
HCM 95th %tile Q(veh)	-	-	0.307	0.182	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 3: Kentuck Road & Ringgold Industrial Parkway

Future (2035) Traffic Conditions  
 PM Peak

Intersection

Intersection Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	16	30	5	322	180	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	14	14	2	2	3	3
Mvmt Flow	18	33	6	358	200	1

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	570	201	201	0	-	0
Stage 1	201	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Follow-up Headway	3.626	3.426	2.218	-	-	-
Pot Capacity-1 Maneuver	463	810	1371	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	461	810	1371	-	-	-
Mov Capacity-2 Maneuver	461	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1371	-	641	-	-
HCM Lane V/C Ratio	0.004	-	0.08	-	-
HCM Control Delay (s)	7.637	0	11.1	-	-
HCM Lane LOS	A	A	B		
HCM 95th %tile Q(veh)	0.012	-	0.259	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 4: Kentuck Road & Eagle Springs Road/Wilkerson Road

Future (2035) Traffic Conditions  
 PM Peak

Intersection

Intersection Delay, s/veh 1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	4	26	0	4	34	7	316	0	20	183	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	8	8	0	2	2	4	4	0	5	5	0
Mvmt Flow	0	4	29	0	4	38	8	351	0	22	203	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	636	615	203	631	615	351	203	0	0	351	0	0
Stage 1	248	248	-	367	367	-	-	-	-	-	-	-
Stage 2	388	367	-	264	248	-	-	-	-	-	-	-
Follow-up Headway	3.5	4.072	3.372	3.5	4.018	3.318	2.236	-	-	2.245	-	-
Pot Capacity-1 Maneuver	393	399	823	396	407	692	1357	-	-	1191	-	-
Stage 1	760	690	-	657	622	-	-	-	-	-	-	-
Stage 2	640	612	-	746	701	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	361	388	823	371	396	692	1357	-	-	1191	-	-
Mov Capacity-2 Maneuver	361	388	-	371	396	-	-	-	-	-	-	-
Stage 1	755	676	-	652	618	-	-	-	-	-	-	-
Stage 2	597	608	-	700	686	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	10.3			11			0.2			0.8		
HCM LOS	B			B								

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	716	642	1191	-	-
HCM Lane V/C Ratio	0.006	-	-	0.047	0.066	0.019	-	-
HCM Control Delay (s)	7.668	0	-	10.3	11	8.08	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.017	-	-	0.146	0.211	0.057	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
5: Eagle Springs Road & Kentuck Road

Future (2035) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 0

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	0	350	203	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	5	5	0	0
Mvmt Flow	0	389	226	2	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	228	0	616
Stage 1	-	-	227
Stage 2	-	-	389
Follow-up Headway	2.2	-	3.5
Pot Capacity-1 Maneuver	1352	-	457
Stage 1	-	-	815
Stage 2	-	-	689
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1352	-	457
Mov Capacity-2 Maneuver	-	-	457
Stage 1	-	-	815
Stage 2	-	-	689

Approach	NB	SB	NE
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	0	1352	-	-	-
HCM Lane V/C Ratio	+	-	-	-	-
HCM Control Delay (s)	0	0	-	-	-
HCM Lane LOS	A	A	-	-	-
HCM 95th %tile Q(veh)	+	0	-	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
7: Kentuck Road & Wilkerson Road

Future (2035) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 1.5

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Vol, veh/h	323	124	0	209	73	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	4	0	5	2	0
Mvmt Flow	359	138	0	232	81	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	497
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	-	-	2.2
Pot Capacity-1 Maneuver	-	-	1077
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	1077
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	15.4
HCM LOS			C

Minor Lane / Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	1077	-	428
HCM Lane V/C Ratio	-	-	-	-	0.19
HCM Control Delay (s)	-	-	0	-	15.4
HCM Lane LOS			A		C
HCM 95th %tile Q(veh)	-	-	0	-	0.69

Notes

- : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions  
PM Peak

Intersection

Intersection Delay, s/veh 3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	30	16	47	12	15	16	44	410	21	5	283	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	4	4	4
Mvmt Flow	33	18	52	13	17	18	49	456	23	6	314	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	923	918	329	941	921	467	344	0	0	479	0	0
Stage 1	341	341	-	565	565	-	-	-	-	-	-	-
Stage 2	582	577	-	376	356	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.5	4	3.3	2.227	-	-	2.236	-	-
Pot Capacity-1 Maneuver	252	274	717	245	273	600	1209	-	-	1073	-	-
Stage 1	678	642	-	513	511	-	-	-	-	-	-	-
Stage 2	502	505	-	649	633	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	222	257	717	205	256	600	1209	-	-	1073	-	-
Mov Capacity-2 Maneuver	222	257	-	205	256	-	-	-	-	-	-	-
Stage 1	641	638	-	485	483	-	-	-	-	-	-	-
Stage 2	444	477	-	581	629	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	19.3			19.3			0.8			0.1		
HCM LOS	C			C								

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1209	-	-	354	299	1073	-	-
HCM Lane V/C Ratio	0.04	-	-	0.292	0.16	0.005	-	-
HCM Control Delay (s)	8.103	0	-	19.3	19.3	8.373	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.126	-	-	1.191	0.561	0.016	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 10: Kentuck Road & Shopping Center

Future (2035) Traffic Conditions  
 PM Peak

Intersection

Intersection Delay, s/veh 2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	24	108	381	30	70	299
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	-	210	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	4	4	4	4
Mvmt Flow	27	120	423	33	78	332

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	911	423	0	0	423	0
Stage 1	423	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Follow-up Headway	3.509	3.309	-	-	2.236	-
Pot Capacity-1 Maneuver	306	633	-	-	1126	-
Stage 1	663	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	285	633	-	-	1126	-
Mov Capacity-2 Maneuver	285	-	-	-	-	-
Stage 1	663	-	-	-	-	-
Stage 2	576	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	13.3		0		1.6
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	285	633	1126	-
HCM Lane V/C Ratio	-	-	0.094	0.19	0.069	-
HCM Control Delay (s)	-	-	18.9	12	8.434	-
HCM Lane LOS			C	B	A	
HCM 95th %tile Q(veh)	-	-	0.307	0.694	0.222	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
 11: South Boston Road & Kentuck Road

Future (2035) Traffic Conditions  
 PM Peak

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	  			
Volume (vph)	413	1063	898	53	69	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Storage Length (ft)	470			1000	225	0
Storage Lanes	1			0	1	1
Taper Length (ft)	165				50	
Lane Util. Factor	1.00	0.95	0.91	0.91	1.00	1.00
Frt			0.992			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1694	3388	4948	0	1687	1509
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1694	3388	4948	0	1687	1509
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			9			264
Link Speed (mph)		45	45		45	
Link Distance (ft)		1265	1521		454	
Travel Time (s)		19.2	23.0		6.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	4%	4%	7%	7%
Adj. Flow (vph)	459	1181	998	59	77	264
Shared Lane Traffic (%)						
Lane Group Flow (vph)	459	1181	1057	0	77	264
Turn Type	Prot	NA	NA		NA	Perm
Protected Phases	1	6	2		3	
Permitted Phases						3
Detector Phase	1	6	2		3	3
Switch Phase						
Minimum Initial (s)	7.0	20.0	20.0		7.0	7.0
Minimum Split (s)	13.0	27.0	27.0		22.0	22.0
Total Split (s)	40.0	73.0	33.0		22.0	22.0
Total Split (%)	42.1%	76.8%	34.7%		23.2%	23.2%
Yellow Time (s)	4.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0		6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min		None	None
Act Effct Green (s)	26.5	57.7	25.1		9.7	9.7
Actuated g/C Ratio	0.33	0.71	0.31		0.12	0.12
v/c Ratio	0.82	0.49	0.68		0.38	0.64
Control Delay	38.9	5.9	28.0		40.6	12.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	38.9	5.9	28.0		40.6	12.5
LOS	D	A	C		D	B
Approach Delay		15.2	28.0		18.9	
Approach LOS		B	C		B	
Queue Length 50th (ft)	211	107	168		37	0

Kentuck Road Study  
 11: South Boston Road & Kentuck Road

Future (2035) Traffic Conditions  
 PM Peak

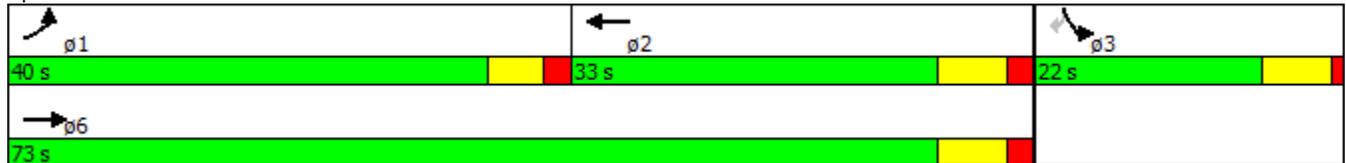
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 95th (ft)	355	185	260		83	69
Internal Link Dist (ft)		1185	1441		374	
Turn Bay Length (ft)	470				225	
Base Capacity (vph)	726	2798	1628		340	515
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.63	0.42	0.65		0.23	0.51

Intersection Summary

Area Type: Other  
 Cycle Length: 95  
 Actuated Cycle Length: 80.7  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 20.1  
 Intersection Capacity Utilization 63.1%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service B

Splits and Phases: 11: South Boston Road & Kentuck Road



APPENDIX G  
KENTUCK ROAD AND HALIFAX ROAD INTERSECTION ALTERNATIVES  
LEVEL OF SERVICE ANALYSIS

Kentuck Road  
9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions with Turn Lanes

AM Peak

Intersection

Intersection Delay, s/veh

2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	27	6	27	7	9	10	22	275	7	6	426	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	5	5	5	6	6	6	3	3	3
Mvmt Flow	30	7	30	8	10	11	24	306	8	7	473	23

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	867	860	485	875
Stage 1	498	498	-	358
Stage 2	369	362	-	517
Follow-up Headway	3.5	4	3.3	3.545
Pot Capacity-1 Maneuver	275	296	586	267
Stage 1	558	548	-	654
Stage 2	655	629	-	536
Time blocked-Platoon, %				
Mov Capacity-1 Maneuver	258	288	586	243
Mov Capacity-2 Maneuver	258	288	-	243
Stage 1	545	545	-	639
Stage 2	620	615	-	500

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	16.3	0.6	0.1
HCM LOS	C	C		

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1047	-	-	350	347	1242	-	-
HCM Lane V/C Ratio	0.023	-	-	0.19	0.083	0.005	-	-
HCM Control Delay (s)	8.521	-	-	17.7	16.3	7.914	-	-
HCM Lane LOS	A			C	C	A		
HCM 95th %tile Q(veh)	0.072	-	-	0.692	0.271	0.016	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions with Turn Lanes

PM Peak

Intersection

Intersection Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	30	14	47	10	9	10	44	410	19	4	283	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	200	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	4	4	4
Mvmt Flow	33	16	52	11	10	11	49	456	21	4	314	30

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	912	912	329	936	917	466	344	0	0	477	0	0
Stage 1	338	338	-	564	564	-	-	-	-	-	-	-
Stage 2	574	574	-	372	353	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.5	4	3.3	2.227	-	-	2.236	-	-
Pot Capacity-1 Maneuver	257	276	717	247	274	601	1209	-	-	1075	-	-
Stage 1	681	644	-	514	512	-	-	-	-	-	-	-
Stage 2	507	506	-	653	634	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	237	264	717	211	262	601	1209	-	-	1075	-	-
Mov Capacity-2 Maneuver	237	264	-	211	262	-	-	-	-	-	-	-
Stage 1	653	642	-	493	491	-	-	-	-	-	-	-
Stage 2	468	485	-	589	632	-	-	-	-	-	-	-

Approach	EB		WB			NB		SB				
HCM Control Delay, s	18.3		18.7			0.8				0.1		
HCM LOS	C		C									

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1209	-	-	371	295	1075	-	-
HCM Lane V/C Ratio	0.04	-	-	0.273	0.109	0.004	-	-
HCM Control Delay (s)	8.103	-	-	18.3	18.7	8.363	-	-
HCM Lane LOS	A			C	C	A		
HCM 95th %tile Q(veh)	0.126	-	-	1.089	0.364	0.012	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions with Traffic Signal  
AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	6	27	7	9	10	22	275	7	6	426	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			200			200		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.940			0.949			0.996			0.993	
Flt Protected		0.978			0.986		0.950			0.950		
Satd. Flow (prot)	0	1747	0	0	1637	0	1646	1726	0	1694	1771	0
Flt Permitted					0.911		0.482			0.570		
Satd. Flow (perm)	0	1786	0	0	1512	0	835	1726	0	1016	1771	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			11			4			8	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		283			289			667			639	
Travel Time (s)		7.7			7.9			10.1			9.7	
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%	5%	5%	5%	6%	6%	6%	3%	3%	3%
Adj. Flow (vph)	30	7	30	8	10	11	24	306	8	7	473	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	29	0	24	314	0	7	496	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		18.0	18.0		18.0	18.0	
Total Split (s)	17.0	17.0		17.0	17.0		43.0	43.0		43.0	43.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%		71.7%	71.7%	
Yellow Time (s)	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	
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 Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		7.4			7.4		28.3	28.3		28.3	28.3	
Actuated g/C Ratio		0.21			0.21		0.80	0.80		0.80	0.80	
v/c Ratio		0.17			0.09		0.04	0.23		0.01	0.35	
Control Delay		10.0			11.2		4.6	4.3		4.5	5.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		10.0			11.2		4.6	4.3		4.5	5.1	
LOS		B			B		A	A		A	A	
Approach Delay		10.0			11.2			4.4			5.1	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		5			2		0	0		0	0	

Kentuck Road  
9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions with Traffic Signal  
AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		31			19		10	75		5	130	
Internal Link Dist (ft)		203			209			587			559	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		583			484		810	1674		985	1718	
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		0.11			0.06		0.03	0.19		0.01	0.29	

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 35.4  
 Natural Cycle: 40  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.35  
 Intersection Signal Delay: 5.4  
 Intersection Capacity Utilization 39.5%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Kentuck Road & Halifax Road



Kentuck Road  
9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions with Traffic Signal

PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	14	47	10	9	10	44	410	19	4	283	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	11	11	11	11	11	11
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			200			200		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.930			0.954			0.993			0.987	
Flt Protected		0.984			0.983		0.950			0.950		
Satd. Flow (prot)	0	1739	0	0	1722	0	1694	1771	0	1678	1743	0
Flt Permitted		0.879			0.846		0.554			0.479		
Satd. Flow (perm)	0	1553	0	0	1482	0	988	1771	0	846	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		52			11			7			14	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		283			289			667			639	
Travel Time (s)		7.7			7.9			10.1			9.7	
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%	0%	0%	0%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	33	16	52	11	10	11	49	456	21	4	314	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	101	0	0	32	0	49	477	0	4	344	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		18.0	18.0		18.0	18.0	
Total Split (s)	19.0	19.0		19.0	19.0		41.0	41.0		41.0	41.0	
Total Split (%)	31.7%	31.7%		31.7%	31.7%		68.3%	68.3%		68.3%	68.3%	
Yellow Time (s)	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	
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 Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Act Effct Green (s)		7.8			7.8		23.1	23.1		23.1	23.1	
Actuated g/C Ratio		0.20			0.20		0.60	0.60		0.60	0.60	
v/c Ratio		0.29			0.10		0.08	0.45		0.01	0.33	
Control Delay		10.3			11.3		6.0	8.2		5.5	6.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		10.3			11.3		6.0	8.2		5.5	6.9	
LOS		B			B		A	A		A	A	
Approach Delay		10.3			11.3			8.0			6.9	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		7			3		5	58		1	37	

Kentuck Road  
9: Kentuck Road & Halifax Road

Future (2035) Traffic Conditions with Traffic Signal

PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		40			20		17	130		3	86	
Internal Link Dist (ft)		203			209			587			559	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		568			516		886	1589		758	1564	
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		0.18			0.06		0.06	0.30		0.01	0.22	

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 38.7  
 Natural Cycle: 40  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.45  
 Intersection Signal Delay: 8.0  
 Intersection Capacity Utilization 53.4%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 9: Kentuck Road & Halifax Road



# LANE SUMMARY

Site: AM - Halifax Rd and Kentuck Rd

AM - Halifax Road and Kentuck Road Roundabout

Lane Use and Performance																
	Demand Flows			Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R								Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec			veh	ft	ft	%	%
South: Kentuck Road																
Lane 1	24	306	17	347	6.0	1006	P	100	7.2	LOS A	1.6	41.3	1600	-	0.0	0.0
Approach	24	306	17	347	6.0		0.345		7.2	LOS A	1.6	41.3				
East: Halifax Road																
Lane 1	10	11	12	33	5.0	736	P	100	5.3	LOS A	0.1	3.8	1600	-	0.0	0.0
Approach	10	11	12	33	5.0		0.045		5.3	LOS A	0.1	3.8				
North: Kentuck Road																
Lane 1	13	473	23	510	3.0	1046	P	100	9.1	LOS A	2.9	74.2	1600	-	0.0	0.0
Approach	13	473	23	510	3.0		0.488		9.1	LOS A	2.9	74.2				
West: Halifax Road																
Lane 1	30	14	30	74	0.0	677	P	100	6.5	LOS A	0.4	9.5	1600	-	0.0	0.0
Approach	30	14	30	74	0.0		0.110		6.5	LOS A	0.4	9.5				
Intersection				964	3.9		0.488		8.1	LOS A	2.9	74.2				

P: You need to Process this Site (F9) for this variable to be computed.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

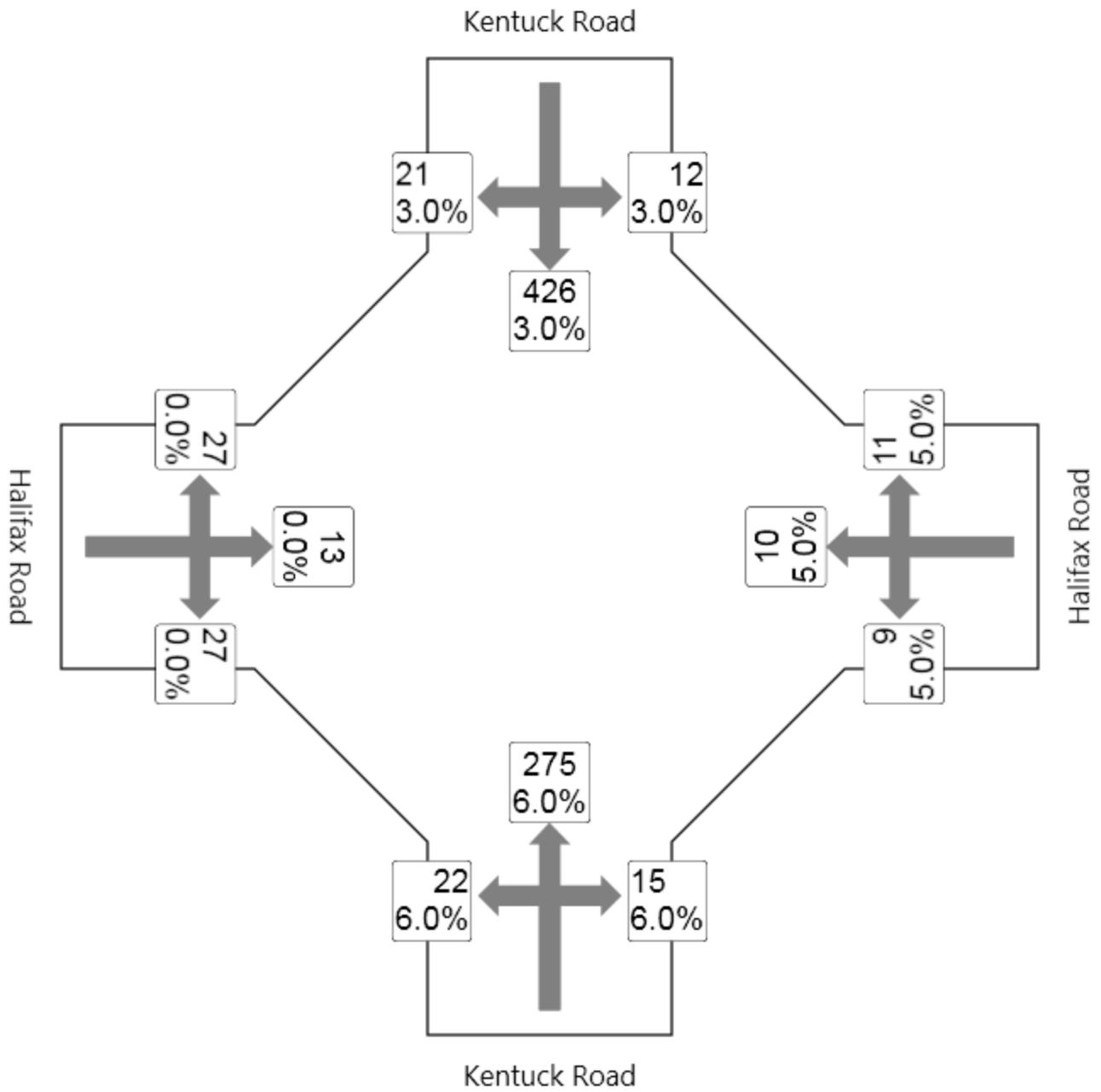
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.



# LANE SUMMARY

Site: PM - Halifax Rd and Kentuck Rd

PM - Halifax Road and Kentuck Road Roundabout

Lane Use and Performance																
	Demand Flows			Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R								Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec			veh	ft	ft	%	%
South: Kentuck Road																
Lane 1	49	456	23	528	3.0	1036	P	100	9.6	LOS A	3.1	79.8	1600	-	0.0	0.0
Approach	49	456	23	528	3.0		0.509		9.6	LOS A	3.1	79.8				
East: Halifax Road																
Lane 1	13	17	18	48	0.0	650	P	100	6.3	LOS A	0.2	6.2	1600	-	0.0	0.0
Approach	13	17	18	48	0.0		0.073		6.3	LOS A	0.2	6.2				
North: Kentuck Road																
Lane 1	6	314	30	350	4.0	1003	P	100	7.2	LOS A	1.6	42.1	1600	-	0.0	0.0
Approach	6	314	30	350	4.0		0.349		7.2	LOS A	1.6	42.1				
West: Halifax Road																
Lane 1	33	18	52	103	0.0	799	P	100	5.8	LOS A	0.5	11.7	1600	-	0.0	0.0
Approach	33	18	52	103	0.0		0.129		5.8	LOS A	0.5	11.7				
Intersection				1029	2.9		0.509		8.3	LOS A	3.1	79.8				

P: You need to Process this Site (F9) for this variable to be computed.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

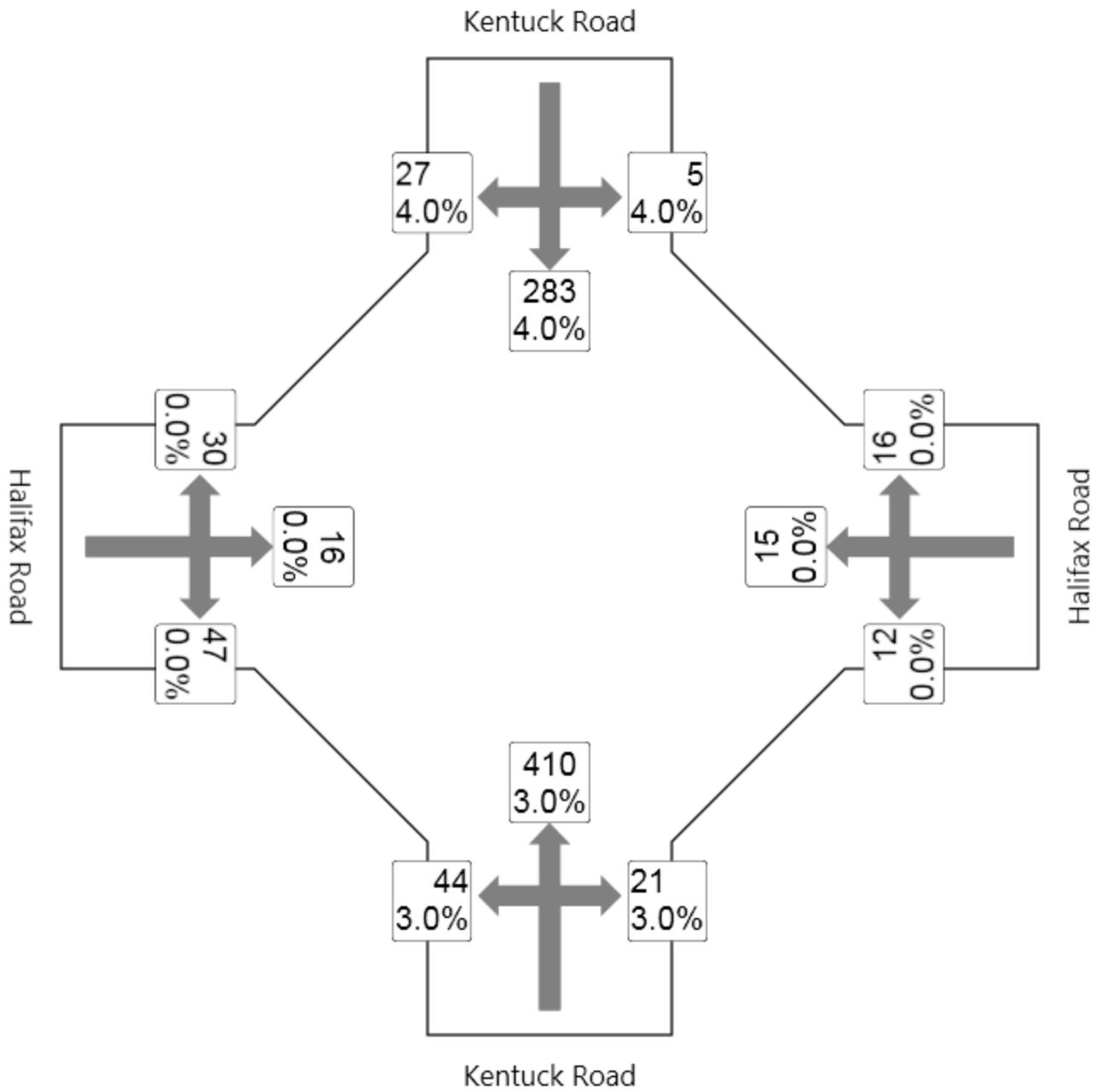
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.



APPENDIX H  
KENTUCK ROAD AND HALIFAX ROAD INTERSECTION ALTERNATIVES  
PRELIMINARY ESTIMATES OF PROBABLE COST

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND HALIFAX ROAD ALTERNATIVE 1**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
INSTALL LEFT TURN LANE - NORTHBOUND	840	LF	\$ 335.00	\$ 281,400.00
INSTALL LEFT TURN LANE - SOUTHBOUND	740	EA	\$ 335.00	\$ 247,900.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	4	EA	\$ 7,500.00	\$ 30,000.00
			<b>SUB TOTAL</b>	<b>\$ 586,800.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 146,700.00
			15% FOR ENGINEERING	\$ 88,020.00
			18% FOR CONSTRUCTION INSPECTION	\$ 105,624.00
			<b>TOTAL</b>	<b>\$ 927,144.00</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND HALIFAX ROAD ALTERNATIVE 2**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
INSTALL LEFT TURN LANE - NORTHBOUND	740	LF	\$ 335.00	\$ 247,900.00
INSTALL LEFT TURN LANE - SOUTHBOUND	740	EA	\$ 335.00	\$ 247,900.00
INSTALL TRAFFIC SIGNAL	1	EA	\$ 180,000.00	\$ 180,000.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	4	EA	\$ 7,500.00	\$ 30,000.00
			<b>SUB TOTAL</b>	<b>\$ 733,300.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 183,325.00
			15% FOR ENGINEERING	\$ 109,995.00
			18% FOR CONSTRUCTION INSPECTION	\$ 131,994.00
			<b>TOTAL</b>	<b>\$ 1,158,614.00</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND HALIFAX ROAD ALTERNATIVE 3**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
ROUNDBOUT	1	EA	\$ 625,000.00	\$ 625,000.00
WIDEN APPROACHES	2625	LF	\$ 335.00	\$ 879,375.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	10	EA	\$ 7,500.00	\$ 75,000.00
			<b>SUB TOTAL</b>	<b>\$ 1,606,875.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 401,718.75
			15% FOR ENGINEERING	\$ 241,031.25
			18% FOR CONSTRUCTION INSPECTION	\$ 289,237.50
			<b>TOTAL</b>	<b>\$ 2,538,862.50</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

APPENDIX I  
KENTUCK ROAD AND HALIFAX ROAD INTERSECTION  
SIGNAL WARRANT ANALYSIS

# Ramey Kemp & Associates, Inc.

Kentuck Road & Halifax Road

Future Traffic Conditions

## Signal Warrants - Summary

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### Major Street Approaches

**Northbound: Kentuck Road**

Number of Lanes: 2

85% Speed > 40 MPH.

Total Approach Volume: 1,357

**Southbound: Kentuck Road**

Number of Lanes: 2

85% Speed > 40 MPH.

Total Approach Volume: 1,329

### Minor Street Approaches

**Eastbound: Halifax Road**

Number of Lanes: 1

Total Approach Volume: 245

**Westbound: Halifax Road**

Number of Lanes: 1

Total Approach Volume: 93

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### Warrant Summary (Rural values apply.)

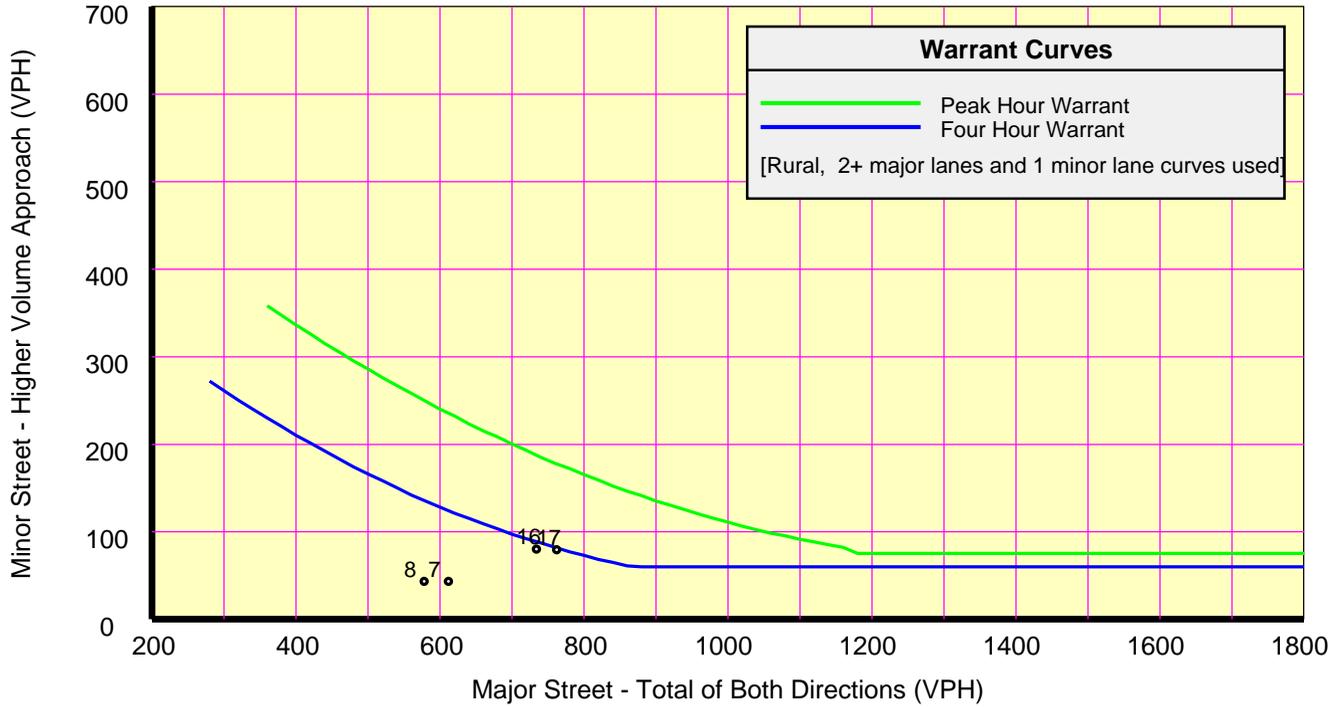
<b>Warrant 1 - Eight Hour Vehicular Volumes</b> .....	<b>Not Evaluated</b>
Warrant 1A - Minimum Vehicular Volume .....	Not Evaluated
Warrant 1B - Interruption of Continuous Traffic .....	Not Evaluated
Warrant 1 A&B - Combination of Warrants .....	Not Evaluated
<b>Warrant 2 - Four Hour Volumes</b> .....	<b>Not Satisfied</b>
Number of hours (0) volumes exceed minimum < minimum required (4).	
<b>Warrant 3 - Peak Hour</b> .....	<b>Not Satisfied</b>
Warrant 3A - Peak Hour Delay .....	Not Satisfied
Approach volumes on minor street don't exceed minimums for any hour. Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes .....	Not Satisfied
Volumes do not exceed minimums for any hour.	
<b>Warrant 4 - Pedestrian Volumes</b> .....	<b>Not Evaluated</b>
<b>Warrant 5 - School Crossing</b> .....	<b>Not Evaluated</b>
<b>Warrant 6 - Coordinated Signal System</b> .....	<b>Not Evaluated</b>
<b>Warrant 7 - Crash Experience</b> .....	<b>Not Evaluated</b>
<b>Warrant 8 - Roadway Network</b> .....	<b>Not Evaluated</b>
<b>Warrant 9 - Intersection Near a Grade Crossing</b> .....	<b>Not Evaluated</b>

# Ramey Kemp & Associates, Inc.

Kentuck Road & Halifax Road

Future Traffic Conditions

## Signal Warrants - Summary



### Analysis of 8-Hour Volume Warrants:

#### War 1A-Minimum Volume

#### War 1B-Interruption of Traffic

#### War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol	Dir	Maj 0	Min 0	Hour Begin	Major Total	Minor Vol	Dir	Maj 0	Min 0	Hour Begin	Major Total	Minor Vol	Dir	Maj 0	Min 0
17:00	762	79	EB	Yes	Yes	17:00	762	79	EB	Yes	Yes	17:00	762	79	EB	Yes	Yes
16:00	734	80	EB	Yes	Yes	16:00	734	80	EB	Yes	Yes	16:00	734	80	EB	Yes	Yes
07:00	612	43	EB	Yes	Yes	07:00	612	43	EB	Yes	Yes	07:00	612	43	EB	Yes	Yes
08:00	578	43	EB	Yes	Yes	08:00	578	43	EB	Yes	Yes	08:00	578	43	EB	Yes	Yes
22:00	0	0	W	Yes	Yes	22:00	0	0	W	Yes	Yes	22:00	0	0	W	Yes	Yes
21:00	0	0	W	Yes	Yes	21:00	0	0	W	Yes	Yes	21:00	0	0	W	Yes	Yes
20:00	0	0	W	Yes	Yes	20:00	0	0	W	Yes	Yes	20:00	0	0	W	Yes	Yes
19:00	0	0	W	Yes	Yes	19:00	0	0	W	Yes	Yes	19:00	0	0	W	Yes	Yes
18:00	0	0	W	Yes	Yes	18:00	0	0	W	Yes	Yes	18:00	0	0	W	Yes	Yes
15:00	0	0	W	Yes	Yes	15:00	0	0	W	Yes	Yes	15:00	0	0	W	Yes	Yes
14:00	0	0	W	Yes	Yes	14:00	0	0	W	Yes	Yes	14:00	0	0	W	Yes	Yes
13:00	0	0	W	Yes	Yes	13:00	0	0	W	Yes	Yes	13:00	0	0	W	Yes	Yes
12:00	0	0	W	Yes	Yes	12:00	0	0	W	Yes	Yes	12:00	0	0	W	Yes	Yes
11:00	0	0	W	Yes	Yes	11:00	0	0	W	Yes	Yes	11:00	0	0	W	Yes	Yes
10:00	0	0	W	Yes	Yes	10:00	0	0	W	Yes	Yes	10:00	0	0	W	Yes	Yes
09:00	0	0	W	Yes	Yes	09:00	0	0	W	Yes	Yes	09:00	0	0	W	Yes	Yes
06:00	0	0	W	Yes	Yes	06:00	0	0	W	Yes	Yes	06:00	0	0	W	Yes	Yes
05:00	0	0	W	Yes	Yes	05:00	0	0	W	Yes	Yes	05:00	0	0	W	Yes	Yes
04:00	0	0	W	Yes	Yes	04:00	0	0	W	Yes	Yes	04:00	0	0	W	Yes	Yes
03:00	0	0	W	Yes	Yes	03:00	0	0	W	Yes	Yes	03:00	0	0	W	Yes	Yes
02:00	0	0	W	Yes	Yes	02:00	0	0	W	Yes	Yes	02:00	0	0	W	Yes	Yes
01:00	0	0	W	Yes	Yes	01:00	0	0	W	Yes	Yes	01:00	0	0	W	Yes	Yes
00:00	0	0	W	Yes	Yes	00:00	0	0	W	Yes	Yes	00:00	0	0	W	Yes	Yes
16:45	783	84	EB	Yes	Yes	16:45	783	84	EB	Yes	Yes	16:45	783	84	EB	Yes	Yes

APPENDIX J  
KENTUCK ROAD AND EAGLE SPRINGS ROAD INTERSECTION ALTERNATIVES  
LEVEL OF SERVICE ANALYSIS

Kentuck Road Study  
7: Kentuck Road & Wilkerson Road

Future (2035) Traffic Conditions with Turn Lane  
AM Peak

Intersection

Intersection Delay, s/veh 3.3

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Vol, veh/h	204	34	0	314	142	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	5	0	2	1	0
Mvmt Flow	227	38	0	349	158	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	227
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	-	-	2.2
Pot Capacity-1 Maneuver	-	-	1353
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	1353
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	16.1
HCM LOS			C

Minor Lane / Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	1353	-	481
HCM Lane V/C Ratio	-	-	-	-	0.328
HCM Control Delay (s)	-	-	0	-	16.1
HCM Lane LOS			A		C
HCM 95th %tile Q(veh)	-	-	0	-	1.415

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road Study  
7: Kentuck Road & Wilkerson Road

Future (2035) Traffic Conditions with Turn Lane

PM Peak

Intersection

Intersection Delay, s/veh 1.4

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Vol, veh/h	323	124	0	209	73	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	4	4	0	5	2	0
Mvmt Flow	359	138	0	232	81	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	359
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	-	-	2.2
Pot Capacity-1 Maneuver	-	-	1211
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	1211
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	14.3
HCM LOS			B

Minor Lane / Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	1211	-	470
HCM Lane V/C Ratio	-	-	-	-	0.173
HCM Control Delay (s)	-	-	0	-	14.3
HCM Lane LOS			A		B
HCM 95th %tile Q(veh)	-	-	0	-	0.618

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
4: Kentuck Road & Eagles Springs Road/Wilkerson Road

Future (2035) Traffic Conditions with Turn Lanes

AM Peak

Intersection

Intersection Delay, s/veh 4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	4	7	142	6	27	27	177	34	24	307	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	100	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	30	30	1	1	1	5	5	5	1	1	0
Mvmt Flow	0	4	8	158	7	30	30	197	38	27	341	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	669	651	341	658	651	197	341	0	0	197	0	0
Stage 1	394	394	-	257	257	-	-	-	-	-	-	-
Stage 2	275	257	-	401	394	-	-	-	-	-	-	-
Follow-up Headway	3.5	4.27	3.57	3.509	4.009	3.309	2.245	-	-	2.209	-	-
Pot Capacity-1 Maneuver	374	354	642	379	389	847	1202	-	-	1382	-	-
Stage 1	635	559	-	750	697	-	-	-	-	-	-	-
Stage 2	736	646	-	628	607	-	-	-	-	-	-	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	342	335	642	356	369	847	1202	-	-	1382	-	-
Mov Capacity-2 Maneuver	342	335	-	356	369	-	-	-	-	-	-	-
Stage 1	617	546	-	728	677	-	-	-	-	-	-	-
Stage 2	683	627	-	601	592	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.7			17.4			0.9			0.6		
HCM LOS	B			C								

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	482	356	444	1382	-	-
HCM Lane V/C Ratio	0.025	-	-	0.025	0.295	0.201	0.019	-	-
HCM Control Delay (s)	8.072	0	-	12.7	19.3	15.1	7.656	0	-
HCM Lane LOS	A	A	-	B	C	C	A	A	-
HCM 95th %tile Q(veh)	0.077	-	-	0.078	1.211	0.742	0.059	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
5: Eagle Springs Road & Kentuck Road

Future (2035) Traffic Conditions with Turn Lanes  
AM Peak

Intersection

Intersection Delay, s/veh 0

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	0	204	331	4	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	1	1	30	0
Mvmt Flow	0	227	368	4	1	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	372	0	370
Stage 1	-	-	370
Stage 2	-	-	227
Follow-up Headway	2.2	-	3.77
Pot Capacity-1 Maneuver	1198	-	680
Stage 1	-	-	641
Stage 2	-	-	749
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1198	-	680
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	641
Stage 2	-	-	749

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

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	423	1198	-	-	-
HCM Lane V/C Ratio	0.003	-	-	-	-
HCM Control Delay (s)	13.5	0	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.008	0	-	-	-

Notes

- : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
4: Kentuck Road & Eagle Springs Road/Wilkerson Road

Future (2035) Traffic Conditions with Turn Lanes

PM Peak

Intersection

Intersection Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	4	26	73	4	34	7	316	124	20	183	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	100	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	8	8	2	2	2	4	4	4	5	5	0
Mvmt Flow	0	4	29	81	4	38	8	351	138	22	203	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	636	615	203	631	615	351	203	0	0	351	0	0
Stage 1	248	248	-	367	367	-	-	-	-	-	-	-
Stage 2	388	367	-	264	248	-	-	-	-	-	-	-
Follow-up Headway	3.5	4.072	3.372	3.518	4.018	3.318	2.236	-	-	2.245	-	-
Pot Capacity-1 Maneuver	393	399	823	394	407	692	1357	-	-	1191	-	-
Stage 1	760	690	-	653	622	-	-	-	-	-	-	-
Stage 2	640	612	-	741	701	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	360	387	823	369	395	692	1357	-	-	1191	-	-
Mov Capacity-2 Maneuver	360	387	-	369	395	-	-	-	-	-	-	-
Stage 1	754	676	-	648	617	-	-	-	-	-	-	-
Stage 2	596	607	-	695	686	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	10.3			14.7			0.1			0.8		
HCM LOS	B			B								

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	716	369	498	1191	-	-
HCM Lane V/C Ratio	0.006	-	-	0.047	0.147	0.139	0.019	-	-
HCM Control Delay (s)	7.668	0	-	10.3	16.4	13.4	8.08	0	-
HCM Lane LOS	A	A	-	B	C	B	A	A	-
HCM 95th %tile Q(veh)	0.017	-	-	0.146	0.509	0.48	0.057	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
5: Eagle Springs Road & Kentuck Road

Future (2035) Traffic Conditions with Turn Lanes

PM Peak

Intersection

Intersection Delay, s/veh 0

Movement	NBL	NBT	SBT	SBR	NEL	NER
Vol, veh/h	0	350	203	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	4	5	5	0	0
Mvmt Flow	0	389	226	2	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	228	0	616
Stage 1	-	-	227
Stage 2	-	-	389
Follow-up Headway	2.2	-	3.5
Pot Capacity-1 Maneuver	1352	-	457
Stage 1	-	-	815
Stage 2	-	-	689
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1352	-	457
Mov Capacity-2 Maneuver	-	-	457
Stage 1	-	-	815
Stage 2	-	-	689

Approach	NB	SB	NE
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane / Major Mvmt	NELn1	NBL	NBT	SBT	SBR
Capacity (veh/h)	0	1352	-	-	-
HCM Lane V/C Ratio	+	-	-	-	-
HCM Control Delay (s)	0	0	-	-	-
HCM Lane LOS	A	A	-	-	-
HCM 95th %tile Q(veh)	+	0	-	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

APPENDIX K  
KENTUCK ROAD AND EAGLE SPRINGS ROAD INTERSECTION ALTERNATIVES  
PRELIMINARY ESTIMATES OF PROBABLE COST

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND EAGLE SPRINGS ROAD ALTERNATIVE 1**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
INSTALL RIGHT TURN LANE - NORTHBOUND	250	LF	\$ 335.00	\$ 83,750.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	3	EA	\$ 7,500.00	\$ 22,500.00
			<b>SUB TOTAL</b>	<b>\$ 133,750.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 33,437.50
			15% FOR ENGINEERING	\$ 20,062.50
			18% FOR CONSTRUCTION INSPECTION	\$ 24,075.00
			<b>TOTAL</b>	<b>\$ 211,325.00</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND EAGLE SPRINGS ROAD ALTERNATIVE 2**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
INSTALL RIGHT TURN LANE - NORTHBOUND	200	LF	\$ 335.00	\$ 67,000.00
INSTALL RIGHT TURN LANE - WESTBOUND	200	LF	\$ 335.00	\$ 67,000.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	1	EA	\$ 7,500.00	\$ 7,500.00
			<b>SUB TOTAL</b>	<b>\$ 169,000.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 42,250.00
			15% FOR ENGINEERING	\$ 25,350.00
			18% FOR CONSTRUCTION INSPECTION	\$ 30,420.00
			<b>TOTAL</b>	<b>\$ 267,020.00</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

APPENDIX L  
KENTUCK RD AND FALL CREEK/LITTLE CREEK RD INTERSECTION ALTERNATIVES  
LEVEL OF SERVICE ANALYSIS

Kentuck Road  
1: Kentuck Road & Little Creek Road

Future (2035) Traffic Conditions with Turn Lanes

AM Peak

Intersection

Intersection Delay, s/veh 5.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	140	173	150	138	252	337
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	150	0	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	156	192	167	153	280	374

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	767	280	280	0	-	0
Stage 1	280	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Follow-up Headway	3.5	3.3	2.209	-	-	-
Pot Capacity-1 Maneuver	373	764	1288	-	-	-
Stage 1	772	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	325	764	1288	-	-	-
Mov Capacity-2 Maneuver	325	-	-	-	-	-
Stage 1	772	-	-	-	-	-
Stage 2	541	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	4.3	0
HCM LOS	C		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1288	-	325	764	-	-
HCM Lane V/C Ratio	0.129	-	0.479	0.252	-	-
HCM Control Delay (s)	8.21	-	25.8	11.3	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.444	-	2.467	0.995	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
2: Kentuck Road & Fall Creek Road

Future (2035) Traffic Conditions with Turn Lanes

AM Peak

Intersection

Intersection Delay, s/veh 1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	17	83	205	5	34	391
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	0	1	1	1	1
Mvmt Flow	19	92	228	6	38	434

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	741	231	0	0	233	0
Stage 1	231	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.209	-
Pot Capacity-1 Maneuver	387	813	-	-	1340	-
Stage 1	812	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	376	813	-	-	1340	-
Mov Capacity-2 Maneuver	376	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	590	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	11.3		0		0.6
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	679	1340	-
HCM Lane V/C Ratio	-	-	0.164	0.028	-
HCM Control Delay (s)	-	-	11.3	7.764	-
HCM Lane LOS			B	A	
HCM 95th %tile Q(veh)	-	-	0.582	0.087	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
1: Kentuck Road & Little Creek Road

Future (2035) Traffic Conditions with Turn Lanes

PM Peak

Intersection

Intersection Delay, s/veh 10.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	201	152	159	236	129	109
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	150	0	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	223	169	177	262	143	121

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	759	143	143	0	-	0
Stage 1	143	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Follow-up Headway	3.509	3.309	2.209	-	-	-
Pot Capacity-1 Maneuver	376	907	1446	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	330	907	1446	-	-	-
Mov Capacity-2 Maneuver	330	-	-	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	475	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.8	3.2	0
HCM LOS	C		

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1446	-	330	907	-	-
HCM Lane V/C Ratio	0.122	-	0.677	0.186	-	-
HCM Control Delay (s)	7.836	-	36	9.9	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.416	-	4.656	0.681	-	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road  
2: Kentuck Road & Fall Creek Road

Future (2035) Traffic Conditions with Turn Lanes

PM Peak

Intersection

Intersection Delay, s/veh 1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	11	33	362	20	59	222
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	0	1	1	0	0
Mvmt Flow	12	37	402	22	66	247

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	791	413	0	0	424	0
Stage 1	413	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Follow-up Headway	3.5	3.3	-	-	2.2	-
Pot Capacity-1 Maneuver	361	643	-	-	1146	-
Stage 1	672	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	340	643	-	-	1146	-
Mov Capacity-2 Maneuver	340	-	-	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	657	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	12.5		0		1.7
HCM LOS	B				

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	526	1146	-
HCM Lane V/C Ratio	-	-	0.093	0.057	-
HCM Control Delay (s)	-	-	12.5	8.332	-
HCM Lane LOS			B	A	
HCM 95th %tile Q(veh)	-	-	0.306	0.182	-

Notes

~ : Volume Exceeds Capacity; \$ : Delay Exceeds 300 Seconds; Error : Computation Not Defined

Kentuck Road

Future (2035) Traffic Conditions with Traffic Signal

1: Kentuck Road & Little Creek Road/Fall Creek Road

AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	28	145	17	81	2	69	136	5	6	246	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	100		0	100		100
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			200			200		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.874			0.998			0.994				0.850
Flt Protected	0.950				0.992		0.950			0.950		
Satd. Flow (prot)	1745	1600	0	0	1783	0	1728	1807	0	1711	1818	1546
Flt Permitted	0.685				0.910		0.591			0.657		
Satd. Flow (perm)	1258	1600	0	0	1635	0	1075	1807	0	1183	1818	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		161			2			4				374
Link Speed (mph)		45			45			45				45
Link Distance (ft)		499			477			446				639
Travel Time (s)		7.6			7.2			6.8				9.7
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%	2%	0%	2%	2%	2%	1%	1%	2%	2%	1%	1%
Adj. Flow (vph)	156	31	161	19	90	2	77	151	6	7	273	374
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	192	0	0	111	0	77	157	0	7	273	374
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	27.0	27.0		27.0	27.0		33.0	33.0		33.0	33.0	33.0
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	55.0%
Yellow Time (s)	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
Lost Time Adjust (s)	0.0	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	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effect Green (s)	10.2	10.2			10.2		15.2	15.2		15.2	15.2	15.2
Actuated g/C Ratio	0.27	0.27			0.27		0.40	0.40		0.40	0.40	0.40
v/c Ratio	0.46	0.35			0.25		0.18	0.21		0.01	0.37	0.44
Control Delay	15.8	5.3			11.7		9.6	9.0		8.2	10.5	3.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	15.8	5.3			11.7		9.6	9.0		8.2	10.5	3.3
LOS	B	A			B		A	A		A	B	A
Approach Delay		10.0			11.7			9.2			6.4	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	22	4			15		9	18		1	34	0
Queue Length 95th (ft)	68	37			47		34	55		7	95	38

Kentuck Road

Future (2035) Traffic Conditions with Traffic Signal

1: Kentuck Road & Little Creek Road/Fall Creek Road

AM Peak

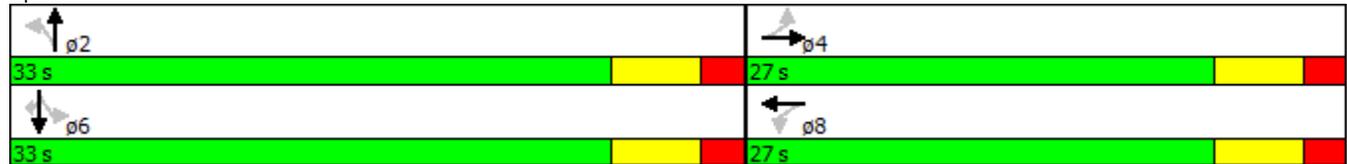
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		419			397			366			559	
Turn Bay Length (ft)							100			100		100
Base Capacity (vph)	714	977			929		784	1320		863	1326	1229
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.22	0.20			0.12		0.10	0.12		0.01	0.21	0.30

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 37.7  
 Natural Cycle: 40  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.46  
 Intersection Signal Delay: 8.2  
 Intersection Capacity Utilization 56.9%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service B

Splits and Phases: 1: Kentuck Road & Little Creek Road/Fall Creek Road



Kentuck Road

Future (2035) Traffic Conditions with Traffic Signal

1: Kentuck Road & Little Creek Road/Fall Creek Road

PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	201	57	95	11	31	2	128	234	20	2	127	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	100		0	100		100
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (ft)	25			25			200			200		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.906			0.994			0.988				0.850
Flt Protected	0.950				0.988		0.950			0.950		
Satd. Flow (prot)	1728	1654	0	0	1804	0	1728	1798	0	1745	1837	1561
Flt Permitted	0.726				0.901		0.667			0.587		
Satd. Flow (perm)	1320	1654	0	0	1645	0	1213	1798	0	1078	1837	1561
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		106			2			8				121
Link Speed (mph)		45			45			45				45
Link Distance (ft)		499			477			446				639
Travel Time (s)		7.6			7.2			6.8				9.7
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 (%)	1%	0%	1%	0%	0%	0%	1%	1%	0%	0%	0%	0%
Adj. Flow (vph)	223	63	106	12	34	2	142	260	22	2	141	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	169	0	0	48	0	142	282	0	2	141	121
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		12.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	28.0
Total Split (%)	53.3%	53.3%		53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	46.7%
Yellow Time (s)	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
Lost Time Adjust (s)	0.0	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	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Act Effect Green (s)	11.8	11.8			11.8		13.9	13.9		13.9	13.9	13.9
Actuated g/C Ratio	0.31	0.31			0.31		0.37	0.37		0.37	0.37	0.37
v/c Ratio	0.54	0.29			0.09		0.32	0.43		0.01	0.21	0.19
Control Delay	16.1	5.8			9.1		12.5	12.3		9.5	10.6	3.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	16.1	5.8			9.1		12.5	12.3		9.5	10.6	3.6
LOS	B	A			A		B	B		A	B	A
Approach Delay		11.7			9.1			12.4			7.4	
Approach LOS		B			A			B			A	
Queue Length 50th (ft)	34	8			6		19	38		0	18	0
Queue Length 95th (ft)	92	40			23		65	110		4	58	25

Kentuck Road

Future (2035) Traffic Conditions with Traffic Signal

1: Kentuck Road & Little Creek Road/Fall Creek Road

PM Peak

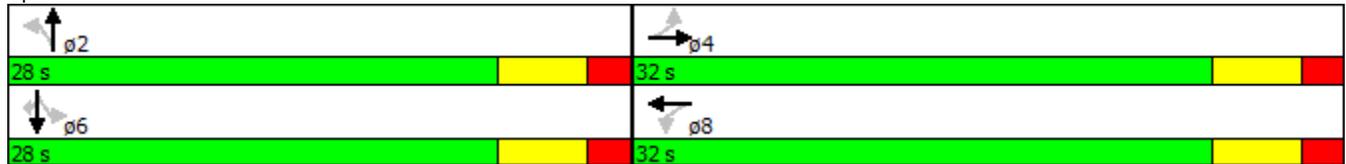
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		419			397			366			559	
Turn Bay Length (ft)							100			100		100
Base Capacity (vph)	923	1188			1151		717	1067		638	1087	973
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.24	0.14			0.04		0.20	0.26		0.00	0.13	0.12

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 38  
 Natural Cycle: 40  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.54  
 Intersection Signal Delay: 10.8  
 Intersection Capacity Utilization 56.3%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 1: Kentuck Road & Little Creek Road/Fall Creek Road



# LANE SUMMARY

Site: AM - Little Creek Rd and  
Kentuck Rd

AM - Little Creek Road and Kentuck Road  
Roundabout

Lane Use and Performance																
	Demand Flows				HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	Lane	SL	Cap.	Prob.	
	L	T	R	Total												Satn
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	ft	ft	%	%	
South: Kentuck Road																
Lane 1	77	151	6	233	1.0	922	P	100	6.5	LOS A	1.1	26.5	1600	-	0.0	0.0
Approach	77	151	6	233	1.0		0.253		6.5	LOS A	1.1	26.5				
East: Fall Creek Road																
Lane 1	19	90	2	111	0.0	768	P	100	6.2	LOS A	0.5	13.1	1600	-	0.0	0.0
Approach	19	90	2	111	0.0		0.145		6.2	LOS A	0.5	13.1				
North: Kentuck Road																
Lane 1	7	273	374	654	1.0	929	P	100	16.1	LOS C	6.5	163.6	1600	-	0.0	0.0
Approach	7	273	374	654	1.0		0.705		16.1	LOS C	6.5	163.6				
West: Little Creek Road																
Lane 1	156	31	161	348	0.0	836	P	100	9.4	LOS A	2.0	49.6	1600	-	0.0	0.0
Approach	156	31	161	348	0.0		0.416		9.4	LOS A	2.0	49.6				
Intersection				1347	0.7		0.705		11.9	LOS B	6.5	163.6				

P: You need to Process this Site (F9) for this variable to be computed.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

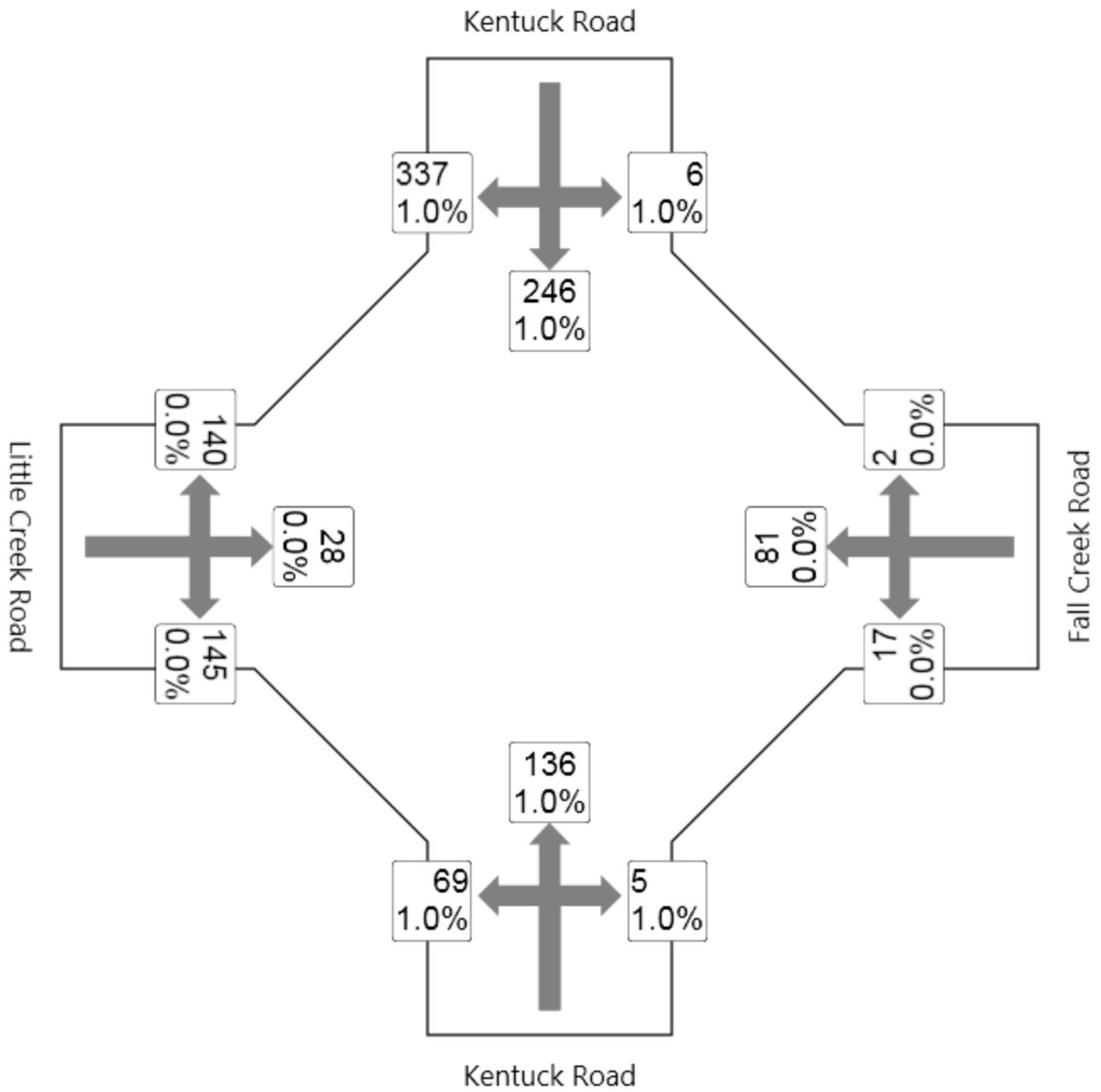
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.



# LANE SUMMARY

Site: PM - Little Creek Rd and  
Kentuck Rd

PM - Little Creek Road and Kentuck Road  
Roundabout

Lane Use and Performance																
	Demand Flows				HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	Lane	SL	Cap.	Prob.	
	L	T	R	Total												Satn
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	ft	ft	%	%	
South: Kentuck Road																
Lane 1	142	260	22	424	1.0	836	P	100	11.2	LOS B	2.9	72.0	1600	-	0.0	0.0
Approach	142	260	22	424	1.0		0.508		11.2	LOS B	2.9	72.0				
East: Fall Creek Road																
Lane 1	12	34	2	49	0.0	601	P	100	6.9	LOS A	0.3	6.8	1600	-	0.0	0.0
Approach	12	34	2	49	0.0		0.081		6.9	LOS A	0.3	6.8				
North: Kentuck Road																
Lane 1	2	141	121	264	0.0	934	P	100	6.8	LOS A	1.2	30.7	1600	-	0.0	0.0
Approach	2	141	121	264	0.0		0.283		6.8	LOS A	1.2	30.7				
West: Little Creek Road																
Lane 1	223	63	106	392	1.0	958	P	100	8.4	LOS A	2.1	52.2	1600	-	0.0	0.0
Approach	223	63	106	392	1.0		0.410		8.4	LOS A	2.1	52.2				
Intersection				1130	0.7		0.508		9.0	LOS A	2.9	72.0				

P: You need to Process this Site (F9) for this variable to be computed.

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

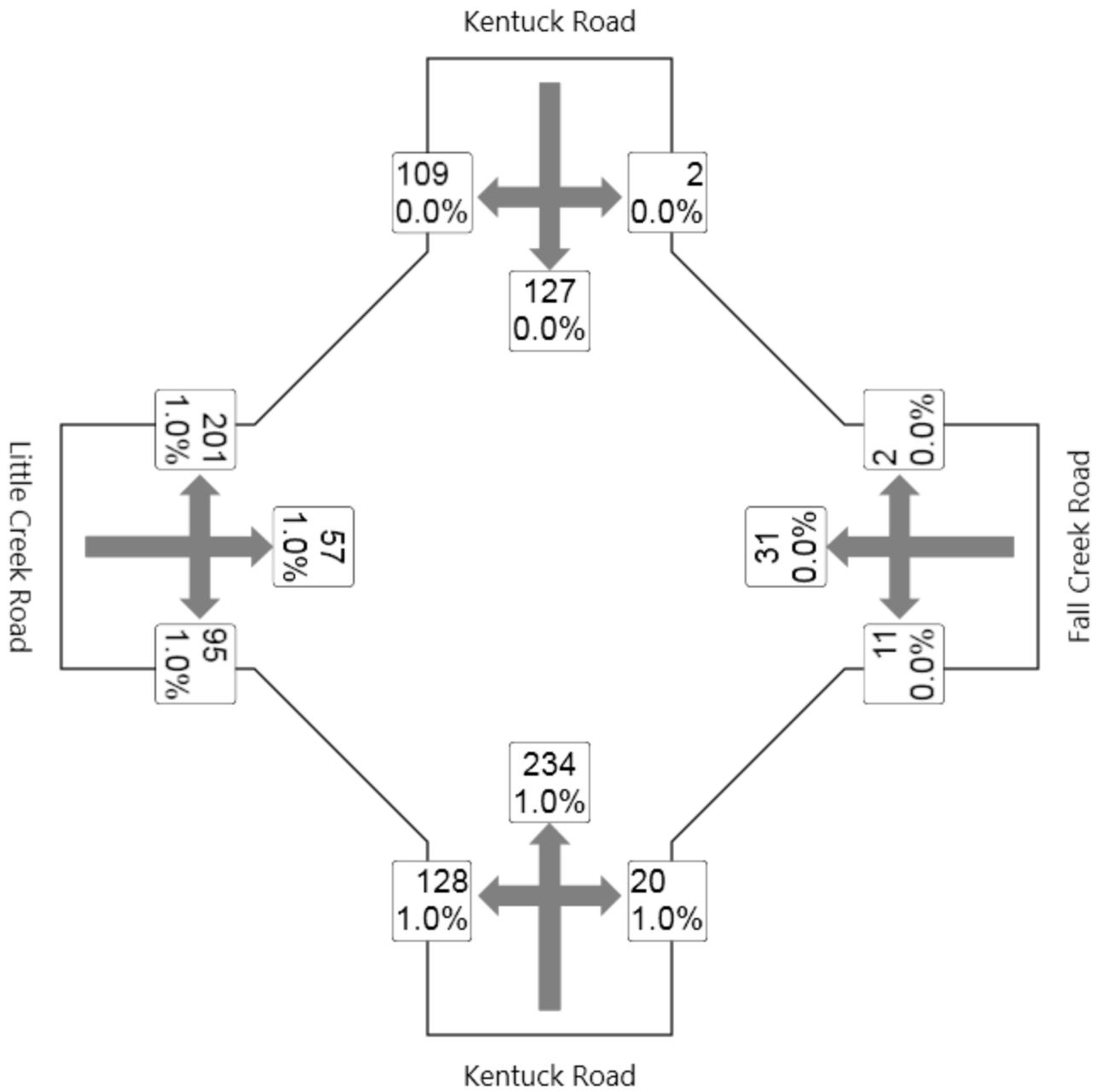
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.



APPENDIX M  
KENTUCK RD AND FALL CREEK/LITTLE CREEK RD INTERSECTION ALTERNATIVES  
PRELIMINARY ESTIMATES OF PROBABLE COST

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND LITTLE CREEK/FALL CREEK ROAD ALTERNATIVE 1**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
INSTALL CENTER TURN LANE	1800	LF	\$ 335.00	\$ 603,000.00
INSTALL RIGHT TURN LANE - SOUTHBOUND	200	LF	\$ 335.00	\$ 67,000.00
INSTALL RIGHT TURN LANE - EASTBOUND	250	LF	\$ 335.00	\$ 83,750.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	7	EA	\$ 7,500.00	\$ 52,500.00
			<b>SUB TOTAL</b>	<b>\$ 833,750.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 208,437.50
			15% FOR ENGINEERING	\$ 125,062.50
			18% FOR CONSTRUCTION INSPECTION	\$ 150,075.00
			<b>TOTAL</b>	<b>\$ 1,317,325.00</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND LITTLE CREEK/FALL CREEK ROAD ALTERNATIVE 2**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
INSTALL RIGHT TURN LANE - SOUTHBOUND	200	LF	\$ 335.00	\$ 67,000.00
INSTALL LEFT TURN LANE - SOUTHBOUND	740	LF	\$ 335.00	\$ 247,900.00
INSTALL LEFT TURN LANE - NORTHBOUND	740	LF	\$ 335.00	\$ 247,900.00
INSTALL LEFT TURN LANE - EASTBOUND	200	LF	\$ 335.00	\$ 67,000.00
NEW ALIGNMENT OF LOCAL ROADS	1815	LF	\$ 400.00	\$ 726,000.00
INSTALL TRAFFIC SIGNAL	1	EA	\$ 180,000.00	\$ 180,000.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	7	EA	\$ 7,500.00	\$ 52,500.00
			<b>SUB TOTAL</b>	<b>\$ 1,615,800.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 403,950.00
			15% FOR ENGINEERING	\$ 242,370.00
			18% FOR CONSTRUCTION INSPECTION	\$ 290,844.00
			<b>TOTAL</b>	<b>\$ 2,552,964.00</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

KENTUCK ROAD - PLANNING LEVEL STUDY

**KENTUCK ROAD - INTERSECTION OF KENTUCK AND LITTLE CREEK/FALL CREEK ROAD ALTERNATIVE 3**  
 PRELIMINARY ESTIMATE OF PROBABLE COST

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
ROUNDBOUT	1	EA	\$ 625,000.00	\$ 625,000.00
WIDEN APPROACHES	1100	LF	\$ 335.00	\$ 368,500.00
NEW ALIGNMENT OF LOCAL ROADS	2050	LF	\$ 400.00	\$ 820,000.00
STORMWATER MANAGEMENT - BASINS	1	EA	\$ 27,500.00	\$ 27,500.00
ENTRANCE IMPROVEMENTS	9	EA	\$ 7,500.00	\$ 67,500.00
			<b>SUB TOTAL</b>	<b>\$ 1,908,500.00</b>
			25% FOR RIGHT OF WAY AND UTILITY RELOCATIONS	\$ 477,125.00
			15% FOR ENGINEERING	\$ 286,275.00
			18% FOR CONSTRUCTION INSPECTION	\$ 343,530.00
			<b>TOTAL</b>	<b>\$ 3,015,430.00</b>

\* This cost estimate was prepared using the VDOT Transportation and Mobility Planning Division's Statewide Planning Level Cost Estimates.

APPENDIX N  
KENTUCK RD AND FALL CREEK/LITTLE CREEK RD INTERSECTION  
SIGNAL WARRANT ANALYSIS

**Ramey Kemp & Associates, Inc.**  
Kentuck Rd & Little Creek Rd/Fall Creek Rd  
Future Traffic Conditions

**Signal Warrants - Summary**

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**Major Street Approaches**

**Northbound: Kentuck Road**  
Number of Lanes: 2  
85% Speed > 40 MPH.  
Total Approach Volume: 1,112

**Southbound: Kentuck Road**  
Number of Lanes: 2  
85% Speed > 40 MPH.  
Total Approach Volume: 1,324

**Minor Street Approaches**

**Eastbound: Little Creek Road**  
Number of Lanes: 2  
  
Total Approach Volume: 1,125

**Westbound: Fall Creek Road**  
Number of Lanes: 1  
  
Total Approach Volume: 223

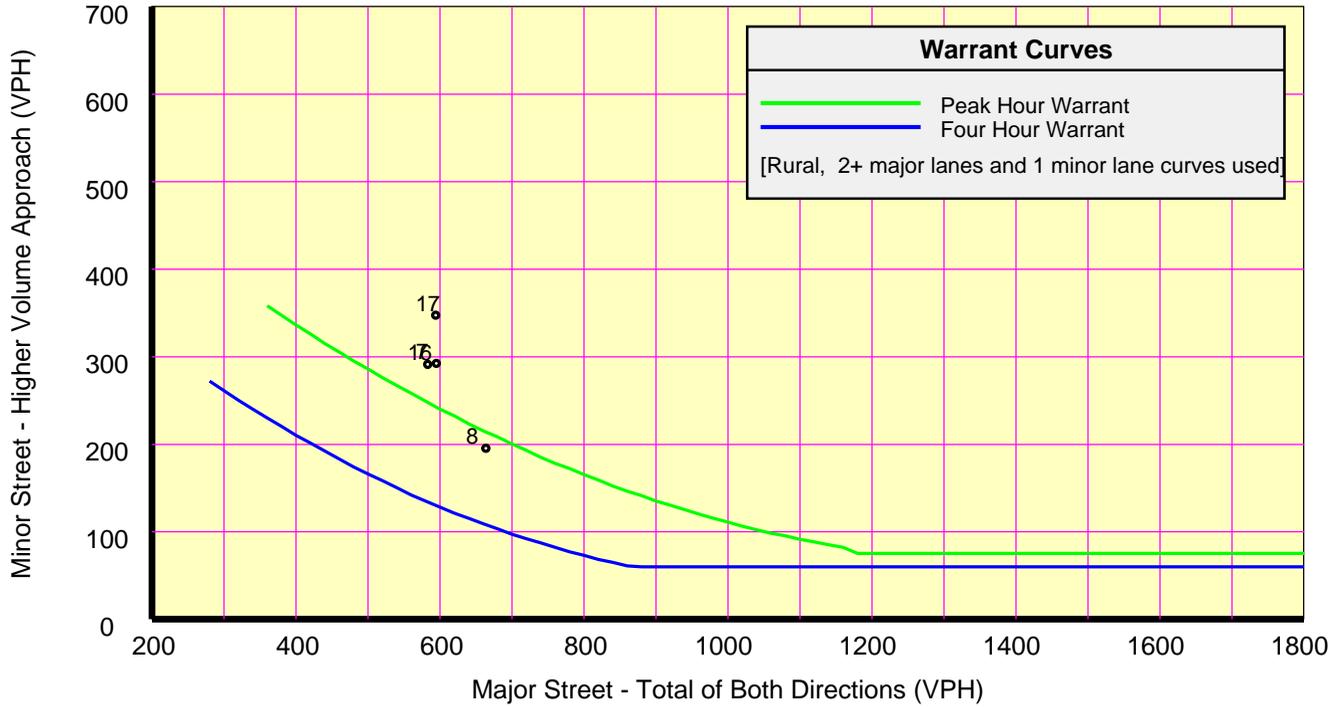
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**Warrant Summary** (Rural values apply.)

<b>Warrant 1 - Eight Hour Vehicular Volumes</b> .....	<b>Not Evaluated</b>
<b>Warrant 1A - Minimum Vehicular Volume</b> .....	Not Evaluated
<b>Warrant 1B - Interruption of Continuous Traffic</b> .....	Not Evaluated
<b>Warrant 1 A&amp;B - Combination of Warrants</b> .....	Not Evaluated
<b>Warrant 2 - Four Hour Volumes</b> .....	<b>Satisfied</b>
Number of hours (0) volumes exceed minimum < minimum required (4).	
<b>Warrant 3 - Peak Hour</b> .....	<b>Satisfied</b>
<b>Warrant 3A - Peak Hour Delay</b> .....	<b>Satisfied</b>
Number of hours (10) volumes exceed minimum >= required (1). Delay data not evaluated.	
<b>Warrant 3B - Peak Hour Volumes</b> .....	<b>Satisfied</b>
Volumes exceed minimums for at least one hour.	
<b>Warrant 4 - Pedestrian Volumes</b> .....	<b>Not Evaluated</b>
<b>Warrant 5 - School Crossing</b> .....	<b>Not Evaluated</b>
<b>Warrant 6 - Coordinated Signal System</b> .....	<b>Not Evaluated</b>
<b>Warrant 7 - Crash Experience</b> .....	<b>Not Evaluated</b>
<b>Warrant 8 - Roadway Network</b> .....	<b>Not Evaluated</b>
<b>Warrant 9 - Intersection Near a Grade Crossing</b> .....	<b>Not Evaluated</b>

**Ramey Kemp & Associates, Inc.**  
 Kentuck Rd & Little Creek Rd/Fall Creek Rd  
 Future Traffic Conditions

**Signal Warrants - Summary**



**Analysis of 8-Hour Volume Warrants:**

**War 1A-Minimum Volume**

**War 1B-Interruption of Traffic**

**War 1C-Combination of Warrants**

Hour Begin	Major Total	Minor Vol	Dir	Maj 0	Min 0	Hour Begin	Major Total	Minor Vol	Dir	Maj 0	Min 0	Hour Begin	Major Total	Minor Vol	Dir	Maj 0	Min 0
08:00	664	195	EB	Yes	Yes	08:00	664	195	EB	Yes	Yes	08:00	664	195	EB	Yes	Yes
07:00	595	292	EB	Yes	Yes	07:00	595	292	EB	Yes	Yes	07:00	595	292	EB	Yes	Yes
17:00	594	347	EB	Yes	Yes	17:00	594	347	EB	Yes	Yes	17:00	594	347	EB	Yes	Yes
16:00	583	291	EB	Yes	Yes	16:00	583	291	EB	Yes	Yes	16:00	583	291	EB	Yes	Yes
22:00	0	0	W	Yes	Yes	22:00	0	0	W	Yes	Yes	22:00	0	0	W	Yes	Yes
21:00	0	0	W	Yes	Yes	21:00	0	0	W	Yes	Yes	21:00	0	0	W	Yes	Yes
20:00	0	0	W	Yes	Yes	20:00	0	0	W	Yes	Yes	20:00	0	0	W	Yes	Yes
19:00	0	0	W	Yes	Yes	19:00	0	0	W	Yes	Yes	19:00	0	0	W	Yes	Yes
18:00	0	0	W	Yes	Yes	18:00	0	0	W	Yes	Yes	18:00	0	0	W	Yes	Yes
15:00	0	0	W	Yes	Yes	15:00	0	0	W	Yes	Yes	15:00	0	0	W	Yes	Yes
14:00	0	0	W	Yes	Yes	14:00	0	0	W	Yes	Yes	14:00	0	0	W	Yes	Yes
13:00	0	0	W	Yes	Yes	13:00	0	0	W	Yes	Yes	13:00	0	0	W	Yes	Yes
12:00	0	0	W	Yes	Yes	12:00	0	0	W	Yes	Yes	12:00	0	0	W	Yes	Yes
11:00	0	0	W	Yes	Yes	11:00	0	0	W	Yes	Yes	11:00	0	0	W	Yes	Yes
10:00	0	0	W	Yes	Yes	10:00	0	0	W	Yes	Yes	10:00	0	0	W	Yes	Yes
09:00	0	0	W	Yes	Yes	09:00	0	0	W	Yes	Yes	09:00	0	0	W	Yes	Yes
06:00	0	0	W	Yes	Yes	06:00	0	0	W	Yes	Yes	06:00	0	0	W	Yes	Yes
05:00	0	0	W	Yes	Yes	05:00	0	0	W	Yes	Yes	05:00	0	0	W	Yes	Yes
04:00	0	0	W	Yes	Yes	04:00	0	0	W	Yes	Yes	04:00	0	0	W	Yes	Yes
03:00	0	0	W	Yes	Yes	03:00	0	0	W	Yes	Yes	03:00	0	0	W	Yes	Yes
02:00	0	0	W	Yes	Yes	02:00	0	0	W	Yes	Yes	02:00	0	0	W	Yes	Yes
01:00	0	0	W	Yes	Yes	01:00	0	0	W	Yes	Yes	01:00	0	0	W	Yes	Yes
00:00	0	0	W	Yes	Yes	00:00	0	0	W	Yes	Yes	00:00	0	0	W	Yes	Yes
07:30	796	314	EB	Yes	Yes	07:30	796	314	EB	Yes	Yes	07:30	796	314	EB	Yes	Yes

APPENDIX O  
SITE PHOTOGRAPHS





Photo #1: Intersection of Kentuck Road and Route 58 Looking West



Photo #2: Intersection of Kentuck Road and Route 58 Looking East



Photo #3: Kentuck Road Looking South to the Intersection with Route 58



Photo #4: Intersection of Kentuck Road and Route 58 Looking North



Photo #5: Intersection of Kentuck Road and Shopping Center Entrance Looking East



Photo #6: Intersection of Kentuck Road and Halifax Road Looking South



Photo #7: Intersection of Kentuck Road and Halifax Road Looking North



Photo #8: Intersection of Kentuck Road and Halifax Road Looking South



Photo #9: Intersection of Kentuck Road and Halifax Road Looking North



Photo #10: Halifax Road Looking East to the Intersection with Kentuck Road



Photo #11: Halifax Road Looking West to the Intersection with Kentuck Road



Photo #12: Intersection of Kentuck Road and Eagle Springs Road Looking South



Photo #13: Intersection of Kentuck Road and Eagle Springs Road Looking North



Photo #14: Intersection of Kentuck Road and Eagle Springs Road Looking South



Photo #15: Intersection of Kentuck Road and Eagle Springs Road Looking North



Photo #16: Kentuck Road Bridge Over Railroad



Photo #17: Eagle Springs Road Looking East to the Intersection with Kentuck Road



Photo #18: Wilkerson Road Looking West to the Intersection with Kentuck Road



Photo #19: Intersection of Kentuck Road and Ringgold Industrial Park Looking South



Photo #20: Intersection of Kentuck Road and Ringgold Industrial Park Looking North



Photo #21: Intersection of Kentuck Road and Ringgold Industrial Park Looking West



Photo #22: Intersection of Kentuck Road and Little Creek Road Looking South



Photo #23: Intersection of Kentuck Road and Little Creek Road Looking North



Photo #24: Intersection of Kentuck Road and Fall Creek Road Looking South



Photo #25: Intersection of Kentuck Road and Fall Creek Road Looking North



Photo #26: Little Creek Road Looking West to the Intersection with Kentuck Road



Photo #27: Fall Creek Road Looking East to the Intersection with Kentuck Road