



# Port Republic Road

# Safety and Operations Study

Harrisonburg, Virginia

April 2019



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## EX-1 Executive Summary

A team comprised of members from the Harrisonburg Rockingham Metropolitan Planning Organization (HRMPO), City of Harrisonburg, Harrisonburg Department of Public Transportation (HDPT), and Virginia Department of Transportation (VDOT) identified the need to evaluate Port Republic Road for improved safety and operations within the City of Harrisonburg. Port Republic Road is a major urban arterial, providing access to commercial and residential areas of the City of Harrisonburg as well as the primary entrance into the James Madison University (JMU) campus. The project corridor spans from the intersection of Port Republic Road and South Main Street to the intersection of Port Republic Road and Devon Lane as shown in Figure 1.1. Closely spaced intersections, including the I-81 ramp interchange ramps, create congestion and safety concerns. This report documents the findings of the safety and operational analysis and presents the final recommendations for the corridor.







**FIGURE 1.1**  
**VICINITY MAP**

Port Republic Road Safety and Operations Study  
Harrisonburg, Virginia



## Operational and Safety Analyses

As part of the study, an operational analysis of signalized and key unsignalized intersections along the project corridor was conducted. The evaluation examined (2018) existing conditions, 2030 no build and 2030 build conditions. The analysis of existing and no build conditions demonstrates that several intersections within the corridor are operating over capacity, creating undesirable level of service metrics as well as significant queues which contribute to slow speeds and increased travel times throughout the corridor. The results of these analysis guided the operational recommendations that were included in the 2030 build model.

A safety analysis was conducted along the corridor to measure current crash trends and develop site specific improvements to achieve a reduction in the number of crashes or the severity of crashes. Five (5) years and six months (January 2013-June 2018) of crash data was used to assess the current safety of the Port Republic Road study corridor. The crash reports were categorized by several factors, including crash frequency per location, time of day, and crash types. The data was processed from multiple perspectives to provide the most comprehensive evaluation of the roadway conditions. The results were used to recommend a set of countermeasures which can predictively produce facilities with reduced crash rates after implementation.

## Operational and Safety Recommendations

The recommendations can be organized into four (4) categories: traffic control measures, geometric changes, access management strategies and miscellaneous.

### Traffic Control Measures

- Optimize corridor signal timings including cycle lengths, splits, offsets, and phasing sequences;
- Eliminate the split phase operation at the relocated NB I-81 off-ramp and Forest Hills;
- Eliminate the split phase operation at Port Republic Road and Devon Lane;
- Eliminate the northbound and southbound pedestrian crossing at Port Republic Road and Bluestone Drive;
- Signalize Port Republic Road and Bradley Lane;
- Install flashing yellow arrows (FYAs) where protected/permissive left turns are used. This allows for lead/leg left turn phasing which will assist in bi-directional coordination.
- Install High Visibility Backplates;
- Evaluate the implementation of red-light running cameras;
- Install yield sign on the right side of the roadway for the northbound channelized right turn at Port Republic Road and South Main Street;
- Relocate the crosswalk within the channelized northbound right turn lane at Port Republic Road and Devon Road;

- Install green markings in the bike lane across driveways and intersections; and,
- Restripe the westbound left turn lane at the intersection of Port Republic Road and Devon Road to clearly designate the transition from a two-way-left-turn-lane to a dedicated left turn lane.

### Geometric Changes

- Construct a westbound right turn lane with 100 feet of storage and a 100 foot taper on Port Republic Road at the intersection of Port Republic Road and Forest Hill Road;
- Increase the eastbound left turn lane storage length on Port Republic Road and Bluestone Drive from 100 feet to 300 feet;
- Increase the southbound left turn lane and right turn lane storage length on the south I-81 off ramp from 100 feet to 500 feet;
- Reconfigure the westbound Port Republic Road approach at South Main Street to include two left turn lanes, one through lane, one through/right and one right turn lane;
- Reconfigure the northbound approach of Devon Lane at Port Republic Road to include one left turn lane, one through lane and one right turn lane. Widen the southbound approach to include one left turn lane, one through lane and one right turn lane; and,
- Construct a pedestrian overpass over Port Republic at Bluestone Drive/Hillside Avenue.

### Access Management Strategies

- Implement peak hour turning restrictions at Hillcrest Drive, Crawford Ave, and Hunters Road;
- Install a median to restrict turning movements within the proximity of all signalized intersections; and,
- Close the gas station driveway located on the north side of Port Republic Road just east of Forest Hill Road on Port Republic Road.

### Miscellaneous Recommendations

- Install high friction surface course at downhill approaches to increase skid resistance and reduce stopping distances.

### Future Considerations

Below are considerations that are excepted to involve significant financial investment, or will require more study, and should be considered in the future.

- Transit stop enhancements;
- Evaluate intersection sight distance;
- Install left turn lanes at the unsignalized intersections;
- Evaluate the design of the vertical curves to current geometric design standards to provide adequate sight distance; and,
- Investigate a bus pull-out for transit vehicles in the westbound direction on Port Republic Road just east of Forest Hill Road.

# 1 Introduction and Methodology

## Purpose

A team comprised of members from the Harrisonburg Rockingham Metropolitan Planning Organization (HRMPO), City of Harrisonburg, Harrisonburg Department of Public Transportation (HDPT), and Virginia Department of Transportation (VDOT) identified the need to evaluate Port Republic Road for improved safety and operations within the City of Harrisonburg. Port Republic Road is a major urban arterial, providing access to commercial and residential areas of the City of Harrisonburg as well as the primary entrance into the James Madison University (JMU) campus. The project corridor spans from the intersection of Port Republic Road and South Main Street to the intersection of Port Republic Road and Devon Lane as shown above in Figure 1.1. Closely spaced intersections, including the I-81 ramp interchange ramps, create congestion and safety concerns.

The purpose of this study was to identify improvements that should improve transportation safety and operations within the Port Republic Corridor through the study area.

## Study Background

The study area is along Port Republic Road from South Main Street to Devon Lane and is approximately one (1) mile in length. Ten (10) intersections located along the corridor were chosen for the study as shown in Figure 1.2. Port Republic Road is classified as a major urban arterial and provides access to commercial and residential areas of the City of Harrisonburg as well as serves as the primary access onto the JMU Campus. Population growth and expansion of the JMU campus and student housing has significantly increased motor vehicle traffic as well as bicycle and pedestrian traffic over the past few years.

The intersections included in the study are:

- Port Republic Road and South Main Street;
- Port Republic Road and Hillcrest Drive;
- Port Republic Road and Crawford Avenue;
- Port Republic Road and Bluestone Drive/Hillside Avenue;
- Port Republic Road and Southbound I-81 Ramps;
- Port Republic Road and Northbound I-81 Ramps;
- Port Republic Road and Forest Hill Road;
- Port Republic Road and Hunters Road;
- Port Republic Road and Bradley Drive; and,
- Port Republic Road and Devon Lane.

The study area includes six (6) signalized intersections and four (4) unsignalized intersections. The study area map is shown in Figure 1.2 and displays the study intersections and the street network serving the site. Figure 1.3 shows the existing lane configurations at each of the intersections.



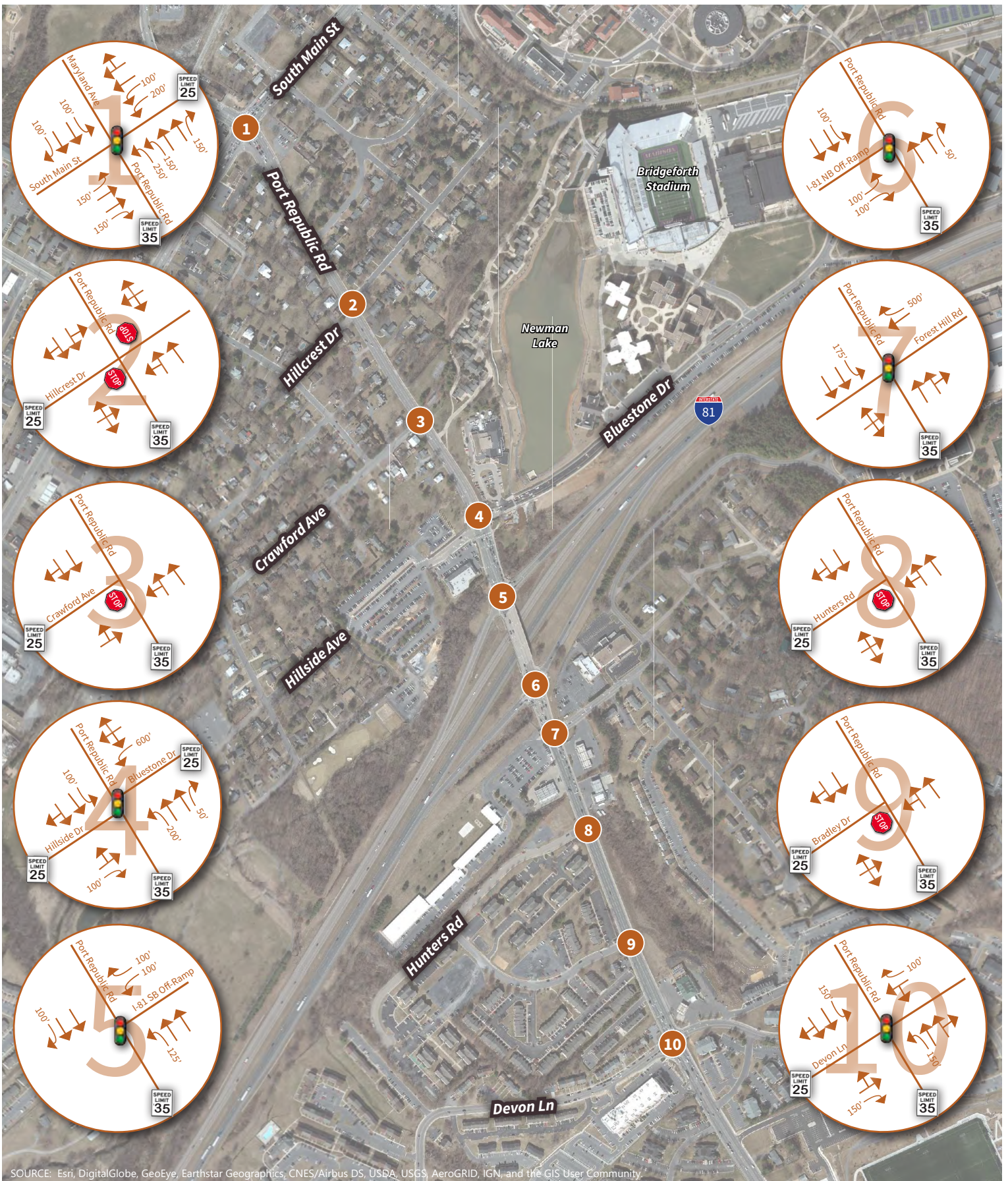


**FIGURE 1.2**  
**STUDY AREA MAP**

Port Republic Road Safety and Operations Study  
Harrisonburg, Virginia







SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 1.3**  
**EXISTING LANE CONFIGURATION**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia



## Study Area Roadways

### Port Republic Road

Port Republic Road is a four-lane major urban arterial which provides access to commercial and residential areas of the City of Harrisonburg as well as access to JMU campus. Turn lanes are provided at each signalized intersection within the study area. Painted bike lanes are present east of the I-81 interchange. In 2017 VDOT reported an annual average daily traffic along the Port Republic corridor both east and west of I-81 within the study area at 27,000 vehicles per day. The posted speed limit is 35 miles per hour (mph).

### South Main Street

South Main Street is a five-lane major urban arterial which provides access to commercial and residential areas of the City of Harrisonburg as well as access to JMU campus. Dedicated right turn lanes are provided for the eastbound, westbound and northbound right turning movements. Dual left turn lanes are provided for the westbound and southbound turning movements, and single left turn lanes are provided for the eastbound and northbound movements. Painted bike lanes are present both north and south of the intersection with Port Republic Road. In 2017 VDOT reported an annual average daily traffic along South Main Street 19,000 vehicles per day south of the intersection with Port Republic Road and 23,000 vehicles per day north of the intersection with Port Republic Road. The posted speed limit is 25 mph north of the intersection with Port Republic Road and 35 mph south of the intersection with Port Republic Road.

### Hillcrest Drive

Hillcrest Drive is an unsignalized two-lane roadway that runs both north and south of Port Republic Road. Hillcrest Drive provides access to a neighborhood with single family homes. The posted speed limit on the north side of Port Republic Road is 25 mph. The speed limit is not posted on the south side of Port Republic Road and is considered 25 mph due to its classification as a residential street.

### Crawford Avenue

Crawford Avenue is an unsignalized two-lane roadway that runs both north and south of Port Republic Road. Hillcrest Drive provides access to a neighborhood with single family homes. The posted speed limit is 25 mph.

### Bluestone Drive

Bluestone Drive extends from the north side of Port Republic Road and serves as a primary access for JMU's main campus. It is a signalized two-lane roadway with a left turn lane provided for southbound traffic onto Port Republic Road. The Bluestone Trail runs parallel to Bluestone Drive along the north side of the roadway. The posted speed limit is 25 mph.

## Hillside Avenue

Hillside Avenue extends from the south side of Port Republic Road across from Bluestone Drive. It is a signalized two-lane roadway with a dedicated northbound right turn lane onto Port Republic Road. It provides access to a commercial property as well as a permitted parking lot for JMU. The Bluestone Trail runs parallel to Hillside Avenue on the north side of the roadway and crosses Port Republic Road at a signalized marked crosswalk. There is no posted speed limit.

## I-81

Interstate 81 that traverses through the City of Harrisonburg serving long-range travelers, regional travelers from the surrounding areas, and local users. I-81 bisects the City of Harrisonburg and JMU.

### I-81 Southbound

It is anticipated the I-81 southbound on- and off-ramps will retain their existing alignment through 2030. In 2017 the average annual daily traffic along I-81 south was 4,300 vehicles per day. The advisory speed of this exit is 30 mph.

### I-81 Northbound

Currently the on- and off-ramps of I-81 northbound are signalized with a configuration of dedicated left and right northbound turn lanes onto Port Republic Road. In 2017 the average annual daily traffic along I-81 south was 4,600 vehicles per day. The advisory speed of this exit is 30 mph.

Design plans are currently being developed to relocate the northbound off-ramp to align with Forest Hill Drive to the east. This realignment will provide direct access to University Boulevard, which provides access to the east campus of JMU. The on-ramp to travel north on I-81 will retain its existing alignment.

## Forest Hill Road

Forest Hill Road on the north side of Port Republic Road is a two-lane roadway with a dedicated southbound right turn lane onto Port Republic Road. It provides access to a multitude of uses including a hotel, multi-family households and single-family households, as well as JMU east campus. Currently the south leg is access into and out of a parking lot of JMU. This parking lot access will be relocated to Hunters Road and the south leg will become the relocated northbound I-81 ramp. The posted speed limit is 25 mph.

## Hunters Road

Hunters Road is a two-lane roadway which provides access to multi-family housing. There is no posted speed limit. The speed limit is considered 25 mph due to its classification as a residential street.

### **Bradley Lane**

Bradley Lane is a two-lane roadway and provides access to multi-family housing. There is no posted speed limit. The speed limit is considered to be 25 mph due to its classification as a residential street.

### **Devon Lane**

Devon Lane is a two-lane roadway with dedicated north and southbound right turn lanes onto Port Republic Road. A 25 mph speed limit is posted on the north leg. It is not posted on the south leg. The speed limit is considered to be 25 mph due to the classification as a residential street. Devon Lane provides access to multi-family housing and a gas station/restaurant on the northwest corner.

### **Pedestrian Activity**

The Port Republic Road corridor experiences heavy pedestrian activity. Crosswalks are provided at all the signalized intersections and pedestrian signal heads are provided. Leading pedestrian intervals are used at the intersections of Port Republic Road with Bluestone Drive/Hillside Avenue and Main Street.

### **Transit Operation**

Harrisonburg Department of Public Transportation (HDPT) operates a number of bus lines along the study corridor, primarily serving JMU students traveling between campus and off-campus housing. Transit route maps and time schedules from HDPT's website were obtained, and a HDPT representative provided typical loading volumes at bus stops along the corridor.

## 2 Operational Analysis

As part of this study, an analysis of the operational conditions along the corridor was conducted to determine areas for improved operations. This evaluation examined the 2018 existing, 2030 no build and 2030 build conditions. Additionally, the analyses included an alternative intersection analysis at the Port Republic Road and Main Street intersection using VDOT's Vjust program.

The analyses utilized the microsimulation traffic software, *PTV VISSIM 8.0*, and were coded according to the procedures outlined in Virginia Department of Transportation's (VDOT) Traffic Operations and Safety Analysis Manual (TOSAM) and VDOT's *VISSIM* User Guide.

### Existing Conditions Review

The existing conditions for the AM and PM peak hours were developed and calibrated according to field observations, field measurements, and the factors provided in this report. These details are discussed in detail in Appendix A. This model was created to replicate the traffic volumes, travel time, queue data and the overall congestion observed in the field so that improvements can accurately be assessed.

### Geometry

Links were coded over aerial imagery within *VISSIM* to model accurate 2-D link geometry such as length and curvature. Turn bays were coded as separate parallel links according to the procedures in the guide. Due to the significant gradients on Port Republic Road, VHB obtained 3-D data from a topographic map on the City of Harrisonburg's website and utilized this map to code the elevations of each link. Link gradient was calculated from elevation change rather than from default gradient values.

### Intersection Control

Six (6) of the study intersections are signalized. The City of Harrisonburg provided timing plans for each of the signalized intersections from which the signal controllers in *VISSIM* were coded. Video detection is utilized along the corridor. During the field visit, VHB verified the locations of the stop signs on the stop controlled approaches. Timing information provided by the City of Harrisonburg is in Appendix B. Detailed information about traffic control parameters used in the *VISSIM* model are provided in Appendix A.

## Traffic Volume Collection

The traffic counts for the 10 study intersections on the Port Republic Road corridor were not collected on the same day. Two (2) of the unsignalized intersection counts (Hunters Road and Bradley Drive) date further back to a 2016 Traffic Impact Analysis report, performed by DRW Consultants, LLS. In this study, 2017 traffic counts were projected at these two (2) intersections with the opening of the associated retail parcel. The City pulled counts from their GRIDSMART cameras at the intersections of Main Street and Devon Lane on October 3, 2018 to coincide with the field data collection effort. These counts are shown in Appendix C.

A microsimulation traffic network requires a balanced volume network to accurately model conditions. Unbalanced volumes always exist due to uncaptured and unmodeled minor streets and driveway entrances, but unbalanced volumes were particularly prevalent in this study due to the varying dates traffic volumes were collected. After corridor-wide peak hours of 8:00 AM - 9:00 AM and 4:45 PM - 5:45 PM were determined from the count data, a balanced volume network was developed. The intersection counts taken at Port Republic Road and Main Street and Port Republic Road and Devon Lane, which were taken October 3, 2018, were held as key balancing nodes. Existing (2018) peak hour turning movements are shown in Figure 2.1.

## Static Routing Decisions

Due to the short distance between many of the study intersections, VHB decided to develop a full origin-destination (O-D) matrix for the network in which vehicles entering on each link were assigned a destination exiting the network. This methodology improved the accuracy of modeled lane changes as vehicles realistically positioned themselves in the appropriate lane upstream of their next turning movement. The O-D matrix was developed based on the existing traffic patterns/turning movements, engineering judgment, and specified input from VDOT on certain vehicle movements.





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.1**  
**2018 EXISTING TRAFFIC VOLUMES**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia



## Measures of Effectiveness

The measures of effectiveness (MOEs) obtained from the model are average queue length, maximum queue length, control delay (and corresponding level of service), and travel time. These MOE's are described in detail below.

### Delay and Level of Service Analysis

Capacity analysis results are expressed in terms of Level of Service (LOS). LOS is a qualitative measurement of traffic operations. It is translated from a measure of delay to drivers in units of time, seconds per vehicle. The Transportation Research Board's Highway Capacity Manual (HCM) defines six levels of service for intersections with LOS "A" representing operating conditions with minimal constraints on traffic movements and LOS "F" representing extremely congested operating conditions. LOS "D" is considered the threshold of acceptable operations for an overall intersection. Exhibit 18-4 of the HCM gives the criteria for signal controlled intersections, while HCM Exhibit 19-1 gives the criteria for unsignalized intersections.

HCM Exhibit 18-4: Level of Service Criteria		HCM Exhibit 19-1: Level of Service Criteria	
Signalized Level of Service	Signal Delay per Vehicle (sec/veh)	Unsignalized Level of Service	Stopped Delay per Vehicle (sec/veh)
A	$\leq 10.0$	A	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$	B	$> 10.0$ and $\leq 15.0$
C	$> 20.0$ and $\leq 35.0$	C	$> 15.0$ and $\leq 25.0$
D	$> 35.0$ and $\leq 55.0$	D	$> 25.0$ and $\leq 35.0$
E	$> 55.0$ and $\leq 80.0$	E	$> 35.0$ and $\leq 50.0$
F	$> 80.0$	F	$> 50.0$

**Figure 2.2 HCM Level of Service Criteria**

*PTV VISSIM 8.0* was the software tool used in determining the delay, capacity and corresponding LOS of the study intersections. The delay and LOS information for the 2018 existing conditions are presented in Tables 2.1 and 2.2. A graphical representation of the LOS condition is shown in Figures 2.3 and 2.4.

Based on the existing conditions analysis, all intersections in the study area currently operate at acceptable levels of service D or better during the AM peak hour. There are several movements, however, that operate at level of service E.

Movements that are expected to operate at a LOS of E in the 2018 AM peak hour are:

- Port Republic Road and Main Street:
  - eastbound left;
  - southbound left; and,
  - northbound left.
- Port Republic and Bluestone Drive/Hillside Avenue:
  - northbound through; and,
  - southbound through.
- Port Republic and I-81 Northbound ramps:
  - northbound left.
- Port Republic Road and Forest Hill Road:
  - northbound through;
  - southbound left; and,
  - southbound through.

During the existing PM peak period, all intersections in the study area currently operate at an acceptable level of service D or better. However, there are several movements that operate at a level of service E. This occurs more in the PM peak period than the AM period. Additionally, there are four (4) movements that operate at a level of service F.

The movements that are expected to operate at a LOS of E in the 2018 PM peak hour are:

- Port Republic Road and Main Street:
  - eastbound through;
  - southbound left; and,
  - northbound left.
- Port Republic Road and Crawford Avenue:
  - westbound left.
- Port Republic and Bluestone Drive/Hillside Avenue:
  - northbound left;
  - northbound through; and,
  - southbound left.
- Port Republic and I-81 Southbound ramps:
  - southbound left.

- Port Republic and I-81 Northbound ramps:
  - northbound left; and,
  - northbound right.
- Port Republic Road and Forest Hill Road:
  - northbound left;
  - northbound through;
  - southbound left; and,
  - southbound through.

The movements that are expected to operate at a LOS of F in the 2018 PM peak hour are:

- Port Republic Road and Main Street:
  - eastbound left.
- Port Republic and Bluestone Drive/Hillside Avenue:
  - southbound through;
  - southbound right; and,
  - eastbound left.

**Table 2.1 2018 AM Existing Level of Service**

Node No.	Intersection	Traffic Control	Approach	Movement	Movement Delay (sec./veh)	Estimated Movement LOS	Approach Delay (sec./veh)	Estimated Approach LOS		
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	70.9	E	42.3	D		
				EBT	50.7	D				
				EBR	7.3	A				
			Port Republic Road	WBL	47.6	D	38.5	D		
				WBT	41.1	D				
				WBR	35.2	D				
			South Main Street	SBL	58.3	E	37.4	D		
				SBT	26.0	C				
				SBR	28.1	C				
			South Main Street	NBL	56.2	E	25.1	C		
				NBT	31.6	C				
				NBR	4.1	A				
<b>Intersection</b>				<b>34.8</b>	<b>C</b>	<b>34.8</b>	<b>C</b>			
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	11.1	B	0.4	A		
				EBT	0.3	A				
				EBR	0.0	A				
			Port Republic Road	WBL	2.9	A	1.9	A		
				WBT	1.9	A				
				WBR	2.6	A				
			Hillcrest Drive	SBL	18.1	C	15.5	C		
				SBR	8.4	A				
			Hillcrest Drive	NBL	0.0	A	8.5	A		
				NBR	8.5	A				
			<b>Intersection</b>				<b>1.5</b>	<b>A</b>	<b>1.5</b>	<b>A</b>
			3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0.0	A	9.9
NBR	9.9	A								
Port Republic Road	EBT	0.3				A	0.3	A		
	EBR	0.0				A				
Port Republic Road	WBL	5.7				A	1.9	A		
	WBT	1.9				A				
<b>Intersection</b>						<b>1.4</b>	<b>A</b>	<b>1.4</b>	<b>A</b>	
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal				Hillside Avenue	NBL	50.1	D	32.2
			NBT	55.6	E					
			NBR	8.6	A					
			Bluestone Drive	SBL	49.6	D	44.7	D		
				SBT	55.5	E				
				SBR	32.3	C				
			Port Republic Road	EBL	44.1	D	31.8	C		
				EBT	29.9	C				
				EBR	23.8	C				
			Port Republic Road	WBL	18.0	B	18.0	B		
				WBT	19.1	B				
				WBR	13.6	B				
<b>Intersection</b>				<b>24.3</b>	<b>C</b>	<b>24.3</b>	<b>C</b>			
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	54.9	D	49.5	D		
				SBR	44.7	D				
			Port Republic Road	EBT	1.2	A	1.1	A		
				EBR	0.8	A				
			Port Republic Road	WBL	11.1	B	19.0	B		
				WBT	20.1	C				
			<b>Intersection</b>				<b>18.3</b>	<b>B</b>	<b>18.3</b>	<b>B</b>

**Table 2.1 2018 AM Existing Level of Service (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	68.6	E	46.0	D
				NBR	23.9	C		
			Port Republic Road	EBL	15.5	B	9.3	A
				EBT	8.1	A		
			Port Republic Road	WBT	5.0	A	4.6	A
				WBR	2.1	A		
			<b>Intersection</b>				13.9	B
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	80.5	F	58.1	E
				NBT	55.4	E		
				NBR	20.1	C		
			Forest Hill Road	SBL	60.5	E	27.6	C
				SBT	62.2	E		
				SBR	9.8	A		
			Port Republic Road	EBL	17.4	B	5.5	A
				EBT	2.4	A		
				EBR	1.9	A		
			Port Republic Road	WBT	16.0	B	16.2	B
				WBL	17.4	B		
				WBR	17.4	B		
			<b>Intersection</b>				13.7	B
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	16.4	C	14.9	B
				NBR	8.9	A		
			Port Republic Road	EBT	0.8	A	1.0	A
				EBR	3.5	A		
			Port Republic Road	WBL	4.2	A	2.7	A
				WBT	2.6	A		
			<b>Intersection</b>				2.7	A
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	13.8	B	11.7	B
				NBR	9.6	A		
			Port Republic Road	EBT	0.4	A	0.4	A
				EBR	2.5	A		
			Port Republic Road	WBL	2.4	A	0.5	A
				WBT	0.5	A		
			<b>Intersection</b>				1.0	A
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	36.4	D	34.2	C
				NBT	36.1	D		
				NBR	4.4	A		
			Devon Lane	SBL	38.6	D	14.8	B
				SBT	44.3	D		
				SBR	10.5	B		
			Port Republic Road	EBL	14.7	B	13.9	B
				EBT	14.1	B		
				EBR	10.8	B		
			Port Republic Road	WBL	13.6	B	16.4	B
				WBT	16.5	B		
				WBR	17.0	B		
			<b>Intersection</b>				17.9	C



**Table 2.2 2018 PM Existing Level of Service**

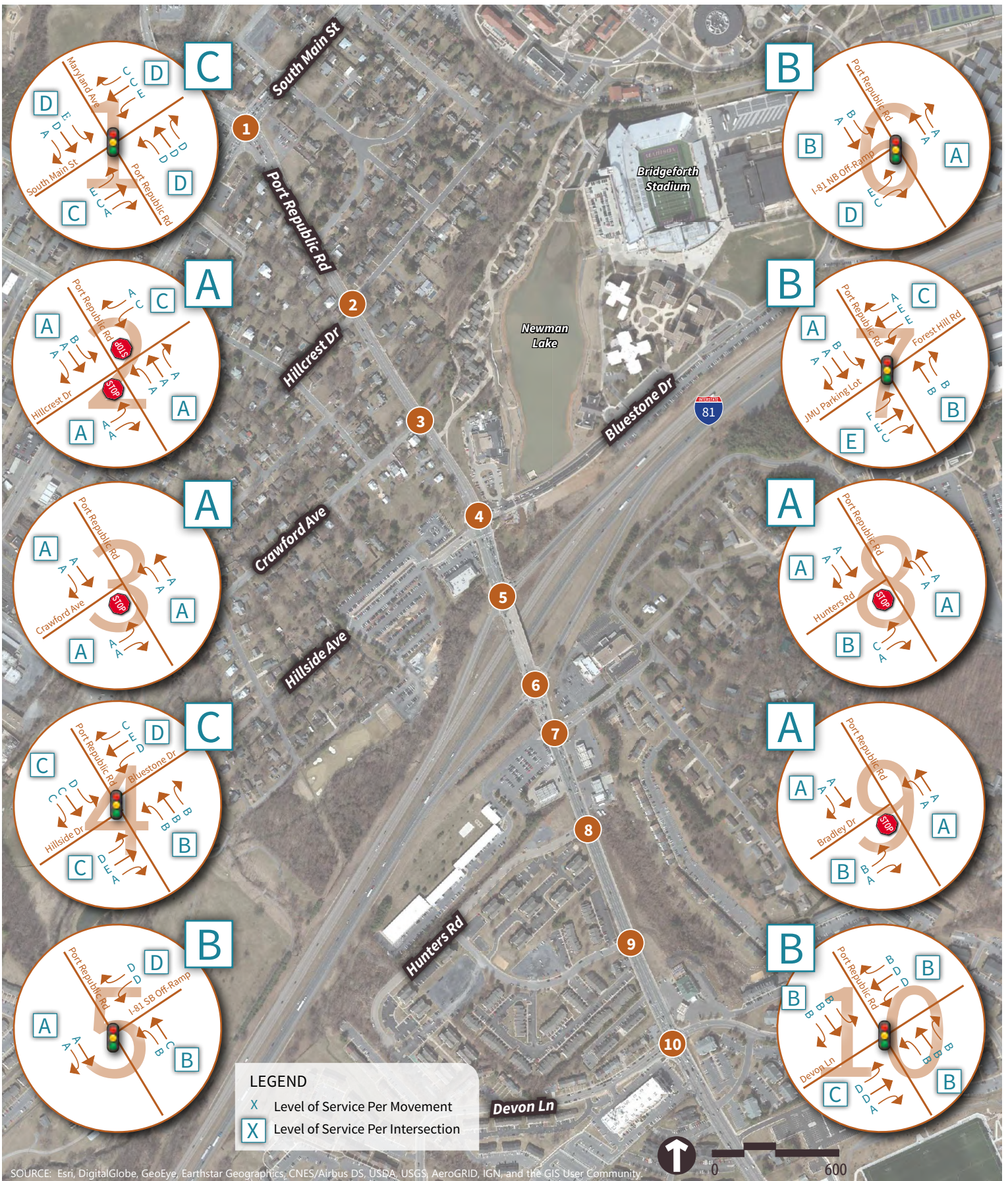
Node No.	Intersection	Traffic Control	Approach	Movement	Existing MOEs			
					Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	104.0	F	49.1	D
				EBT	60.3	E		
				EBR	11.7	B		
			Port Republic Road	WBL	53.1	D	35.0	D
				WBT	38.8	D		
				WBR	16.1	B		
			South Main Street	SBL	68.1	E	50.6	D
				SBT	35.5	D		
				SBR	38.9	D		
			South Main Street	NBL	62.7	E	34.1	C
				NBT	44.2	D		
				NBR	13.1	B		
			<b>Intersection</b>					<b>41.8</b>
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	15.7	C	1.0	A
				EBT	0.9	A		
				EBR	0.8	A		
			Port Republic Road	WBL	8.4	A	1.3	A
				WBT	1.2	A		
				WBR	2.5	A		
			Hillcrest Drive	SBL	19.3	C	13.9	B
				SBR	7.7	A		
			Hillcrest Drive	NBL	0.0	A	10.4	B
				NBR	10.4	B		
			<b>Intersection</b>					<b>1.2</b>
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0.0	A	26.6	D
				NBR	26.6	D		
			Port Republic Road	EBT	9.5	A	9.5	A
				EBR	0.0	A		
			Port Republic Road	WBL	40.1	E	4.3	A
				WBT	3.8	A		
			<b>Intersection</b>					<b>7.3</b>
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	63.5	E	30.0	C
				NBT	59.2	E		
				NBR	13.2	B		
			Bluestone Drive	SBL	70.6	E	76.4	E
				SBT	100.3	F		
				SBR	84.9	F		
			Port Republic Road	EBL	82.3	F	41.9	D
				EBT	37.0	D		
			Port Republic Road	EBR	30.7	C	20.9	C
				WBL	22.1	C		
				WBT	22.3	C		
Port Republic Road	WBR	15.7	B	38.7	D			
	WBR	15.7	B					
<b>Intersection</b>					<b>38.7</b>	<b>D</b>	<b>38.7</b>	<b>D</b>
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	58.7	E	54.4	D
				SBR	50.5	D		
			Port Republic Road	EBT	4.1	A	3.7	A
				EBR	1.9	A		
			Port Republic Road	WBL	32.0	C	21.0	C
				WBT	18.5	B		
			<b>Intersection</b>					<b>16.4</b>



**Table 2.2 2018 PM Existing Level of Service (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	Existing MOEs						
					Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS			
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	74.9	E	70.7	E			
				NBR	67.6	E					
			Port Republic Road	EBL	30.7	C	11.5	B			
				EBT	7.7	A					
			Port Republic Road	WBT	6.3	A	5.7	A			
				WBR	2.7	A					
			<b>Intersection</b>					16.9	C	16.9	B
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	58.4	E	58.5	E			
				NBT	64.4	E					
				NBR	33.6	C					
			Forest Hill Road	SBL	55.6	E	31.1	C			
				SBT	59.5	E					
			Port Republic Road	SBR	12.5	B	9.8	A			
				EBL	27.5	C					
			Port Republic Road	EBT	6.4	A	36.5	D			
				EBR	7.5	A					
			Port Republic Road	WBT	35.7	D	36.5	D			
				WBR	41.1	D					
			<b>Intersection</b>					24.2	C	24.2	C
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	24.4	C	21.6	C
NBR	15.2	C									
Port Republic Road	EBT	1.6				A	1.8	A			
	EBR	4.2				A					
Port Republic Road	WBL	9.1				A	7.9	A			
	WBT	7.9				A					
<b>Intersection</b>						5.0	A	5.0	A		
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	17.4	C	14.2	B			
				NBR	11.9	B					
			Port Republic Road	EBT	1.4	A	1.5	A			
				EBR	3.1	A					
			Port Republic Road	WBL	7.4	A	0.8	A			
				WBT	0.7	A					
			<b>Intersection</b>					1.5	A	1.5	A
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	40.1	D	35.8	D			
				NBT	41.5	D					
				NBR	5.5	A					
			Devon Lane	SBL	45.9	D	22.7	C			
				SBT	44.7	D					
			Port Republic Road	SBR	9.1	A	18.1	B			
				EBL	18.9	B					
			Port Republic Road	EBT	18.4	B	22.0	C			
				EBR	16.7	B					
			Port Republic Road	WBL	17.0	B	22.0	C			
				WBT	22.3	C					
			Port Republic Road	WBR	20.4	C	21.7	C			
				<b>Intersection</b>					21.7	C	21.7





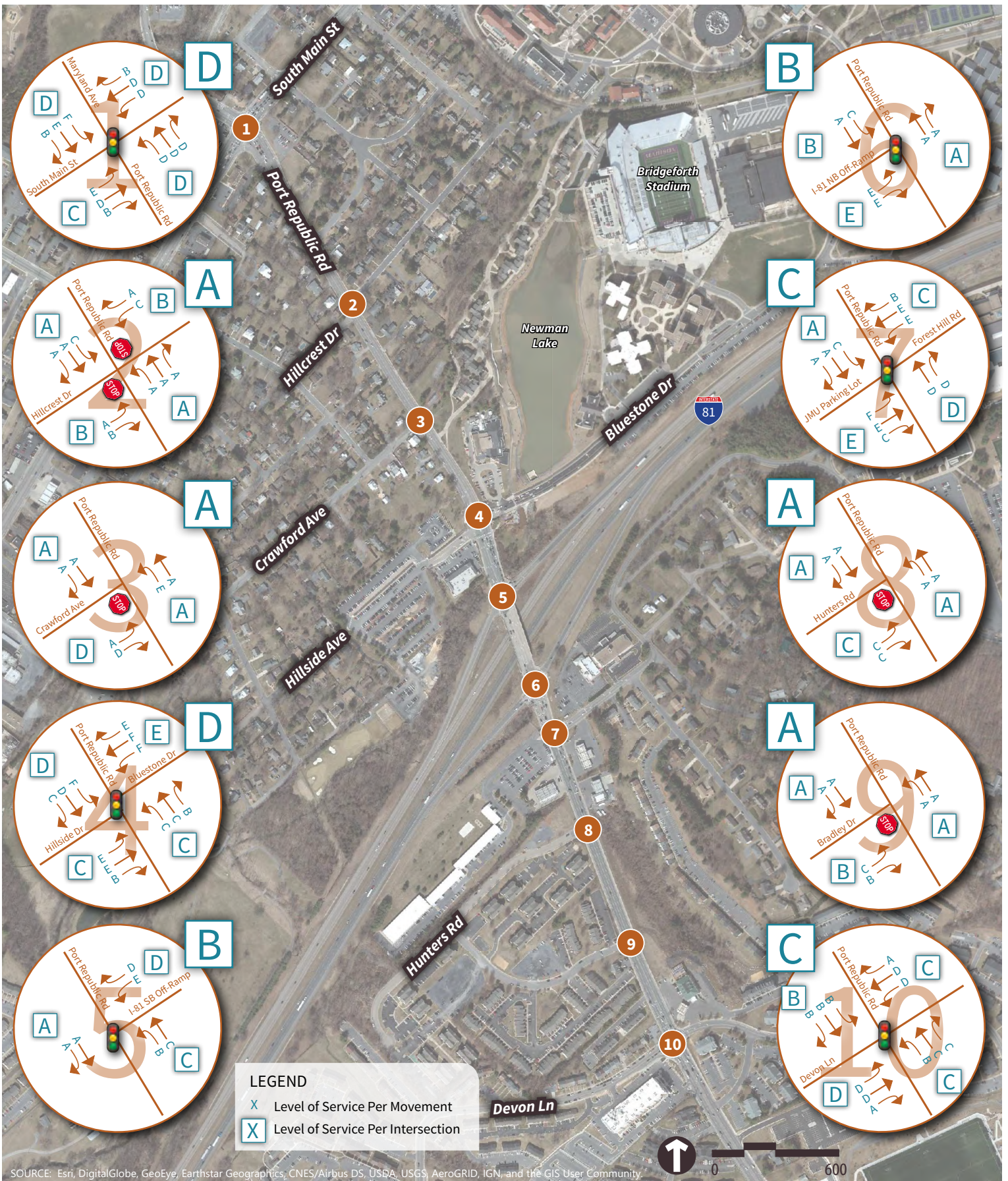
SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.3**  
**EXISTING 2018 AM LEVEL OF SERVICE**

Port Republic Road Safety and Operations Study  
Harrisonburg, Virginia





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**FIGURE 2.4**  
**EXISTING 2018 PM LEVEL OF SERVICE**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





## Queue Analysis

Queue length, expressed as feet and represented as the number of vehicles queued in a lane behind the stop line at an intersection, measures the level of congestion on an intersection approach. After the *VISSIM* model was created and validated, 10 runs, with random seeding, were modeled to simulate vehicle loadings and the nature of vehicle arrivals. One of the key elements of saturated flow is that traffic flow is affected by downstream conditions. This flow description applies to the peak periods of both the 2018 existing AM and PM peak hour on Port Republic Road, where multiple downstream signals (particularly around the I-81 interchange) impact upstream flow in both directions based on the *VISSIM* model. Tables 2.3 and 2.4 show the simulated maximum queue lengths for all movements. Locations where average or maximum queue lengths extend beyond the available storage are shown in red.

The storage length for through movements or turning movements that do not have a dedicated turn lane are shown in the column labeled link distance in Table 2.3 and 2.4. These lengths along Port Republic Road are the distance between the stop bar and the downstream study intersection. The eastbound storage on Port Republic Road west of Main Street extends to Keister Elementary. The westbound storage on Port Republic Road east of Devon Lane extends to Deer Run. The intersecting streets are measured from the stop bar to the roadway terminus, or a downstream intersection.

Turn lane lengths are reported as the storage length plus half of the taper length in *VISSIM*. While the taper length is intended to be used as a space for deceleration, not for storage, this method more accurately reflects the real-world conditions. In analyzing the queue lengths in comparison to the available turn lane capacity, only the storage space was considered. The existing lane configuration, including the available turn lane storage lengths, are shown in Figure 1.3.

The storage capacity of many of the existing turn lanes is insufficient to accommodate the maximum queue lengths. The maximum queue length is the longest anticipated queue which occurs during the heaviest period of the peak hour. There are several auxiliary lanes that do not contain enough storage for the average queue lengths. As aptly named, these queue lengths represent the average queue length that is anticipated to occur during the peak hours. These locations are:

- Port Republic Road and Main Street:
  - westbound left; and
  - southbound left;
- Port Republic Road and I-81 Northbound ramps:
  - northbound left; and
  - northbound right

It is worthwhile to note *VISSIM* reports queues based upon vehicles moving at speeds less than 6.2 mph; so, vehicles traveling just over this speed are not considered in the queue values. The perception to the motorists, however, is that the roadway is congested.

**Table 2.3 2018 AM Simulated Queue Lengths**

Node No.	Intersection	Traffic Control	Approach	Movement	Existing MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	19	146		150
				EBT	49	217	225	
				EBR	0	55		100
			Port Republic Road	WBL	29	137		250
				WBT	72	742	875	
				WBR	197	813		150
			South Main Street	SBL	34	153		200
				SBT	26	185	200	
				SBR	24	188	200	
			South Main Street	NBL	22	153		150
				NBT	54	328	350	
NBR	1	111			150			
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	0	25	275	
				EBT	0	7	275	
				EBR	0	7	275	
			Port Republic Road	WBL	0	54	525	
				WBT	1	98	525	
				WBR	0	80	525	
			Hillcrest Drive	SBL	2	64	525	
				SBR	1	65	525	
				NBL	0	41	375	
			Hillcrest Drive	NBT	0	42	375	
				NBR	0	42	375	
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	1	88	275	
				NBR	2	113	275	
			Port Republic Road	EBT	0	0	525	
				EBR	0	0	525	
			Port Republic Road	WBL	1	137	450	
				WBT	1	97	450	
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	17	151	200	
				NBT	17	151	200	
				NBR	1	63		100
			Bluestone Drive	SBL	18	120		600
				SBT	18	120	600	
				SBR	18	143	600	
			Port Republic Road	EBL	24	260		100
				EBT	63	353	475	
				EBR	5	245	475	
			Port Republic Road	WBL	10	121		200
				WBT	139	354	225	
				WBR	14	311		50
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	53	351		100
				SBR	40	302		100
			Port Republic Road	EBT	2	75	250	
				EBR	0	34		100
			Port Republic Road	WBL	5	186		125
				WBT	61	454	350	

**Table 2.3 2018 AM Simulated Queue Lengths (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	Existing MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	144	699		100
				NBR	29	455		100
			Port Republic Road	EBL	6	151		125
				EBT	16	173	325	
			Port Republic Road	WBT	20	301	150	
				WBR	1	178		50
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	4	56	400	
				NBT	4	56	400	
				NBR	1	68	400	
			Forest Hill Road	SBL	29	167	500	
				SBT	29	167	500	
				SBR	29	167		500
			Port Republic Road	EBL	13	171		175
				EBT	4	117	125	
				EBR	2	134	125	
			Port Republic Road	WBT	362	1262	375	
				WBR	362	1262	375	
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	8
NBR	6	106					725	
Port Republic Road	EBT	0				35	375	
	EBR	1				85	375	
Port Republic Road	WBL	8				832	525	
	WBT	6				832	525	
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	5	101	900	
				NBR	5	101	900	
			Port Republic Road	EBT	0	21	525	
				EBR	0	51	525	
			Port Republic Road	WBL	0	232	425	
				WBT	0	232	425	
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	63	371	4250	
				NBT	63	371	4250	
				NBR	0	21		150
			Devon Lane	SBL	7	109	300	
				SBT	7	109	300	
				SBR	8	167		100
			Port Republic Road	EBL	3	76		150
				EBT	29	260	425	
			Port Republic Road	EBR	27	262	425	
				WBL	2	58		150
Port Republic Road	WBT	50	382	800				
	WBR	49	382	800				

**Table 2.4 2018 PM Simulated Queue Lengths**

Node No.	Intersection	Traffic Control	Approach	Movement	Existing MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	9	65		150
				EBT	63	287	225	
				EBR	1	73		100
			Port Republic Road	WBL	60	382		250
				WBT	101	593	875	
				WBR	30	413		150
			South Main Street	SBL	272	1266		200
				SBT	210	1271	200	
				SBR	210	1272	200	
				NBL	35	183		150
South Main Street	NBT	93	536	350				
	NBR	13	317		150			
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	1	84	275	
				EBT	0	61	275	
				EBR	0	61	275	
			Port Republic Road	WBL	1	155	525	
				WBT	0	36	525	
				WBR	0	7	525	
			Hillcrest Drive	SBL	1	61	525	
				SBR	1	61	525	
			Hillcrest Drive	NBL	0	37	375	
				NBR	0	38	375	
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	2	92	275	
				NBR	4	116	275	
			Port Republic Road	EBT	38	506	525	
				EBR	38	506	525	
			Port Republic Road	WBL	20	376	450	
				WBT	15	334	450	
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	16	119	200	
				NBT	16	119	200	
				NBR	2	77		100
			Bluestone Drive	SBL	139	838		600
				SBT	139	838	600	
				SBR	153	859	600	
			Port Republic Road	EBL	99	915		100
				EBT	0	1572	475	
			Port Republic Road	EBR	7	1572	475	
				WBL	5	80		200
WBT	140	345		225				
WBR	16	314			50			
5	Port Republic Road at SB I-81 Ramps	Signal		SB I-81 Off-Ramp	SBL	62	416	
			SBR		64	429		100
			Port Republic Road	EBT	19	333	250	
				EBR	1	71		100
			Port Republic Road	WBL	44	357		125
				WBT	41	426	350	



**Table 2.4 2018 PM Simulated Queue Lengths (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	Existing MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	171	789		100
				NBR	198	793		100
			Port Republic Road	EBL	37	318		125
				EBT	21	250	325	
			Port Republic Road	WBT	24	301	150	
				WBR	1	112		50
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	28	217	400	
				NBT	28	217	400	
				NBR	27	231	400	
			Forest Hill Road	SBL	72	321	500	
				SBT	72	321	500	
				SBR	72	321		500
			Port Republic Road	EBL	55	275		175
				EBT	46	273	125	
				EBR	27	319	125	
			Port Republic Road	WBT	227	801	375	
				WBR	227	801	375	
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	8
NBR	6	103					725	
Port Republic Road	EBT	1				162	375	
	EBR	3				208	375	
Port Republic Road	WBL	26				371	525	
	WBT	21				371	525	
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	5	97	900	
				NBR	4	97	900	
			Port Republic Road	EBT	1	260	525	
				EBR	2	260	525	
			Port Republic Road	WBL	1	0	425	
				WBT	1	0	425	
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	63	382	4250	
				NBT	63	382	4250	
				NBR	0	31		150
			Devon Lane	SBL	22	171	300	
				SBT	22	171	300	
				SBR	5	123		100
			Port Republic Road	EBL	15	201		150
				EBT	68	765	425	
				EBR	68	765	425	
			Port Republic Road	WBL	2	57		150
				WBT	59	355	800	
				WBR	58	355	800	

## Travel Time Analysis

VHB collected average corridor travel time data on October 3, 2018 and October 4, 2018 during field visits. Travel time run segments were collected to/from 480 feet north of South Main Street and to/from 390 feet south of Devon Lane. The corridor travel times were displayed across the entire study area and broken down between the segments of eastbound between 480 feet north of South Main Street to the I-81 northbound ramps, and westbound between 390 feet south of Devon Lane to the I-81 southbound ramps. These observed travel times are shown in Table 2.5.

**Table 2.5 2018 Observed Travel Times**

Peak Hour	Travel Time Run	Observed Travel Time (sec)	Observed Travel Time (M:SS)
	Segment		
AM Peak Hour	Port Republic Road Eastbound	233.92	03:53.9
	Port Republic Road Westbound	265.7	04:25.7
	Port Republic Road EB to I-81 NB Ramps	156.66	02:36.7
	Port Republic Road WB to I-81 SB Ramps	140.27	02:20.3
PM Peak Hour	Port Republic Road Eastbound	238.03	03:58.0
	Port Republic Road Westbound	247.39	04:07.4
	Port Republic Road EB to I-81 NB Ramps	177.83	02:57.8
	Port Republic Road WB to I-81 SB Ramps	102.33	01:42.3

TOSAM specifies a 30% maximum difference between observed and modeled travel times on an arterial network for the model to be considered properly calibrated. The differences between the observed travel time and the simulated traffic time for each segment along the corridor are within the calibration threshold of 30%, as shown in Appendix A. The simulated travel times are shown in Table 2.6.

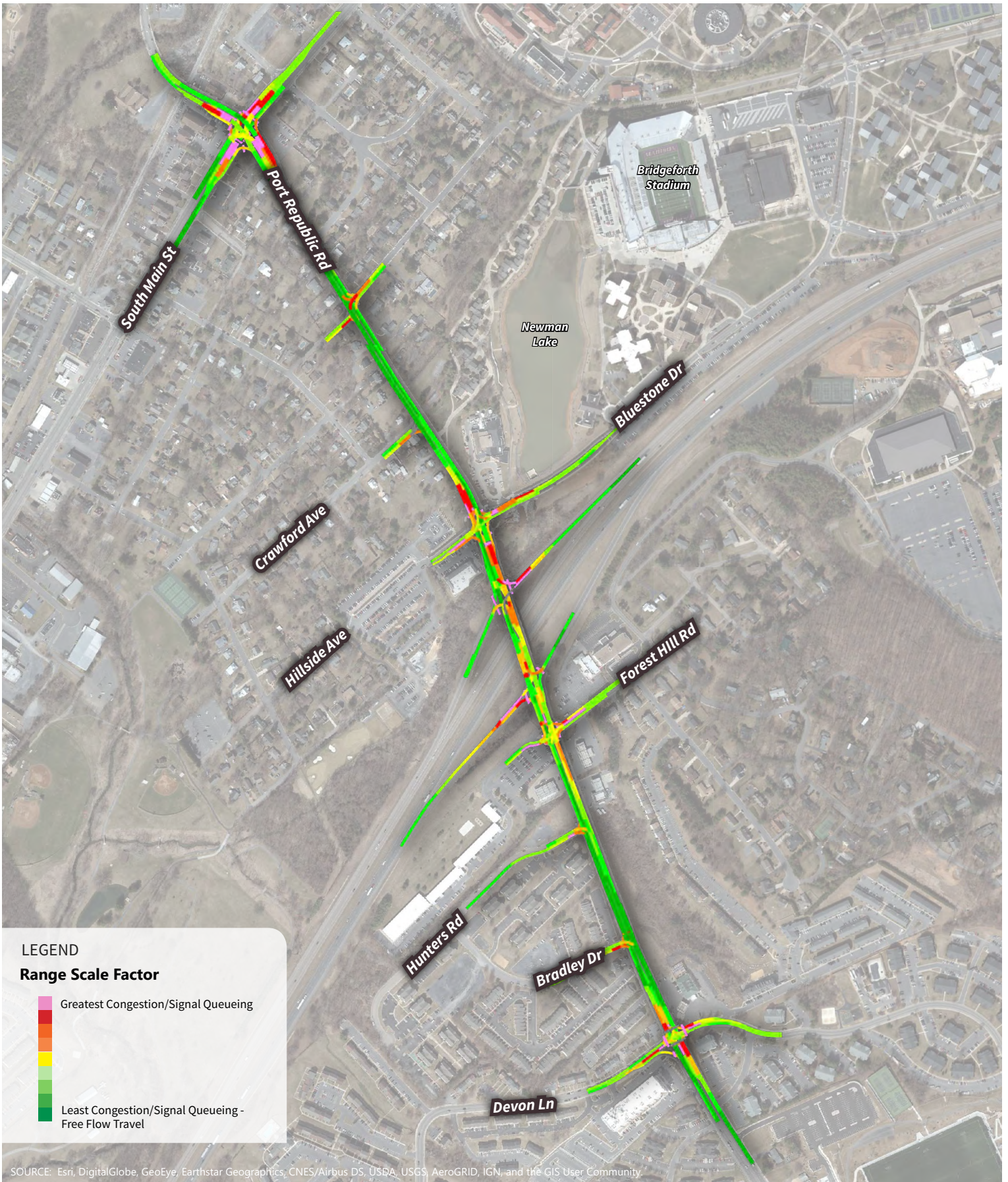
To better reflect the operating conditions and the perception of congestion felt by motorists who are traveling at speeds lower than desired, the operating speeds were mapped to visually display operating conditions. The dark green color represents expected vehicle speeds near the speed limit of the corridor, which is 35 mph, and the red and pink colors denote areas of slower speed vehicles traveling through the model, with pink representing the highest level of congestion.

These slow speeds are the result of more congestion and signal queuing. These speed maps are presented in Figures 2.5 and 2.6.

**Table 2.6 2018 Simulated Travel Times**

Peak Hour	Travel Time Run	Simulated Travel Time (sec)	Simulated Travel Time (M:SS)
	Segment		
AM Peak Hour	Port Republic Road Eastbound	217.55	03:37.5
	Port Republic Road Westbound	232.73	03:52.7
	Port Republic Road EB to I-81 NB Ramps	152.75	02:32.8
	Port Republic Road WB to I-81 SB Ramps	103.23	01:43.2
PM Peak Hour	Port Republic Road Eastbound	261.92	04:21.9
	Port Republic Road Westbound	256.04	04:16.0
	Port Republic Road EB to I-81 NB Ramps	185.4	03:05.4
	Port Republic Road WB to I-81 SB Ramps	127.73	02:07.7

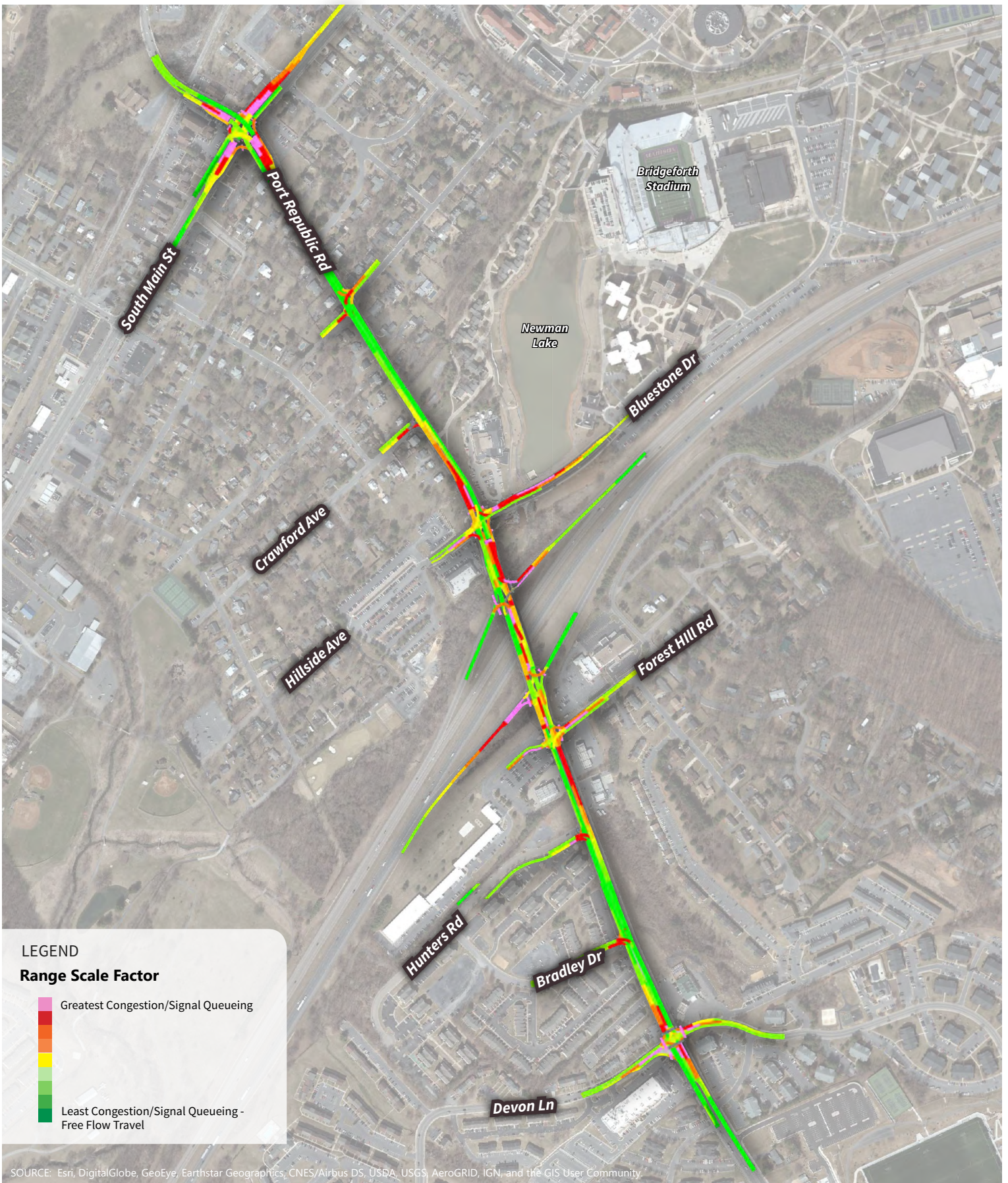




**FIGURE 2.5**  
**EXISTING AM SPEED MAP**

Port Republic Road Safety and Operations Study  
Harrisonburg, Virginia





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.6**  
**EXISTING PM SPEED MAP**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia



## 2030 No Build Conditions Analysis

The calibrated and validated 2018 existing conditions AM and PM *VISSIM* models were utilized as the foundation for the 2030 models. The coded *VISSIM* geometry was modified to reflect the upcoming roadway projects consisting of the lengthening of the southbound left turn lanes at Port Republic Road and South Main Street and the I-81 northbound ramp relocation, including the JMU parking lot change of access from Forest Hill Road to Hunters Road as shown in Figure 2.7. No additional geometric modifications in addition to those referenced above were entered in the model (see Figure 2.8).

Modifications to signal phasing were applied at the intersections of Port Republic Road with the I-81 northbound on-ramp and the Forest Hill Road/relocated I-81 northbound off-ramp as shown in the ramp relocation design plans provided by VDOT (see Appendix D) and in Figure 2.7. Signal timing parameters including cycle length, splits, and offsets were optimized for the 2030 no build geometry and volumes utilizing the traffic software *Synchro Professional Version 9*. Cycle length optimization was limited to 5-second interval values between 110 and 135 seconds to maintain minimum timing parameters, and limit pedestrian wait time. This cycle length closely matches the existing coordinated cycle length of 134 seconds.

A one percent (1%) annual growth rate was used to increase the traffic volumes to represent future traffic volumes. The projected 2030 volumes were computed and coded in *VISSIM* using the same methodology as the existing conditions models (see Appendix E). The 2030 no build traffic volumes are depicted in Figure 2.9.

Initial *VISSIM* simulation of the no build conditions assumed that 100% of the JMU parking lot traffic would now utilize Hunters Road to access Port Republic Road; however, initial model results in the PM peak hour revealed excessive delay and queueing on Hunters Road at Port Republic Road. This delay is due to the high volume of left turns that were unable to enter Port Republic Road due to the heavy westbound queueing on Port Republic Road at Forest Hill Road and the absence of a signal to facilitate the left turn. Vehicles exiting the new JMU parking lot access can easily use Bradley Drive to access Port Republic Road, which places them farther upstream where they are more likely to avoid the Forest Hill Road queue and should be able to complete the left turn. Analysis indicated that rerouting 90% of the parking lot traffic that intends to travel west on Port Republic Road balanced the system, meaning Hunters Road and Bradley Drive had similar delay and queueing metrics. This can be accomplished by restricting movements to and from Hunters Road to right in, right out only during peak hour so that left turns must be made from Bradley drive. Restricting left turns onto Port Republic Road from Bradley Drive is a recommendation due to safety concerns. In order to balance the operational and safety needs at this intersection, it is shown as signalized in the 2030 build model which is discussed later in the report.



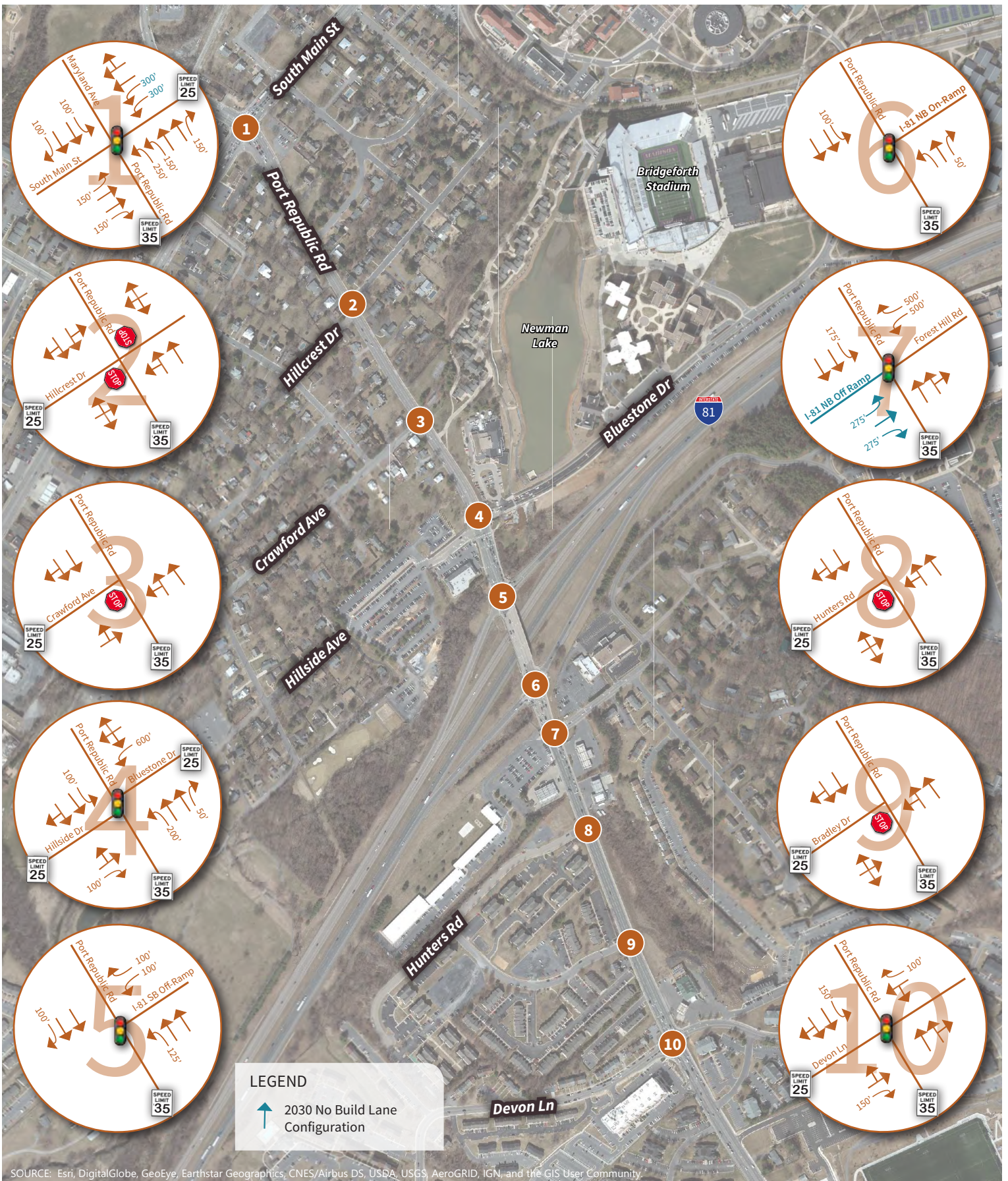


SOURCE: (c) 2015 Microsoft Corporation and its data suppliers.



**FIGURE 2.7**  
**INTERCHANGE ALTERNATIVE**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





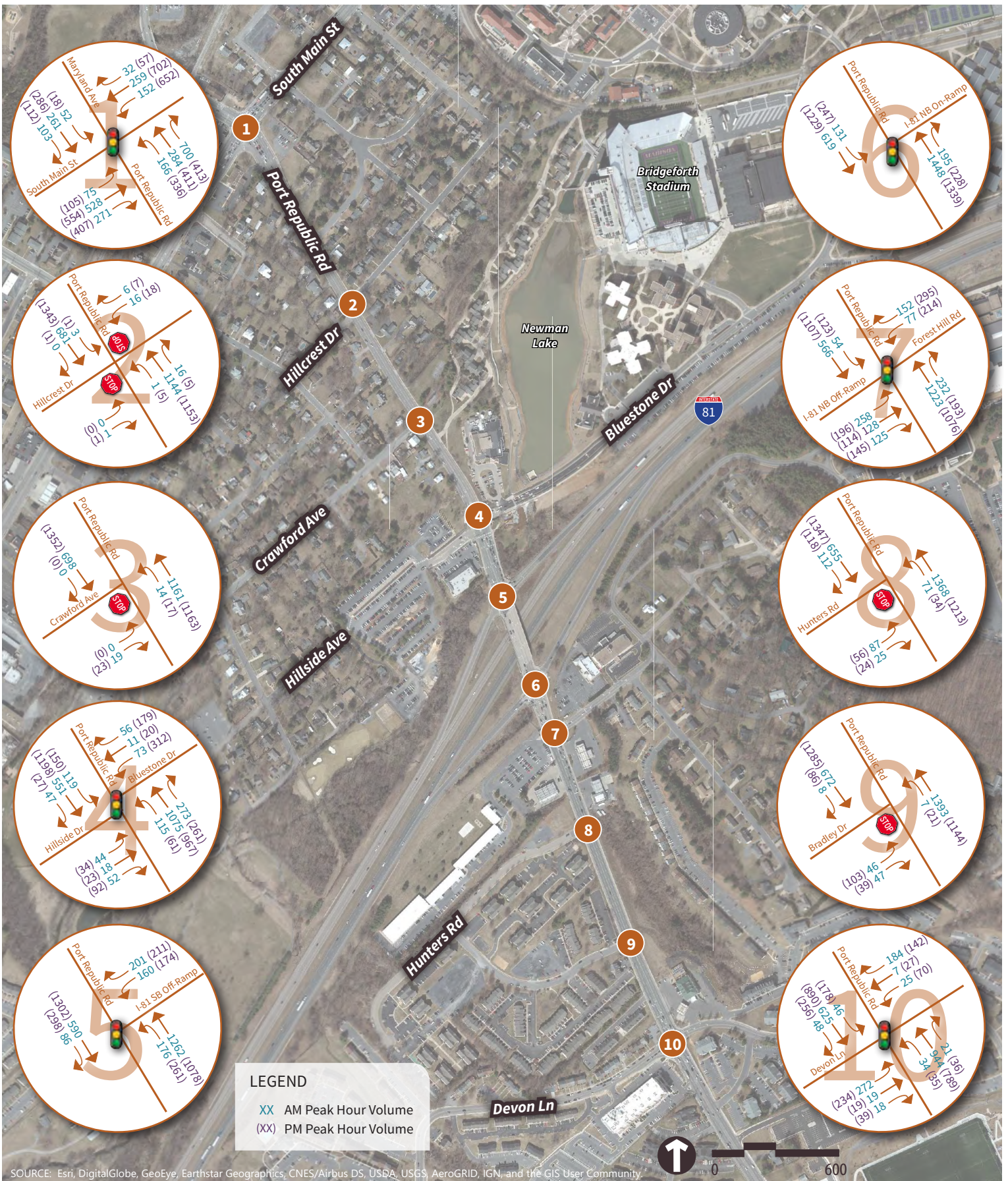
SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.8**  
**2030 NO BUILD LANE GEOMETRICS**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.9**  
**2030 NO-BUILD NETWORK BALANCED TRAFFIC VOLUMES**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





## Measures of Effectiveness

As described previously, the no build model includes the extension of the southbound dual left turn lanes at Port Republic Road and South Main Street, the relocation of the I-81 northbound off-ramp, and the relocation of the JMU parking lot access. The signal cycle lengths, splits, and offsets throughout the corridor were optimized.

This analysis demonstrated that several intersections within the corridor are operating over capacity, creating undesirable level of service metrics as well as significant queues which contribute to slow speeds and increased travel times throughout the corridor.

### Delay and Level of Service Analysis

Based on the 2030 no build conditions analysis, all intersections in the study area are expected to operate at acceptable levels of service C or better during the AM peak hour. There are several movements, however, that operate at LOS of E and four (4) that operate at a LOS F which will be listed below and shown in Table 2.7 and Table 2.8 and in Figures 2.10 and 2.11.

Movements that are expected to operate at a LOS of E in the 2030 no build AM peak hour are:

- Port Republic Road and South Main Street:
  - southbound left; and,
  - northbound left.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - northbound through; and,
  - eastbound left.
- Port Republic and I-81 southbound ramps:
  - southbound left.
- Port Republic Road and I-81 northbound off ramp/Forest Hill Road:
  - northbound left; and,
  - southbound left.
- Port Republic Road and Bradley Drive:
  - northbound left.

Movements that are expected to operate at a LOS of F in the 2030 no build AM peak hour are:

- Port Republic Road and South Main Street:
  - eastbound left.
- Port Republic Road and I-81 southbound ramps:
  - southbound right.
- Port Republic Road and Hunters Road:
  - northbound left; and,
  - northbound right.

During the 2030 no build PM peak period, all intersections in the study area are expected to operate at an acceptable LOS D or better except for Port Republic Road and Hunters Road; Port Republic Road and Bradley Drive; and Port Republic Road at Devon Lane which operate at an overall LOS E. There are a number of movements that operate at a LOS E and 21 movements that operate at LOS F 2030 PM peak period as shown in Table 2.8.

It is important to note that *VISSIM* calculates the delay at an intersection based on the difference between the free flow travel time and the simulated travel times between the study intersections. This differs from Synchro, which calculates delay based on an intersection by intersection basis and does not account for queueing from upstream or downstream intersections. The method that *VISSIM* uses to calculate delay is a more realistic and useful metric for corridors under saturated conditions, such as this corridor. In the PM peak hour, westbound traffic on Port Republic Road at Forest Hill Road queues past the intersections of Port Republic Road with Hunters Road and Bradley Drive. The corresponding delay is assigned to the westbound movements at Hunters Road and Bradley Drive, resulting in a LOS of F at these intersections in the PM peak hour.

Movements that are expected to operate at a LOS of E in the 2030 no build PM peak hour are:

- Port Republic Road and South Main Street:
  - southbound left; and,
  - northbound left.
- Port Republic Road and Hillcrest Drive:
  - northbound right.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - northbound through; and
  - northbound left.
- Port Republic and I-81 southbound ramps:
  - southbound left.
- Port Republic Road and I-81 northbound off-ramp and Forest Hill Road:
  - northbound left;
  - southbound left; and,
  - westbound through.
- Port Republic Road and Devon Lane:
  - southbound left;
  - southbound through
  - eastbound left; and
  - westbound right.

Movements that are expected to operate at a LOS of F in the 2030 PM peak hour are:

- Port Republic Road and South Main Street:
  - eastbound left.
- Port Republic Road and Crawford Avenue:
  - northbound right; and,
  - westbound left.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - southbound left;
  - southbound through;
  - southbound right; and,
  - eastbound left.
- Port Republic Road and I-81 southbound ramps:
  - southbound right.
- Port Republic Road and I-81 northbound off-ramp and Forest Hill Road:
  - westbound right.
- Port Republic Road and Hunters Road:
  - northbound left;
  - northbound right;
  - westbound left; and,
  - westbound through.
- Port Republic Road and Bradley Drive:
  - northbound left;
  - northbound right;
  - westbound left; and,
  - west bound through.
- Port Republic Road and Devon Lane:
  - northbound left;
  - northbound through;
  - northbound right; and,
  - westbound through.



**Table 2.7 2030 AM No Build Level of Service**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	89.6	F	45.1	D
				EBT	50.3	D		
				EBR	8.9	A		
			Port Republic Road	WBL	32.4	C	32.1	C
				WBT	22.3	C		
				WBR	36.2	D		
			South Main Street	SBL	60.6	E	36.9	D
				SBT	24.1	C		
				SBR	26.4	C		
			South Main Street	NBL	59.5	E	22.4	C
				NBT	26.5	C		
NBR	4.7	A						
<b>Intersection</b>					<b>31.8</b>	<b>C</b>	<b>31.8</b>	<b>C</b>
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	13.4	B	0.4	A
				EBT	0.4	A		
				EBR	0.0	A		
			Port Republic Road	WBL	2.2	A	3.9	A
				WBT	3.9	A		
				WBR	5.6	A		
			Hillcrest Drive	SBL	21.1	C	17.1	C
				SBR	7.9	A		
			Hillcrest Drive	NBL	0.0	A	8.8	A
				NBR	8.8	A		
			<b>Intersection</b>					<b>2.7</b>
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0.0	A	9.5	A
				NBR	9.5	A		
			Port Republic Road	EBT	0.3	A	0.3	A
				EBR	0.0	A		
			Port Republic Road	WBL	2.5	A	2.4	A
				WBT	2.4	A		
			<b>Intersection</b>					<b>1.7</b>
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	53.1	D	34.1	C
				NBT	55.5	E		
				NBR	10.2	B		
			Bluestone Drive	SBL	50.0	D	42.9	D
				SBT	53.0	D		
				SBR	28.8	C		
			Port Republic Road	EBL	58.1	E	33.4	C
				EBT	29.3	C		
			Port Republic Road	EBR	22.4	C	20.1	C
				WBL	22.8	C		
				WBT	20.8	C		
Port Republic Road	WBR	15.9	B	26.1	C			
	WBR	15.9	B					
<b>Intersection</b>					<b>26.1</b>	<b>C</b>	<b>26.1</b>	<b>C</b>
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	67.6	E	148.7	F
				SBR	217.0	F		
			Port Republic Road	EBT	7.7	A	7.1	A
				EBR	3.0	A		
			Port Republic Road	WBL	15.1	B	17.5	B
				WBT	17.8	B		
			<b>Intersection</b>					<b>31.3</b>

**Table 2.7 2030 AM No Build Level of Service (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs						
					Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS			
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	50.2	D	12.6	B			
				EBT	4.3	A					
			Port Republic Road	WBT	4.5	A	4.1	A			
				WBR	1.3	A					
			<b>Intersection</b>					<b>6.9</b>	<b>A</b>	<b>6.9</b>	<b>A</b>
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	62.4	E	47.1	D			
				NBT	53.9	D					
				NBR	9.8	A					
			Forest Hill Road	SBL	79.3	E	33.6	C			
				SBR	9.8	A					
			Port Republic Road	EBL	33.5	C	16.8	B			
				EBT	15.1	B					
			Port Republic Road	WBT	31.8	C	33.3	C			
				WBR	41.3	D					
			<b>Intersection</b>					<b>32.2</b>	<b>C</b>	<b>32.2</b>	<b>C</b>
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	139.5	F	135.5	F
NBR	120.4	F									
Port Republic Road	EBT	2.0				A	2.1	A			
	EBR	2.8				A					
Port Republic Road	WBL	21.5				C	26.3	D			
	WBT	26.6				D					
<b>Intersection</b>						<b>22.8</b>	<b>C</b>	<b>22.8</b>	<b>C</b>		
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	35.6	E	28.3	D			
				NBR	21.2	C					
			Port Republic Road	EBT	0.5	A	0.5	A			
				EBR	0.7	A					
			Port Republic Road	WBL	6.9	A	12.8	B			
				WBT	12.8	B					
			<b>Intersection</b>					<b>9.7</b>	<b>A</b>	<b>9.7</b>	<b>A</b>
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	43.8	D	41.7	D			
				NBT	42.4	D					
				NBR	14.6	B					
			Devon Lane	SBL	37.6	D	17.4	B			
				SBT	43.1	D					
				SBR	13.6	B					
			Port Republic Road	EBL	22.2	C	18.5	B			
				EBT	18.5	B					
			Port Republic Road	EBR	14.7	B	38.3	D			
				WBL	29.2	C					
				WBT	38.7	D					
				WBR	36.1	D					
			<b>Intersection</b>					<b>30.5</b>	<b>D</b>	<b>30.5</b>	<b>C</b>

**Table 2.8 2030 PM No Build Level of Service**

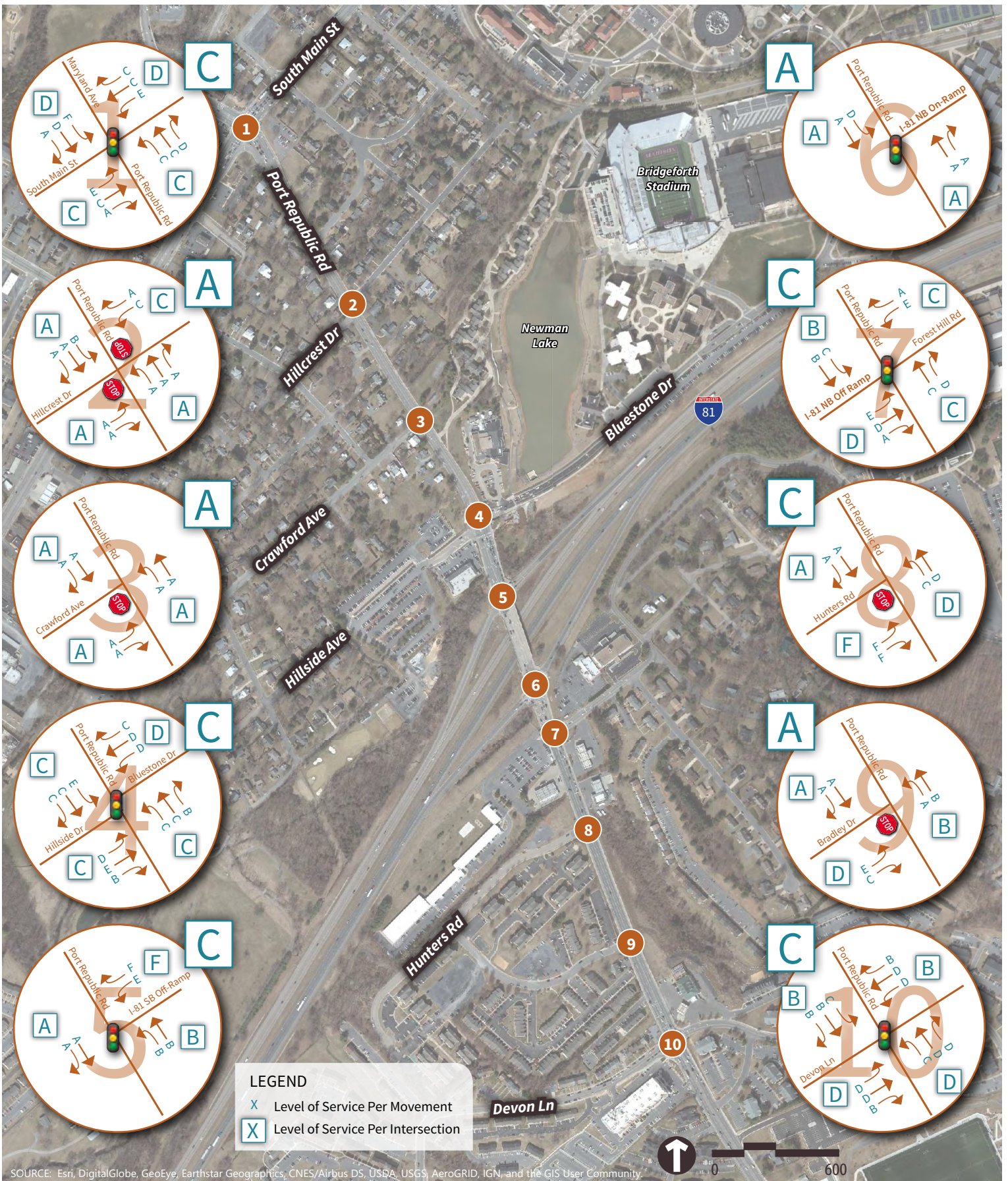
Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	91.8	F	43.3	D
				EBT	52.8	D		
				EBR	11.4	B		
			Port Republic Road	WBL	37.0	D	21.5	C
				WBT	21.3	C		
				WBR	9.6	A		
			South Main Street	SBL	74.7	E	53.7	D
				SBT	35.7	D		
				SBR	39.0	D		
			South Main Street	NBL	60.7	E	35.4	D
				NBT	43.9	D		
NBR	17.0	B						
<b>Intersection</b>					<b>39.4</b>	<b>D</b>	<b>39.4</b>	<b>D</b>
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	13.5	B	13.3	B
				EBT	13.3	B		
				EBR	31.1	D		
			Port Republic Road	WBL	10.0	A	1.3	A
				WBT	1.2	A		
				WBR	1.7	A		
			Hillcrest Drive	SBL	34.2	D	22.8	C
				SBR	9.4	A		
			Hillcrest Drive	NBL	0.0	A	36.9	E
				NBR	36.9	E		
			<b>Intersection</b>					<b>8.2</b>
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0.0	A	83.7	F
				NBR	83.7	F		
			Port Republic Road	EBT	22.7	C	22.7	C
				EBR	0.0	A		
			Port Republic Road	WBL	72.7	F	7.9	A
				WBT	7.0	A		
			<b>Intersection</b>					<b>16.7</b>
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	64.5	E	31.8	C
				NBT	58.3	E		
				NBR	15.7	B		
			Bluestone Drive	SBL	98.0	F	101.5	F
				SBT	122.1	F		
				SBR	105.6	F		
			Port Republic Road	EBL	92.4	F	44.4	D
				EBT	38.7	D		
				EBR	29.9	C		
			Port Republic Road	WBL	24.7	C	23.1	C
				WBT	24.6	C		
WBR	17.1	B						
<b>Intersection</b>					<b>45.2</b>	<b>D</b>	<b>45.2</b>	<b>D</b>
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	75.8	E	78.4	E
				SBR	80.7	F		
			Port Republic Road	EBT	7.9	A	6.9	A
				EBR	2.2	A		
			Port Republic Road	WBL	26.7	C	34.3	C
				WBT	36.1	D		
			<b>Intersection</b>					<b>25.2</b>



**Table 2.8 2030 PM No Build Level of Service (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	38.8	D	19.2	B
				EBT	15.2	B		
			Port Republic Road	WBT	10.7	B	9.8	A
				WBR	4.5	A		
			<b>Intersection</b>				<b>14.7</b>	<b>B</b>
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	73.0	E	49.3	D
				NBT	53.3	D		
				NBR	15.5	B		
			Forest Hill Road	SBL	67.3	E	48.0	D
				SBR	33.5	C		
			Port Republic Road	EBL	35.2	D	13.9	B
				EBT	11.5	B		
			Port Republic Road	WBT	65.8	E	69.0	E
				WBR	86.9	F		
			<b>Intersection</b>				<b>42.1</b>	<b>D</b>
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	371.5	F	358.5	F
				NBR	324.4	F		
			Port Republic Road	EBT	3.7	A	3.8	A
				EBR	5.0	A		
			Port Republic Road	WBL	57.0	F	78.1	F
				WBT	78.8	F		
			<b>Intersection</b>				<b>42.7</b>	<b>E</b>
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	386.2	F	387.9	F
				NBR	392.7	F		
			Port Republic Road	EBT	5.9	A	5.8	A
				EBT	4.3	A		
			Port Republic Road	WBL	59.9	F	61.2	F
				WBT	61.2	F		
			<b>Intersection</b>				<b>42.2</b>	<b>E</b>
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	219.3	F	201.5	F
				NBT	177.9	F		
				NBR	99.6	F		
			Devon Lane	SBL	55.3	E	52.3	D
				SBT	58.6	E		
				SBR	49.7	D		
			Port Republic Road	EBL	69.1	E	37.9	D
				EBT	33.1	C		
			Port Republic Road	EBR	32.5	C	86.6	F
				WBL	52.2	D		
			Port Republic Road	WBT	88.5	F	79.7	E
				WBR	79.7	E		
<b>Intersection</b>				<b>65.4</b>	<b>F</b>	<b>65.4</b>	<b>E</b>	

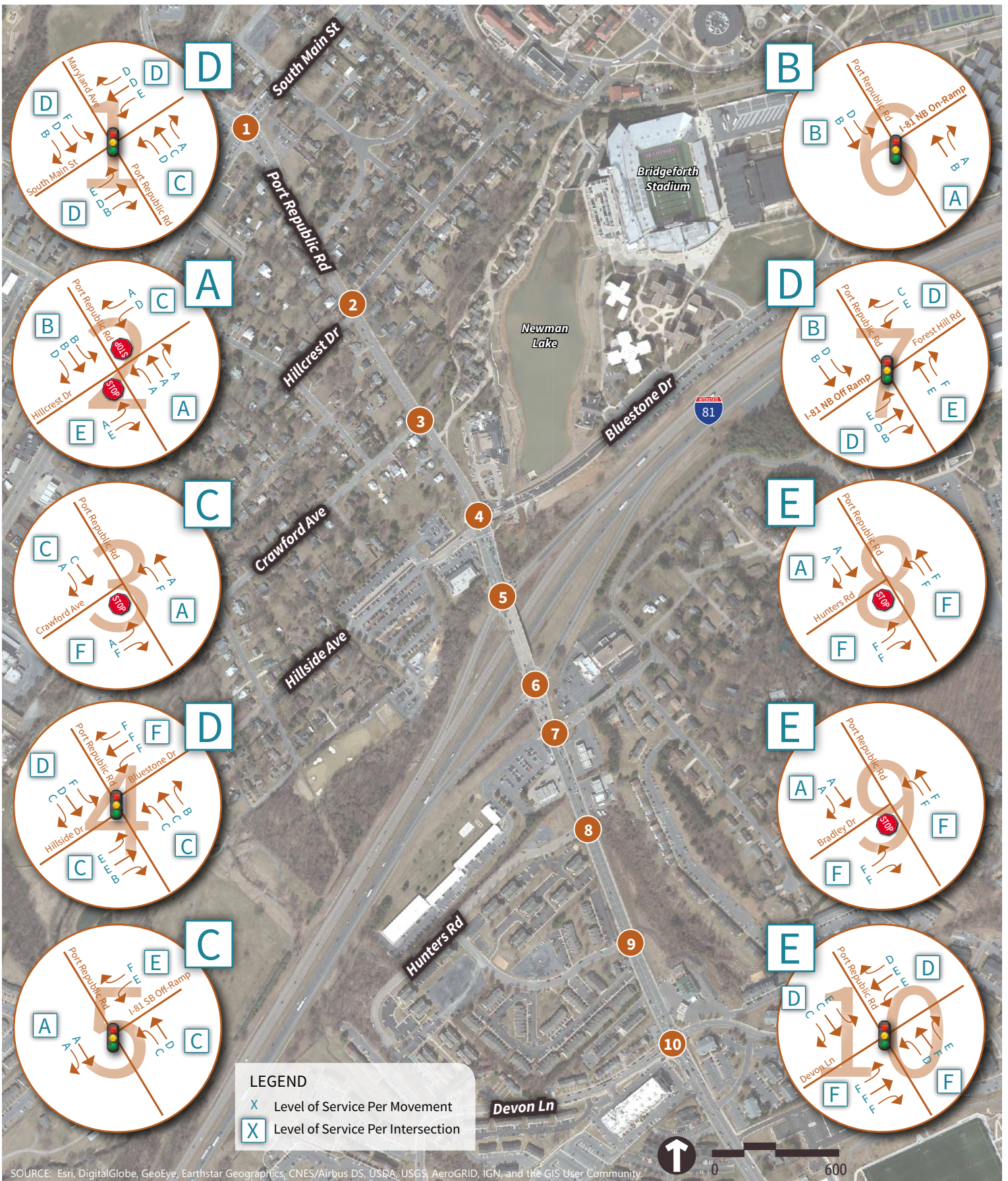




**FIGURE 2.10**  
**2030 AM NO BUILD LEVEL OF SERVICE**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





**FIGURE 2.11**  
**2030 PM NO BUILD LEVEL OF SERVICE**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





## Queue Analysis

In the 2030 no build analysis model there are several locations where downstream signals (particularly around the I-81 interchange) impact upstream flow in both directions based on the VISSIM model. Tables 2.9 and 2.10 show the 2030 no build simulated average and maximum queue lengths for all movements. Locations where average or maximum queue lengths extend beyond the available storage are shown in red.

There were several through movements, particularly in the PM peak period, where queueing is anticipated to back up to a level where vehicles intending to turn onto Port Republic Road are unable to do so due to excessive congestion. These locations were carefully monitored during the 2030 build model to ensure the queues are managed to allow these movements to enter the system. These critical locations are:

- Port Republic Road and Southbound I-81 off-ramp;
- Port Republic Road and northbound Bradley Drive;
- Port Republic Road and northbound Devon Lane; and,
- Westbound on Port Republic Road east of Devon Lane.

The majority of the no build turn lanes are unable to contain the anticipated maximum queues as shown in Tables 2.9 and 2.10. Additionally, there are several turn lanes that are unable to handle the average queues. These locations are described below.

The auxiliary lanes that are unable to accommodate the expected average queue lengths are:

- Port Republic Road and South Main Street:
  - westbound right; and,
  - southbound left.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - eastbound left.
- Port Republic Road and I-81 southbound ramps:
  - southbound left; and,
  - southbound right.

The auxiliary lanes that are unable to accommodate the simulated maximum queue lengths are:

- Port Republic Road and South Main Street:
  - westbound left;
  - westbound right;
  - eastbound left;
  - southbound left;
  - northbound left; and,
  - northbound right.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - southbound left;
  - eastbound left; and,
  - westbound right.
- Port Republic Road and I-81 southbound ramps:
  - westbound left;
  - southbound left; and,
  - Southbound right.
- Port Republic Road and I-81 northbound on-ramp:
  - eastbound left; and,
  - westbound right.
- Port Republic Road and I-81 northbound off-ramp and Forest Hill Road:
  - northbound left; and
  - eastbound left.
- Port Republic Road and Devon Lane:
  - southbound right; and
  - eastbound left.

It is important to point out that the southbound queues at the I-81 southbound off-ramp during the 2030 no build AM peak hour are approaching a length that could back up onto the I-81 southbound main line. This is a critical concern. The improvements included in the 2030 build model manage the queues so there is not spillback onto I-81 southbound. These improvements include lengthening the signal cycle length to 150 seconds; installing a flashing yellow arrow signal head to allow for lagging lefts at this intersection in the AM peak hour; lengthening the length of the left turn lane and right turn lane on the ramp to 500 feet; and installing a pedestrian overpass at Bluestone Drive that allows for more green time on Port Republic Road. To reduce potential queuing in the short term, installation of the flashing yellow arrow and optimization of the signal timing and phasing are recommended.



**Table 2.9 2030 No Build AM Simulated Queue Lengths**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	29	200		150
				EBT	56	318	225	
				EBR	1	67		100
			Port Republic Road	WBL	21	144		250
				WBT	52	787	525	
				WBR	263	900		150
			South Main Street	SBL	39	148		200
				SBT	28	177	300	
				SBR	26	179	300	
			South Main Street	NBL	26	167		150
				NBT	52	381	350	
NBR	2	135			150			
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	1	55	275	
				EBT	0	21	275	
				EBR	0	21	275	
			Port Republic Road	WBL	10	209	525	
				WBT	17	289	525	
				WBR	14	249	525	
			Hillcrest Drive	SBL	2	66	525	
				SBR	1	67	525	
			Hillcrest Drive	NBL	0	41	375	
				NBR	0	42	375	
			3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	1
NBR	2	109					275	
Port Republic Road	EBT	0				3	525	
	EBR	0				3	525	
Port Republic Road	WBL	3				212	450	
	WBT	2				163	450	
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal				Hillside Avenue	NBL	20
			NBT	20	172		200	
			NBR	1	55			100
			Bluestone Drive	SBL	18	96		600
				SBT	18	96	600	
				SBR	20	101	600	
			Port Republic Road	EBL	42	371		100
				EBT	67	461	475	
				EBR	3	253	475	
			Port Republic Road	WBL	14	123		200
				WBT	170	367	225	
				WBR	35	367		50
			5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	940
SBR	1137	1775						100
Port Republic Road	EBT	19				313	250	
	EBR	0				56		100
Port Republic Road	WBL	12				358		125
	WBT	77				467	350	

**Table 2.9 2030 No Build AM Simulated Queue Lengths (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	46	326		125
				EBT	0	24	325	
			Port Republic Road	WBT	15	302	150	
				WBR	0	46		50
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	110	510		275
				NBT	44	227	900	
				NBR	6	118	900	
			Forest Hill Road	SBL	41	197		500
				SBR	41	197		500
			Port Republic Road	EBL	9	120		175
				EBT	38	237	125	
			Port Republic Road	WBT	2025	2293	375	
				WBR	2025	2293	375	
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	115
NBR	113	496					725	
Port Republic Road	EBT	2				182	375	
	EBR	3				225	375	
Port Republic Road	WBL	219				1863	525	
	WBT	201				1863	525	
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	17	178	900	
				NBR	16	179	900	
			Port Republic Road	EBT	0	7	525	
				EBT	0	10	525	
			Port Republic Road	WBL	71	1263	425	
				WBT	62	1263	425	
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	89	435	4250	
				NBT	89	435	4250	
				NBR	0	32		150
			Devon Lane	SBL	7	87	300	
				SBT	7	87	300	
				SBR	11	181		150
			Port Republic Road	EBL	5	77		150
				EBT	43	342	425	
				EBR	41	344	425	
			Port Republic Road	WBL	3	65		150
				WBT	180	688	800	
				WBR	179	687	800	



**Table 2.10 2030 No Build PM Simulated Queue Lengths**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	9	70		150
				EBT	62	302	225	
				EBR	1	74		100
			Port Republic Road	WBL	43	419		250
				WBT	56	482	525	
				WBR	14	350		150
			South Main Street	SBL	347	1301		200
				SBT	192	1254	300	
				SBR	192	1255	300	
			South Main Street	NBL	37	174		150
				NBT	110	588	350	
NBR	24	418			150			
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	84	687	275	
				EBT	75	641	275	
				EBR	75	641	275	
			Port Republic Road	WBL	1	153	525	
				WBT	1	111	525	
				WBR	1	77	525	
			Hillcrest Drive	SBL	2	61	525	
				SBR	1	62	525	
			Hillcrest Drive	NBL	0	37	375	
				NBR	0	38	375	
			3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	5
NBR	14	129					275	
Port Republic Road	EBT	170				681	525	
	EBR	170				681	525	
Port Republic Road	WBL	46				544	450	
	WBT	37				502	450	
	WBR							
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	19	183	200	
				NBT	19	183	200	
				NBR	2	82		100
			Bluestone Drive	SBL	387	1136		600
				SBT	387	1136	600	
				SBR	404	1157	600	
			Port Republic Road	EBL	136	2336		100
				EBT	0	3630	475	
				EBR	17	3630	475	
			Port Republic Road	WBL	5	85		200
				WBT	167	359	225	
WBR	30	349			50			
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	122	633		100
				SBR	160	685		100
			Port Republic Road	EBT	47	405	250	
				EBR	1	68		100
			Port Republic Road	WBL	31	372		125
				WBT	103	454	350	

**Table 2.10 2030 No Build PM Simulated Queue Lengths (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	77	451		125
				EBT	23	393	325	
			Port Republic Road	WBT	54	337	150	
				WBR	3	279		50
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	101	505		275
				NBT	37	197	900	
				NBR	10	133	900	
			Forest Hill Road	SBL	116	393		500
				SBR	116	393		500
			Port Republic Road	EBL	29	240		175
				EBT	92	354	125	
			Port Republic Road	WBT	1682	2238	375	
				WBR	1682	2238	375	
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	216
NBR	216	584					725	
Port Republic Road	EBT	8				327	375	
	EBR	9				362	375	
Port Republic Road	WBL	494				1808	525	
	WBT	463				1808	525	
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	334	486	900	
				NBR	334	487	900	
			Port Republic Road	EBT	22	1216	525	
				EBT	26	1216	525	
			Port Republic Road	WBL	277	1208	425	
				WBT	252	1208	425	
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	273	472	4250	
				NBT	273	472	4250	
				NBR	0	22		150
			Devon Lane	SBL	31	240	300	
				SBT	31	240	300	
			Port Republic Road	SBR	46	342		100
				EBL	78	479		150
			Port Republic Road	EBT	154	1721	425	
				EBR	155	1721	425	
			Port Republic Road	WBL	4	66		150
WBT	340	720		800				
WBR	339	720	800					



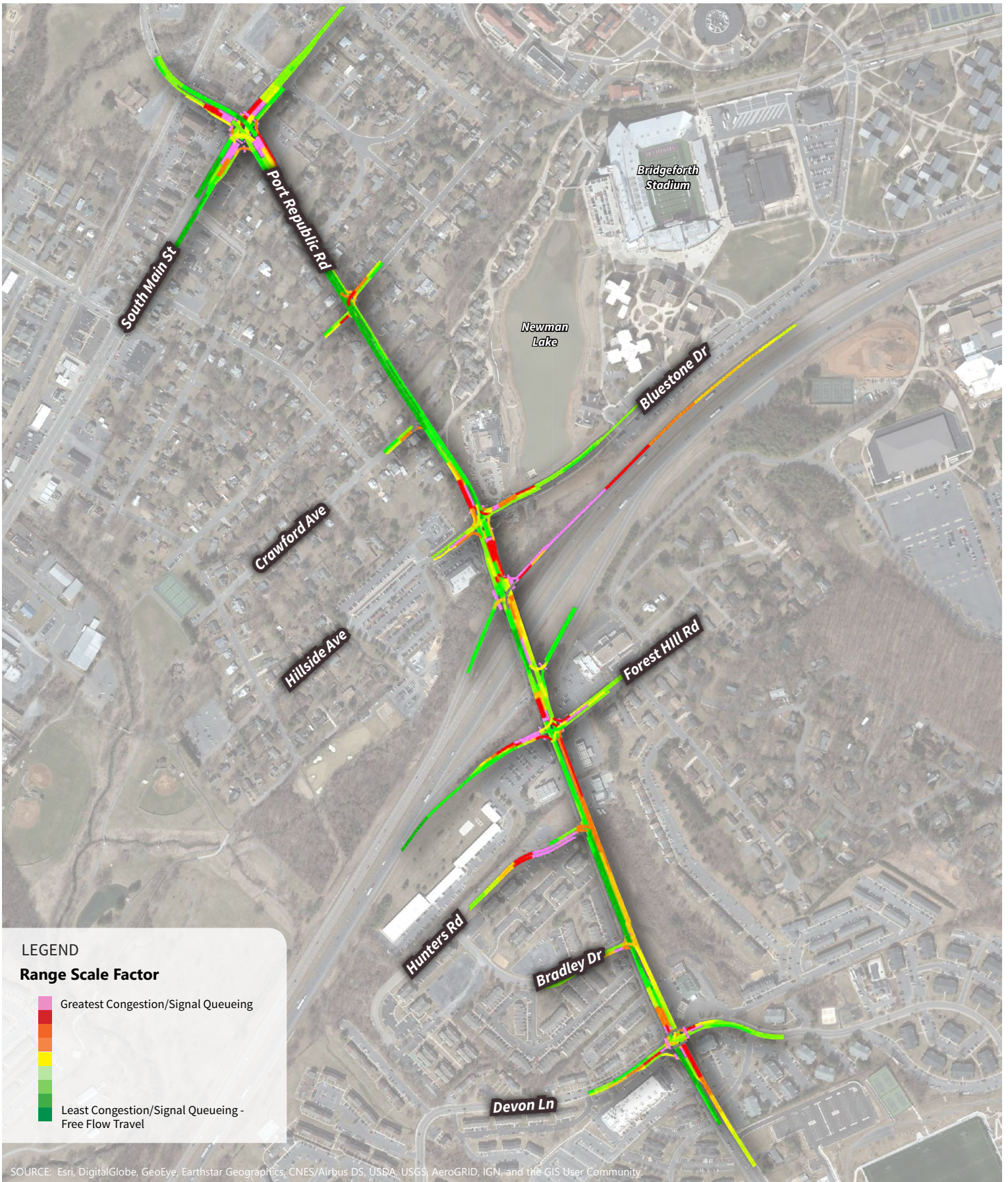
## Travel Time Analysis

Travel times to traverse the corridor were calculated using the same method used in the 2018 existing model. The travel time results are displayed in Table 2.11. Speed maps for the 2030 no build AM and PM peak hours are shown in Figures 2.12 and 2.13. The dark green color represents expected vehicle speeds near the speed limit of the corridor, which is 35 mph, and the red and pink colors denote areas of slower speed vehicles traveling through the model, with pink representing the highest level of congestion.

**Table 2.11 2030 No Build Summary of Travel Time**

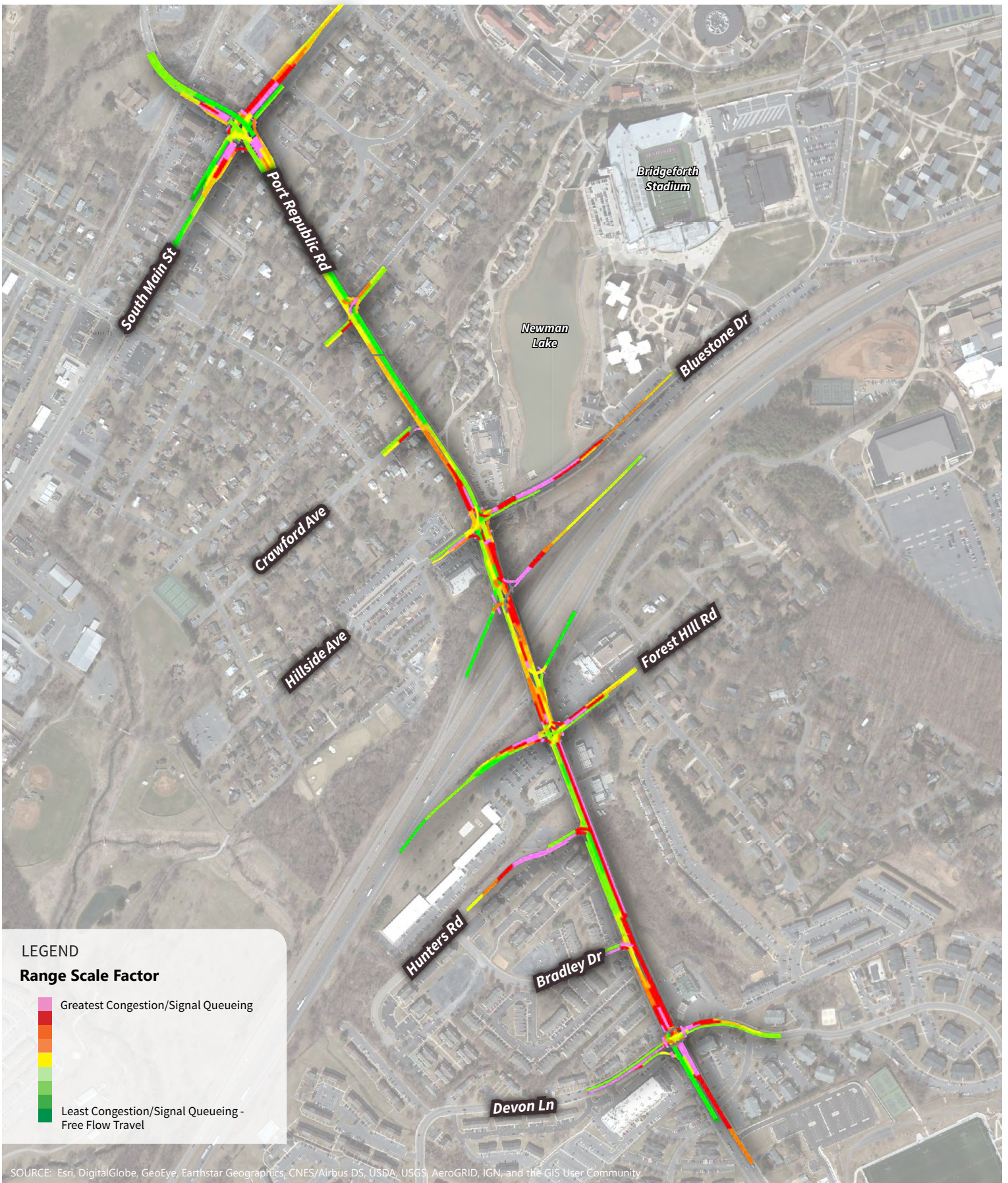
Peak Hour	Travel Time Run	Simulated Travel Time (sec)	Simulated Travel Time (M:SS)
	Segment		
AM Peak Hour	Port Republic Road Eastbound	260.88	04:20.9
	Port Republic Road Westbound	274.93	04:34.9
	Port Republic Road EB to I-81 NB Ramps	171.43	02:51.4
	Port Republic Road WB to I-81 SB Ramps	181.24	03:01.2
PM Peak Hour	Port Republic Road Eastbound	334.32	05:34.3
	Port Republic Road Westbound	478.6	07:58.6
	Port Republic Road EB to I-81 NB Ramps	228.51	03:48.5
	Port Republic Road WB to I-81 SB Ramps	385.08	06:25.1





**FIGURE 2.12**  
**2030 AM NO BUILD SPEED MAP**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





**FIGURE 2.13**  
**2030 PM NO BUILD SPEED MAP**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia



## 2030 Build Conditions Analysis

Through the operational analysis of the 2018 existing conditions, the 2030 no build conditions, and the safety analysis potential shortfalls were identified along the corridor and a set of recommendations was developed to mitigate these shortfalls. The main objective of these recommended improvements is to manage queues and maximize throughput to prevent queue spillback and resultant congestion.

The calibrated and validated 2018 existing conditions AM and PM VISSIM models was utilized as the foundation for the build models. The coded VISSIM geometry was modified to reflect the upcoming roadway projects that were included in the 2030 no build model as well as the improvements listed below. The 2030 build lane geometry is shown in Figure 2.14. The methodology and model development for the 2030 build model is documented in Appendix F.

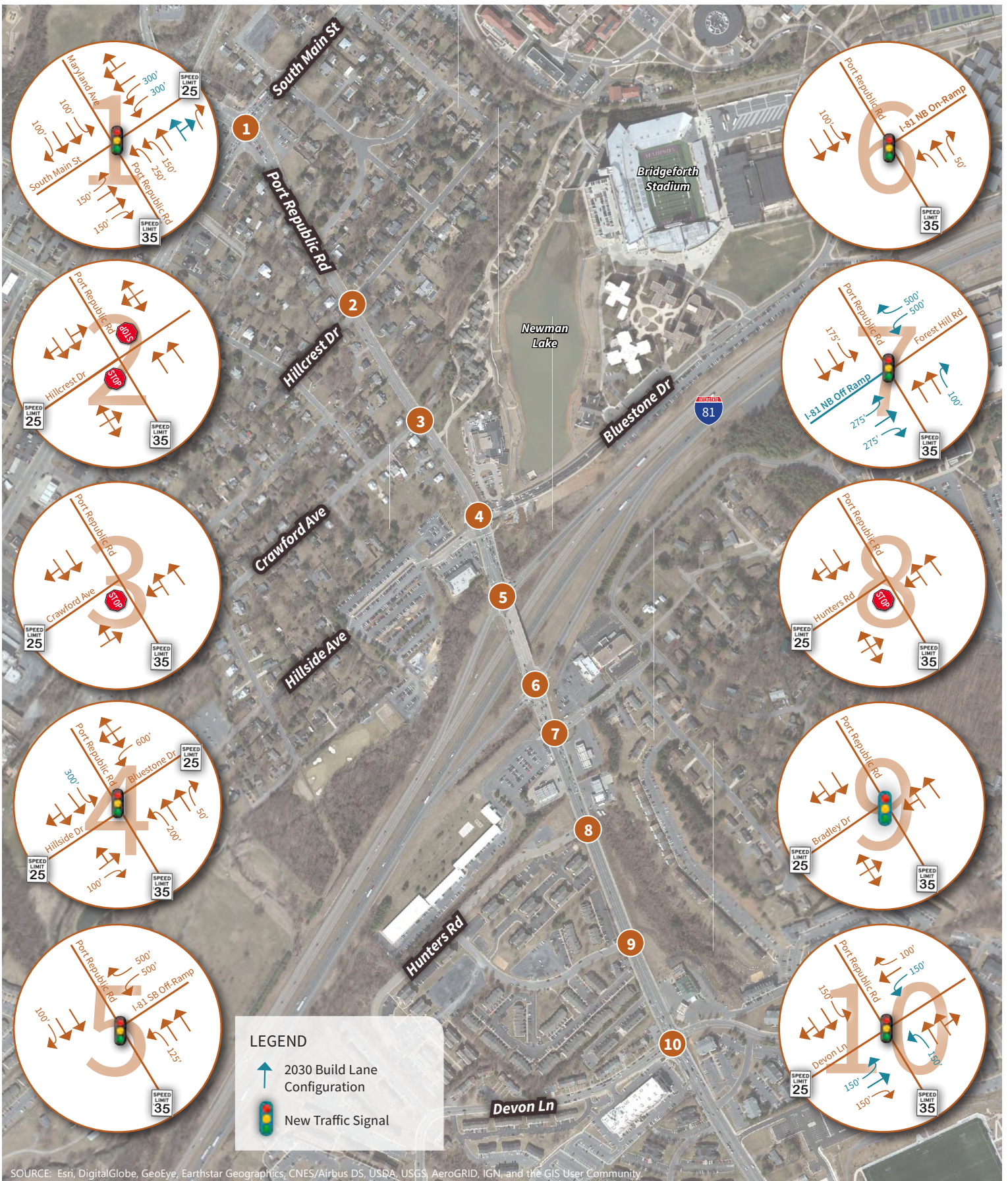
### Geometric Changes

Turn lanes were included, or extended, by reconfiguring the lane configurations within the existing roadway footprint or widening of the existing roadway at the intersections of Port Republic Road with Forest Hill Bluestone Drive, South Main Street, I-81 southbound off ramp, and Devon Lane. These lanes provide storage for queued vehicles and allow for strategic changes to signal phasing.

An alternative intersections analysis was performed for the intersection of Port Republic Road and South Main Street using VDOT's VJUST tool. This analysis included the feasibility of alternative intersection configurations to improve operations at this intersection. The intersection types that were evaluated included a conventional signalized intersection, a full displaced left turn intersection, a partial displaced left turn intersection, a roundabout, and a stop control intersection. The results show that three of these intersection types have the capacity to facilitate the 2030 projected traffic volumes. These include the conventional signalized intersection, and the full and partial displaced left turns. The intersection types that were not evaluated require significant financial, right-of-way, or were not applicable for this facility type. This report is included in Appendix G.

The most favorable, in terms of congestion, are the conventional signalized intersection and the partial displaced left turn. The partial displacement intersection configuration does reduce some of the conflict points, resulting in an anticipated safety benefit for vehicles but was less accommodating to pedestrians. For this reason, it is recommended this intersection remains a conventional signalized intersection. For the build model a focus on access management strategies, lane configurations and signal operations were considered to improve operations at this intersection.





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.14**  
**2030 BUILD LANE GEOMETRICS**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia



Additional geometric changes include a grade separated pedestrian overpass to facilitate the northbound and southbound pedestrian movements at the intersection of Port Republic Road and Bluestone Drive/Hillside Avenue. This improvement is further discussed in the traffic signal optimization section.

Geometric Improvements that were included in the 2030 Build Model are summarized below:

- Include a westbound right turn lane with 100 feet of storage on Port Republic Road at the intersection of Port Republic Road and Forest Hill Road;
- Increase the eastbound left turn lane storage length on Port Republic Road and Bluestone Drive from 100 feet to 300 feet;
- Increase the southbound left turn lane and right turn lane storage length on the south I-81 off ramp from 100 feet to 500 feet;
- Reconfigure westbound Port Republic Road approach at South Main Street to include two (2) left turn lanes, one (1) through lane and one (1) through/right and one (1) right turn lane;
- Reconfigure the westbound approach of Devon Lane at Port Republic Road to include one (1) left turn lane, one (1) through lane and one (1) right turn lane and widen the southbound approach to include one (1) left turn lane, one (1) through lane and one (1) right turn-lane; and,
- Pedestrian overpass over Port Republic at Bluestone Drive/Hillside Avenue.

### Access Management Strategies

Safety and operations at some intersections may be enhanced by restricting left turning maneuvers during specific times of the day using signage or by prohibiting the turning movement all together by installing a median or channelizing device. Restricting these movements increases the operational capacity of the roadway and should practically eliminate crashes related to the affected turning maneuver due to the removal of conflict points. Additionally, a non-traversable median separates opposing directions of travel, significantly reducing the potential for head-on crashes.

Peak hour turn restrictions are recommended at three (3) of the four (4) currently unsignalized study intersections. While these restrictions should improve operations on Port Republic Road, and provide a safety benefit, it is important to understand the impact to the system.

Restricting eastbound left turns onto Hillcrest Drive should result in a minimal detour as traffic can access Fairview Avenue or Maplehurst Avenue from South Main Street. The westbound left turn restriction at Hillcrest Drive and Crawford Avenue will be a more significant detour as traffic will need to make a left onto South Main Street and then a left onto Weaver Avenue or Monument Avenue. While these movements will see some delay, there is an overall safety benefit of making these left turns within a dedicated left turning space on South Main Street in addition to the operational benefit on Port Republic Road.



Restricting access at both Hunters Road and Bradley Drive is more difficult as these roadways are the only access points to the apartments. Prohibiting these left turns at both locations will re-route traffic patterns which may involve risky U-turn maneuvers at adjacent traffic signals, or at gas station drives and may negatively impact transit operations. Therefore, it is recommended that one of these access points remain open. The addition of a traffic signal at Bradley Drive, which would require a waiver due to its proximity to the signalized intersection of Port Republic Road and Devon Lane, should be the best option for safety and access. Since a left turn lane at this location is not considered to be an option at this time due to right of way constraints, the proposed signal will include a westbound leading left with concurrent through phase to accommodate the westbound left turns onto Bradley Drive.

Traffic counts used for Bradley Drive were peak hour counts obtained from a 2016 Traffic Impact Analysis report, performed by DRW Consultants, LLS. Therefore, a preliminary signal warrant analysis was based on ADT values, as outlined in Table 4C-V1 of the Virginia Supplement to the 2009 MUTCD was performed. The 2017 ADT counts provided by VDOT were used for Port Republic and an assumption that the design peak hour volumes on Bradley Drive represent roughly 10% of the daily AADT. Based on these counts and assumptions, a signal is warranted at the intersection of Port Republic Road and Bradley Drive as shown in Table 2.12. A full signal justification report will need to be performed before a signal is installed at this location.

**Table 2.12 Planning Level Signal Warrant Analysis**

Port Republic Street and Bradley Drive				Major		Minor		Meet Warrant?
	Major AADT (2017 VDOT)	Minor Street VPH	Minor AADT*	Cond. A	Cond. B	Cond. A	Cond. B	
AM	27,000	180	1,800	Yes	Yes	No	Yes	Yes
PM	27,000	198	1,980	Yes	Yes	No	Yes	Yes

\* Assumption That Peak Hour Traffic Volumes are Equal to 10% of Daily AADT

Additionally, there were five angled collisions in 2017 that involved a northbound vehicle on Bradley Lane attempting to turn left onto Port Republic Road. These crashes would be considered to be correctable with the installation of a traffic signal and would satisfy condition B of Warrant 7, Crash Experience, found within the MUTCD.

A restriction of northbound and southbound through movements at the intersection of Port Republic Road and Devon Lane was discussed with stakeholders. The through movements during the AM and PM peak hours are low: 17 northbound vehicles in the AM and PM peak, and six (6) southbound vehicles in the AM peak, and 24 in the PM peak. Restricting these through movements would remove the need to provide a split phase at the signal and would allow for additional time to be provided to the eastbound and westbound movements on Port Republic Road.

Using Synchro 9.1 software, a model was created that compared existing lane configuration and signal phasing at Devon Lane and Port Republic Road to eliminating the northbound and southbound through movements and changing the lane configurations, both of which allow for the removal of the split phase which was found to benefit operations at the intersection. These results are shown below in Table 2.13.

While this analysis shows significant advantages to the overall operations of the intersection by restricting the through movement, there is a concern that transit vehicles currently performing a through movement at this intersection would endure significant delay that might necessitate re-routing. Additionally, while it was assumed this restriction could be made using an electronic R3-27 sign installed on the mast arm, compliance would be difficult to enforce. Due to these concerns, the 2030 build model includes the lane change option with no turn restrictions.

**Table 2.13 Devon Lane Alternatives**

Peak Hour	Approach	Delay			Queue		
		Base Build	Thru Restrict	Lane Change	Base Build	Thru Restrict	Lane Change
AM Peak	Intersection	37 (D)	22 (C)	31 (C)	N/A		
	NB Devon Lane	81 (F)	66 (E)	67 (E)	450	360	320
	SB Devon Lane	37 (D)	18 (B)	36 (D)	70	45	114
	WB Port Republic Road	31 (C)	17 (B)	27 (C)	540	411	500
	EB Port Republic Road	28 (C)	12 (B)	21 (C)	411	200	320
PM Peak	Intersection	30 (C)	16 (B)	24 (C)	N/A		
	NB Devon Lane	66 (E)	56 (E)	44 (D)	320	285	230
	SB Devon Lane	35 (D)	22 (C)	31 (C)	140	100	100
	WB Port Republic Road	30 (C)	17 (B)	27 (C)	400	300	390
	EB Port Republic Road	21 (C)	5 (A)	16 (B)	580	180	500

Access management improvements that were included in the 2030 Build Model are summarized below:

- Peak hour left turn restrictions onto and off Hillcrest Drive, Crawford Avenue, and Hunters Road;
- Install a median to restrict left turning movements within the proximity of all signalized intersections; and,
- Close the gas station entrance nearest the intersection of Port Republic Road and Forest Hills Road on the northeast corner.



The left turning restrictions on Port Republic Road at Hillcrest Drive, Crawford Avenue and Hunters Road is anticipated to be during the peak traffic hours in the morning and evening. The exact time of the restriction is estimated to be from 7AM to 9AM and 4 PM and 6PM. This can be accomplished through the use of a flashing sign, that will flash during the time of the restriction, and police enforcement. It is important for the city to monitor compliance and install a physical barrier on the side street approaches, making the restriction full time if necessary.

### Traffic Control Measures

Signal timing parameters including cycle length, splits, and offsets were optimized for the 2030 no build geometry and volumes utilizing the Synchro software. These parameters are discussed in greater detail below.

Traffic signal operations throughout the study area were analyzed and optimized in the 2030 build model. Signal optimization strategies include split reallocation, cycle length increase from 134 seconds to 150 seconds, and phase sequence modifications to increase the bandwidth and progress vehicles through the corridor.

The signalized intersections that currently operate with a split phase were analyzed to allow simultaneous opposing through and left turn movements when applicable. To facilitate these movements a change in the lane configuration, or the addition of turn lanes was considered.

Using flashing yellow arrow signal indications allows for left turn phases to be leading or lagging without the safety concern of yellow trap. In addition to allowing for better two-way progression, the sequence of the left turns can benefit locations with limited left turn storage. Leading lefts are beneficial in areas where the left turn volume exceeds its available storage while lagging lefts are more appropriate if the through lane typically backs up past the end of the left turn storage bay. Optimizing the left turn sequence is particularly beneficial in coordinated systems with closely spaced signals such as the study corridor. Note that the optimization includes the use of a lagging westbound left during the AM peak hour and a leading left turn during the PM peak hour at the intersection of Port Republic Road and southbound I-81 ramps.

The reconfiguration of the westbound approach at South Main Street to include two (2) left turn lanes, one (1) through lane and (1) through/right and one (1) right turn lane was first modeled in Synchro to determine the potential benefits before including the reconfiguration in the VISSIM model. Based on the results of the Synchro the reconfiguration was anticipated to produce significant improvements in delay and queueing during both the AM and PM

peak hours. The results of the VISSIM Build AM peak model show an anticipated reduction of the maximum queue by 127 feet and a reduction of the queue for the westbound right movement by 240 feet. The build AM peak model also projects improvements to the level of service and overall intersection delay improvement by 1.5 seconds. However, in the PM peak hour the proposed reconfiguration is not expected to have a positive impact. While eight (8) of the 12 movements are expected to have a maximum queue length less than what is predicted in the no build model, the westbound right queue increases by 135 feet. This anticipated result is counterintuitive. One theory is that due to the congestion in the no build model the westbound traffic was essentially metered. The expected improvement between the no build and build model in westbound travel time by almost three (3) minutes and an expected reduction in stops from 4.5 seconds per vehicle to 2.68 stops per vehicle would suggest this may be the case. Additionally, there were some unprocessed vehicles in the no build model that are able to enter in the build model.

One of the improvements included in the 2030 build model is the addition of a grade separated pedestrian overpass at Port Republic and Hillside Drive/Bluestone Drive to facilitate pedestrians and cyclists coming from the Bluestone Trail into the JMU campus. A significant volume of pedestrians cross Port Republic Road at Bluestone Drive/Hillside. Seventy-nine (79) pedestrians cross northbound or southbound across Port Republic in the AM peak hour and 69 pedestrians cross in the PM peak hour with a total of 932 a day. In addition to increasing the mobility, comfort, and safety to the pedestrian, removing the northbound and southbound pedestrian phase should have a significant benefit to the throughput capacity along Port Republic Road because network coordination is more efficient and more green time is available to westbound and eastbound movements.

The minimum signal green time programmed for the vehicular north and southbound movements are less than the necessary pedestrian clearance time. The northbound and southbound pedestrian phase is served by suspending coordination, requiring the controller to transition back into the coordination pattern after the pedestrian phase is served resulting in a less than optimal timing plan.

The projected conditions based on the 2030 build model show a slight increase in the PM queue for the I-81 southbound ramp. This projected increase in queue is a result of the improved travel conditions on Port Republic Road. The projected maximum PM queue length of 742 feet contains the queue within the ramp length and is not projected to back onto the interstate. The projected average queues should be contained within the proposed 500' turn lane. Increasing green time for the southbound ramp does not



alleviate the potential increase in queue since the ramp traffic is constrained from turning onto Port Republic Road by the queued traffic on Port Republic Road as well as the adjacent traffic signals at Bluestone Drive and the I-81 northbound ramp. Queues should be monitored in the future to see if the queues increase as projected.

Traffic control improvements that were included in the 2030 Build Model are summarized below:

- Optimize signal timings including cycle lengths, splits, offsets, and phasing sequences;
- Eliminate the northbound and southbound split phase operation at the relocated northbound I-81 off-ramp and Forest Hills Road and allowing simultaneously protected and permissive left turns in the northbound and southbound directions;
- Eliminate the northbound and southbound split phase operation at Port Republic Road and Devon Lane by providing exclusive left turn lanes on the north and south legs, allowing for simultaneous protected and permissive southbound and northbound left turns;
- Eliminate the northbound and southbound pedestrian crossing at Port Republic Road and Bluestone Drive by installing a pedestrian overpass;
- Signalize Port Republic Road and Bradley Lane; and,
- Installing flashing yellow signals where protected/permissive left turns are used. This allows for lead/leg left turn phasing which will assist in bi-directional coordination.

The same projected 2030 volumes that were computed and coded in 2030 no build VISSIM model were used for the build scenario; however, they were redistributed to reflect the change in access and turn restrictions. The 2030 build traffic volumes are depicted in Figure 2.15.







## Measures of Effectiveness

As described above, the build condition measures of effectiveness include several strategies to improve operations. With these improvements coded into the build model, the analysis demonstrated a significant improvement in delay and queueing in comparison to the 2030 no build model. A comparison of the measures of effectiveness between the models is detailed later in this report.

### Delay and Level of Service Analysis

Based on the 2030 build conditions analysis, all intersections in the study area are expected to operate at acceptable levels of service C or better during the AM peak hour. There are no movements in the 2030 build AM peak hour that are expected to operate at a LOS F, which is an improvement from the 2030 no build model where four (4) movements are expected to operate at a LOS of F. There are several movements, however, that are expected to operate at LOS E which will be listed below and shown in Table 2.14 and Table 2.15 and in Figures 2.16 and 2.17.

Movements that are expected to operate at a LOS of E in the 2030 build AM peak hour are:

- Port Republic Road and Main Street:
  - eastbound left;
  - westbound left;
  - southbound left; and,
  - northbound left.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - northbound through
- Port Republic Road and Bradley Drive:
  - northbound left.
- Port Republic Road and Devon Lane:
  - southbound through.

During the 2030 build PM peak period, all intersections in the study area are expected to operate at an acceptable LOS D, which is an improvement from the 2030 no build model where three (3) intersections operated at an overall LOS of E. There are 14 movements that are expected to operate at a LOS E and three (3) movements that are expected to operate at LOS F 2030 PM peak period as shown in Table 2.14. This is a significant improvement from the 2030 no build model, where 21 movements are expected to operate at a LOS of F.

Movements that are expected to operate at a LOS of E in the 2030 build PM peak hour are:

- Port Republic Road and South Main Street:
  - eastbound left;
  - southbound left; and,
  - northbound left.
- Port Republic Road and Crawford Avenue
  - northbound right
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - northbound left;
  - northbound through;
  - southbound left;
  - southbound through; and
  - southbound right
- Port Republic and I-81 southbound ramps:
  - southbound left.
- Port Republic Road and I-81 northbound off-ramp and Forest Hill Road:
  - northbound through
- Port Republic and Bradley Drive:
  - northbound left.
- Port Republic Road and Devon Lane:
  - northbound through; and
  - southbound through.

Movements that operate at a LOS of F in the 2030 build PM peak hour are:

- Port Republic Road and South Main Street:
  - westbound left.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - eastbound left.
- Port Republic Road and I-81 southbound ramps:
  - southbound right.



**Table 2.14 2030 AM Build Level of Service**

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs							
					Movement Delay (sec/veh)	Estimated Movement LOS	Steps per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS			
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	57.6	E	1.0	31.5	C			
				EBT	36.0	D	0.7					
				EBR	7.2	A	1.0					
			Port Republic Road	WBL	59.8	E	1.0	32.1	C			
				WBT	37.1	D	0.9					
				WBR	22.8	C	1.2					
			South Main Street	SBL	57.3	E	0.9	36.8	D			
				SBT	25.2	C	0.7					
				SBR	17.4	B	0.7					
			South Main Street	NBL	57.6	E	0.9	23.8	C			
				NBT	29.2	C	0.7					
				NBR	4.4	A	0.2					
<b>Intersection</b>					<b>30.3</b>	<b>C</b>	<b>0.8</b>	<b>30.3</b>	<b>C</b>			
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBT	0.3	A	0.0	0.3	A			
				EBR	0.0	A	0.0					
			Port Republic Road	WBT	1.7	A	0.0	1.7	A			
				WBR	2.6	A	0.1					
			Hillcrest Drive	SBR	11.7	B	1.5	11.7	B			
				NBR	9.3	A	1.3	9.3	A			
			<b>Intersection</b>					<b>1.2</b>	<b>A</b>	<b>0.0</b>	<b>1.2</b>	<b>A</b>
			3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBR	9.8	A	1.2	9.8	A
Port Republic Road	EBT	0.3				A	0.0	0.3	A			
	EBR	0.0				A	0.0					
	WBT	0.4				A	0.0					
<b>Intersection</b>						<b>0.5</b>	<b>A</b>	<b>0.0</b>	<b>0.5</b>	<b>A</b>		
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	54.5	D	0.9	37.2	D			
				NBT	63.9	E	1.0					
				NBR	10.5	B	1.1					
			Bluestone Drive	SBL	53.5	D	0.9	43.0	D			
				SBT	48.0	D	1.0					
				SBR	28.2	C	1.2					
			Port Republic Road	EBL	34.8	C	1.4	17.2	B			
				EBT	13.5	B	0.4					
				EBR	11.3	B	0.4					
			Port Republic Road	WBL	12.3	B	0.6	8.4	A			
				WBT	8.3	A	0.2					
				WBR	7.3	A	0.4					
<b>Intersection</b>					<b>14.3</b>	<b>B</b>	<b>0.4</b>	<b>14.3</b>	<b>B</b>			
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	49.4	D	0.9	32.4	C			
				SBR	18.1	B	1.9					
			Port Republic Road	EBT	5.8	A	0.2	5.3	A			
				EBR	2.3	A	0.2					
			Port Republic Road	WBL	6.9	A	0.4	8.8	A			
				WBT	9.0	A	0.4					
			<b>Intersection</b>					<b>11.3</b>	<b>B</b>	<b>0.5</b>	<b>11.3</b>	<b>B</b>

**Table 2.14 2030 AM Build Level of Service (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs						
					Movement Delay (sec/veh)	Estimated Movement LOS	Stops per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS		
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	21.5	C	1.3	4.4	A		
				EBT	0.8	A	0.0				
			Port Republic Road	WBT	2.0	A	0.1	1.8	A		
				WBR	0.6	A	0.0				
			<b>Intersection</b>				<b>2.7</b>	<b>A</b>	<b>0.1</b>	<b>2.7</b>	<b>A</b>
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	41.3	D	0.9	35.5	D		
				NBT	50.8	D	0.9				
				NBR	8.3	A	1.3				
			Forest Hill Road	SBL	54.1	D	0.9	25.6	C		
				SBR	11.4	B	1.6				
			Port Republic Road	EBL	26.5	C	1.2	7.1	A		
				EBT	5.1	A	0.2				
			Port Republic Road	WBT	12.9	B	0.4	13.9	B		
				WBR	18.9	B	0.7				
			<b>Intersection</b>				<b>17.2</b>	<b>B</b>	<b>0.6</b>	<b>17.2</b>	<b>B</b>
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBR	5.9	A	1.1	5.9
Port Republic Road	EBT	0.7				A	0.0	0.8	A		
	EBR	1.6				A	0.0				
Port Republic Road	WBT	4.5				A	0.2	4.5	A		
<b>Intersection</b>						<b>3.2</b>	<b>A</b>	<b>0.1</b>	<b>3.2</b>	<b>A</b>	
9	Port Republic Road at Bradley Drive	Signal	Bradley Drive	NBL	56.0	E	1.0	51.5	D		
				NBR	39.3	D	1.1				
			Port Republic Road	EBT	7.1	A	0.2	7.1	A		
				EBR	6.2	A	0.3				
			Port Republic Road	WBL	11.2	B	0.7	7.6	A		
				WBT	7.5	A	0.3				
			<b>Intersection</b>				<b>11.0</b>	<b>B</b>	<b>0.4</b>	<b>11.0</b>	<b>B</b>
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	47.9	D	0.9	45.0	D		
				NBT	43.1	D	0.9				
				NBR	7.4	A	0.3				
			Devon Lane	SBL	44.7	D	0.8	17.7	B		
				SBT	63.5	E	1.0				
			SBR	SBR	12.6	B	2.3				
				Port Republic Road	EBL	20.2	C	1.0	10.8	B	
			EBT		10.1	B	0.3				
			EBR	EBR	9.0	A	2.3				
				Port Republic Road	WBL	16.9	B	0.9	14.6	B	
			WBT		14.5	B	0.5				
WBR	14.5	B	0.5								
<b>Intersection</b>				<b>17.8</b>	<b>C</b>	<b>0.7</b>	<b>17.8</b>	<b>B</b>			



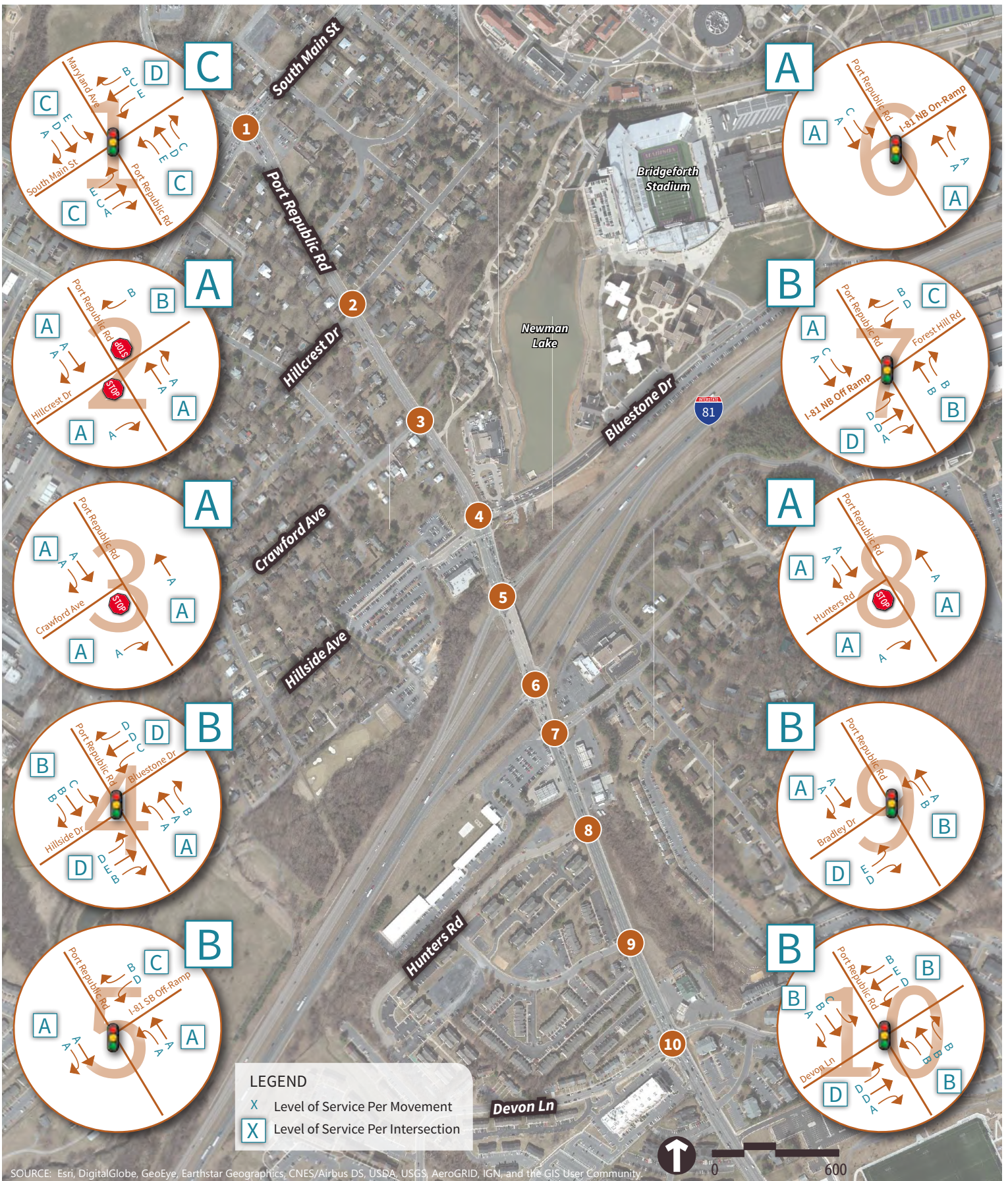
**Table 2.15 2030 PM Build Level of Service**

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs				
					Movement Delay (sec/veh)	Estimated Movement LOS	Stops per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	62.8	E	1.1	37.2	D
				EBT	46.5	D	0.8		
				EBR	10.0	A	1.2		
			Port Republic Road	WBL	100.3	F	1.1	48.6	D
				WBT	40.3	D	0.6		
				WBR	12.9	B	0.5		
			South Main Street	SBL	65.3	E	1.0	45.6	D
				SBT	28.6	C	0.7		
				SBR	31.2	C	0.7		
			South Main Street	NBL	62.2	E	1.0	31.2	C
				NBT	37.7	D	0.8		
				NBR	13.9	B	0.6		
			<b>Intersection</b>					<b>41.8</b>	<b>D</b>
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBT	2.0	A	0.1	2.0	A
				EBR	0.8	A	0.0		
			Port Republic Road	WBT	1.5	A	0.0	1.5	A
				WBR	1.8	A	0.0		
			Hillcrest Drive	SBR	7.0	A	1.0	7.0	A
				NBR	21.8	C	1.7		
			<b>Intersection</b>					<b>1.8</b>	<b>A</b>
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBR	35.9	E	2.2	35.9	E
				EBT	9.9	A	0.3		
			Port Republic Road	EBR	0.0	A	0.0	9.9	A
				WBT	0.8	A	0.0		
			<b>Intersection</b>					<b>5.9</b>	<b>A</b>
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	59.4	E	0.9	31.1	C
				NBT	56.0	E	0.9		
				NBR	16.8	B	1.7		
			Bluestone Drive	SBL	68.2	E	1.5	68.7	E
				SBT	79.5	E	1.8		
				SBR	68.6	E	2.0		
			Port Republic Road	EBL	89.6	F	2.4	35.5	D
				EBT	29.1	C	0.7		
				EBR	24.7	C	0.6		
			Port Republic Road	WBL	40.9	D	1.4	22.3	C
				WBT	22.7	C	0.3		
				WBR	16.8	B	0.7		
<b>Intersection</b>					<b>35.4</b>	<b>D</b>	<b>0.9</b>	<b>35.4</b>	<b>D</b>
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	57.2	E	0.9	85.0	F
				SBR	110.1	F	4.3		
			Port Republic Road	EBT	7.0	A	0.2	6.3	A
				EBR	2.8	A	0.2		
			Port Republic Road	WBL	34.8	C	1.5	24.6	C
				WBT	22.2	C	0.7		
			<b>Intersection</b>					<b>22.3</b>	<b>C</b>

**Table 2.15 2030 PM Build Level of Service (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs						
					Movement Delay (sec/veh)	Estimated Movement LOS	Stops per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS		
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	18.0	B	1.2	7.8	A		
				EBT	5.8	A	0.2				
			Port Republic Road	WBT	8.8	A	0.3	8.2	A		
				WBR	4.9	A	0.3				
			<b>Intersection</b>				<b>8.0</b>	<b>A</b>	<b>0.3</b>	<b>8.0</b>	<b>A</b>
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	37.7	D	1.1	34.5	C		
				NBT	57.8	E	0.9				
				NBR	11.8	B	1.3				
			Forest Hill Road	SBL	53.2	D	1.0	35.1	D		
				SBR	21.9	C	1.8				
			Port Republic Road	EBL	44.5	D	1.5	13.3	B		
				EBT	9.9	A	0.2				
			Port Republic Road	WBT	36.2	D	0.9	34.3	C		
				WBR	23.5	C	1.3				
			<b>Intersection</b>				<b>26.9</b>	<b>C</b>	<b>0.8</b>	<b>26.9</b>	<b>C</b>
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBR	8.5	A	1.5	8.5
Port Republic Road	EBT	1.9				A	0.0	2.0	A		
	EBR	2.7				A	0.0				
Port Republic Road	WBT	19.1				C	0.6	19.1	C		
<b>Intersection</b>						<b>10.0</b>	<b>A</b>	<b>0.3</b>	<b>10.0</b>	<b>A</b>	
9	Port Republic Road at Bradley Drive	Signal	Bradley Drive	NBL	56.7	E	1.0	54.7	D		
				NBR	45.2	D	1.1				
			Port Republic Road	EBT	11.2	B	0.3	11.1	B		
				EBR	10.4	B	0.4				
			Port Republic Road	WBL	32.3	C	1.3	11.7	B		
				WBT	10.7	B	0.4				
			<b>Intersection</b>				<b>14.5</b>	<b>B</b>	<b>0.4</b>	<b>14.5</b>	<b>B</b>
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	54.2	D	1.0	49.5	D		
				NBT	78.0	E	1.3				
				NBR	6.3	A	0.3				
			Devon Lane	SBL	38.0	D	0.8	28.9	C		
				SBT	61.6	E	1.0				
				SBR	19.0	B	1.9				
			Port Republic Road	EBL	29.3	C	1.1	17.4	B		
				EBT	15.6	B	0.4				
				EBR	14.9	B	0.6				
			Port Republic Road	WBL	30.2	C	1.0	24.2	C		
				WBT	24.0	C	0.6				
				WBR	23.4	C	0.7				
			<b>Intersection</b>				<b>24.1</b>	<b>C</b>	<b>0.7</b>	<b>24.1</b>	<b>C</b>



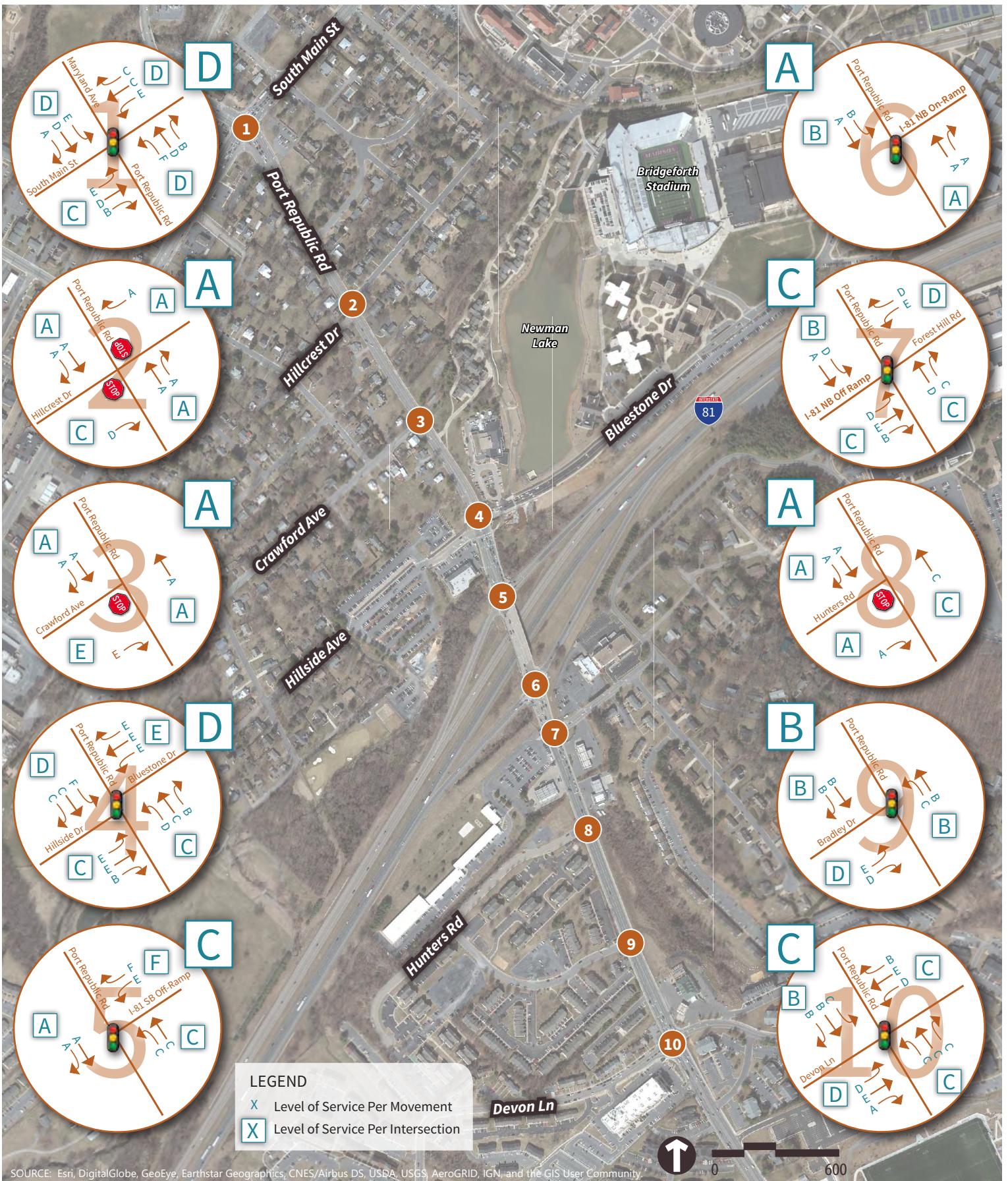


SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.16**  
**2030 AM BUILD LEVEL OF SERVICE**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 2.17**  
**2030 PM BUILD LEVEL OF SERVICE**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia



## Queue Analysis

Tables 2.16 and 2.17 show the 2030 build simulated average and maximum queue lengths for all movements. Locations where average or maximum queue lengths extend beyond the available storage are shown in red.

The auxiliary lanes that are unable to accommodate the expected average queue lengths are:

- Port Republic Road and South Main Street:
  - southbound left.
- Port Republic Road and I-81 southbound ramps:
  - southbound right.
- Port Republic Road and I-81 northbound off-ramp and Forest Hill Road:
  - westbound right.

The auxiliary lanes that unable to accommodate the simulated maximum queue lengths are:

- Port Republic Road and Main Street:
  - westbound left;
  - westbound right;
  - southbound left;
  - northbound left; and,
  - northbound right.
- Port Republic Road and Bluestone Drive/Hillside Avenue:
  - southbound left;
  - eastbound left; and,
  - westbound right.
- Port Republic Road and I-81 southbound ramps:
  - westbound left;
  - southbound left; and,
  - southbound right.
- Port Republic Road and I-81 northbound on-ramp:
  - eastbound left; and,
  - westbound right.
- Port Republic Road and I-81 northbound off-ramp and Forest Hill Road:
  - westbound right
  - northbound left; and
  - eastbound left.
- Port Republic Road and Devon Lane:
  - southbound left
  - southbound right; and
  - eastbound left.

**Table 2.16 2030 Build AM Simulated Queue Lengths**

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	17	119		150
				EBT	40	247	225	
				EBR	1	68		100
			Port Republic Road	WBL	41	190		250
				WBT	99	660	525	
				WBR	99	660		150
			South Main Street	SBL	41	159		200
				SBT	28	172	300	
				SBR	25	174	300	
			South Main Street	NBL	24	155		150
NBT	57	323		350				
NBR	2	119		150				
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBT	0	0	0	
				EBR	0	0	0	
			Port Republic Road	WBT	4	0	0	
				WBR	5	0	2	
			Hillcrest Drive	SBR	0	0	44	
Hillcrest Drive	NBR	0	0	42				
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBR	1	109	275	
			Port Republic Road	EBT	0	0	525	
				EBR	0	0	525	
			Port Republic Road	WBT	0	0	450	
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	41	207	200	
				NBT	42	208	200	
				NBR	1	60		100
			Bluestone Drive	SBL	20	95		600
				SBT	20	95	600	
				SBR	22	118	600	
			Port Republic Road	EBL	21	174		300
				EBT	29	263	475	
			Port Republic Road	EBR	3	187	475	
				WBL	5	104		200
				WBT	56	346	225	
WBR	4	232			50			
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	53	262		500
				SBR	18	186		500
			Port Republic Road	EBT	13	249	250	
				EBR	0	56		100
			Port Republic Road	WBL	3	204		125
				WBT	36	429	350	



**Table 2.16 2030 Build AM Simulated Queue Lengths (Cont)**

Node No.	Node No.	Node No.	Node No.	Node No.	Node No.	Node No.	Node No.	Node No.
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	10	176		125
				EBT	0	4	325	
			Port Republic Road	WBT	6	255	150	
				WBR	0	33		50
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	69	354		275
				NBT	41	216	900	
				NBR	5	110	900	
			Forest Hill Road	SBL	28	193		500
				SBR	28	193		500
			Port Republic Road	EBL	5	93		175
				EBT	10	166	125	
			Port Republic Road	WBT	208	992	375	
				WBR	208	992		100
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBR	1
Port Republic Road	EBT	0				0	375	
	EBR	0				8	375	
Port Republic Road	WBT	20				562	525	
9	Port Republic Road at Bradley Drive	Signal	Bradley Drive	NBL	62	334	900	
				NBR	66	341	900	
			Port Republic Road	EBT	18	192	525	
				EBT	22	225	525	
			Port Republic Road	WBL	36	484	425	
				WBT	36	484	425	
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	95	537	4250	
				NBT	5	55	4250	
				NBR	0	33		150
			Devon Lane	SBL	7	77		100
				SBT	3	38	300	
				SBR	12	167		100
			Port Republic Road	EBL	4	77		150
				EBT	23	211	425	
			Port Republic Road	EBR	23	212	425	
				WBL	2	57		150
			Port Republic Road	WBT	50	458	800	
WBR	49	458		800				

**Table 2.17 2030 Build PM Simulated Queue Lengths**

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	6	63		150
				EBT	55	237	225	
				EBR	1	72		100
			Port Republic Road	WBL	131	492		250
				WBT	74	485	525	
				WBR	74	485		150
			South Main Street	SBL	295	1,178		200
				SBT	145	1,099	300	
				SBR	145	1,101	300	
			South Main Street	NBL	39	191		150
NBT	90	500		350				
			NBR	18	306		150	
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBT	3	110	275	
				EBR	3	110	275	
			Port Republic Road	WBT	0	18	525	
				WBR	0	0	525	
			Hillcrest Drive	SBR	0	47	525	
Hillcrest Drive	NBR	0	38	375				
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBR	5	115	275	
			Port Republic Road	EBT	58	546	525	
				EBR	58	546	525	
			Port Republic Road	WBT	0	0	450	
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	19	171	200	
				NBT	19	171	200	
				NBR	2	78		100
			Bluestone Drive	SBL	183	1129		600
				SBT	183	1129	600	
				SBR	196	1150	600	
			Port Republic Road	EBL	92	0		300
				EBT	431	1295	475	
				EBR	6	1295	475	
			Port Republic Road	WBL	7	85		200
WBT	179	352		225				
			WBR	44	366		50	
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	67	311		100
				SBR	190	742		100
			Port Republic Road	EBT	43	409	250	
				EBR	1	98		100
			Port Republic Road	WBL	54	411		125
				WBT	72	463	350	



**Table 2.17 2030 Build PM Simulated Queue Lengths (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	No Build MOEs			
					Average Queue Length (ft)	Max Queue Length (ft)	Link Distance (ft)	Storage Length (ft)
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	21	378		125
				EBT	4	163	325	
			Port Republic Road	WBT	54	312	150	
				WBR	5	263		50
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	45	273		275
				NBT	41	206	900	
				NBR	7	122	900	
			Forest Hill Road	SBL	81	363		500
				SBR	81	363		500
			Port Republic Road	EBL	38	261		175
				EBT	54	328	125	
			Port Republic Road	WBT	431	1295	375	
WBR	431	1295			100			
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBR	1	67	725	
			Port Republic Road	EBT	1	116	375	
				EBR	1	129	375	
			Port Republic Road	WBT	104	865	525	
9	Port Republic Road at Bradley Drive	Signal	Bradley Drive	NBL	73	354	900	
				NBR	78	362	900	
			Port Republic Road	EBT	53	453	525	
				EBT	65	484	525	
			Port Republic Road	WBL	47	265	425	
				WBT	47	265	425	
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	93	469	4250	
				NBT	8	74	4250	
				NBR	0	45		150
			Devon Lane	SBL	16	183		100
				SBT	9	81	300	
			Port Republic Road	SBR	14	224		100
				EBL	30	281		150
			Port Republic Road	EBT	63	511	425	
				EBR	63	512	425	
			Port Republic Road	WBL	4	79		150
WBT	74	459		800				
WBR	73	459	800					

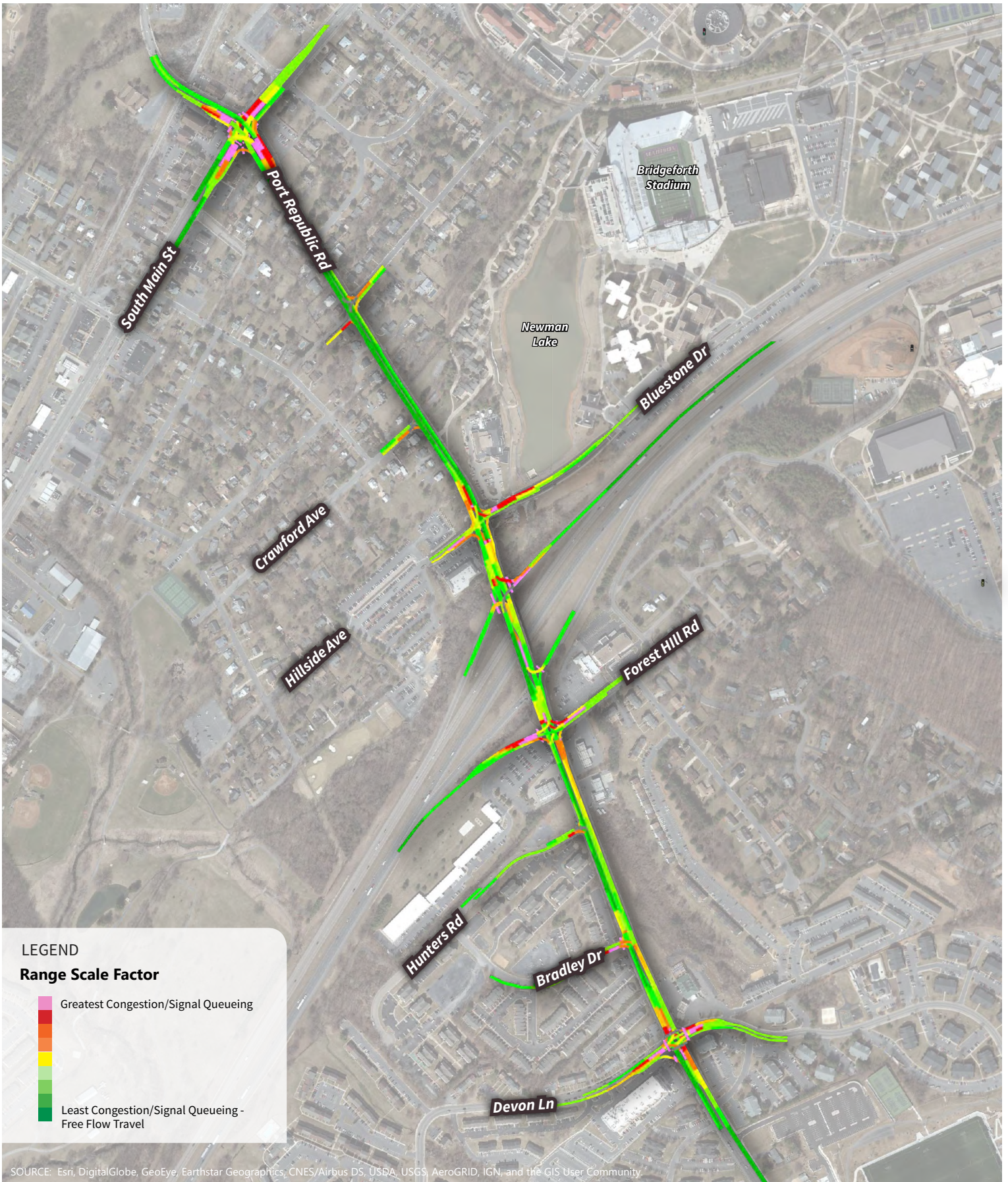
## Travel Time Analysis

Travel times to traverse the corridor were calculated using the same method used in the 2018 existing and 2030 no build models. The travel time results are displayed in Table 2.18. Speed maps for the 2030 build AM and PM peak hours are shown in Figures 2.18 and 2.19. The dark green color represents expected vehicle speeds near the speed limit of the corridor, which is 35 mph, and the red and pink colors denote areas of slower speed vehicles traveling through the model, with pink representing the highest level of congestion. This is a projected improvement in the westbound direction of one (1) minute and 3.9 seconds in the AM peak hour and two (2) minutes and 59.6 seconds in the PM peak hour and 56.2 seconds in the AM peak hour and one (1) minute and 20.5 seconds in the PM peak hour in the eastbound direction.

**Table 2.18 2030 Build Summary of Travel Time**

Peak Hour	Travel Time Run	Simulated Travel Time (sec)	Simulated Travel Time (M:SS)
	Segment		
AM Peak Hour	Port Republic Road Eastbound	208.04	03:28.0
	Port Republic Road Westbound	207.65	03:27.6
	Port Republic Road EB to I-81 NB Ramps	131.55	02:11.5
	Port Republic Road WB to I-81 SB Ramps	93.99	01:34.0
PM Peak Hour	Port Republic Road Eastbound	258.00	04:18.0
	Port Republic Road Westbound	302.26	05:02.3
	Port Republic Road EB to I-81 NB Ramps	165.28	02:45.3
	Port Republic Road WB to I-81 SB Ramps	167.10	02:47.1

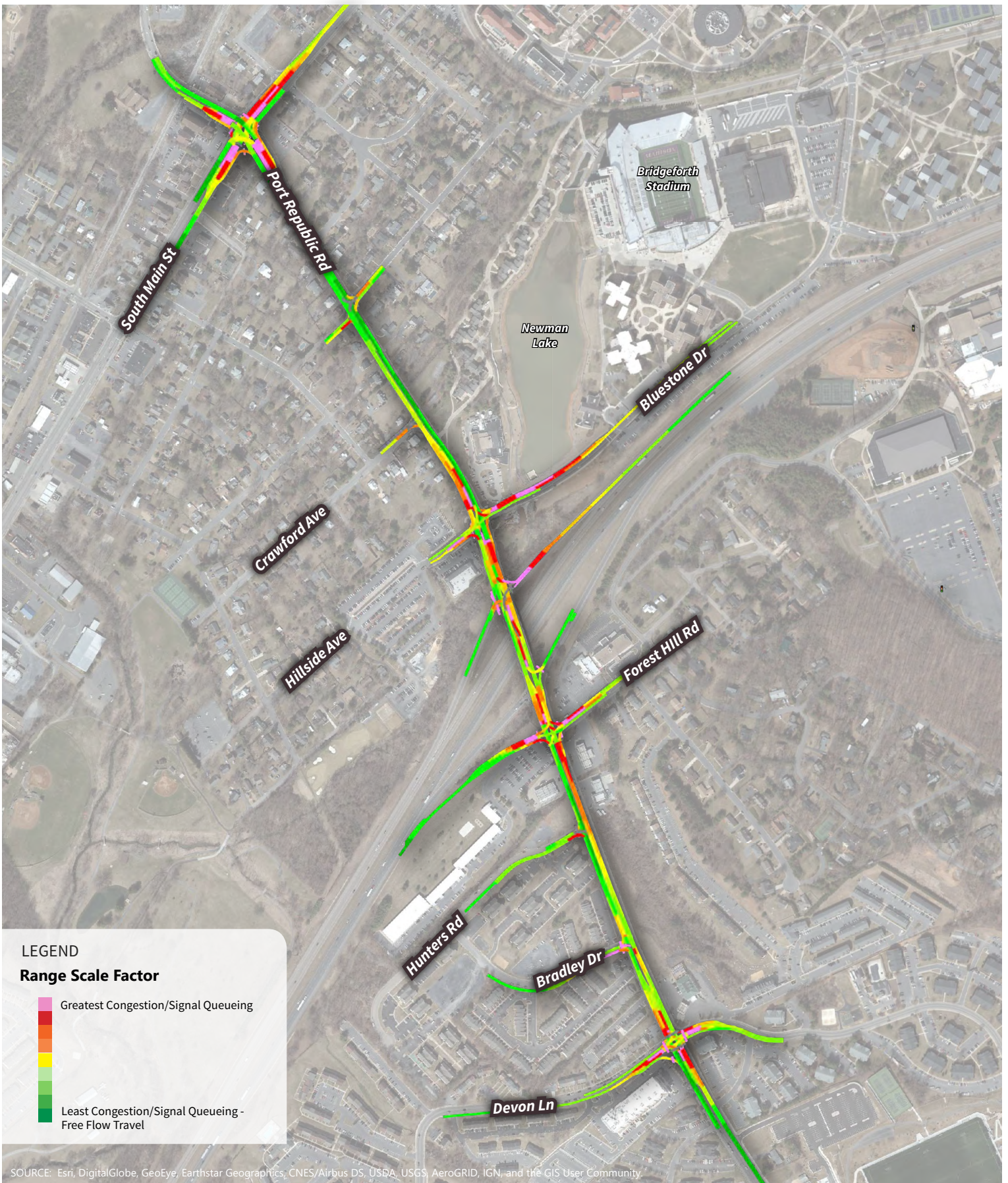




**FIGURE 2.18**  
**2030 AM BUILD SPEED MAP**

Port Republic Road Safety and Operations Study  
Harrisonburg, Virginia





**FIGURE 2.19**  
**2030 PM BUILD SPEED MAP**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia



## 2018 Existing, No Build 2030, and Build 2030 Model Comparisons

The MOEs obtained from the VISSIM models include length of the average queue and maximum queues, control delay (and corresponding level of service), travel time and average and total number of stops. Side-by-side comparison of these metrics is shown in Tables 2.19, 2.20, 2.21, 2.22, 2.23, and 2.24 below.

**Table 2.19 Travel Time and Total Stops**

Travel Time	Eastbound	Westbound
	VISSIM Travel Time (M:SS)	VISSIM Travel Time (M:SS)
<b>AM Peak Hour</b>		
Existing	03:37.5	03:52.7
No Build (2030)	04:20.9	04:34.9
Build (2030)	03:28.0	03:27.6
<b>PM Peak Hour</b>		
Existing	04:21.9	04:16.0
No Build (2030)	05:34.3	07:58.6
Build (2030)	04:18.0	05:02.3

**Table 2.20 Average and Total Vehicle Stops**

Stops	Average Stops per Vehicle within Network	Total Number of Stops in Peak Hour
<b>AM Peak Hour</b>		
Existing	2.26	10,524
No Build (2030)	4.29	22,543
Build (2030)	1.87	9,643
<b>PM Peak Hour</b>		
Existing	2.51	15,550
No Build (2030)	4.50	30,423
Build (2030)	2.68	18,417

Change in delay between scenarios does not correspond to the change in travel time because the travel time measurement is from one end of Port Republic Road to the other, which only a small subset of network vehicles travel, while average delay represents every vehicle in the network. Since many of these vehicles are only traversing a portion of the network, they don't experience as high a delay value as does a vehicle traversing Port Republic Road from end to end.

**Table 2.21 Average and Total Vehicle Delay Time**

Delay	Average Delay [sec] per Vehicle	Total Vehicle Delay [min] in Peak Hour
<b>AM Peak Hour</b>		
Existing	69.3	5,380
No Build (2030)	122.3	10,711
Build (2030)	58.4	5,029
<b>PM Peak Hour</b>		
Existing	92.3	9,525
No Build (2030)	171.2	19,277
Build (2030)	101.1	11,594



**Table 2.22 AM LOS Comparison**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build	
					Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	42.3	D	45.1	D	31.5	C
				EBT						
				EBR						
			Port Republic Road	WBL	38.5	D	32.1	C	32.1	C
				WBT						
				WBR						
			South Main Street	SBL	37.4	D	36.9	D	36.8	D
				SBT						
				SBR						
			South Main Street	NBL	25.1	C	22.4	C	23.8	C
NBT										
NBR										
<b>Intersection</b>					<b>34.8</b>	<b>C</b>	<b>31.8</b>	<b>C</b>	<b>30.3</b>	<b>C</b>
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	0.4	A	0.4	A	0.3	A
				EBT						
				EBR						
			Port Republic Road	WBL	1.9	A	3.9	A	1.7	A
				WBT						
				WBR						
			Hillcrest Drive	SBL	15.5	C	17.1	C	11.7	A
				SBR						
				NBL						
			Hillcrest Drive	NBL	8.5	A	8.8	A	9.3	A
NBT										
NBR										
<b>Intersection</b>					<b>1.5</b>	<b>A</b>	<b>2.7</b>	<b>A</b>	<b>1.2</b>	<b>A</b>
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	9.9	A	9.5	A	9.8	A
				NBR						
			Port Republic Road	EBT	0.3	A	0.3	A	0.3	A
				EBR						
			Port Republic Road	WBL	1.9	A	2.4	A	0.4	A
				WBT						
<b>Intersection</b>					<b>1.4</b>	<b>A</b>	<b>1.7</b>	<b>A</b>	<b>0.5</b>	<b>A</b>
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	32.2	C	34.1	C	37.2	D
				NBT						
				NBR						
			Bluestone Drive	SBL	44.7	D	42.9	D	43.0	D
				SBT						
				SBR						
			Port Republic Road	EBL	31.8	C	33.4	C	17.2	B
				EBT						
				EBR						
			Port Republic Road	WBL	18.0	B	20.1	C	8.4	A
WBT										
WBR										
<b>Intersection</b>					<b>24.3</b>	<b>C</b>	<b>26.1</b>	<b>C</b>	<b>14.3</b>	<b>B</b>
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	49.5	D	148.7	F	32.4	C
				SBR						
			Port Republic Road	EBT	1.1	A	7.1	A	5.3	A
				EBR						
			Port Republic Road	WBL	19.0	B	17.5	B	8.8	A
				WBT						
<b>Intersection</b>					<b>18.3</b>	<b>B</b>	<b>31.3</b>	<b>C</b>	<b>11.3</b>	<b>B</b>

**Table 2.22 AM LOS comparison (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build	
					Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS
6	Port Republic Road at NB I-81 On-Ramp	Signal	NB I-81 Off-Ramp (2018 existing model only)	NBL	46.0	D				
				NBR						
			Port Republic Road	EBL	9.3	A	12.6	B	4.4	A
				EBT						
			Port Republic Road	WBT	4.6	A	4.1	A	1.8	A
	WBR									
<b>Intersection</b>					<b>13.9</b>	<b>B</b>	<b>6.9</b>	<b>A</b>	<b>2.7</b>	<b>A</b>
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	JMU Parking Lot (2018) NB I-81 Off-Ramp (2030)	NBL	58.1	E	47.1	D	35.5	D
				NBT						
				NBR						
			Forest Hill Road	SBL	27.6	C	33.6	C	25.6	C
				SBT (Existing Only)						
			Port Republic Road	EBL	5.5	A	16.8	B	7.1	A
				EBT						
			Port Republic Road	WBT	16.2	B	33.3	C	13.9	B
				WBR						
			<b>Intersection</b>					<b>13.7</b>	<b>B</b>	<b>32.2</b>
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	14.9	B	135.5	F	5.9	A
				NBR						
			Port Republic Road	EBT	1.0	A	2.1	A	0.8	A
				EBR						
			Port Republic Road	WBL	2.7	A	26.3	D	4.5	A
	WBT									
<b>Intersection</b>					<b>2.7</b>	<b>A</b>	<b>22.8</b>	<b>C</b>	<b>3.2</b>	<b>A</b>
9	Port Republic Road at Bradley Drive	Unsignalized/Signal	Bradley Drive	NBL	11.7	B	28.3	D	51.5	D
				NBR						
			Port Republic Road	EBT	0.4	A	0.5	A	7.1	A
				EBT						
			Port Republic Road	WBL	0.5	A	12.8	B	7.6	A
	WBT									
<b>Intersection</b>					<b>1.0</b>	<b>A</b>	<b>9.7</b>	<b>A</b>	<b>11.0</b>	<b>B</b>
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	34.2	C	41.7	D	45.0	D
				NBT						
				NBR						
			Devon Lane	SBL	14.8	B	17.4	B	17.7	B
				SBT						
			Port Republic Road	SBR	13.9	B	18.5	B	10.8	B
				EBL						
			Port Republic Road	EBT	16.4	B	38.3	D	14.6	B
				EBR						
			Port Republic Road	WBL						
WBT										
	WBR									
<b>Intersection</b>					<b>17.9</b>	<b>B</b>	<b>30.5</b>	<b>C</b>	<b>17.8</b>	<b>B</b>



**Table 2.23 PM LOS Comparison**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build	
					Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	49.1	D	43.3	D	37.2	D
				EBT						
				EBR						
			Port Republic Road	WBL	35.0	D	21.5	C	48.6	D
				WBT						
				WBR						
			South Main Street	SBL	50.6	D	53.7	D	45.6	D
				SBT						
				SBR						
			South Main Street	NBL	34.1	C	35.4	D	31.2	C
NBT										
NBR										
<b>Intersection</b>					<b>41.8</b>	<b>D</b>	<b>39.4</b>	<b>D</b>	<b>41.8</b>	<b>D</b>
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	1.0	A	13.3	B	2.0	A
				EBT						
				EBR						
			Port Republic Road	WBL	1.3	A	1.3	A	1.5	A
				WBT						
				WBR						
			Hillcrest Drive	SBL	13.9	B	22.8	C	7.0	A
				SBR						
			Hillcrest Drive	NBL	10.4	B	36.9	E	21.8	C
				NBR						
<b>Intersection</b>					<b>1.2</b>	<b>A</b>	<b>8.2</b>	<b>A</b>	<b>1.8</b>	<b>A</b>
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	26.6	D	83.7	F	35.9	E
				NBR						
			Port Republic Road	EBT	9.5	A	22.7	C	9.9	A
				EBR						
			Port Republic Road	WBL	4.3		7.9	A	0.8	A
				WBT						
<b>Intersection</b>					<b>7.3</b>		<b>16.7</b>	<b>C</b>	<b>5.9</b>	<b>A</b>
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	30.0	C	31.8	C	31.1	C
				NBT						
				NBR						
			Bluestone Drive	SBL	76.4	E	101.5	F	68.7	E
				SBT						
				SBR						
			Port Republic Road	EBL	41.9	D	44.4	D	35.5	D
				EBT						
				EBR						
			Port Republic Road	WBL	20.9	C	23.1	C	22.3	C
WBT										
WBR										
<b>Intersection</b>					<b>38.7</b>	<b>D</b>	<b>45.2</b>	<b>D</b>	<b>35.4</b>	<b>D</b>
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	54.4	D	78.4	E	85.0	F
				SBR						
			Port Republic Road	EBT	3.7	A	6.9	A	6.3	A
				EBR						
			Port Republic Road	WBL	21.0	C	34.3	C	24.6	C
				WBT						
<b>Intersection</b>					<b>16.4</b>	<b>B</b>	<b>25.2</b>	<b>C</b>	<b>22.3</b>	<b>C</b>

**Table 2.23 PM LOS Comparison (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build	
					Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Approach Delay (sec/veh)	Estimated Approach LOS
6	Port Republic Road at NB I-81 On-Ramp	Signal	NB I-81 Off-Ramp (2018 existing model only)	NBL	70.7	E				
				NBR						
			Port Republic Road	EBL	11.5	B	19.2	B	7.8	B
				EBT						
			Port Republic Road	WBT	5.7	A	9.8	A	8.2	A
	WBR									
<b>Intersection</b>					<b>16.9</b>	<b>B</b>	<b>14.7</b>	<b>B</b>	<b>8.0</b>	<b>A</b>
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	JMU Parking Lot (2018)	NBL	58.5	E	49.3	D	34.5	C
				NBT						
			NB I-81 Off-Ramp (2030)	NBR	31.1	C	48.0	D	35.1	D
				SBL (Existing Only)						
			Forest Hill Road	SBR	9.8	A	13.9	B	13.3	B
				EBL						
			Port Republic Road	EBT	36.5	D	69.0	E	34.3	D
				WBT						
				WBR						
			<b>Intersection</b>					<b>24.2</b>	<b>C</b>	<b>42.1</b>
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	21.6	C	358.5	F	8.5	A
				NBR						
			Port Republic Road	EBT	1.8	A	3.8	A	2.0	A
				EBR						
			Port Republic Road	WBL	7.9	A	78.1	F	19.1	C
	WBT									
<b>Intersection</b>					<b>5.0</b>	<b>A</b>	<b>42.7</b>	<b>E</b>	<b>10.0</b>	<b>A</b>
9	Port Republic Road at Bradley Drive	Unsignalized/Signal	Bradley Drive	NBL	14.2	B	387.9	F	54.7	D
				NBR						
			Port Republic Road	EBT	1.5	A	5.8	A	11.1	B
				EBT						
			Port Republic Road	WBL	0.8	A	61.2	F	11.7	B
	WBT									
<b>Intersection</b>					<b>1.5</b>	<b>A</b>	<b>42.2</b>	<b>E</b>	<b>14.5</b>	<b>B</b>
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	35.8	D	201.5	F	49.5	D
				NBT						
			Devon Lane	NBR	22.7	C	52.3	D	28.9	C
				SBL						
			Port Republic Road	SBT	17.1	B	37.9	D	17.4	B
				SBR						
			Port Republic Road	EBL	22.0	C	86.6	F	24.2	C
				EBT						
				EBR						
				WBL						
	WBT									
	WBR									
<b>Intersection</b>					<b>21.7</b>	<b>C</b>	<b>65.4</b>	<b>E</b>	<b>24.1</b>	<b>C</b>



**Table 2.24 AM Queue Comparison**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build				
					Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)			
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	19	146	29	200	17	119			
				EBT	49	217	56	318	40	247			
				EBR	0	55	1	67	1	68			
			Port Republic Road	WBL	29	137	21	144	41	190			
				WBT	72	742	52	787	99	660			
				WBR	197	813	263	900	99	660			
			South Main Street	SBL	34	153	39	148	41	159			
				SBT	26	185	28	177	28	172			
				SBR	24	188	26	179	25	174			
			South Main Street	NBL	22	153	26	167	24	155			
NBT	54	328		52	381	57	323						
			NBR	1	111	2	135	2	119				
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	0	25	1	55					
				EBT	0	7	0	21	0	0			
				EBR	0	7	0	21	0	0			
			Port Republic Road	WBL	0	54	10	209					
				WBT	1	98	17	289	0	0			
				WBR	0	80	14	249	0	2			
			Hillcrest Drive	SBL	2	64	2	66					
				SBR	1	65	1	67	0	44			
			Hillcrest Drive	NBL	0	41	0	41					
				NBR	0	42	0	42	0	42			
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	1	88	1	85					
				NBR	2	113	2	109	1	109			
			Port Republic Road	EBT	0	0	0	3	0	0			
				EBR	0	0	0	3	0	0			
			Port Republic Road	WBL	1	137	3	212					
				WBT	1	97	2	163	0	0			
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	17	151	20	172	41	207			
				NBT	17	151	20	172	42	208			
				NBR	1	63	1	55	1	60			
			Bluestone Drive	SBL	18	120	18	96	20	95			
				SBT	18	120	18	96	20	95			
				SBR	18	143	20	101	22	118			
			Port Republic Road	EBL	24	260	42	371	21	174			
				EBT	63	353	67	461	29	263			
				EBR	5	245	3	253	3	187			
			Port Republic Road	WBL	10	121	14	123	5	104			
				WBT	139	354	170	367	56	346			
				WBR	14	311	35	367	4	232			
			5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	53	351	940	1672	53	262
							SBR	40	302	1137	1775	18	186
Port Republic Road	EBT	2				75	19	313	13	249			
	EBR	0				34	0	56	0	56			
Port Republic Road	WBL	5				186	12	358	3	204			
	WBT	61				454	77	467	36	429			

**Table 2.24 AM Queue Comparison (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build	
					Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)
6	Port Republic Road at NB I-81 On-Ramp	Signal	NB I-81 Off-Ramp (2018 existing model only)	NBL	144	699				
				NBR	29	455				
			Port Republic Road	EBL	6	151	46	326	10	176
				EBT	16	173	0	24	0	4
			Port Republic Road	WBT	20	301	15	302	6	255
				WBR	1	178	0	46	0	33
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	JMU Parking Lot (2018) NB I-81 Off-Ramp (2030)	NBL	4	56	110	510	69	354
				NBT	4	56	44	227	41	216
				NBR	1	68	6	118	5	110
			Forest Hill Road	SBL	29	167	41	197	28	193
				SBT (2018)	29	167				
			Forest Hill Road	SBR	29	167	41	197	28	193
				EBL	13	171	9	120	5	93
			Port Republic Road	EBT	4	117	38	237	10	166
				EBR (2018)	2	134				
			Port Republic Road	WBT	362	1262	2025	2293	208	992
				WBR	362	1262	2025	2293	208	992
			8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	8	105	115
NBR	6	106					113	496	1	67
Port Republic Road	EBT	0				35	2	182	0	0
	EBR	1				85	3	225	0	8
Port Republic Road	WBL	8				832	219	1863		
	WBT	6				832	201	1863	20	562
9	Port Republic Road at Bradley Drive	Unsignalized/Signal	Bradley Drive	NBL	5	101	17	178	62	334
				NBR	5	101	16	179	66	341
			Port Republic Road	EBT	0	21	0	7	18	192
				EBT	0	51	0	10	22	225
			Port Republic Road	WBL	0	232	71	1263	36	484
				WBT	0	232	62	1263	36	484
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	63	371	89	435	95	537
				NBT	63	371	89	435	5	55
				NBR	0	21	0	32	0	33
			Devon Lane	SBL	7	109	7	87	7	77
				SBT	7	109	7	87	3	38
				SBR	8	167	11	181	12	167
			Port Republic Road	EBL	3	76	5	77	4	77
				EBT	29	260	43	342	23	211
				EBR	27	262	41	344	23	212
			Port Republic Road	WBL	2	58	3	65	2	57
				WBT	50	382	180	688	50	458
				WBR	49	382	179	687	49	458



**Table 2.25 PM Queue Comparison**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build	
					Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	9	65	9	70	6	63
				EBT	63	287	62	302	55	237
				EBR	1	73	1	74	1	72
			Port Republic Road	WBL	60	382	43	419	131	492
				WBT	101	593	56	482	74	485
				WBR	30	413	14	350	74	485
			South Main Street	SBL	272	1266	347	1301	295	1,178
				SBT	210	1271	192	1254	145	1099
				SBR	210	1272	192	1255	145	1101
			South Main Street	NBL	35	183	37	174	39	191
				NBT	93	536	110	588	90	500
NBR	13	317		24	418	18	306			
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	1	84	84	687		
				EBT	0	61	75	641	3	110
				EBR	0	61	75	641	3	110
			Port Republic Road	WBL	1	155	1	153		
				WBT	0	36	1	111	0	18
				WBR	0	7	1	77	0	0
			Hillcrest Drive	SBL	1	61	2	61		
				SBR	1	61	1	62	0	47
			Hillcrest Drive	NBL	0	37	0	37		
				NBR	0	38	0	38	0	38
			3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	2	92	5
NBR	4	116					14	129	5	115
Port Republic Road	EBT	38				506	170	681	58	546
	EBR	38				506	170	681	58	546
Port Republic Road	WBL	20				376	46	544		
	WBT	15				334	37	502	0	0
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal				Hillside Avenue	NBL	16	119	19
			NBT	16	119		19	183	19	171
			NBR	2	77		2	82	2	78
			Bluestone Drive	SBL	139	838	387	1136	183	1129
				SBT	139	838	387	1136	183	1129
				SBR	153	859	404	1157	196	1150
			Port Republic Road	EBL	99	777	136	2336	92	0
				EBT	885	1572	3358	3630	0	0
				EBR	7	1572	17	3630	6	0
			Port Republic Road	WBL	5	80	5	85	7	85
				WBT	140	345	167	359	179	352
				WBR	16	314	30	349	44	366
			5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	62	416	122
SBR	64	429					160	685	190	742
Port Republic Road	EBT	19				333	47	405	43	409
	EBR	1				71	1	68	1	98
Port Republic Road	WBL	44				357	31	372	54	411
	WBT	41				426	103	454	72	463

**Table 2.25 PM Queue Comparison (Cont)**

Node No.	Intersection	Traffic Control	Approach	Movement	2018 Existing		2030 No Build		2030 Build	
					Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)	Average Queue Length (ft)	Max Queue Length (ft)
6	Port Republic Road at NB I-81 On-Ramp	Signal	NB I-81 Off-Ramp (2018 existing model only)	NBL	171	789				
				NBR	198	793				
			Port Republic Road	EBL	37	318	77	451	21	378
				EBT	21	250	23	393	4	163
			Port Republic Road	WBT	24	301	54	337	54	312
				WBR	1	112	3	279	5	263
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	JMU Parking Lot (2018) NB I-81 Off-Ramp (2030)	NBL	28	217	101	505	45	273
				NBT	28	217	37	197	41	206
				NBR	27	231	10	133	7	122
			Forest Hill Road	SBL	72	321	116	393	81	363
				SBT (2018)	72	321				
			Port Republic Road	SBR	72	321	116	393	81	363
				EBL	55	275	29	240	38	261
			Port Republic Road	EBT	46	273	92	354	54	328
				EBR (2018)	27	319				
			Port Republic Road	WBT	227	801	1682	2238	431	1295
				WBR	227	801	1682	2238	431	1295
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	8	103	216	583		
				NBR	6	103	216	584	1	67
			Port Republic Road	EBT	1	162	8	327	1	116
				EBR	3	208	9	362	1	129
			Port Republic Road	WBL	26	371	494	1808		
				WBT	21	371	463	1808	104	865
9	Port Republic Road at Bradley Drive	Unsignalized/Signal	Bradley Drive	NBL	5	97	334	486	73	354
				NBR	4	97	334	487	78	362
			Port Republic Road	EBT	1	260	22	1216	53	453
				EBT	2	260	26	1216	65	484
			Port Republic Road	WBL	1	0	277	1208	47	265
				WBT	1	0	252	1208	47	265
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	63	382	273	472	93	469
				NBT	63	382	273	472	8	74
				NBR	0	31	0	22	0	45
			Devon Lane	SBL	22	171	31	240	16	183
				SBT	22	171	31	240	9	81
			Port Republic Road	SBR	5	123	46	342	14	224
				EBL	15	201	78	479	30	281
			Port Republic Road	EBT	68	765	154	1721	63	511
				EBR	68	765	155	1721	63	512
			Port Republic Road	WBL	2	57	4	66	4	79
				WBT	59	355	340	720	74	459
Port Republic Road	WBR	58	355	339	720	73	459			



## 3 Safety Analysis

### Methodology

Five (5) years and six months (January 2013–June 2018) of crash data was used to measure current crash trends and develop site specific improvements to achieve a reduction in the number of crashes or the severity of crashes. VHB took a hybrid approach to evaluating the corridor using a process that combines systemic and site-specific approaches at locations with high crash frequency and severity to comprehensively review the Port Republic Road corridor.

The objectives in comprehensively assessing the safety of the corridors are as follows:

- Conduct a field review, inventory, and evaluation of existing conditions.
- Identify roadway characteristics and key issues affecting travel along the corridor.
- Synthesize crash data.
- Develop recommendations that address safety concerns and operational issues.
- Provide planning level cost estimates for associated study recommendation

This report provides the documentation of the study, results, and recommendations. It is generally organized by existing corridor conditions, site specific location evaluations, and recommendations.

GIS mapping tools and crash data analysis for a five-and-a-half-year period were used to identify specific areas of concern, or locations that have a potential for safety improvement. Heat maps were created by crash location and severe crash locations. These maps are shown in Figures 3.1 and 3.2. Crash location and crash type, by study intersection, are shown in Appendix H. A more in-depth review was conducted at two (2) site specific locations, which are described in detail later in this report and are shown in Figures 3.3 and 3.4.

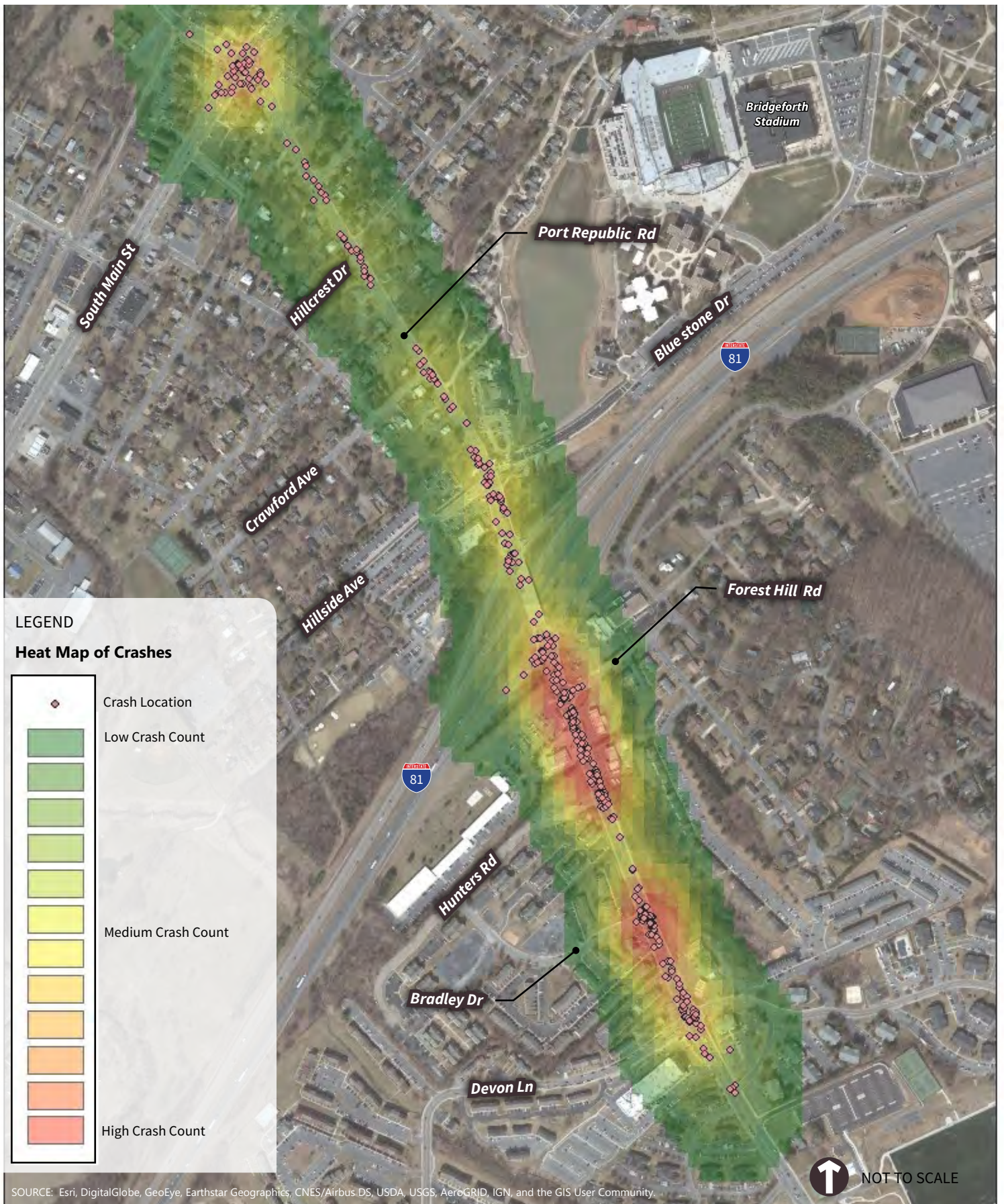
### Crash Modification Factors

A crash modification factor (CMF) is a factor, based on documented safety research studies, used to compute the expected number of crashes after implementing a given countermeasure at a specific site. CMFs provide some indication of the potential benefit, or lack thereof, associated with specific countermeasures. The Federal Highway Administration (FHWA) compiles CMF data from published safety studies and posts them in the CMF Clearinghouse (<http://www.cmfclearinghouse.org/index.cfm>) to help practitioners select the most effective safety treatments. While CMF data is not available for all potential countermeasures, the CMF Clearinghouse provides a useful and consolidated source of data to help engineers, planners, and project owners make informed decisions. CMFs for the specific countermeasures are shown in Table 3.1.

**Table 3.1 Proposed Countermeasures for the Study Area**

	Countermeasure Measures	CMF	Notes	Source
1	Reducing number of driveways/consolidating driveways	0.93	All crashes - all severities	Clearinghouse
2	Eliminating certain movements (right in/right out street intersections and drives)	0.129-0.456	Angle,Fixed object,Left turn,Rear end,Vehicle/bicycle,Vehicle/pedestrian/all severities	Clearinghouse
3	Adding medians in the intersection functional area	0.77	All crashes - all severities	Clearinghouse
4	High friction surface course (at approaches)	0.207	All crashes	Clearinghouse
5	Enhanced transit stations	0.88	All crashes - all severities	Clearinghouse
6	Increase intersection sight distance	0.44-0.53	All crashes - KABC severities	Clearinghouse
7	Adding left turn lanes	0.85	All crashes - all severities	Smart Scale CMF
8	High visibility back plates	0.85	All crashes - all severities	Clearinghouse
9	Red light running cameras	0.8	All crashes - all severities	Clearinghouse
10	Change from Protected/Permissive Left-Turn to Flashing Yellow Arrow	0.935	All crashes- all severities	Clearinghouse





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.



**FIGURE 3.1**  
**HEAT MAP OF CRASH LOCATIONS**

Port Republic Road Safety and Operations Study  
Harrisonburg, Virginia



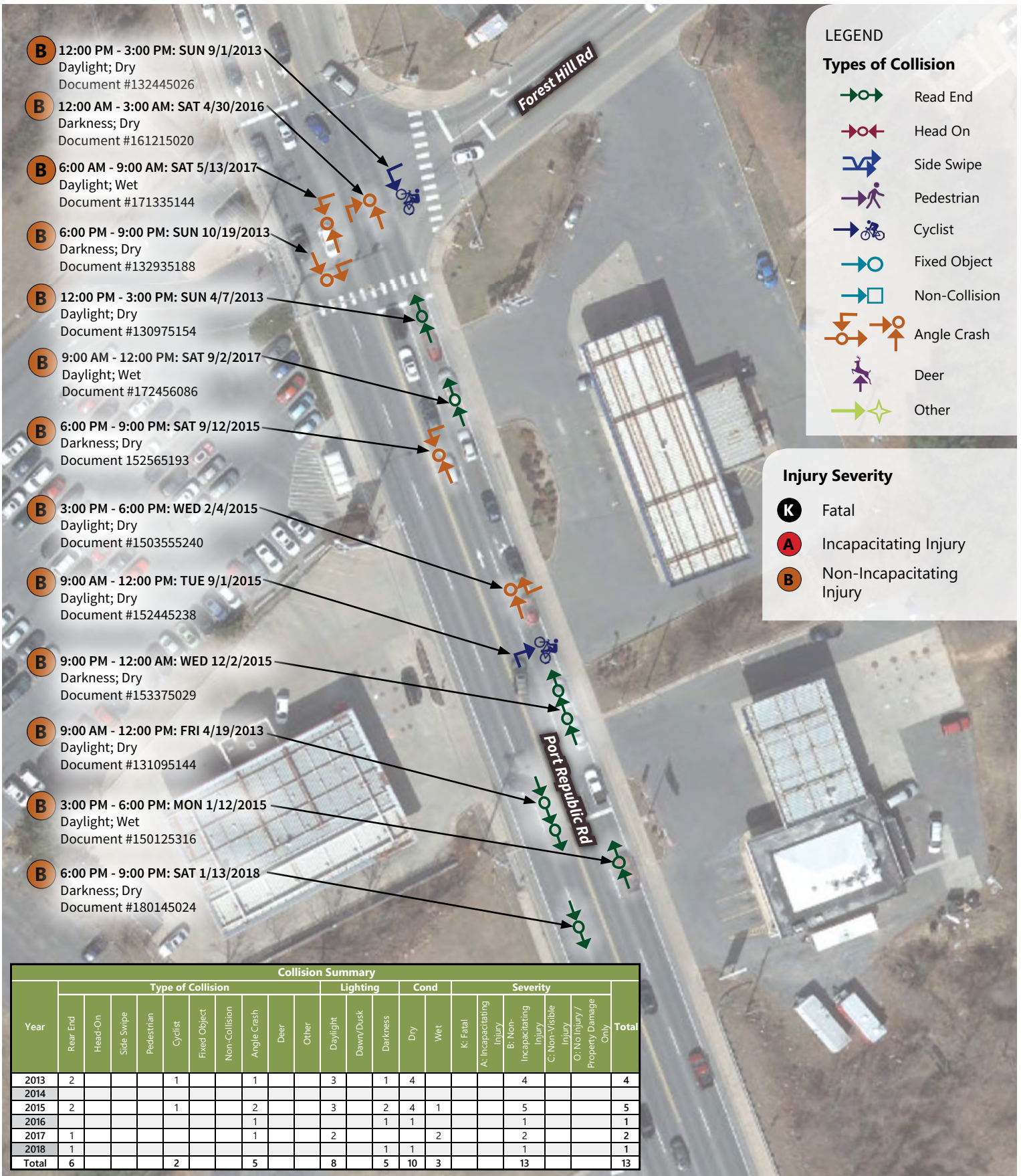


**FIGURE 3.2**  
**HEAT MAP OF CRASH LOCATIONS AND SEVERITY**

Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





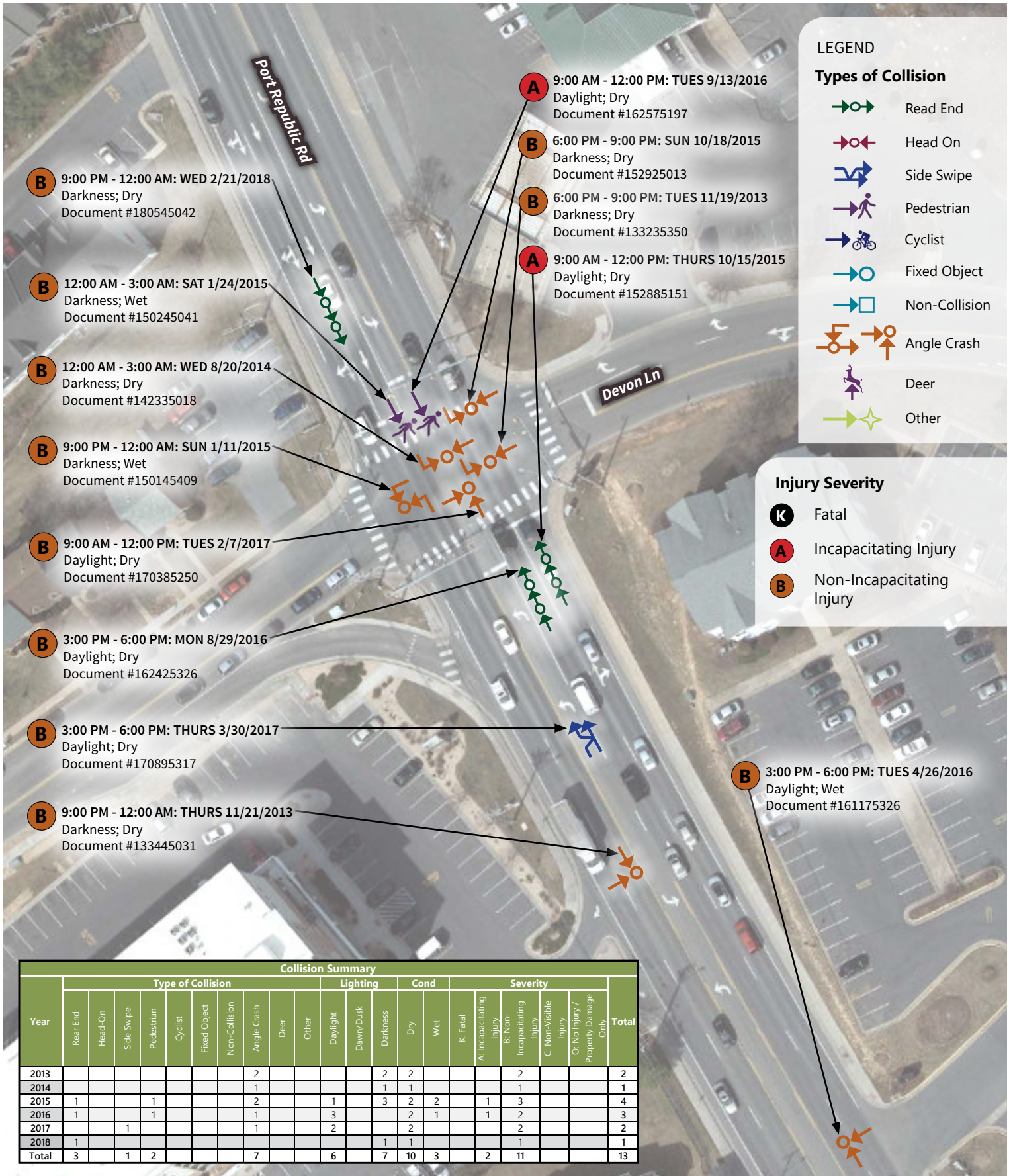


SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.



**FIGURE 3.3**  
**CRASH DIAGRAM**  
 FOREST HILL ROAD AND PORT REPUBLIC ROAD  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





Year	Type of Collision									Lighting			Cond		Severity					Total		
	Rear End	Head-On	Side Swipe	Pedestrian	Cyclist	Fixed Object	Non-Collision	Angle Crash	Deer	Other	Daylight	Dawn/Dusk	Darkness	Dry	Wet	K: Fatal	A: Incapacitating Injury	B: Non-Incapacitating Injury	C: Non-Visible Injury		O: No Injury / Property Damage Only	
2013							2					2	2					2				2
2014							1					1	1					1				1
2015	1			1			2			1		3	2	2		1	3					4
2016	1			1			1			3		2	1			1	2					3
2017			1				1			2			2				2					2
2018	1											1	1				1					1
<b>Total</b>	<b>3</b>		<b>1</b>	<b>2</b>			<b>7</b>			<b>6</b>		<b>7</b>	<b>10</b>	<b>3</b>		<b>2</b>	<b>11</b>				<b>13</b>	

SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.



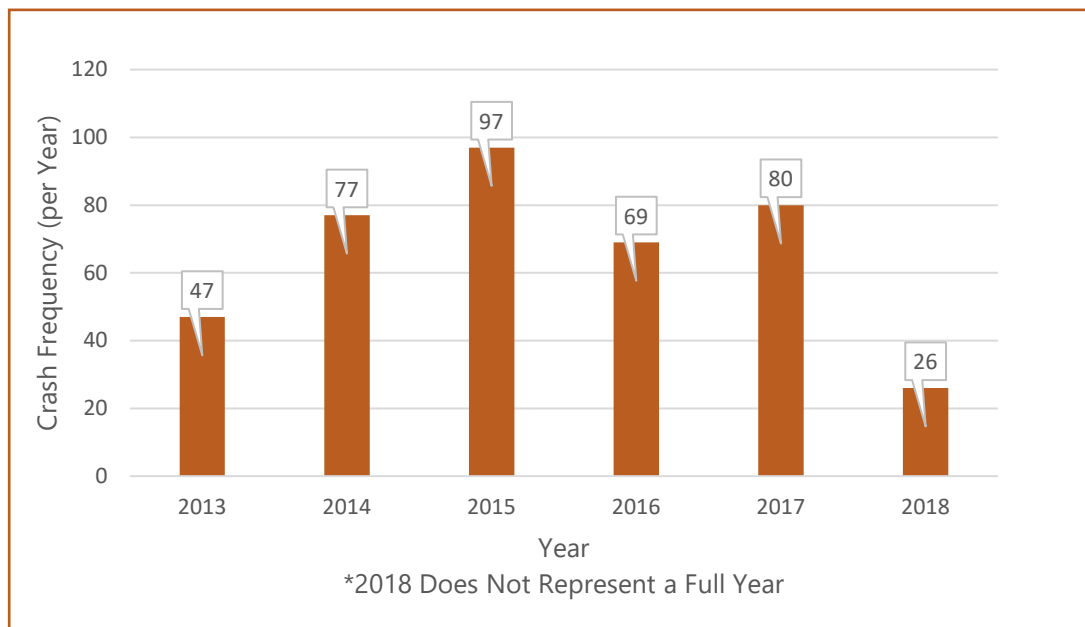
**FIGURE 3.4**  
**CRASH DIAGRAM**  
DEVON LANE AND PORT REPUBLIC ROAD  
Port Republic Road Safety and Operations Study  
Harrisonburg, Virginia



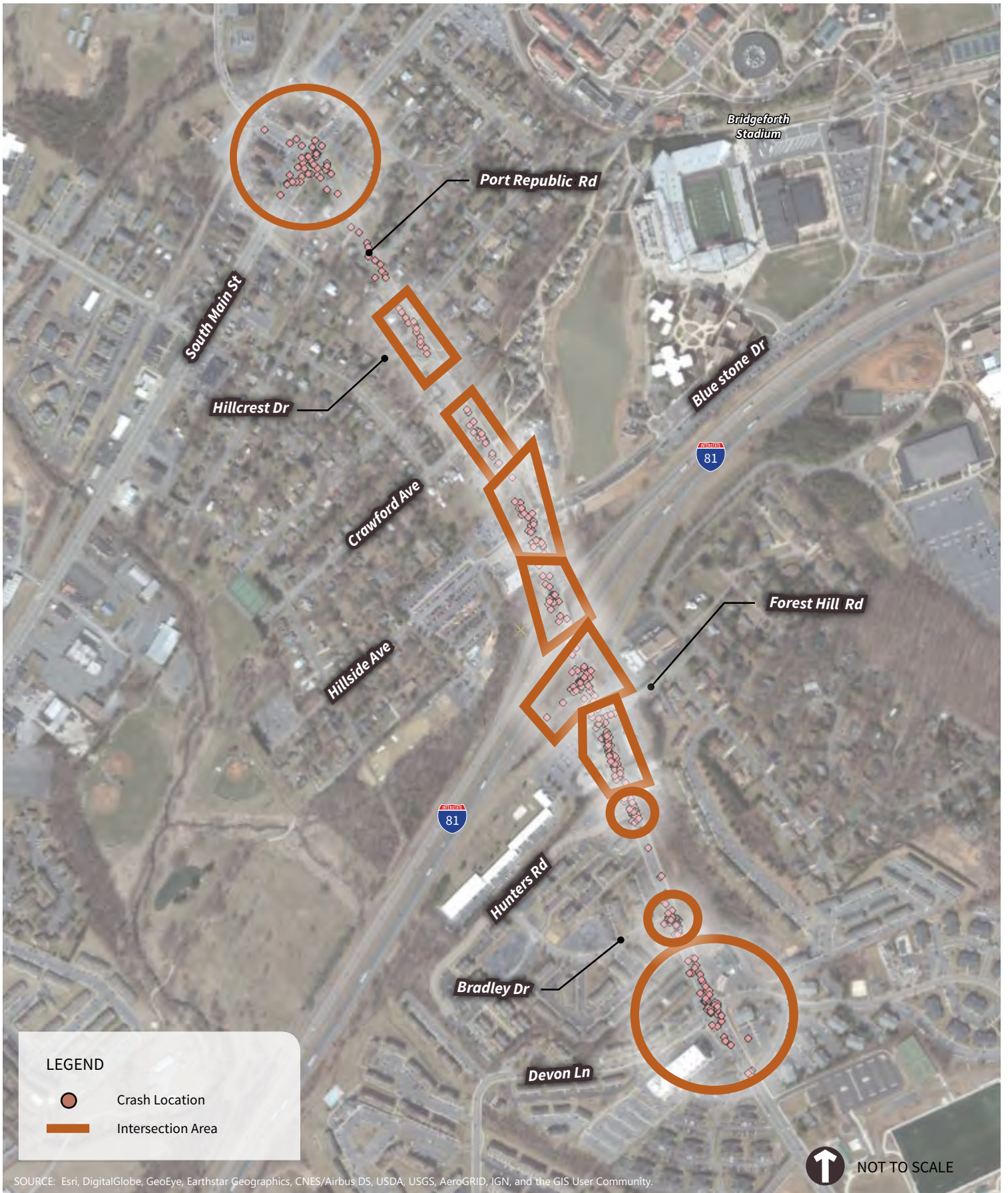
## Systemic Risk Factor Analysis

The following analysis involves the identification of focus areas and the associated risk factors. The data set used in the analysis includes 396 crashes for the five-and-a-half-year period from January 2013 to June 2018 over approximately one (1) mile, equivalent to an average of 72 crashes a year. Table 3.2 illustrates the trend of yearly crash frequencies in the study area.

**Table 3.2** Crash Frequency

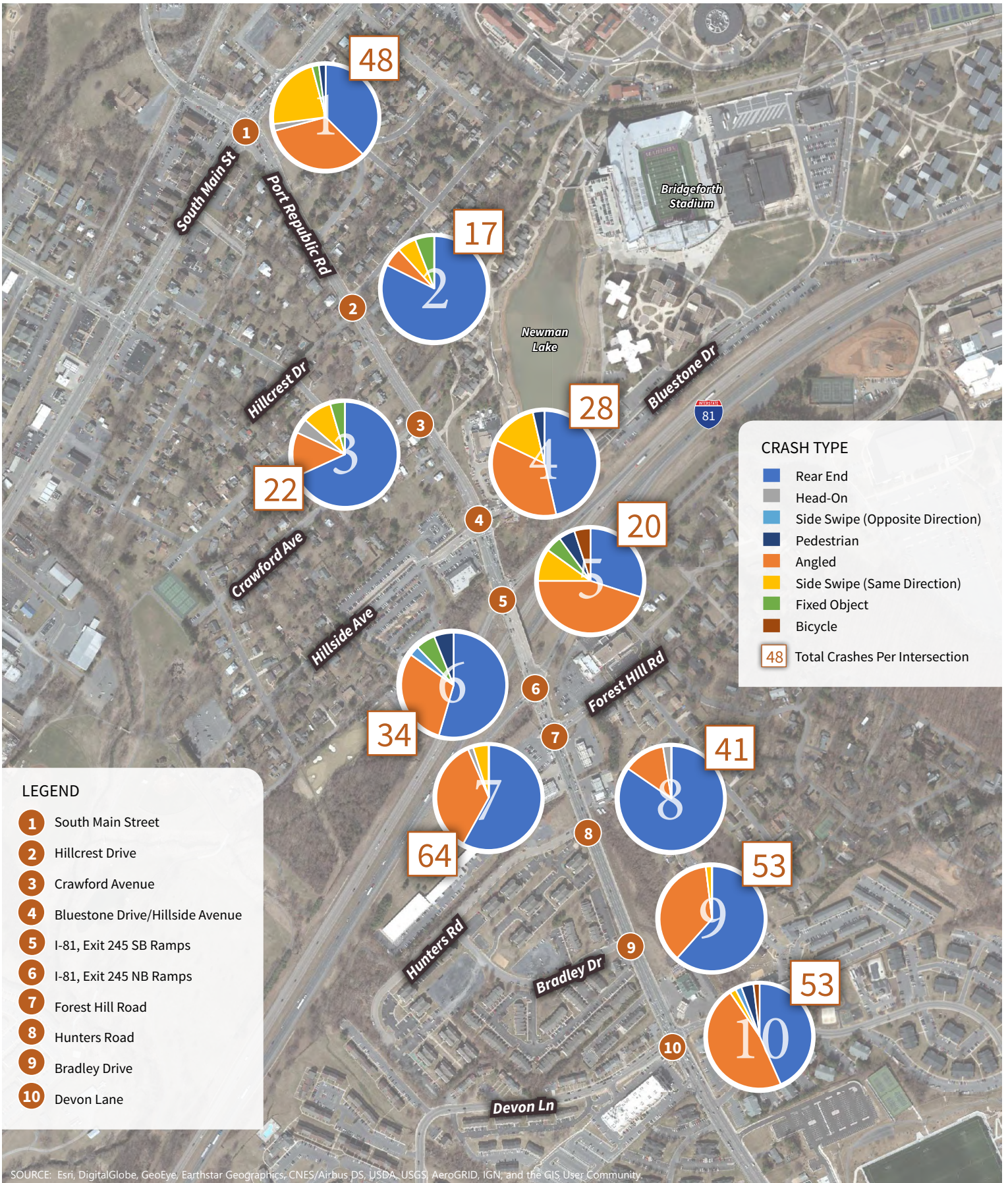


In order to analyze crash frequencies and patterns for each study intersection on Port Republic Road, the corridor crashes were assigned to individual intersections based on proximity to the intersection and engineering judgement. VDOT guidelines recommend crashes be linked to the intersection when the first harmful event occurs within 250 feet of the center of an intersection and be used for network level screenings. For project level analysis, like this project, the engineer determines the most appropriate intersection influence area. The signalized intersection area included the entire taper and storage length of dedicated turn bays under the assumption that crashes within that area were attributable to the corresponding intersection. For unsignalized intersections the 250-foot radius was used. Sixteen (16) crashes were considered corridor crashes, meaning they occurred with the study area, but were not close enough to assign to a specific intersection. A graphical representation of the areas used for the analysis are shown in Figure 3.5 below. The corresponding summary of crashes per intersection on Port Republic Road are shown in Figure 3.6.



**FIGURE 3.5**  
**INTERSECTION CRASH AREA**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia





SOURCE: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**FIGURE 3.6**  
**CRASH TYPE BY INTERSECTION**  
 Port Republic Road Safety and Operations Study  
 Harrisonburg, Virginia

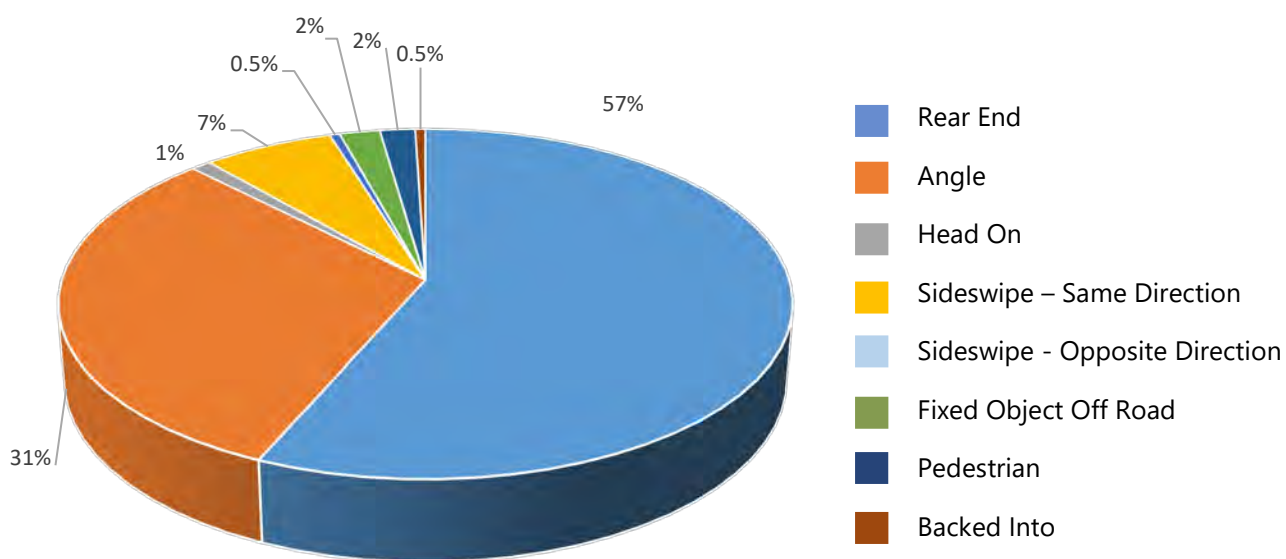


## Primary Focus Areas

There are two (2) primary approaches to addressing safety, using a site-specific approach to address locations with a history of high or severe crashes, and using a systemic approach to proactively address safety by identifying and targeting specific risk factors. The following analysis involves the identification of focus areas and the associated risk factors. The data set used in the analysis includes 396 crashes for the five-and-a-half-year period.

There are two (2) possible types of focus areas in systemic data analysis: focus crash types and focus facility types. With the available robust crash dataset, the analysis was guided by the focus crash types. The highest proportion of crashes are rear-end followed by angle crash types as shown in Figure 3.7. Together these two (2) crash types comprised 88 percent of the total crashes and 85 percent of the severe crashes within the study area as shown in Table 3.3. Figure 3.8 and Table 3.4 show the number and percentage of injury crashes by severity type. KAB crashes are fatal and severe crashes as noted by the KABCO scale: K = fatal crash, A = incapacitating injury, B = non-incapacitating injury, C = possible injury, and O = no injury.

## Crash Frequency Analysis

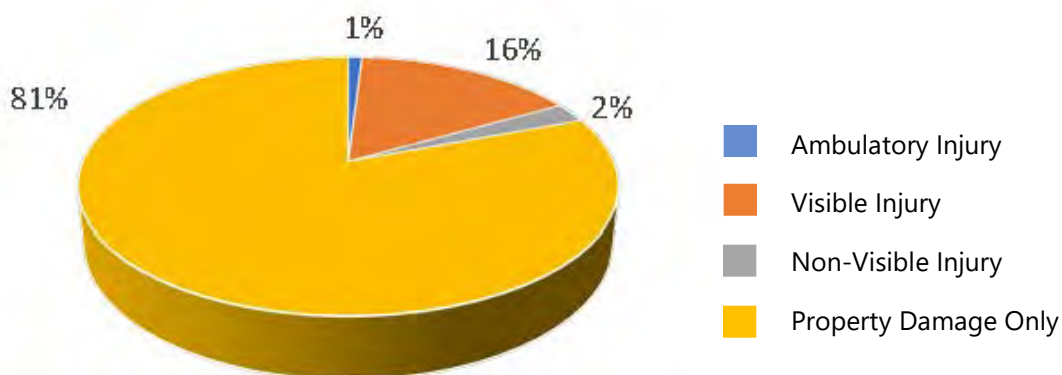


**Figure 3.7** Percent of Total Crashes



**Table 3.3 Percentage of Total Crashes by Type**

Crash Types	All Crashes	% of Total Crashes (n=396)	Fatal and Severe Crashes (K, A, B codes)	% of Total Fatal and Severe Crashes (n=68)
Rear End	224	57%	33	49%
Angle	123	31%	24	36%
Head On	4	1%	2	3%
Sideswipe- Same Direction	26	7%	1	1%
Sideswipe- Opposite Direction	2	0.5%	0	0%
Fixed Object Off Road	8	2%	1	1%
Pedestrian	7	2%	6	9%
Backed Into	2	0.5%	0	0%
<b>Total</b>	<b>396</b>	<b>100%</b>	<b>67</b>	<b>100%</b>



**Figure 3.8 Crash Severity**

**Table 3.4 Crash Severity**

Crash Severity	Number of Crashes	Percentage of Total Crashes (n=396)
A. Ambulatory Injury	4	1%
B. Visible Injury	63	16%
C. Non-Visible Injury	10	2%
PDO. Property Damage Only	319	81%
<b>Total Crashes</b>	<b>396</b>	<b>100%</b>

## Crash Rates

VDOT has moved away from traditional crash rate comparisons to a Potential for Safety Improvement (PSI) philosophy which is a data-driven, strategic approach based on expected performance outcomes. VDOT's program involves the identification of intersections and roadway segments with above average total and injury crashes for existing traffic, analysis of crash trends and existing conditions, and economic and/or risk evaluation of proposed safety project benefits.

Nearly all the Port Republic Road study area has been identified within the top 100 miles of segments in the Staunton District with the largest potential for safety improvements for 2013 through 2017. Locations that have been identified for safety improvements along Port Republic Road include the section between I-81 southbound ramp and Hillside Avenue, Forest Hills Road to approximately 300 feet east of the intersection, and 200 feet west of Devon Lane to beyond the study area to the east.

The intersection of Port Republic Road with I-81 southbound ramps was also identified, but not targeted for safety improvements. No other study intersections were identified.

At the City of Harrisonburg's request, the overall crash rates for the corridor, and corridor segments, were compared to the statewide average rates for all primary roads and urban minor arterials. The crash rates were calculated based on the published average annual daily traffic volumes (AADT) and traffic counts provided by the City. When sufficient volume information was not available, assumptions between the peak hour volumes and AADT was calculated using a K factor of .1046, which represents the average K value for the corridor in the published AADT and classification data from 2017. An average of 2013-2017 AADTs was used for the statewide average crash rate and an average of the crashes was used for the total crashes. A growth factor of 1% was used to reduce existing volumes to calculate past year volumes, if the information was not available. The crashes were analyzed by entire corridor and corridor segment in units of crashes per 100 million vehicle miles traveled (VMT).

While the average statewide corridor rates were available on the Tableau website statewide intersection crash rates are not available as VDOT has moved away from this type of comparison. The individual intersection crash rates were calculated in crashes per million entering vehicles (MEV) and are used as a comparison between the study intersections only. This information is shown in Table 3.5 and Table 3.6.



**Table 3.5 Segment Crash Analysis**

Road Segment	Total Crashes (January 2013-June)	Segment Crash Rate per 100 VMT	Statewide Average Crash Rate per 100 VMT	Percent Difference
Port Republic Road S. Main St. to Devon Ln.	396	790.6	126.3 (All Primary Roads)	526.0%
			181.1 (Urban Minor Arterial)	336.6%
Port Republic Road S. Main St. to I-81 SB Ramp	146	513.1	126.3 (All Primary Roads)	306.3%
			181.1 (Urban Minor Arterial)	183.3%
Port Republic Road I-81 SB Ramp to Devon Ln.	250	1151.6	126.3 (All Primary Roads)	815.0%
			181.1 (Urban Minor Arterial)	538.1%

Road Segment	Total Injury Crashes (January 2013-June)	Segment Injury Crash Rate per 100 VMT	Statewide Average Crash Rate per 100 VMT	Percent Difference
Port Republic Road S. Main St. to Devon Ln.	67	133.8	43.1 (All Primary Roads)	210.4%
			59.1 (Urban Minor Arterial)	126.4%
Port Republic Road S. Main St. to I-81 SB Ramp	21	73.8	43.1 (All Primary Roads)	71.2%
			59.1 (Urban Minor Arterial)	24.9%
Port Republic Road I-81 SB Ramp to Devon Ln.	46	212.6	43.1 (All Primary Roads)	393.3%
			59.1 (Urban Minor Arterial)	259.7%

**Table 3.6 Intersection Crash Rate Analysis**

Intersection	Total crashes (January 2013-June)	Intersection Crash Rate per MEV	Study Area Ranking	Total Injury Crashes (January 2013-June)	Intersection Injury Crash Rate	Study Area Ranking
Port Republic Road S. Main St.	48	0.54	6	6	0.06	8
Port Republic Road Hillcrest Dr.	17	0.45	7	2	0.05	9
Port Republic Road Crawford Ave.	22	0.42	9	2	0.04	10
Port Republic Road Bluestone Dr. / Hillside Ave.	28	0.45	8	5	0.08	5
Port Republic Road I-81 SB Ramp	20	0.34	10	4	0.07	7
Port Republic Road I-81 NB Ramp	34	0.58	5	4	0.07	6
Port Republic Road Forest Hills Rd.	64	1.06	1	12	0.2	2
Port Republic Road Hunters Rd.	41	0.79	4	6	0.12	4
Port Republic Road Bradley Dr.	53	1.02	3	9	0.17	3
Port Republic Road Devon Ln.	53	1.04	2	13	0.25	1

## Risk Factor Determination

The following is a description and overview of the risk factor determination for the focus crash types: rear-end and angle crashes. Included is an analysis related to each focus area within the corridor.

Rear-end crashes were the most prevalent crash type with 57 percent of the total crashes and 49 percent of the severe crashes. There were 224 total rear-end crashes reported of which 33 were reported as severe. Over half (52 percent) of the total rear-end crashes and the majority of severe crashes (52 percent), occurred at signalized intersection locations. Rear-end collisions within the vicinity of the unsignalized, residential entrances represent 43 percent of the total rear-end crashes and 39 percent of severe rear-end crashes. Five (5) percent of all rear-end crashes were not intersection related. Table 3.7 presents rear-end crashes with respect to the intersection type (signalized, unsignalized, or non-intersection).

**Table 3.7 Rear-End Crashes**

All Crash Types	Rear-End Crashes	Percentage of Rear-End Crashes (n=224)	Rear-End KAB Crashes	Percentage of Rear-End KAB Crashes (n=33)
Unsignalized Intersection-Related	96	43%	13	39%
Signalized Intersection-Related	116	52%	17	52%
Not Intersection-Related	12	5%	3	9%
<b>Total</b>	<b>224</b>	<b>100%</b>	<b>33</b>	<b>100%</b>

Rear-end and severe rear-end crashes along the corridor typically occurred during the PM peak hour, between 3 PM to 6 PM. Thirty-two (32) percent of total rear-end crashes and 30 percent of severe rear-end crashes occurred in this time frame as shown in Table 3.8.



**Table 3.8 Rear-End Crashes by Time**

Time of Day	Rear-End Crashes	% of Rear-End Crashes (n=224)	Rear-End KAB Crashes	% of Rear-End KAB Crashes (n=33)
0 AM TO 3 AM	7	3%	1	3%
3 AM TO 6 AM	0	0%	0	0%
6 AM TO 9 AM	19	8%	2	6%
9 AM TO 12 PM	24	11%	6	18%
12 PM TO 3 PM	41	18%	5	15%
3 PM TO 6 PM	71	32%	10	30%
6 PM TO 9 PM	49	22%	6	18%
9 PM TO 12 AM	13	6%	3	9%
<b>Total</b>	<b>224</b>	<b>100%</b>	<b>33</b>	<b>100%</b>

Congestion, excessive access points, an absence of turn lanes, in-lane transit bus stops, and closely spaced signalized intersections are probable causes for vehicles to be stopped in the flow of traffic. Motorists who are distracted or following too closely fail to stop in time to avoid colliding with the car in front of it. It is not anticipated that excessive speeding is a factor contributing to most or the rear-end collisions, as the time of the crashes corresponds to a period of congestion where free flow speed is slower than the posted speed limit. Roadway surfaces in areas steep grades and intersection approaches can become polished, reducing friction between the pavement and the tires, contributing to crashes. In some cases, the rear-end crash pattern could also reflect geometric conditions, such as the grade of the roadway causing a reduction in sight distance, and an increase in stopping sight distance.

### Rear-End Crashes at Signalized Intersections

#### Port Republic Road and South Main Street

There were 18 rear-end crashes at the intersection of Port Republic and South Main Street. Six (6) of the rear-end crashes involved eastbound vehicles, and five (5) included westbound vehicles. Two (2) of the eastbound crashes occurred within, or just past, the northbound channelized right turn onto Port Republic Road. The MUTCD requires yield signs to be installed on the near side of the intersection on the right-hand side of the intersection. The existing yield sign in the median, to the left of the channelized roadway should be used as a supplement only.

The remaining rear-end crashes involve a vehicle that was stopped, but it is unclear if it is due to the signal or the driveways located near the intersection. Medians are recommended on all legs of the signalized intersections within the functional area of the intersection, which will prohibit

left turns onto Port Republic Road and South Main Street which will mitigate the crashes that originate from these driveways.

#### Port Republic Road and Bluestone Drive

Thirteen (13) rear-end collisions occurred at the intersection of Port Republic Road and Bluestone Drive. Six (6) of the collisions involved westbound vehicles, six (6) involved eastbound vehicles and only one (1) involved southbound vehicles. All collision descriptions indicate that vehicles were stopped due to the signal and were following too closely to stop in time. No improvements are warranted at this time.

#### Port Republic Road and Southbound I-81

Six (6) rear-end crashes occurred at the intersection of Port Republic Road and the southbound I-81 ramps. Five (5) of the incidents involved at the southbound ramps were eastbound vehicles, while only one (1) was a westbound vehicle. All rear-end crashes were due to vehicles stopped at the traffic signal and following too closely. No changes are being suggested at this time.

#### Port Republic Road and Northbound I-81

There were 18 rear-end collisions that occurred at the intersection of Port Republic Road and the northbound I-81 ramps. Eight (8) of the rear-end collisions involved westbound traffic, five (5) involved eastbound vehicles and five (5) involved northbound vehicles. Like the southbound ramps, all rear-end crashes were due to vehicles stopped due to the traffic signal and following too closely. No changes are being suggested at this time. The relocation of the northbound off-ramp configuration that is currently being designed should have a positive impact on this area.

#### Port Republic Road and Forest Hill Road

The majority (38) of total rear-end crashes occurred at the intersection of Port Republic Road and Forest Hill Road. This intersection is analyzed further in the site-specific portion of the report.

#### Port Republic Road and Devon Lane

Twenty-three (23) rear-end crashes occurred at the intersection of Port Republic Road and Devon Lane. This intersection was identified as a hot spot for total crashes and severe crashes and is analyzed further in the site-specific portion of the report.



## Rear-End Crashes at Unsignalized Intersections

### Port Republic Road and Hillcrest Drive

Fourteen (14) rear-end crashes occurred at the intersection of Port Republic Road and Hillcrest Drive. Nine (9) of those collisions involved westbound vehicles and five (5) involved eastbound vehicles. Four (4) of the crash descriptions note the driver was attempting to turn left onto Hillcrest Drive (two in the westbound direction and two in the eastbound direction). The crest of the hill causes a reduction in sight distance of stopped vehicles and was specifically mentioned in one (1) of the eastbound collisions. The length and angle of curvature of Port Republic Road, as well as the existing retaining structures in this area, should be evaluated and improved on future roadway projects, if necessary. All other collisions are related to stopped vehicles due to congestion from the upstream and downstream signalized intersections. As previously recommended in the operational analysis it a peak hour left turn restriction is recommended at this intersection. Restricting left turn movements during the peak periods will assist flow and prevent rear-end collisions in this area.

### Port Republic Road and Crawford Drive

There were 15 rear-end collisions at the intersection of Port Republic Road and Crawford Drive. Thirteen (13) of those crashes involve westbound vehicles. Of the 13 crashes involving westbound vehicles, eight (8) specifically mention the vehicle was struck while being stopped in traffic attempting a left turn onto Crawford Avenue. The vertical grade in the area, combined with following too closely or being distracted, is the likely reason that westbound vehicles did not see the vehicle stopped in traffic. As previously recommended in the operational analysis it a peak hour left turn restriction is recommended at this intersection. Restricting left turn movements during the peak periods will assist flow and prevent rear-end collisions in this area.

### Port Republic Road and Hunters Road

Thirty-three (34) rear-end crashes occurred at the intersection of Port Republic Road and Hunters Road. A significant number of the rear-end crashes were westbound vehicles. This is likely due to the westbound downhill grade of the intersection and the queuing from Forest Hill Road. While these crashes are coded at the intersection of Port Republic Road and Hunters Road, the configuration of the crashes and the crash descriptions describe rear-end crash origins being backed up from the signal at Forest Hill, and vehicles stopped to turn into the gas station located on the north side of Port Republic across Hunters Road, in addition to vehicles turning onto Hunters Road. High-friction surface course is recommended for the locations with significant downhill grade, such as this location. This will decrease braking distance at this location and may reduce the rear-end collisions at this location. A peak hour left turn restriction is recommended at this intersection. Restricting left turn movements during the peak periods so that vehicle may only perform a right turn movement in and a right turn movement out will assist flow and prevent rear-end collisions in this area.

## Port Republic Road and Bradley Drive

There were 34 rear-end collisions at the intersection of Port Republic Road and Bradley Drive. The rear-end collisions at the intersection of Port Republic Road and Bradley Drive have a concentrated pattern within the inside westbound lane, just east of Bradley Drive. This suggests that these crashes involve a stopped vehicle waiting to make a left-hand turn onto Bradley Drive. The topography of the area in the vicinity of Bradley Drive limits a westbound vehicle's view of a stopped car until it is too close to safely come to a stop. A left turn restriction into Bradley Drive during peak hour traffic was investigated in the preliminary draft report; however, after considering the effect to the system this recommendation has been removed. Bradley Drive and Hunters Lane are the sole access points to the apartments located on the south side of Port Republic Road and turn restrictions will likely move the problem elsewhere. A signal is recommended in this location to assist the turning movements. In the long term, a left turn pocket on Port Republic Road to facilitate these left turns by removing them from the vehicle flow should greatly improve safety and operations at this intersection.

### Angle Crashes

Angle crashes were the second most prevalent crash type in the study area. There was a total of 123 total angle crashes, of which 24 were severe angle crashes. Relative to all other crash types, angle crashes comprised 31% of total crashes, and 36% of severe crashes. As shown in Table 3.9, approximately 76% (83% of severe) occurred at signalized intersections. This comparison appears counterintuitive, as you would anticipate angle crashes to occur at a lower rate at signalized intersections when compared with unsignalized intersections. It is important to note that traffic volumes making turning movements occur at a significantly higher rate at the signalized intersections. Additionally, more crashes are attributed to the signalized intersections because there is a much larger influence area as shown previously in Figure 3.5.

**Table 3.9 Angle Crashes**

All Crash Types	Angle Crashes	Percentage of Angle Crashes (n=123)	Angle KAB Crashes	Percentage of Angle KAB Crashes (n=24)
Unsignalized Intersection-Related	29	24%	3	13%
Signalized Intersection-Related	93	76%	20	83%
Not Intersection-Related	1	1%	1	4%
<b>Total</b>	<b>123</b>	<b>100%</b>	<b>24</b>	<b>100%</b>

Total and severe angle crashes most often occurred during 12:00 PM to 3:00 PM, however it is almost evenly spaced between 12:00 PM to 9:00 PM, as shown in Table 3.10.



**Table 3.10 Angle Crashes by Time**

Time of Day	Angle Crashes	% of Angle Crashes (n=123)	Angle KAB Crashes	% of Angle KAB Crashes (n=24)
0 AM TO 3 AM	8	7%	2	8%
3 AM TO 6 AM	3	2%	1	4%
6 AM TO 9 AM	8	7%	2	8%
9 AM TO 12 PM	19	15%	2	8%
12 PM TO 3 PM	27	22%	4	17%
3 PM TO 6 PM	25	20%	3	13%
6 PM TO 9 PM	22	18%	7	29%
9 PM TO 12 AM	11	9%	3	13%
<b>Total</b>	<b>123</b>	<b>100%</b>	<b>24</b>	<b>100%</b>

Angled crashes occur when a vehicle makes a turning maneuver and does not yield right of way to opposing traffic. For those crashes at signalized intersections there are several elements that may have contributed to the improper maneuver such as speed, heavy traffic volumes, driver impatience, large vehicles obscuring the view of other on-coming vehicles, lack of adequate sight distance, lack of sufficient protected turn phasing, or not being able to clearly see the signal indications.

### Angle Crashes at Signalized Intersections

#### Port Republic Road and South Main Street

There were 16 angle crashes at the intersection of Port Republic Road and South Main Street. The angle crashes are nearly evenly distributed between directions of travel. The angle crashes at the intersection were the result of traffic violating the traffic signal control and running a red light or turning on a permissive green phase without yielding to through traffic. Three (3) of the angle crashes involved turns from private driveways in the influence area of the intersection. Median treatments are recommended at all signalized intersections within the functional area of the intersection, which should mitigate the crashes that originate from these driveways.

#### Port Republic Road and Bluestone Drive

There were 10 angle collisions that occurred at the intersection of Port Republic Road and Bluestone Drive. Six (6) of the collisions were westbound vehicles. There is no visible reason that would cause westbound vehicles to misjudge the signal indication. No other improvements are warranted at this time.

### Port Republic Road and Southbound I-81

There were nine (9) angle collisions that occurred at the intersection of Port Republic Road and southbound I-81 ramps. Over half (5 total) of these angle collisions involve an eastbound vehicle running a red light. This could indicate that eastbound vehicles are seeing a green light at the intersection with the northbound I-81 ramps and mistakenly enter the intersection illegally.

Guidance suggests that programable signals, or louvered signals, should be used when intersections are spaced 300 feet or less apart. Since programable or louvered signals come with some drawbacks -- they can be difficult to position properly, and these signals are 450 feet apart, this countermeasure is not suggested at this time; however, this countermeasure should be considered in the future if there is an increase in this type of crashes at this location.

### Port Republic Road and Northbound I-81

Eleven (11) angle crashes occurred at the intersection of Port Republic Road and Northbound I-81 ramps. Two (2) of the crashes involved running a red light in the eastbound direction, and two (2) involved running the red light in the westbound direction. Two (2) of the crashes involved a right turn on red from the off-ramp who were unable to see the eastbound traffic properly. Additionally, it is assumed that some of the crashes were attributed to the weaving movement of left bound from I-81 northbound ramps. This should no longer be an issue when the ramp is moved to meet Forest Hills Drive in the near future. No countermeasures are recommended at this time.

### Port Republic Road and Forest Hill Road

Twenty-two (22) angle crashes occurred at the intersection of Port Republic Road and Forest Hill Road. This intersection was identified as a hot spot for total crashes and severe crashes and is analyzed further in the site-specific portion of the report.

### Port Republic Road and Devon Lane

The intersections with the highest frequency of angled crashes occur at the intersection of Port Republic Road with Devon Lane. This intersection was identified as a hot spot for total crashes and severe crashes and is analyzed further in the site-specific portion of the report.

## Angle Crashes at Unsignalized Intersections

At unsignalized intersections turns are not facilitated through signal phasing. As a result, a driver's gap acceptance behavior is typically a factor in angle crashes. Factors that influence gap acceptance are the presence of a queue behind a driver, driver wait time, and number of gaps rejected. When a driver feels pressure or grows impatient, they may accept shorter gaps, sacrificing a degree of safety, to execute their turn. Studies have also indicated that younger drivers often exhibit riskier behavior when evaluating gaps.



### Port Republic Road and Hillcrest Drive

Only one (1) angle crash was reported at the intersection of Hillcrest Drive and Port Republic Road. This is particularly surprising given the limited sight distance due to the topography and the retaining wall structures located on the corners of both the north and south legs. The crash reported originated from a residential driveway on the south side of Port Republic Road west of Hillcrest Drive. A possible explanation is sincere care is taken when vehicles are making turns due to the discomfort created by the reduction in sight distance. Another explanation is local traffic is choosing alternative access points during congested periods of the day. No improvements are recommended at this time.

### Port Republic Road and Crawford Drive

There were three (3) angle collisions at the intersection of Port Republic Road and Crawford Drive. With an average crash rate of less than one (1) crash per year, no recommendations are being proposed at this time beyond the time of day turning restriction already recommended for operational capacity and reduction in rear-end collisions.

### Port Republic Road and Hunters Drive

Six (6) angle crashes occurred at the intersection of Port Republic Road and Hunters Road. Of these six (6) crashes, only two (2) specifically reference turning into (1 crash) or turning out of (1 crash) Hunters Road. No recommendations beyond the time of day turning restriction already recommended for operational capacity and reduction in rear-end collisions are proposed at this time.

### Port Republic Road and Bradley Drive

Nineteen (19) angled crashes, representing almost 15% of the total angle crashes, occurred at the intersection of Port Republic Road and Bradley Drive. After reviewing AM and PM peak hour turning movements, there is less traffic entering and exiting Bradley Drive when compared to Hunters Road; but it has almost four (4) times the number of angle crashes. Ten (10) of the 19 angled crashes at this location involved a northbound vehicle and an eastbound vehicle. Some of the crash descriptions discuss traffic in the outside eastbound lane queuing and leaving a gap/waving in for the northbound traffic on Bradley Drive to turn. When the driver made the turn, he or she was hit by an eastbound vehicle in the inside eastbound lane, that the drivers could not see. Other reports simply state the driver could not see the eastbound vehicles with no further explanation. There are trees and a fence present on the south side of Port Republic Road, west of the intersection with Bradley Drive, that may hinder the ability of a northbound vehicle to see eastbound traffic. It is recommended that the City of Harrisonburg investigate this further during leaf out to ensure standard sight distance can be achieved.

Due to the lack of alternative access locations into the apartment complex served by Hunters Road and Bradley Drive, a turn restriction at both Hunters Road and Bradley Lane was not feasible. There were five angled collisions in 2017 that involved a northbound vehicle on

Bradley Lane attempting to turn left onto Port Republic Road. These crashes are considered to be correctable with the installation of a traffic signal and would satisfy condition B of Warrant 7, Crash Experience, found within the MUTCD. To provide access and address the safety of northbound and westbound left turning vehicles into and out of Bradley safely, a signal is being recommended at this location.

### Pedestrian Crashes

Crashes between motor vehicles and people walking only represent two (2) percent of the total crashes, but account for the third highest of severe crashes. There was a total of seven (7) crashes involving a pedestrian, accounting for nine (9%) of the total severe crashes. All of the pedestrian crashes occurred at signalized intersections. The pedestrian crashes were evenly dispersed and did not concentrate at one (1) intersection. One (1) pedestrian crash each occurred at the intersections of Port Republic Road and South Main Street, Bluestone Drive, Southbound I-81 ramps. One (1) pedestrian crash also occurred outside of an intersection area. Two (2) pedestrian crashes occurred at the Northbound I-81 ramps and at Devon Lane.

Two (2) of the collisions with a pedestrian ended with the pedestrian receiving the citation. While this means the pedestrian is considered to be at fault because they did not yield right-of-way, the signal cycle length should be researched as pedestrians are very sensitive to delay and may perform risky maneuvers.

A total of three (3) pedestrian crashes occurred within the interchange with Port Republic Road and the I-81 ramps. Two (2) of the pedestrian crashes involved vehicles exiting NB I-81 and attempting to turn right onto Port Republic Road. Both were turning right on red. In one (1) crash the pedestrian was eastbound, the second is unknown. In both accidents the pedestrians were in the crosswalk. The fenced portion and bridge may be creating a sight distance issue with someone on the sidewalk. This should not be a concern once the northbound I-81 off-ramp is moved to align with Forest Hills Road. However, before the relocation of the northbound I-81 ramp is constructed the City of Harrisonburg should evaluate this further. The pedestrian crash located at the southbound I-81 ramp involved a driver who was westbound on Port Republic Road and turned left to enter the southbound direction of I-81. The driver had a green light but did not yield right-of-way to the pedestrian lawfully crossing the intersection. The crash occurred at 7:46 AM, during morning rush hour. The driver was on her cell phone.

During the site observation, vehicles queueing up to adjacent intersections was frequently witnessed. While the vehicles did not block the downstream intersection, they queued up close enough to the intersection to obscure the view of pedestrians in the crosswalk from a left turning vehicle. This would be especially concerning if the vehicle at the back of this queue was a large vehicle as shown in the following photograph. Fortunately, this observation is not represented in the crash data; however, to prevent a crash in the future "Do Not Block the Box" intersection markings should be considered. Additionally, these markings would prevent queued vehicles from blocking the crosswalk.

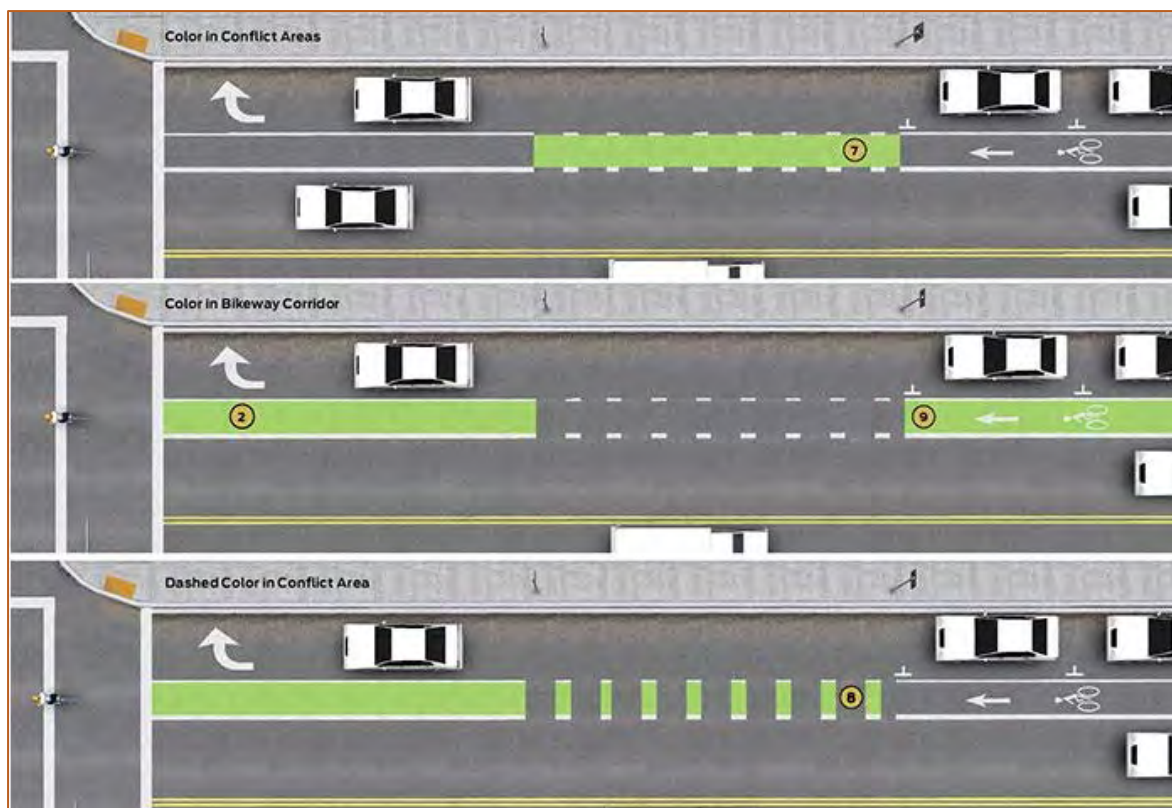




**Large Vehicle Queueing Example**

### **Bicycle Crashes**

Four (4) of the angled crashes and one (1) of the rear-end crashes involved a bicycle. Two (2) of these collisions occurred due to turning vehicles not yielding to a bicycle in the bike lane. In one (1) instance the vehicle was traveling westbound and turned left onto Bradley Drive and struck the person riding a bike. In the other instance, a westbound vehicle was making a right turn into the gas station on the northeast corner and hit the person riding a bike, who was going too fast to stop. A countermeasure that should be considered is the use of green colored markings in the conflict areas to highlight the potential presence of people riding bikes as shown in the following photograph.



**Green Colored Conflict Markings**

### Site Specific Analysis

The second approach to addressing safety in the corridor is through a site-specific analysis. Heat maps created by crash frequency, and crash severity of the five-and-a-half-year period (2013-2018) of crash data led to the identification of two (2) site specific locations due to the crash frequency, and crash severity that is occurring at these locations. These heat maps are shown in Figure 3.1 and Figure 3.2.

The site-specific locations were chosen based on their potential to show reduced average crash frequency or severity. Once the locations were identified, collision diagrams were created of the injury crashes to get a more detailed view into the cause of the collisions. Key safety concerns, recommended counter-measures, and implementation for short-term and long-term conditions are described in this section of the report.



## Site Specific Location #1 – Port Republic and Forest Hill Road

This location is a signalized, four-legged intersection of Port Republic Road and Forest Hill Road. Surrounding areas include a parking lot for JMU to the south, a gas station to the east, a hotel and single-family neighborhood is located to the north. The bus stop located near this intersection picks up 15-20 people per hour.

On the western leg of the intersection, there is a 150-foot left turn lane that continues through the I-81 northbound on-ramp interchange, without a taper. The eastern leg of the intersection does not have dedicated turn lanes, and left turns into the parking lot are restricted. The north leg of the intersection has a 500-foot right turn lane, that terminates at the intersection with Oak Hill Drive, without a taper. The eastbound lefts are facilitated with a protected/permissive left turn phase. A five-section, dog house style signal head was installed until recently when a four-section with flashing yellow signal was installed. The southern leg is the exit of JMU parking lot and does not have dedicated left turn lanes. The north and southbound traffic is split-phased to allow for protected lefts, in the absence of dedicated left turn lanes.

There are sidewalks on both sides of Port Republic Road through the intersection with Forest Hill Road, and crosswalks are present across the east leg and the north leg of the intersection. There is a bike lane east of the intersection on Port Republic Road. This bike lane ends abruptly at Forest Hill Road. It is assumed that people riding bikes to the JMU main campus likely use the sidewalk once the bike lane ends.

A construction project to relocate the northbound I-81 on-ramp to align with Forest Hill Road is currently under design. This exit serves as the primary access for the JMU east campus, as well as access to employment and activity centers in the City. This realignment will provide direct access to JMU east campus, including the convention center. This realignment is anticipated to have a positive impact on safety as motorists entering the corridor from I-81 north who intend to travel north on Forest Hills Road will no longer be required to weave across two (2) lanes of traffic in a short distance in order to turn left onto Forest Hills Drive.

### Crash Summary

Between January of 2013 and June of 2018, 64 crashes occurred at Port Republic Road and Forest Hill Road. This represents just over 16% of the total crashes within the study corridor. Nineteen (19) % (12 crashes) resulted in an injury (crash type A or B) and 81% (52 crashes) resulted in a property damage only (crash type O). There were 36 total rear-end crashes, with six (6) of them resulting in an injury. There was a total of 22 angle crashes, with seven (7) of them resulting in an injury. Collision diagrams of the injury crashes are shown in Figure 3.3.

Westbound vehicles are involved in 61 percent of rear-end crashes, and 68 percent of angle crashes. This is not surprising given the steep downhill grade of westbound Port Republic Road in this vicinity. While the grade is not something that can be changed without a significant investment and adjacent property impacts, the use of a high friction surface treatment in the

downhill direction should mitigate the increase in stopping sight distance resulting from the grade.

A westbound right turn lane is recommended at this intersection in the operational analysis section of the report. The addition of a right turn lane will provide a safety benefit as right turning vehicles will have space outside of the through travel lane to decelerate before making their turn or stop to yield to a pedestrian within the crosswalk.

Four (4) of the angled collisions involved turning movements into or out of the gas station located on the northeast corner. The proximity of the entrances to the gas station to the intersection is undesirable as it relates to safety and operations. Closing the driveway nearest to the intersection is recommended. In addition, reduction of conflict points through the use of a median through the functional area of the intersection is recommended. If the roadway does not provide sufficient space for a concrete barrier median, the use of flexible curbing and flex tubes can be a low-cost method to provide a physical barrier to prevent left turns in the functional area of the intersection. An example of this improvement is shown in the following photograph.



**Flex Tubes**

### Traffic Signal Timing and Operations

Three (3) angled collisions involved an eastbound vehicle running a red light, while one (1) included a westbound vehicle running a red light. Four (4) involved an eastbound left turn movement on a permissive phase and not yielding the right-of-way to westbound vehicles. The use of high visibility back plates could assist motorists in recognizing the signal at a further distance, and at night.

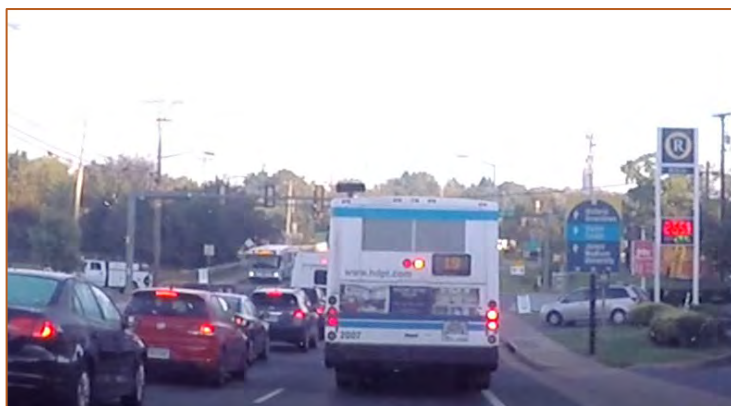
A check of the pedestrian clearance interval and the yellow and all red change intervals show that the total time appears to be within current standards, and no changes are recommended.



The distance between the westbound signal indications for Forest Hill Road is located only 285 feet from the signal indications for northbound I-81. A standard industry practice is referenced in the Caltrans traffic manual which provides some guidance relating to countermeasures to avoid motorist confusion when two (2) intersections are located less than 300 feet apart. It is suggested that programmable traffic signals, or louvers be installed so that only certain lanes of traffic get a clear indication and other lanes controlled by a second signal do not see that indication. Only one (1) angled crash was attributed to a westbound vehicle running a red light, which would indicate that is not a problem at this time; however, this condition should be monitored and potentially considered in the future if warranted.

### Transit

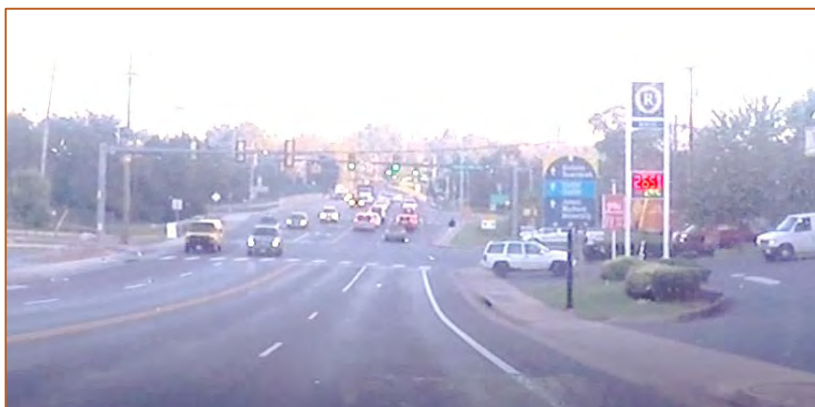
A near side, in-lane transit stop is located at the bottom of the hill, which may contribute to the frequency of rear-end collisions. For safety reasons, it would be beneficial to provide a bus pull out at this location, which can be accommodated if the gas station entrance nearest Forest Hills Drive is removed. For transit operations, this is not ideal as the bus will be required to find a gap to get back into the flow of traffic. Another countermeasure could be the installation of a more robust rear flashers to alert on-coming traffic that the bus is stopped in the lane.



**Rear Flasher on Bus**

### Suggested Countermeasures

- Reflective back plates
- Better rear warning lights for the transit vehicles
- Eliminate the gas station entrance that is closest to Forest Hill Road
- Provide a bus pull out at bottom of hill
- Install a median within the functional area of the intersection
- High friction surface treatment on the downgrade lanes
- Construct westbound right turn lane.



**Northbound I-81 Signals Visible at the Forest Hill Road Intersection**



**High Friction Surface Treatment**

### Site Specific Location #2 – Port Republic Road and Devon Lane

This location is a signalized, four-legged intersection of Port Republic Drive and Devon Lane. Surrounding areas include a gas station and restaurant on the northwest corner, multi-family apartment complex on the northeast corner, multi-use commercial/residential on the southeast corner, and dense student housing to the south on both sides of the intersection.

The start of the left turn lane on the eastern leg is not well defined as it transitions from a two-way left turn lane (TWLTL) to a left turn only lane. The western leg of the intersection has a 175-foot left turn lane and 250-foot taper. The right turn lane on the north leg is 85 feet with no taper. The south leg has a channelized right turn lane (yield condition) with 135 feet of storage and a 75-foot taper. The striping for the westbound turn bay should be re-striped to clarify the extents of the dedicated left turn lane in compliance with VDOT standard PM-5. The eastbound and westbound directions have a protected/permissive left turn phase with a five-section, dog house style. The southern leg does not have a dedicated left turn lane. The north and southbound traffic is split phased to allow for protected lefts in both directions.

There are curb ramps on all legs of the intersection of Port Republic through the intersection with Devon Lane, and crosswalks are present across all legs of the intersection. There is continuous sidewalk on all approaches, except the western side of the north leg on Devon Lane.

#### Crash Summary

Between 2013 and 2018, 53 crashes occurred at Port Republic Road and Devon Lane. This represents just over 13% of the total crashes within the study corridor. Twenty-five (25) percent (13 crashes) resulted in a visible, or non-visible injury (crash type A or B) and 75 percent (40 crashes) resulted in a property damage only crash (crash type O). Collision diagrams of the injury crashes are shown in Figure 3.2. There were total 36 rear-end crashes, with three (3) of them



resulting in an injury. There was a total of 25 angled crashes, with six (6) of them resulting in an injury. This intersection also experienced two (2) pedestrian crashes, both which resulted in an injury.

Thirteen (13) of the rear-end collisions involved a westbound vehicle, while seven (7) involved an eastbound vehicle. Two (2) of the rear-end collisions specifically mention a stopped transit vehicle being the reason a vehicle was stopped in the roadway. Three (3) mentioned site congestion being the reason for the stopped vehicle, although it is anticipated that this number is much higher. One (1) westbound crash contributes the sun to being unable to see the vehicles in front of them before the collision. Given that the orientation of Port Republic Road is not true east and west facing, it is not believed this is a significant factor. The location of the transit stop should be evaluated for sight distance and relocated if the bus is stopped in a location where sufficient stopping sight distance is not provided. Additionally, the increase in warning lights for stopped transit vehicles could help alert drivers to the presence of a stopped transit vehicle.

Five (5) of the angled crashes involved a westbound vehicle which ran a red light, while three (3) involved an eastbound vehicle which ran red light. High visibility back plates should be installed to help draw attention to the signal, which should reduce the frequency of this type of collision. There is a possibility that vehicles are intentionally running the red light just after it turns red in an attempt to avoid waiting through another cycle. In this case the installation of red light running cameras should be investigated to discourage this behavior.

#### Traffic Signal Timing and Operations

Four (4) angled collisions were the result of an eastbound vehicle turning left during a permissive phase and failing to yield to a westbound vehicle. Two (2) angles crashes were the result of a westbound vehicle performing a permissive left and failing to yield to an eastbound vehicle. The location of the intersection on a crest makes it difficult for westbound and eastbound vehicles to see vehicles turning; however, the frequency of these crashes does not warrant the use of protected only left turn phasing at this time. The installation of a flashing yellow arrow signal head to replace the existing five-section dog house should reduce these types of collisions. The yellow and red change intervals appear to be within current standards and no changes are recommended at this time.

Six (6) of the angled crashes involved a vehicle exiting from a roadway or driveway near the intersection. A median should be installed within the functional area of the intersection to prevent these movements.

Two (2) of the collisions with a pedestrian were the result of the pedestrian crossing Port Republic against a no walk indication. While this means the pedestrian is "at fault," the signal cycle length could be reviewed if there is a high frequency of pedestrian travel as pedestrians are sensitive to long wait times, which results in risky crossing behaviors.

No pedestrian crashes occurred within the northbound channelized right turn lane. However, the FHWA suggests that crosswalks should be located more towards the middle of the channelized turn. This is because turners are generally fully committed to their turn at the location where the crosswalk is located and are generally looking towards their right for conflicting vehicles, instead of pedestrians, as shown in the adjacent photograph. This would require the reconfiguration of the wheel chair ramps.

### Suggested Countermeasures

- Reflective back plates.
- Striping of westbound turn lane to clearly define the left turn lane bay area and improve guidance to the motorists.
- Relocation of crosswalk at channelized right.
- Install a median within the functional area of the intersection
- Flashing yellow arrow for the east and west bound movements.



**Turn Lane Striping**

## Recommendations

The goal of the study was to provide a set of recommendations to improve safety within the Port Republic Road corridor. To achieve that goal, this safety analysis provided a comprehensive evaluation the corridor with the purpose of understanding the safety conditions. The outcome of these evaluations is a series of recommended treatments which have proven safety benefits and address existing, short-term, and long-term corridor needs.

### Safety Recommendations

The safety portion of the study incorporated intersection evaluation and site-specific assessment toward the development of the recommendations. The safety improvements are comprised of a set of tiered recommendations of access management, traffic control techniques, and other improvements to enhance safety and operations of the Port Republic Road corridor. The recommendations were determined through an evaluation of crash history and proactively applying Crash Modification Factors modifications with proven safety results.

During the five-and-a-half-year period between January 2013 and June 2018, there were 396 crashes. Through the approach presented in this report, the most prevalent and most severe crash types have been comprehensively considered and addressed.



## Congestion Mitigation

Congestion mitigation is a key recommendation that is anticipated to reduce the risk of both rear-end collisions, and angled collisions. Less congestion correlates to fewer stopped vehicles in the travel lane, which will lessen the exposure a car has to being rear-ended. Reduced congestion is expected to reduce risky turning maneuvers and gap acceptance behavior, leading to fewer angled crashes. Additionally, increasing traffic flow should reduce the desire to quickly change lanes to avoid stopping for queued cars, which can lead to a collision.

Rear-end collisions are one of the most common accidents that occur in heavy traffic, especially stop and go traffic. In congested situations vehicles may follow the vehicle in front of them too closely and become eager to accelerate when traffic starts moving. Additionally, being stuck in congestion can be stressful, causing a driver to become distracted, or drive aggressively. When a driver brakes suddenly in dense traffic, discontinuities in the traffic stream in the form of shock waves can occur. This transition zone between the stopped vehicle and the faster moving upstream vehicle travels varies according to the density and speed of traffic. As the speed of the shock wave increases, the potential for rear end collisions increases.

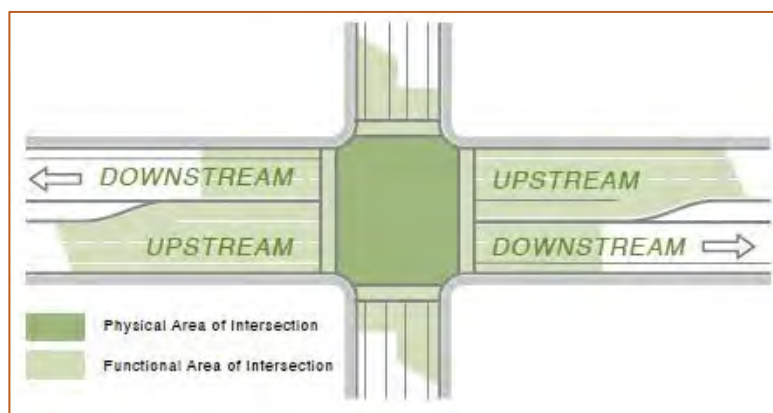
A key element in reducing the frequency of rear-end collisions along a corridor is reduce the number of stops that occur on the roadway. This is done through a series of strategies aimed at reducing the number of vehicles stopped in the traffic flow through the use of access management strategies, providing turn lanes and increasing the throughput capacity through signal timing and phasing optimization.

Recommendations that are intended to increase the operational capacity of the corridor, and thus reducing stops, have been identified in the operational analysis. As displayed above in Tables 2.18 and 2.19 these improvements have shown the potential to decrease the average number of stops along the study corridor. While the modeled corridor volumes increased over the 12-year analysis due to anticipated growth, the average stops per vehicle within the network was anticipated to drop by 11.5% when compared to existing conditions in the AM peak hour, and a modest increase of 9.16% in the PM peak hour. While the number of stops is expected to increase in the PM peak hour when compared to existing conditions, it is anticipated to be significantly better than the no build scenarios, which is anticipated to increase by 79.28% in 2030 if the proposed recommendations are not in place.

## Access Management

Access management provides a safety improvement by both reducing conflict points, and by facilitating traffic flow, reducing speed differential and exposure to crashes. As discussed previously in the document, medians should be provided within the functional area of the signalized intersections to prohibit left turns. See following figure as an illustration.

Additionally, peak hour turning restrictions have been recommended at three (3) of the four (4) unsignalized study intersections and it is recommended the gas station access along the south side of Port Republic Road nearest Forest Hill Road be removed.



## Median Intersections

## Signal Optimization

The signals in the corridor are currently coordinated to provide progression through the corridor; however, the green bands appear to break down during the most congested times of the AM and PM peak hour. There are a few reasons this might be happening. One (1) reason may be that the offsets do not account for the reduction in speed due to the congestion/queueing and are not appropriate during the peak volume times.

Another reason might be attributed to the high number of pedestrian calls. Pedestrian walk and clearance times to cross Port Republic Road often exceed the maximum green time for the vehicular movements. To accommodate this movement, the controller will suspend coordination. The transition back to the coordination pattern after the pedestrian phase has been served can take some time.

The addition of flashing yellow arrows at all locations where left turns are protected and permitted will provide additional safety against angled crashes while allowing more flexibility for coordination due to the ability to lead lag left turns without the concern of yellow trap.

## Conclusion

Safety plays an important role in improving mobility along the Port Republic Road corridor. This study has identified several low-cost improvements that can be implemented along the corridor to provide a safer travel experience to road users.

## 4 Conclusion and Cost Estimate

The goal of this study was to provide a set of recommendations for operational and safety improvements to the Port Republic Road study corridor. In order to achieve this goal, this report provides a comprehensive evaluation of the corridor with the purpose of understanding the operational and safety concerns. The outcome of these evaluations is a series of recommended treatments which have proven operational and safety benefits. Graphical representation of these improvements by intersection are shown in Appendix I. These recommendations have been prioritized as short term, mid term and long term improvements as shown in Tables 4.1, 4.2 and 4.3.

The recommendations can be organized into four (4) categories: traffic control measures, geometric changes, access management strategies and miscellaneous.

### Traffic Control Measures

- Optimize corridor signal timings including cycle lengths, splits, offsets, and phasing sequences;
- Eliminate the split phase operation at the relocated NB I-81 off-ramp and Forest Hills once left turn lanes are added to the northbound and southbound directions and allowing protected left turn movements to occur simultaneously;
- Eliminate the split phase operation at Port Republic Road and Devon Lane by including left turn lanes in the northbound and southbound direction, and allowing these protected/permissive left turn movements to occur simultaneously;
- Eliminate the northbound and southbound pedestrian signal crossing at Port Republic Road and Bluestone Drive by providing a pedestrian overpass;
- Signalize Port Republic Road and Bradley Lane;
- Install flashing yellow arrows (FYAs) where protected/permissive left turns are used. This allows for lead/leg left turn phasing which will assist in bi-directional coordination.
- Install High Visibility Backplates;
- Install yield sign on the right side of the roadway for the northbound channelized right turn at Port Republic Road and South Main Street;
- Relocate the crosswalk within the channelized northbound right turn lane at Port Republic Road and Devon Road;
- Install green markings in the bike lane across driveways and intersections; and,
- Restripe the westbound left turn lane at the intersection of Port Republic Road and Devon Road to clearly designate the transition from a two-way-left-turn-lane to a dedicated left turn lane.



## Geometric Changes

- Construct a westbound right turn lane with 100 feet of storage and a 100 foot taper on Port Republic Road at the intersection of Port Republic Road and Forest Hill Road;
- Increase the eastbound left turn lane storage length on Port Republic Road and Bluestone Drive from 100 feet to 300 feet;
- Reconfigure the westbound Port Republic Road approach at South Main Street to include two left turn lanes, one through lane, one through/right and one right turn lane;
- Reconfigure the westbound approach of Devon Lane at Port Republic Road to include one left turn lane, one through lane and one right turn lane. Widen the southbound approach to include one left turn lane, one through lane and one right turn lane; and,
- Construct a pedestrian overpass over Port Republic at Bluestone Drive/Hillside Avenue in order to improve pedestrian mobility and safety while eliminating the northbound and southbound pedestrian crossings that are facilitated by the existing traffic signals.

## Access Management Strategies

- Implement peak hour turning restrictions at Hillcrest Drive, Crawford Avenue, and Hunters Road;
- Install a median to restrict turning movements within the proximity of all signalized intersections; and,
- Close gas station driveway located on the northside of Port Republic Road just east of Forest Hill Road.

## Miscellaneous Recommendations

- Install high friction surface course at downhill approaches to increase skid resistance and reduce stopping distances.

## Future Considerations

Below are considerations that are expected to involve significant financial investment, or will require more study, and should be considered in the future.

- Transit stop enhancements;
- Evaluate intersection sight distance;
- Install left turn lanes at the unsignalized intersections;
- Evaluate the need to use louvered or programmable signal indications where the signals are closely spaced;
- Evaluate the implementation of red-light running cameras;

- Evaluate the design of the vertical curves to current geometric design standards to provide adequate sight distance; and,
- Investigate a bus pull-out for transit vehicles in the westbound direction on Port Republic Road just east of Forest Hill Road.

### Probable Estimate of Cost

Safety and operations play an important role in improving mobility along Port Republic Road. This study has identified varying tiers of improvements that can be implemented along the corridor to provide a safer travel experience to road users. A cost estimate for these improvements is shown in Table 4.1. These cost estimates are intended to be planning level costs for budgeting purposes only.

The cost estimate does not include an estimate for right-of-way costs or utility relocations that may be required to construct the recommendations that include:

- Pedestrian overpass;
- Permanent four-foot-wide median installation within intersection influence area;
- Proposed turn lanes that require widening of the roadway;
- Flashing beacon sign during peak hour restrictions;
- Traffic signal installation at Bradley Drive; and
- Relocation of one mast arm at Devon Lane and Port Republic Road.



**Flashing Beacon Sign**

Several of the recommendations are considered to be low-cost and can be done utilizing City staff and are not included in the cost estimate. These include:

- Median separation using flexible tubes and curbing;
- Lane configuration changes that include removal of existing striping and re-striping in the new configuration;
- Traffic signal optimization; and
- Installing left turn prohibition signage on side streets.

Funding has been identified to install FYA signal heads and high visibility back plates at the signalized locations proposed in this report and are therefore not reflected in the cost estimate.

## Short Term Projects

These projects are assumed to include city crews or an on-call contract and produce improvements to the safety and operations along the Port Republic Corridor. These items are not anticipated to require right-of-way or utility relocation.

**Table 4.1 Short Term Projects**

Intersection	Pay Item	Quantity	Unit Cost	Total Cost
Port Republic Road S. Main St.	Yield Sign - Installed	1	\$150	\$150
	Pavement Marking Arrows	3	\$750	\$2,250
Port Republic Road Hillcrest Dr.	Solar Flashing Beacon	2	\$10,000	\$20,000
Port Republic Road Crawford Ave.	Solar Flashing Beacon	2	\$10,000	\$20,000
Port Republic Road Hunters Rd.	Solar Flashing Beacon	2	\$10,000	\$20,000
Corridor	Temporary Median (flex Tubes)	1,545 LF	\$75	\$115,875
Corridor	High Friction Surface Coarse	2,445 SF	\$29	\$70,891
Corridor	Green Paint (Bike Lane)	70 rectangles	\$200	\$14,000
<b>Total</b>				\$263,166

## Mid Term Projects

These projects are anticipated to increase safety and produce benefit operations along the Port Republic Corridor in the midterm as they will require detailed engineering design and identified funding source to construct. These improvements are anticipated to require some right-of-way acquisition and utility relocations, that are not included in the cost estimate. The estimated build year for inflation is 2024.



**Table 4.2 Mid Term Projects**

Intersection	Pay Item	A *	B *	C *	D *	Total Cost	Total Cost (With Inflation)
Port Republic Road I-81 SB Ramp	Widen ramp to lengthen turn lanes	\$315,024	\$110,258	\$42,528	\$191,802	\$659,613	\$764,672
Port Republic Road Forest Hills Road	Right turn lane and relocated ped pole (widened only to the north)	\$180,983	\$63,344	\$24,433	\$110,191	\$378,951	\$439,308
Port Republic Road Bradley Drive	Install Traffic Signal	\$225,000	\$78,750	\$30,375	\$136,991	\$471,116	\$546,153
<b>Total</b>							\$1,750,133

The columns in table 4.2 are described below:

- A \* Includes base bid estimate for work. This includes an estimate for relocated drainage pipes and structures and stormwater management (where applicable).
- B \* cost includes erosion and sediment control (estimated at 5% of base bid 'A'), maintenance of traffic (estimated at 5% of base bid 'A') and miscellaneous items (estimated at 25% of base bid 'A').
- C \* cost includes mobilization (estimated at 10% of subtotal A\* and B\*)
- D\* cost includes preliminary engineering (estimated at 14% of subtotal A\* and B\* and C\*), construction engineering (estimated at 17% of subtotal A\* and B\* and C\*) , and a construction contingency (estimated at 10% of subtotal A\* and B\* and C\*)
- The Grand Total Cost is the combination of A\*, B\*, C\* and D\*.
- The Grand Total Cost with Inflation - An annual inflation rate of 3% is was applied to construction year 2024. This was applied to projects that are considered to be long term.

## Long Term Projects

These projects are anticipated to increase safety and produce benefit operations along the Port Republic Corridor in the long term as they will require substantial funding sources to construct. These improvements are anticipated to require some right-or-way acquisition and utility relocations, that are not included in the cost estimate. The estimated build year for inflation is 2029.

**Table 4.3 Long Term Projects**

Intersection	Pay Item	A*	B*	C*	D*	Total Cost	Total Cost (With Inflation)
Port Republic Road Bluestone Drive / Hillside Avenue	Lengthen EB Left Turn Lane	\$234,640	\$82,124	\$31,676	\$142,861	\$491,301	\$660,267
	Pedestrian Overpass	\$1,500,000	\$525,000	\$202,500	\$913,275	\$3,140,775	\$4,220,939
Port Republic Road Devon Lane	Installing Left Turn Lane on North Leg and Re-Striping on South Leg	\$238,959	\$83,636	\$32,259	\$145,490	\$500,344	\$672,421
Corridor	Permament 4' concrete median and widening	\$1,529,951	\$535,483	\$206,543	\$931,511	\$3,203,488	\$4,305,220
<b>Total</b>							\$9,858,847

The columns in table 4.3 are described below:

- A\* Includes base bid estimate for work. This includes an estimate for relocated drainage pies and structures and stormwater management (where applicable).
- B\* cost includes erosion and sediment control (estimated at 5% of base bid 'A'), maintenance of traffic (estimated at 5% of base bid 'A') and miscellaneous items (estimated at 25% of base bid 'A').
- C\* cost includes mobilization (estimated at 10% of subtotal A\* and B\*)
- D\* cost includes preliminary engineering (estimated at 14% of subtotal A\* and B\* and C\*), construction engineering (estimated at 17% of subtotal A\* and B\* and C\*), and a construction contingency (estimated at 10% of subtotal A\* and B\* and C\*)
- The Grand Total Cost is the combination of A\*, B\*, C\* and D\*.
- The Grand Total Cost with Inflation - An annual inflation rate of 3% is was applied to construction year 2029. This was applied to projects that are considered to be long term.

## Appendix A

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Technical Memorandum – Existing Conditions



To: Brad Reed  
VDOT Staunton District

Date: October 31, 2018  
Revised December 3, 2018

Cc: Ann Cundy, HRMPO  
Dastan Khaleel, HPWD  
Tom Hartman, HPWD

From: Lisa Simpson, P.E.  
Chuck Conran, E.I.T.

Re: Port Republic Road  
Existing Conditions VISSIM Calibration

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The purpose of this memorandum is to document the study methodology and model development for AM and PM peak hour traffic operations for Port Republic Road in Harrisonburg, Virginia. The model utilizes the microsimulation traffic software, *PTV VISSIM 8.0*, and was coded according to the procedures outlined in VDOT's TOSAM (Traffic Operations and Safety Analysis Manual) and VDOT's VISSIM User Guide (hereafter referred to as "Guide"). The limits of the study corridor (**Figure 1**) extend from the Port Republic Road / Maryland Avenue / South Main Street intersection southeast approximately one mile to the Port Republic Road / Devon Lane intersection, encompassing ten total intersections, six of which are signalized.



**Figure 1: VISSIM Study Network**

The City of Harrisonburg ("City") provided much of the base data for network coding, including traffic counts for the ten study intersections and signal timing plans for the six signalized intersections. VHB obtained and/or collected the remaining data needed to code and calibrate the VISSIM model.

## Model Development

### Geometry

Links were coded over aerial imagery within VISSIM to ensure accurate modeled 2-D link geometry such as length and curvature. Turn bays are coded as separate parallel links according to the procedures in the Guide. Due to the significant gradients on Port Republic Road, VHB obtained 3-D data from a topographic map on the City's website and utilized this map to code the elevations of each link. Link gradient is thus calculated from elevation change rather than from inputted gradient value. Following Guide instruction, links are only broken into separate segments when the number of lanes change or there is a significant topographical change.

### Intersection Control

Six of the study intersections are signalized (Port Republic Road at South Main Street, at Bluestone Drive / Hillside Avenue, at I-81 southbound ramps, at I-81 northbound ramps, at Forest Hill Road / JMU Parking Lot, and at Devon Lane). The remaining four (Port Republic Road at Hillcrest Drive, at Crawford Avenue, at Hunters Road, and at Bradley Drive) are unsignalized, minor-street stop-control intersections. The City provided timing plans for each of the signalized intersections from which the signal controllers in VISSIM were coded. Video detection is utilized along the corridor. Within VISSIM, VHB modeled 40-foot signal detection zones on side streets and mainline left turns (two feet of detection was placed beyond the stop bar per VDOT convention), and a pair of 6-foot detection zones on mainline through approaches (separated by approximately 250-feet per VDOT convention on a 35-mph road). During the field visit, VHB verified the locations of the stop signs on the stop-control approaches and modeled these intersections in VISSIM with stop signs and conflict areas. Stop signs were also used to code right-turn-on-red at the signalized intersections.

### Volume Balancing

The traffic counts for the ten study intersections on the Port Republic Road corridor were not collected on the same day; rather, many were collected by the City over the course of the past year. Two of the unsignalized intersection counts (Hunters Road and Bradley Drive) date further back to a 2016 Traffic Impact Analysis report, which projected 2017 counts at these two intersections with the opening of the associated retail parcel. The City pulled counts from their GRIDSMART cameras at the intersections of Main Street and Devon Lane on October 3<sup>rd</sup>, 2018, when VHB was in the field collecting additional data.

A microsimulation traffic network requires a balanced volume network to accurately model conditions. Unbalanced volumes always exist due to uncaptured and unmodeled minor streets and driveway entrances, but unbalanced volumes were particularly prevalent in this study due to the varying dates traffic volumes were collected. After corridor-wide peak hours of 8:00-9:00 AM and 4:45-5:45 PM were determined from the count data, a balanced volume network was developed in which the October 3<sup>rd</sup> intersection counts, taken at Port Republic Road / South Main Street and Port Republic Road / Devon Lane, were held as key balancing nodes.

### Input Volumes

Volumes were coded in 15-minute intervals according to the existing peak hour volume distributions present in the traffic counts. This varied hourly distribution achieves the same effect as the "peak hour factor" parameter in macroscopic traffic simulation such as Synchro. All inputs were set to "Exact Volume" as specified by TOSAM instead of the default "Stochastic Volume."

A 30-minute preloading interval was coded to load the network with traffic prior to the start of the analysis peak hour. This period is sufficient for vehicles to fully traverse and populate the network.

## Vehicle Composition

The only vehicle counts from the study corridor that included vehicle classification data were the counts from the retail Traffic Impact Analysis report. These counts identified a 4% heavy vehicle composition. In lieu of additional data, a 4% heavy vehicle composition was modeled on the majority of the corridor. At the direction of VDOT, a 1% heavy vehicle composition was modeled on both Bluestone Drive and Forest Hill Road. The "North American" vehicle fleet was used to represent the passenger vehicle and heavy vehicle model distribution.

## Static Routing Decisions

Due to the short distance between many of the study intersections VHB decided to develop a full origin-destination (O-D) matrix for the network in which vehicles entering on each link are assigned a destination exiting the network. This methodology improves the accuracy of modeled lane changes as vehicles can realistically position themselves in the appropriate lane upstream of their next turning movement. The O-D matrix was developed based on the existing traffic patterns/turning movements, engineering judgement, and specified input from VDOT on certain vehicle movements.

## Partial Routing Decisions

Two partial routing decisions are coded to accurately model lane utilization of dual-lefts in the study corridor:

- Southbound South Main Street to eastbound Port Republic Road, and
- Westbound Port Republic Road to southbound South Main Street.

## Speed Data

Free flow speed data was not collected during the off-peak period to derive desired speed distributions for the modeled network. Instead, the future conditions methodology outlined in TOSAM was utilized to set desired speed distributions. This methodology is a +/- 5mph linear distribution around the posted speed limit. The posted speed limit on Port Republic Road and South Main Street (south of Port Republic Road) is 35 mph; the posted warning speed on the I-81 ramps is 30mph; the posted speed limit on all other study streets is 25 mph.

Reduced speed distributions on turns were coded according to TOSAM and Guide procedures. A linear distribution between 7.5 and 15.50 mph was coded for right turns, and a linear distribution between 12.10 and 18.60 mph was coded for left turns.

## Transit

Harrisonburg Department of Public Transportation (HDPT) operates a number of bus lines along the study corridor, primarily serving James Madison University students traveling between campus and off-campus housing. In-lane bus stops impact traffic operations by stopping a lane of traffic and causing other vehicles to weave around the stopped bus. It was important to capture the impact of bus operations on the corridor's traffic operations. VHB obtained transit route maps and time schedules from HDPT's website, and a HDPT representative provided typical loading volumes at bus stops along the corridor. Bus dwell time was modeled as a 10-20 second distribution per input from HDPT. This information was all coded into the VISSIM model.

## Model Calibration

The focus of this model calibration effort is to replicate the traffic volumes, travel time, and queue data and the overall congestion observed in the field. After the initial VISSIM model was developed, multiple runs (10 runs with random



seeding) of the existing AM and PM peak hour conditions were conducted to simulate vehicle loadings and the nature of vehicle arrivals. Model calibration is the process of adjusting the model to better simulate the local driving behavior.

To calibrate and validate the model, base driver behavior parameters were changed from their default values as defined in **Table 1**. These changes were necessary for calibration in the Existing Condition AM model, but not the Existing Condition PM model. Initial model runs utilizing the default driver behavior parameters produced modeled AM traffic flow better than observed conditions, while modeled PM traffic flow was near observed conditions. Decreasing the modeled AM saturation flow rate with these parameter changes improved the calibration of the AM conditions. The modified values of the driver behavior parameters fall within the defined allowable limits set by TOSAM.

**Table 1: Driver Behavior Calibration Parameters**

Calibration Parameter	Default Value	Modified Value
W74bxAdd	2.00	2.20
W74bxMult	3.00	3.30

Notes

\* *W74bxAdd (Additive Part of Safety Distance) helps define the average desired distance between two cars. Adjustment of this value changes the saturation flow of the modeled roadway.*

\* *W74bxMult (Multiplicative Part of Safety Distance) helps define the average desired distance between two cars. Adjustment of this value changes the saturation flow of the modeled roadway.*

**Calibration Results**

After several iterations of adjusting the driver behaviors and lane changing parameters, the model started to simulate the level of congestion observed in the field. The evaluation criteria used to analyze the study area roadways and intersections are based on the measures of effectiveness (MOEs) provided by the VISSIM traffic simulation model. The VISSIM output includes a variety of MOEs, which are used to evaluate the operational qualities within the study area. These MOEs include volume throughput, delays, average and maximum queue lengths, and speeds/travel times). All model results reported in this evaluation are based on an average of ten model runs (with different random seed values) to accurately model the stochastic (random) nature of the simulation model.

Volume Throughput

TOSAM outlines the calibration thresholds for microsimulation models. The requisite volume-based thresholds vary depending on the quantity of volume completing the movement. **Table 2** contains the TOSAM threshold requirements.

**Table 2: Volume Calibration Thresholds**

Movement Volume Quantity	Calibration Threshold*
< 100 VPH (Vehicle per Hour)	20%
≥ 100 and < 300 VPH	15%
≥ 300 and < 1000 VPH	10%
≥ 1000 VPH	5%

\* *Maximum allowable difference between coded and modeled volume.*

**Table 3** shows a comparison between the coded/observed volumes and simulated volumes for the AM and PM peak hour networks. The differences between these volumes are within the requisite calibration threshold. A more detailed volumes comparison for every intersection movement and approach is provided in **Appendix A**.

**Table 3: Volume Calibration Results**

Peak Hour	Coded Volume	Simulated Volume	Difference	Percentage Difference	Calibration Threshold
AM Network	20,857	20,864	7	0.03%	5%
PM Network	26,962	26,883	79	0.29%	5%

Travel Time

VHB collected average corridor travel time data on October 3<sup>rd</sup> and 4<sup>th</sup> during a field visit. Travel time run segments were collected to/from 480 feet west of South Main Street from/to 390 feet east of Devon Lane. TOSAM specifies a 30% maximum difference between observed and modeled travel times on an arterial network for the model to be considered properly calibrated. As shown in **Table 4**, the differences between the observed travel time and the simulated traffic time for each segment along the corridor are within the calibration threshold of 30%.

**Table 4: Travel Time Calibration Results**

Peak Hour	Travel Time Run Segment	Observed Travel Time (sec)	Observed Travel Time (M:SS)	Simulated Travel Time (sec)	Simulated Travel Time (M:SS)	Δ Travel Time (M:SS)	% Difference
AM Peak Hour	Port Republic Eastbound	233.92	03:53.9	217.55	03:37.5	<b>00:16.4</b>	<b>(-7%)</b>
	Port Republic Westbound	265.70	04:25.7	232.73	03:52.7	<b>00:33.0</b>	<b>(-12%)</b>
	Port Republic EB to I-81 NB Ramps	156.66	02:36.7	152.75	02:32.8	<b>00:03.9</b>	<b>(-2%)</b>
	Port Republic WB to I-81 SB Ramps	140.27	02:20.3	103.23	01:43.2	<b>00:37.0</b>	<b>(-26%)</b>
PM Peak Hour	Port Republic Eastbound	238.03	03:58.0	261.92	04:21.9	<b>00:23.9</b>	10%
	Port Republic Westbound	247.39	04:07.4	256.04	04:16.0	<b>00:08.6</b>	3%
	Port Republic EB to I-81 NB Ramps	177.83	02:57.8	185.40	03:05.4	<b>00:07.6</b>	4%
	Port Republic WB to I-81 SB Ramps	102.33	01:42.3	127.73	02:07.7	<b>00:25.4</b>	25%

Queues

VHB recorded and observed the average and maximum queue lengths on some of the critical movements/approaches along the corridor during the AM and PM peak hours. Queue length was noted using a combination of two techniques: number of queued vehicles multiplied by an average vehicle length and extent of queue noted on an aerial printout (distance later determined using aerial imagery).

In oversaturated conditions, TOSAM states that the calibrated average and maximum queue lengths should be within 20% of observed condition length. In undersaturated conditions, the average queue length should be within 20% (movements with > 10 VPH) or 30% (movements with ≤ 10 VPH), while the maximum queue should be within 25%. TOSAM provides the *HCM 2010* definition for undersaturated and saturated flow; one of the key elements of saturated flow is that traffic flow is affected by downstream conditions. This flow description applies to the peak periods of both the AM and PM peak hour on Port Republic Road, where multiple downstream signals (particularly around the I-81 interchange) impact upstream flow in both directions. The saturated queue calibration thresholds are therefore applied.

**Table 5** shows the observed and simulated maximum queue lengths for critical movements and the numerical and percentage difference between observed and simulated length; the queue lengths meet the 20% calibration threshold.

**Table 5: Key Queue Calibration Results**

Peak Hour	Critical Max Queue	Observed Queue Length [ft]	Simulated Queue Length [ft]	Difference [ft]	Percentage Difference	Calibration Threshold
AM	Port Republic WBT at South Main St	850	742	-108	-13%	20%
	Port Republic EBL at Bluestone	275	260	-15	-6%	20%
	Port Republic WBT at Forest Hill	1,300	1,262	-38	-3%	20%
	Devon Lane NBL/T at Port Republic	400	371	-29	-7%	20%
PM	Port Republic WBT at South Main St	525	593	68	13%	20%
	Port Republic EBL at Bluestone	800	777	-23	-3%	20%
	Port Republic WBT at Forest Hill	1,000	801	-199	-20%	20%
	Devon Lane NBL/T at Port Republic	375	382	7	2%	20%

**Calibration Conclusion**

Given that traffic volumes, travel time, and queue lengths are fully calibrated to TOSAM requirements, VHB considers the AM and PM peak hour Existing Conditions VISSIM models calibrated and validated. Visual inspection of the simulation further revealed that the modeled traffic flow matches the field conditions conveyed to and observed in the field by VHB, further validating the accuracy of the model. Speed maps of the calibrated VISSIM models are provided in **Appendix B**. The darker the color, the slower the average vehicle speed on that segment of roadway. These maps are an easy way to visualize the simulated traffic congestion.



Appendix A - Weekday AM Existing Conditions Volume Calibration

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes Calibration Thresholds									
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Met Threshold?
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	46	44	-2	-4%	369	364	-5	-1%	10%	YES
					232	229	-3	-1%						
					91	91	0	0%						
					147	151	4	3%						
					252	246	-6	-2%	1,020	1,000	-20	-2%	5%	YES
					621	603	-18	-3%						
					135	139	4	3%						
					230	231	1	0%						
					28	27	-1	-4%						
					67	66	-1	-1%						
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Hillcrest Drive	EBL	3	3	0	0%	607	613	6	1%	10%	YES
					604	610	6	1%						
					0	0	0	0%						
					1	2	1	100%						
					1,015	990	-25	-2%	1,030	1,004	-26	-3%	5%	YES
					14	12	-2	-14%						
					14	14	0	0%						
					5	5	0	0%	19	19	0	0%	20%	YES
					0	0	0	0%	1	1	0	0%	20%	YES
					1	1	0	0%						
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0	0	0	0%	17	17	0	0%	20%	YES
					17	17	0	0%						
					619	632	13	2%	619	632	13	2%	10%	YES
					0	0	0	0%						
					12	10	-2	-17%	1,042	1,022	-20	-2%	5%	YES
					1,030	1012	-18	-2%						
					1,678	1,671	-7	0%	1,678	1,671	-7	0%	5%	YES
					39	37	-2	-5%						
					16	17	1	6%	101	99	-2	0%	15%	YES
					46	45	-1	-2%						
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	37	37	-2	-5%	117	121	4	0%	15%	YES
					17	17	0	0%						
					45	45	0	0%						
					72	72	0	0%						
					10	11	1	10%						
					38	38	0	0%						
					104	103	-1	-1%	636	652	16	3%	10%	YES
					493	509	16	3%						
					39	40	1	3%						
					102	101	-1	-1%						
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	142	149	7	5%	314	319	5	2%	10%	YES
					172	170	-2	-1%						
					523	543	20	4%	604	625	21	0%	10%	YES
					81	82	1	1%						
					156	153	-3	-2%	1,289	1,275	-14	-1%	5%	YES
					1,133	1,122	-11	-1%						
					2,207	2,219	12	1%	2,207	2,219	12	1%	5%	YES
					142	149	7	5%						
					172	170	-2	-1%						
					523	543	20	4%						
81	82	1	1%											
156	153	-3	-2%											
1,133	1,122	-11	-1%											
2,207	2,219	12	1%											

Appendix A - Weekday AM Existing Conditions Volume Calibration

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes Calibration Thresholds															
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Met Threshold?						
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	228	223	-5	-2%	452	450	-2	0%	10%	YES						
					NBR	224	227	3	1%											
					EBL	116	119	3	3%	665	689	24	4%	10%	YES					
					EBT	549	570	21	4%											
					WBT	1,061	1,051	-10	-1%	1,234	1,225	-9	0%	5%	YES					
					WBR	173	174	1	1%	2,351	2,364	13	1%	5%	YES					
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	4	4	0	0%	12	11	-1	-8%	20%	YES						
					NBT	6	5	-1	-17%											
					NBR	2	0	0	0%											
					SBL	58	59	1	2%	204	203	-1	0%	15%	YES					
					SBT	11	12	1	9%											
					SBR	135	132	-3	-2%	773	797	24	3%	10%	YES					
					EBL	161	166	5	3%											
					EBT	579	598	19	3%	1,295	1,288	-7	0%	5%	YES					
					EBR	33	33	0	0%	2,284	2,299	15	1%	5%	YES					
					WBT	1,095	1,091	-4	0%											
					WBR	200	197	-3	-2%											
					8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	67	67	0	0%	87	84	-3	-3%	20%	YES	
NBR	20	17	-3	-15%						639	657	18	3%	10%	YES					
EBT	583	597	14	2%						1,291	1,279	-12	-1%	5%	YES					
EBR	56	60	4	7%						2,017	2,020	3	0%	5%	YES					
WBL	63	59	-4	-6%																
WBT	1,228	1,220	-8	-1%																
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL						41	42	1	2%	83	81	-2	-2%	20%	YES	
										NBR	42	39	-3	-7%	603	613	10	2%	10%	YES
										EBT	596	605	9	2%	1,256	1,243	-13	-1%	5%	YES
										EBR	7	8	1	14%	1,942	1,937	-5	0%	5%	YES
										WBL	6	6	0	0%						
										WBT	1,250	1,237	-13	-1%						
					10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	241	239	-2	-1%	274	275	1	0%	15%	YES	
										NBT	17	18	1	6%	191	197	6	3%	15%	YES
										NBR	16	18	2	13%	638	648	10	2%	10%	YES
										SBL	22	22	0	0%	901	891	-10	-1%	10%	YES
										SBT	6	7	1	17%	2,004	2,011	7	0%	5%	YES
										SBR	163	168	5	3%	20,857	20,864	7	0.03%	5%	YES
EBL	41	45	4	10%																
EBT	555	559	4	1%																
EBR	42	44	2	5%																
WBL	30	30	0	0%																
WBT	852	837	-15	-2%																
WBR	19	22	3	16%																
Total Study Area Roadways/Intersections					2,004	2,011	7	0%	2,004	2,011	7	0%	5%	YES						

Appendix A - Weekday PM Existing Conditions Volume Calibration

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes Calibration Thresholds															
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Met Threshold?						
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	16	16	0	0%	369	370	1	0%	10%	YES						
					EBT	254	254	0	0%											
					EBR	99	100	1	1%											
					WBL	298	292	-6	-2%											
					WBT	365	353	-12	-3%											
					WBR	366	351	-15	-4%											
					SBL	579	575	-4	-1%											
					SBT	623	624	1	0%											
					SBR	51	53	2	4%											
					NBL	93	91	-2	-2%											
NBT	492	491	-1	0%																
NBR	361	357	-4	-1%																
					<b>3,597</b>	<b>3,557</b>	<b>-40</b>	<b>-1%</b>	<b>3,597</b>	<b>3,557</b>	<b>-40</b>	<b>-1%</b>	<b>5%</b>	<b>YES</b>						
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	1	1	0	0%	1,194	1,186	-8	-1%	5%	YES						
					EBT	1,192	1,184	-8	-1%											
					EBR	1	1	0	0%											
					WBL	4	5	1	25%											
					WBT	1,023	989	-34	-3%											
					WBR	4	4	0	0%											
					SBL	7	7	0	0%											
					SBR	6	6	0	0%											
					NBL	0	0	0	0%											
					NBR	1	1	0	0%											
					<b>2,239</b>	<b>2,198</b>	<b>-41</b>	<b>-2%</b>	<b>2,239</b>	<b>2,198</b>	<b>-41</b>	<b>-2%</b>	<b>5%</b>	<b>YES</b>						
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0	0	0	0%	20	20	0	0%	20%	YES						
					NBR	20	20	0	0%											
					EBT	1,200	1192	-8	-1%											
					EBR	0	0	0	0%											
					WBL	15	15	0	0%											
					WBT	1,031	1002	-29	-3%											
										<b>2,266</b>	<b>2,229</b>	<b>-37</b>	<b>-2%</b>	<b>2,266</b>	<b>2,229</b>	<b>-37</b>	<b>-2%</b>	<b>5%</b>	<b>YES</b>	
					4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	30	26	-4	-13%	129	127	-2	0%	15%	YES	
										NBT	20	18	-2	-10%						
										NBR	79	83	4	5%						
SBL	277	291	14	5%																
SBT	18	16	-2	-11%																
SBR	157	151	-6	-4%																
EBL	132	135	3	2%																
EBT	1,064	1,057	-7	-1%																
EBR	24	24	0	0%																
WBL	54	52	-2	-4%																
WBT	859	845	-14	-2%																
WBR	232	238	6	3%																
					<b>2,946</b>	<b>2,936</b>	<b>-10</b>	<b>0%</b>	<b>2,946</b>	<b>2,936</b>	<b>-10</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>						
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	154	159	5	3%	338	334	-4	-1%	10%	YES						
					SBR	184	175	-9	-5%											
					EBT	1,156	1,169	13	1%											
					EBR	264	259	-5	-2%											
					WBL	232	221	-11	-5%											
					WBT	961	958	-3	0%											
										<b>2,951</b>	<b>2,941</b>	<b>-10</b>	<b>0%</b>	<b>2,951</b>	<b>2,941</b>	<b>-10</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>	



Appendix A - Weekday PM Existing Conditions Volume Calibration

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes Calibration Thresholds														
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Met Threshold?					
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	173	163	-10	-6%	401	390	-11	-3%	10%	YES					
					228	227	-1	0%											
					219	0	-1	0%	1,310	1,323	13	1%	5%	YES					
					1,091	1,105	14	1%											
					1,020	1,016	-4	0%	1,221	1,222	1	0%	5%	YES					
					201	206	5	2%	<b>2,932</b>	<b>2,935</b>	<b>3</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>					
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	56	56	0	0%	78	78	0	0%	20%	YES					
					19	18	-1	-5%											
					3	4	1	33%											
					187	191	4	2%	452	451	-1	0%	10%	YES					
					3	3	0	0%											
					262	257	-5	-2%											
					209	212	3	1%	1,319	1,330	11	1%	5%	YES					
					1,101	1,108	7	1%											
					9	10	1	11%											
					903	912	9	1%	1,056	1,071	15	0%	5%	YES					
					153	159	6	4%	<b>2,905</b>	<b>2,930</b>	<b>25</b>	<b>1%</b>	<b>5%</b>	<b>YES</b>					
					8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	43	41	-2	-5%	62	59	-3	-5%	20%	YES
19	18	-1	-5%																
1,198	1,200	2	0%	1,291						1,299	8	1%	5%	YES					
93	99	6	6%																
30	30	0	0%	1,043						1,057	14	1%	5%	YES					
1,013	1,027	14	1%	<b>2,396</b>						<b>2,415</b>	<b>19</b>	<b>1%</b>	<b>5%</b>	<b>YES</b>					
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL						24	26	2	8%	59	61	2	3%	20%	YES
										35	35	0	0%						
										1,140	1,137	-3	0%	1,217	1,216	-1	0%	5%	YES
										77	79	2	3%						
										19	16	-3	-16%	1,038	1,047	9	1%	5%	YES
										1,019	1,031	12	1%	<b>2,314</b>	<b>2,324</b>	<b>10</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>
					10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	208	212	4	2%	262	262	0	0%	15%	YES
										19	17	-2	-11%						
										35	33	-2	-6%	212	217	5	2%	15%	YES
										62	58	-4	-6%						
										24	23	-1	-4%	1,175	1,171	-4	0%	5%	YES
										126	136	10	8%						
158	161	3	2%	767						768	1	0%	10%	YES					
790	783	-7	-1%	<b>2,416</b>						<b>2,418</b>	<b>2</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>					
227	227	0	0%	26,962						26,883	-79	-0.29%	5%	YES					
31	31	0	0%																
704	701	-3	0%																
32	36	4	13%																
<b>Total Study Area Roadways/Intersections</b>					<b>2,416</b>	<b>2,418</b>	<b>2</b>	<b>0%</b>	<b>2,416</b>	<b>2,418</b>	<b>2</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>					



Appendix A - Weekday AM Existing Conditions Volume Calibration

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes Calibration Thresholds															
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Met Threshold?						
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	228	223	-5	-2%	452	450	-2	0%	10%	YES						
					NBR	224	227	3	1%											
					EBL	116	119	3	3%	665	689	24	4%	10%	YES					
					EBT	549	570	21	4%											
					WBT	1,061	1,051	-10	-1%	1,234	1,225	-9	0%	5%	YES					
					WBR	173	174	1	1%	2,351	2,364	13	1%	5%	YES					
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	4	4	0	0%	12	11	-1	-8%	20%	YES						
					NBT	6	5	-1	-17%											
					NBR	2	0	0	0%											
					SBL	58	59	1	2%	204	203	-1	0%	15%	YES					
					SBT	11	12	1	9%											
					SBR	135	132	-3	-2%	773	797	24	3%	10%	YES					
					EBL	161	166	5	3%											
					EBT	579	598	19	3%	1,295	1,288	-7	0%	5%	YES					
					EBR	33	33	0	0%	2,284	2,299	15	1%	5%	YES					
					WBT	1,095	1,091	-4	0%											
					WBR	200	197	-3	-2%											
					8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	67	67	0	0%	87	84	-3	-3%	20%	YES	
NBR	20	17	-3	-15%						639	657	18	3%	10%	YES					
EBT	583	597	14	2%						1,291	1,279	-12	-1%	5%	YES					
EBR	56	60	4	7%						2,017	2,020	3	0%	5%	YES					
WBL	63	59	-4	-6%																
WBT	1,228	1,220	-8	-1%																
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL						41	42	1	2%	83	81	-2	-2%	20%	YES	
										NBR	42	39	-3	-7%	603	613	10	2%	10%	YES
										EBT	596	605	9	2%	1,256	1,243	-13	-1%	5%	YES
										EBR	7	8	1	14%	1,942	1,937	-5	0%	5%	YES
										WBL	6	6	0	0%						
										WBT	1,250	1,237	-13	-1%						
					10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	241	239	-2	-1%	274	275	1	0%	15%	YES	
										NBT	17	18	1	6%	191	197	6	3%	15%	YES
										NBR	16	18	2	13%	638	648	10	2%	10%	YES
										SBL	22	22	0	0%	901	891	-10	-1%	10%	YES
										SBT	6	7	1	17%	2,004	2,011	7	0%	5%	YES
										SBR	163	168	5	3%	20,857	20,864	7	0.03%	5%	YES
EBL	41	45	4	10%																
EBT	555	559	4	1%																
EBR	42	44	2	5%																
WBL	30	30	0	0%																
WBT	852	837	-15	-2%																
WBR	19	22	3	16%																
Total Study Area Roadways/Intersections					2,004	2,011	7	0%	2,004	2,011	7	0%	5%	YES						



Appendix A - Weekday PM Existing Conditions Volume Calibration

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes Calibration Thresholds															
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Met Threshold?						
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	16	16	0	0%	369	370	1	0%	10%	YES						
					EBT	254	254	0	0%											
					EBR	99	100	1	1%											
					WBL	298	292	-6	-2%											
					WBT	365	353	-12	-3%											
					WBR	366	351	-15	-4%											
					SBL	579	575	-4	-1%											
					SBT	623	624	1	0%											
					SBR	51	53	2	4%											
					NBL	93	91	-2	-2%											
NBT	492	491	-1	0%																
NBR	361	357	-4	-1%																
					<b>3,597</b>	<b>3,557</b>	<b>-40</b>	<b>-1%</b>	<b>3,597</b>	<b>3,557</b>	<b>-40</b>	<b>-1%</b>	<b>5%</b>	<b>YES</b>						
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	1	1	0	0%	1,194	1,186	-8	-1%	5%	YES						
					EBT	1,192	1,184	-8	-1%											
					EBR	1	1	0	0%											
					WBL	4	5	1	25%											
					WBT	1,023	989	-34	-3%											
					WBR	4	4	0	0%											
					SBL	7	7	0	0%											
					SBR	6	6	0	0%											
					NBL	0	0	0	0%											
					NBR	1	1	0	0%											
					<b>2,239</b>	<b>2,198</b>	<b>-41</b>	<b>-2%</b>	<b>2,239</b>	<b>2,198</b>	<b>-41</b>	<b>-2%</b>	<b>5%</b>	<b>YES</b>						
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0	0	0	0%	20	20	0	0%	20%	YES						
					NBR	20	20	0	0%											
					EBT	1,200	1192	-8	-1%											
					EBR	0	0	0	0%											
					WBL	15	15	0	0%											
					WBT	1,031	1002	-29	-3%											
										<b>2,266</b>	<b>2,229</b>	<b>-37</b>	<b>-2%</b>	<b>2,266</b>	<b>2,229</b>	<b>-37</b>	<b>-2%</b>	<b>5%</b>	<b>YES</b>	
					4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	30	26	-4	-13%	129	127	-2	0%	15%	YES	
										NBT	20	18	-2	-10%						
										NBR	79	83	4	5%						
SBL	277	291	14	5%																
SBT	18	16	-2	-11%																
SBR	157	151	-6	-4%																
EBL	132	135	3	2%																
EBT	1,064	1,057	-7	-1%																
EBR	24	24	0	0%																
WBL	54	52	-2	-4%																
WBT	859	845	-14	-2%																
WBR	232	238	6	3%																
					<b>2,946</b>	<b>2,936</b>	<b>-10</b>	<b>0%</b>	<b>2,946</b>	<b>2,936</b>	<b>-10</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>						
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	154	159	5	3%	338	334	-4	-1%	10%	YES						
					SBR	184	175	-9	-5%											
					EBT	1,156	1,169	13	1%											
					EBR	264	259	-5	-2%											
					WBL	232	221	-11	-5%											
					WBT	961	958	-3	0%											
										<b>2,951</b>	<b>2,941</b>	<b>-10</b>	<b>0%</b>	<b>2,951</b>	<b>2,941</b>	<b>-10</b>	<b>0%</b>	<b>5%</b>	<b>YES</b>	

Appendix A - Weekday PM Existing Conditions Volume Calibration

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes Calibration Thresholds										
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Counted Link Volumes (vph)	Simulated Link Volumes (vph)	Difference	% Difference	Calibration Threshold Within ±	Met Threshold?	
6	Port Republic Road at NB I-81 Ramps	Signal	NB I-81 Off-Ramp	NBL	173	163	-10	-6%	401	390	-11	-3%	10%	YES	
					NBR	228	227	-1	0%						
					EBL	219	0	-1	0%	1,310	1,323	13	1%	5%	YES
					EBT	1,091	1,105	14	1%						
					WBT	1,020	1,016	-4	0%	1,221	1,222	1	0%	5%	YES
					WBR	201	206	5	2%						
			Intersection		2,932	2,935	3	0%	2,932	2,935	3	0%	5%	YES	
7	Port Republic Road at JMU Parking / Forest Hill Road	Signal	JMU Parking Lot	NBL	56	56	0	0%	78	78	0	0%	20%	YES	
					NBT	19	18	-1	-5%						
					NBR	3	4	1	33%						
					SBL	187	191	4	2%						
					SBT	3	3	0	0%	452	451	-1	0%	10%	YES
					SBR	262	257	-5	-2%						
					EBL	209	212	3	1%						
					EBT	1,101	1,108	7	1%	1,319	1,330	11	1%	5%	YES
					EBR	9	10	1	11%						
					WBT	903	912	9	1%	1,056	1,071	15	0%	5%	YES
					WBR	153	159	6	4%						
								Intersection		2,905	2,930	25	1%	2,905	2,930
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	43	41	-2	-5%	62	59	-3	-5%	20%	YES	
					NBR	19	18	-1	-5%						
					EBT	1,198	1,200	2	0%	1,291	1,299	8	1%	5%	YES
					EBR	93	99	6	6%						
					WBL	30	30	0	0%	1,043	1,057	14	1%	5%	YES
					WBT	1,013	1,027	14	1%						
			Intersection		2,396	2,415	19	1%	2,396	2,415	19	1%	5%	YES	
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	24	26	2	8%	59	61	2	3%	20%	YES	
					NBR	35	35	0	0%						
					EBT	1,140	1,137	-3	0%	1,217	1,216	-1	0%	5%	YES
					EBR	77	79	2	3%						
					WBL	19	16	-3	-16%	1,038	1,047	9	1%	5%	YES
					WBT	1,019	1,031	12	1%						
			Intersection		2,314	2,324	10	0%	2,314	2,324	10	0%	5%	YES	
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	208	212	4	2%	262	262	0	0%	15%	YES	
					NBT	19	17	-2	-11%						
					NBR	35	33	-2	-6%						
					SBL	62	58	-4	-6%	212	217	5	2%	15%	YES
					SBT	24	23	-1	-4%						
					SBR	126	136	10	8%						
					EBL	158	161	3	2%	1,175	1,171	-4	0%	5%	YES
					EBT	790	783	-7	-1%						
					EBR	227	227	0	0%						
					WBL	31	31	0	0%	767	768	1	0%	10%	YES
					WBT	704	701	-3	0%						
					WBR	32	36	4	13%						
			Intersection		2,416	2,418	2	0%	2,416	2,418	2	0%	5%	YES	
<b>Total Study Area Roadways/Intersections</b>									26,962	26,883	-79	-0.29%	5%	YES	





## Appendix B

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### Signal Timing Data

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Configuration Controller Sequence**

**Phase Ring Sequence and Assignment (MM) 1-1-1**

Hardware Alternate Sequence Enable: No

**Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)**

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Sequence 1																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 2																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 3																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 4																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 5																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 6																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 7																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 8																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 9																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 10																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 11																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 12																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 13																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 14																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 15																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 16																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .

**Phases In Use/Exclusive Ped (MM) 1-2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	X	X	X	X	X	X	X	X								

Exclusive Ped | | | | | | | | | | | | | | | | | | | | | |

**Phase Compatibility (MM) 1-1-2**

Phase	
n/a	Barrier Mode

**Phase and Overlap Descriptions**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
<b>Overlap</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>	<b>P</b>
Description																

**Administration (MM) 1-7-1**

Enable Controller/Cabinet Interlock CRC No  
 CRC (16 bit) 54FC  
 Enable Automatic Backup to Datakey No



**Backup Prevent (MM) 1-1-3**

Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing Phases	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Simultaneous Gap (MM) 1-1-4**

Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phase Must Gap With Phase	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Load Switch Assignments (MM) 1-3**

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto		X	X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto		X	X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			
10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Configuration Port 1 (SDLC)**

**Port 1 SDLC (MM) 1-4-1**

BIU	1	2	3	4	5	6	7	8
Term & Facility								
Detector Rack								

Enable TS2/MMU Type Cabinet: No  
 Enable MMU Extended Status: No  
 Enable SDLC Stop Time: No  
 Enable 3 Critical RFE's Lockup: Yes

**MMU Program (MM) 1-4-2**

Channel Can Serve With Channel	
Channel 1	Channel 2

**Color Check Enable (MM) 1-4-3**

Enable Color Check: Yes

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

**Secondary Stations/Tests (MM) 1-4-4**

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

## City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Configuration Communications 1 (SDLC)****Ethernet Port Configuration (MM) 1-5-1**

Controller IP: 192.168.40.27  
 Subnet Mask: 255.255.254.0  
 Default Gateway IP: 192.168.40.1  
 Server IP: 192.168.40.1

**NTCIP (MM) 1-5-5**

NTCIP Backup Time (Sec): 0  
 NTCIP UDP Port: 501  
 Ethernet Priority: 1  
 Port 2 Priority (Port C50S for 2070): 4  
 Port 3A Priority (Port C21S for 2070): 2  
 Port 3B Priority (Port C22S for 2070): 3

**Port Configuration (MM) 1-5-2 to 1-5-4**

Port	2 (C50S)	3A (C21S)	3B (C22S)
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

**ECPIP (MM) 1-5-6**

Controller Address: 0  
 Expanded System Detector Address: 0

**System Detector Assignment**

System Detector	Local Detector
-----------------	----------------



City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Configuration Logging / Display**

**Event Logging (MM) 1-6-1**

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

**Display Options (MM) 1-7-2**

Key Click Enable:	No
Backlight Enable:	Yes
LED Mode:	Auto
Display Mode:	Basic
Screen Format:	Advanced
Trans Mode Pop-Up Disable:	No

**Sign On (MM) 8-5**

Sign On Message Line 1: Solutions that Move the World  
 Sign On Message Line 2:

**Software Modules (MM) 8-7**

Application Version: 02.64.00  
 OS (Boot) Version: 01.14.03

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Logic Processor Page 1**  
**Logic Statement Control (MM)**  
**1-8-1**

Logic #	Statement Control
---------	-------------------

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Logic Processor Page 2**

**Logic Statements (MM) 1-8-2**



City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Min Green	7	10	7	7	7	10	7	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	30	0	27	0	27	0	24	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	20	45	30	45	30	45	25	35	35	35	35	35	35	35	35	35
Max2	10	25	10	15	10	25	10	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.6	3.0	3.5	3.1	3.6	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	4.1	2.0	3.5	2.0	4.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## Plan 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Min Green	7	10	7	7	7	10	7	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	30	0	27	0	27	0	24	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	20	40	20	35	30	40	20	35	35	35	35	35	35	35	35	35
Max2	10	25	10	15	10	25	10	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.6	3.0	3.5	3.1	3.6	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	4.1	2.0	3.5	2.0	4.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Min Green	7	10	7	7	7	10	7	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	30	0	27	0	27	0	24	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.6	3.0	3.5	3.1	3.6	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	4.1	2.0	3.5	2.0	4.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



## Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Min Green	7	10	7	7	7	10	7	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	30	0	27	0	27	0	24	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	10	35	10	15	10	35	10	15	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.6	3.0	3.5	3.1	3.6	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	4.1	2.0	3.5	2.0	4.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Controller Overlaps**  
**Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
A	Normal	0.0	0.0	0.0	0.0

**Phases**

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green
A	1	Yes	No	No	No		No	No	.

**PPLT FYA**

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

**Guaranteed Minimum Time Data (MM) 2-4**

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	2.0	5
B02	5	0	7	3.0	2.0	5
C03	5	0	7	3.0	2.0	5
D04	5	0	7	3.0	2.0	5
E05	5	0	7	3.0	2.0	5
F06	5	0	7	3.0	2.0	5
G07	5	0	7	3.0	2.0	5
H08	5	0	7	3.0	2.0	5
I09	5	0	7	3.0	2.0	5
J10	5	0	7	3.0	2.0	5
K11	5	0	7	3.0	2.0	5
L12	5	0	7	3.0	2.0	5
M13	5	0	7	3.0	2.0	5
N14	5	0	7	3.0	2.0	5
O15	5	0	7	3.0	2.0	5
P16	5	0	7	3.0	2.0	5

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Controller Pedestrian Overlaps**  
**Vehicle / Pedestrian Overlaps (MM) 2-3**

Included	Pedestrian Overlaps
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## City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Controller Start / Flash Data (MM) 2-5****Start Up**

Phase	Phase Setting
1	.
2	G
3	.
4	.
5	.
6	G
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon: No  
Flash Time: 5  
All Red: 5  
Power Start Seq: 1  
MUTCD Enabled: No  
Y->G: n/a

**Automatic Flash**

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon: No  
Exit Flash: G  
Minimum Flash: 8  
Minimum Recall: No  
Cycle Through Phase: No

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Controller Options**

**Controller Options (MM) 2-6-1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I	X					X										
Non-Act II																
Dual Entry																
Cond Service																
Cond Reservice																
Ped Re-Service																
Rest In Walk																
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

**Pre-Timed Mode (MM) 2-7**

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

**Phase Recall Options (MM) 2-8**

**Plan # 1**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

**Plan # 2**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

**Plan # 3**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

**Plan # 4**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																



City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Coordination Options**

**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Fixed
Offset Reference	Lead	Use Ped Time	No
Ped Recall	No	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

**Auto Perm Minimum Green (Seconds) (MM) 3-4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Split Demand (MM) 3-5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Coordination Pattern Data**

**Coordinator Pattern Data (MM) 3-2**

**Coordinator Pattern # 1**

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Seconds
Cycle	114	Std (COS)	9	Offsets In	Seconds
Offset Value	0s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	2		
Actuated Walk Rest	No	Sequence	5		
Phase Reserve	No	Action Plan	1		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 1)	21	38	20	35	18	41	20	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	114s	114s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 2**

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Seconds
Cycle	128	Std (COS)	17	Offsets In	Seconds
Offset Value	51s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 2)	26	42	20	40	18	50	25	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	128s	128s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 3**

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Seconds
Cycle	150	Std (COS)	25	Offsets In	Seconds
Offset Value	63s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	3		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 3)	33	52	20	45	30	55	30	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																



**Coordinator Pattern # 4**

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	114	Std (COS)	33	Offsets In	Seconds
Offset Value	36s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	2		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	4		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 4)	21	37	15	35	15	37	21	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	108s	108s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 5**

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Seconds
Cycle	108	Std (COS)	41	Offsets In	Seconds
Offset Value	0s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	5		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 5)	21	37	20	30	15	37	20	30	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	108s	102s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 15**

Split Pattern	15	TS2 (Pat-Off)	4-3	Splits In	Seconds
Cycle	130	Std (COS)	169	Offsets In	Seconds
Offset Value	0s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	2		
Phase Reservice	No	Action Plan	15		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 15)	27	43	20	40	20	50	25	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	130s	130s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 16**

Split Pattern	16	TS2 (Pat-Off)	5-1	Splits In	Seconds
Cycle	130	Std (COS)	201	Offsets In	Seconds
Offset Value	0s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	2		
Phase Reservice	No	Action Plan	16		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 16)	28	43	18	41	20	51	24	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	130s	130s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 17**

Split Pattern	17	TS2 (Pat-Off)	5-2	Splits In	Seconds
Cycle	150	Std (COS)	209	Offsets In	Seconds
Offset Value	0s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	2		
Phase Reservice	No	Action Plan	17		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 17)	40	43	20	47	27	56	30	37	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 20**

Split Pattern	20	TS2 (Pat-Off)	6-2	Splits In	Seconds
Cycle	150	Std (COS)	233	Offsets In	Seconds
Offset Value	39s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	20		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 20)	28	59	17	46	22	65	28	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																



**Coordinator Pattern # 21**

Split Pattern	21	TS2 (Pat-Off)	6-3	Splits In	Seconds
Cycle	150	Std (COS)	10	Offsets In	Seconds
Offset Value	127s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	21		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 21)	35	51	17	47	22	64	29	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 22**

Split Pattern	22	TS2 (Pat-Off)	7-1	Splits In	Seconds
Cycle	150	Std (COS)	18	Offsets In	Seconds
Offset Value	145s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	22		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 22)	33	52	17	48	20	65	30	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 23**

Split Pattern	23	TS2 (Pat-Off)	7-2	Splits In	Seconds
Cycle	150	Std (COS)	26	Offsets In	Seconds
Offset Value	9s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	23		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 23)	27	37	17	69	19	45	51	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 24**

Split Pattern	24	TS2 (Pat-Off)	7-3	Splits In	Seconds
Cycle	150	Std (COS)	34	Offsets In	Seconds
Offset Value	16s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	24		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 24)	27	37	17	69	19	45	51	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 25**

Split Pattern	25	TS2 (Pat-Off)	8-1	Splits In	Seconds
Cycle	150	Std (COS)	42	Offsets In	Seconds
Offset Value	94s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	25		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 25)	50	38	17	45	20	68	27	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 26**

Split Pattern	26	TS2 (Pat-Off)	8-2	Splits In	Seconds
Cycle	150	Std (COS)	74	Offsets In	Seconds
Offset Value	94s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	26		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 26)	50	38	17	45	20	68	27	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																



**Coordinator Pattern # 33**

Split Pattern	33	TS2 (Pat-Off)	10-3	Splits In	Seconds
Cycle	150	Std (COS)	154	Offsets In	Seconds
Offset Value	24s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	33		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 33)	50	40	17	43	20	70	25	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	150s	150s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 50**

Split Pattern	50	TS2 (Pat-Off)	0-0	Splits In	Seconds
Cycle	70	Std (COS)	107	Offsets In	Seconds
Offset Value	23s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	4		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	50		
Max Select	None	Force Off	Float		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 50)	17	20	15	18	15	20	15	18	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	70s	68s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 51**

Split Pattern	51	TS2 (Pat-Off)	0-0	Splits In	Seconds
Cycle	70	Std (COS)	139	Offsets In	Seconds
Offset Value	23s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	4		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	51		
Max Select	None	Force Off	Float		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Splits (Split Pat 51)	17	20	15	18	15	20	15	18	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	70s	68s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

City of Harrisonburg, VA



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**Coordination Split Pattern**  
**Split Pattern Data (MM) 3-3**

**Split Pattern # 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	21	38	20	35	18	41	20	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	114s	114s	0s	0s

**Split Pattern # 2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	26	42	20	40	18	50	25	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	128s	128s	0s	0s

**Split Pattern # 3**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	33	52	20	45	30	55	30	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	150s	0s	0s

**Split Pattern # 4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	21	37	15	35	15	37	21	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	108s	108s	0s	0s



**Split Pattern # 5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	21	37	20	30	15	37	20	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	108s	102s	0s	0s

**Split Pattern # 15**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	27	43	20	40	20	50	25	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	130s	130s	0s	0s

**Split Pattern # 16**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	28	43	18	41	20	51	24	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	130s	130s	0s	0s

**Split Pattern # 17**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	40	43	20	47	27	56	30	37	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	150s	0s	0s

**Split Pattern # 20**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	28	59	17	46	22	65	28	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	150s	0s	0s

**Split Pattern # 21**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	35	51	17	47	22	64	29	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	150s	0s	0s

**Split Pattern # 22**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	33	52	17	48	20	65	30	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	150s	0s	0s

**Split Pattern # 23**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	27	37	17	69	19	45	51	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	150s	0s	0s

**Split Pattern # 24**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	27	37	17	69	19	45	51	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	150s	0s	0s

**Split Pattern # 25**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	50	38	17	45	20	68	27	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																

Omit Phase										X	X	X	X	X	X	X	X
------------	--	--	--	--	--	--	--	--	--	---	---	---	---	---	---	---	---

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	150s	150s	0s	0s

**Split Pattern # 26**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	50	38	17	45	20	68	27	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	150s	150s	0s	0s

**Split Pattern # 33**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	50	40	17	43	20	70	25	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	150s	150s	0s	0s

**Split Pattern # 50**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	17	20	15	18	15	20	15	18	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	70s	68s	0s	0s

**Split Pattern # 51**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	EBLT	WB	NBLT	SB	WBLT	EB								
Split (seconds)	17	20	15	18	15	20	15	18	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	70s	68s	0s	0s



City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Preempt Plan**

**Preempt Plan (MM) 4-1**

**Preempt Plan 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dwell Ped	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	X	X	X	.	.	X	X	X	.	.	.	.	.	.	.	.
Cycling Ped	.	X	.	.	.	X	.	X	.	.	.	.	.	.	.	.
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	12	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	Yes	Terminate Phase	No
Ped Dark	No	Track Clear Rsv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Red	Exit Options	CRD
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	Yes	Yes	Yes	Yes

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	5	3.6	4.6
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	10	0	0	3.5	3.5
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	3.6	4.6

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Preempt Plan 3**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	X	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Exit Phases																				
Exit Calls																				
Special Function																				

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	Yes	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	CRD
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Free During Pmt	No	No	No	No

<b>Timing</b>	<b>Walk</b>	<b>Ped Clr</b>	<b>Min Grn</b>	<b>Yellow</b>	<b>Red</b>
Entrance	0	255	5	3.6	4.6
	<b>Min Grn</b>	<b>Ext Grn</b>	<b>Max Grn</b>	<b>Yellow</b>	<b>Red</b>
Track Clear	0	0	0	3.5	2.0
	<b>Min Dwell</b>	<b>Pmt Ext</b>	<b>Max Time</b>	<b>Yellow</b>	<b>Red</b>
Dwell / Cycle-Exit	10	0.0	60	3.6	4.1

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Preempt Plan 4**

<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
<b>Overlap</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>	<b>P</b>
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	Yes	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	CRD
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Free During Pmt	No	No	No	No

<b>Timing</b>	<b>Walk</b>	<b>Ped Clr</b>	<b>Min Grn</b>	<b>Yellow</b>	<b>Red</b>
Entrance	0	255	5	3.6	4.6
	<b>Min Grn</b>	<b>Ext Grn</b>	<b>Max Grn</b>	<b>Yellow</b>	<b>Red</b>
Track Clear	0	0	0	3.5	2.0
	<b>Min Dwell</b>	<b>Pmt Ext</b>	<b>Max Time</b>	<b>Yellow</b>	<b>Red</b>
Dwell / Cycle-Exit	10	0.0	60	3.6	4.6

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off

Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Preempt Plan 5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls																
Special Function																

Enable Yes Preempt Override Yes Interlock Enable No  
 Det Lock Yes Delay 0 Inhibit 0  
 Override Flash Yes Duration 10 CLR > GRN No  
 Term Ovlp Asap No PC Through Yel Yes Terminate Phase No  
 Ped Dark No Track Clear Rsrv No Dwell Flash Off  
 Linked Pmt 0 FL Exit Color Grn Exit Options CRD  
 Exit Timing Plan 0 Reservice 0 Fault Type Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	5	3.6	4.6
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	3.5	2.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	10	0.0	60	3.5	3.5

Preemption Active Out On Preempt Act Dwell No  
 Other - Priority Preempt Off Non-Priority Pmt Off  
 Inhibit Extension Time 0.0 Ped Priority Return Off  
 Veh Priority Return Off Queue Delay Off  
 Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Preempt Plan 6**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls																
Special Function																

Enable Yes Preempt Override Yes Interlock Enable No  
 Det Lock Yes Delay 0 Inhibit 0  
 Override Flash Yes Duration 10 CLR > GRN No  
 Term Ovlp Asap No PC Through Yel Yes Terminate Phase No  
 Ped Dark No Track Clear Rsrv No Dwell Flash Off



Linked Pmt 0 FL Exit Color Grn Exit Options CRD  
 Exit Timing Plan 0 Reservice 0 Fault Type Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	5	3.6	4.6
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	3.5	2.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	10	0.0	60	3.5	3.9

Preemption Active Out On Preempt Act Dwell No  
 Other - Priority Preempt Off Non-Priority Pmt Off  
 Inhibit Extension Time 0.0 Ped Priority Return Off  
 Veh Priority Return Off Queue Delay Off  
 Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Preempt Preempt Filtering**  
**Enable Preempt Filtering & TSP/SCP**  
**(MM) 4-2**

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Preempt TSP/SCP Plan and Split**

**TSP / SCP Plan (MM) 4-3**

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP  
 Free Default Pattern: 120  
 Headway Allowance: 100

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**TSP / SCP Split Pattern (MM) 4-4**

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

## City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Time Base Clock/Calendar****Clock/Calendar Data (MM) 5-1**

Manual Action Plan: 0  
SYNC Reference Time: 00:00  
SYNC Reference: Reference Time  
Day Light Savings: No  
Time Reset Input Set Time: 3:30:00  
Standard Time From GMT: 0



City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Time Base Action Plan**  
**Action Plan (MM) 5-2**

**Action Plan - 1**

Pattern	1	Override Sys	No
Timing Plan	2	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 2**

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 3**

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 4**

Pattern	4	Override Sys	No
Timing Plan	2	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 5**

Pattern	5	Override Sys	No
Timing Plan	2	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 10**

Pattern	Free	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 11**

Pattern	Free	Override Sys	No
Timing Plan	4	Sequence	1
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.



**Action Plan - 15**

Pattern	15	Override Sys	No
Timing Plan	1	Sequence	2
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 16**

Pattern	16	Override Sys	No
Timing Plan	1	Sequence	2
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 17**

Pattern	17	Override Sys	No
Timing Plan	1	Sequence	2
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

**Action Plan - 20**

Pattern	20	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

**Action Plan - 21**

Pattern	21	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 22**

Pattern	22	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 23**

Pattern	23	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

**Action Plan - 24**

Pattern	24	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	



**Action Plan - 25**

Pattern	25	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 26**

Pattern	26	Override Sys	No
Timing Plan	1	Sequence	5
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 33**

Pattern	33	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 50**

Pattern	50	Override Sys	No
Timing Plan	4	Sequence	0
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 51**

Pattern	51	Override Sys	No
Timing Plan	4	Sequence	0
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)

Aux Func (1-3)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

## City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Time Base Day Plan/Schedule****Day Plan (MM) 5-3****Day Plan #1**

Event	Action Plan	Start Time
1	10	06:00
2	2	07:15
3	2	10:45
4	3	12:00
5	2	18:00
6	1	19:00
7	10	20:45
8	11	00:00

**Day Plan #2**

Event	Action Plan	Start Time
1	10	06:00
2	2	07:15
3	2	10:45
4	3	12:00
5	1	18:00
6	10	20:00
7	11	00:00

**Day Plan #3**

Event	Action Plan	Start Time
1	10	06:00
2	1	10:00
3	10	19:00
4	11	00:00

**Day Plan #4**

Event	Action Plan	Start Time
1	10	06:00
2	1	12:00
3	10	18:30
4	11	00:00

**Day Plan #5**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:45
3	2	11:30
4	1	17:30
5	10	19:00
6	11	00:00

**Day Plan #6**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:45
3	2	11:30
4	1	17:30



5	10	19:00
6	11	00:00

**Day Plan #7**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:45
3	10	17:15
4	11	00:00

**Day Plan #8**

Event	Action Plan	Start Time
1	10	06:00
2	1	12:00
3	10	14:00
4	11	00:00

**Day Plan #11**

Event	Action Plan	Start Time
1	10	06:00
2	15	07:30
3	16	10:00
4	17	15:00
5	16	17:45
6	10	20:00
7	11	00:00

**Day Plan #12**

Event	Action Plan	Start Time
1	10	06:00
2	15	07:30
3	16	10:00
4	17	11:45
5	16	18:15
6	10	21:15
7	11	00:00

**Day Plan #13**

Event	Action Plan	Start Time
1	10	06:00
2	16	09:30
3	10	19:45
4	11	00:00

**Day Plan #14**

Event	Action Plan	Start Time
1	10	06:00
2	16	10:45
3	10	18:45
4	11	00:00

**Schedule (MM) 5-4**

**Schedule Number - 1**

Day Plan No.: 11

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X		

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 2**

Day Plan No.: 12

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
						X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 3**

Day Plan No.: 13

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
							X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 4**

Day Plan No.: 14

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
	X	X	X	X	X	X	X	X	X	X	X
	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		
	X	X	X	X	X	X	X	X	X		

City of Harrisonburg, VA



Solutions that Move the World™

I-060 - S Main St @ Port Republic Rd - Econolite Type - ASC/3

**Time Base Exceptions**

**Exception Day Program (MM) 5-5**

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan
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City of Harrisonburg, VA



Solutions that Move the World™

I-540 - Port Republic Rd @ Bluestone Dr - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	WBLT	EB		NB	EBLT	WB		SB								
Min Green	5	10	0	7	5	10	0	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	21	0	22	0	22	0	22	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	45	0	15	15	45	0	40	40	35	35	35	35	35	35	35
Max2	10	25	0	15	10	25	0	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.5	4.5	3.0	3.5	4.5	4.5	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.6	2.6	3.9	4.4	2.6	2.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## Plan 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	WBLT	EB		NB	EBLT	WB		SB								
Min Green	5	10	0	7	5	10	0	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	21	0	22	0	22	0	22	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	45	0	30	15	45	0	30	35	35	35	35	35	35	35	35
Max2	10	25	0	15	10	25	0	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.5	4.5	3.0	3.5	4.5	4.5	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.6	2.6	3.9	4.4	2.6	2.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	WBLT	EB		NB	EBLT	WB		SB								
Min Green	5	10	0	7	5	10	0	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	21	0	22	0	22	0	22	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	45	0	30	15	45	0	30	35	35	35	35	35	35	35	35
Max2	10	25	0	15	10	25	0	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.5	4.5	3.0	3.5	4.5	4.5	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.6	2.6	3.9	4.4	2.6	2.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	WBLT	EB		NB	EBLT	WB		SB								
Min Green	5	10	0	7	5	10	0	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	21	0	22	0	22	0	22	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	10	35	0	15	10	35	0	15	35	35	35	35	35	35	35	35
Max2	10	25	0	15	10	25	0	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.5	4.5	3.0	3.5	4.5	4.5	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.6	2.6	3.9	4.4	2.6	2.6	2.0	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



## City of Harrisonburg, VA



Solutions that Move the World™

I-540 - Port Republic Rd @ Bluestone Dr - Econolite Type - ASC/3

**Controller Overlaps****Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
A	Normal	0.0	0.0	0.0	0.0

**Phases**

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green
---------	-------	----------	---------	-------------	-------------	----------	--------------	--------------	-------------

**PPLT FYA**

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable
---------	-----------------------------	----------------------------------	-----------------------	--------------------------	--------------------	--------------------------	----------------------------	----------------------

**Guaranteed Minimum Time Data (MM) 2-4**

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	2.0	5
B02	5	0	7	3.0	2.0	5
C03	5	0	7	3.0	2.0	5
D04	5	0	7	3.0	2.0	5
E05	5	0	7	3.0	2.0	5
F06	5	0	7	3.0	2.0	5
G07	5	0	7	3.0	2.0	5
H08	5	0	7	3.0	2.0	5
I09	5	0	7	3.0	2.0	5
J10	5	0	7	3.0	2.0	5
K11	5	0	7	3.0	2.0	5
L12	5	0	7	3.0	2.0	5
M13	5	0	7	3.0	2.0	5
N14	5	0	7	3.0	2.0	5
O15	5	0	7	3.0	2.0	5
P16	5	0	7	3.0	2.0	5

City of Harrisonburg, VA



Solutions that Move the World™

I-540 - Port Republic Rd @ Bluestone Dr - Econolite Type - ASC/3

**Controller Pedestrian Overlaps**  
**Vehicle / Pedestrian Overlaps (MM) 2-3**

Included	Pedestrian Overlaps
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## City of Harrisonburg, VA



Solutions that Move the World™

I-540 - Port Republic Rd @ Bluestone Dr - Econolite Type - ASC/3

**Controller Start / Flash Data (MM) 2-5****Start Up**

Phase	Phase Setting
1	.
2	G
3	.
4	.
5	.
6	G
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon: No  
Flash Time: 5  
All Red: 5  
Power Start Seq: 1  
MUTCD Enabled: No  
Y->G: n/a

**Automatic Flash**

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon: No  
Exit Flash: W  
Minimum Flash: 8  
Minimum Recall: No

City of Harrisonburg, VA



Solutions that Move the World™

I-540 - Port Republic Rd @ Bluestone Dr - Econolite Type - ASC/3

**Controller Options**

**Controller Options (MM) 2-6-1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I	X					X										
Non-Act II																
Dual Entry																
Cond Service																
Cond Reservice																
Ped Re-Service	X	X	X	X	X											
Rest In Walk																
Flashing Walk																
Ped Clr-Yel				X				X								
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

**Pre-Timed Mode (MM) 2-7**

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

**Phase Recall Options (MM) 2-8**

**Plan # 1**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

**Plan # 2**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

**Plan # 3**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																



Max Recall																				
Soft Recall																				
No Rest																				
AI Calc																				

**Plan # 4**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Configuration Controller Sequence**

**Phase Ring Sequence and Assignment (MM) 1-1-1**

Hardware Alternate Sequence Enable: No

**Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)**

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Sequence 1																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 2																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 3																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 4																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 5																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 6																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 7																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 8																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 9																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 10																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 11																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 12																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 13																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 14																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 15																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 16																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .

**Phases In Use/Exclusive Ped (MM) 1-2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	X	X		X		X										



**Backup Prevent (MM) 1-1-3**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Simultaneous Gap (MM) 1-1-4**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phase	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Load Switch Assignments (MM) 1-3**

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto		X	X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto		X	X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			
10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X



City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	WBLT	EB		SB		WB										
Min Green	5	10	0	7	5	10	0	0	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	27	0	0	0	18	0	0	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	30	45	0	35	0	45	0	0	35	35	35	35	35	35	35	35
Max2	15	25	0	60	0	25	0	0	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.0	2.0	2.0	3.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Controller Overlaps**  
**Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
A	Normal	0.0	0.0	0.0	0.0

**Phases**

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

**PPLT FYA**

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

**Guaranteed Minimum Time Data (MM) 2-4**

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.5	2.0	5
B02	5	0	7	3.5	2.0	5
C03	5	0	7	3.5	2.0	5
D04	5	0	7	3.5	2.0	5
E05	5	0	7	3.5	2.0	5
F06	5	0	7	3.5	2.0	5
G07	5	0	7	3.5	2.0	5
H08	5	0	7	3.5	2.0	5
I09	5	0	7	3.5	2.0	5
J10	5	0	7	3.5	2.0	5
K11	5	0	7	3.5	2.0	5
L12	5	0	7	3.5	2.0	5
M13	5	0	7	3.5	2.0	5
N14	5	0	7	3.5	2.0	5
O15	5	0	7	3.5	2.0	5
P16	5	0	7	3.5	2.0	5

City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Controller Pedestrian Overlaps**  
**Vehicle / Pedestrian Overlaps (MM) 2-3**

Included	Pedestrian Overlaps
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City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Coordination Options**

**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Fixed
Offset Reference	Lead	Use Ped Time	No
Ped Recall	No	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

**Auto Perm Minimum Green (Seconds) (MM) 3-4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Split Demand (MM) 3-5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0



City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Coordination Pattern Data**

**Coordinator Pattern Data (MM) 3-2**

**Coordinator Pattern # 1**

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Seconds
Cycle	114	Std (COS)	9	Offsets In	Seconds
Offset Value	98s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	1		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Splits (Split Pat 1)	20	54	0	40	0	74	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	114s	74s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 2**

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Seconds
Cycle	134	Std (COS)	17	Offsets In	Seconds
Offset Value	80s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Splits (Split Pat 2)	30	72	0	32	0	102	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	134s	102s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 3**

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Seconds
Cycle	108	Std (COS)	25	Offsets In	Seconds
Offset Value	89s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	3		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Splits (Split Pat 3)	20	48	0	40	0	68	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	108s	68s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 4**

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	128	Std (COS)	33	Offsets In	Seconds
Offset Value	88s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	4		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Splits (Split Pat 4)	37	56	0	35	0	93	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	128s	93s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 7**

Split Pattern	7	TS2 (Pat-Off)	2-1	Splits In	Seconds
Cycle	144	Std (COS)	81	Offsets In	Seconds
Offset Value	76s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Splits (Split Pat 7)	30	80	0	34	0	110	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	144s	110s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Coordination Split Pattern**  
**Split Pattern Data (MM) 3-3**

**Split Pattern # 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	20	54	0	40	0	74	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	114s	74s	0s	0s

**Split Pattern # 2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	30	72	0	32	0	102	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	134s	102s	0s	0s

**Split Pattern # 3**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	20	48	0	40	0	68	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	108s	68s	0s	0s

**Split Pattern # 4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	37	56	0	35	0	93	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	128s	93s	0s	0s



**Split Pattern # 7**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	30	80	0	34	0	110	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	144s	110s	0s	0s

**Split Pattern # 20**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	35	80	0	35	0	115	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	115s	0s	0s

**Split Pattern # 21**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	35	80	0	35	0	115	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	115s	0s	0s

**Split Pattern # 22**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	35	80	0	35	0	115	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	115s	0s	0s

**Split Pattern # 23**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	25	55	0	70	0	80	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	80s	0s	0s

**Split Pattern # 24**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	25	45	0	80	0	70	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	70s	0s	0s

**Split Pattern # 25**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	35	80	0	35	0	115	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	115s	0s	0s

**Split Pattern # 26**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	35	80	0	35	0	115	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	115s	0s	0s

**Split Pattern # 27**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	25	65	0	80	0	90	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	170s	90s	0s	0s

**Split Pattern # 31**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	50	75	0	25	0	125	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																

Omit Phase										X	X	X	X	X	X	X	X	X
------------	--	--	--	--	--	--	--	--	--	---	---	---	---	---	---	---	---	---

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	150s	125s	0s	0s

**Split Pattern # 50**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	13	35	0	22	0	48	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	70s	48s	0s	0s

**Split Pattern # 51**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		SB		WB										
Split (seconds)	13	35	0	22	0	48	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase	X								X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	70s	48s	0s	0s

City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Time Base Action Plan**  
**Action Plan (MM) 5-2**

**Action Plan - 1**

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.



**Action Plan - 2**

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 3**

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 4**

Pattern	4	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 10**

Pattern	Free	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

## City of Harrisonburg, VA



Solutions that Move the World™

I-550 - Port Republic Rd @ I-81 SB Ramp - Econolite Type - ASC/3

**Time Base Day Plan/Schedule**  
**Day Plan (MM) 5-3**
**Day Plan #1**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:00
3	2	07:35
4	2	08:00
5	2	08:35
6	2	09:05
7	2	10:30
8	1	19:45
9	10	22:15
10	11	00:00

**Day Plan #2**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:00
3	2	08:15
4	2	09:00
5	2	10:30
6	1	19:45
7	10	23:15
8	11	00:00

**Day Plan #3**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:30
3	10	23:15
4	11	00:00

**Day Plan #4**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:45
3	10	21:15
4	11	00:00

**Day Plan #5**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:15
3	1	10:30
4	1	19:00
5	10	22:00
6	11	00:00

**Day Plan #6**

Event	Action Plan	Start Time
1	10	06:00

2	1	07:15
3	1	10:30
4	1	19:00
5	10	22:00
6	11	00:00

**Day Plan #7**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:30
3	10	22:00
4	11	00:00

**Day Plan #8**

Event	Action Plan	Start Time
1	10	06:00
2	1	10:30
3	10	21:00
4	11	00:00



**Schedule (MM) 5-4****Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X		

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 2**

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
						X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 3**

Day Plan No.: 3

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
							X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 4**

Day Plan No.: 4

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
	X	X	X	X	X	X	X	X	X	X	X
	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		
	X	X	X	X	X	X	X	X	X		

City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Configuration Controller Sequence**

**Phase Ring Sequence and Assignment (MM) 1-1-1**

Hardware Alternate Sequence Enable: No

**Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)**

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Sequence 1																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 2																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 3																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 4																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   7	8   11	12   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 5																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 6																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 7																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 8																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   7	8   12	11   15	16   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 9																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 10																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 11																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 12																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	5	6   8	7   11	12   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 13																
Ring 1	1	2   3	4   9	10   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 14																
Ring 1	2	1   3	4   10	9   13	14   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 15																
Ring 1	1	2   4	3   9	10   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Sequence 16																
Ring 1	2	1   4	3   10	9   14	13   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .
Ring 2	6	5   8	7   12	11   16	15   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .	.   .

**Phases In Use/Exclusive Ped (MM) 1-2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use		X		X	X	X										





**Backup Prevent (MM) 1-1-3**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Simultaneous Gap (MM) 1-1-4**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Load Switch Assignments (MM) 1-3**

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto		X	X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto		X	X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	4	P				-	Auto			
10	2	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction		EB		NB	EBLT	WB										
Min Green	0	10	0	7	5	10	0	0	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	20	0	0	0	16	0	0	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	0	45	0	35	15	45	0	0	35	35	35	35	35	35	35	35
Max2	0	25	0	60	15	25	0	0	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.0	2.0	2.0	3.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Controller Overlaps**  
**Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
A	Normal	0.0	0.0	0.0	0.0

**Phases**

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

**PPLT FYA**

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

**Guaranteed Minimum Time Data (MM) 2-4**

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.5	2.0	5
B02	5	0	7	3.5	2.0	5
C03	5	0	7	3.5	2.0	5
D04	5	0	7	3.5	2.0	5
E05	5	0	7	3.5	2.0	5
F06	5	0	7	3.5	2.0	5
G07	5	0	7	3.5	2.0	5
H08	5	0	7	3.5	2.0	5
I09	5	0	7	3.5	2.0	5
J10	5	0	7	3.5	2.0	5
K11	5	0	7	3.5	2.0	5
L12	5	0	7	3.5	2.0	5
M13	5	0	7	3.5	2.0	5
N14	5	0	7	3.5	2.0	5
O15	5	0	7	3.5	2.0	5
P16	5	0	7	3.5	2.0	5

City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Controller Pedestrian Overlaps**  
**Vehicle / Pedestrian Overlaps (MM) 2-3**

Included	Pedestrian Overlaps
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City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Coordination Options**

**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Fixed
Offset Reference	Lead	Use Ped Time	No
Ped Recall	No	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

**Auto Perm Minimum Green (Seconds) (MM) 3-4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Split Demand (MM) 3-5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Coordination Pattern Data**

**Coordinator Pattern Data (MM) 3-2**

**Coordinator Pattern # 1**

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Seconds
Cycle	114	Std (COS)	9	Offsets In	Seconds
Offset Value	104s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	1		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Splits (Split Pat 1)	0	74	0	40	20	54	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	114s	74s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 2**

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Seconds
Cycle	134	Std (COS)	17	Offsets In	Seconds
Offset Value	94s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Splits (Split Pat 2)	0	102	0	32	30	72	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	134s	102s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 3**

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Seconds
Cycle	108	Std (COS)	25	Offsets In	Seconds
Offset Value	84s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	3		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Splits (Split Pat 3)	0	68	0	40	20	48	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	108s	68s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 4**

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	128	Std (COS)	33	Offsets In	Seconds
Offset Value	94s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	4		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Splits (Split Pat 4)	0	93	0	35	35	58	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	128s	93s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 7**

Split Pattern	7	TS2 (Pat-Off)	2-1	Splits In	Seconds
Cycle	144	Std (COS)	81	Offsets In	Seconds
Offset Value	94s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Splits (Split Pat 7)	0	110	0	34	30	80	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	144s	110s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Coordination Split Pattern**  
**Split Pattern Data (MM) 3-3**

**Split Pattern # 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	74	0	40	20	54	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	114s	74s	0s	0s

**Split Pattern # 2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	102	0	32	30	72	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	134s	102s	0s	0s

**Split Pattern # 3**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	68	0	40	20	48	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	108s	68s	0s	0s

**Split Pattern # 4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	93	0	35	35	58	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	128s	93s	0s	0s



**Split Pattern # 7**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	110	0	34	30	80	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	144s	110s	0s	0s

**Split Pattern # 20**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	110	0	40	60	50	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	110s	0s	0s

**Split Pattern # 21**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	70	0	80	25	45	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	70s	0s	0s

**Split Pattern # 22**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	70	0	80	25	45	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	70s	0s	0s

**Split Pattern # 23**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	115	0	35	35	80	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	115s	0s	0s

**Split Pattern # 24**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	115	0	35	35	80	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	115s	0s	0s

**Split Pattern # 25**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	110	0	40	40	70	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	110s	0s	0s

**Split Pattern # 26**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	110	0	40	40	70	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	110s	0s	0s

**Split Pattern # 27**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	120	0	25	80	65	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	145s	145s	0s	0s

**Split Pattern # 31**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	120	0	30	28	92	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																

Omit Phase										X	X	X	X	X	X	X	X	X
------------	--	--	--	--	--	--	--	--	--	---	---	---	---	---	---	---	---	---

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	150s	120s	0s	0s

**Split Pattern # 50**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	50	0	20	13	35	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	70s	48s	0s	0s

**Split Pattern # 51**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB										
Split (seconds)	0	50	0	20	13	35	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase					X				X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	70s	48s	0s	0s

City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Time Base Action Plan**  
**Action Plan (MM) 5-2**

**Action Plan - 1**

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)

Aux Func (1-3)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 2**

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 3**

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.



**Action Plan - 4**

Pattern	4	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)									
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 10**

Pattern	Free	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								
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Aux Func (1-3)			
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

## City of Harrisonburg, VA



Solutions that Move the World™

I-560 - Port Republic Rd @ I-81 NB Ramp - Econolite Type - ASC/3

**Time Base Day Plan/Schedule**  
**Day Plan (MM) 5-3**
**Day Plan #1**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:00
3	2	07:35
4	2	08:00
5	2	08:35
6	2	09:05
7	2	10:30
8	1	19:45
9	10	22:15
10	11	00:00

**Day Plan #2**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:00
3	2	08:15
4	2	09:00
5	2	10:30
6	1	19:45
7	10	23:15
8	11	00:00

**Day Plan #3**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:30
3	10	23:15
4	11	00:00

**Day Plan #4**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:45
3	10	21:15
4	11	00:00

**Day Plan #5**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:15
3	1	10:30
4	1	19:00
5	10	22:00
6	11	00:00

**Day Plan #6**

Event	Action Plan	Start Time
1	10	06:00

2	1	07:15
3	1	10:30
4	1	19:00
5	10	22:00
6	11	00:00

**Day Plan #7**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:30
3	10	22:00
4	11	00:00

**Day Plan #8**

Event	Action Plan	Start Time
1	10	06:00
2	1	10:30
3	10	21:00
4	11	00:00

**Schedule (MM) 5-4**

**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X		

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 2**

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
						X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 3**

Day Plan No.: 3

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
							X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 4**

Day Plan No.: 4

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
	X	X	X	X	X	X	X	X	X	X	X
	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		
	X	X	X	X	X	X	X	X	X		



City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Configuration Controller Sequence**

**Phase Ring Sequence and Assignment (MM) 1-1-1**

Hardware Alternate Sequence Enable: No

**Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)**

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Sequence 1

Ring 1	1	2	4	8	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	.	.	11	12	15	16	.	.	.	.	.	.	.	.

**Phases In Use/Exclusive Ped (MM) 1-2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use		X		X	X	X		X								
Exclusive Ped																

**Phase Compatibility (MM) 1-1-2**

Phase	
n/a	Barrier Mode

**Phase and Overlap Descriptions**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Description																

**Administration (MM) 1-7-1**

Enable Controller/Cabinet Interlock CRC No  
 CRC (16 bit) 7BF8  
 Enable Automatic Backup to Datakey No

**Backup Prevent (MM) 1-1-3**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Simultaneous Gap (MM) 1-1-4**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phase	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Load Switch Assignments (MM) 1-3**

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto		X	X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto		X	X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			
10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction		EB		NB	EBLT	WB		SB								
Min Green	0	10	7	7	5	10	0	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	5	0	7	0	0	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	17	0	19	0	0	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	0	45	30	15	20	45	0	30	35	35	35	35	35	35	35	35
Max2	0	25	15	10	10	25	0	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.7	4.7	4.2	3.0	4.7	4.7	3.5	4.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.6	2.6	3.8	2.8	2.6	2.6	2.0	3.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Controller Overlaps**  
**Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
---------	------	-----------	--------	-----	------------

**Phases**

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green
---------	-------	----------	---------	-------------	-------------	----------	--------------	--------------	-------------

**PPLT FYA**

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable
A	5	6	Yellow Ped	11	2.0	0.0	0	n/a

**Guaranteed Minimum Time Data (MM) 2-4**

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	2.0	5
B02	5	0	7	3.0	2.0	5
C03	5	0	7	3.0	2.0	5
D04	5	0	7	3.0	2.0	5
E05	5	0	7	3.0	2.0	5
F06	5	0	7	3.0	2.0	5
G07	5	0	7	3.0	2.0	5
H08	5	0	7	3.0	2.0	5
I09	5	0	7	3.0	2.0	5
J10	5	0	7	3.0	2.0	5
K11	5	0	7	3.0	2.0	5
L12	5	0	7	3.0	2.0	5
M13	5	0	7	3.0	2.0	5
N14	5	0	7	3.0	2.0	5
O15	5	0	7	3.0	2.0	5
P16	5	0	7	3.0	2.0	5

City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Controller Pedestrian Overlaps**  
**Vehicle / Pedestrian Overlaps (MM) 2-3**

Included	Pedestrian Overlaps
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City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Coordination Options**

**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	No
Ped Recall	No	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

**Auto Perm Minimum Green (Seconds) (MM) 3-4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Split Demand (MM) 3-5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Coordination Pattern Data**

**Coordinator Pattern Data (MM) 3-2**

**Coordinator Pattern # 1**

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Seconds
Cycle	114	Std (COS)	9	Offsets In	Seconds
Offset Value	109s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	1		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Splits (Split Pat 1)	0	68	0	26	23	45	0	20	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	114s	68s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 2**

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Seconds
Cycle	134	Std (COS)	17	Offsets In	Seconds
Offset Value	107s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Splits (Split Pat 2)	0	79	0	26	25	54	0	29	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	134s	79s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 3**

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Seconds
Cycle	108	Std (COS)	25	Offsets In	Seconds
Offset Value	87s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	3		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Splits (Split Pat 3)	0	40	0	28	21	40	0	19	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	87s	61s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 4**

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	128	Std (COS)	33	Offsets In	Seconds
Offset Value	111s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	4		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Splits (Split Pat 4)	0	48	0	28	23	48	0	29	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	105s	71s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 7**

Split Pattern	7	TS2 (Pat-Off)	2-1	Splits In	Seconds
Cycle	144	Std (COS)	81	Offsets In	Seconds
Offset Value	108s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Splits (Split Pat 7)	0	87	0	26	26	61	0	31	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	144s	87s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Coordination Split Pattern**  
**Split Pattern Data (MM) 3-3**

**Split Pattern # 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	68	0	26	23	45	0	20	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	114s	68s	0s	0s

**Split Pattern # 2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	79	0	26	25	54	0	29	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	134s	79s	0s	0s

**Split Pattern # 3**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	40	0	28	21	40	0	19	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	87s	61s	0s	0s

**Split Pattern # 4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	48	0	28	23	48	0	29	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	105s	71s	0s	0s



**Split Pattern # 7**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	87	0	26	26	61	0	31	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	144s	87s	0s	0s

**Split Pattern # 20**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	92	0	28	28	64	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	92s	0s	0s

**Split Pattern # 21**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	92	0	28	28	64	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	92s	0s	0s

**Split Pattern # 22**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	92	0	28	28	64	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	92s	0s	0s

**Split Pattern # 23**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	92	0	28	28	64	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	92s	0s	0s

**Split Pattern # 24**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	92	0	28	28	64	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	92s	0s	0s

**Split Pattern # 25**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	92	0	28	28	64	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	92s	0s	0s

**Split Pattern # 26**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	92	0	28	28	64	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	150s	92s	0s	0s

**Split Pattern # 27**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	84	0	28	28	84	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	142s	112s	0s	0s

**Split Pattern # 31**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	71	0	28	26	45	0	51	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																

Omit Phase										X	X	X	X	X	X	X	X	X
------------	--	--	--	--	--	--	--	--	--	---	---	---	---	---	---	---	---	---

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	150s	71s	0s	0s

**Split Pattern # 50**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	38	0	13	15	24	0	18	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	69s	39s	0s	0s

**Split Pattern # 51**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		EB		NB	EBLT	WB		SB								
Split (seconds)	0	38	0	13	15	24	0	18	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase					X				X	X	X	X	X	X	X	X

<b>Ring</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Split Sum	69s	39s	0s	0s

City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Time Base Action Plan**  
**Action Plan (MM) 5-2**

**Action Plan - 1**

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)

Aux Func (1-3)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 2**

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 3**

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.



**Action Plan - 4**

Pattern	4	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 10**

Pattern	Free	Override Sys	No
Timing Plan	1	Sequence	3
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall		X				X										
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

## City of Harrisonburg, VA



Solutions that Move the World™

I-780 - Port Republic Rd @ Forest Hill Rd - Econolite Type - ASC/3

**Time Base Day Plan/Schedule**  
**Day Plan (MM) 5-3**
**Day Plan #1**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:00
3	2	07:35
4	2	08:00
5	2	08:35
6	2	09:05
7	2	10:30
8	1	19:45
9	10	22:15
10	11	00:00

**Day Plan #2**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:00
3	2	08:15
4	2	09:00
5	2	10:30
6	1	19:45
7	10	23:15
8	11	00:00

**Day Plan #3**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:30
3	10	23:15
4	11	00:00

**Day Plan #4**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:45
3	10	21:15
4	11	00:00

**Day Plan #5**

Event	Action Plan	Start Time
1	10	06:00
2	1	07:15
3	1	10:30
4	1	19:00
5	10	22:00
6	11	00:00

**Day Plan #6**

Event	Action Plan	Start Time
1	10	06:00

2	1	07:15
3	1	10:30
4	1	19:00
5	10	22:00
6	11	00:00

**Day Plan #7**

Event	Action Plan	Start Time
1	10	06:00
2	1	09:30
3	10	22:00
4	11	00:00

**Day Plan #8**

Event	Action Plan	Start Time
1	10	06:00
2	1	10:30
3	10	21:00
4	11	00:00

**Schedule (MM) 5-4**

**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X		

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 2**

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
						X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 3**

Day Plan No.: 3

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
							X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 4**

Day Plan No.: 4

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
	X	X	X	X	X	X	X	X	X	X	X
	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		
	X	X	X	X	X	X	X	X	X		



City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Configuration Controller Sequence**

**Phase Ring Sequence and Assignment (MM) 1-1-1**

Hardware Alternate Sequence Enable: No

**Phase Ring Sequence**.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Sequence 1

Ring 1	1	2	4	8	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	.	.	11	12	15	16	.	.	.	.	.	.	.	.

**Phases In Use/Exclusive Ped (MM) 1-2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	X	X		X	X	X		X								
Exclusive Ped																

**Phase Compatibility (MM) 1-1-2**

Phase	
n/a	Barrier Mode

**Phase and Overlap Descriptions**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Description																

**Administration (MM) 1-7-1**

Enable Controller/Cabinet Interlock CRC No  
 CRC (16 bit) 0617  
 Enable Automatic Backup to Datakey No

**Backup Prevent (MM) 1-1-3**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Simultaneous Gap (MM) 1-1-4**

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Load Switch Assignments (MM) 1-3**

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto		X	X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto		X	X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			
10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	WBLT	EB		NB	EBLT	WB		SB								
Min Green	5	10	0	7	5	10	0	7	7	7	7	7	7	7	7	7
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	7	0	5	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	15	0	23	0	15	0	22	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	45	0	20	15	45	0	20	35	35	35	35	35	35	35	35
Max2	10	45	0	20	10	45	0	15	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.5	3.5	3.5	3.0	3.5	3.5	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Red Clear	2.5	2.5	2.0	3.0	2.5	2.5	2.0	3.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Controller Overlaps**  
**Vehicle Overlaps (MM) 2-2**

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
A	Normal	0.0	0.0	0.0	0.0

**Phases**

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

**PPLT FYA**

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

**Guaranteed Minimum Time Data (MM) 2-4**

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	2.0	5
B02	5	0	7	3.0	2.0	5
C03	5	0	7	3.0	2.0	5
D04	5	0	7	3.0	2.0	5
E05	5	0	7	3.0	2.0	5
F06	5	0	7	3.0	2.0	5
G07	5	0	7	3.0	2.0	5
H08	5	0	7	3.0	2.0	5
I09	5	0	7	3.0	2.0	5
J10	5	0	7	3.0	2.0	5
K11	5	0	7	3.0	2.0	5
L12	5	0	7	3.0	2.0	5
M13	5	0	7	3.0	2.0	5
N14	5	0	7	3.0	2.0	5
O15	5	0	7	3.0	2.0	5
P16	5	0	7	3.0	2.0	5

City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Controller Pedestrian Overlaps**  
**Vehicle / Pedestrian Overlaps (MM) 2-3**

Included	Pedestrian Overlaps
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City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Coordination Options**

**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Fixed
Offset Reference	Lead	Use Ped Time	No
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

**Auto Perm Minimum Green (Seconds) (MM) 3-4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Split Demand (MM) 3-5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Coordination Pattern Data**

**Coordinator Pattern Data (MM) 3-2**

**Coordinator Pattern # 1**

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Seconds
Cycle	114	Std (COS)	9	Offsets In	Seconds
Offset Value	0s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reserve	No	Action Plan	1		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Splits (Split Pat 1)	18	37	0	34	15	40	0	25	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	114s	55s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 2**

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Seconds
Cycle	134	Std (COS)	17	Offsets In	Seconds
Offset Value	9s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Splits (Split Pat 2)	18	48	0	34	18	48	0	34	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	134s	66s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 4**

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	128	Std (COS)	33	Offsets In	Seconds
Offset Value	5s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	4		
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Splits (Split Pat 4)	18	43	0	34	18	43	0	33	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	128s	61s	0s	0s

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Coordination Split Pattern**  
**Split Pattern Data (MM) 3-3**

**Split Pattern # 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Split (seconds)	18	37	0	34	15	40	0	25	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	114s	55s	0s	0s

**Split Pattern # 2**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Split (seconds)	18	48	0	34	18	48	0	34	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	134s	66s	0s	0s

**Split Pattern # 4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Split (seconds)	18	43	0	34	18	43	0	33	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	128s	61s	0s	0s

**Split Pattern # 50**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Split (seconds)	13	24	0	18	13	24	0	15	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	70s	37s	0s	0s

**Split Pattern # 51**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	WBLT	EB		NB	EBLT	WB		SB								
Split (seconds)	13	24	0	18	13	24	0	15	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase	X				X				X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	70s	37s	0s	0s



City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Time Base Action Plan**  
**Action Plan (MM) 5-2**

**Action Plan - 1**

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)

Aux Func (1-3)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 2**

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

**Action Plan - 3**

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

**Action Plan - 4**

Pattern	4	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	1	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**Action Plan - 10**

Pattern	Free	Override Sys	No
Timing Plan	1	Sequence	1
Veh Detector Plan	2	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	2	Ped Det Diag Plan	1
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

## City of Harrisonburg, VA



Solutions that Move the World™

I-670 - Port Republic Rd @ Devon Ln - Econolite Type - ASC/3

**Time Base Day Plan/Schedule****Day Plan (MM) 5-3****Day Plan #1**

Event	Action Plan	Start Time
1	10	06:00
2	10	07:00
3	2	15:00
4	10	18:30
5	11	00:00

**Day Plan #2**

Event	Action Plan	Start Time
1	10	06:00
2	2	14:00
3	10	18:00
4	11	02:00

**Day Plan #3**

Event	Action Plan	Start Time
1	10	06:00
2	10	09:30
3	10	23:15
4	11	02:00

**Day Plan #4**

Event	Action Plan	Start Time
1	10	06:00
2	10	09:45
3	10	21:15
4	11	00:00

**Day Plan #5**

Event	Action Plan	Start Time
1	10	06:00
2	10	07:15
3	10	10:30
4	10	19:00
5	10	22:00
6	11	00:00

**Day Plan #6**

Event	Action Plan	Start Time
1	10	06:00
2	10	07:15
3	10	10:30
4	10	19:00
5	10	22:00
6	11	00:00

**Day Plan #7**

Event	Action Plan	Start Time
1	10	06:00

1	10	06:00
2	10	09:30
3	10	22:00
4	11	00:00

**Day Plan #8**

Event	Action Plan	Start Time
1	10	06:00
2	10	10:30
3	10	21:00
4	11	00:00



**Schedule (MM) 5-4**

**Schedule Number - 1**

Day Plan No.: 5

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X		

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 2**

Day Plan No.: 6

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
						X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 3**

Day Plan No.: 7

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
							X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

**Schedule Number - 4**

Day Plan No.: 8

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
	X	X	X	X	X	X	X	X	X	X	X
	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		
	X	X	X	X	X	X	X	X	X		

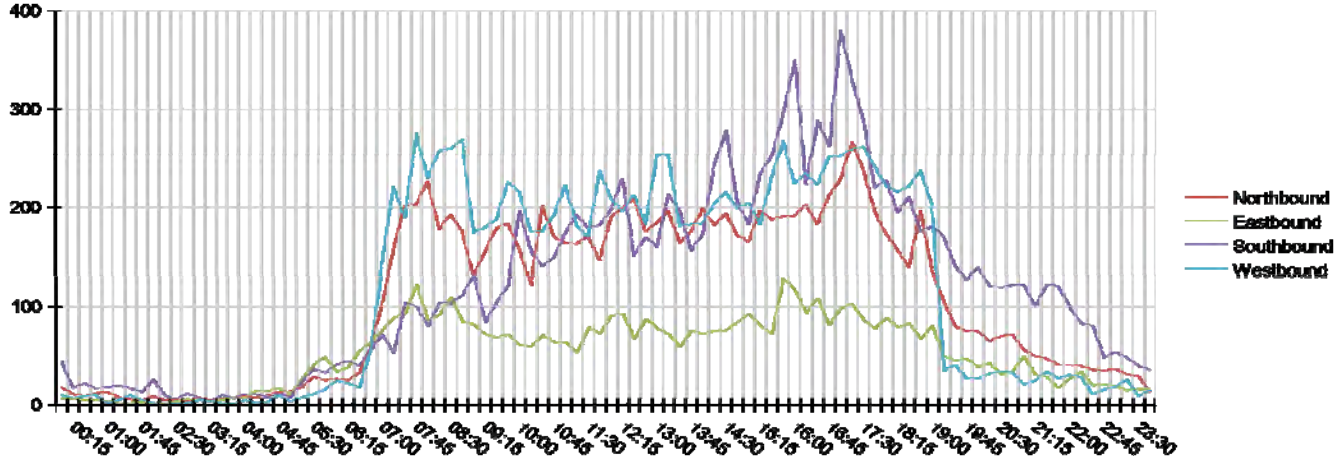
## Appendix C

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October 3, 2018 Port Republic Road Turning Movement Counts

Intersection S Main st & Port Republic  
Date 10/3/2018

	Right	Through	Left	UTurn	Total
Northbound	3763	5789	721	16	10289
Eastbound	1349	3340	356	26	5071
Southbound	573	6055	4992	68	11688
Westbound	5231	3368	2723	24	11346
<b>Total</b>	<b>10916</b>	<b>18552</b>	<b>8792</b>	<b>134</b>	<b>38394</b>



	Northbound				Eastbound				Southbound				Westbound			
	R	T	L	U	R	T	L	U	R	T	L	U	R	T	L	U
00:00	12	6	0	0	1	5	0	0	2	17	25	0	6	2	2	0
00:15	4	7	0	0	0	6	1	0	0	8	9	0	5	1	1	0
00:30	6	3	0	0	0	5	0	0	3	5	14	0	7	0	2	0
00:45	9	3	0	0	0	5	0	0	2	7	8	0	4	3	3	0
01:00	7	6	0	0	0	3	1	0	0	8	10	0	1	0	0	0
01:15	4	4	0	0	1	1	0	0	0	6	14	0	5	0	0	0
01:30	4	2	0	0	0	2	0	0	0	8	8	1	6	1	3	0
01:45	2	2	1	0	1	2	0	0	0	8	5	0	4	0	1	0
02:00	6	3	0	0	0	0	0	0	1	12	13	0	2	0	0	0
02:15	2	3	0	0	0	1	0	0	0	7	3	0	2	0	0	0
02:30	3	2	0	0	1	3	0	0	0	3	3	0	1	0	0	0
02:45	1	3	0	0	2	3	1	0	1	9	2	0	1	0	1	0
03:00	2	6	0	0	0	5	0	0	0	3	4	0	4	1	0	0
03:15	2	3	0	0	2	2	0	0	0	4	0	0	3	0	1	0
03:30	3	3	0	0	3	2	0	0	1	7	2	0	1	1	0	0
03:45	2	6	0	0	2	4	2	0	1	5	1	0	0	0	1	0
04:00	3	6	0	0	4	3	0	0	0	4	7	0	4	1	0	0
04:15	4	4	0	0	8	6	1	0	0	10	1	0	2	0	0	0
04:30	4	6	0	0	7	7	0	0	0	6	2	0	0	1	2	0
04:45	7	6	0	0	7	10	0	0	1	10	0	0	7	1	2	0
05:00	6	7	1	0	3	8	0	0	0	6	2	0	4	0	0	0
05:15	9	9	0	0	14	13	0	0	0	21	3	0	6	2	0	0
05:30	17	12	0	0	21	19	1	0	1	32	4	0	8	2	1	0
05:45	15	10	0	0	20	27	2	0	3	23	7	0	10	3	3	0
06:00	20	7	0	0	12	22	0	0	1	29	11	0	17	5	3	0
06:15	14	11	0	0	8	27	3	0	1	27	17	0	17	1	4	0
06:30	20	12	1	0	10	44	1	0	0	31	9	0	11	4	2	1
06:45	29	30	1	0	22	41	1	0	7	36	13	0	22	19	16	0
07:00	33	65	6	0	20	52	3	1	2	42	27	1	80	30	31	1
07:15	54	93	10	0	10	67	11	1	0	37	15	1	118	62	42	0
07:30	63	129	9	1	16	69	8	0	4	62	38	0	115	50	24	0
07:45	55	130	18	0	28	85	9	1	4	47	43	6	160	76	39	1
08:00	59	149	18	1	22	58	5	1	4	48	24	4	140	58	32	0
08:15	60	104	14	0	23	59	8	2	9	58	38	0	152	62	43	1
08:30	47	128	18	0	28	65	16	1	8	57	36	2	163	67	29	1
08:45	71	88	17	0	18	50	17	0	7	67	37	1	161	65	43	1
09:00	46	77	7	0	22	54	5	1	4	84	44	0	86	64	24	0
09:15	46	98	11	0	21	45	5	1	3	54	27	0	81	62	37	0
09:30	65	106	8	0	26	37	6	0	7	57	39	2	112	49	27	0
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10:45	50	115	5	0	20	42	2	0	8	90	49	2	85	65	42	0
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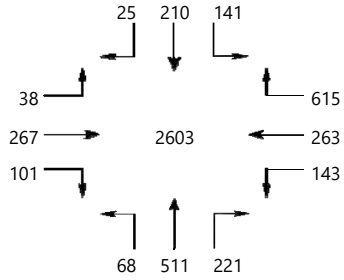
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11:45	47	82	16	1	27	40	5	1	5	104	73	0	111	74	53	0
12:00	64	108	19	0	25	59	7	0	8	107	83	0	82	76	51	0
12:15	69	114	16	0	32	56	5	0	4	113	113	0	69	68	57	2
12:30	60	137	12	0	18	43	5	1	5	90	56	0	95	57	60	1
12:45	65	90	18	2	24	56	6	2	5	115	50	0	93	51	39	0
13:00	53	103	29	0	24	45	9	0	9	88	62	1	113	74	67	0
13:15	61	114	21	0	19	46	5	2	7	114	91	2	105	75	74	0
13:30	58	101	5	0	16	39	4	0	4	109	83	0	92	49	40	0
13:45	56	103	17	0	19	53	3	1	4	98	53	1	87	42	54	0
14:00	72	118	9	0	15	45	11	1	4	111	57	1	84	55	45	0
14:15	52	116	13	1	22	50	4	0	7	122	114	1	98	56	50	0
14:30	70	111	12	1	20	55	1	0	12	136	131	0	69	70	77	0
14:45	50	101	21	0	28	49	7	0	10	113	83	0	87	53	57	2
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15:15	67	121	9	0	12	64	5	0	14	112	107	1	70	61	52	0
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15:45	72	105	14	0	25	94	10	0	10	133	152	2	116	76	75	1
16:00	73	95	23	0	30	83	4	1	9	150	189	2	70	85	67	2
16:15	75	116	11	1	25	64	5	0	12	128	83	0	87	71	77	0
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17:00	97	110	20	1	16	75	7	0	14	191	173	2	88	95	69	1
17:15	91	143	33	0	31	69	3	0	14	146	167	2	87	95	75	2
17:30	91	127	21	0	29	52	6	0	13	152	122	0	87	94	81	0
17:45	71	106	19	0	15	52	11	0	8	117	91	4	96	81	65	0
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18:30	58	66	14	1	17	57	8	1	3	90	114	4	102	73	47	0
18:45	81	102	11	3	18	47	2	0	3	78	93	1	104	58	76	0
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22:00	22	19	0	0	5	18	4	0	11	49	40	0	13	8	10	0
22:15	24	16	0	0	5	27	2	0	13	31	39	0	11	9	8	0
22:30	23	11	2	0	3	17	0	0	9	32	40	0	4	5	2	0
22:45	19	16	0	0	0	21	0	0	6	20	21	1	7	5	4	0
23:00	16	19	2	0	5	12	2	0	6	28	20	0	11	2	5	0
23:15	17	14	0	0	5	9	1	0	4	20	24	0	11	4	11	0
23:30	16	14	0	0	4	10	2	0	1	14	25	0	9	0	0	0
23:45	8	5	0	0	3	12	1	0	3	15	18	0	10	4	1	0
<b>Total</b>	<b>3763</b>	<b>5789</b>	<b>721</b>	<b>16</b>	<b>1349</b>	<b>3340</b>	<b>356</b>	<b>26</b>	<b>573</b>	<b>6055</b>	<b>4992</b>	<b>68</b>	<b>5231</b>	<b>3368</b>	<b>2723</b>	<b>24</b>



**Intersection** S Main st & Port Republic  
**Date** 10/3/2018

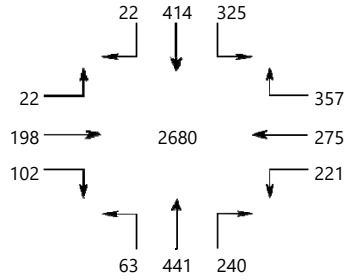
### AM PEAK HOUR VOLUME (0:00-10:45)

FROM 07:45 TO 08:45



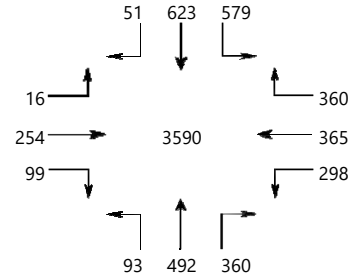
### MID-DAY PEAK HOUR VOLUME (11:00-14:00)

FROM 11:45 TO 12:45



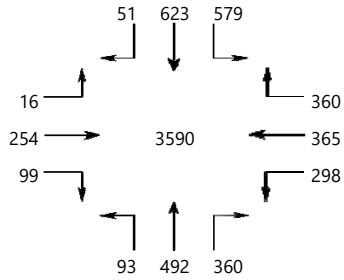
### PM PEAK HOUR VOLUME (14:15-23:45)

FROM 16:45 TO 17:45



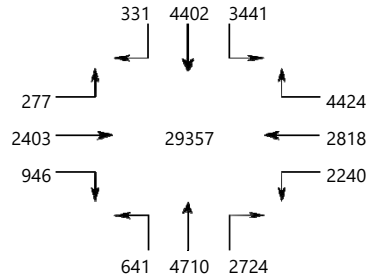
### OVERALL PEAK HOUR VOLUME

FROM 16:45 TO 17:45



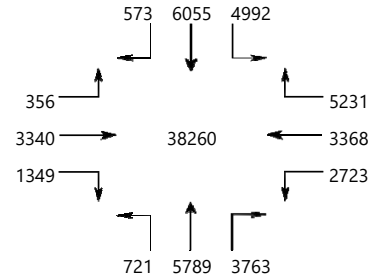
### DAYTIME TOTAL VOLUME

FROM 07:00 TO 18:00



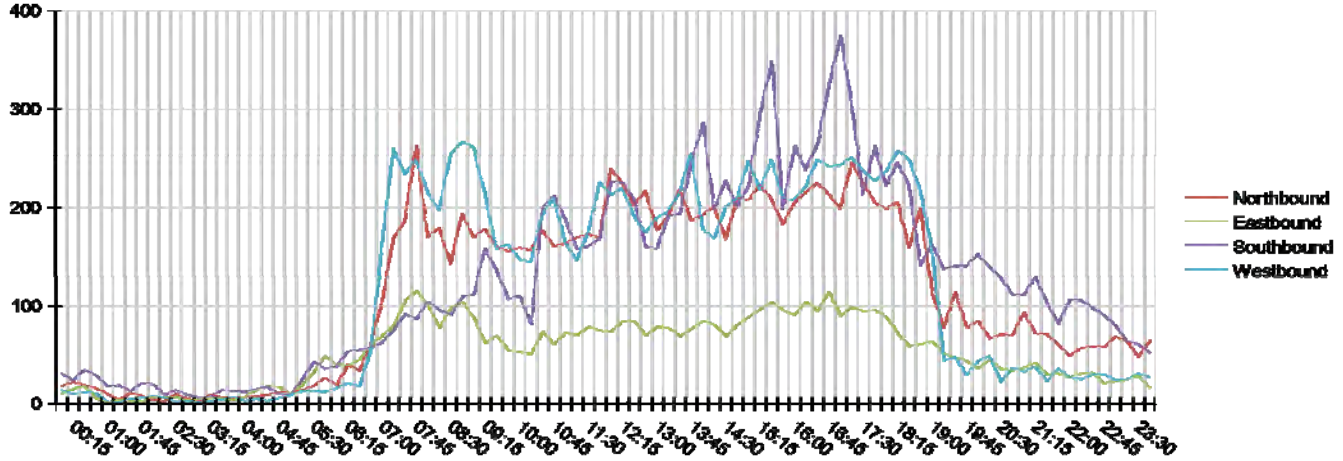
### SELECTED TIME VOLUME

FROM 00:00 TO 23:59



Intersection S Main st & Port Republic  
Date 10/4/2018

	Right	Through	Left	UTurn	Total
Northbound	4045	6207	750	24	11026
Eastbound	1508	3207	370	18	5103
Southbound	622	6265	5096	61	12044
Westbound	5103	3315	2829	29	11276
<b>Total</b>	<b>11278</b>	<b>18994</b>	<b>9045</b>	<b>132</b>	<b>39449</b>



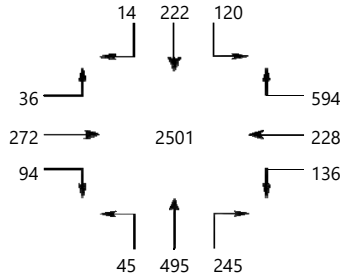
	Northbound				Eastbound				Southbound				Westbound			
	R	T	L	U	R	T	L	U	R	T	L	U	R	T	L	U
00:00	10	8	0	0	2	7	1	0	1	20	10	0	9	3	2	0
00:15	18	4	0	0	4	8	3	0	7	7	10	0	6	3	1	0
00:30	9	10	0	0	5	12	1	0	4	16	15	0	7	3	2	0
00:45	11	5	0	0	1	4	1	0	2	9	18	0	7	2	2	0
01:00	3	7	0	0	0	0	1	0	1	11	6	0	1	0	1	0
01:15	3	1	0	0	0	3	1	0	3	8	8	0	0	0	1	0
01:30	6	5	0	0	0	3	0	0	1	3	9	0	1	1	3	0
01:45	2	6	0	0	0	1	1	0	0	6	15	0	6	0	0	0
02:00	2	2	0	0	5	2	0	0	2	10	8	0	7	1	0	0
02:15	2	1	0	0	2	3	1	0	0	3	6	0	3	3	0	0
02:30	4	5	1	0	1	6	0	0	1	8	5	0	1	1	0	0
02:45	2	3	0	0	1	2	0	0	0	4	5	0	3	0	0	0
03:00	0	3	0	0	0	4	0	0	0	6	1	0	1	0	0	0
03:15	3	6	0	0	4	2	0	0	0	5	2	0	1	1	1	0
03:30	4	3	0	0	2	3	0	0	1	9	4	0	2	0	2	0
03:45	3	3	0	0	1	3	0	0	0	9	4	0	3	2	2	0
04:00	6	1	0	0	3	4	0	0	1	9	2	0	2	1	0	0
04:15	2	6	0	0	9	5	0	0	1	11	3	0	5	0	0	0
04:30	4	5	0	0	8	10	0	0	0	12	5	0	1	2	0	0
04:45	9	3	0	0	6	11	0	0	0	7	3	0	4	2	0	0
05:00	7	4	0	0	1	8	1	0	1	7	1	0	3	3	3	0
05:15	7	7	0	0	7	12	0	0	2	19	4	0	11	2	0	0
05:30	10	8	0	0	19	12	1	0	2	31	10	0	11	1	1	0
05:45	10	17	0	0	25	21	3	0	5	29	2	0	6	1	5	0
06:00	12	7	0	0	11	28	1	0	4	22	12	0	10	4	2	0
06:15	25	15	0	0	10	28	1	0	1	39	14	0	16	3	2	0
06:30	15	19	0	0	14	29	2	0	5	36	14	0	10	5	3	0
06:45	32	28	1	0	19	38	2	0	5	36	16	0	27	15	13	0
07:00	42	60	3	1	21	44	5	0	3	38	22	0	97	30	34	0
07:15	62	96	10	1	22	52	6	0	1	53	22	0	172	48	40	0
07:30	58	121	8	0	15	82	9	0	2	51	39	0	152	56	26	0
07:45	62	184	17	0	30	73	12	1	3	54	27	3	144	73	31	1
08:00	63	94	10	3	27	65	9	0	8	64	32	1	126	51	39	0
08:15	67	99	13	1	25	48	5	0	5	56	31	4	112	52	33	0
08:30	23	110	10	0	31	55	12	0	9	49	31	2	147	69	39	0
08:45	61	118	16	0	23	61	21	0	5	70	32	3	164	74	29	0
09:00	55	101	14	0	25	60	3	0	5	62	42	3	160	67	34	0
09:15	57	107	15	0	18	36	7	1	7	83	69	0	113	61	40	0
09:30	49	98	12	2	26	41	3	0	4	87	45	1	67	53	39	0
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11:15	56	98	16	0	25	38	5	2	6	96	55	2	56	44	47	0
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11:45	54	104	12	0	28	44	3	0	9	103	55	2	110	53	63	0
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12:15	60	142	22	0	20	59	5	1	6	104	114	1	96	72	51	1
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13:00	63	98	16	0	20	52	7	0	13	90	54	2	83	58	49	0
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13:30	70	138	10	1	12	54	3	0	10	110	71	3	101	49	66	0
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14:15	55	126	20	0	32	43	6	0	7	111	80	0	61	49	59	0
14:30	55	106	7	0	14	50	5	0	9	126	91	2	71	62	68	0
14:45	68	125	17	0	25	54	2	0	8	118	73	1	90	65	54	0
15:00	72	118	18	0	23	66	0	0	3	102	115	2	107	83	58	0
15:15	75	128	20	0	19	68	10	0	12	136	148	2	82	69	67	0
15:30	75	121	13	0	36	62	5	1	14	166	169	0	101	77	67	4
15:45	55	112	15	1	32	51	13	0	15	97	85	1	67	85	56	1
16:00	79	112	14	0	27	57	7	0	7	132	123	1	73	63	72	0
16:15	75	119	22	0	30	73	2	0	10	129	97	2	83	72	67	0
16:30	84	117	24	0	24	66	5	0	12	134	120	0	95	95	58	1
16:45	87	105	22	0	34	79	2	0	13	142	169	2	112	65	65	0
17:00	76	102	20	1	19	65	6	0	18	187	169	1	82	80	81	0
17:15	85	126	34	1	27	69	2	1	14	168	118	0	91	89	69	2
17:30	105	99	20	1	25	60	10	0	12	110	90	1	76	91	71	0
17:45	77	118	11	0	29	59	7	1	9	131	123	0	86	79	62	0
18:00	75	105	18	1	27	56	6	0	6	120	95	1	97	81	59	0
18:15	70	115	21	0	18	48	6	0	8	107	130	1	113	70	74	1
18:30	68	79	13	0	10	48	1	0	4	101	118	0	107	71	71	0
18:45	76	110	11	3	9	48	4	0	4	67	70	0	104	58	55	0
19:00	53	54	6	0	20	40	4	0	13	84	67	0	47	59	53	0
19:15	26	52	0	0	20	27	5	0	16	58	64	0	16	14	12	2
19:30	47	68	0	0	13	29	5	0	10	71	60	0	20	13	14	1
19:45	32	43	3	0	8	34	2	0	6	67	68	0	7	11	10	1
20:00	38	42	5	0	12	22	2	0	16	69	67	1	15	13	16	0
20:15	28	38	0	1	13	26	6	0	13	61	67	0	19	15	12	3
20:30	31	38	2	0	14	21	1	0	12	59	56	2	10	5	7	0
20:45	30	38	2	0	12	20	2	0	11	50	51	0	18	7	11	1
21:00	52	40	2	0	11	24	2	0	17	54	41	0	8	9	15	1
21:15	28	43	1	0	11	30	1	0	15	70	44	1	17	10	10	1
21:30	34	37	0	0	11	18	1	0	3	48	53	0	8	7	8	0
21:45	35	23	3	0	6	22	3	0	4	40	38	0	18	8	10	0
22:00	26	23	0	0	7	18	1	1	7	48	52	0	9	7	10	1
22:15	33	21	3	0	10	16	5	0	8	44	53	1	11	7	6	1
22:30	36	23	0	0	7	22	3	0	17	32	49	0	8	9	13	0
22:45	33	23	2	0	4	15	2	0	11	44	36	0	12	8	10	0
23:00	43	23	2	1	5	17	1	0	8	41	31	0	7	8	9	0
23:15	41	22	1	0	8	15	2	0	3	37	24	0	11	7	7	0
23:30	34	13	1	0	10	18	1	0	7	28	26	0	12	7	12	0
23:45	46	14	5	0	4	12	0	0	7	31	14	0	11	3	13	0
<b>Total</b>	<b>4045</b>	<b>6207</b>	<b>750</b>	<b>24</b>	<b>1508</b>	<b>3207</b>	<b>370</b>	<b>18</b>	<b>622</b>	<b>6265</b>	<b>5096</b>	<b>61</b>	<b>5103</b>	<b>3315</b>	<b>2829</b>	<b>29</b>

**Intersection** S Main st & Port Republic  
**Date** 10/4/2018

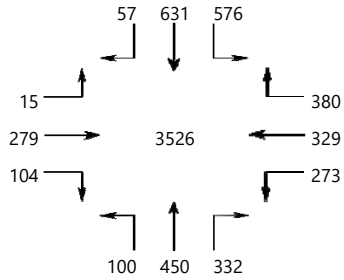
### AM PEAK HOUR VOLUME (0:00-10:45)

FROM 07:15 TO 08:15



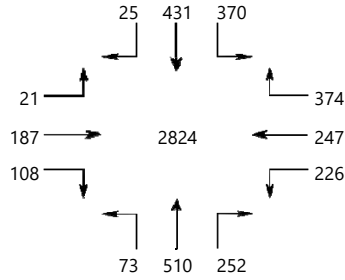
### OVERALL PEAK HOUR VOLUME

FROM 16:30 TO 17:30



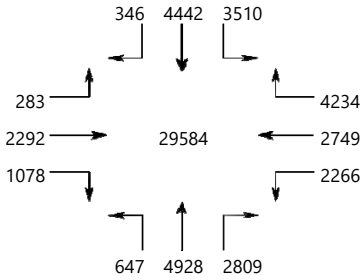
### MID-DAY PEAK HOUR VOLUME (11:00-14:00)

FROM 11:45 TO 12:45



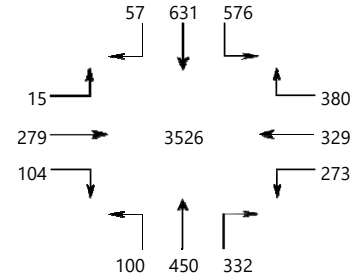
### DAYTIME TOTAL VOLUME

FROM 07:00 TO 18:00



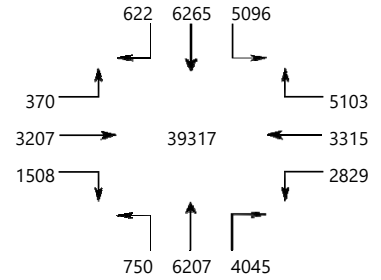
### PM PEAK HOUR VOLUME (14:15-23:45)

FROM 16:30 TO 17:30



### SELECTED TIME VOLUME

FROM 00:00 TO 23:59



### Port Republic Road and Hillcrest Drive

Time	WB Left	NB Right	NB Left	EB Right
7:00	0	0	0	0
7:15	0	0	0	0
7:30	0	0	0	1
7:45	0	1	0	1
8:00	1	0	0	0
8:15	0	1	0	0
8:30	0	0	0	0
8:45	0	0	0	0
9:00	0	0	1	0
9:15	0	0	0	0
9:30	0	0	0	0
9:45	0	0	1	0
11:00	0	1	0	0
11:15	0	0	0	1
11:30	0	0	0	0
11:45	1	1	0	1
12:00	0	0	0	0
12:15	0	0	0	1
12:30	0	0	0	0
12:45	0	0	0	0
13:00	0	0	0	0
13:15	1	0	0	0
13:30	0	0	0	1
13:45	0	1	0	0
16:00	0	5	1	1
16:15	1	1	0	1
16:30	0	0	0	3
16:45	0	0	0	1
17:00	2	0	0	0
17:15	1	1	0	0
17:30	1	0	0	0
17:45	3	0	1	1
18:00	3	1	0	0
18:15	1	0	0	0
18:30	3	0	0	1
18:45	2	0	0	0



### Port Republic and Hillside Drive - North Leg

Time	SB Right	SB Thru	SB Left	WB Right	WB Thru	WB Left	NB Right	NB Thru	NB Left	EB Right	EB Thru	EB Left
7:00	0	0	0	0	0	0				0	0	0
7:15	2	0	3	1	0	0				0	0	0
7:30	0	0	1	4	0	0				0	0	0
7:45	0	0	1	1	0	0				0	0	0
8:00	1	0	2	2	0	0				0	0	1
8:15	3	0	5	6	0	0				0	0	1
8:30	0	0	4	3	0	0				0	0	1
8:45	1	0	3	3	0	0				0	0	0
9:00	0	0	5	2	0	0				0	0	0
9:15	1	0	2	1	0	0				0	0	0
9:30	0	0	1	1	0	0				0	0	0
9:45	0	0	4	2	0	0				0	0	0
10:00												
16:00	2	0	4	4	0	0				0	0	2
16:15	0	0	1	4	0	0				0	0	1
16:30	0	0	0	0	0	0				0	0	0
16:45	0	0	3	0	0	0				0	0	3
17:00	4	0	1	0	0	0				0	0	0
17:15	2	0	3	3	0	0				0	0	0
17:30	0	0	0	1	0	0				0	0	0
17:45	0	0	3	7	0	0				0	0	0
18:00	0	0	0	4	0	0				0	0	0
18:15	0	0	2	5	0	0				0	0	0
18:30	0	0	3	0	0	0				0	0	0
18:45	0	0	0	3	0	0				0	0	2

Port Republic Road and Crawford Avenue

Time	WB Left	NB Right	NB Left	EB Right
7:00	4	9	1	1
7:15	2	4	0	0
7:30	6	7	0	0
7:45	2	10	0	2
8:00	6	6	0	0
8:15	2	7	0	0
8:30	2	1	0	0
8:45	2	3	0	0
11:00	3	2	1	0
11:15	2	1	0	0
11:30	1	1	1	1
11:45	4	6	1	3
12:00	2	4	0	2
12:15	4	5	0	2
12:30	6	2	1	2
12:45	4	5	0	0
13:00	4	3	0	2
13:15	2	2	0	0
13:30	2	3	1	0
13:45	3	6	0	2
16:00	3	3	0	0
16:15	2	9	0	0
16:30	5	2	0	0
16:45	4	4	0	0
17:00	2	6	0	0
17:15	4	2	0	0
17:30	5	8	0	0
17:45	10	13	1	1
18:00	8	8	0	0
18:15	9	6	0	5
18:30	4	3	0	3
18:45	5	12	1	1

**VEHICLES TURNING MOVEMENT COUNT - SUMMARY**

Intersection of: Port Republic Road  
and: Bluestone Drive - Hillside Avenue  
Location: Rockingham County, Virginia

Counted by: VCU  
Date: April 04, 2018  
Weather: Mild, Light Rain  
Entered by: CK

Wednesday  
Star Rating: 5



TIME	TRAFFIC FROM NORTH on: Port Republic Road					TRAFFIC FROM SOUTH on: Port Republic Road					TRAFFIC FROM EAST on: Bluestone Drive					TRAFFIC FROM WEST on: Hillside Avenue					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
<b>AM</b>																					
7:00 - 7:15	4	80	10	0	94	24	106	19	0	149	4	1	7	0	12	11	2	6	0	19	274
7:15 - 7:30	9	121	26	0	156	59	180	21	0	260	3	1	6	0	10	14	3	10	0	27	453
7:30 - 7:45	5	77	30	0	112	131	226	31	0	388	14	0	8	0	22	9	3	14	0	26	548
7:45 - 8:00	4	108	43	0	155	95	247	24	0	366	10	2	10	0	22	14	6	10	0	30	573
8:00 - 8:15	9	120	28	0	157	47	214	21	0	282	10	1	10	1	22	12	4	9	0	25	486
8:15 - 8:30	8	140	29	0	177	46	202	22	0	270	7	1	11	0	19	9	3	9	0	21	487
8:30 - 8:45	8	111	17	0	136	55	255	30	0	340	11	4	10	0	25	14	6	14	0	34	535
8:45 - 9:00	17	133	35	0	185	69	261	29	0	359	14	4	34	0	52	11	3	6	0	20	616
9:00 - 9:15	11	128	22	0	161	57	189	26	1	273	38	1	64	0	103	14	5	6	0	25	562
9:15 - 9:30	9	112	13	0	134	39	140	14	0	193	4	0	14	0	18	14	1	6	0	21	366
9:30 - 9:45	16	114	19	0	149	32	179	31	0	242	12	4	17	0	33	16	4	6	0	26	450
9:45 - 10:00	11	167	28	0	206	77	201	43	0	321	20	0	23	0	43	14	3	8	0	25	595
10:00 - 10:15	14	150	21	0	185	36	149	30	0	215	42	7	57	0	106	27	3	10	0	40	546
10:15 - 10:30	10	130	17	0	157	31	187	26	0	244	8	5	15	0	28	19	3	10	0	32	461
10:30 - 10:45	7	173	19	0	199	20	159	30	0	209	15	4	19	0	38	18	3	7	0	28	474
10:45 - 11:00	13	148	22	0	183	63	178	26	0	267	17	3	30	0	50	20	5	12	0	37	537
11:00 - 11:15	10	161	35	0	206	51	156	27	0	234	24	7	62	0	93	29	3	10	0	42	575
11:15 - 11:30	17	180	16	0	213	36	156	18	0	210	25	4	34	0	63	22	4	12	0	38	524
11:30 - 11:45	11	168	19	0	198	27	161	17	0	205	18	2	22	0	42	16	4	6	0	26	471
11:45 - 12:00	8	164	19	0	191	43	161	22	0	226	13	4	28	0	45	16	4	11	0	31	493
12:00 - 12:15	11	148	8	0	167	58	173	26	0	257	15	8	35	0	58	25	6	11	0	42	524
12:15 - 12:30	12	184	27	0	223	26	177	28	1	232	29	4	55	0	88	45	3	16	0	64	607
12:30 - 12:45	9	180	17	0	206	37	193	27	0	257	43	5	25	0	73	19	5	10	0	34	570
12:45 - 1:00	10	138	16	0	164	37	176	28	0	241	18	2	31	0	51	28	5	7	0	40	496
1:00 - 1:15	15	170	30	0	215	58	198	20	0	276	27	2	47	0	76	26	3	7	0	36	603
1:15 - 1:30	18	232	26	0	276	41	190	15	0	246	36	1	51	0	88	29	6	11	0	46	656
1:30 - 1:45	8	174	29	0	211	23	138	23	0	184	18	4	37	0	59	25	0	15	0	40	494
1:45 - 2:00	6	171	20	0	197	33	174	23	0	230	24	2	36	0	62	22	4	12	0	38	527
2:00 - 2:15	6	177	26	0	209	58	193	18	0	269	34	0	39	0	73	19	5	9	0	33	584
2:15 - 2:30	9	211	21	0	241	34	163	17	0	214	34	1	64	0	99	15	6	10	0	31	585
2:30 - 2:45	6	214	27	0	247	25	150	12	0	187	22	4	37	0	63	21	3	9	0	33	530
2:45 - 3:00	2	196	12	0	210	34	151	11	0	196	23	1	33	0	57	20	3	3	0	26	489
3:00 - 3:15	8	194	31	0	233	22	185	13	0	220	30	0	34	0	64	7	0	2	0	9	526
3:15 - 3:30	8	204	26	0	238	32	176	12	0	220	26	3	45	0	74	11	0	14	0	25	557
3:30 - 3:45	10	218	41	0	269	60	208	14	0	282	38	6	66	0	110	22	5	11	0	38	699
3:45 - 4:00	8	231	40	0	279	74	191	18	0	283	39	6	70	0	115	36	5	12	0	53	730
4:00 - 4:15	16	286	33	0	335	39	168	19	0	226	28	3	70	0	101	32	6	11	0	49	711
4:15 - 4:30	10	237	34	0	281	52	170	13	0	235	20	1	43	0	64	27	2	14	0	43	623
4:30 - 4:45	11	242	21	0	274	40	193	11	0	244	38	4	42	0	84	21	3	8	0	32	634
4:45 - 5:00	7	256	30	0	293	37	210	12	0	259	30	2	40	0	72	14	6	8	0	28	652
5:00 - 5:15	4	265	34	0	303	54	219	19	0	292	40	3	87	0	130	12	7	10	0	29	754
5:15 - 5:30	9	265	29	0	303	77	190	10	0	277	47	10	90	0	147	27	4	5	0	36	763
5:30 - 5:45	4	271	39	0	314	64	217	13	0	294	37	3	60	0	100	26	3	6	0	35	743
5:45 - 6:00	5	194	24	0	223	54	206	10	0	270	43	5	42	0	90	10	4	10	0	24	607
6:00 - 6:15	4	204	22	0	230	42	183	22	0	247	24	11	35	0	70	23	5	6	0	34	581
6:15 - 6:30	5	220	19	0	244	51	204	11	0	266	30	3	43	0	76	13	4	5	0	22	608
6:30 - 6:45	8	204	34	0	246	54	191	8	0	253	26	0	56	0	82	13	2	4	0	19	600
6:45 - 7:00	4	166	42	0	212	74	174	8	0	256	38	3	77	0	118	19	4	10	0	33	619
<b>12 Hr Totals</b>	<b>434</b>	<b>8537</b>	<b>1226</b>	<b>0</b>	<b>10197</b>	<b>2328</b>	<b>8868</b>	<b>968</b>	<b>2</b>	<b>12166</b>	<b>1166</b>	<b>152</b>	<b>1871</b>	<b>1</b>	<b>3190</b>	<b>926</b>	<b>181</b>	<b>438</b>	<b>0</b>	<b>1545</b>	<b>27098</b>

**VEHICLES TURNING MOVEMENT COUNT - SUMMARY**

Intersection of: Port Republic Road  
and: Bluestone Drive - Hillside Avenue  
Location: Rockingham County, Virginia

Counted by: VCU  
Date: April 04, 2018  
Weather: Mild, Light Rain  
Entered by: CK

Wednesday  
Star Rating: 5



TIME	TRAFFIC FROM NORTH on: Port Republic Road					TRAFFIC FROM SOUTH on: Port Republic Road					TRAFFIC FROM EAST on: Bluestone Drive					TRAFFIC FROM WEST on: Hillside Avenue					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
<b>1 Hr Totals</b>																					
7:00 - 8:00	22	386	109	0	517	309	759	95	0	1163	31	4	31	0	66	48	14	40	0	102	1848
7:15 - 8:15	27	426	127	0	580	332	867	97	0	1296	37	4	34	1	76	49	16	43	0	108	2060
7:30 - 8:30	26	445	130	0	601	319	889	98	0	1306	41	4	39	1	85	44	16	42	0	102	2094
7:45 - 8:45	29	479	117	0	625	243	918	97	0	1258	38	8	41	1	88	49	19	42	0	110	2081
8:00 - 9:00	42	504	109	0	655	217	932	102	0	1251	42	10	65	1	118	46	16	38	0	100	2124
8:15 - 9:15	44	512	103	0	659	227	907	107	1	1242	70	10	119	0	199	48	17	35	0	100	2200
8:30 - 9:30	45	484	87	0	616	220	845	99	1	1165	67	9	122	0	198	53	15	32	0	100	2079
8:45 - 9:45	53	487	89	0	629	197	769	100	1	1067	68	9	129	0	206	55	13	24	0	92	1994
9:00 - 10:00	47	521	82	0	650	205	709	114	1	1029	74	5	118	0	197	58	13	26	0	97	1973
9:15 - 10:15	50	543	81	0	674	184	669	118	0	971	78	11	111	0	200	71	11	30	0	112	1957
9:30 - 10:30	51	561	85	0	697	176	716	130	0	1022	82	16	112	0	210	76	13	34	0	123	2052
9:45 - 10:45	42	620	85	0	747	164	696	129	0	989	85	16	114	0	215	78	12	35	0	125	2076
10:00 - 11:00	44	601	79	0	724	150	673	112	0	935	82	19	121	0	222	84	14	39	0	137	2018
10:15 - 11:15	40	612	93	0	745	165	680	109	0	954	64	19	126	0	209	86	14	39	0	139	2047
10:30 - 11:30	47	662	92	0	801	170	649	101	0	920	81	18	145	0	244	89	15	41	0	145	2110
10:45 - 11:45	51	657	92	0	800	177	651	88	0	916	84	16	148	0	248	87	16	40	0	143	2107
11:00 - 12:00	46	673	89	0	808	157	634	84	0	875	80	17	146	0	243	83	15	39	0	137	2063
11:15 - 12:15	47	660	62	0	769	164	651	83	0	898	71	18	119	0	208	79	18	40	0	137	2012
11:30 - 12:30	42	664	73	0	779	154	672	93	1	920	75	18	140	0	233	102	17	44	0	163	2095
11:45 - 12:45	40	676	71	0	787	164	704	103	1	972	100	21	143	0	264	105	18	48	0	171	2194
12:00 - 1:00	42	650	68	0	760	158	719	109	1	987	105	19	146	0	270	117	19	44	0	180	2197
12:15 - 1:15	46	672	90	0	808	158	744	103	1	1006	117	13	158	0	288	118	16	40	0	174	2276
12:30 - 1:30	52	720	89	0	861	173	757	90	0	1020	124	10	154	0	288	102	19	35	0	156	2325
12:45 - 1:45	51	714	101	0	866	159	702	86	0	947	99	9	166	0	274	108	14	40	0	162	2249
1:00 - 2:00	47	747	105	0	899	155	700	81	0	936	105	9	171	0	285	102	13	45	0	160	2280
1:15 - 2:15	38	754	101	0	893	155	695	79	0	929	112	7	163	0	282	95	15	47	0	157	2261
1:30 - 2:30	29	733	96	0	858	148	668	81	0	897	110	7	176	0	293	81	15	46	0	142	2190
1:45 - 2:45	27	773	94	0	894	150	680	70	0	900	114	7	176	0	297	77	18	40	0	135	2226
2:00 - 3:00	23	798	86	0	907	151	657	58	0	866	113	6	173	0	292	75	17	31	0	123	2188
2:15 - 3:15	25	815	91	0	931	115	649	53	0	817	109	6	168	0	283	63	12	24	0	99	2130
2:30 - 3:30	24	808	96	0	928	113	662	48	0	823	101	8	149	0	258	59	6	28	0	93	2102
2:45 - 3:45	28	812	110	0	950	148	720	50	0	918	117	10	178	0	305	60	8	30	0	98	2271
3:00 - 4:00	34	847	138	0	1019	188	760	57	0	1005	133	15	215	0	363	76	10	39	0	125	2512
3:15 - 4:15	42	939	140	0	1121	205	743	63	0	1011	131	18	251	0	400	101	16	48	0	165	2697
3:30 - 4:30	44	972	148	0	1164	225	737	64	0	1026	125	16	249	0	390	117	18	48	0	183	2763
3:45 - 4:45	45	996	128	0	1169	205	722	61	0	988	125	14	225	0	364	116	16	45	0	177	2698
4:00 - 5:00	44	1021	118	0	1183	168	741	55	0	964	116	10	195	0	321	94	17	41	0	152	2620
4:15 - 5:15	32	1000	119	0	1151	183	792	55	0	1030	128	10	212	0	350	74	18	40	0	132	2663
4:30 - 5:30	31	1028	114	0	1173	208	812	52	0	1072	155	19	259	0	433	74	20	31	0	125	2803
4:45 - 5:45	24	1057	132	0	1213	232	836	54	0	1122	154	18	277	0	449	79	20	29	0	128	2912
5:00 - 6:00	22	995	126	0	1143	249	832	52	0	1133	167	21	279	0	467	75	18	31	0	124	2867
5:15 - 6:15	22	934	114	0	1070	237	796	55	0	1088	151	29	227	0	407	86	16	27	0	129	2694
5:30 - 6:30	18	889	104	0	1011	211	810	56	0	1077	134	22	180	0	336	72	16	27	0	115	2539
5:45 - 6:45	22	822	99	0	943	201	784	51	0	1036	123	19	176	0	318	59	15	25	0	99	2396
6:00 - 7:00	21	794	117	0	932	221	752	49	0	1022	118	17	211	0	346	68	15	25	0	108	2408
<b>PEAK HOUR</b>																					
<b>8:15 - 9:15</b>	44	512	103	0	659	227	907	107	1	1242	70	10	119	0	199	48	17	35	0	100	2200
<b>4:45 - 5:45</b>	24	1057	132	0	1213	232	836	54	0	1122	154	18	277	0	449	79	20	29	0	128	2912

### Port Republic and Southbound Ramps

Leg Direction Start Time	South Northbound		North Southbound			East Westbound		
	Left	Thru	Left	Thru	Right	Left	Thru	Right
2018-04-04 07:00:00	39	112	0	72	28	14	0	40
2018-04-04 07:15:00	48	208	0	92	33	26	0	43
2018-04-04 07:30:00	36	352	0	92	21	34	0	48
2018-04-04 07:45:00	41	288	0	97	34	53	0	73
2018-04-04 08:00:00	29	234	0	96	35	27	0	34
2018-04-04 08:15:00	35	248	0	133	29	32	0	55
2018-04-04 08:30:00	27	289	0	124	13	39	0	33
2018-04-04 08:45:00	36	304	0	154	13	34	0	43
2018-04-04 09:00:00	29	246	0	178	35	36	0	30
2018-04-04 09:15:00	24	176	0	117	35	26	0	35
2018-04-04 09:30:00	22	206	0	118	18	20	1	29
2018-04-04 09:45:00	18	278	0	165	12	20	1	34
2018-04-04 10:00:00	24	213	0	232	28	19	1	22
2018-04-04 10:15:00	27	205	0	145	18	24	2	40
2018-04-04 10:30:00	38	165	0	175	30	23	0	33
2018-04-04 10:45:00	30	234	0	164	30	29	0	35
2018-04-04 11:00:00	33	237	0	218	20	21	0	22
2018-04-04 11:15:00	40	169	0	203	25	29	0	35
2018-04-04 11:30:00	44	166	0	164	28	19	0	37
2018-04-04 11:45:00	38	208	0	182	22	22	0	28
2018-04-04 12:00:00	45	234	0	194	21	20	0	31
2018-04-04 12:15:00	53	183	0	270	22	27	0	31
2018-04-04 12:30:00	48	227	0	188	31	42	0	37
2018-04-04 12:45:00	39	211	0	191	25	26	0	39
2018-04-04 13:00:00	42	223	0	192	32	23	0	41
2018-04-04 13:15:00	52	216	0	260	32	25	0	33
2018-04-04 13:30:00	53	168	0	217	38	22	0	28
2018-04-04 13:45:00	24	207	0	214	30	25	0	32
2018-04-04 14:00:00	37	227	0	185	20	22	0	35
2018-04-04 14:15:00	36	194	0	237	27	29	0	32
2018-04-04 14:30:00	58	163	0	242	48	25	0	33
2018-04-04 14:45:00	50	157	0	206	40	31	0	30
2018-04-04 15:00:00	54	167	0	184	35	29	0	41
2018-04-04 15:15:00	45	186	0	215	41	37	0	38
2018-04-04 15:30:00	43	252	0	277	52	25	0	41
2018-04-04 15:45:00	46	248	0	267	24	24	0	37
2018-04-04 16:00:00	44	191	0	336	48	39	0	33
2018-04-04 16:15:00	72	226	0	275	69	25	0	32
2018-04-04 16:30:00	80	187	0	219	60	32	0	43
2018-04-04 16:45:00	73	224	0	243	57	39	0	31
2018-04-04 17:00:00	47	254	0	304	66	42	0	52
2018-04-04 17:15:00	57	239	0	325	66	34	0	47
2018-04-04 17:30:00	55	221	0	290	57	39	0	50
2018-04-04 17:45:00	48	219	0	209	33	33	0	40
2018-04-04 18:00:00	38	230	0	238	30	31	0	44
2018-04-04 18:15:00	45	235	0	250	31	24	0	40
2018-04-04 18:30:00	38	212	0	227	34	28	0	32
2018-04-04 18:45:00	41	219	0	242	21	26	0	42



**VEHICLES TURNING MOVEMENT COUNT - SUMMARY**

Intersection of: Port Republic Road  
and: I-81NB On Ramp - I-81NB Off Ramp  
Location: Rockingham County, Virginia

Counted by: VCU  
Date: April 04, 2018  
Weather: Mild, Light Rain  
Entered by: CK

Wednesday  
Star Rating: 4



TIME	TRAFFIC FROM NORTH on: Port Republic Road					TRAFFIC FROM SOUTH on: Port Republic Road					TRAFFIC FROM EAST on: I-81NB On Ramp					TRAFFIC FROM WEST on: I-81NB Off Ramp					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
<b>AM</b>																					
7:00 - 7:15	0	57	25	0	82	23	119	0	0	142	0	0	0	0	0	32	0	28	0	60	284
7:15 - 7:30	0	88	32	0	120	21	204	0	0	225	0	0	0	0	0	37	0	56	0	93	438
7:30 - 7:45	0	97	27	0	124	26	333	0	0	359	0	0	0	0	0	44	0	59	0	103	586
7:45 - 8:00	0	126	29	0	155	36	272	0	0	308	0	0	0	0	0	51	1	55	0	107	570
8:00 - 8:15	0	94	32	0	126	30	200	0	0	230	0	0	0	0	0	50	1	63	0	114	470
8:15 - 8:30	0	127	25	0	152	34	240	0	0	274	0	0	0	0	0	61	0	48	0	109	535
8:30 - 8:45	0	141	31	0	172	27	282	0	0	309	0	0	0	0	0	50	0	48	0	98	579
8:45 - 9:00	0	161	33	0	194	21	274	0	0	295	0	0	0	0	0	53	0	63	0	116	605
9:00 - 9:15	0	184	24	0	208	28	220	0	0	248	0	0	0	0	0	46	0	46	0	92	548
9:15 - 9:30	0	114	28	0	142	25	168	0	1	194	0	0	0	0	0	41	0	36	0	77	413
9:30 - 9:45	0	110	33	0	143	18	188	0	0	206	0	0	0	0	0	44	0	44	0	88	437
9:45 - 10:00	0	176	22	0	198	24	269	0	0	293	0	0	0	0	0	45	1	35	0	81	572
10:00 - 10:15	0	210	29	0	239	21	205	0	0	226	0	0	0	0	0	35	0	21	0	56	521
10:15 - 10:30	0	139	30	0	169	25	188	0	0	213	0	0	0	0	0	31	1	39	0	71	453
10:30 - 10:45	0	155	39	0	194	20	174	0	0	194	0	0	0	0	0	50	0	29	0	79	467
10:45 - 11:00	0	163	33	0	196	31	247	0	0	278	0	0	0	0	0	51	0	31	0	82	556
11:00 - 11:15	0	202	46	0	248	29	235	0	0	264	0	0	0	0	0	40	0	23	0	63	575
11:15 - 11:30	0	205	39	0	244	28	183	0	0	211	0	0	0	0	0	41	0	22	0	63	518
11:30 - 11:45	0	147	35	0	182	30	174	0	0	204	0	0	0	0	0	47	0	28	0	75	461
11:45 - 12:00	0	171	26	0	197	47	218	0	0	265	0	0	0	0	0	37	0	31	0	68	530
12:00 - 12:15	0	185	41	0	226	37	253	0	0	290	0	0	0	0	0	68	0	24	0	92	608
12:15 - 12:30	0	258	32	0	290	31	190	0	0	221	0	0	0	0	0	56	2	33	0	91	602
12:30 - 12:45	0	194	32	0	226	35	247	0	0	282	0	0	0	0	0	60	0	38	0	98	606
12:45 - 1:00	0	179	36	0	215	35	219	0	0	254	0	0	0	0	0	51	0	32	0	83	552
1:00 - 1:15	0	199	28	0	227	34	228	0	0	262	0	0	0	0	0	46	0	41	0	87	576
1:15 - 1:30	0	249	44	0	293	28	235	0	0	263	0	0	0	0	0	51	0	29	0	80	636
1:30 - 1:45	0	186	43	0	229	22	196	0	0	218	0	0	0	0	0	52	0	27	0	79	526
1:45 - 2:00	0	199	44	0	243	46	207	0	0	253	0	0	0	0	0	46	0	24	0	70	566
2:00 - 2:15	0	175	38	0	213	28	243	0	0	271	0	0	0	0	0	50	0	31	0	81	565
2:15 - 2:30	0	232	46	0	278	27	214	0	0	241	0	0	0	0	0	38	0	17	0	55	574
2:30 - 2:45	0	216	39	0	255	31	200	0	0	231	0	0	0	0	0	37	0	23	0	60	546
2:45 - 3:00	0	203	49	0	252	34	182	0	0	216	0	0	0	0	0	38	0	31	0	69	537
3:00 - 3:15	0	185	42	0	227	28	201	0	0	229	0	0	0	0	0	38	0	27	0	65	521
3:15 - 3:30	0	200	37	0	237	30	210	0	0	240	0	0	0	0	0	58	0	29	0	87	564
3:30 - 3:45	0	255	52	0	307	43	272	0	0	315	0	0	0	0	0	51	0	27	0	78	700
3:45 - 4:00	0	252	53	0	305	49	238	0	0	287	0	0	0	0	0	53	0	44	0	97	689
4:00 - 4:15	0	304	53	0	357	47	211	0	0	258	0	0	0	0	0	45	0	41	0	86	701
4:15 - 4:30	0	240	58	0	298	60	260	0	0	320	0	0	0	0	0	62	0	41	0	103	721
4:30 - 4:45	0	223	49	0	272	45	237	0	0	282	0	0	0	0	0	52	0	33	0	85	639
4:45 - 5:00	0	237	52	0	289	73	239	0	0	312	0	0	0	0	0	62	0	38	0	100	701
5:00 - 5:15	0	267	57	0	324	53	294	0	0	347	0	0	0	0	0	41	1	35	0	77	748
5:15 - 5:30	0	319	57	0	376	55	246	0	0	301	0	0	0	0	0	62	0	38	0	100	777
5:30 - 5:45	0	283	53	0	336	52	236	0	0	288	0	0	0	0	0	66	0	42	0	108	732
5:45 - 6:00	0	194	42	0	236	36	242	0	0	278	0	0	0	0	0	40	0	26	0	66	580
6:00 - 6:15	0	227	39	0	266	32	238	0	0	270	0	0	0	0	0	43	0	28	0	71	607
6:15 - 6:30	0	238	42	0	280	37	221	0	0	258	0	0	0	0	0	52	0	42	0	94	632
6:30 - 6:45	0	207	44	0	251	31	220	0	0	251	0	0	0	0	0	37	0	25	0	62	564
6:45 - 7:00	0	233	36	0	269	34	241	0	0	275	0	0	0	0	0	34	0	19	0	53	597
<b>12 Hr Totals</b>	0	9206	1856	0	11062	1637	10813	0	1	12451	0	0	0	0	0	2275	7	1690	0	3972	27485

**VEHICLES TURNING MOVEMENT COUNT - SUMMARY**

Intersection of: Port Republic Road  
and: I-81NB On Ramp - I-81NB Off Ramp  
Location: Rockingham County, Virginia

Counted by: VCU  
Date: April 04, 2018  
Weather: Mild, Light Rain  
Entered by: CK

Wednesday  
Star Rating: 4



TIME	TRAFFIC FROM NORTH on: Port Republic Road					TRAFFIC FROM SOUTH on: Port Republic Road					TRAFFIC FROM EAST on: I-81NB On Ramp					TRAFFIC FROM WEST on: I-81NB Off Ramp					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
<b>1 Hr Totals</b>																					
7:00 - 8:00	0	368	113	0	481	106	928	0	0	1034	0	0	0	0	0	164	1	198	0	363	1878
7:15 - 8:15	0	405	120	0	525	113	1009	0	0	1122	0	0	0	0	0	182	2	233	0	417	2064
7:30 - 8:30	0	444	113	0	557	126	1045	0	0	1171	0	0	0	0	0	206	2	225	0	433	2161
7:45 - 8:45	0	488	117	0	605	127	994	0	0	1121	0	0	0	0	0	212	2	214	0	428	2154
8:00 - 9:00	0	523	121	0	644	112	996	0	0	1108	0	0	0	0	0	214	1	222	0	437	2189
8:15 - 9:15	0	613	113	0	726	110	1016	0	0	1126	0	0	0	0	0	210	0	205	0	415	2267
8:30 - 9:30	0	600	116	0	716	101	944	0	1	1046	0	0	0	0	0	190	0	193	0	383	2145
8:45 - 9:45	0	569	118	0	687	92	850	0	1	943	0	0	0	0	0	184	0	189	0	373	2003
9:00 - 10:00	0	584	107	0	691	95	845	0	1	941	0	0	0	0	0	176	1	161	0	338	1970
9:15 - 10:15	0	610	112	0	722	88	830	0	1	919	0	0	0	0	0	165	1	136	0	302	1943
9:30 - 10:30	0	635	114	0	749	88	850	0	0	938	0	0	0	0	0	155	2	139	0	296	1983
9:45 - 10:45	0	680	120	0	800	90	836	0	0	926	0	0	0	0	0	161	2	124	0	287	2013
10:00 - 11:00	0	667	131	0	798	97	814	0	0	911	0	0	0	0	0	167	1	120	0	288	1997
10:15 - 11:15	0	659	148	0	807	105	844	0	0	949	0	0	0	0	0	172	1	122	0	295	2051
10:30 - 11:30	0	725	157	0	882	108	839	0	0	947	0	0	0	0	0	182	0	105	0	287	2116
10:45 - 11:45	0	717	153	0	870	118	839	0	0	957	0	0	0	0	0	179	0	104	0	283	2110
11:00 - 12:00	0	725	146	0	871	134	810	0	0	944	0	0	0	0	0	165	0	104	0	269	2084
11:15 - 12:15	0	708	141	0	849	142	828	0	0	970	0	0	0	0	0	193	0	105	0	298	2117
11:30 - 12:30	0	761	134	0	895	145	835	0	0	980	0	0	0	0	0	208	2	116	0	326	2201
11:45 - 12:45	0	808	131	0	939	150	908	0	0	1058	0	0	0	0	0	221	2	126	0	349	2346
12:00 - 1:00	0	816	141	0	957	138	909	0	0	1047	0	0	0	0	0	235	2	127	0	364	2368
12:15 - 1:15	0	830	128	0	958	135	884	0	0	1019	0	0	0	0	0	213	2	144	0	359	2336
12:30 - 1:30	0	821	140	0	961	132	929	0	0	1061	0	0	0	0	0	208	0	140	0	348	2370
12:45 - 1:45	0	813	151	0	964	119	878	0	0	997	0	0	0	0	0	200	0	129	0	329	2290
1:00 - 2:00	0	833	159	0	992	130	866	0	0	996	0	0	0	0	0	195	0	121	0	316	2304
1:15 - 2:15	0	809	169	0	978	124	881	0	0	1005	0	0	0	0	0	199	0	111	0	310	2293
1:30 - 2:30	0	792	171	0	963	123	860	0	0	983	0	0	0	0	0	186	0	99	0	285	2231
1:45 - 2:45	0	822	167	0	989	132	864	0	0	996	0	0	0	0	0	171	0	95	0	266	2251
2:00 - 3:00	0	826	172	0	998	120	839	0	0	959	0	0	0	0	0	163	0	102	0	265	2222
2:15 - 3:15	0	836	176	0	1012	120	797	0	0	917	0	0	0	0	0	151	0	98	0	249	2178
2:30 - 3:30	0	804	167	0	971	123	793	0	0	916	0	0	0	0	0	171	0	110	0	281	2168
2:45 - 3:45	0	843	180	0	1023	135	865	0	0	1000	0	0	0	0	0	185	0	114	0	299	2322
3:00 - 4:00	0	892	184	0	1076	150	921	0	0	1071	0	0	0	0	0	200	0	127	0	327	2474
3:15 - 4:15	0	1011	195	0	1206	169	931	0	0	1100	0	0	0	0	0	207	0	141	0	348	2654
3:30 - 4:30	0	1051	216	0	1267	199	981	0	0	1180	0	0	0	0	0	211	0	153	0	364	2811
3:45 - 4:45	0	1019	213	0	1232	201	946	0	0	1147	0	0	0	0	0	212	0	159	0	371	2750
4:00 - 5:00	0	1004	212	0	1216	225	947	0	0	1172	0	0	0	0	0	221	0	153	0	374	2762
4:15 - 5:15	0	967	216	0	1183	231	1030	0	0	1261	0	0	0	0	0	217	1	147	0	365	2809
4:30 - 5:30	0	1046	215	0	1261	226	1016	0	0	1242	0	0	0	0	0	217	1	144	0	362	2865
4:45 - 5:45	0	1106	219	0	1325	233	1015	0	0	1248	0	0	0	0	0	231	1	153	0	385	2958
5:00 - 6:00	0	1063	209	0	1272	196	1018	0	0	1214	0	0	0	0	0	209	1	141	0	351	2837
5:15 - 6:15	0	1023	191	0	1214	175	962	0	0	1137	0	0	0	0	0	211	0	134	0	345	2696
5:30 - 6:30	0	942	176	0	1118	157	937	0	0	1094	0	0	0	0	0	201	0	138	0	339	2551
5:45 - 6:45	0	866	167	0	1033	136	921	0	0	1057	0	0	0	0	0	172	0	121	0	293	2383
6:00 - 7:00	0	905	161	0	1066	134	920	0	0	1054	0	0	0	0	0	166	0	114	0	280	2400
<b>PEAK HOUR</b>																					
<b>8:15 - 9:15</b>	0	613	113	0	726	110	1016	0	0	1126	0	0	0	0	0	210	0	205	0	415	2267
<b>4:45 - 5:45</b>	0	1106	219	0	1325	233	1015	0	0	1248	0	0	0	0	0	231	1	153	0	385	2958

**VEHICLES TURNING MOVEMENT COUNT - SUMMARY**

Intersection of: Port Republic Road  
and: Forest Hill Road - Parking Lot  
Location: Rockingham County, Virginia

Counted by: VCU  
Date: April 04, 2018  
Weather: Mild, Light Rain  
Entered by: CK



TIME	TRAFFIC FROM NORTH Port Republic Road					TRAFFIC FROM SOUTH Port Republic Road					TRAFFIC FROM EAST Forest Hill Road					TRAFFIC FROM WEST Parking Lot					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
<b>AM</b>																					
7:00 - 7:15	1	65	21	0	87	15	129	0	0	144	17	1	8	0	26	0	0	1	0	1	258
7:15 - 7:30	2	100	21	0	123	26	190	0	0	216	32	4	6	0	42	0	2	0	0	2	383
7:30 - 7:45	4	108	20	0	132	31	323	0	0	354	35	1	12	0	48	0	0	1	0	1	535
7:45 - 8:00	1	139	41	0	181	32	273	0	0	305	32	0	11	0	43	0	0	1	0	1	530
8:00 - 8:15	3	106	35	0	144	27	194	0	0	221	34	1	14	0	49	0	1	1	0	2	416
8:15 - 8:30	5	141	39	0	185	25	240	0	0	265	23	1	12	0	36	0	1	2	0	3	489
8:30 - 8:45	13	144	38	0	195	50	294	0	0	344	35	2	12	0	49	0	1	1	0	2	590
8:45 - 9:00	22	144	49	0	215	52	248	0	0	300	43	7	16	0	66	1	3	0	0	4	585
9:00 - 9:15	32	168	32	0	232	25	193	0	0	218	29	9	23	0	61	1	6	0	0	7	518
9:15 - 9:30	14	115	29	0	158	26	162	0	0	188	26	5	10	0	41	0	4	2	0	6	393
9:30 - 9:45	4	106	40	0	150	58	178	0	0	236	31	5	11	0	47	0	3	3	0	6	439
9:45 - 10:00	7	166	51	0	224	84	237	0	0	321	50	1	15	0	66	0	0	3	0	3	614
10:00 - 10:15	4	177	54	0	235	39	168	0	0	207	47	0	26	0	73	0	4	7	0	11	526
10:15 - 10:30	1	126	48	0	175	21	166	0	0	187	55	1	18	0	74	0	1	1	0	2	438
10:30 - 10:45	2	152	51	0	205	24	167	0	0	191	32	3	10	0	45	0	6	3	0	9	450
10:45 - 11:00	6	153	51	0	210	63	206	0	0	269	49	1	17	0	67	1	2	1	0	4	550
11:00 - 11:15	1	184	49	0	234	27	207	0	0	234	57	2	26	0	85	0	3	4	0	7	560
11:15 - 11:30	4	185	66	0	255	23	153	0	0	176	57	2	40	0	99	0	2	3	0	5	535
11:30 - 11:45	4	130	61	0	195	15	143	0	0	158	62	2	20	0	84	0	5	3	0	8	445
11:45 - 12:00	10	158	35	0	203	42	202	0	0	244	53	4	22	0	79	0	0	3	0	3	529
12:00 - 12:15	14	191	53	0	258	36	220	0	0	256	44	0	24	0	68	3	9	24	0	36	618
12:15 - 12:30	29	233	55	0	317	25	160	0	0	185	53	1	50	0	104	4	3	22	0	29	635
12:30 - 12:45	21	190	47	0	258	30	176	0	0	206	69	0	36	0	105	1	8	16	0	25	594
12:45 - 1:00	27	153	46	0	226	41	200	0	0	241	46	0	28	0	74	0	6	9	0	15	556
1:00 - 1:15	22	176	46	0	244	56	211	0	0	267	68	6	33	0	107	0	1	2	0	3	621
1:15 - 1:30	6	234	54	0	294	26	181	0	0	207	70	7	48	0	125	1	2	7	0	10	636
1:30 - 1:45	6	173	52	0	231	23	151	0	0	174	45	2	34	0	81	3	2	3	0	8	494
1:45 - 2:00	5	188	57	0	250	31	203	0	0	234	57	1	26	0	84	0	3	5	0	8	576
2:00 - 2:15	1	174	55	0	230	38	212	0	0	250	55	0	43	0	98	0	1	3	0	4	582
2:15 - 2:30	3	209	55	0	267	26	154	0	0	180	67	2	57	0	126	0	1	2	0	3	576
2:30 - 2:45	3	200	46	0	249	25	150	0	0	175	79	1	63	0	143	0	1	3	0	4	571
2:45 - 3:00	4	191	47	0	242	27	168	0	0	195	51	0	38	0	89	0	3	2	0	5	531
3:00 - 3:15	3	187	35	0	225	35	162	0	0	197	60	0	40	0	100	1	0	1	0	2	524
3:15 - 3:30	6	198	38	0	242	34	183	0	0	217	58	0	50	0	108	1	2	3	0	6	573
3:30 - 3:45	2	261	49	0	312	22	254	0	0	276	66	0	37	0	103	0	0	8	0	8	699
3:45 - 4:00	2	257	51	0	310	35	226	0	0	261	60	1	58	0	119	0	0	9	0	9	699
4:00 - 4:15	4	283	62	0	349	28	152	0	0	180	66	0	46	0	112	0	5	28	0	33	674
4:15 - 4:30	8	239	43	0	290	34	216	0	0	250	58	1	32	0	91	0	7	37	0	44	675
4:30 - 4:45	4	231	44	1	280	42	226	0	0	268	57	1	46	0	104	0	2	17	0	19	671
4:45 - 5:00	2	242	48	0	292	38	222	0	0	260	60	0	42	0	102	0	10	30	0	40	694
5:00 - 5:15	2	242	50	0	294	29	249	0	0	278	68	2	51	0	121	3	5	11	0	19	712
5:15 - 5:30	1	344	48	1	394	32	243	0	0	275	63	0	46	0	109	0	1	6	0	7	785
5:30 - 5:45	4	291	63	0	358	57	203	0	0	260	71	1	51	0	123	0	3	9	0	12	753
5:45 - 6:00	2	178	57	0	237	45	209	0	0	254	53	0	44	0	97	0	3	3	0	6	594
6:00 - 6:15	0	204	54	0	258	43	195	0	0	238	68	0	41	0	109	0	2	2	0	4	609
6:15 - 6:30	2	233	53	0	288	46	205	0	0	251	55	0	40	0	95	0	0	3	0	3	637
6:30 - 6:45	2	206	34	0	242	55	201	0	0	256	53	0	35	0	88	0	1	0	0	1	587
6:45 - 7:00	1	219	49	0	269	37	201	0	0	238	67	0	56	0	123	0	0	1	0	1	631
<b>12 Hr Totals</b>	<b>326</b>	<b>8894</b>	<b>2222</b>	<b>2</b>	<b>11444</b>	<b>1701</b>	<b>9606</b>	<b>0</b>	<b>0</b>	<b>11307</b>	<b>2486</b>	<b>78</b>	<b>1524</b>	<b>0</b>	<b>4088</b>	<b>20</b>	<b>125</b>	<b>306</b>	<b>0</b>	<b>451</b>	<b>27290</b>

**VEHICLES TURNING MOVEMENT COUNT - SUMMARY**

Intersection of: Port Republic Road  
and: Forest Hill Road - Parking Lot  
Location: Rockingham County, Virginia

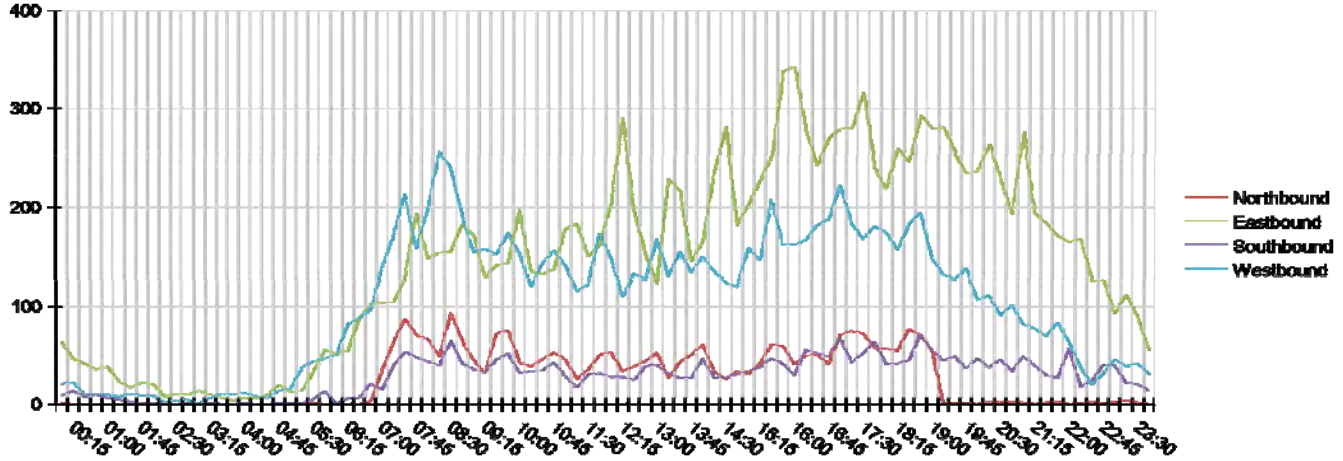
Counted by: VCU  
Date: April 04, 2018  
Weather: Mild, Light Rain  
Entered by: CK



TIME	TRAFFIC FROM NORTH Port Republic Road					TRAFFIC FROM SOUTH Port Republic Road					TRAFFIC FROM EAST Forest Hill Road					TRAFFIC FROM WEST Parking Lot					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
<b>1 Hr Totals</b>																					
7:00 - 8:00	8	412	103	0	523	104	915	0	0	1019	116	6	37	0	159	0	2	3	0	5	1706
7:15 - 8:15	10	453	117	0	580	116	980	0	0	1096	133	6	43	0	182	0	3	3	0	6	1864
7:30 - 8:30	13	494	135	0	642	115	1030	0	0	1145	124	3	49	0	176	0	2	5	0	7	1970
7:45 - 8:45	22	530	153	0	705	134	1001	0	0	1135	124	4	49	0	177	0	3	5	0	8	2025
8:00 - 9:00	43	535	161	0	739	154	976	0	0	1130	135	11	54	0	200	1	6	4	0	11	2080
8:15 - 9:15	72	597	158	0	827	152	975	0	0	1127	130	19	63	0	212	2	11	3	0	16	2182
8:30 - 9:30	81	571	148	0	800	153	897	0	0	1050	133	23	61	0	217	2	14	3	0	19	2086
8:45 - 9:45	72	533	150	0	755	161	781	0	0	942	129	26	60	0	215	2	16	5	0	23	1935
9:00 - 10:00	57	555	152	0	764	193	770	0	0	963	136	20	59	0	215	1	13	8	0	22	1964
9:15 - 10:15	29	564	174	0	767	207	745	0	0	952	154	11	62	0	227	0	11	15	0	26	1972
9:30 - 10:30	16	575	193	0	784	202	749	0	0	951	183	7	70	0	260	0	8	14	0	22	2017
9:45 - 10:45	14	621	204	0	839	168	738	0	0	906	184	5	69	0	258	0	11	14	0	25	2028
10:00 - 11:00	13	608	204	0	825	147	707	0	0	854	183	5	71	0	259	1	13	12	0	26	1964
10:15 - 11:15	10	615	199	0	824	135	746	0	0	881	193	7	71	0	271	1	12	9	0	22	1998
10:30 - 11:30	13	674	217	0	904	137	733	0	0	870	195	8	93	0	296	1	13	11	0	25	2095
10:45 - 11:45	15	652	227	0	894	128	709	0	0	837	225	7	103	0	335	1	12	11	0	24	2090
11:00 - 12:00	19	657	211	0	887	107	705	0	0	812	229	10	108	0	347	0	10	13	0	23	2069
11:15 - 12:15	32	664	215	0	911	116	718	0	0	834	216	8	106	0	330	3	16	33	0	52	2127
11:30 - 12:30	57	712	204	0	973	118	725	0	0	843	212	7	116	0	335	7	17	52	0	76	2227
11:45 - 12:45	74	772	190	0	1036	133	758	0	0	891	219	5	132	0	356	8	20	65	0	93	2376
12:00 - 1:00	91	767	201	0	1059	132	756	0	0	888	212	1	138	0	351	8	26	71	0	105	2403
12:15 - 1:15	99	752	194	0	1045	152	747	0	0	899	236	7	147	0	390	5	18	49	0	72	2406
12:30 - 1:30	76	753	193	0	1022	153	768	0	0	921	253	13	145	0	411	2	17	34	0	53	2407
12:45 - 1:45	61	736	198	0	995	146	743	0	0	889	229	15	143	0	387	4	11	21	0	36	2307
1:00 - 2:00	39	771	209	0	1019	136	746	0	0	882	240	16	141	0	397	4	8	17	0	29	2327
1:15 - 2:15	18	769	218	0	1005	118	747	0	0	865	227	10	151	0	388	4	8	18	0	30	2288
1:30 - 2:30	15	744	219	0	978	118	720	0	0	838	224	5	160	0	389	3	7	13	0	23	2228
1:45 - 2:45	12	771	213	0	996	120	719	0	0	839	258	4	189	0	451	0	6	13	0	19	2305
2:00 - 3:00	11	774	203	0	988	116	684	0	0	800	252	3	201	0	456	0	6	10	0	16	2260
2:15 - 3:15	13	787	183	0	983	113	634	0	0	747	257	3	198	0	458	1	5	8	0	14	2202
2:30 - 3:30	16	776	166	0	958	121	663	0	0	784	248	1	191	0	440	2	6	9	0	17	2199
2:45 - 3:45	15	837	169	0	1021	118	767	0	0	885	235	0	165	0	400	2	5	14	0	21	2327
3:00 - 4:00	13	903	173	0	1089	126	825	0	0	951	244	1	185	0	430	2	2	21	0	25	2495
3:15 - 4:15	14	999	200	0	1213	119	815	0	0	934	250	1	191	0	442	1	7	48	0	56	2645
3:30 - 4:30	16	1040	205	0	1261	119	848	0	0	967	250	2	173	0	425	0	12	82	0	94	2747
3:45 - 4:45	18	1010	200	1	1229	139	820	0	0	959	241	3	182	0	426	0	14	91	0	105	2719
4:00 - 5:00	18	995	197	1	1211	142	816	0	0	958	241	2	166	0	409	0	24	112	0	136	2714
4:15 - 5:15	16	954	185	1	1156	143	913	0	0	1056	243	4	171	0	418	3	24	95	0	122	2752
4:30 - 5:30	9	1059	190	2	1260	141	940	0	0	1081	248	3	185	0	436	3	18	64	0	85	2862
4:45 - 5:45	9	1119	209	1	1338	156	917	0	0	1073	262	3	190	0	455	3	19	56	0	78	2944
5:00 - 6:00	9	1055	218	1	1283	163	904	0	0	1067	255	3	192	0	450	3	12	29	0	44	2844
5:15 - 6:15	7	1017	222	1	1247	177	850	0	0	1027	255	1	182	0	438	0	9	20	0	29	2741
5:30 - 6:30	8	906	227	0	1141	191	812	0	0	1003	247	1	176	0	424	0	8	17	0	25	2593
5:45 - 6:45	6	821	198	0	1025	189	810	0	0	999	229	0	160	0	389	0	6	8	0	14	2427
6:00 - 7:00	5	862	190	0	1057	181	802	0	0	983	243	0	172	0	415	0	3	6	0	9	2464
<b>PEAK HOUR</b>																					
<b>8:15 - 9:15</b>	72	597	158	0	827	152	975	0	0	1127	130	19	63	0	212	2	11	3	0	16	2182
<b>4:45 - 5:45</b>	9	1119	209	1	1338	156	917	0	0	1073	262	3	190	0	455	3	19	56	0	78	2944

Intersection Port Republic Rd & Devon Ln  
Date 10/3/2018

	Right	Through	Left	UTurn	Total
Northbound	257	178	2169	1	2605
Eastbound	2724	9795	1773	20	14312
Southbound	1913	235	625	3	2776
Westbound	509	9021	510	6	10046
<b>Total</b>	<b>5403</b>	<b>19229</b>	<b>5077</b>	<b>30</b>	<b>29739</b>



	Northbound				Eastbound				Southbound				Westbound			
	R	T	L	U	R	T	L	U	R	T	L	U	R	T	L	U
00:00	0	0	1	0	28	24	12	0	4	0	5	0	2	16	3	0
00:15	0	0	0	0	10	25	12	0	8	1	5	0	0	20	3	0
00:30	0	0	0	0	15	17	10	0	5	2	1	0	0	10	0	0
00:45	0	0	0	0	12	12	12	0	9	0	1	0	0	11	0	0
01:00	0	0	0	0	14	16	9	0	4	1	2	0	0	9	1	0
01:15	0	0	0	0	6	15	3	0	3	2	0	0	0	7	1	0
01:30	0	0	0	0	3	9	5	0	2	1	0	0	0	10	1	0
01:45	0	0	0	0	6	11	5	0	0	0	0	0	0	9	0	0
02:00	0	0	0	0	9	8	4	0	0	0	2	0	0	8	1	0
02:15	0	0	0	0	0	7	1	0	0	0	0	0	0	2	0	0
02:30	0	0	0	0	1	10	0	0	0	0	0	0	0	3	1	0
02:45	0	0	0	0	1	8	1	0	0	0	1	0	0	5	0	0
03:00	0	0	0	0	3	10	1	0	0	0	0	0	0	1	0	0
03:15	0	0	0	0	4	6	0	0	0	0	1	0	0	7	0	0
03:30	0	0	0	0	1	6	0	0	0	0	0	0	0	11	0	0
03:45	0	0	0	0	0	4	0	0	0	0	0	0	0	10	0	0
04:00	0	0	0	0	0	7	0	0	0	0	1	0	1	10	1	0
04:15	0	0	0	0	0	6	0	0	0	0	0	0	0	8	0	0
04:30	0	0	0	0	0	10	0	0	0	0	0	0	0	7	0	0
04:45	0	0	0	0	3	17	0	0	1	0	0	0	0	14	0	0
05:00	0	0	0	0	0	13	0	0	0	0	1	0	0	16	0	0
05:15	0	0	0	0	0	14	0	0	0	0	1	0	0	36	2	0
05:30	0	1	0	0	0	32	2	0	5	0	0	0	0	43	1	0
05:45	0	0	0	0	4	50	2	0	11	1	2	0	0	47	0	0
06:00	0	0	0	0	0	45	6	0	1	0	0	0	1	49	1	0
06:15	0	0	0	0	2	52	1	0	4	1	1	0	2	80	0	0
06:30	0	0	0	0	8	71	9	0	5	0	2	0	3	82	3	0
06:45	0	2	1	0	8	87	8	0	17	1	3	0	3	92	2	0
07:00	2	0	33	0	4	96	4	0	14	1	0	0	0	134	4	0
07:15	2	4	58	0	2	95	8	0	39	0	1	0	1	168	2	0
07:30	6	1	81	0	10	109	10	0	49	1	4	0	1	208	5	0
07:45	5	4	62	0	6	175	9	5	44	0	4	0	3	143	12	0
08:00	8	7	52	0	7	133	8	0	34	1	9	0	6	185	7	0
08:15	1	3	45	0	9	136	9	0	33	4	3	0	2	244	10	0
08:30	6	5	83	0	14	124	15	2	56	1	8	0	4	229	8	0
08:45	1	2	61	1	12	162	9	0	40	0	2	0	7	180	5	0
09:00	5	3	37	0	29	129	14	0	27	3	6	0	4	139	11	0
09:15	4	2	26	0	14	111	4	0	30	0	3	0	3	150	5	0
09:30	5	6	62	0	11	123	7	0	44	0	2	0	2	146	4	0
09:45	5	3	68	0	19	108	16	0	48	1	3	0	3	161	10	0
10:00	4	1	38	0	33	143	22	0	27	1	4	0	6	141	6	0
10:15	5	1	33	0	15	106	13	1	25	1	8	0	2	114	4	0
10:30	6	3	37	0	13	107	12	0	28	2	5	0	3	137	3	0
10:45	5	3	45	0	13	112	12	0	34	0	9	0	4	148	4	0
11:00	0	3	43	0	45	114	19	0	20	3	6	0	5	133	3	0

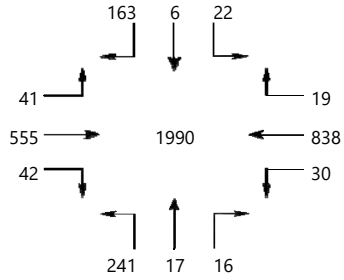
11:15	2	1	23	0	45	116	22	1	12	2	3	0	4	109	3	0
11:30	4	1	31	0	16	126	8	0	24	1	6	0	6	115	2	0
11:45	7	2	42	0	15	125	22	0	25	1	6	0	3	168	3	0
12:00	5	1	47	0	30	156	18	0	21	1	6	0	6	134	8	0
12:15	5	2	27	0	53	210	27	0	18	2	8	0	7	98	5	0
12:30	3	1	35	0	25	148	24	0	19	0	6	0	4	120	9	0
12:45	3	1	40	0	19	122	12	0	28	0	11	0	5	118	4	0
13:00	7	1	45	0	12	102	9	0	33	0	8	0	4	154	10	0
13:15	3	3	21	0	47	155	27	0	24	2	5	0	7	119	4	0
13:30	4	3	36	0	33	163	22	0	19	1	7	0	11	141	3	0
13:45	6	3	42	0	22	106	17	0	22	1	4	0	5	123	6	0
14:00	7	3	51	0	26	123	16	0	39	4	4	0	3	145	2	0
14:15	3	5	26	0	44	162	30	0	19	2	6	0	16	117	2	0
14:30	4	2	20	0	47	186	49	0	15	1	11	0	6	111	8	0
14:45	6	1	27	0	32	129	21	0	24	2	5	0	4	107	8	1
15:00	3	5	23	0	40	144	18	1	28	3	3	0	8	147	4	0
15:15	6	1	35	0	37	157	33	0	26	5	7	0	13	122	11	0
15:30	1	1	59	0	43	174	33	1	29	6	12	0	8	196	4	0
15:45	6	1	53	0	68	211	57	2	33	4	5	0	10	148	4	0
16:00	8	5	28	0	63	231	49	0	18	0	12	0	7	147	8	0
16:15	7	6	37	0	40	202	33	1	39	7	10	0	8	153	6	0
16:30	2	5	44	0	29	187	27	0	37	6	9	0	7	167	7	1
16:45	6	0	35	0	42	197	31	0	32	5	12	0	8	174	6	0
17:00	8	6	57	0	45	200	34	0	36	11	21	0	6	209	8	0
17:15	12	5	58	0	54	188	37	1	27	4	12	0	15	161	8	0
17:30	9	6	58	0	56	205	56	0	31	4	17	0	3	156	9	0
17:45	6	5	47	0	37	171	33	0	43	3	18	0	11	158	11	1
18:00	5	3	49	0	37	158	24	0	22	5	15	0	3	167	5	0
18:15	7	6	42	0	45	181	33	0	25	1	16	0	7	141	9	0
18:30	15	3	59	0	43	174	30	0	35	2	8	0	19	153	11	0
18:45	11	4	56	0	52	192	48	1	48	7	17	0	9	174	12	0
19:00	5	3	48	0	65	180	34	0	33	7	16	0	18	117	13	0
19:15	0	1	0	0	77	173	31	0	29	1	15	0	16	108	7	1
19:30	0	1	0	0	80	135	39	1	34	3	11	1	25	90	11	1
19:45	0	1	0	0	72	137	26	0	25	4	8	0	16	101	21	0
20:00	0	0	0	0	66	133	37	1	26	4	16	1	17	78	12	0
20:15	0	3	0	0	81	143	40	0	19	7	12	0	21	76	15	0
20:30	1	1	0	0	67	121	42	0	20	11	14	1	11	62	17	1
20:45	0	3	0	0	55	104	34	0	19	4	11	0	13	78	11	0
21:00	0	2	0	0	84	156	36	0	23	11	15	0	6	63	13	0
21:15	0	0	0	0	50	114	30	0	25	4	11	0	10	62	6	0
21:30	0	2	0	0	52	98	34	0	10	8	12	0	14	42	14	0
21:45	0	3	0	0	50	85	35	1	14	2	11	0	11	67	6	0
22:00	0	0	0	0	61	76	28	0	34	11	13	0	12	45	7	0
22:15	0	1	0	0	49	83	35	1	7	4	7	0	2	31	5	0
22:30	0	3	0	0	41	61	24	0	11	8	5	0	3	15	2	0
22:45	0	0	1	0	48	60	19	0	15	9	17	0	3	26	3	0
23:00	0	2	1	0	37	42	14	0	21	2	17	0	2	38	6	0
23:15	0	4	0	0	39	59	15	0	7	11	4	0	3	26	10	0
23:30	0	2	0	0	38	35	16	0	10	2	9	0	2	34	6	0
23:45	0	0	0	0	21	24	10	0	9	0	5	0	3	27	1	0
<b>Total</b>	<b>257</b>	<b>178</b>	<b>2169</b>	<b>1</b>	<b>2724</b>	<b>9795</b>	<b>1773</b>	<b>20</b>	<b>1913</b>	<b>235</b>	<b>625</b>	<b>3</b>	<b>509</b>	<b>9021</b>	<b>510</b>	<b>6</b>



**Intersection** Port Republic Rd & Devon Ln  
**Date** 10/3/2018

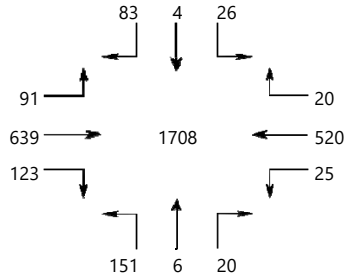
### AM PEAK HOUR VOLUME (0:00-10:45)

FROM 08:00 TO 09:00



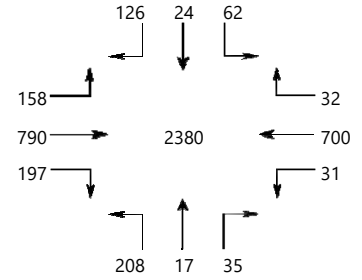
### MID-DAY PEAK HOUR VOLUME (11:00-14:00)

FROM 11:45 TO 12:45



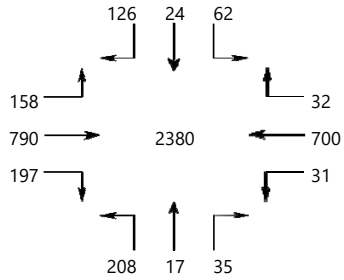
### PM PEAK HOUR VOLUME (14:15-23:45)

FROM 16:45 TO 17:45



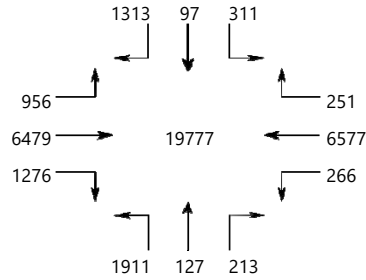
### OVERALL PEAK HOUR VOLUME

FROM 16:45 TO 17:45



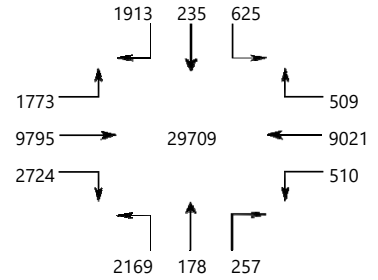
### DAYTIME TOTAL VOLUME

FROM 07:00 TO 18:00



### SELECTED TIME VOLUME

FROM 00:00 TO 23:59

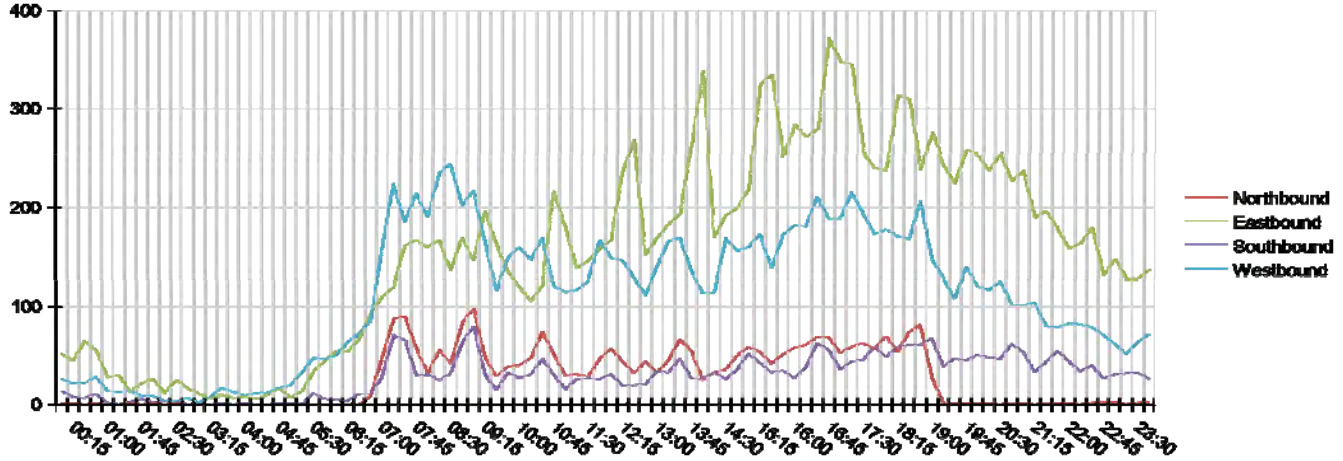


# GRIDSMART.

## Turning Movement Counts

Intersection Port Republic Rd & Devon Ln  
Date 10/4/2018

	Right	Through	Left	UTurn	Total
Northbound	292	182	2153	0	2627
Eastbound	2965	10212	1776	14	14967
Southbound	1909	292	621	1	2823
Westbound	548	9428	638	12	10626
<b>Total</b>	<b>5714</b>	<b>20114</b>	<b>5188</b>	<b>27</b>	<b>31043</b>



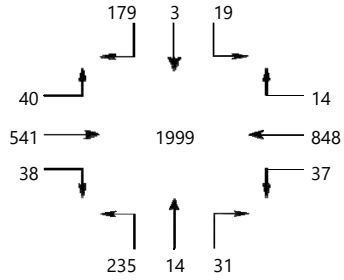
	Northbound				Eastbound				Southbound				Westbound			
	R	T	L	U	R	T	L	U	R	T	L	U	R	T	L	U
00:00	0	1	0	0	18	22	12	0	7	1	6	0	1	22	3	0
00:15	0	1	0	0	11	19	15	0	3	1	4	0	0	20	2	0
00:30	0	0	0	0	20	34	11	0	2	2	3	0	2	20	0	0
00:45	0	1	0	0	20	25	11	0	7	3	1	0	0	22	6	0
01:00	0	0	0	0	7	17	4	0	1	1	0	0	1	8	5	0
01:15	0	0	0	0	13	12	5	0	0	0	0	0	0	13	0	0
01:30	0	1	0	0	1	8	4	0	3	0	0	0	1	10	3	0
01:45	0	0	0	0	9	11	2	0	4	0	2	0	1	7	1	0
02:00	0	1	0	0	11	10	5	0	0	1	1	0	0	9	0	0
02:15	0	0	0	0	3	6	3	0	1	1	2	0	0	4	0	0
02:30	0	1	0	0	2	20	3	0	2	1	0	0	0	3	0	0
02:45	0	0	0	0	6	10	1	0	0	0	0	0	0	6	1	0
03:00	0	0	0	0	3	6	2	0	0	0	0	0	0	2	0	0
03:15	0	0	0	0	1	4	1	0	0	0	0	0	0	8	0	0
03:30	0	0	0	0	0	7	3	0	1	0	0	0	0	17	0	0
03:45	0	0	0	0	0	7	0	0	0	0	0	0	0	13	0	0
04:00	0	0	0	0	2	6	0	0	0	1	0	0	0	9	0	0
04:15	0	0	0	0	1	4	1	0	0	0	0	0	0	12	0	0
04:30	0	0	0	0	0	10	0	0	0	0	0	0	0	12	0	0
04:45	0	0	0	0	0	17	0	0	1	0	0	0	0	15	2	0
05:00	0	0	0	0	1	6	0	0	0	0	1	0	0	19	1	0
05:15	0	0	0	0	1	13	0	0	0	0	0	0	0	33	0	0
05:30	0	0	0	0	4	30	0	0	11	0	1	0	0	47	1	0
05:45	0	0	0	0	3	39	3	0	6	0	0	0	0	46	0	0
06:00	0	0	0	0	0	51	4	0	4	0	1	0	1	50	0	0
06:15	0	0	0	0	2	48	4	0	4	0	0	0	1	62	1	0
06:30	0	0	0	0	0	61	6	0	10	0	1	0	0	71	2	0
06:45	0	1	8	5	84	4	0	11	0	0	0	1	81	4	0	
07:00	3	1	44	3	100	7	0	25	2	2	0	1	152	4	0	
07:15	3	2	83	4	113	3	0	66	2	3	0	2	221	2	0	
07:30	4	3	83	8	148	5	0	51	2	13	0	4	170	11	0	
07:45	7	3	47	5	156	6	0	25	0	4	0	4	187	24	0	
08:00	3	0	29	8	142	10	0	23	3	5	0	5	168	17	0	
08:15	9	3	44	6	158	3	0	22	0	3	0	4	211	20	0	
08:30	1	1	40	10	119	7	0	29	1	2	0	5	233	7	0	
08:45	13	5	66	12	140	18	0	54	1	9	0	1	196	5	0	
09:00	8	5	85	10	124	12	0	74	1	5	0	4	208	5	0	
09:15	5	0	43	29	143	25	0	23	1	6	0	8	147	10	0	
09:30	2	1	26	12	133	18	0	11	1	3	0	4	109	3	0	
09:45	6	3	30	14	116	5	0	26	2	5	0	3	140	5	1	
10:00	4	3	33	8	101	11	0	20	1	6	0	9	142	9	0	
10:15	10	2	36	11	87	8	0	27	2	2	0	5	138	4	0	
10:30	6	1	68	17	93	12	0	36	4	7	0	4	158	7	0	
10:45	4	3	44	43	156	18	0	25	0	5	0	5	113	3	0	
11:00	2	1	27	39	128	14	0	10	3	3	0	3	110	2	0	

11:15	6	1	24	22	109	7	0	19	2	5	0	3	109	5	0
11:30	2	1	26	10	120	16	0	22	0	5	0	0	120	6	0
11:45	2	3	42	16	127	15	0	20	0	6	0	4	161	2	0
12:00	4	1	52	15	136	15	1	23	4	4	0	3	138	8	0
12:15	7	4	33	40	161	36	0	14	2	3	0	3	140	3	0
12:30	8	0	24	53	185	29	1	12	1	7	0	6	115	8	0
12:45	6	3	35	24	119	9	0	13	2	6	0	7	104	1	0
13:00	2	1	30	17	139	13	0	25	2	7	0	7	128	5	0
13:15	8	2	35	29	134	19	1	21	2	10	0	5	152	9	0
13:30	4	8	55	36	137	20	0	41	2	4	0	2	165	2	0
13:45	4	4	47	45	191	26	1	19	2	6	0	3	128	5	0
14:00	2	3	20	81	208	50	0	19	2	5	0	5	102	6	1
14:15	6	1	26	18	131	21	0	18	1	14	0	18	86	9	1
14:30	5	3	28	32	143	17	0	17	1	8	0	9	158	2	0
14:45	8	2	40	26	149	24	0	29	0	7	0	10	141	5	0
15:00	6	3	50	31	160	28	0	44	4	4	0	4	148	8	0
15:15	3	3	48	67	218	40	0	27	6	10	0	4	165	3	1
15:30	8	2	32	61	217	57	0	21	5	7	0	9	122	7	0
15:45	4	8	39	35	197	19	0	21	4	10	0	7	157	7	1
16:00	8	3	47	44	220	20	0	23	1	3	0	12	162	8	0
16:15	8	3	50	44	203	24	0	25	1	12	0	8	166	7	0
16:30	9	3	57	44	201	32	2	42	6	15	0	6	189	14	2
16:45	11	7	51	69	237	66	0	43	3	10	0	10	165	12	2
17:00	9	4	40	77	231	40	0	21	4	11	0	6	170	13	0
17:15	9	8	42	54	243	47	1	27	8	9	0	10	194	11	1
17:30	5	6	52	40	189	27	0	29	7	10	0	11	171	12	0
17:45	5	1	51	46	175	20	0	35	7	17	0	10	157	6	0
18:00	7	3	60	50	165	23	0	34	4	11	0	7	163	8	0
18:15	7	4	43	58	224	31	1	36	6	17	0	16	144	11	0
18:30	14	4	56	61	205	42	1	35	7	19	0	15	144	9	0
18:45	10	10	62	57	139	43	0	42	6	13	0	10	180	17	0
19:00	4	5	19	67	168	41	0	34	11	23	0	13	125	9	0
19:15	0	2	0	66	144	33	1	21	8	10	0	16	99	14	0
19:30	0	1	0	72	109	43	1	28	6	13	0	18	81	9	0
19:45	1	0	0	75	142	41	0	19	11	15	0	20	108	12	0
20:00	0	1	0	89	127	38	0	28	8	15	0	17	91	13	0
20:15	0	1	0	60	140	38	0	26	13	9	0	11	87	18	1
20:30	0	0	0	79	132	44	0	25	11	11	0	21	88	17	0
20:45	0	2	0	64	121	42	0	34	7	21	0	15	74	12	1
21:00	0	1	0	73	123	41	1	28	14	12	0	7	77	17	0
21:15	0	0	0	51	106	33	0	18	6	9	0	16	81	7	0
21:30	0	1	1	71	103	23	0	24	5	15	0	9	59	12	0
21:45	0	1	0	70	84	24	0	32	4	19	0	10	60	9	0
22:00	0	1	0	57	83	18	0	22	9	12	1	5	69	9	0
22:15	0	0	0	66	72	26	0	17	7	10	0	5	58	19	0
22:30	0	2	0	61	96	23	0	26	6	8	0	12	51	16	0
22:45	0	3	0	47	63	20	1	14	6	7	0	7	53	11	0
23:00	0	3	0	57	65	25	1	19	5	7	0	7	49	6	0
23:15	0	0	0	46	58	24	0	19	4	9	0	4	39	9	0
23:30	0	2	0	48	57	23	0	20	7	6	0	11	43	10	0
23:45	0	3	0	61	62	14	0	13	4	9	0	14	48	10	0
<b>Total</b>	<b>292</b>	<b>182</b>	<b>2153</b>	<b>2965</b>	<b>10212</b>	<b>1776</b>	<b>14</b>	<b>1909</b>	<b>292</b>	<b>621</b>	<b>1</b>	<b>548</b>	<b>9428</b>	<b>638</b>	<b>12</b>

**Intersection** Port Republic Rd & Devon Ln  
**Date** 10/4/2018

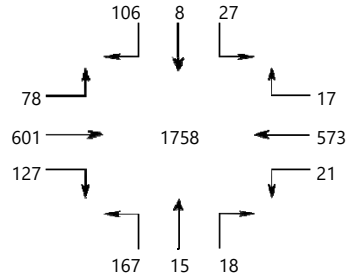
### AM PEAK HOUR VOLUME (0:00-10:45)

FROM 08:15 TO 09:15



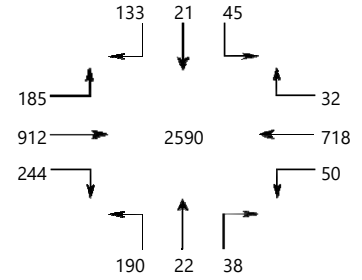
### MID-DAY PEAK HOUR VOLUME (11:00-14:00)

FROM 13:00 TO 14:00



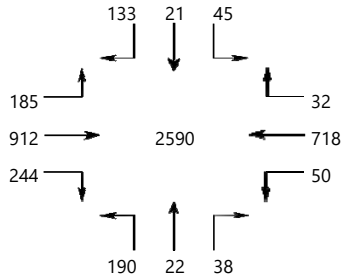
### PM PEAK HOUR VOLUME (14:15-23:45)

FROM 16:30 TO 17:30



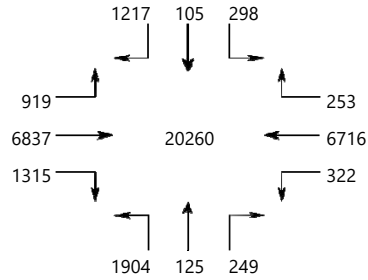
### OVERALL PEAK HOUR VOLUME

FROM 16:30 TO 17:30



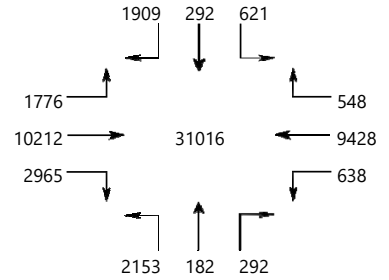
### DAYTIME TOTAL VOLUME

FROM 07:00 TO 18:00



### SELECTED TIME VOLUME

FROM 00:00 TO 23:59



**AM PEAK HOUR TOTAL VEHICLES** Date: Wed, 4/20/16  
COUNTS CONDUCTED THE TRAFFIC GROUP  
LOCATION: Rt. 253 Port Republic Road/Hunters Road  
CUMULATIVE 15 MINUTE COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15																	0
7:15 to 7:30																	0
7:30 to 7:45																	0
7:45 to 8:00																	0
8:00 to 8:15																	0
8:15 to 8:30																	0
8:30 to 8:45																	0
8:45 to 9:00																	0

Count Sheet

15 MINUTE INTERVAL COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15	0	4	0	0	0	0	0	0	0	1	148	0	0	0	79	0	232
7:15 to 7:30	0	4	0	0	0	0	0	0	0	1	214	0	0	0	103	5	327
7:30 to 7:45	0	9	0	7	0	0	0	0	0	0	256	0	0	0	135	2	409
7:45 to 8:00	0	5	0	5	0	0	0	0	0	0	296	0	0	0	154	4	464
8:00 to 8:15	0	4	0	1	0	0	0	0	0	0	220	0	0	0	156	1	382
8:15 to 8:30	0	7	0	0	0	0	0	0	0	2	219	0	0	0	145	1	374
8:30 to 8:45	0	5	0	1	0	0	0	0	0	0	341	0	0	0	145	2	494
8:45 to 9:00	0	8	0	0	0	0	0	0	0	0	342	0	0	0	170	1	521

HOURLY INTERVAL

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 8:00	0	22	0	12	0	0	0	0	0	2	914	0	0	0	471	11	1432
7:15 to 8:15	0	22	0	13	0	0	0	0	0	1	986	0	0	0	548	12	1582
7:30 to 8:30	0	25	0	13	0	0	0	0	0	2	991	0	0	0	590	8	1629
7:45 to 8:45	0	21	0	7	0	0	0	0	0	2	1076	0	0	0	600	8	1714
8:00 to 9:00	0	24	0	2	0	0	0	0	0	2	1122	0	0	0	616	5	1771

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
8:00 to 9:00	0	24	0	2	0	0	0	0	0	2	1122	0	0	0	616	5	1771

PEAK HOUR FACTOR BY APPROACH

	EB	WB	NB	SB	
7:00 to 7:15	4	0	149	79	232
7:15 to 7:30	4	0	215	108	327
7:30 to 7:45	16	0	256	137	409
7:45 to 8:00	10	0	296	158	464
8:00 to 8:15	5	0	220	157	382
8:15 to 8:30	7	0	221	146	374
8:30 to 8:45	6	0	341	147	494
8:45 to 9:00	8	0	342	171	521
PHF	0.81	####	0.82	0.91	0.85

**AM PEAK HOUR TRUCKS**

Date: Wed, 4/20/16

COUNTS CONDUCTED THE TRAFFIC GROUP

LOCATION: Rt. 253 Port Republic Road/Hunters Road

**CUMULATIVE 15 MINUTE COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15																	0
7:15 to 7:30																	0
7:30 to 7:45																	0
7:45 to 8:00																	0
8:00 to 8:15																	0
8:15 to 8:30																	0
8:30 to 8:45																	0
8:45 to 9:00																	0

Count Sheet

**15 MINUTE INTERVAL COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15	0	0	0	0	0	0	0	0	0	1	4	0	0	0	5	0	10
7:15 to 7:30	0	0	0	0	0	0	0	0	0	0	3	0	0	0	12	2	17
7:30 to 7:45	0	0	0	0	0	0	0	0	0	0	8	0	0	0	3	0	11
7:45 to 8:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	5
8:00 to 8:15	0	0	0	0	0	0	0	0	0	0	8	0	0	0	10	1	19
8:15 to 8:30	0	0	0	0	0	0	0	0	0	1	4	0	0	0	10	0	15
8:30 to 8:45	0	0	0	0	0	0	0	0	0	0	13	0	0	0	6	1	20
8:45 to 9:00	0	0	0	0	0	0	0	0	0	0	3	0	0	0	9	0	12

**HOURLY INTERVAL**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 8:00	0	0	0	0	0	0	0	0	0	1	17	0	0	0	23	2	43
7:15 to 8:15	0	0	0	0	0	0	0	0	0	0	21	0	0	0	28	3	52
7:30 to 8:30	0	0	0	0	0	0	0	0	0	1	22	0	0	0	26	1	50
7:45 to 8:45	0	0	0	0	0	0	0	0	0	1	27	0	0	0	29	2	59
8:00 to 9:00	0	0	0	0	0	0	0	0	0	1	28	0	0	0	35	2	66

**PEAK HOUR TURNING MOVEMENT VOLUMES**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
8:00 to 9:00	0	0	0	0	0	0	0	0	0	1	28	0	0	0	35	2	66

**PERCENTAGE TRUCKS**

EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
####	0%	####	0%	####	####	####	####	####	50%	2%	####	####	####	6%	40%	4%



**PM PEAK HOUR TOTAL VEHICLES** Date: Wed, 4/20/16  
COUNTS CONDUCTED THE TRAFFIC GROUP  
LOCATION: Rt. 253 Port Republic Road/Hunters Road  
CUMULATIVE 15 MINUTE COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
3:45 to 4:00																	0
4:00 to 4:15																	0
4:15 to 4:30																	0
4:30 to 4:45																	0
4:45 to 5:00																	0
5:00 to 5:15																	0
5:15 to 5:30																	0
5:30 to 5:45																	0
5:45 to 6:00																	0

Count Sheet

15 MINUTE INTERVAL COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 4:15	0	5	0	3	0	0	0	0	0	2	217	0	0	0	327	9	563
4:15 to 4:30	0	12	0	2	0	0	0	0	0	6	224	0	0	0	254	10	508
4:30 to 4:45	0	13	0	2	0	0	0	0	0	2	218	0	0	0	259	6	500
4:45 to 5:00	0	6	0	1	0	0	0	0	0	2	269	0	0	0	285	9	572
5:00 to 5:15	0	2	0	3	0	0	0	0	0	1	255	0	0	0	308	12	581
5:15 to 5:30	0	7	0	3	0	0	0	0	0	1	252	0	1	0	371	13	648
5:30 to 5:45	0	5	0	5	0	0	0	0	0	2	253	0	0	0	311	9	585
5:45 to 6:00	0	5	0	1	0	0	0	0	0	3	248	0	0	0	262	7	526

HOURLY INTERVAL

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 5:00	0	36	0	8	0	0	0	0	0	12	928	0	0	0	1125	34	2143
4:15 to 5:15	0	33	0	8	0	0	0	0	0	11	966	0	0	0	1106	37	2161
4:30 to 5:30	0	28	0	9	0	0	0	0	0	6	994	0	1	0	1223	40	2301
4:45 to 5:45	0	20	0	12	0	0	0	0	0	6	1029	0	1	0	1275	43	2386
5:00 to 6:00	0	19	0	12	0	0	0	0	0	7	1008	0	1	0	1252	41	2340

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:45 to 5:45	0	20	0	12	0	0	0	0	0	6	1029	0	1	0	1275	43	2386

PEAK HOUR FACTOR BY APPROACH

	EB	WB	NB	SB	Total
4:00 to 4:15	8	0	219	336	563
4:15 to 4:30	14	0	230	264	508
4:30 to 4:45	15	0	220	265	500
4:45 to 5:00	7	0	271	294	572
5:00 to 5:15	5	0	256	320	581
5:15 to 5:30	10	0	253	384	647
5:30 to 5:45	10	0	255	320	585
5:45 to 6:00	6	0	251	269	526
PHF	0.80	####	0.95	0.86	0.92

**PM PEAK HOUR TRUCKS**

Date: Wed, 4/20/16

COUNTS CONDUCTED THE TRAFFIC GROUP

LOCATION: Rt. 253 Port Republic Road/Hunters Road

**CUMULATIVE 15 MINUTE COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
3:45 to 4:00																	0
4:00 to 4:15																	0
4:15 to 4:30																	0
4:30 to 4:45																	0
4:45 to 5:00																	0
5:00 to 5:15																	0
5:15 to 5:30																	0
5:30 to 5:45																	0
5:45 to 6:00																	0

Count Sheet

**15 MINUTE INTERVAL COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 4:15	0	0	0	1	0	0	0	0	0	0	6	0	0	0	8	1	16
4:15 to 4:30	0	0	0	0	0	0	0	0	0	0	9	0	0	0	5	0	14
4:30 to 4:45	0	0	0	0	0	0	0	0	0	0	9	0	0	0	2	0	11
4:45 to 5:00	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	1	13
5:00 to 5:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	1	6
5:15 to 5:30	0	0	0	0	0	0	0	0	0	0	7	0	0	0	3	1	11
5:30 to 5:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
5:45 to 6:00	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	1	9

**HOUR INTERVAL**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 5:00	0	0	0	1	0	0	0	0	0	0	30	0	0	0	21	2	54
4:15 to 5:15	0	0	0	0	0	0	0	0	0	0	26	0	0	0	16	2	44
4:30 to 5:30	0	0	0	0	0	0	0	0	0	0	24	0	0	0	14	3	41
4:45 to 5:45	0	0	0	0	0	0	0	0	0	0	16	0	0	0	13	3	32
5:00 to 6:00	0	0	0	0	0	0	0	0	0	0	14	0	0	0	11	3	28

**PEAK HOUR TURNING MOVEMENT VOLUMES**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:45 to 5:45	0	0	0	0	0	0	0	0	0	0	16	0	0	0	13	3	32

**PERCENTAGE TRUCKS**

EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
####	0%	####	0%	####	####	####	####	####	0%	2%	####	0%	####	1%	7%	1%

**AM PEAK HOUR TOTAL VEHICLES** Date: Wed, 4/20/16  
COUNTS CONDUCTED THE TRAFFIC GROUP  
LOCATION: Rt. 253 Port Republic Road/Bradley Drive  
CUMULATIVE 15 MINUTE COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15																	0
7:15 to 7:30																	0
7:30 to 7:45																	0
7:45 to 8:00																	0
8:00 to 8:15																	0
8:15 to 8:30																	0
8:30 to 8:45																	0
8:45 to 9:00																	0

Count Sheet

15 MINUTE INTERVAL COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15	0	6	0	1	0	0	0	0	0	2	145	0	0	0	79	1	234
7:15 to 7:30	0	6	0	1	0	0	0	0	0	0	217	0	0	0	97	1	322
7:30 to 7:45	0	7	0	5	0	0	0	0	2	1	270	0	0	0	149	0	434
7:45 to 8:00	0	4	0	4	0	0	0	0	0	0	289	0	0	0	158	2	457
8:00 to 8:15	0	4	0	3	0	0	0	0	0	1	188	0	0	0	154	2	352
8:15 to 8:30	0	0	0	6	0	0	0	0	0	2	225	0	0	0	145	2	380
8:30 to 8:45	0	9	0	5	0	0	0	0	0	0	348	0	0	0	150	3	515
8:45 to 9:00	0	8	0	1	0	0	0	0	0	2	311	0	0	0	166	0	488

HOURLY INTERVAL

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 8:00	0	23	0	11	0	0	0	0	2	3	921	0	0	0	483	4	1447
7:15 to 8:15	0	21	0	13	0	0	0	0	2	2	964	0	0	0	558	5	1565
7:30 to 8:30	0	15	0	18	0	0	0	0	2	4	972	0	0	0	606	6	1623
7:45 to 8:45	0	17	0	18	0	0	0	0	0	3	1050	0	0	0	607	9	1704
8:00 to 9:00	0	21	0	15	0	0	0	0	0	5	1072	0	0	0	615	7	1735

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
8:00 to 9:00	0	21	0	15	0	0	0	0	0	5	1072	0	0	0	615	7	1735

PEAK HOUR FACTOR BY APPROACH

	EB	WB	NB	SB	Total
7:00 to 7:15	7	0	147	80	234
7:15 to 7:30	7	0	217	98	322
7:30 to 7:45	12	0	271	149	432
7:45 to 8:00	8	0	289	160	457
8:00 to 8:15	7	0	189	156	352
8:15 to 8:30	6	0	227	147	380
8:30 to 8:45	14	0	348	153	515
8:45 to 9:00	9	0	313	166	488
PHF	0.64	####	0.77	0.94	0.84

**AM PEAK HOUR TRUCKS**

Date: Wed, 4/20/16

COUNTS CONDUCTED THE TRAFFIC GROUP

LOCATION: Rt. 253 Port Republic Road/Bradley Drive

**CUMULATIVE 15 MINUTE COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15																	0
7:15 to 7:30																	0
7:30 to 7:45																	0
7:45 to 8:00																	0
8:00 to 8:15																	0
8:15 to 8:30																	0
8:30 to 8:45																	0
8:45 to 9:00																	0

Count Sheet

**15 MINUTE INTERVAL COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 7:15	0	1	0	0	0	0	0	0	0	0	4	0	0	0	5	0	10
7:15 to 7:30	0	0	0	1	0	0	0	0	0	0	4	0	0	0	11	0	16
7:30 to 7:45	0	0	0	1	0	0	0	0	0	0	7	0	0	0	3	0	11
7:45 to 8:00	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	7
8:00 to 8:15	0	0	0	1	0	0	0	0	0	0	5	0	0	0	9	0	15
8:15 to 8:30	0	0	0	1	0	0	0	0	0	0	5	0	0	0	12	0	18
8:30 to 8:45	0	0	0	1	0	0	0	0	0	0	17	0	0	0	6	0	24
8:45 to 9:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	9	0	11

**HOUR INTERVAL**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
7:00 to 8:00	0	1	0	2	0	0	0	0	0	0	19	0	0	0	22	0	44
7:15 to 8:15	0	0	0	3	0	0	0	0	0	0	20	0	0	0	26	0	49
7:30 to 8:30	0	0	0	3	0	0	0	0	0	0	21	0	0	0	27	0	51
7:45 to 8:45	0	0	0	3	0	0	0	0	0	0	31	0	0	0	30	0	64
8:00 to 9:00	0	0	0	3	0	0	0	0	0	0	29	0	0	0	36	0	68

**PEAK HOUR TURNING MOVEMENT VOLUMES**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
8:00 to 9:00	0	0	0	3	0	0	0	0	0	0	29	0	0	0	36	0	68

**PERCENTAGE TRUCKS**

EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
####	0%	####	20%	####	####	####	####	####	0%	3%	####	####	####	6%	0%	4%

**PM PEAK HOUR TOTAL VEHICLES** Date: Wed, 4/20/16  
COUNTS CONDUCTED THE TRAFFIC GROUP  
LOCATION: Rt. 253 Port Republic Road/Bradley Drive  
CUMULATIVE 15 MINUTE COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
3:45 to 4:00																	0
4:00 to 4:15																	0
4:15 to 4:30																	0
4:30 to 4:45																	0
4:45 to 5:00																	0
5:00 to 5:15																	0
5:15 to 5:30																	0
5:30 to 5:45																	0
5:45 to 6:00																	0

Count Sheet

15 MINUTE INTERVAL COUNTS

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 4:15	0	10	0	11	0	0	0	0	0	6	197	0	0	0	318	11	553
4:15 to 4:30	0	6	0	3	0	0	0	0	0	1	217	0	0	0	247	4	478
4:30 to 4:45	0	6	0	3	0	0	0	0	0	8	236	0	0	0	258	4	515
4:45 to 5:00	0	8	0	7	0	0	0	0	0	2	242	0	0	0	287	4	550
5:00 to 5:15	0	4	0	7	0	0	0	0	0	3	250	0	0	0	293	11	568
5:15 to 5:30	0	6	0	6	0	0	0	0	0	6	255	0	0	0	371	6	650
5:30 to 5:45	0	6	0	4	0	0	0	0	0	8	244	0	0	0	299	6	567
5:45 to 6:00	0	5	0	8	0	0	0	0	0	5	239	0	0	0	257	9	523

HOURLY INTERVAL

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 5:00	0	30	0	24	0	0	0	0	0	17	892	0	0	0	1110	23	2096
4:15 to 5:15	0	24	0	20	0	0	0	0	0	14	945	0	0	0	1085	23	2111
4:30 to 5:30	0	24	0	23	0	0	0	0	0	19	983	0	0	0	1209	25	2283
4:45 to 5:45	0	24	0	24	0	0	0	0	0	19	991	0	0	0	1250	27	2335
5:00 to 6:00	0	21	0	25	0	0	0	0	0	22	988	0	0	0	1220	32	2308

PEAK HOUR TURNING MOVEMENT VOLUMES

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:45 to 5:45	0	24	0	24	0	0	0	0	0	19	991	0	0	0	1250	27	2335

PEAK HOUR FACTOR BY APPROACH

	EB	WB	NB	SB	Total
4:00 to 4:15	21	0	203	329	553
4:15 to 4:30	9	0	218	251	478
4:30 to 4:45	9	0	244	262	515
4:45 to 5:00	15	0	244	291	550
5:00 to 5:15	11	0	253	304	568
5:15 to 5:30	12	0	261	377	650
5:30 to 5:45	10	0	252	305	567
5:45 to 6:00	13	0	244	266	523
PHF	0.80	####	0.97	0.85	0.90

**PM PEAK HOUR TRUCKS**

Date: Wed, 4/20/16

COUNTS CONDUCTED THE TRAFFIC GROUP

LOCATION: Rt. 253 Port Republic Road/Bradley Drive

**CUMULATIVE 15 MINUTE COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
3:45 to 4:00																	0
4:00 to 4:15																	0
4:15 to 4:30																	0
4:30 to 4:45																	0
4:45 to 5:00																	0
5:00 to 5:15																	0
5:15 to 5:30																	0
5:30 to 5:45																	0
5:45 to 6:00																	0

Count Sheet

**15 MINUTE INTERVAL COUNTS**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 4:15	0	0	0	2	0	0	0	0	0	0	4	0	0	0	7	0	13
4:15 to 4:30	0	0	0	0	0	0	0	0	0	0	9	0	0	0	5	0	14
4:30 to 4:45	0	0	0	0	0	0	0	0	0	0	8	0	0	0	2	0	10
4:45 to 5:00	0	0	0	1	0	0	0	0	0	0	7	0	0	0	6	0	14
5:00 to 5:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	5
5:15 to 5:30	0	0	0	1	0	0	0	0	0	0	7	0	0	0	3	0	11
5:30 to 5:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
5:45 to 6:00	0	0	0	1	0	0	0	0	0	0	5	0	0	0	4	0	10

**HOUR INTERVAL**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:00 to 5:00	0	0	0	3	0	0	0	0	0	0	28	0	0	0	20	0	51
4:15 to 5:15	0	0	0	1	0	0	0	0	0	0	25	0	0	0	17	0	43
4:30 to 5:30	0	0	0	2	0	0	0	0	0	0	23	0	0	0	15	0	40
4:45 to 5:45	0	0	0	2	0	0	0	0	0	0	16	0	0	0	15	0	33
5:00 to 6:00	0	0	0	2	0	0	0	0	0	0	14	0	0	0	13	0	29

**PEAK HOUR TURNING MOVEMENT VOLUMES**

TIME	EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
4:45 to 5:45	0	0	0	2	0	0	0	0	0	0	16	0	0	0	15	0	33

**PERCENTAGE TRUCKS**

EB Uturn	EB Left	EB Thru	EB Right	WB Uturn	WB Left	WB Thru	WB Right	NB Uturn	NB Left	NB Thru	NB Right	SB Uturn	SB Left	SB Thru	SB Right	Total
####	0%	####	8%	####	####	####	####	####	0%	2%	####	####	####	1%	0%	1%





## Appendix D

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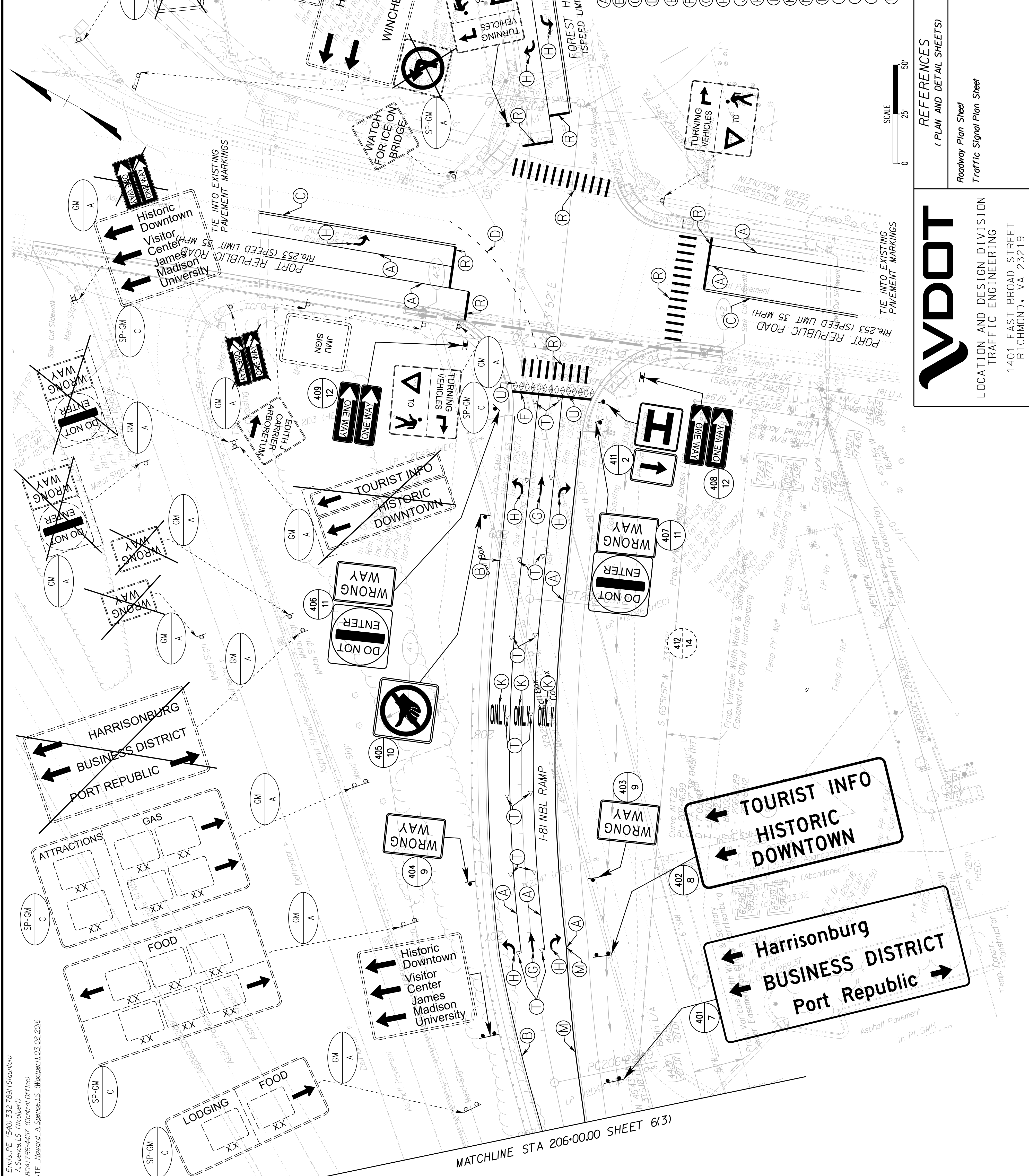
VDOT Ramp Relocation Design Plans

REVISED	STATE	PROJECT	SHEET NO.
	VA.	0081-15-833-C-501	6(4)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

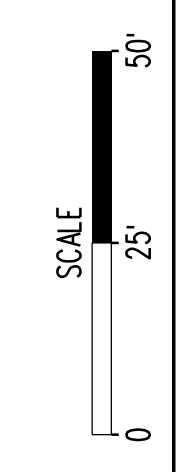
**PAUL TIMOTHY SARAHAN**  
Lic. No. 049569  
PROFESSIONAL ENGINEER  
COMMONWEALTH OF VIRGINIA

**VDOT Location & Design**  
Richmond, Virginia  
TRAFFIC ENGINEER



MATCHLINE STA 206+00.00 SHEET 6(3)

- PAVEMENT MARKING LEGEND**
- (A) TYPE A WHITE PAVEMENT LINE MARKING, 4" WIDTH
  - (B) TYPE B WHITE PAVEMENT LINE MARKING, 4" WIDTH
  - (C) TYPE A YELLOW PAVEMENT LINE MARKING, 4" WIDTH
  - (D) TYPE A DOUBLE YELLOW PAVEMENT LINE MARKING, 4" WIDTH
  - (E) TYPE A WHITE PAVEMENT LINE MARKING, 4" WIDTH (12 LINE, 4" SPACE)
  - (F) TYPE A WHITE PAVEMENT LINE MARKING, 4" WIDTH (10 LINE, 30" SPACE)
  - (G) TYPE B CLASS II WHITE PAVEMENT LINE MARKING, 2.4" WIDTH
  - (H) PAVEMENT MARKING (THRU ARROW) TYPE B CLASS II
  - (I) PAVEMENT SYMBOL MARKING (SINGLE TURN ARROW) TYPE B CLASS II
  - (J) PAVEMENT SYMBOL MARKING (DOUBLE TURN ARROW THRU/RT OR LT) TYPE B CLASS II
  - (K) PAVEMENT MESSAGE MARKING (ONLY) TYPE B CLASS II
  - (L) TYPE B CLASS VI WHITE PAVEMENT LINE MARKING, 8" WIDTH
  - (M) TYPE B CLASS VI WHITE PAVEMENT LINE MARKING, 6" WIDTH
  - (N) TYPE B CLASS VI WHITE PAVEMENT LINE MARKING, 4" WIDTH
  - (O) TYPE B CLASS VI YELLOW PAVEMENT LINE MARKING, 4" WIDTH
  - (P) TYPE A WHITE PAVEMENT LINE MARKING, 2.4" WIDTH
  - (Q) PAVEMENT SYMBOL MARKING (SINGLE TURN ARROW) TYPE A
  - (R) ONE-WAY SNOW PLOWABLE RAISED PAVEMENT MARKER (ASPHALT CONCRETE)
  - (S) ONE-WAY SNOW PLOWABLE RAISED PAVEMENT MARKER (ASPHALT CONCRETE)



**VDOT**

LOCATION AND DESIGN DIVISION  
TRAFFIC ENGINEERING  
1401 EAST BROAD STREET  
RICHMOND, VA 23219

**TRAFFIC CONTROL DEVICE PLANS**  
SIGNING & PAVEMENT MARKINGS  
PLAN

REFERENCES  
(PLAN AND DETAIL SHEETS)

Roadway Plan Sheet 4  
Traffic Signal Plan Sheet 7(4)

CITY OF HARRISONBURG  
PROJECT  
0081-15-833  
SHEET NO.  
6(4)





PROJECT MANAGER: John-Alex Ennis, PE (540) 332-7891 (Shourton)  
 SURVEYED BY: DATE: Howard A. Spence, LS (Woodport)  
 DESIGN BY: Paul Saratov, PE (804) 786-4457 (Central Office)  
 SUBSURFACE UTILITY BY: DATE: Howard A. Spence, LS (Woolport) 03-08-2016

**PAVEMENT MARKING LEGEND**

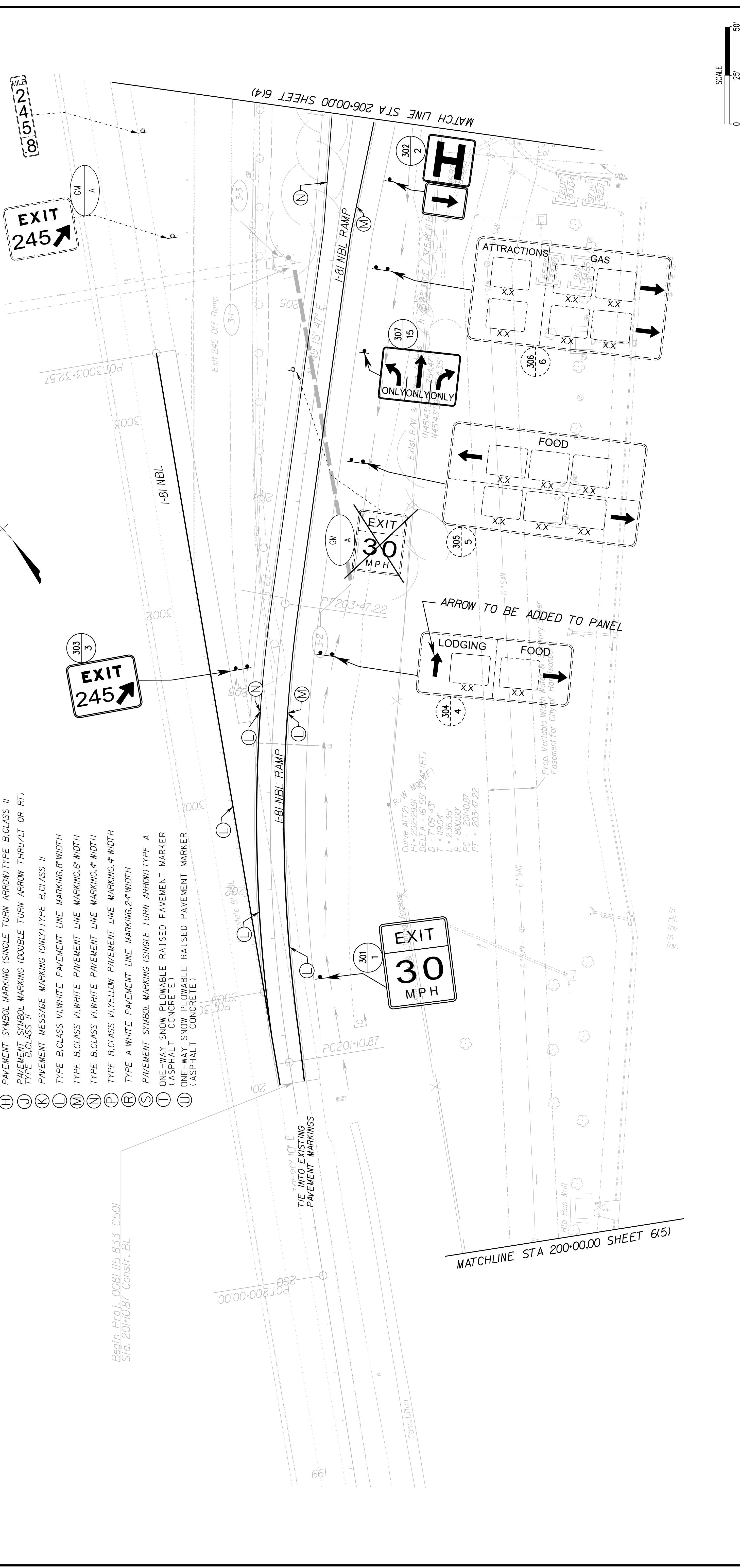
- (A) TYPE A WHITE PAVEMENT LINE MARKING, 4" WIDTH
- (B) TYPE A-YELLOW PAVEMENT LINE MARKING, 4" WIDTH
- (C) TYPE A DOUBLE YELLOW PAVEMENT LINE MARKING, 4" WIDTH
- (D) TYPE A WHITE PAVEMENT LINE MARKING, 4" WIDTH (2 LINE, 4" SPACE)
- (E) TYPE A-WHITE PAVEMENT LINE MARKING, 4" WIDTH (10" LINE, 30" SPACE)
- (F) TYPE B-CLASS II WHITE PAVEMENT LINE MARKING, 24" WIDTH
- (G) PAVEMENT SYMBOL MARKING (THRU ARROW) TYPE B-CLASS II
- (H) PAVEMENT SYMBOL MARKING (SINGLE TURN ARROW) TYPE B-CLASS II
- (I) PAVEMENT SYMBOL MARKING (DOUBLE TURN ARROW THRU/LT OR RT) TYPE B-CLASS II
- (J) PAVEMENT MESSAGE MARKING (ONLY) TYPE B-CLASS II
- (L) TYPE B-CLASS VI, WHITE PAVEMENT LINE MARKING, 8" WIDTH
- (M) TYPE B-CLASS VI, WHITE PAVEMENT LINE MARKING, 6" WIDTH
- (N) TYPE B-CLASS VI, WHITE PAVEMENT LINE MARKING, 4" WIDTH
- (P) TYPE B-CLASS VI, YELLOW PAVEMENT LINE MARKING, 4" WIDTH
- (R) TYPE A WHITE PAVEMENT LINE MARKING, 24" WIDTH
- (S) PAVEMENT SYMBOL MARKING (SINGLE TURN ARROW) TYPE A
- (T) ONE-WAY SNOW PLOWABLE RAISED PAVEMENT MARKER (ASPHALT CONCRETE)
- (U) ONE-WAY SNOW PLOWABLE RAISED PAVEMENT MARKER (ASPHALT CONCRETE)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

COMMONWEALTH OF VIRGINIA  
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REVISED	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA. 81	0081-115-833.C-501	6(3)



**VDOT**  
 LOCATION AND DESIGN DIVISION  
 TRAFFIC ENGINEERING  
 1401 EAST BROAD STREET  
 RICHMOND, VA 23219

**REFERENCES**  
 (PLAN AND DETAIL SHEETS)  
 Roadway Plan Sheet 3

**TRAFFIC CONTROL DEVICE PLANS**  
 SIGNING & PAVEMENT MARKINGS  
 PLAN

CITY OF HARRISONBURG  
 PROJECT 0081-115-833  
 SHEET NO. 6(3)

## Appendix E

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Technical Memorandum – 2030 No Build Conditions



To: Brad Reed  
VDOT Staunton District

Date: December 3, 2018

Cc: Ann Cundy, HRMPO  
Dastan Khaleel, HPWD  
Tom Hartman, HPWD

From: Lisa Simpson, P.E.  
Chuck Conran, E.I.T.

Re: Port Republic Road  
No Build Conditions VISSIM Development

The purpose of this memorandum is to document the study methodology and model development for the 2030 No Build AM and PM peak hour traffic operations for Port Republic Road in Harrisonburg, Virginia. The model utilizes the microsimulation traffic software, *PTV VISSIM 8.0*, and was coded according to the procedures outlined in VDOT's TOSAM (Traffic Operations and Safety Analysis Manual) and VDOT's VISSIM User Guide (hereafter referred to as "Guide"). The limits of the study corridor (**Figure 1**) extend from the Port Republic Road / Maryland Avenue / South Main Street intersection southeast approximately one mile to the Port Republic Road / Devon Lane intersection, encompassing ten total intersections, six of which are signalized.



**Figure 1: VISSIM Study Network**

The 2018 Existing Conditions AM and PM VISSIM models, following a revision to address comments, was considered to be calibrated by VDOT, the City of Harrisonburg, and HRMPO. These models were utilized as the foundation for the No Build models. The 2018 existing models were copied and then altered as needed to produce the No Build models.

## No Build Model Assumptions and Modifications

### Geometry and Volume Rerouting

Coordination with the client team indicated that there are two road design projects in the study network that will be constructed by the 2030 No Build analysis year for this project. The first of these projects is to extend the length of the southbound, dual left-turn lanes from South Main Street onto eastbound Port Republic Road. VHB obtained the design plans from the City and modified the coded VISSIM geometry to mirror the new geometry. No intersection control changes, volume rerouting, or other modifications accompanied this geometric alteration.

The second, and more significant, road design project in the network is the realignment of the northbound I-81 off-ramp. Plans received from VDOT indicate that the ramp will be realigned from its current location opposite the northbound on-ramp to opposite Forest Hill Road a couple hundred feet to the east. The new off-ramp will have a left only, through only, right only lane configuration and will be accompanied by signal changes at the Port Republic / Forest Hill / New Off-Ramp intersection. The eradication of the existing off-ramp terminus opposite the on-ramp will also remove a signal phase from the Port Republic / Northbound I-81 intersection. Finally, the off-ramp is being relocated through the old exit of the JMU parking lot onto Port Republic; a new entrance to the parking lot will be constructed that will provide access via Hunters Road and Bradley Drive.

Initial VISSIM simulation of the No Build conditions assumed 100% of the JMU parking lot traffic would now utilize Hunters Road to access Port Republic Road; however, initial model results in the PM peak hour revealed excessive delay and queueing on Hunters Road at Port Republic because of the high volume of left turns that were unable to enter Port Republic due to the heavy westbound queueing on Port Republic at Forest Hill Road and the lack of a signal to facilitate the left turn. Vehicles exiting the new JMU parking lot access can easily use Bradley Drive to access Port Republic, which places them farther upstream where they are more likely to avoid the Forest Hill queue, and thus able to complete their left turn. Analysis indicated that rerouting 90% of the parking lot traffic that intends to travel west on Port Republic Road balanced the system, meaning Hunters Road and Bradley Drive had similar delay and queueing metrics.

Initial VISSIM simulation also revealed that the SB I-81 off-ramp was not processing all the demand. To attempt to capture the extent of the congestion, the off-ramp was extended from the ramp gore (Existing Conditions model limit) to the start of the off-ramp deceleration lane. As can be seen in Table 1, there is still unmet demand with this geometry, but the model limits cannot be extended further with accurate simulation due to interaction with southbound I-81.

### Volume Growth

The No Build analysis year of 2030 is twelve years after existing traffic counts were collected. At the kick-off meeting for this study, the client team indicated that a 1% annual growth rate should be utilized. Across twelve years of traffic growth, this annual growth rate correlates to a 12.68% growth in traffic volumes. 2030 volumes were computed and coded in VISSIM using the same methodology as for the Existing Conditions models. No additional background growth due to known developments was discussed by the client team or included in the 2030 No Build models.

### Intersection Control

The previously mentioned modifications to signal phasing were applied at the intersections of Port Republic Road and the I-81 northbound on-ramp and Port Republic Road and Forest Hill/relocated I-81 northbound off-ramp as shown in the ramp relocation design plans. Additionally, signal timings including cycle length, splits, and offsets were optimized for No Build geometry and volumes utilizing the traffic software *Synchro Professional Version 9*. As conditions on the corridor change over the next twelve years, the City will continue to update their signal timings to maintain system

optimization. This No Build optimization process does not include any study of or mediation to signal phasing. That will be a Build model condition if it is identified as a potential need and solution.

Cycle length optimization was limited to 5-second interval values between 110 and 135 seconds to maintain minimum timing parameters and limit pedestrian wait time. A 135 second cycle length was used, which closely matches the existing coordinated cycle length of 134 seconds. Traffic signal splits and offsets were updated throughout the corridor.

## No Build Measures of Effectiveness

### Volume Throughput

**Table 1** shows a comparison between the observed and served volumes for several underserved input volumes in the AM and PM peak hour networks. An underserved input volume is a volume group that is not able to fully enter the network during the simulation period due to impeding congestion within the network. These are critical locations that need to be addressed in the Build condition model.

**Table 1: Unmet Demand**

Peak Hour	Movement	Observed Vehicles	Vehicles Served	Unmet Demand	Percent Served
AM Network	SB I-81 Off-Ramp	354	315	39	88.98%
PM Network	SB I-81 Off-Ramp	381	342	39	89.76%
	NB Bradley	142	87	55	61.27%
	NB Devon	292	165	127	56.51%
	WB Port Republic	865	788	77	91.10%

### Travel Time

The same travel time segments from the Existing model are recorded in the No Build. The results are shown in **Table 2**.

**Table 2: Travel Time Results**

Peak Hour	Travel Time Run Segment	Simulated Travel Time (sec)	Simulated Travel Time (M:SS)
AM Peak Hour	Port Republic Eastbound	260.88	04:20.9
	Port Republic Westbound	274.93	04:34.9
	Port Republic EB to I-81 NB Ramps	171.43	02:51.4
	Port Republic WB to I-81 SB Ramps	181.24	03:01.2
PM Peak Hour	Port Republic Eastbound	334.32	05:34.3
	Port Republic Westbound	478.60	07:58.6
	Port Republic EB to I-81 NB Ramps	228.51	03:48.5
	Port Republic WB to I-81 SB Ramps	385.08	06:25.1

### Delay, Level of Service, and Queue Length

Delay, level of service (LOS), and average and maximum queue lengths were recorded for each vehicle movement in both the AM and PM peak hour models. This full set of MOEs can be found in **Appendix A**.

Appendix A - Weekday AM 2030 No Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes					No Build MOEs										
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)						
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	52	53	1	2%	89.6	F	45.1	D	29	200						
				EBT	261	266	5	2%	50.3	D			56	318						
				EBR	103	103	0	0%	8.9	A			1	67						
				WBL	166	161	-5	-3%	32.4	C			21	144						
				WBT	284	273	-11	-4%	22.3	C			52	787						
				WBR	700	650	-50	-7%	36.2	D			263	900						
				SBL	152	150	-2	-1%	60.6	E			39	148						
				SBT	259	252	-7	-3%	24.1	C			28	177						
				SBR	32	31	-1	-3%	26.4	C			26	179						
				NBL	75	72	-3	-4%	59.5	E			26	167						
NBT	528	528	0	0%	26.5	C	52	381												
NBR	271	275	4	1%	4.7	A	2	135												
			<b>Intersection</b>	<b>2,883</b>	<b>2,814</b>	<b>-69</b>	<b>-2%</b>	<b>31.8</b>	<b>C</b>	<b>31.8</b>	<b>C</b>									
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	3	3	0	0%	13.4	B	0.4	A	1	55						
				EBT	681	689	8	1%	0.4	A			0	21						
				EBR	0	0	0	0%	0.0	A			0	21						
				WBL	1	1	0	0%	2.2	A			10	209						
				WBT	1,144	1,101	-43	-4%	3.9	A			17	289						
				WBR	16	14	-2	-13%	5.6	A			14	249						
				SBL	16	14	-2	-13%	21.1	C			2	66						
				SBR	6	6	0	0%	7.9	A			1	67						
				NBL	0	0	0	0%	0.0	A			0	41						
				NBR	1	1	0	0%	8.8	A			0	42						
			<b>Intersection</b>	<b>1,868</b>	<b>1,829</b>	<b>-39</b>	<b>-2%</b>	<b>2.7</b>	<b>A</b>	<b>2.7</b>	<b>A</b>									
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0	0	0	0%	0.0	A	9.5	A	1	85						
				NBR	19	17	-2	-11%	9.5	A			2	109						
				EBT	698	704	6	1%	0.3	A			0	3						
				EBR	0	0	0	0%	0.0	A			0	3						
				WBL	14	13	-1	-7%	2.5	A			3	212						
				WBT	1,161	1,124	-37	-3%	2.4	A			2	163						
							<b>Intersection</b>	<b>1,892</b>	<b>1,858</b>	<b>-34</b>			<b>-2%</b>	<b>1.7</b>	<b>A</b>	<b>1.7</b>	<b>A</b>			
				4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	44	44			0	0%	53.1	D	34.1	C	20	172
								NBT	18	19			1	6%	55.5	E			20	172
								NBR	52	52			0	0%	10.2	B			1	55
SBL	73	78	5					7%	50.0	D	18	96								
SBT	11	10	-1					-9%	53.0	D	18	96								
SBR	48	46	-2					-4%	28.8	C	20	101								
EBL	117	115	-2					-2%	58.1	E	42	371								
EBT	556	574	18					3%	29.3	C	67	461								
EBR	44	43	-1					-2%	22.4	C	3	253								
WBL	115	112	-3					-3%	22.8	C	14	123								
WBT	1,083	1,048	-35	-3%	20.8	C	170	367												
WBR	273	262	-11	-4%	15.9	B	35	367												
			<b>Intersection</b>	<b>2,434</b>	<b>2,403</b>	<b>-31</b>	<b>-1%</b>	<b>26.1</b>	<b>C</b>	<b>26.1</b>	<b>C</b>									
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	160	144	-16	-10%	67.6	E	148.7	F	940	1672						
				SBR	194	171	-23	-12%	217.0	F			1137	1775						
				EBT	590	617	27	5%	7.7	A			19	313						
				EBR	91	92	1	1%	3.0	A			0	56						
				WBL	176	172	-4	-2%	15.1	B			12	358						
				WBT	1,277	1,252	-25	-2%	17.8	B			77	467						
							<b>Intersection</b>	<b>2,488</b>	<b>2,448</b>	<b>-40</b>			<b>-2%</b>	<b>31.3</b>	<b>C</b>	<b>31.3</b>	<b>C</b>			

Appendix A - Weekday AM 2030 No Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes					No Build MOEs									
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)					
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	131	137	6	5%	50.2	D	12.6	B	46	326					
					619	623	4	1%	4.3	A	0	24							
					1,453	1,409	-44	-3%	4.5	A	15	302							
					196	193	-3	-2%	1.3	A	0	46							
			Intersection		<b>2,399</b>	<b>2,362</b>	<b>-37</b>	<b>-2%</b>	<b>6.9</b>	<b>A</b>	<b>6.9</b>	<b>A</b>							
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	NB I-81 Off-Ramp	NBL	258	255	-3	-1%	62.4	E	47.1	D	110	510					
					128	129	1	1%	53.9	D	44	227							
					125	128	3	2%	9.8	A	6	118							
					77	78	1	1%	79.3	E	41	197							
					152	150	-2	-1%	9.8	A	9	197							
					54	58	4	7%	33.5	C	41	120							
					566	563	-3	-1%	15.1	B	38	237							
					1,239	1,195	-44	-4%	31.8	C	2025	2293							
					232	222	-10	-4%	41.3	D	2025	2293							
								Intersection		<b>2,831</b>	<b>2,778</b>	<b>-53</b>	<b>-2%</b>	<b>32.2</b>	<b>C</b>	<b>32.2</b>	<b>C</b>		
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	NBL	87	75	-12	-14%	139.5	F	135.5	F	115	496					
					25	20	-5	-20%	120.4	F	113	496							
					655	652	-3	0%	2.0	A	2	182							
					112	111	-1	-1%	2.8	A	3	225							
					71	69	-2	-3%	21.5	C	219	1863							
					1,384	1,363	-21	-2%	26.6	D	201	1863							
								Intersection		<b>2,334</b>	<b>2,290</b>	<b>-44</b>	<b>-2%</b>	<b>22.8</b>	<b>C</b>	<b>22.8</b>	<b>C</b>		
					9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	NBL	46	46	0	0%	35.6	E	28.3	D	17	178
										47	48	1	2%	21.2	C	16	179		
										672	659	-13	-2%	0.5	A	0	7		
8	11	3	38%	0.7						A	0	10							
7	6	-1	-14%	6.9						A	71	1263							
1,409	1,406	-3	0%	12.8						B	62	1263							
			Intersection							<b>2,189</b>	<b>2,176</b>	<b>-13</b>	<b>-1%</b>	<b>9.7</b>	<b>A</b>	<b>9.7</b>	<b>A</b>		
10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL						272	270	-2	-1%	43.8	D	41.7	D	89	435
										19	21	2	11%	42.4	D	89	435		
										18	21	3	17%	14.6	B	0	32		
					25	25	0	0%	37.6	D	7	87							
					7	8	1	14%	43.1	D	7	87							
					184	187	3	2%	13.6	B	11	181							
					46	50	4	9%	22.2	C	5	77							
					625	614	-11	-2%	18.5	B	43	342							
					48	49	1	2%	14.7	B	41	344							
								Intersection		<b>2,259</b>	<b>2,259</b>	<b>0</b>	<b>0%</b>	<b>30.5</b>	<b>D</b>	<b>30.5</b>	<b>C</b>		
			Port Republic Road	WBL	34	35	1	3%	29.2	C	3	65							
			Port Republic Road		955	955	0	0%	38.7	D	180	688							
			Port Republic Road		21	24	3	14%	36.1	D	179	687							
			Intersection		<b>2,259</b>	<b>2,259</b>	<b>0</b>	<b>0%</b>	<b>30.5</b>	<b>D</b>	<b>30.5</b>	<b>C</b>							

Total Study Area Roadways/Intersections

Appendix A - Weekday PM 2030 No Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes					No Build MOEs								
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)				
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	18	18	0	0%	91.8	F			9	70				
				EBT	286	288	2	1%	52.8	D	43.3	D	62	302				
				EBR	112	113	1	1%	11.4	B			1	74				
				WBL	336	275	-61	-18%	37.0	D			43	419				
				WBT	411	350	-61	-15%	21.3	C	21.5	C	56	482				
				WBR	413	350	-63	-15%	9.6	A			14	350				
				SBL	652	646	-6	-1%	74.7	E			347	1,301				
				SBT	702	704	2	0%	35.7	D	53.7	D	192	1,254				
				SBR	57	60	3	5%	39.0	D			192	1,255				
				NBL	105	105	0	0%	60.7	E			37	174				
				NBT	554	562	8	1%	43.9	D	35.4	D	110	588				
NBR	407	402	-5	-1%	17.0	B			24	418								
			<b>Intersection</b>	<b>4,053</b>	<b>3,873</b>	<b>-180</b>	<b>-4%</b>	<b>39.4</b>	<b>D</b>	<b>39.4</b>	<b>D</b>							
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBL	1	1	0	0%	13.5	B	13.3	B	84	687				
				EBT	1,343	1,312	-31	-2%	13.3	B			75	641				
				EBR	1	1	0	0%	31.1	D			75	641				
				WBL	5	4	-1	-20%	10.0	A			1	153				
				WBT	1,153	994	-159	-14%	1.2	A	1.3	A	1	111				
				WBR	5	4	-1	-20%	1.7	A			1	77				
				SBL	8	7	-1	-13%	34.2	D	22.8	C	2	61				
				SBR	7	6	-1	-14%	9.4	A			1	62				
				NBL	0	0	0	0%	0.0	A	36.9	E	0	37				
				NBR	1	1	0	0%	36.9	E			0	38				
							<b>Intersection</b>	<b>2,524</b>	<b>2,330</b>	<b>-194</b>	<b>-8%</b>	<b>8.2</b>	<b>A</b>	<b>8.2</b>	<b>A</b>			
3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBL	0	0	0	0%	0.0	A			5	105				
				NBR	23	20	-3	-13%	83.7	F	83.7	F	14	129				
				EBT	1,352	1,309	-43	-3%	22.7	C	22.7	C	170	681				
				EBR	0	0	0	0%	0.0	A			170	681				
				WBL	17	14	-3	-18%	72.7	F	7.9	A	46	544				
				WBT	1,163	1,009	-154	-13%	7.0	A	<b>16.7</b>	<b>C</b>	37	502				
							<b>Intersection</b>	<b>2,555</b>	<b>2,352</b>	<b>-203</b>	<b>-8%</b>	<b>16.7</b>	<b>B</b>	<b>16.7</b>	<b>C</b>			
				4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue	NBL	34	30	-4	-12%	64.5	E			19	183
								NBT	23	21	-2	-9%	58.3	E	31.8	C	19	183
								NBR	90	95	5	6%	15.7	B			2	82
								SBL	312	309	-3	-1%	98.0	F			387	1,136
SBT	20	18	-2					-10%	122.1	F	101.5	F	387	1,136				
SBR	178	166	-12					-7%	105.6	F			404	1,157				
EBL	149	146	-3					-2%	92.4	F			136	2,336				
EBT	1,199	1,153	-46					-4%	38.7	D	44.4	D	3358	3,650				
EBR	27	27	0					0%	29.9	C			17	3,630				
WBL	61	50	-11					-18%	24.7	C			5	85				
WBT	968	834	-134					-14%	24.6	C	23.1	C	167	359				
WBR	261	230	-31	-12%	17.1	B			30	349								
			<b>Intersection</b>	<b>3,322</b>	<b>3,079</b>	<b>-243</b>	<b>-7%</b>	<b>45.2</b>	<b>D</b>	<b>45.2</b>	<b>D</b>							
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	174	163	-11	-6%	75.8	E			122	633				
				SBR	207	179	-28	-14%	80.7	F	78.4	E	160	685				
				EBT	1,302	1,273	-29	-2%	7.9	A	6.9	A	47	405				
				EBR	282	282	0	0%	2.2	A			1	68				
				WBL	261	210	-51	-20%	26.7	C	34.3	C	31	372				
				WBT	1,083	935	-148	-14%	36.1	D	<b>25.2</b>	<b>C</b>	103	454				
							<b>Intersection</b>	<b>3,326</b>	<b>3,042</b>	<b>-284</b>	<b>-9%</b>	<b>25.2</b>	<b>C</b>	<b>25.2</b>	<b>C</b>			



Appendix A - Weekday PM 2030 No Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Simulated Traffic Volumes					No Build MOEs				
					Counted / Coded Volumes (vph)	Simulated Volumes (vph)	Difference	% Difference	Movement Delay (sec/veh)	Estimated Movement LOS	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	247	241	-6	-2%	38.8	D	19.2	B	77	451
					1,229	1,179	-50	-4%	15.2	B	23	393		
					1,344	1,136	-208	-15%	10.7	B	54	337		
					228	191	-37	-16%	4.5	A	3	279		
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	Port Republic Road	EBL	3,048	2,747	-301	-10%	14.7	B	14.7	B	101	505
					196	188	-8	-4%	73.0	E	49.3	D	37	197
					114	115	1	1%	53.3	D	10	133		
					145	145	0	0%	15.5	B	116	393		
8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road	EBL	295	289	-6	-2%	33.5	C	48.0	D	116	393
					1,233	1,119	-114	-9%	35.2	D	29	240		
					1,107	1,057	-50	-5%	11.5	B	92	354		
					1,081	853	-228	-21%	65.8	E	1682	2238		
9	Port Republic Road at Bradley Drive	Two-Way Stop	Bradley Drive	EBL	193	152	-41	-21%	86.9	F	69.0	E	1682	2238
					3,468	3,134	-334	-10%	42.1	D	42.1	D	463	1808
					56	45	-11	-20%	371.5	F	358.5	F	216	583
					24	17	-7	-29%	324.4	F	216	584		
10	Port Republic Road at Devon Lane	Signal	Devon Lane	EBL	1,347	1,295	-52	-4%	3.7	A	3.8	A	8	327
					118	117	-1	-1%	5.0	A	9	362		
					34	30	-4	-12%	57.0	F	78.1	F	494	1808
					1,213	973	-240	-20%	78.8	F	42.7	E	463	1808
10	Port Republic Road at Devon Lane	Signal	Devon Lane	EBL	2,792	2,477	-315	-11%	42.7	E	42.7	E	252	1208
					103	64	-39	-38%	386.2	F	387.9	F	334	486
					39	23	-16	-41%	392.7	F	5.8	A	334	487
					1,285	1,226	-59	-5%	5.9	A	22	1216		
10	Port Republic Road at Devon Lane	Signal	Devon Lane	EBL	86	85	-1	-1%	4.3	A	61.2	F	26	1216
					21	16	-5	-24%	59.9	F	277	1208		
					1,149	968	-181	-16%	61.2	F	42.2	E	252	1208
					2,683	2,382	-301	-11%	42.2	E	42.2	E	273	472
10	Port Republic Road at Devon Lane	Signal	Devon Lane	EBL	234	134	-100	-43%	219.3	F	201.5	F	273	472
					19	10	-9	-47%	177.9	F	0	22	472	
					39	21	-18	-46%	99.6	F	52.3	D	31	240
					70	68	-2	-3%	55.3	E	46	342		
10	Port Republic Road at Devon Lane	Signal	Devon Lane	EBL	27	26	-1	-4%	58.6	E	37.9	D	78	479
					142	145	3	2%	49.7	D	154	1721		
					178	172	-6	-3%	69.1	E	155	1721		
					890	833	-57	-6%	33.1	C	4	66		
10	Port Republic Road at Devon Lane	Signal	Devon Lane	EBL	256	246	-10	-4%	32.5	C	86.6	F	340	720
					35	31	-4	-11%	52.2	D	339	720		
					794	720	-74	-9%	88.5	F	65.4	E	340	720
					36	37	1	3%	79.7	E	65.4	E	339	720
<b>Total Study Area Roadways/Intersections</b>					2,720	2,443	-277	-10%	65.4	F	65.4	E	339	720

## Appendix F

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Technical Memorandum – 2030 Build Conditions

To: Brad Reed  
VDOT Staunton District

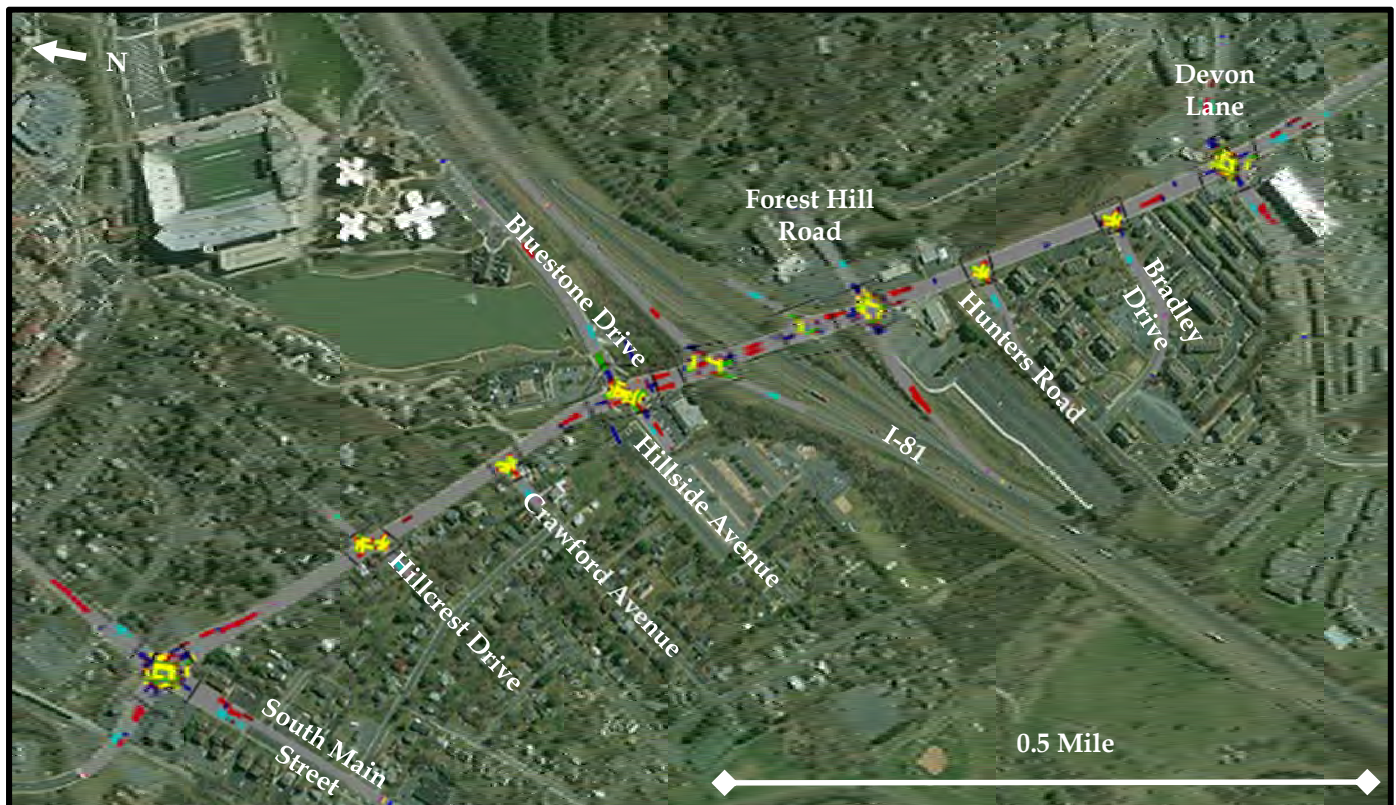
Date: March 29, 2019

Cc: Ann Cundy, HRMPO  
Dastan Khaleel, HPWD  
Tom Hartman, HPWD

From: Lisa Simpson, P.E.  
Chuck Conran, E.I.T.

Re: Port Republic Road  
Build Conditions VISSIM Development

The purpose of this memorandum is to document the study methodology and model development for the 2030 Build AM and PM peak hour traffic operations for Port Republic Road in Harrisonburg, Virginia. The model utilizes the microsimulation traffic software, *PTV VISSIM 8.0*, and was coded according to the procedures outlined in VDOT's TOSAM (Traffic Operations and Safety Analysis Manual) and VDOT's VISSIM User Guide (hereafter referred to as "Guide"). The limits of the study corridor (**Figure 1**) extend from the Port Republic Road / Maryland Avenue / South Main Street intersection southeast approximately one mile to the Port Republic Road / Devon Lane intersection, encompassing ten total intersections, seven of which are signalized.



**Figure 1: VISSIM Study Network**

The 2018 Existing Conditions AM and PM VISSIM models, following a revision to address comments, were considered to be calibrated by VDOT, the City of Harrisonburg, and HRMPO. The 2030 No Build AM and PM VISSIM models identified congestion hot spots that needed to be addressed with targeted improvements. The No Build models also establish baseline conditions to which the Build models will be compared. The Existing and No Build models were utilized as the foundation for the Build models; the 2030 No Build models were copied and then altered as needed to produce the Build models.

## **Build Model Assumptions and Modifications**

### **Base Model**

The 2030 Build model was constructed utilizing the 2030 No Build model as a base. The No Build model already incorporates several planned roadway projects, including the northbound I-81 off-ramp realignment and the extension of the southbound South Main Street left turn lanes at Port Republic Road. Other than recommended build improvements, there are no geometric changes from the No Build to Build model.

The No Build and Build model analysis years are both 2030; therefore, both models have identical volume inputs and base condition routing through the study network. Some Build model volumes are rerouted due to recommended build improvements.

### **Recommended Build Improvements**

The following list of roadway construction, lane configuration, signal timing and phasing, and turning restrictions were identified by the consultant, approved by the client team, and incorporated in the Build VISSIM models. More detail on these improvements can be found in the main body of the Build operations report.

- General Corridor Signal Optimization – FYA, lead/lag, offsets, cycle length
  - These values were optimized within Synchro and then imported to the VISSIM signal controllers
- Eliminate split phase at northbound I-81 Off-Ramp / Forest Hill Road signal
  - The ramp realignment plans that the consultant received showed proposed split phase signal control. The lane configuration of the off-ramp is outdated on this set of plans, and hence the proposed signal phasing may also be outdated. Regardless, elimination of the split phase optimizes signal operation.
- Eliminate split phase at Devon Lane signal by adding 150-foot turn bays on Devon Lane to separate through and left turn movements
- Add a 50-foot storage westbound right turn lane on Port Republic Road at Forest Hill Road
- Lane reconfiguration of westbound Port Republic Road approach at South Main Street to include two left turn lanes, one through lane, one through/right lane, and one right turn lane
- Pedestrian overpass across Port Republic Road at Bluestone Drive / Hillside Avenue
- Peak hour left turning restrictions at Hillcrest Drive, Crawford Avenue., and Hunters Road
- Signal installation at Bradley Drive
- Extend Port Republic eastbound left turn bay storage at Bluestone/Hillside from 100 feet to 300 feet

All recommend build improvements should follow VDOT design standards. The study area roads have posted speed limits of 35 mph or less, which dictates a minimum of a 100-foot taper for single turn lanes and a minimum of a 150-foot taper for dual turn lanes. This specification can be found in Appendix F, Figure 3-1, of the Road Design Manual.

## Build Measures of Effectiveness

### Volume Throughput

The No Build models had several underserved input volumes in the AM and PM peak hour networks. An underserved input volume is a volume group that is not able to fully enter the network during the simulation period due to impeding congestion within the network. Underserved input volumes in the No Build models included the southbound I-81 off-ramp in both the AM and PM peak hours, and northbound Bradley Drive, northbound Devon Lane, and westbound Port Republic Road, all in the PM peak hour. These critical locations were addressed by recommended improvements included in the Build model, and there are no remaining underserved input volumes.

### Travel Time

The same travel time segments from the Existing and No Build models are recorded in the Build model. The Build model results are shown in **Table 1** and compared to No Build model results. No Build corridor length travel times are reduced by 21-37% with the package of recommended Build improvements.

**Table 1: Travel Time Results**

Peak Hour	Travel Time Run Segment	No Build Model		Build Model		Percent Improvement
		Simulated Travel Time (sec)	Simulated Travel Time (M:SS)	Simulated Travel Time (sec)	Simulated Travel Time (M:SS)	
AM Peak Hour	Port Republic Eastbound	260.88	04:20.9	208.04	03:28.0	20.25%
	Port Republic Westbound	274.93	04:34.9	207.65	03:27.6	24.47%
	Port Republic EB to I-81 NB Ramps	171.43	02:51.4	131.55	02:11.5	23.26%
	Port Republic WB to I-81 SB Ramps	181.24	03:01.2	93.99	01:34.0	48.14%
PM Peak Hour	Port Republic Eastbound	334.32	05:34.3	258.00	4:18.0	22.83%
	Port Republic Westbound	478.60	07:58.6	302.26	5:02.3	36.84%
	Port Republic EB to I-81 NB Ramps	228.51	03:48.5	165.28	2:45.3	27.67%
	Port Republic WB to I-81 SB Ramps	385.08	06:25.1	167.10	2:47.1	56.61%

### Delay, Level of Service, Vehicle Stops, and Queue Length

Delay, level of service (LOS), vehicle stops, and average and maximum queue lengths were recorded for each vehicle movement in both the AM and PM peak hour models. This full set of MOEs can be found in **Appendix A**.

Appendix A - Weekday AM 2030 Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs									
					Movement Delay (sec/veh)	Estimated Movement LOS	Stops per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)			
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	57.6	E	1.0	31.5	C	17	119			
				EBT	36.0	D	0.7			40	247			
				EBR	7.2	A	1.0			1	68			
			Port Republic Road	WBL	59.8	E	1.0	32.1	C	41	190			
				WBT	37.1	D	0.9			99	660			
				WBR	22.8	C	1.2			99	660			
			South Main Street	SBL	57.3	E	0.9	36.8	D	41	159			
				SBT	25.2	C	0.7			28	172			
				SBR	17.4	B	0.7			25	174			
			South Main Street	NBL	57.6	E	0.9	23.8	C	24	155			
				NBT	29.2	C	0.7			57	323			
NBR	4.4	A		0.2	2	119								
	Intersection				30.3	C	0.8	30.3	C					
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBT	0.3	A	0.0	0.3	A	0	0			
				EBR	0.0	A	0.0			0	0			
				WBT	1.7	A	0.0			0	0			
			Hillcrest Drive	WBR	2.6	A	0.1	1.7	A	0	0			
				SBR	11.7	B	1.5			0	2			
				NBR	9.3	A	1.3			0	44			
				Intersection				1.2	A	0.0	1.2	A		
			3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue	NBR	9.8	A	1.2	9.8	A	1	109
							EBT	0.3	A	0.0			0	0
							EBR	0.0	A	0.0			0	0
						Port Republic Road	WBT	0.4	A	0.0	0.3	A	0	0
WBR	0.4	A					0.0	0	0					
WBT	0.4	A					0.0	0	0					
	Intersection							0.5	A	0.0	0.5	A		
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal				Hillside Avenue	NBL	54.5	D	0.9	37.2	D	41	207
							NBT	63.9	E	1.0			42	208
							NBR	10.5	B	1.1			1	60
						Bluestone Drive	SBL	53.5	D	0.9	43.0	D	20	95
			SBT	48.0	D		1.0	20	95					
			SBR	28.2	C		1.2	22	118					
			Port Republic Road	EBL	34.8	C	1.4	17.2	B	21	174			
				EBT	13.5	B	0.4			29	263			
				EBR	11.3	B	0.4			3	187			
			Port Republic Road	WBL	12.3	B	0.6	8.4	A	5	104			
				WBT	8.3	A	0.2			56	346			
WBR	7.3	A		0.4	4	232								
	Intersection				14.3	B	0.4	14.3	B					
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	49.4	D	0.9	32.4	C	53	262			
				SBR	18.1	B	1.9			18	186			
				EBT	5.8	A	0.2			13	249			
			Port Republic Road	EBR	2.3	A	0.2	5.3	A	0	56			
				WBL	6.9	A	0.4			3	204			
				WBT	9.0	A	0.4			36	429			
				Intersection				11.3	B	0.5	11.3	B		



Appendix A - Weekday AM 2030 Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs						
					Movement Delay (sec/veh)	Estimated Movement LOS	Stops per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	21.5	C	1.3	4.4	A	10	176
				EBT	0.8	A	0.0			0	4
				WBT	2.0	A	0.1	1.8	A	6	255
				WBR	0.6	A	0.0			0	33
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	Intersection		2.7	A	0.1	2.7	A		
				NBL	41.3	D	0.9	35.5	D	69	354
				NBT	50.8	D	0.9			41	216
				NBR	8.3	A	1.3			5	110
8	Port Republic Road at Hunters Road	Two-Way Stop	Intersection	SBL	54.1	D	0.9	25.6	C	28	193
				SBR	11.4	B	1.6			28	193
				EBL	26.5	C	1.2	7.1	A	5	93
				EBT	5.1	A	0.2			10	166
9	Port Republic Road at Hunters Road	Two-Way Stop	Intersection	WBT	12.9	B	0.4	13.9	B	208	992
				WBR	18.9	B	0.7			208	992
					17.2	B	0.6	17.2	B		
				NBR	5.9	A	1.1	5.9	A	1	67
10	Port Republic Road at Bradley Drive	Signal	Intersection	EBT	0.7	A	0.0	0.8	A	0	0
				EBR	1.6	A	0.0			0	8
				WBT	4.5	A	0.2	4.5	A	20	562
					3.2	A	0.1	3.2	A		
10	Port Republic Road at Devon Lane	Signal	Intersection	NBL	56.0	E	1.0	51.5	D	62	334
				NBR	39.3	D	1.1			66	341
				EBT	7.1	A	0.2	7.1	A	18	192
				EBR	6.2	A	0.3			22	225
10	Port Republic Road at Devon Lane	Signal	Intersection	WBL	11.2	B	0.7	7.6	A	36	-39
				WBR	7.5	A	0.3			36	-39
					11.0	B	0.4	11.0	B		
				NBL	47.9	D	0.9	45.0	D	95	537
10	Port Republic Road at Devon Lane	Signal	Intersection	NBT	43.1	D	0.9			5	55
				NBR	7.4	A	0.3			0	33
				SBL	44.7	D	0.8	17.7	B	7	77
				SBT	63.5	E	1.0			3	38
10	Port Republic Road at Devon Lane	Signal	Intersection	SBR	12.6	B	2.3			12	167
				EBL	20.2	C	1.0	10.8	B	4	77
				EBT	10.1	B	0.3			23	211
				EBR	9.0	A	2.3			23	212
10	Port Republic Road at Devon Lane	Signal	Intersection	WBL	16.9	B	0.9	14.6	B	2	57
				WBT	14.5	B	0.5			50	458
				WBR	14.5	B	0.5	17.8	B	49	458
					17.8	C	0.7				

Appendix A - Weekday PM 2030 Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs												
					Movement Delay (sec/veh)	Estimated Movement LOS	Stops per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)						
1	Port Republic Road / Maryland Avenue at South Main Street	Signal	Maryland Avenue	EBL	62.8	E	1.1	37.2	D	6	63						
				EBT	46.5	D	0.8			55	237						
				EBR	10.0	A	1.2			1	72						
				WBL	100.3	F	1.1			131	492						
				WBT	40.3	D	0.6			74	485						
				WBR	12.9	B	0.5			74	485						
				SBL	65.3	E	1.0			295	1,178						
				SBT	28.6	C	0.7			145	1,099						
				SBR	31.2	C	0.7			145	1,101						
				NBL	62.2	E	1.0			39	191						
				NBT	37.7	D	0.8			90	500						
NBR	13.9	B	0.6	18	306												
Intersection					41.8	D	0.8	41.8	D								
2	Port Republic Road at Hillcrest Drive	Two-Way Stop	Port Republic Road	EBT	2.0	A	0.1	2.0	A	3	110						
				EBR	0.8	A	0.0			3	110						
				WBT	1.5	A	0.0			0	18						
				WBR	1.8	A	0.0			0	0						
				SBR	7.0	A	1.0			7.0	47						
				NBR	21.8	C	1.7			21.8	38						
				Intersection							1.8	A	0.0	1.8	A		
				3	Port Republic Road at Crawford Avenue	Two-Way Stop	Crawford Avenue			NBR	35.9	E	2.2	35.9	E	5	115
										EBT	9.9	A	0.3			58	546
										EBR	0.0	A	0.0			58	546
										WBT	0.8	A	0.0			0	0
Intersection									5.9	A	0.2	5.9	A				
4	Port Republic Road at Hillside Avenue / Bluestone Drive	Signal	Hillside Avenue					NBL	59.4	E	0.9	31.1	C			19	171
								NBT	56.0	E	0.9					19	171
								NBR	16.8	B	1.7					2	78
								SBL	68.2	E	1.5					183	1129
								SBT	79.5	E	1.8					183	1129
								SBR	68.6	E	2.0					196	1150
				EBL	89.6	F	2.4	92	1114								
				EBT	29.1	C	0.7	431	1295								
				EBR	24.7	C	0.6	6	1295								
				WBL	40.9	D	1.4	7	85								
				WBT	22.7	C	0.3	179	352								
WBR	16.8	B	0.7	44	366												
Intersection					35.4	D	0.9	35.4	D								
5	Port Republic Road at SB I-81 Ramps	Signal	SB I-81 Off-Ramp	SBL	57.2	E	0.9	85.0	F	67	311						
				SBR	110.1	F	4.3			190	742						
				EBT	7.0	A	0.2			43	409						
				EBR	2.8	A	0.2			1	98						
				WBL	34.8	C	1.5			54	411						
				WBT	22.2	C	0.7			72	463						
				Intersection							22.3	C	0.7	22.3	C		

Appendix A - Weekday PM 2030 Build Conditions

Node No.	Intersection	Traffic Control	Approach	Movement	Build MOEs												
					Movement Delay (sec/veh)	Estimated Movement LOS	Stops per Vehicle	Approach Delay (sec/veh)	Estimated Approach LOS	Average Queue Length (ft)	Max Queue Length (ft)						
6	Port Republic Road at NB I-81 On-Ramp	Signal	Port Republic Road	EBL	18.0	B	1.2	7.8	A	21	378						
				EBT	5.8	A	0.2			4	163						
				WBT	8.8	A	0.3			54	312						
				WBR	4.9	A	0.3			5	263						
7	Port Republic Road at NB I-81 Off-Ramp / Forest Hill Road	Signal	Intersection	Intersection													
				NBL	37.7	D	1.1	34.5	C	45	273						
				NBT	57.8	E	0.9			41	206						
				NBR	11.8	B	1.3			7	122						
				SBL	53.2	D	1.0			81	363						
				SBR	21.9	C	1.8			81	363						
				EBL	44.5	D	1.5			38	261						
				EBT	9.9	A	0.2			54	328						
				WBT	36.2	D	0.9			431	1295						
				WBR	23.5	C	1.3			431	1295						
				Intersection								26.9	C	26.9	C		
				8	Port Republic Road at Hunters Road	Two-Way Stop	Hunters Road			NBR	8.5	A	1.5	8.5	A	1	67
EBT	1.9	A	0.0							1	116						
EBR	2.7	A	0.0					1	129								
WBT	19.1	C	0.6					19.1	865								
Intersection								10.0	A	10.0	A						
9	Port Republic Road at Bradley Drive	Signal	Bradley Drive					NBL	56.7	E	1.0	54.7	D			73	354
								NBR	45.2	D	1.1					78	362
								EBT	11.2	B	0.3					53	453
				EBR	10.4	B	0.4	65	484								
				WBL	32.3	C	1.3	47	265								
				WBT	10.7	B	0.4	47	265								
				Intersection										14.5	B	14.5	B
				10	Port Republic Road at Devon Lane	Signal	Devon Lane	NBL	54.2	D	1.0			49.5	D	93	469
								NBT	78.0	E	1.3					8	74
								NBR	6.3	A	0.3					0	45
								SBL	38.0	D	0.8					16	183
								SBT	61.6	E	1.0					9	81
SBR	19.0	B	1.9					14	224								
EBL	29.3	C	1.1					30	281								
EBT	15.6	B	0.4					63	511								
EBR	14.9	B	0.6					63	512								
WBL	30.2	C	1.0					4	79								
WBT	24.0	C	0.6					74	459								
WBR	23.4	C	0.7					73	459								
Intersection								24.1	C	24.1	C						

Total Study Area Roadways/Intersections

## Appendix G




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Port Republic Road and South Main Street  
Alternative Intersection Analysis

# VDOT Junction Screening Tool

## Input Worksheet

<b>Project Title:</b>	Port Republic and Main Street
<b>E-W Facility:</b>	Port Republic Road
<b>N-S Facility:</b>	Main Street
<b>Date:</b>	December 10, 2018

Traffic Volume Demand				
Direction	Volume (veh/hr)			Truck Percent (%)
	U-Turn / Left	Through	Right	
				
Eastbound	18	286	112	4.00%
Westbound	336	411	406	4.00%
Northbound	105	554	406	4.00%
Southbound	652	702	57	4.00%
Adjustment Factor	0.80	0.95		0.85
Suggested	<b>U - 0.8</b>	<b>L - 0.95</b>		<b>0.85</b>
Truck to PCE Factor	<b>Suggested = 2.00</b>			2.00
Critical Lane Volume	1600			

Equivalent Passenger Car Volume				
	Volume (pc/hr)			
	U-Turn / Left	Through	Right	Approach
				
Eastbound	19	297	116	432
Westbound	349	427	422	1198
Northbound	109	576	422	1107
Southbound	678	730	59	1467

Notes:	
Left-turn Adjustment Factor	Conversion of left-turning vehicles to equivalent through vehicles
Right-turn Adjustment Factor	Conversion of right-turning vehicles to equivalent through vehicles
U-turn Adjustment Factor	Conversion of U-turning vehicles to equivalent through vehicles
Truck to PCE Factor	1 truck = X Passenger Car Equivalents
Critical Lane Volume Sum Limit	Saturation value for critical lane volume sum at an intersection

# VDOT Junction Screening Tool

## Possible Configurations

Indicate with a "Y" or "N" if each intersection or interchange configuration should or should not be considered. Use the information links for guidance. Then, click the "Show/Hide Configurations button" to hide the worksheets for the configurations that will not be considered.

#	Intersections	Information	Consider?	Justification
<b>Signalized Intersections</b>				
1	<a href="#">Conventional</a>	-	Y	
2	<a href="#">Bowtie</a>	<a href="#">Link</a>	N	Right-of-way restrictions identified
3	<a href="#">Center Turn Overpass</a>	<a href="#">Link</a>	N	Financial constraints identified
4	<a href="#">Continuous Green-T</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
5	<a href="#">Echelon</a>	<a href="#">Link</a>	N	Financial constraints identified
6	<a href="#">Full Displaced Left Turn</a>	<a href="#">Link</a>	Y	
7	<a href="#">Median U-Turn</a>	<a href="#">Link</a>	N	Insufficient intersection spacing
8	<a href="#">Partial Displaced Left Turn</a>	<a href="#">Link</a>	Y	
9	<a href="#">Partial Median U-Turn</a>	<a href="#">Link</a>	N	Insufficient intersection spacing
10	<a href="#">Quadrant Roadway N-E</a>	<a href="#">Link</a>	N	Right-of-way restrictions identified
11	<a href="#">Quadrant Roadway N-W</a>	<a href="#">Link</a>	N	Right-of-way restrictions identified
12	<a href="#">Quadrant Roadway S-E</a>	<a href="#">Link</a>	N	Right-of-way restrictions identified
13	<a href="#">Quadrant Roadway S-W</a>	<a href="#">Link</a>	N	Right-of-way restrictions identified
14	<a href="#">Restricted Crossing U-Turn</a>	<a href="#">Link</a>	N	Unable to accommodate traffic patterns
15	<a href="#">Single Loop</a>	<a href="#">Link</a>	N	Right-of-way restrictions identified
16	<a href="#">Split Intersection</a>	<a href="#">Link</a>	N	Right-of-way restrictions identified
<b>Unsignalized Intersections</b>				
17	<a href="#">50 Mini Roundabout</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
18	<a href="#">75 Mini Roundabout</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
19	<a href="#">Roundabout</a>	<a href="#">Link</a>	Y	
20	<a href="#">Two-Way Stop Control</a>	-	Y	
#	Interchanges	Information	Consider?	Justification
21	<a href="#">Traditional Diamond</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
22	<a href="#">Contraflow Left</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
23	<a href="#">Displaced Left Turn</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
24	<a href="#">Diverging Diamond</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
25	<a href="#">Double Roundabout</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
26	<a href="#">Michigan Urban Diamond</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
27	<a href="#">Partial Cloverleaf</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
28	<a href="#">Single Point</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type
29	<a href="#">Single Roundabout</a>	<a href="#">Link</a>	N	Not feasible for roadway facility type



## VDOT Junction Screening Tool

### Directional Questions and Base Lane Configurations

Before entering a base number of through lanes for each direction, answer all applicable directional question for each intersection or interchange configuration selected for consideration. Navigate to the lane configuration worksheet for example diagrams, if provided.

Intersections	Question	Direction
<b>Bowtie</b>	N/A	N/A
<b>Continuous Green-T</b>	N/A	N/A
<b>Echelon</b>	N/A	N/A
<b>Median U-Turn</b>	N/A	N/A
<b>Partial Displaced Left Turn</b>	Select the roadway with the displaced left turns from the drop-down list.	NB-SB
<b>Partial Median U-Turn</b>	N/A	N/A
<b>Restricted Crossing U-Turn</b>	N/A	N/A
<b>Single Loop</b>	N/A	N/A
<b>Split Intersection</b>	N/A	N/A
Interchanges	Question	Direction
All	N/A	N/A

### Base Number of Through Lanes

Enter a base number of through lanes for each direction. The number of through lanes entered will populate on each non-roundabout lane configuration worksheet. This tool also allows the user to enter the number of through lanes on the lane configuration worksheets directly. This base number may be overwritten on individual lane configuration worksheets. Turn lanes, shared lanes, and channelized lanes must still be entered in each lane configuration worksheet.

Eastbound	2
Westbound	2
Northbound	2
Southbound	2

# VDOT Junction Screening Tool

## Results Worksheet

General Information	
Project Title:	Port Republic and Main Street
EW Facility:	Port Republic Road
NS Facility:	Main Street
Date:	December 10, 2018

Volumes (veh/hr)	U-Turn / Left	Through	Right
Eastbound	18	286	112
Westbound	336	411	406
Northbound	105	554	406
Southbound	652	702	57

**General Instructions:** All intersection and interchange configurations have a default assumption of one exclusive lane per movement. No results shall be interpreted until the user has verified the lane configurations on each worksheet.

## Intersection Results

Intersection Results					
		Congestion	Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points	
Conventional	-	0.63		48	
Full Displaced Left Turn	-	0.68	-	40	
Partial Displaced Left Turn	-	0.63	-	44	
Roundabout	-	2.01		8	
Two-Way Stop Control	-	12.45		48	

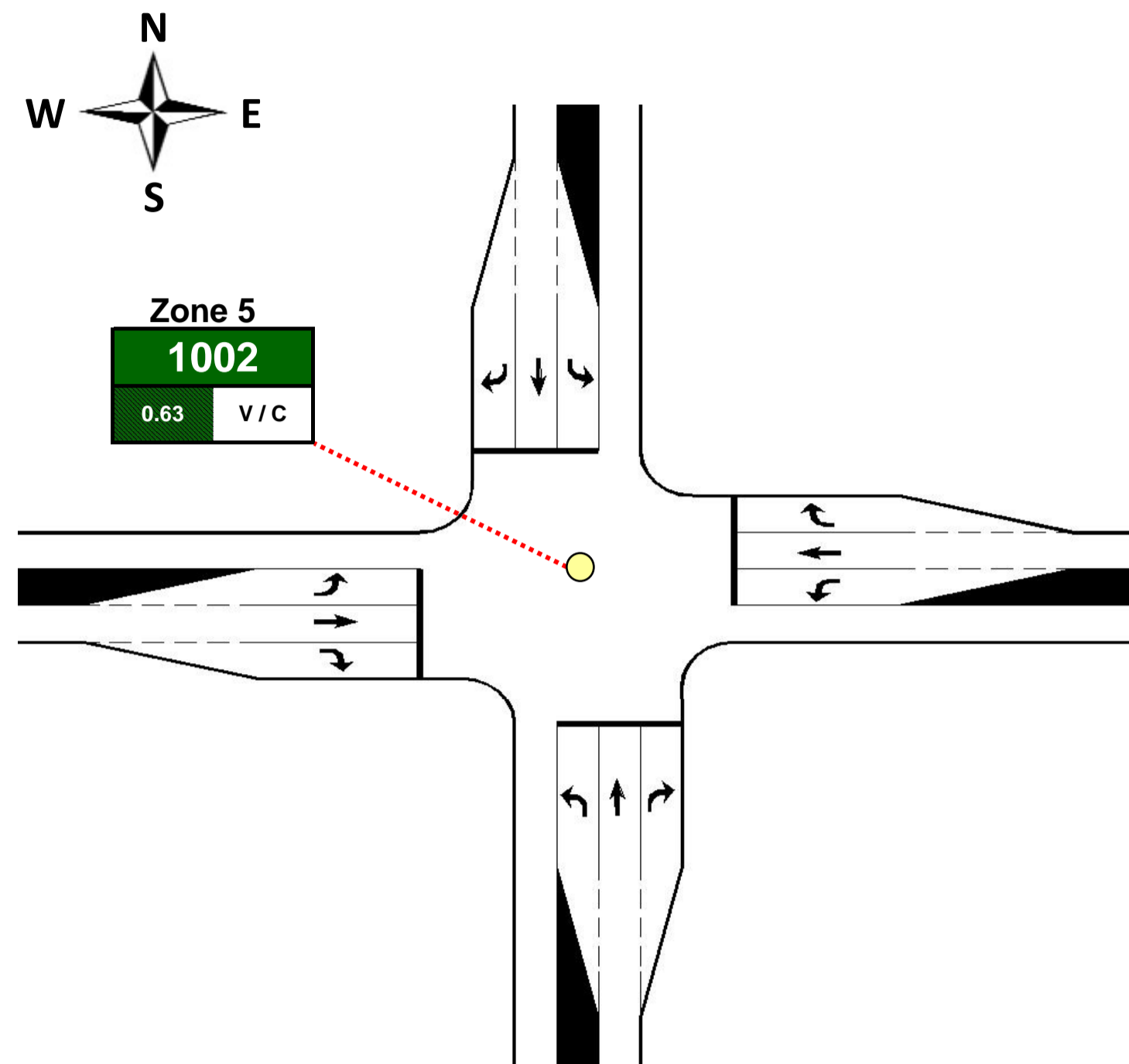
Information	
Congestion	The maximum v/c ratio represents the worst v/c of all zones that make up an intersection.
Pedestrian	Compares the potential of each design to accommodate pedestrians based on safety, wayfinding, and delay. Potential is qualitatively defined as better (+), similar (blank cell), or worse (-) than a conventional intersection or traditional diamond interchange.
Safety	Weighted Total = (2 x Crossing Conflicts) + Merging Conflicts + Diverging Conflicts



### Conventional

#### DESIGN AND RESULTS

Project Name:	Port Republic and Main Street	Critical Lane Volume Sum			
EW Facility:	Port Republic Road	< 1200	1200 - 1399	1400 - 1599	≥ 1600
NS Facility:	Main Street	VOLUME / CAPACITY RATIO:			0.63
Date:	December 10, 2018				



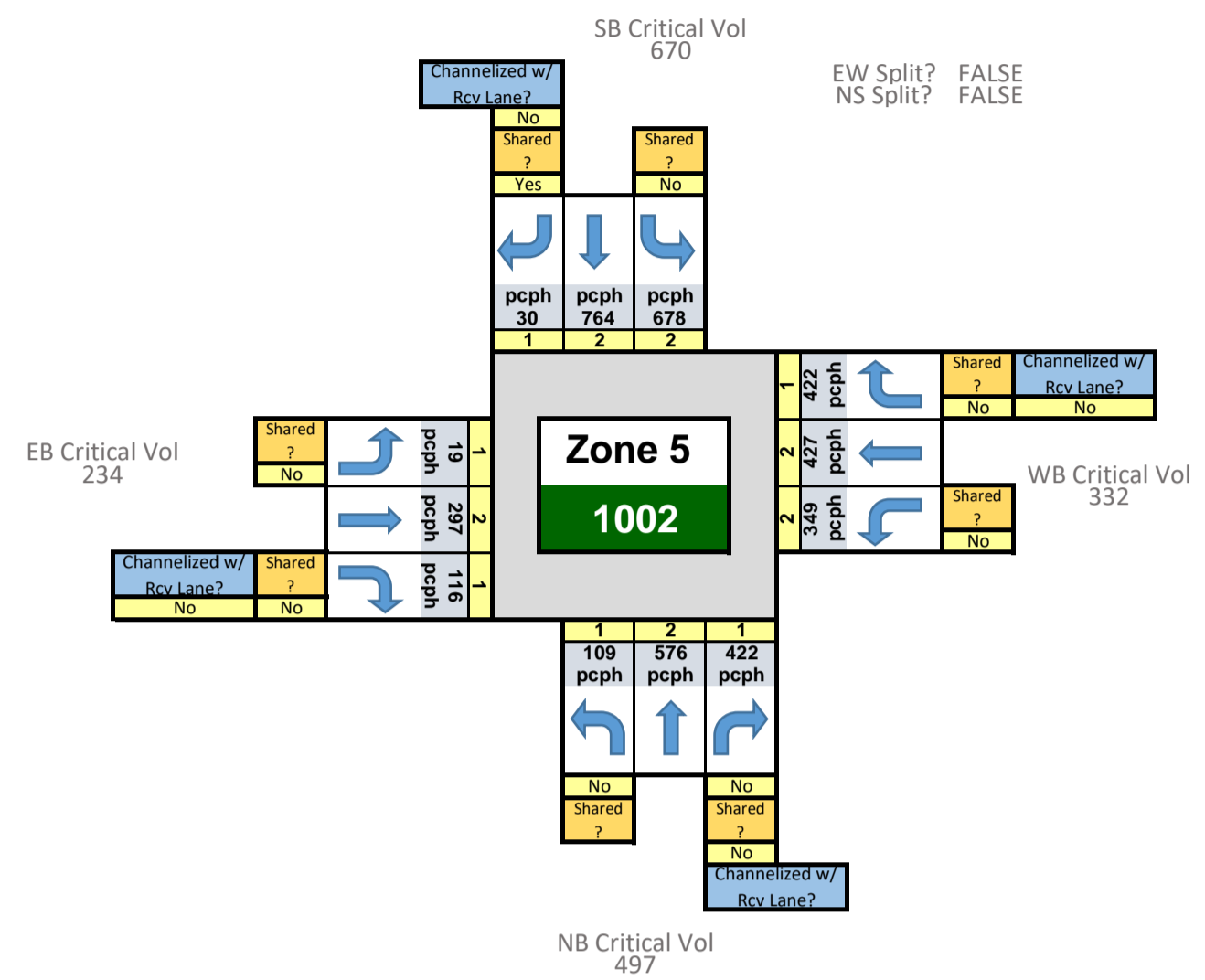
Note: This diagram does not reflect the actual lane configuration of the intersection



### Conventional

#### DATA INPUT AND CONFIGURATION

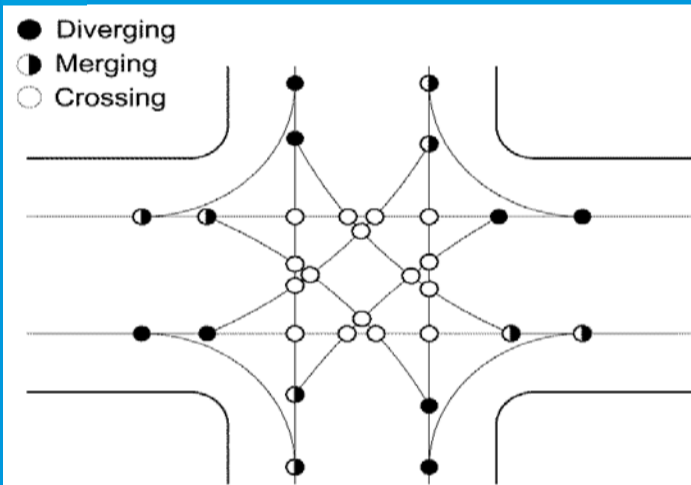
Enter the lane configurations in the yellow cells.



Back to Results



#### Safety - Conflict Point Diagram



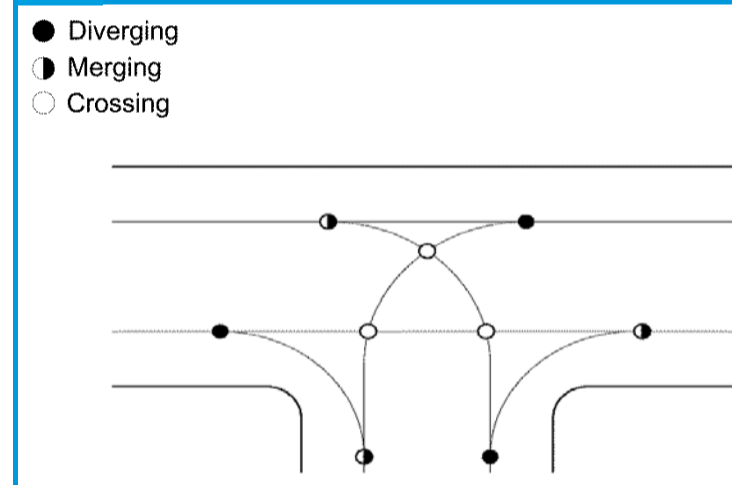
Conflict Type	Count
Crossing	16
Merging	8
Diverging	8
<b>Total</b>	<b>32</b>

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points  
**48**



#### Safety - Conflict Point Diagram (Three Legs)



Conflict Type	Count
Crossing	3
Merging	3
Diverging	3
<b>Total</b>	<b>9</b>

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

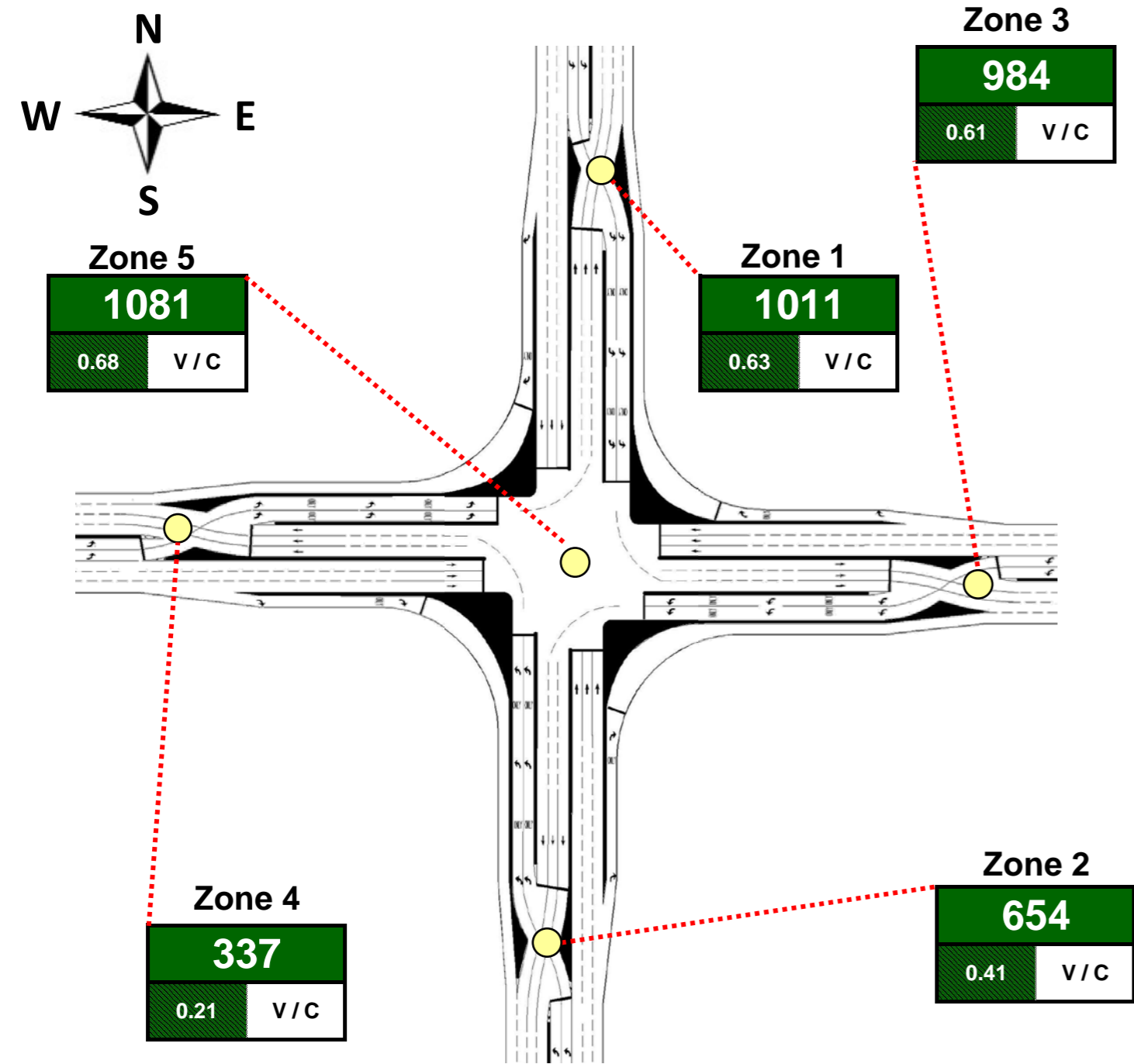
Weighted Total Conflict Points  
**12**



# Full Displaced Left Turn Intersection

## DESIGN AND RESULTS

Project Name:	Port Republic and Main Street	Critical Lane Volume Sum			
EW Facility:	Port Republic Road	< 1200	1200 - 1399	1400 - 1599	≥ 1600
NS Facility:	Main Street	VOLUME / CAPACITY RATIO:			0.68
Date:	December 10, 2018				



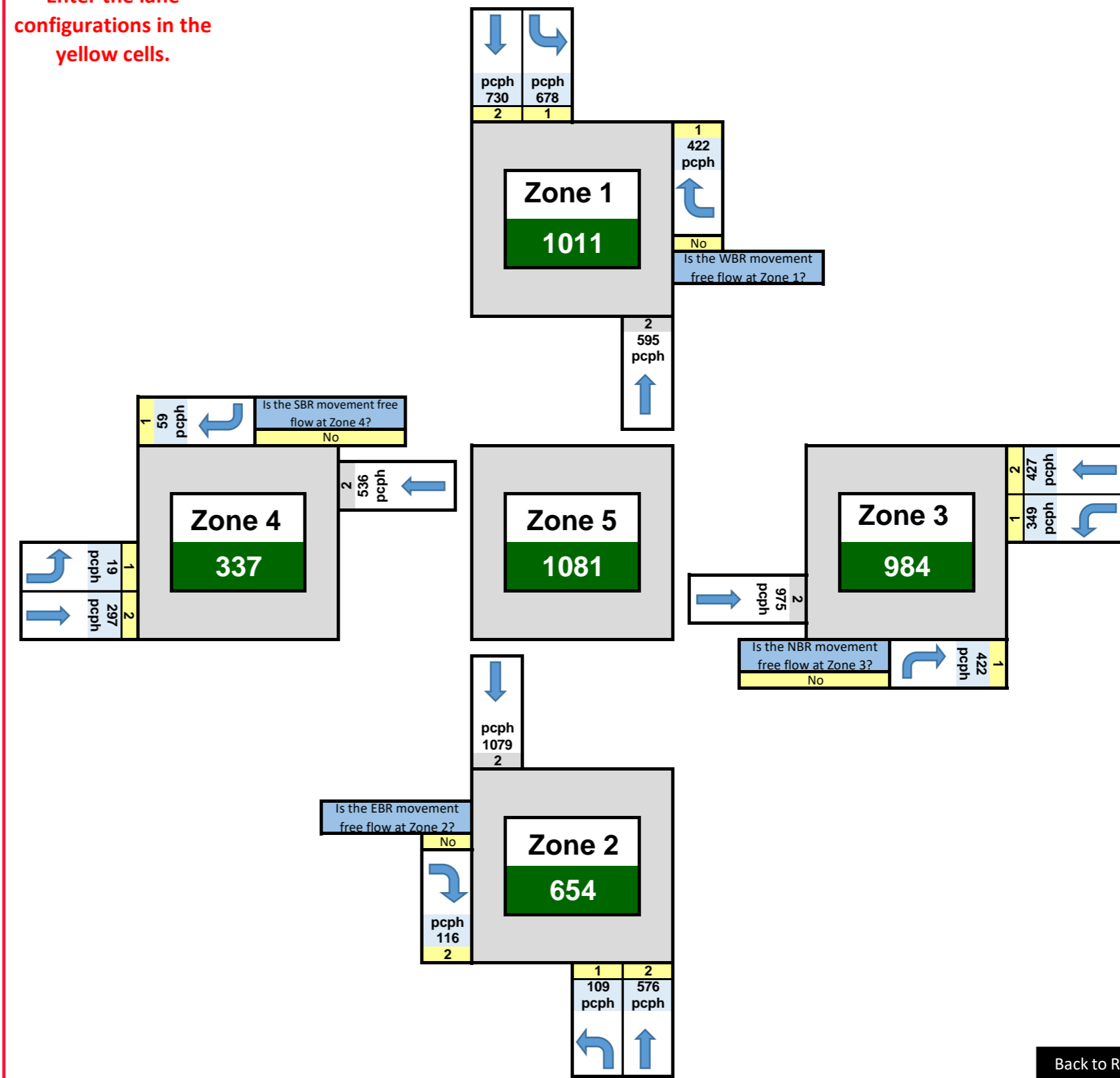
Note: This diagram does not reflect the actual lane configuration of the intersection



# Full Displaced Left Turn Intersection

## DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

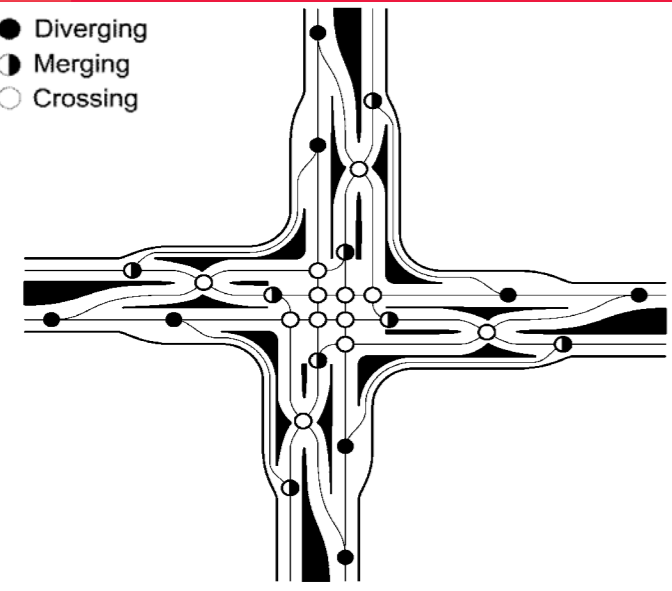


Back to Results



## Safety - Conflict Point Diagram

- Diverging
- Merging
- Crossing



Conflict Type	Count
Crossing	12
Merging	8
Diverging	8
<b>Total</b>	<b>28</b>

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1
<b>Weighted Total Conflict Points</b>	<b>40</b>

## Assumptions

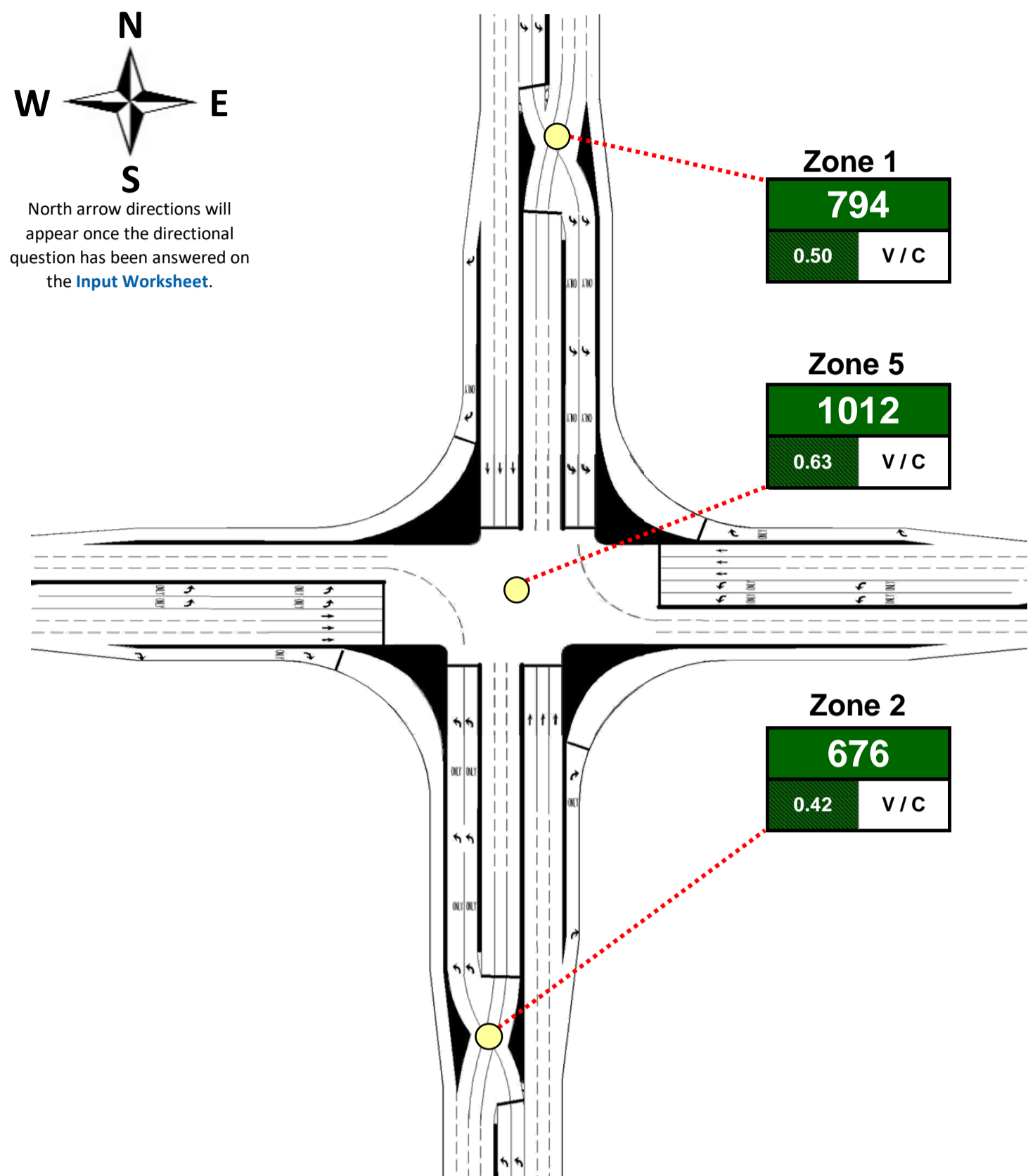
- CLV calculations at Zone 5 do not include right-turn movements.
- The number of through lanes entered in one zone is assumed to be equal to the number of through lanes in all zones that the movement passes through.



# Partial Displaced Left Turn Intersection

## DESIGN AND RESULTS

Project Name:	Port Republic and Main Street	Critical Lane Volume Sum		
EW Facility:	Port Republic Road	< 1200	1200 - 1399	≥ 1600
NS Facility:	Main Street	VOLUME / CAPACITY RATIO:		
Date:	December 10, 2018	0.63		



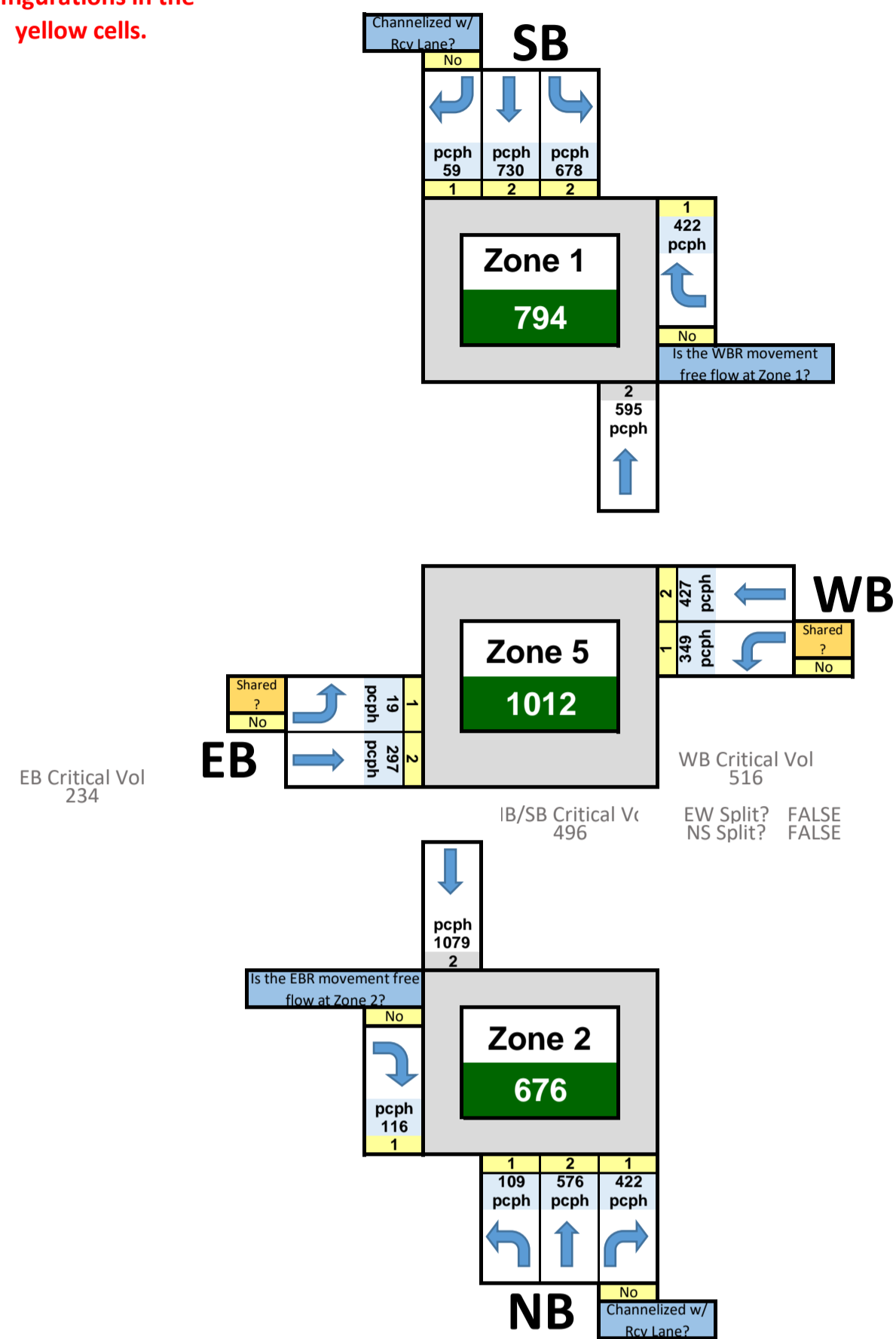
Note: This diagram does not reflect the actual lane configuration of the intersection



# Partial Displaced Left Turn Intersection

## DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

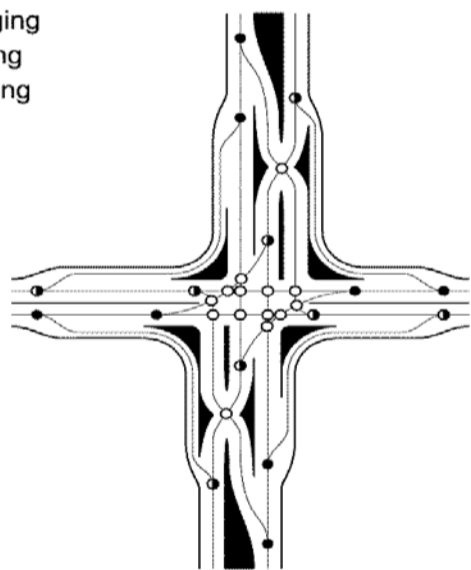


Back to Results



## Safety - Conflict Point Diagram

- Diverging
- Merging
- Crossing



Conflict Type	Count
Crossing	14
Merging	8
Diverging	8
<b>Total</b>	<b>30</b>

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

**Weighted Total Conflict Points**  
**44**

## Assumptions

- CLV calculations at Zone 5 do not include the right-turn movements from the non-displaced-left approaches.
- The number of through lanes entered in one zone is assumed to be equal to the number of through lanes in all zones that the movement passes through.



### Roundabout

**DESIGN AND RESULTS**

Project Name: Port Republic and Main Street  
 EW Facility: Port Republic Road  
 NS Facility: Main Street  
 Date: December 10, 2018

**Critical Lane Volume Sum**

< 1200	1200 - 1399	1400 - 1599	≥ 1600
			2.01

**VOLUME / CAPACITY RATIO: 2.01**

**Zone 1**  
 Predicted approach capacity  
 Lane 1 2.01 V/C  
 Lane 2 0.67 V/C

**Zone 4**  
 Predicted approach capacity  
 Lane 1 0.84 V/C  
 Lane 2 0.53 V/C

**Zone 3**  
 Predicted approach capacity  
 Lane 1 0.55 V/C  
 Lane 2 0.45 V/C

**Zone 2**  
 Predicted approach capacity  
 Lane 1 0.74 V/C  
 Lane 2 0.51 V/C

### Roundabout

**DATA INPUT AND CONFIGURATION**

Enter the lane configurations in the yellow cells.

**SB**  
 Number of Entry Lanes: 2  
 Slip Lane? Yes  
 Number of Circulating Lanes: 2

**NB**  
 Number of Entry Lanes: 2  
 Slip Lane? Yes  
 Number of Circulating Lanes: 2

**EB**  
 Number of Entry Lanes: 2  
 Slip Lane? Yes  
 Number of Circulating Lanes: 2

**WB**  
 Number of Entry Lanes: 2  
 Slip Lane? Yes  
 Number of Circulating Lanes: 2

Back to Results

### Roundabout

**CAPACITY CALCULATIONS**

**SB**  
 Through lane utilization factor: 0.50  
 Lane Capacity: 1 519, 2 547  
 V/C RATIO: 0.97, 2.01

**NB**  
 Through lane utilization factor: 0.50  
 Lane Capacity: 1 536, 2 564

**EB**  
 Through lane utilization factor: 0.50  
 Lane Capacity: 1 646, 2 690

**WB**  
 Through lane utilization factor: 0.50  
 Lane Capacity: 1 646, 2 690

**EQUATION:  $A \times \exp(-B \times Q)$**

Number of Entry Lanes	Number of Circulating Lanes	Lane	A	B
1	1	-	1130	0.001
1	2	-	1130	0.0007
2	1	Left	1130	0.001
2	1	Right	1130	0.001
2	2	Left	1130	0.00075
2	2	Right	1130	0.0007

### Safety - Conflict Point Diagram

Conflict Type	Count
Crossing	4
Merging	2
Diverging	2
<b>Total</b>	<b>8</b>

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1
<b>Weighted Total Conflict Points</b>	<b>8</b>

### Assumptions

- The number of circulating lanes in one quadrant is assumed to be equal to the number of exiting lanes in the next quadrant.
- The roundabout is limited to a maximum of two entry lanes and two circulating lanes.
- All left-turning vehicles are assumed to stay in the innermost lane until exiting the roundabout.
- This worksheet does not use the CLV methodology. The calculations are based on the HCM 2010.



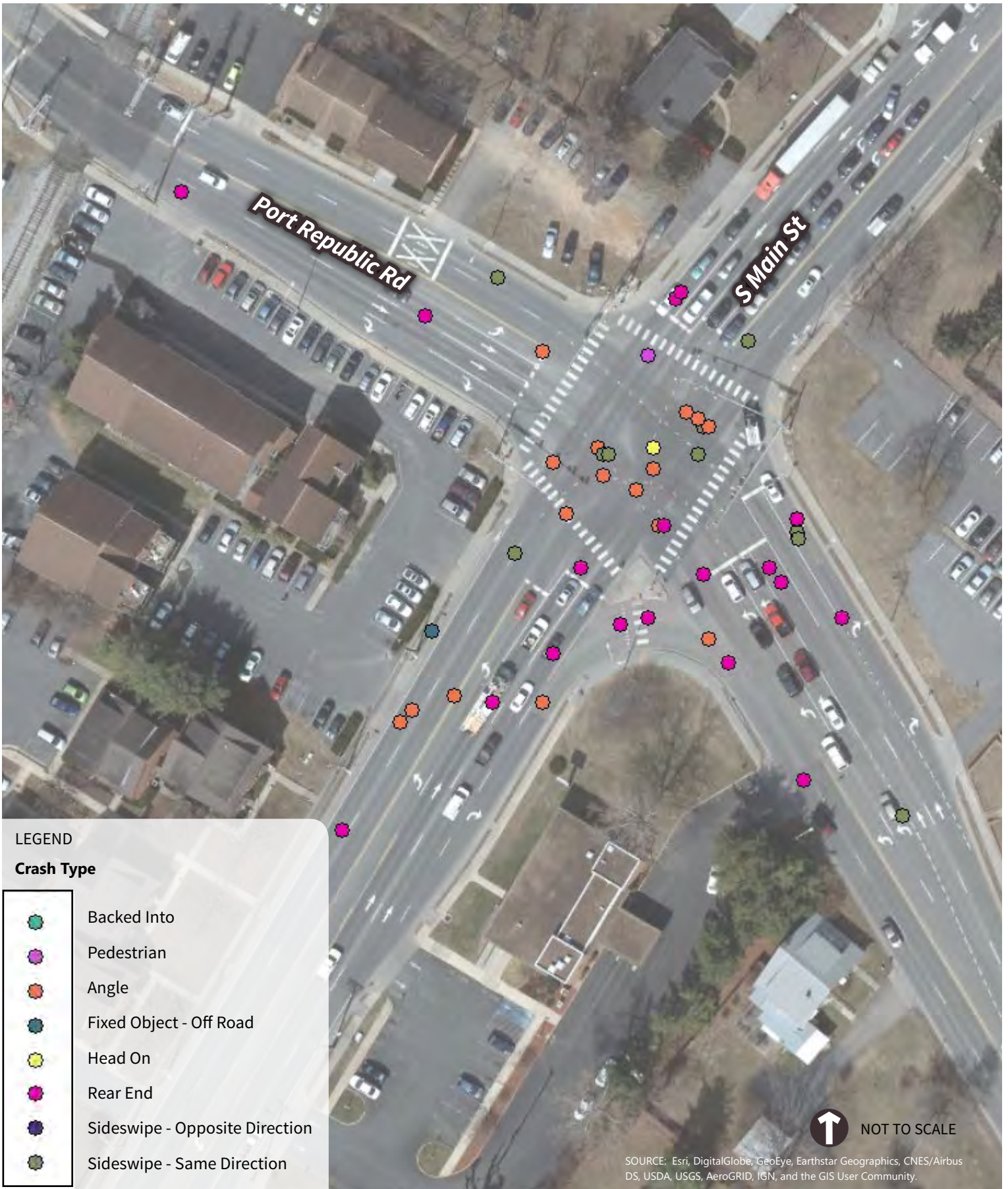


## Appendix H

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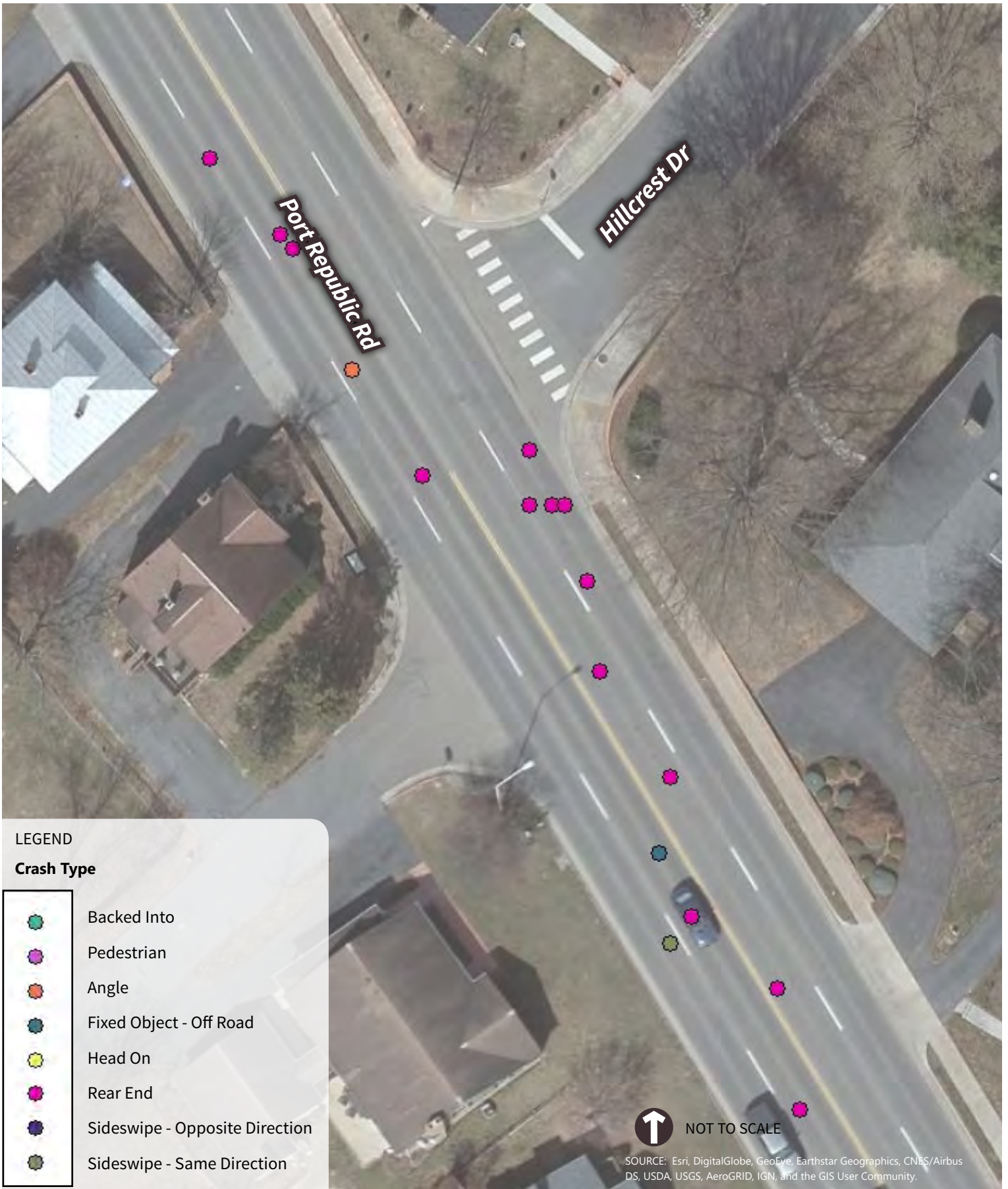
### Crash Locations per Intersection





**FIGURE H-1**  
**CRASH LOCATIONS - SOUTH MAIN ST AND PORT REPUBLIC RD**  
 Port Republic Road Access Management Study  
 Harrisonburg, Virginia





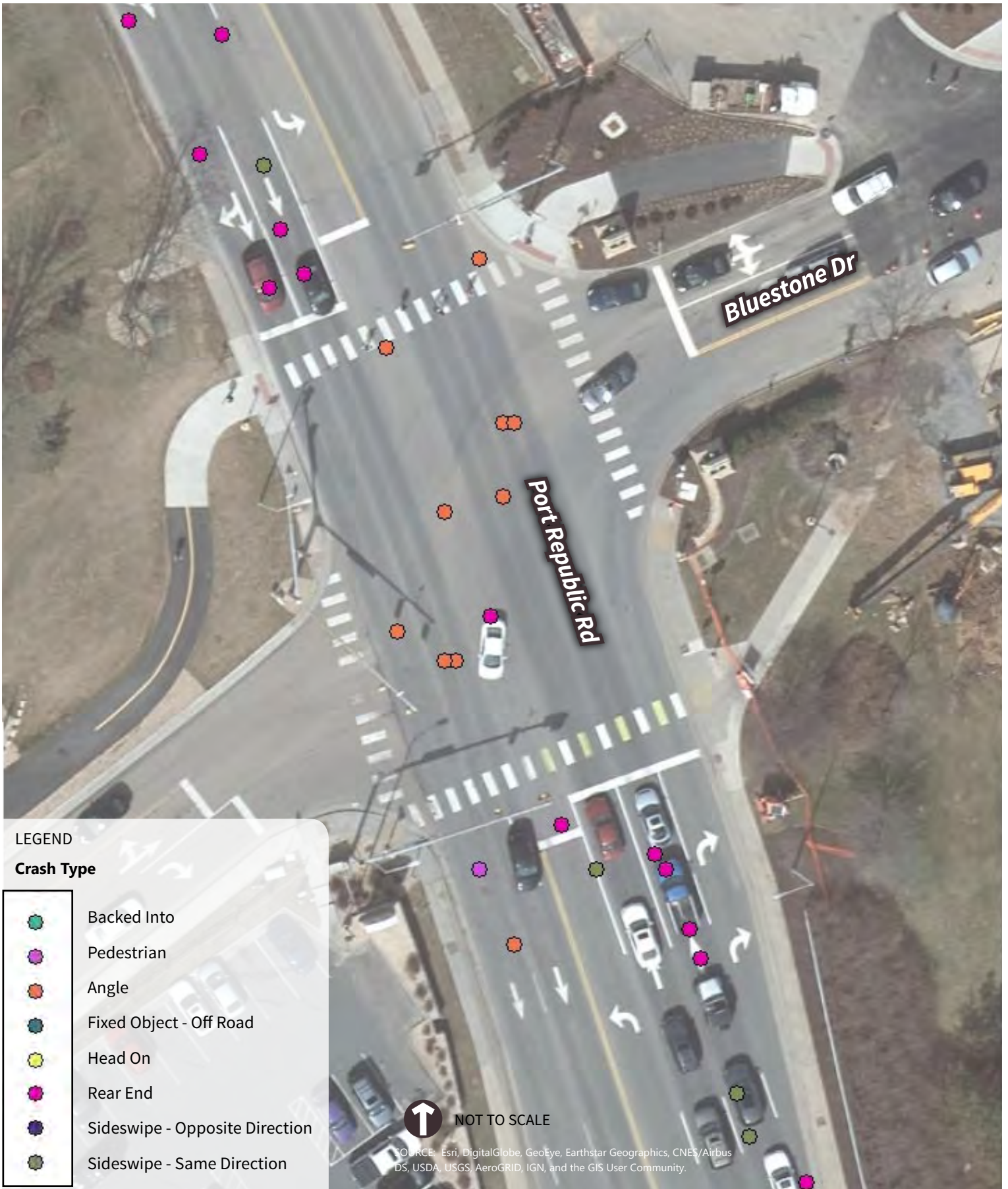
**FIGURE H-2**  
**CRASH LOCATIONS - HILLCREST DR AND PORT REPUBLIC RD**  
 Port Republic Road Access Management Study  
 Harrisonburg, Virginia





**FIGURE H-3**  
**CRASH LOCATIONS - CRAWFORD DR AND PORT REPUBLIC RD**  
 Port Republic Road Access Management Study  
 Harrisonburg, Virginia

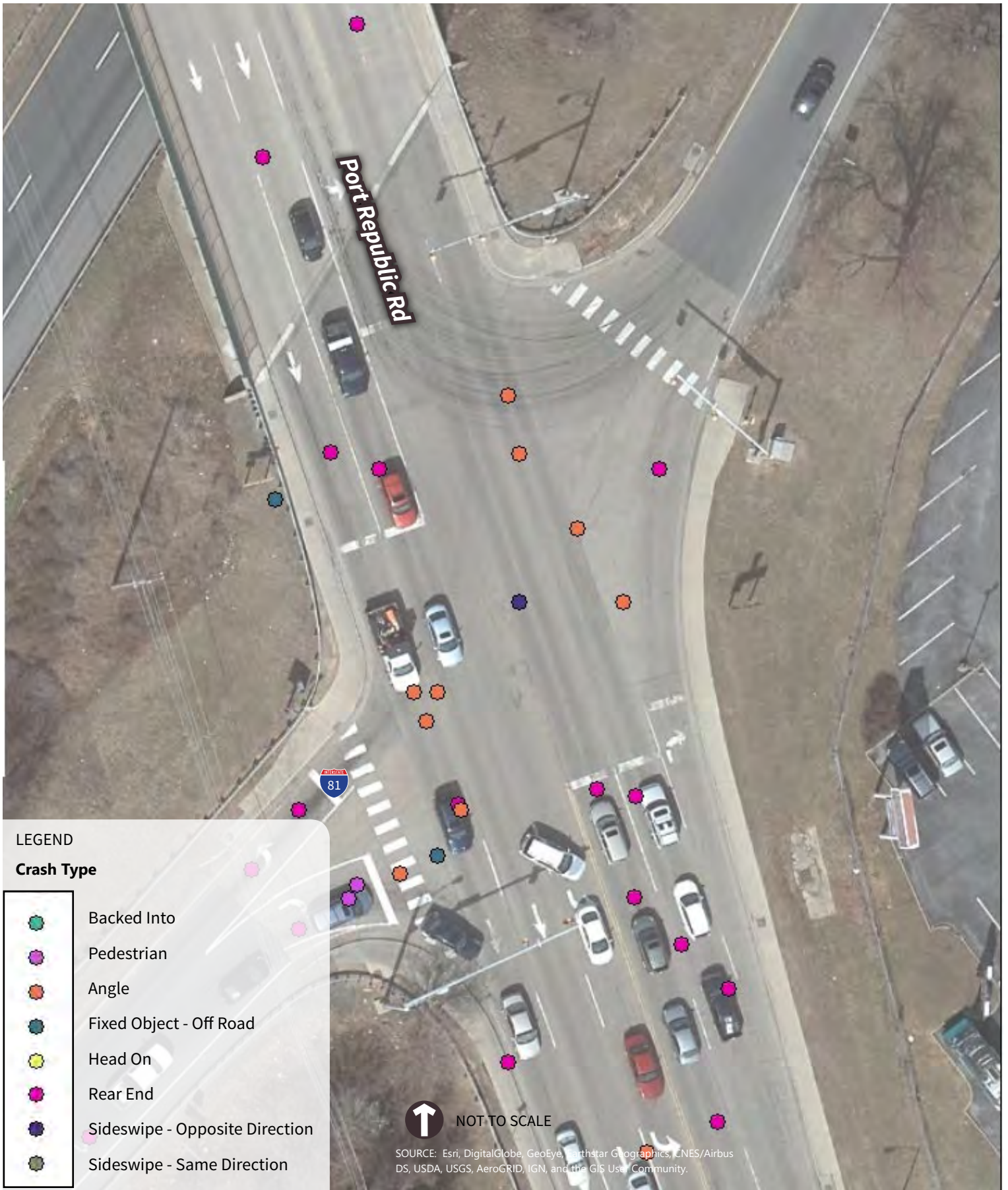




**FIGURE H-4**  
**CRASH LOCATIONS - BLUESTONE DR AND PORT REPUBLIC RD**

Port Republic Road Access Management Study  
 Harrisonburg, Virginia





**FIGURE H-5**  
**CRASH LOCATIONS - I-81 NB RAMP AND PORT REPUBLIC RD**

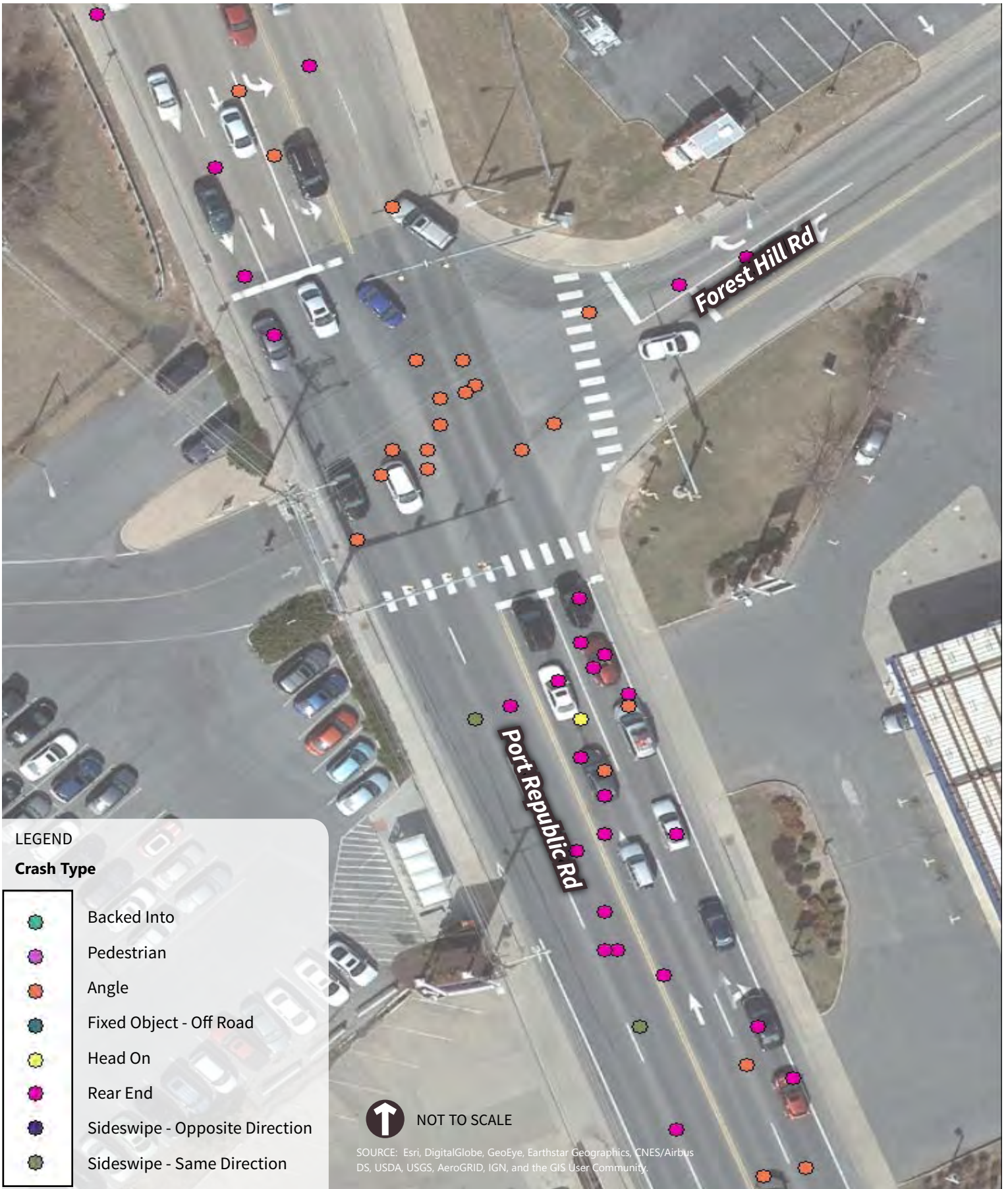
Port Republic Road Access Management Study  
 Harrisonburg, Virginia





**FIGURE H-6**  
**CRASH LOCATIONS - I-81 SB RAMP AND PORT REPUBLIC RD**  
 Port Republic Road Access Management Study  
 Harrisonburg, Virginia

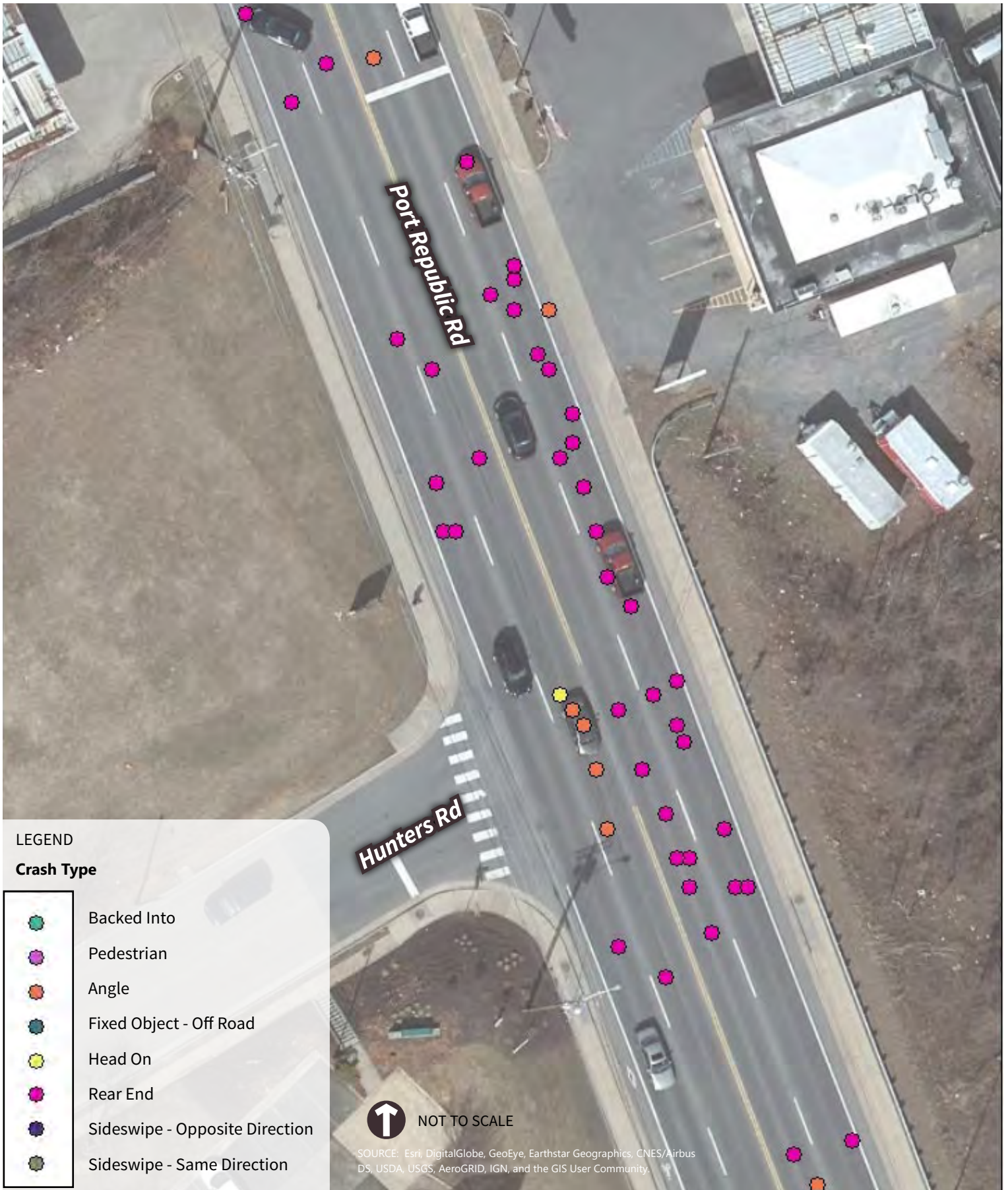




**FIGURE H-7**  
**CRASH LOCATIONS - FOREST HILL RD AND PORT REPUBLIC RD**

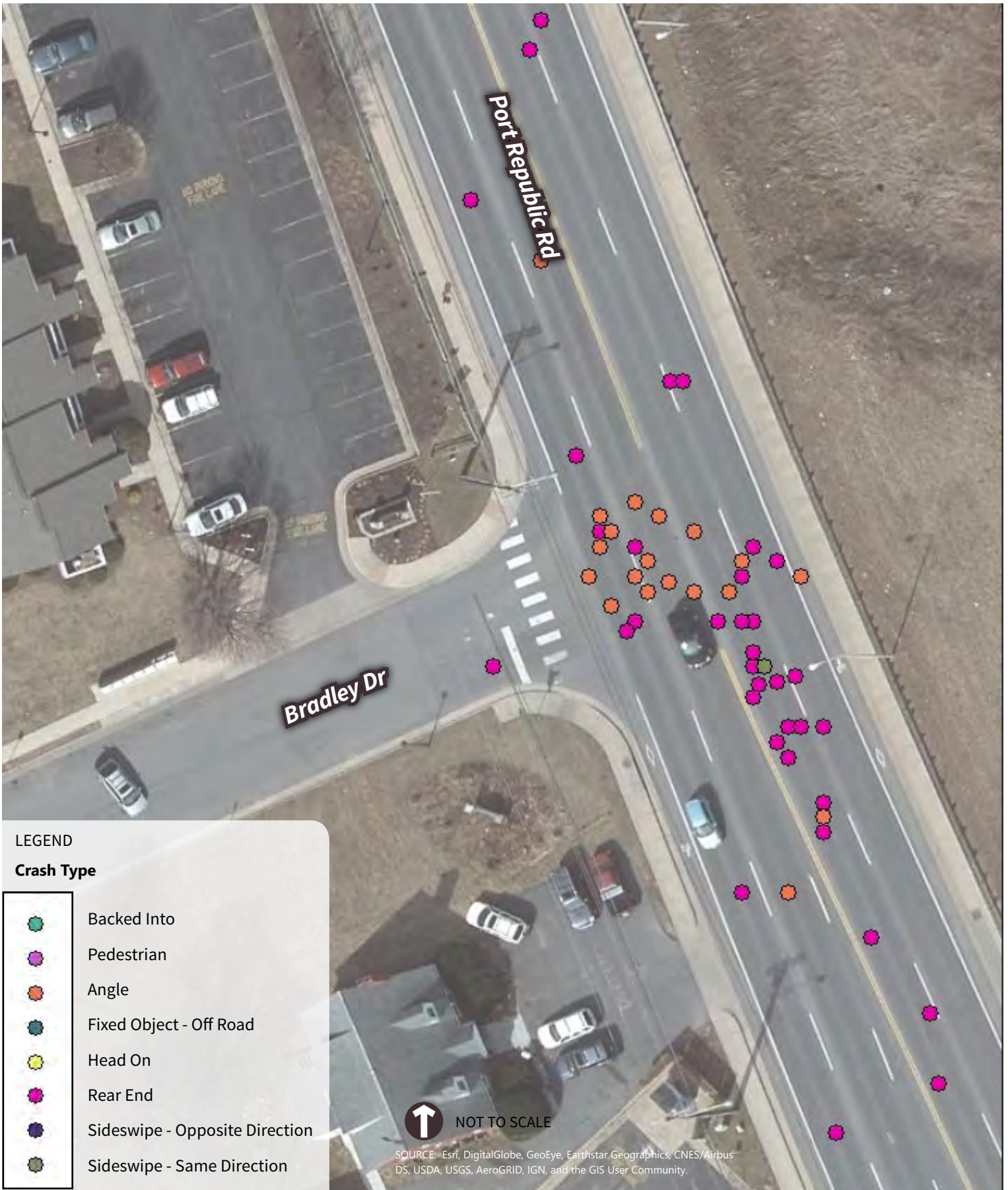
Port Republic Road Access Management Study  
 Harrisonburg, Virginia





**FIGURE H-8**  
**CRASH LOCATIONS - HUNTERS RD AND PORT REPUBLIC RD**  
 Port Republic Road Access Management Study  
 Harrisonburg, Virginia

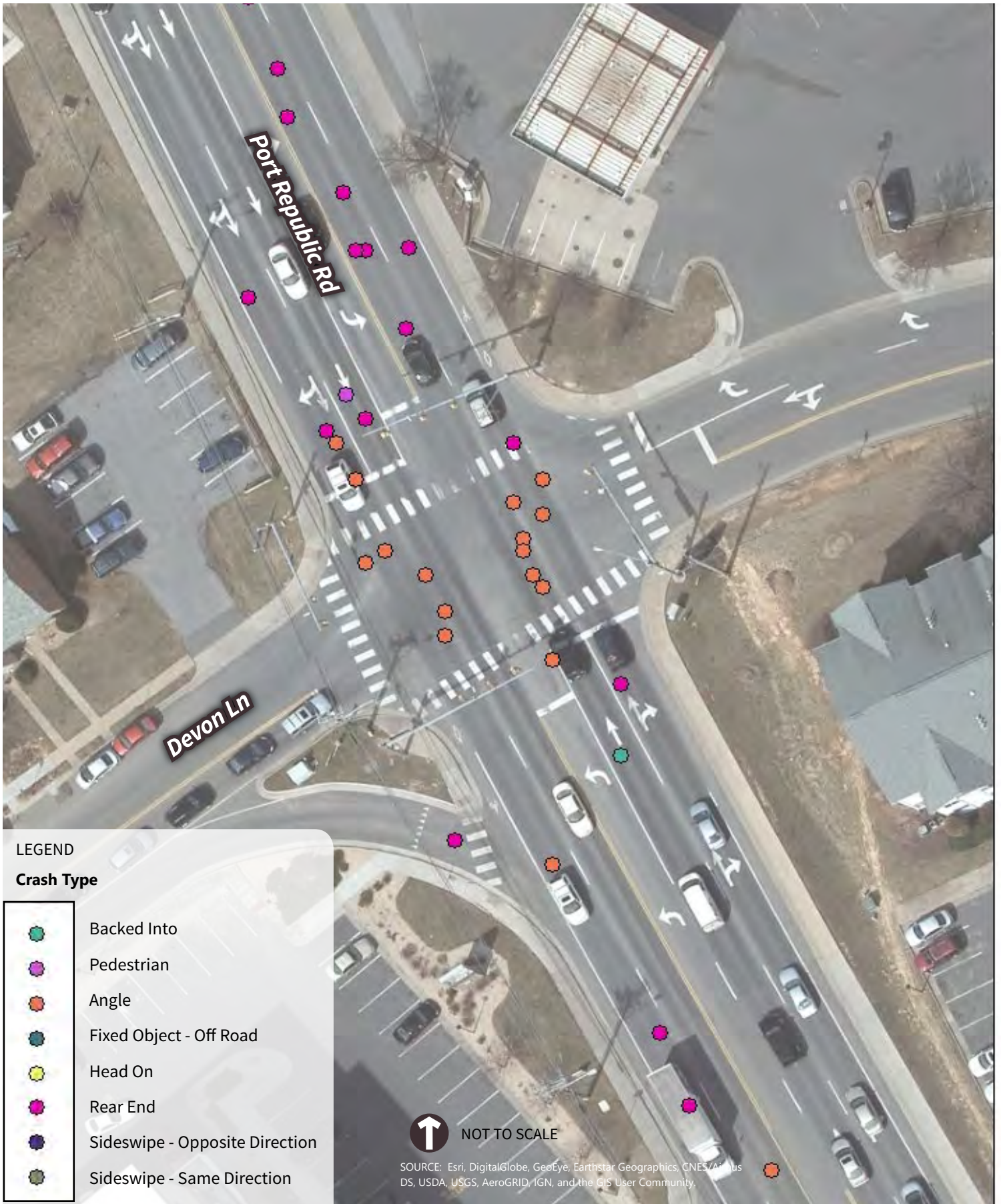




**FIGURE H-9**  
**CRASH LOCATIONS -BRADLEY DR AND PORT REPUBLIC RD**

Port Republic Road Access Management Study  
 Harrisonburg, Virginia





**FIGURE H-10**  
**CRASH LOCATIONS - DEVON LN AND PORT REPUBLIC RD**

Port Republic Road Access Management Study  
 Harrisonburg, Virginia



## Appendix I

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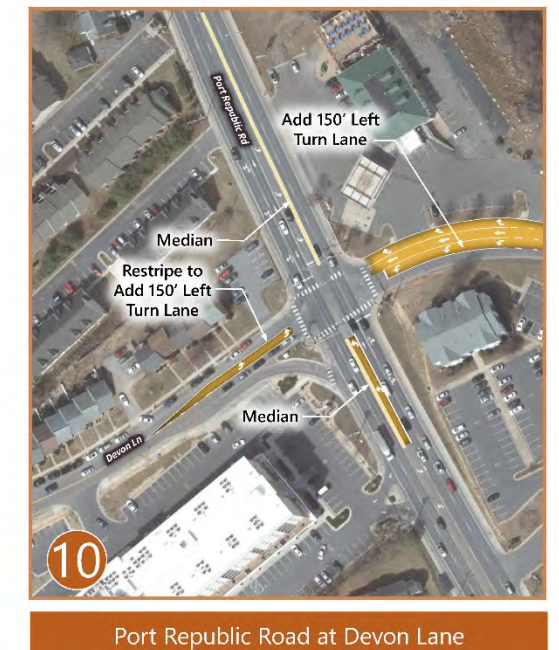
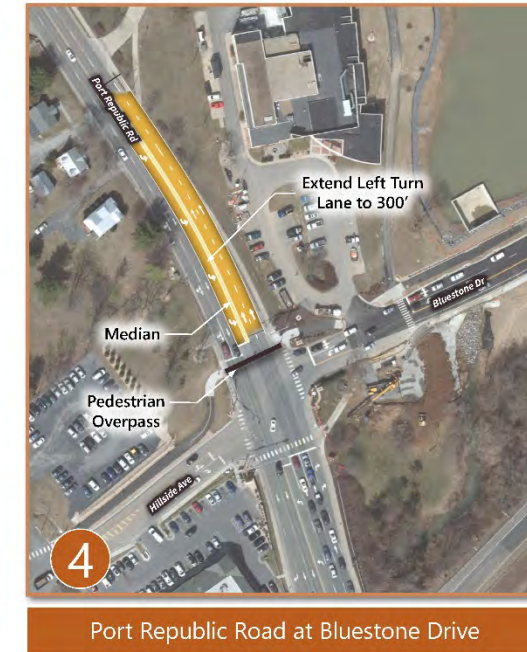
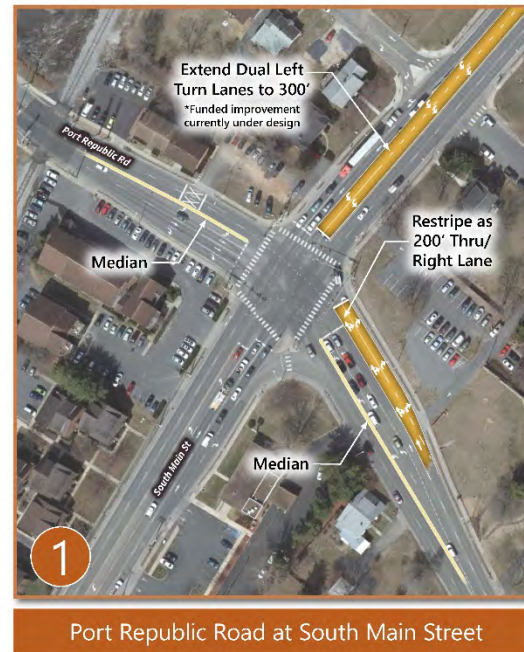
### Intersections and Improvements





# Recommended Conceptual Intersection Improvements

## Port Republic Road Safety and Operations Study Harrisonburg, Virginia



SOURCE: BING, (c) 2015 Microsoft Corporation and its data suppliers.





## Appendix J

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Public Comments



# Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO)

Port Republic Road Corridor Study

Monday, March 11, 2019

5:00PM–7:00PM

Harrisonburg City Hall, Council Chambers, 409 South Main Street



Name	Representing (Citizen, Organization, etc.)	Email Address
Jessica Wetzler	Daily News-Record	jwetzler@dnronline.com
Mary Golden Hughes	Citizen - Forest Hills	marygoldenhughes@gmail.com
Benjamin Craig	Homeowner - Forest Hills	craigb@vt.edu
Lisa Gallagher	Homeowner - Forest Hills	gallagherlj@gmail.com
Martha Kidd	Homeowner	khtsaev@hotmail.com
Jennifer Toth	Citizen	jennytoth@gmail.com
Bradford Dyjak	Rockingham County	BDyjak@RockinghamCountyVA.gov
Don Komara	VDOT H-Burg Rep	Donald.Komara@Virginia.gov

# Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO)

Port Republic Road Corridor Study

Monday, March 11, 2019

5:00PM—7:00PM

Harrisonburg City Hall, Council Chambers, 409 South Main Street



Name	Representing (Citizen, Organization, etc.)	Email Address
Jeff Pierson	Citizen	JPIERSON@BRIDGEWATER.EDU
LEB ESHELMAN	JMU	eshelm11@jmu.edu
Bill Blessing	MPO-TAC	webarb@comcast.net
Scott+Danny Gallagher	Citizen	
David Rudmin	—	rudmind@a@hotmail.com
Kim Sandrum		
Greg Bellamy	Citizen	hburgng@yahoo.com
Justin Michael	The Frazier Quarry	justin.michael@frazierquarry.com



# Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO)

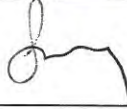
Port Republic Road Corridor Study

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Harrisonburg City Hall, Council Chambers, 409 South Main Street



Name	Representing (Citizen, Organization, etc.)	Email Address
Adrienne Hooker	Citizen Forest Hills	adrihooker@gmail.com
Carina Young	Citizen	
DAVID WANG	Citizen	
Sean Hesse	Citizen Forest Hills	hesse.27@mr.com
Burgess Lindsey	VDOT	burgess.lindsey@vdot.virginia.gov
	citiz	



Port Republic Road Corridor Study  
HARRISONBURG-ROCKINGHAM METROPOLITAN PLANNING ORGANIZATION (HRMPO)

Public Meeting  
March 11, 2019  
5pm – 7:00 pm



**Harrisonburg  
Rockingham**  
Metropolitan Planning  
Organization

112 MacTanly Place  
Staunton, VA 24401  
540-885-5174

COMMENT SHEET

Name (Optional): Mary Golden Hughes Phone/email (Optional): 433-8449

1. Do the study recommendations meet the stated objectives of increasing safety and reducing delay?

Please take the new 500 bed Jennings Hall  
Dormitory, JMU Convocation Center and adjacent  
parking deck into account as you plan to

2. Are there any specific features of the study that you do, or do not favor? What are they? Why?

re-align Forest Hill Road. Can that road  
adequately accommodate the increased traffic -  
without penalizing the neighbors in Forest  
Hills and Harrington Heights. What are re

3. Please provide any additional information you feel would assist us in reaching the goals of the study.

Plans to improve pedestrian traffic along  
Forest Hill Rd as more and more  
pedestrians attempt to safely reach JMU and  
the new conv and new Jennings hall?

4. Was the information presented tonight easy to understand? Did it meet your needs/expectations?

What has been done to improve bike access  
to the new areas of development at  
JMU (Jennings hall, parking deck, Jennings hall)?

Please leave this comment sheet at the designated location, mail your comments to the addressee on the reverse side, or email your comments to [jonathan@cspdc.org](mailto:jonathan@cspdc.org). Please submit your comments by **March 25, 2019**.





# Harrisonburg-Rockingham Metropolitan Planning Organization Civil Rights Informational Survey

Pursuant to Title VI of the Civil Rights Act of 1964 and related nondiscrimination authorities, the HRMPO collects responses to the questions below to evaluate access to public meetings for ALL persons. Disclosure of this information is strictly voluntary, anonymous, and confidential.

1) Gender?

2) Please select the category that includes your age.

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+

3) What best describes your employment status?

- Employed part time
- Employed full time
- Not employed, but looking for work
- Not employed and not looking for work
- Retired
- Student
- Homemaker
- Other
- Prefer not to answer

4) In which jurisdiction do you live?

- Harrisonburg
- Rockingham
- Dayton
- Bridgewater
- Mt. Crawford
- Other (please specify)

5) What best describes your level of education?

- Some High School
- High school graduate or equivalent
- Trade or Vocational degree

- Some College
- Associate degree
- Bachelor's degree
- Graduate or professional degree
- Prefer not to answer

6) Which one of the following ranges includes your total yearly household income before taxes?

- Under \$20,000
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- \$50,000 - \$69,999
- \$70,000 - \$99,999
- \$100,000 +
- Prefer not to answer

7) Are you of Hispanic, Latino, or Spanish origin?

- Yes
- No

8) How would you describe yourself?

- Asian
- American Indian or Alaska Native
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Other
- Mixed Race

Additional comments:


### Staff Use Only

Meeting Name:

Date:

Type of Meeting:



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**Harrisonburg  
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Organization

112 MacTanly Place  
Staunton, VA 24401  
540-885-5174

## COMMENT SHEET

Name (Optional) : \_\_\_\_\_ Phone/email (Optional): \_\_\_\_\_

1. Do the study recommendations meet the stated objectives of increasing safety and reducing delay?

*Yes. Perhaps incomplete given the projected growth of JMU, new apartments and new Convocation Center on University Blvd / Forest Hills Drive.*

2. Are there any specific features of the study that you do, or do not favor? What are they? Why?

*There are a lot of improvements that were ~~stated~~ are slated for eventual completion, however, each of these needs are about 5 yrs behind. Most of these are good suggestions, but they should have been started 5 yrs ago, not waiting another five.*

3. Please provide any additional information you feel would assist us in reaching the goals of the study.

*I believe the physical "parking" barriers would be necessary for forced right turns.*

4. Was the information presented tonight easy to understand? Did it meet your needs/expectations?

*Yes, easy to understand.*

Please leave this comment sheet at the designated location, mail your comments to the addressee on the reverse side, or email your comments to [jonathan@cspdc.org](mailto:jonathan@cspdc.org). Please submit your comments by **March 25, 2019**.



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## COMMENT SHEET

Name (Optional): Lisa Gallagher Phone/email (Optional): \_\_\_\_\_

1. Do the study recommendations meet the stated objectives of increasing safety and reducing delay?

Yes

2. Are there any specific features of the study that you do, or do not favor? What are they? Why?

I am excited about nearly all of the recommendations! My only concern is with the no left turn signs. In seeing how vehicles have responded to the one at ~~the~~ the JMU parking lot (across from Forest Hill Rd), they panic and do it anyway. Thank you for all the hard work that has gone into this project!!!

3. Please provide any additional information you feel would assist us in reaching the goals of the study.

Please keep in mind the impact on Forest Hill Rd. When traffic backs up around the Days Inn, it makes entering and exiting the Forest Hills neighborhood very dangerous.

4. Was the information presented tonight easy to understand? Did it meet your needs/expectations?

Yes. 😊

Please leave this comment sheet at the designated location, mail your comments to the addressee on the reverse side, or email your comments to [jonathan@cspdc.org](mailto:jonathan@cspdc.org). Please submit your comments by **March 25, 2019**.



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## COMMENT SHEET

Name (Optional): Scott Gallagher Phone/email (Optional): \_\_\_\_\_

1. Do the study recommendations meet the stated objectives of increasing safety and reducing delay?

Maybe, but little to address rear end collisions.  
Not much for reducing delay. 8 vs. 5 minutes - maybe?

**\*\* Right turn lane at Forest Hills is a good idea!**

2. Are there any specific features of the study that you do, or do not favor? What are they? Why?

• No red light cameras - will make rear end accidents worse \* ← **seriously DON'T!**

• Do not use flex tubes - don't solve the problem, looks crappy.

• Restricting left turns is a poor solution. - make a center turn lane!

3. Please provide any additional information you feel would assist us in reaching the goals of the study.

You need to take into account all the building being done in County.

You are really hurting the businesses @ I-81

I appreciate what you are trying to do but I don't think it will help much.

4. Was the information presented tonight easy to understand? Did it meet your needs/expectations?

Yes! Easy to understand! My issue is that it won't help much.

\* You did great with all the random questions that was outside your scope.  
**THANK YOU!!**

Please leave this comment sheet at the designated location, mail your comments to the addressee on the reverse side, or email your comments to [jonathan@cspdc.org](mailto:jonathan@cspdc.org). Please submit your comments by March 25, 2019.



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COMMENT SHEET

Name (Optional): Jeff Piersen Phone/email (Optional): 540-421-5209

1. Do the study recommendations meet the stated objectives of increasing safety and reducing delay?

YES! FANTASTIC

2. Are there any specific features of the study that you do, or do not favor? What are they? Why?

NONE - LOOKS WONDERFUL TO ME.

3. Please provide any additional information you feel would assist us in reaching the goals of the study.

4. Was the information presented tonight easy to understand? Did it meet your needs/expectations?

YES. GREAT INFORMATION - EXCELLENT PLAN  
LISA DID A GREAT JOB OF EXPLAINING INTO  
TO ME BEFORE THE TALK.

Please leave this comment sheet at the designated location, mail your comments to the addressee on the reverse side, or email your comments to [jonathan@cspdc.org](mailto:jonathan@cspdc.org). Please submit your comments by March 25, 2019.



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MALE

2) Please select the category that includes your age.

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- 55-64
- 65+

3) What best describes your employment status?

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- Homemaker
- Other
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- Mt. Crawford
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7) Are you of Hispanic, Latino, or Spanish origin?

- Yes
- No

8) How would you describe yourself?

- Asian
- American Indian or Alaska Native
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Other
- Mixed Race

Additional comments:

LISA WAS GREAT w/  
info before meeting.  
Looks like a great plan!

THANK YOU!

### Staff Use Only

Meeting Name:

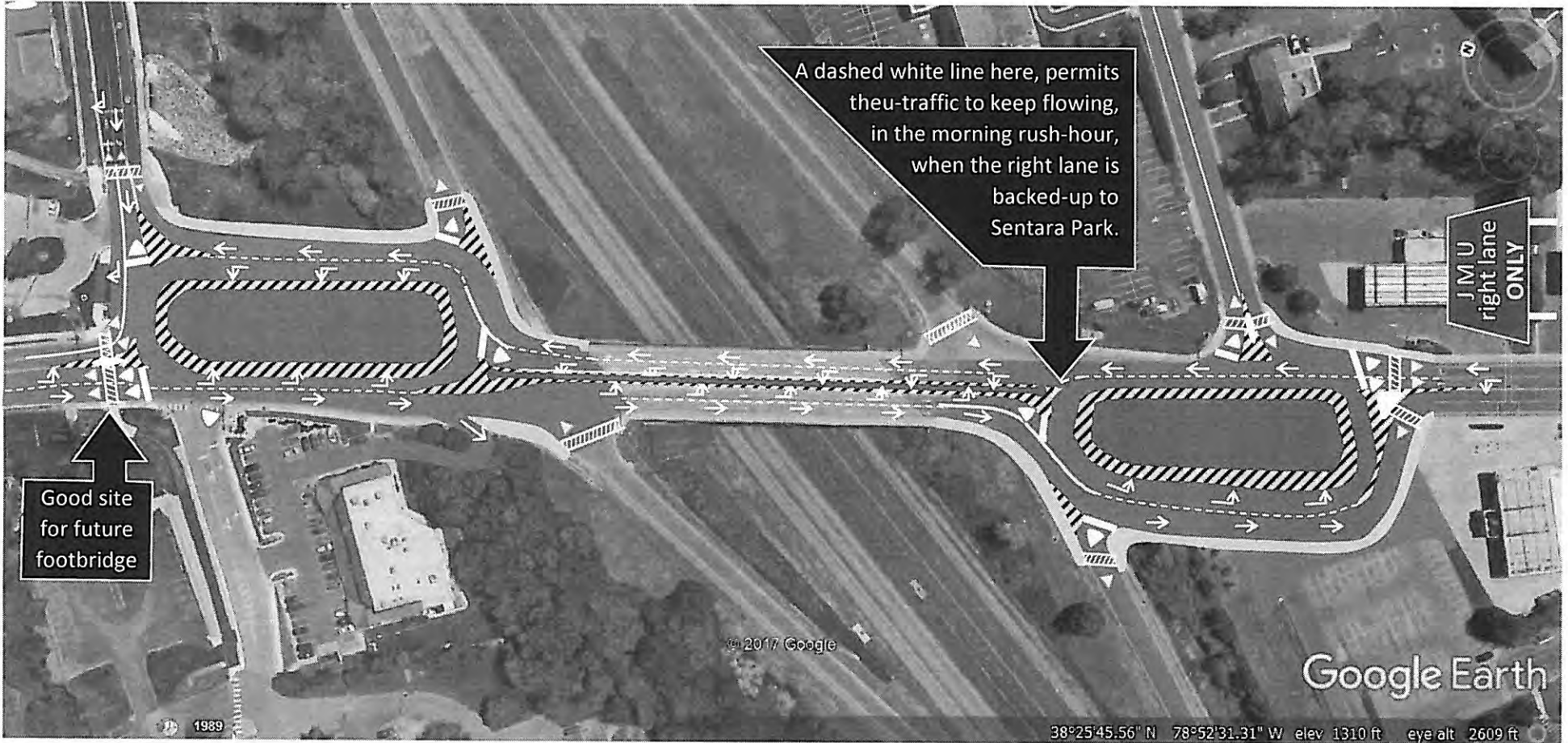
Date:

Type of Meeting:



By David Rudmin

(540) 432 - 5521 / rudminda@hotmail.com



## Jonathan Howard

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**From:** Jessica Pyle <teachpyle@gmail.com>  
**Sent:** Wednesday, February 13, 2019 7:11 PM  
**To:** Jonathan Howard; Ann Cundy  
**Subject:** comment about the Port Republic Road corridor

Hello,

I am a homeowner in Harrisonburg and live just off Port Road along Crawford Avenue. I drive on Port Republic Road no less than 2 times every day, usually more.

I appreciate the meeting taking place on Wednesday, Feb. 20th and welcoming public comment. Unfortunately, I am unable to attend the meeting.

My comments about Port Road improvements:

- It would be great to have a turning lane in the center, similar to the road section between Devon Lane and Neff Avenue. I realize there is not enough room for that, but it would be helpful to keep traffic moving.
- I think left hand turns onto Crawford Avenue or Hillcrest Drive from Port Road (going west) should be prohibited from 4:00 pm - 6:30 pm to keep traffic moving and avoid dangerous situations. I have been rear-ended while waiting to turn left onto Crawford. It's really unsafe. I now drive down to the light on S Main.
- There should be sidewalks on both sides of Port Road all the way to S Main and bike lanes if possible. Again, I realize space is limited.

Thanks for reading my comments. For all the traffic that does go up east up Port Road, I am surprised at how smoothly traffic does move through there most of the time.

Good luck and Thank you,  
Jessica Pyle

