BURGESS & NIPLE
Engineers ■ Architects ■ Planners

Corridor Review and Prioritization

Prepared for Fayette Raleigh Metropolitan Planning Organization

February 2017

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Study Purpose

The purpose of this study is to perform a review of safety, traffic flow, and traffic control in four identified study corridors with the purpose of defining and quantifying current problems and deficiencies so that corridors (or sections of corridors) can be prioritized for improvement studies in later fiscal years. This will allow Fayette-Raleigh Metropolitan Planning Organization (FRM) to focus future study and improvement efforts on corridors with the biggest problems that have the best opportunities for improvement. Improvements were not identified as part of this study, but the types of improvements to be explored in later studies of these corridors are to include those with lower costs and impacts such as signal system and timing upgrades, minor capacity improvements, and safety improvements.

Study Corridors

Through discussions with FRM, four corridors were identified for review. These corridors include locations listed in Table 4.2 of FRM's *2040 Regional Transportation Plan (2040 RTP)* that begin with "T". Per the plan, "Projects with numbers beginning with 'T' are recommended operational improvements which may range from modification of traffic signals, intersection improvements, or increased access management." The study corridors include (descriptions from 2040 RTP recommendations are shown below each):

- Corridor 1 - WV 3 (Harper Road) from Dry Hill Road to WV 16 (Robert C. Byrd Drive)
  - T-1: Signal operations improvements along WV 3 from Dry Hill Road to Hylton Lane and addition of northbound right-turn lanes onto Hylton Lane and Pikeview Drive
  - T-2: Signal operations improvements along WV 3 from Dry Hill Road to Carriage Drive
  - T-3: Intersection improvement – align Ewart Avenue and N Pike Street, add southbound left-turn lane
- Corridor 2 - US 19 (Eisenhower Drive) from Brookshire Lane to US 19 (Corridor L)
  - T-4: Roadway improvements (signs and markings) on Beckley Crossing Shopping Center from WV 16 to US 19
  - T-6: Signal operations improvements along US 19 from WV 16 to Dunn Drive
- Corridor 3 – WV 16 (Robert C. Byrd Drive) from Main Street (in Sophia) to US 19
  - T-8: Signal operations improvements along WV 16 from Reading Street to Old Eccles Road
- Corridor 4 – US 19 (Ritter Drive and Eisenhower Drive) from WV 3 (Hinton Road) to Brookshire Lane
  - T-11: Intersection improvement at WV 3 and Airport Road

Figure 1 through **Figure 4** show the study corridors and intersections being analyzed.

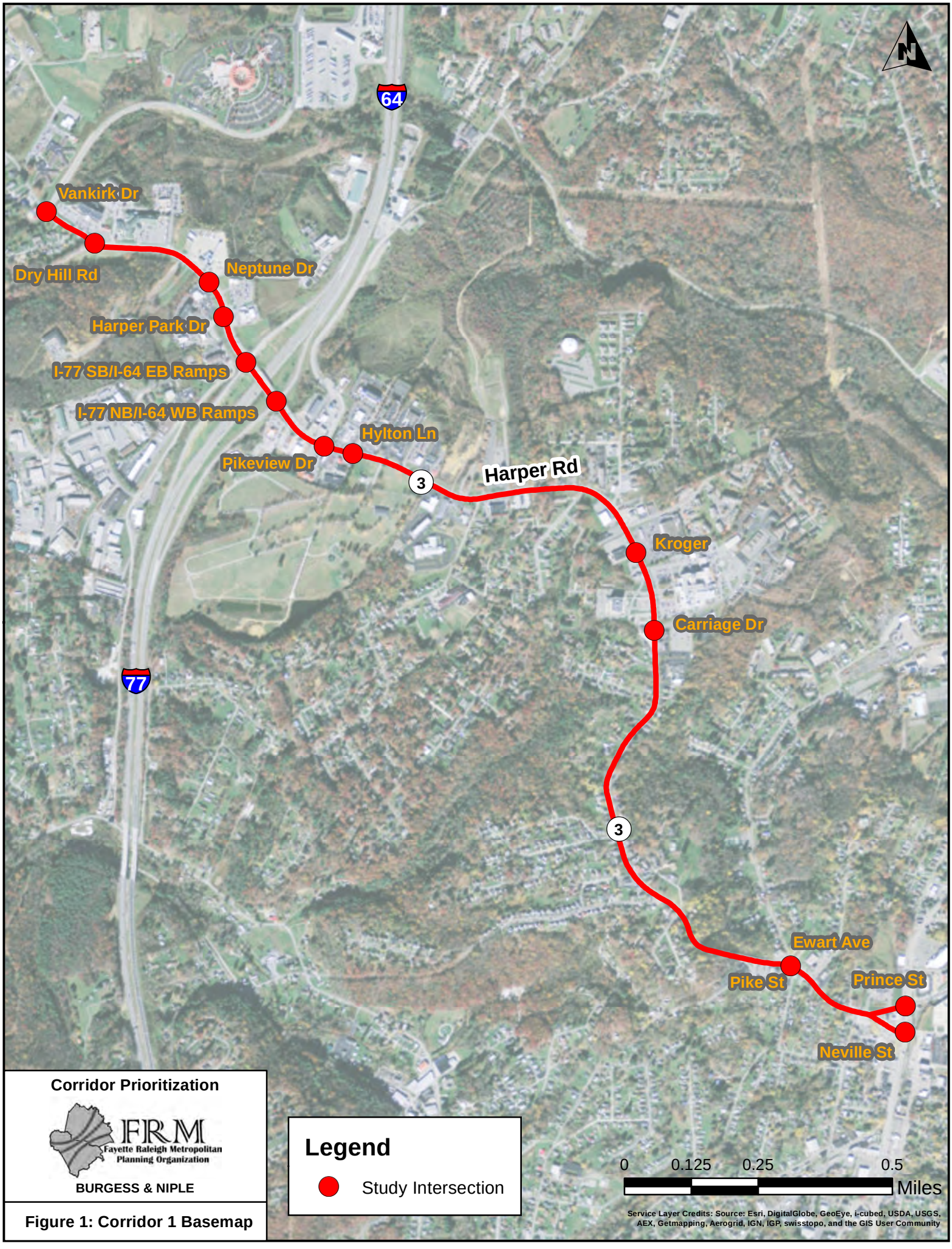

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Figure 1: Corridor 1 Basemap

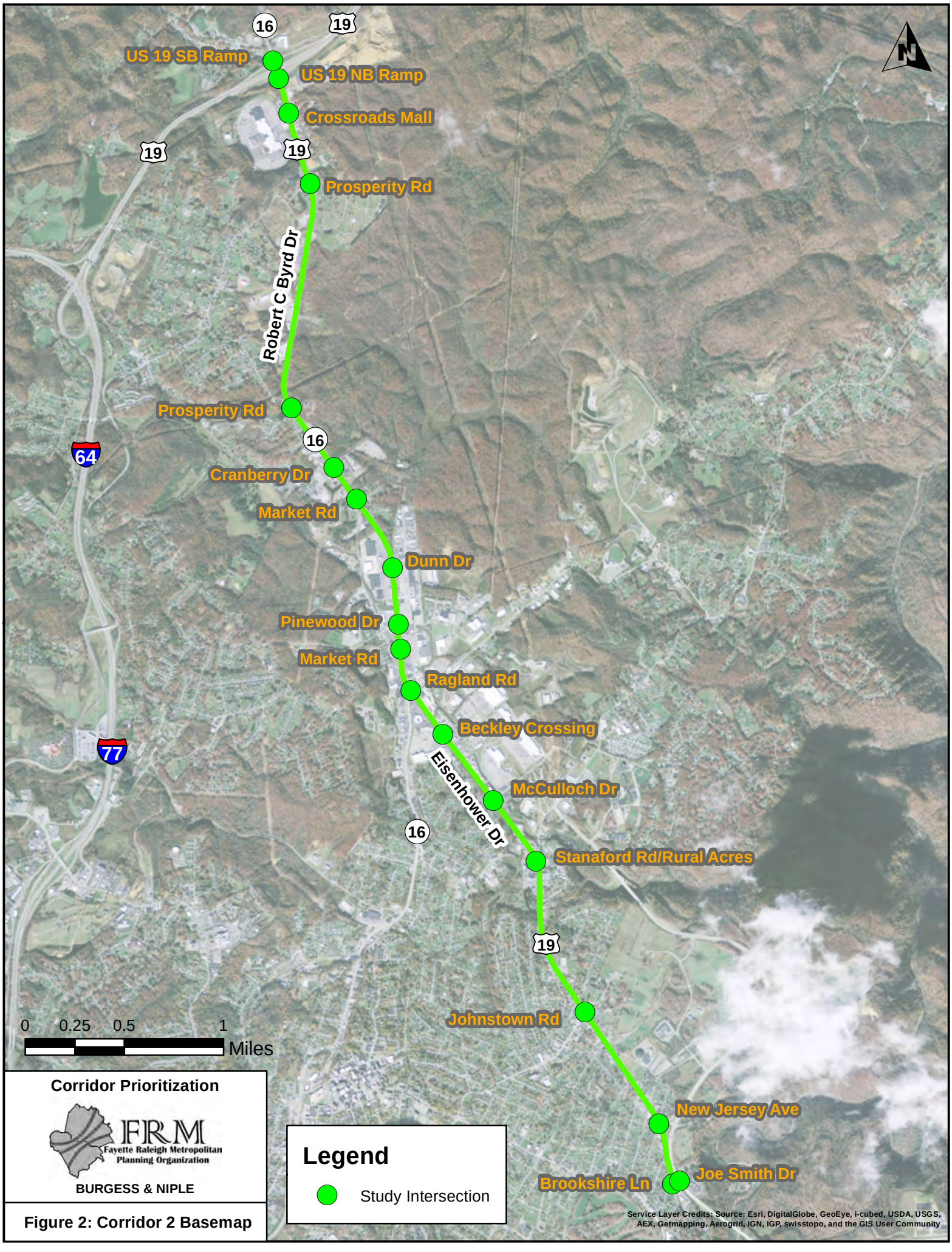
US 19 SB Ramp
US 19 NB Ramp
Crossroads Mall
Prosperity Rd
Robert C Byrd Dr
Prosperity Rd
Cranberry Dr
Market Rd
Dunn Dr
Pinewood Dr
Market Rd
Ragland Rd
Beckley Crossing
Eisenhower Dr
McCulloch Dr
Stanaford Rd/Rural Acres
Johnstown Rd
New Jersey Ave
Joe Smith Dr
Brookshire Ln
16
19
64
77
N
0 0.25 0.5 1
Miles
Legend
Study Intersection
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Figure 2: Corridor 2 Basemap
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

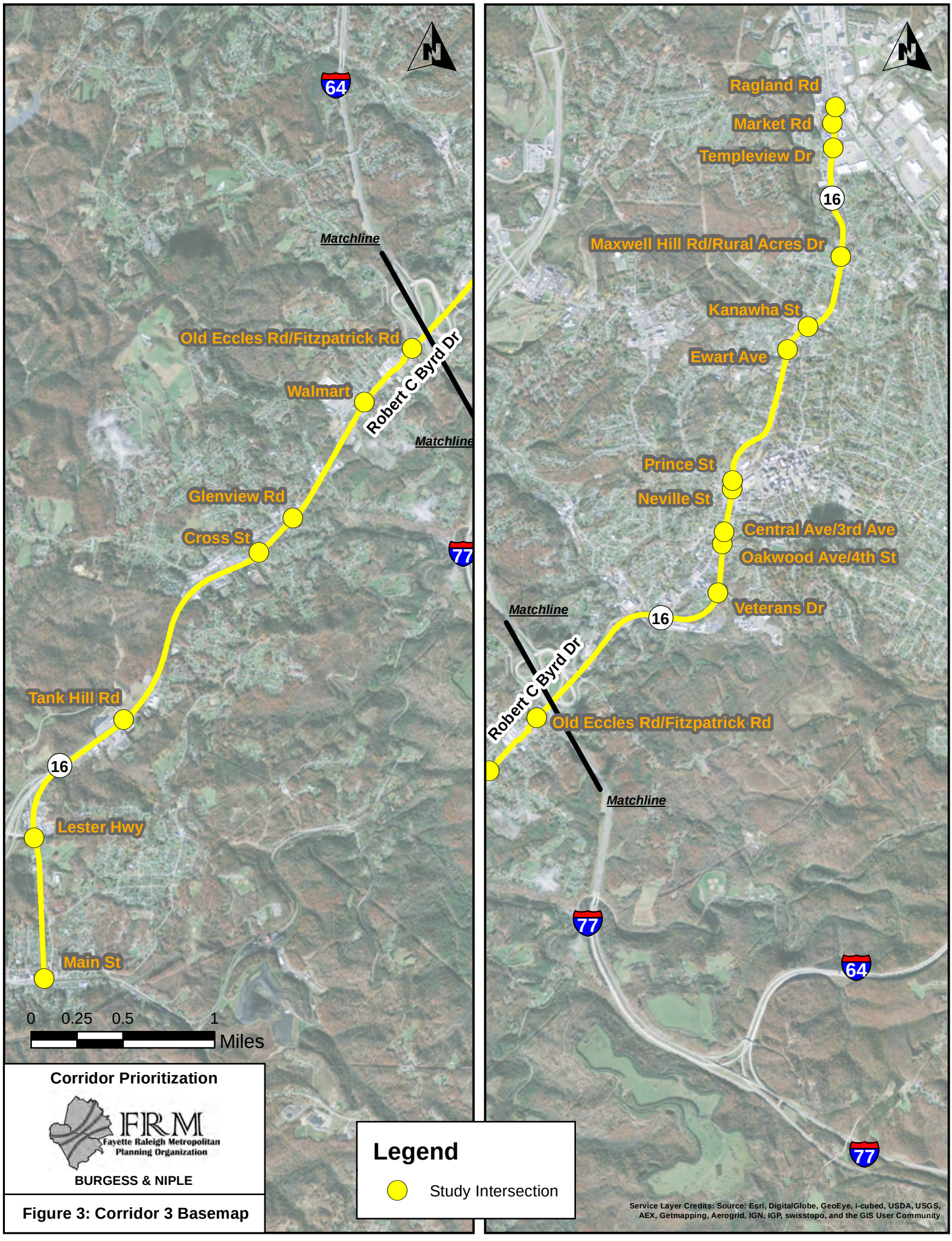

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Figure 3: Corridor 3 Basemap

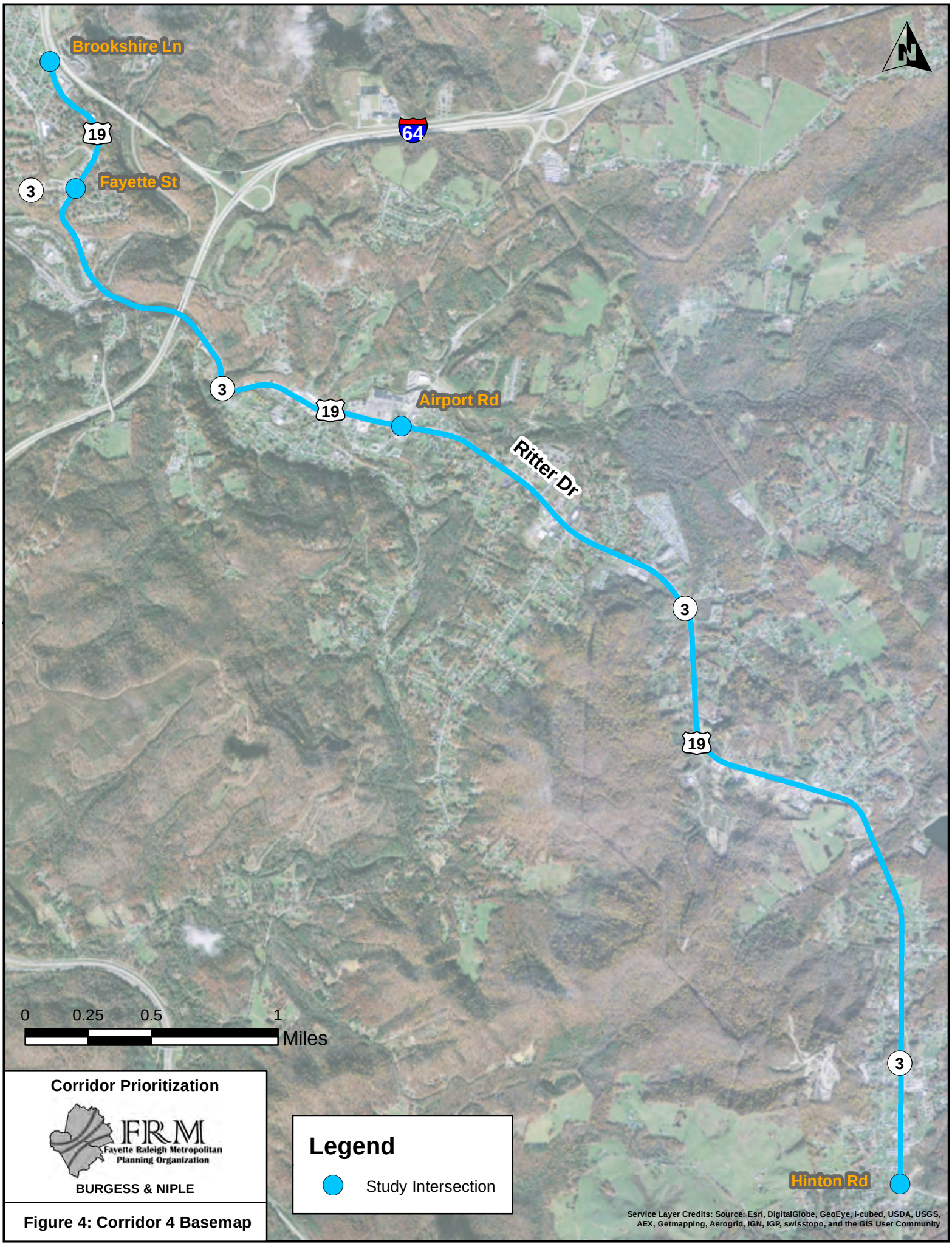

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Figure 4: Corridor 4 Basemap

Study Process

The study process for the corridor review and prioritization is summarized in **Figure 5** and is described below.

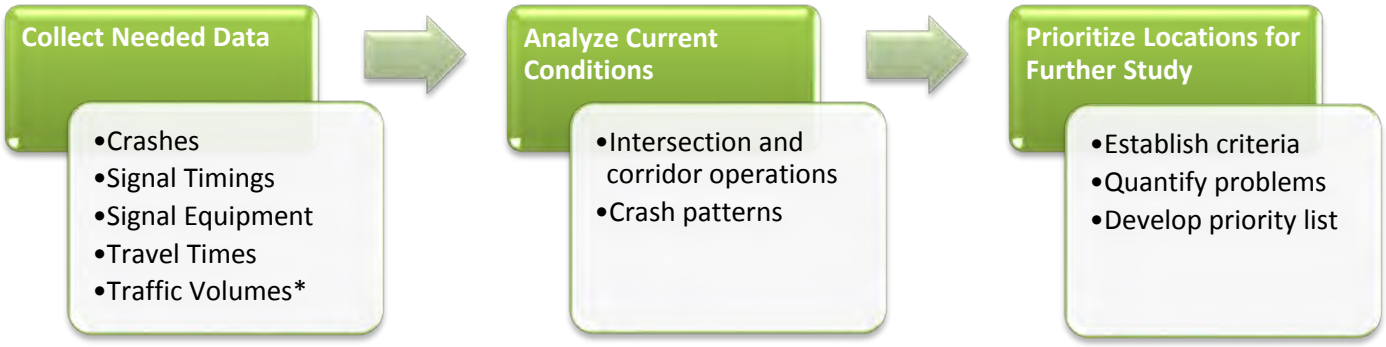

Figure 5: Study Process

The study process involved three main steps:

- Collect Needed Data – Field reviews were conducted for each corridor to obtain existing conditions information to use in the analysis. This process will be discussed in future sections. In the initial scoping process, it was anticipated that turning movement traffic volumes would be collected and provided by WVDOH. However, due to the large number of intersections requested and delays in the counting process, counts were not available for this study.
- Analyze Current Conditions – Using the available data, current conditions were analyzed for operational and safety deficiencies.
- Prioritize Locations for Further Study – A priority list of study locations was developed based on the results of the current conditions analysis and input from stakeholders.

Stakeholder Involvement

Input was sought from local stakeholders to ensure that the study team was well-informed of current conditions and that there was agreement on which corridors to give priority for additional study. The stakeholders engaged included local and state representatives who could have the greatest influence on completing or accelerating a project and local officials who represent the citizens directly affected by these corridors. Members of the stakeholder group included representatives from: FRM, Beckley Mayor, Beckley City Council, City of Beckley Public Works, WVDOH Traffic Engineering, WVDOH District 10, WVDOH Planning, WVDOH Programming, Raleigh County, and Raleigh County 911. A stakeholder meeting was held on August 16, 2016 to discuss the current conditions analysis and Burgess & Niple's recommendations for corridor priorities. Adjustments were made to the final recommendations described herein based on feedback received. A summary of this meeting is provided in **Appendix A**.

Data Collection

A field review was conducted to determine the existing conditions of each corridor. This section details the data collection process. Pictures from the field review are included in the digital **Appendix B**.

Signal Timings and Signal Equipment Inventory

Existing signal timings were provided by WVDOH for signalized intersections that are part of a signal system. A signal system is defined as a group of traffic signals that are connected by communications hardware and software. **Figure 6**

through **Figure 8** illustrate the study intersections that are part of a signal system in Corridors 1 through 3. The intersections included in Corridor 4 are not part of any signal system. Signal timings are provided in **Appendix C**. It should be noted that even though signals are part of a system, the signal timings may not be coordinated/synchronized.

Working with WVDOH Traffic Engineering Division, an inventory of the existing traffic equipment was performed. Photos were collected using a GPS-based camera to show the inside and outside of the signal controller cabinet as well as the type of controller and operational condition of the equipment. These photos and details for each intersection are provided in **Appendix D**. While some equipment was newer than others and some cabinets had been struck by vehicles and were awaiting repair, no intersection was deemed as being deficient because of its traffic equipment.

Table 1 summarizes the signal system inventory by intersection. Information in this table was obtained from field reviews and from signal design plan sheets provided by WVDOH (see **Appendix E**).

There are four different types of controllers within the study area:

- Eagle EPAC 300: The most common controller within the study area is the Eagle EPAC 300. This is a 16-phase NEMA (National Electrical Manufacturers Association) standard controller. According to the Federal Highway Administration's (FHWA) *Traffic Control Systems Handbook,* the NEMA standards define functionality, interfaces, environmental endurance, electrical specifications, and some physical specifications for the components of a traffic signal including the controllers, cabinets, and vehicle detectors. These controllers can operate on their own or through a master controller that coordinates multiple signals. Since Siemens acquired Eagle, Eagle controllers can operate with master controllers manufactured by Siemens or Eagle. This controller is no longer being manufactured.
- Eagle ATC: Only one Eagle ATC controller is installed within the study area. This controller is an Advanced Transportation Controller (ATC) with a combination of standards from NEMA, the Institute of Transportation Engineers (ITE), and the American Association of State Highway Transportation Officials (AASHTO). However, this controller operates similarly to standard NEMA controllers. Based on the *Traffic Control Systems Handbook*, various softwares can be developed for an ATC controller allowing more versatility to communicate with controllers from other manufacturers.
- Econolite ASC/3-2100: This controller operates with NEMA standards. Similar to the EPAC 300, the controller can operate independently or through a master controller. This type of controller does not have the ability to communicate with Eagle or Siemens controllers.
- Siemens m50: These NEMA controllers have been installed at the intersections that have been constructed most recently. Because Siemens acquired Eagle, this controller is compatible with Eagle or Siemens master controllers.

There are several signal systems within this study area. Intersections that are part a signal system are connected so that their individual controllers communicate with a single master controller. The master controller sets the global time for the signal system and communicates to the individual controllers when to change timing plans based on the time of day. Typically, controllers must be manufactured by the same company to be able to communicate with each other and the master controller. Exceptions are detailed above when the controller complies with various standards that make the communications possible.

Based on the field review and signal plans, it appears that all signal systems in this area are closed loop. This means that these intersections do not communicate to one central location, such as a Traffic Operations Center, and timings can only be modified by changing settings on the individual controller or the master controller in the field.

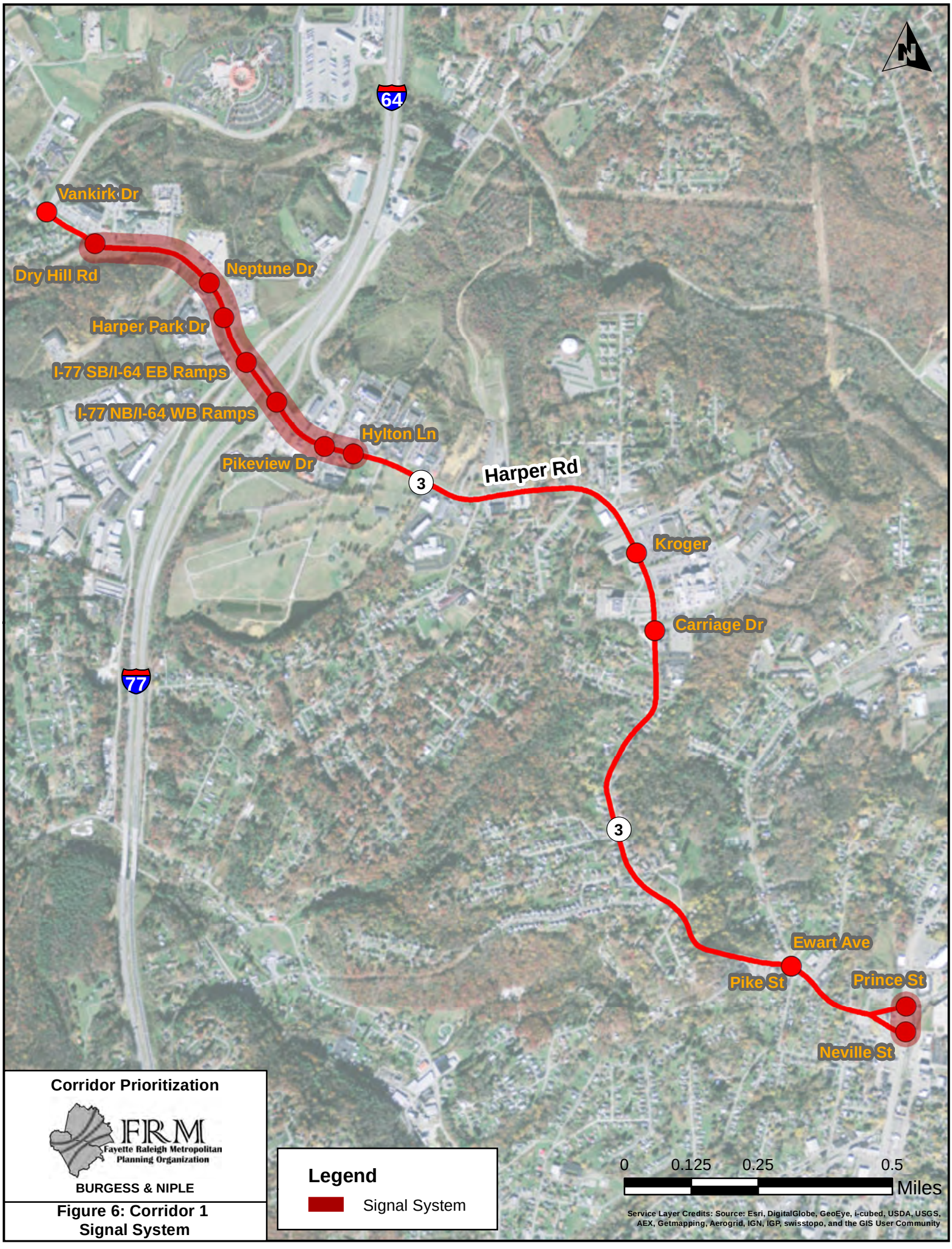

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Figure 6: Corridor 1 Signal System

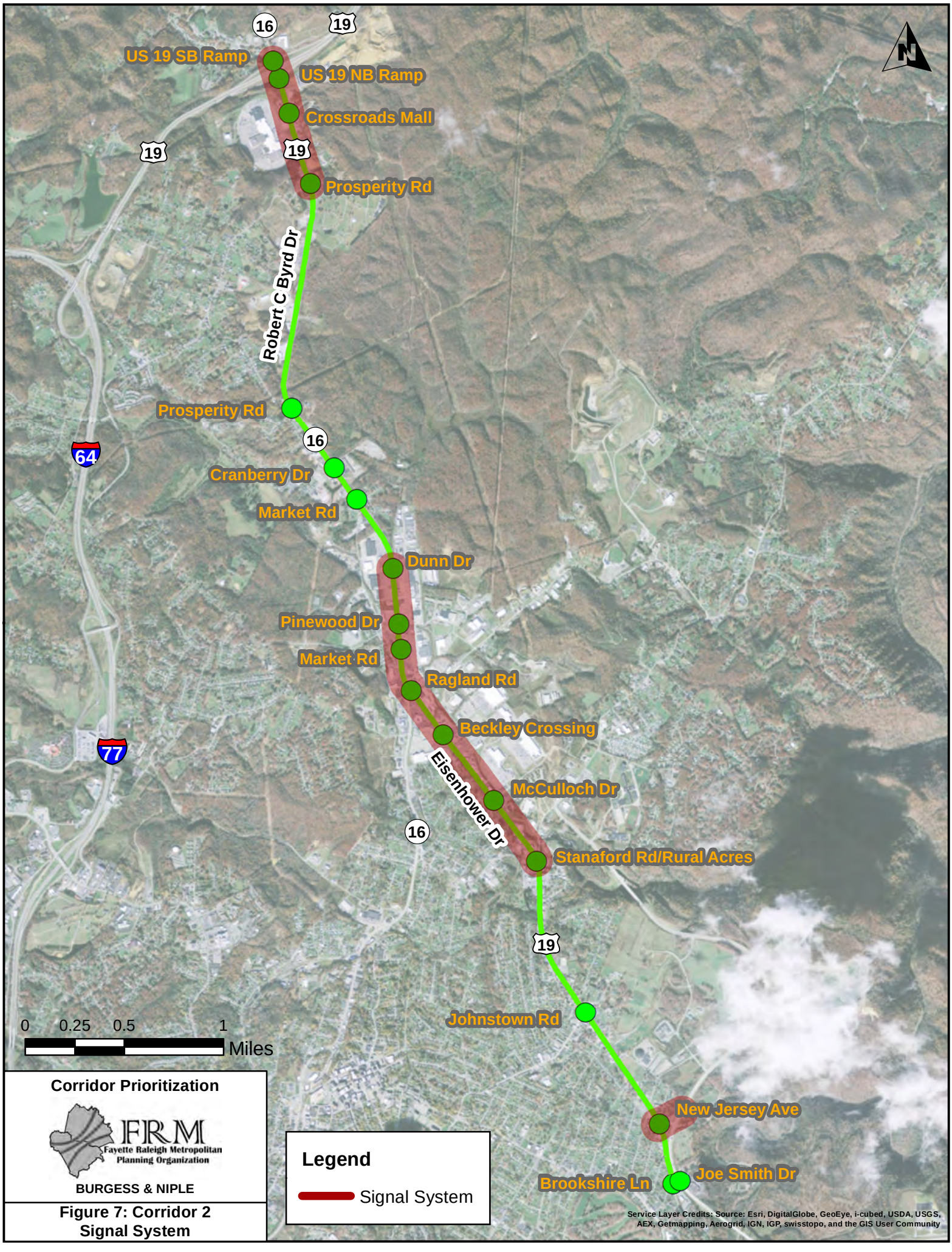

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Figure 7: Corridor 2 Signal System

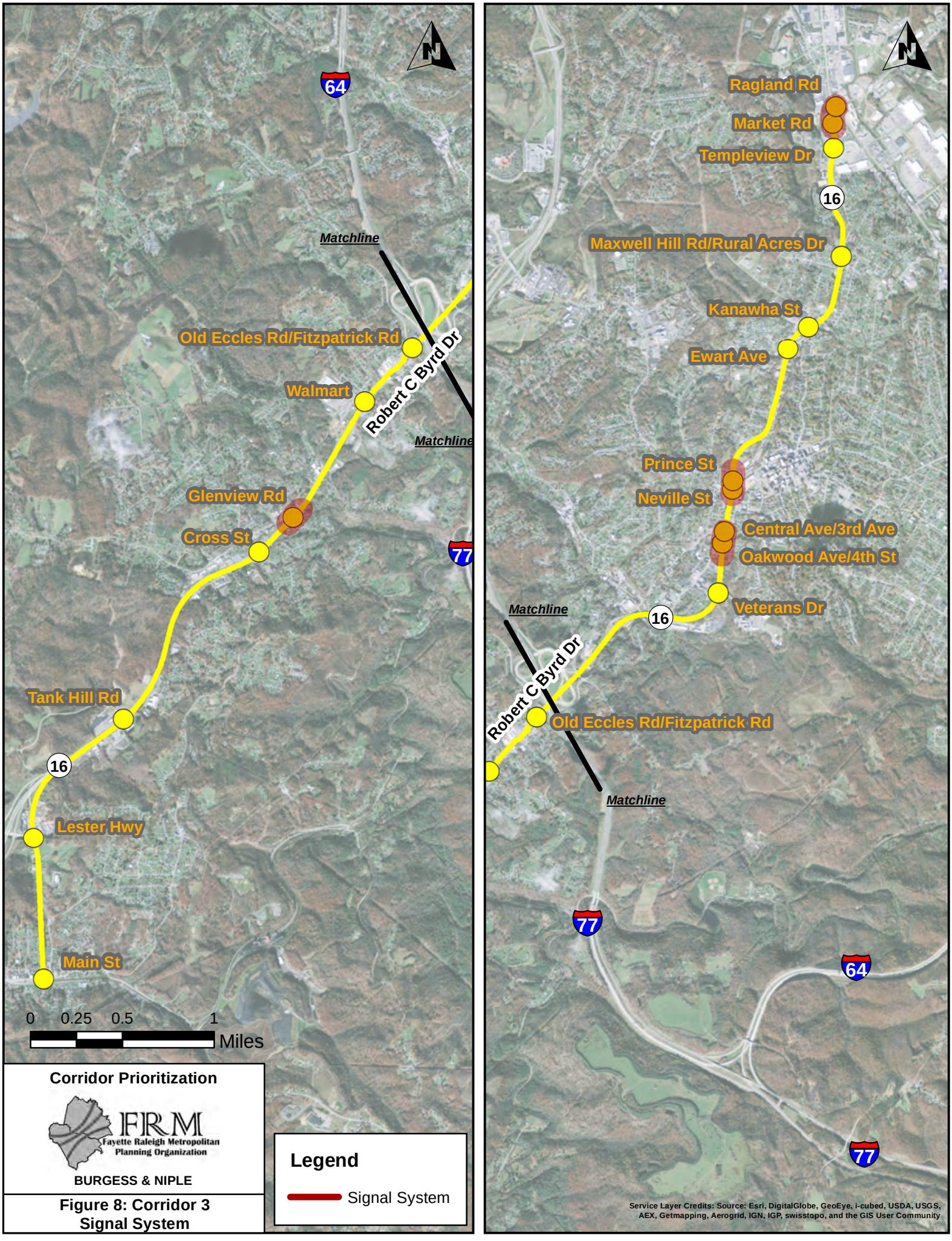

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Figure 8: Corridor 3 Signal System

Legend

Signal System

Table 1: Signal System Inventory Summary

Corridor	Intersection	Installation Date	Controller Type	Detection Type	On-Street Master	Interconnect Type	Signal Type	Pedestrian Signals	Left-Turn Phasing	Number of Signal Heads	Backplates	Notes
1	WV 3 and Dry Hill Rd.	June 2002	Eagle EPAC 300	Loop	WV 3 and I-77 NB/I-64 WB Ramps	Twisted Pair	Span Wire	--	--	9	--	--
	WV 3 and Neptune Dr.	May 1994	Eagle EPAC 300	Loop		Twisted Pair	Mast Arm	--	--	9	On WV 3 Signal Heads	Faded backplates
	WV 3 and Harper Park Dr.	Nov. 1996	Eagle EPAC 300	Loop		Twisted Pair	Span Wire	--	Protected/Permitted – NB WV 3	8	On WV 3 Signal Heads	--
	WV 3 and I-77 SB/I-64 EB Ramps	Nov. 1996	Eagle EPAC 300	Loop		Twisted Pair	Span Wire	--	Protected/Permitted – NB WV 3	8	On WV 3 Signal Heads	Faded backplates
	WV 3 and I-77 NB/I-64 WB Ramps	Nov. 1996	Eagle EPAC 300	Loop		Twisted Pair	Span Wire	--	Protected/Permitted – SB WV 3	7	On WV 3 Signal Heads	--
	WV 3 and Pikeview Dr.	Nov. 1996	Eagle EPAC 300	Loop		Twisted Pair	Span Wire	--	Protected/Permitted – EB WV 3	9	On WV 3 Signal Heads	Faded and worn backplates
	WV 3 and Hylton Lane	Jan. 1997	Eagle EPAC 300	Loop		Twisted Pair	Span Wire	Buttons to Cross WV 3 on West Leg	Protected/Permitted – EB WV 3	8	On WV 3 Signal Heads	--
	WV 3 and Kroger	July 1991*	Eagle EPAC 300	Loop	--	--	Span Wire	--	Protected/Permitted – NB & SB WV 3	9	--	Faulty detection for left-turn into Rite Aid
	WV 3 and Carriage Dr.	June 2002*	Econolite ASC/2S-2100	Loop	--	--	Span Wire	Buttons to Cross WV 3 on South Leg	Protected/Permitted – SB WV 3	7	--	Faulty detection on Carriage Dr.
	WV 16 and Neville St.	Oct. 1994	Eagle EPAC 300	Loop	Beckley Police Station	Twisted Pair	Span Wire	Vehicular Signal Heads	Protected/Permitted – SB WV 16	8	--	--
	WV 16 and Prince St.	Oct. 1994	Eagle EPAC 300	Loop		Twisted Pair	Span Wire	Vehicular Signal Heads	Protected/Permitted – NB WV 16	9	--	--
2	US 19 and Joe Smith Dr.	Unknown	Eagle EPAC 300	Loop	--	--	Span Wire	--	Protected/Permitted – NB US 19 Bypass	9	--	--
	US 19 and Jersey Ave.	Aug. 2003	Eagle EPAC 300	Loop	US 19 and Jersey Ave.	Twisted Pair	Span Wire	Buttons to Cross North and South legs	Protected/Permitted – SB US 19; Overlap - WBRT	9	On US 19 Signal Heads	--
	US 19 and Johnstown Rd.	Oct. 2008	Eagle EPAC 300	Video	--	--	Span Wire	--	Protected/Permitted – NB US 19, EB & WB Johnstown Rd.; Overlap - EBRT	8	On US 19 Signal Heads	Faulty detection on WB Johnstown Rd.
	US 19 and Stanaford Rd./Rural Acres Dr.	June 2008	Eagle EPAC 300	Video	US 19 and WV 16 / Ragland Rd.	Radio	Span Wire	--	Protected/Permitted – All	10	On US 19 Signal Heads	--
	US 19 and McCulloch Dr.	June 2008	Eagle EPAC 300	Video		Radio	Span Wire	--	Protected/Permitted – SB US 19; Overlap – WBRT & NBRT	6	On All Signal Heads	--
	US 19 & Beckley Crossing	June 2008	Eagle EPAC 300	Video		Radio	Span Wire	--	Protected/Permitted – All	9	On US 19 Signal Heads	--
	US 19 and WV 16 / Ragland Rd.	June 2009	Eagle EPAC 300	Video		Radio	Span Wire	--	Split Phase – EB WV 16 and WB Ragland Rd.	10	On US 19 Signal Heads	--
	US 19 and Beckley Shopping Plaza	June 2008	Eagle EPAC 300	Video		Radio	Span Wire	--	Protected/Permitted – NB & SB US 19	10	On US 19 Signal Heads	Faulty detection on NBLT (US 19)
	US 19 and Pinewood Dr. / Industrial Dr.	June 2008	Eagle EPAC 300	Video		Radio	Span Wire	--	Protected/Permitted – NB & SB US 19 and WB Industrial Dr.	11	On US 19 Signal Heads	Faulty detection on SBLT (US 19); Broken visor on Pinewood Dr. signal head
	US 19 and Dunn Dr.	June 2008	Eagle EPAC 300	Video		Radio	Span Wire	--	Protected/Permitted – NB & SB US 19	10	On US 19 Signal Heads	Dunn Dr. signal heads are not hanging straight

Table 1: Signal System Inventory Summary (Continued)

Corridor	Intersection	Installation Date	Controller Type	Detection Type	On-Street Master	Interconnect Type	Signal Type	Pedestrian Signals	Left-Turn Phasing	Number of Signal Heads	Backplates	Notes
2	US 19 and Cranberry Dr.	Aug. 1999	Eagle EPAC 300	Loop	--	--	Span Wire	--	Protected/Permitted – NB & SB US 19	10	On US 19 Signal Heads	--
	US 19 and Prosperity Rd.	July 2012	Eagle ATC	Video	WV 16 & US 19 NB Ramps	Radio	Span Wire	--	Protected/Permitted – NB US 19; Split Phase - EB & WB	10	On US 19 Signal Heads	Potential sight distance deficiency for NBLT
	US 19 and Crossroads Mall	July 2012	Siemens m50	Video		Radio	Span Wire	--	Protected/Permitted – NB & SB US 19; Split Phase - EB & WB	9	On US 19 Signal Heads	Faulty detection on WB Bradley School Rd.
	WV 16 & US 19 NB Ramps	July 2012	Siemens m50	Video		Radio	Span Wire	--	Protected/Permitted – SB US 19	6	On US 19 Signal Heads	--
	WV 16 and US 19 SB Ramps	July 2012	Eagle EPAC 300	Video		Radio	Span Wire	--	Protected/Permitted – NB US 19	7	On US 19 Signal Heads	--
3	WV 16 and Main Street	May 2000	Eagle EPAC 300	Loop	--	--	Span Wire	Buttons and Heads to cross all but South leg	Protected/Permitted – EB Main Street	8	--	Flashing Don't Walk symbol does not illuminate; visor missing on SB signal head
	WV 16 and Lester Hwy	June 2002	Eagle EPAC 300	Loop	--	--	Span Wire	--	Protected/Permitted – NB WV 16	6	On WV 16 Signal Heads	Sign clutter obscures visibility of signal heads on EB approach
	WV 16 and Tank Hill Rd.	June 2010*	Econolite ASC/3-2100	Video	--	--	Span Wire	--	Protected/Permitted – NB WV 16; Overlap - EBRT	9	On WV 16 Signal Heads	Visor missing on WB signal head
	WV 16 and Cross St.	May 2000	Eagle EPAC 300	Loop	--	--	Span Wire	--	Protected/Permitted – NB & SB WV 16	8	On WV 16 Signal Heads	Damaged visors and backplates on WV 16 signal heads
	WV 16 and Glen View Rd.	2015*	Siemens m50	Radar	WV 16 and Glen View Rd. (to be coordinated in the future with Cross St.)	Radio	Span Wire	--	--	8	On WV 16 Signal Heads	--
	WV 16 and Walmart	Nov. 2004*	Eagle EPAC 300	Video & Loop	--	--	Span Wire	--	Protected/Permitted – NB WV 16; Split Phase - EB & WB	12	On WV 16 Signal Heads	SB signal heads are damaged and are varying sizes
	WV 16 and Old Eccles Rd./Fitzpatrick Rd.	April 2012	Siemens m50	Video	--	--	Span Wire	--	Protected/Permitted – NB & SB WV 16	9	On WV 16 Signal Heads	--
	WV 16 and Veterans Dr.	June 2007	Eagle EPAC 300	Video & Loop	--	--	Span Wire	--	Protected/Permitted – SB WV 16; Overlap - NBRT & WBRT	10	On WV 16 Signal Heads	--
	WV 16 and Oakwood Ave./4th St.	Aug. 2010*	Econolite ASC/3-2100	Video	WV 16 and Oakwood Ave./4th St.	Radio	Span Wire	Buttons and Heads to cross North and East legs	--	8	On Oakwood Ave. and 4th St. Signal Heads	--
	WV 16 and Central Ave./3rd St.	Aug. 2010*	Econolite ASC/3-2100	Video		Radio	Span Wire	Buttons and Heads to cross North and South legs	Protected/Permitted – WB 3rd Ave.; Overlap - NBRT	9	On Central Ave. and 3rd St. Signal Heads	--

Table 1: Signal System Inventory Summary (Continued)

Corridor	Intersection	Installation Date	Controller Type	Detection Type	On-Street Master	Interconnect Type	Signal Type	Pedestrian Signals	Left-Turn Phasing	Number of Signal Heads	Backplates	Notes
3	WV 16 and Neville St.	Oct. 1994	Eagle EPAC 300	Loop	Beckley Police Station	Twisted Pair	Span Wire	Vehicular Signal Heads	Protected/Permitted – SB WV 16	8	--	--
	WV 16 and Prince St.	Oct. 1994	Eagle EPAC 300	Loop		Twisted Pair	Span Wire	Vehicular Signal Heads	Protected/Permitted – NB WV 16	9	--	--
	WV 16 and Kanawha St.	Oct. 2008	Eagle EPAC 300	Video	--	--	Span Wire	--	Protected/Permitted – NB & SB WV 16	13	On WV 16 Signal Heads	--
	WV 16 and Maxwell Hill Rd./Rural Acres Dr.	Oct. 2008	Eagle EPAC 300	Video	--	--	Span Wire	--	Protected/Permitted – NB & SB WV 16	11	On WV 16 Signal Heads	--
	WV 16 and Templeview Dr./Beckley Crossing	July 2008	Eagle EPAC 300	Video	US 19 and WV 16 / Ragland Rd.	Radio	Span Wire	--	Protected/Permitted – NB & SB WV 16	10	On WV 16 Signal Heads	--
	WV 16 and Market Rd.	July 2008	Eagle EPAC 300	Video		Radio	Span Wire	--	Protected/Permitted – NB WV 16	10	On All Signal Heads	--
	US 19 and WV 16 / Ragland Rd.	June 2009	Eagle EPAC 300	Video		Radio	Span Wire	--	Split Phase – EB WV 16 and WB Ragland Rd.	10	On US 19 Signal Heads	--
4	WV 3 (Hinton Dr.) and US 19	2011*	Econolite ASC/3-2100	Video	--	--	Span Wire	--	Protected/Permitted – SB US 19	8	On US 19 Signal Heads	--
	WV 3/US 19 and Airport Rd.	Mar. 1998*	Eagle EPAC 300	Loop	--	--	Span Wire	Button to cross East leg from the south and to cross North leg from the west	Protected/Permitted – EB US 19	9	--	--
	WV 3 / Virginia Ave. and US 19	Aug. 1996	Eagle EPAC 300	Loop	--	--	Span Wire	--	Protected/Permitted – NB US 19	9	--	Damaged visor on EB approach

* - Based on date on signal plans

Travel Times

Travel times were collected and evaluated using a GPS based travel time collection software called *Tru-Traffic*. Each corridor was driven multiple times using the *floating car method* in each direction during the morning and afternoon peak periods of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. The floating car method is conducted by the test driver traveling at the speed of surrounding traffic, attempting to pass the same number of cars that pass the test car to estimate the median speed. From the travel time data, the average travel times (in minutes) and average travel speed for each corridor was determined for the AM and PM peak periods. These metrics were then further analyzed using graphs which are included in **Appendix E**.

One graph shows the average (over the multiple runs) travel time between intersections, in minutes, on the vertical axis and the distance between intersections on the horizontal axis. The red and blue lines represent the average travel times in the morning and afternoon peak periods, respectively. To determine a base condition, the travel time at the posted speed limit was calculated using the measured distance between intersections. This travel time at the posted speed is illustrated with a green line. The graph was then analyzed for segments along the red or blue lines that had a drastically different slope (which represents the average travel speed) than the green line.

The second type of graph shows the average speed (in mph) along the vertical axis and distance between intersections along the horizontal axis. Similar to the travel time graphic, the red and blue lines are the average travel speeds in the AM and PM peak periods, respectively. The green dotted line is the posted speed limit in the corridor.

Average travel time and speed graphs were generated for each of the four corridors and were then analyzed to determine which segments experience the most congestion and delays. Segments that had an average travel speed more than 10 mph slower than the posted speed limit were identified as being congested and are illustrated with a black line in **Figure 9** through **Figure 12**. Travel time summary graphs for all corridors in both travel directions are provided in **Appendix F**.

Crash Analysis

Crash data was provided by WVDOH. Between 2013 and 2015, there were a total of 2,237 recorded crashes in all four corridors. In order to help prioritize the corridors using crash data, the frequency of crashes were compared across all corridors. A map illustrating crash frequencies relative to other locations in the corridor was generated for all four corridors. The colored scale, illustrated in **Figure 13**, indicates that a location with red shading has a higher frequency of crashes than one with blue coloring. This color scaling is based on the crash frequencies in these four corridors alone and does not correlate to state or local crash averages.

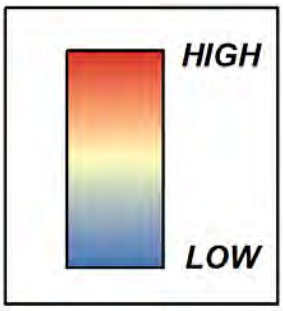

Figure 13: Crash Frequency Scale

The heat maps for the four corridors are illustrated in **Figure 14** through **Figure 17**. In addition to the colored scale, crash details are provided for locations with higher crash frequencies. When a location had a fatal collision, the crash type corresponding to the fatality is highlighted in red.

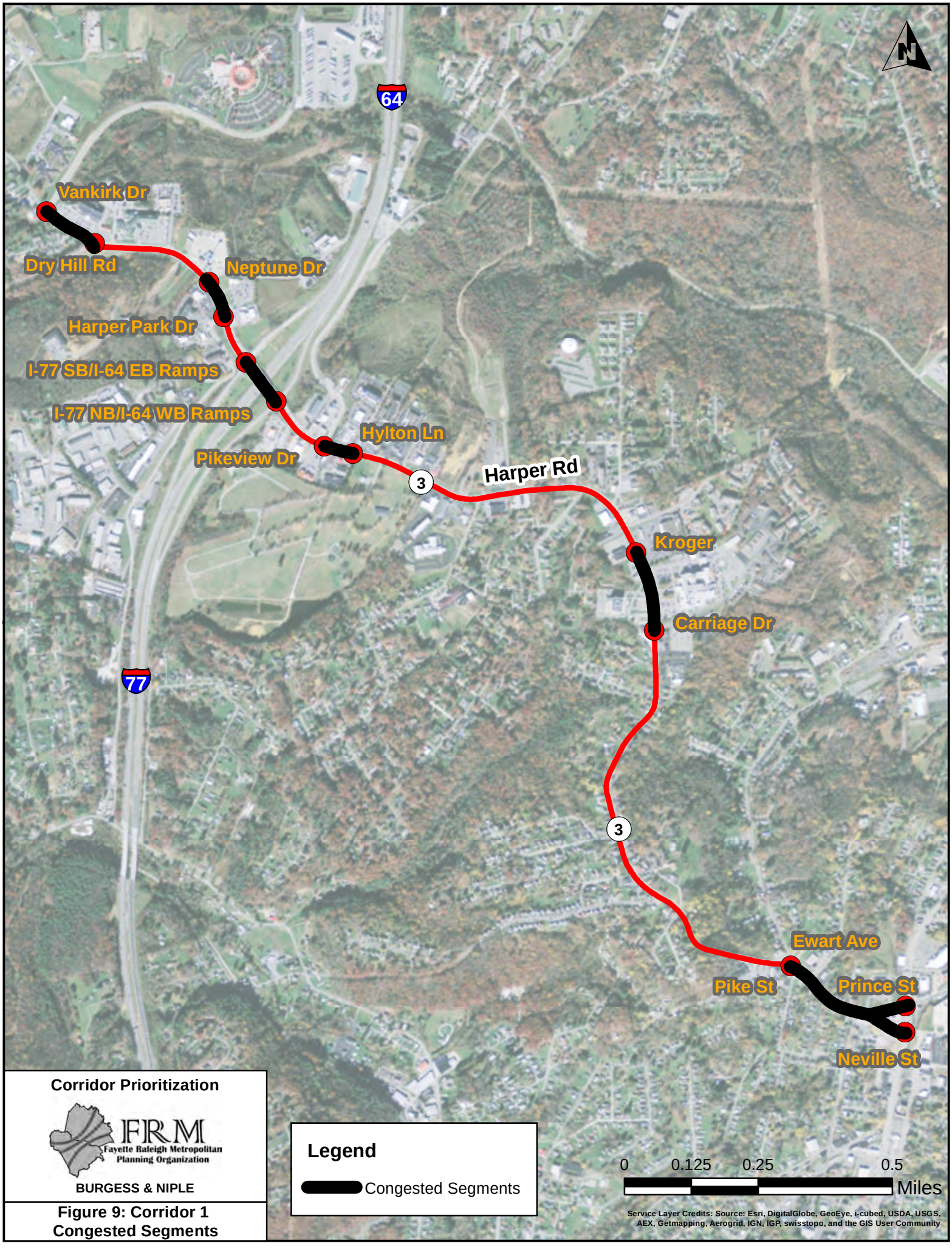

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Figure 9: Corridor 1 Congested Segments

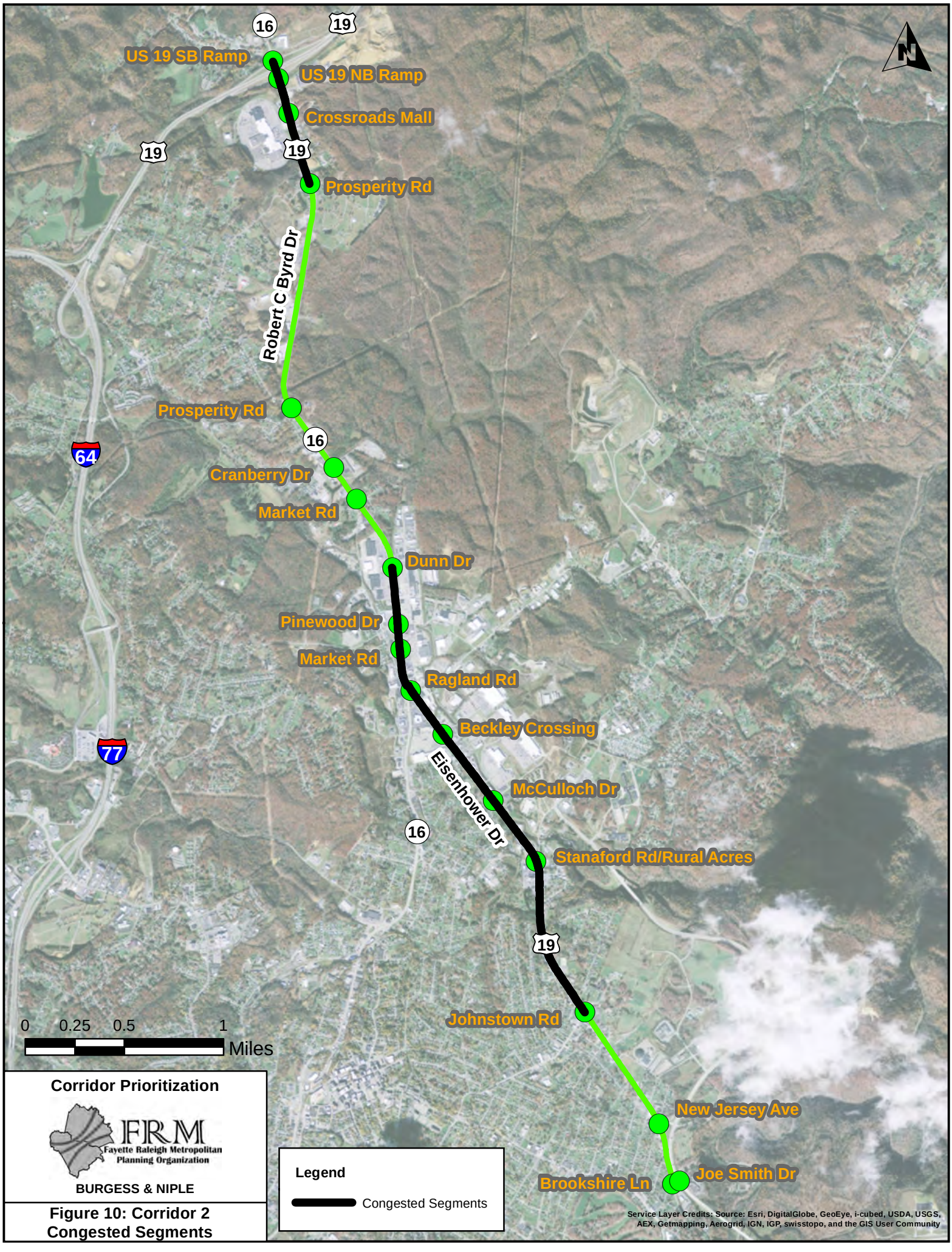

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Figure 10: Corridor 2 Congested Segments

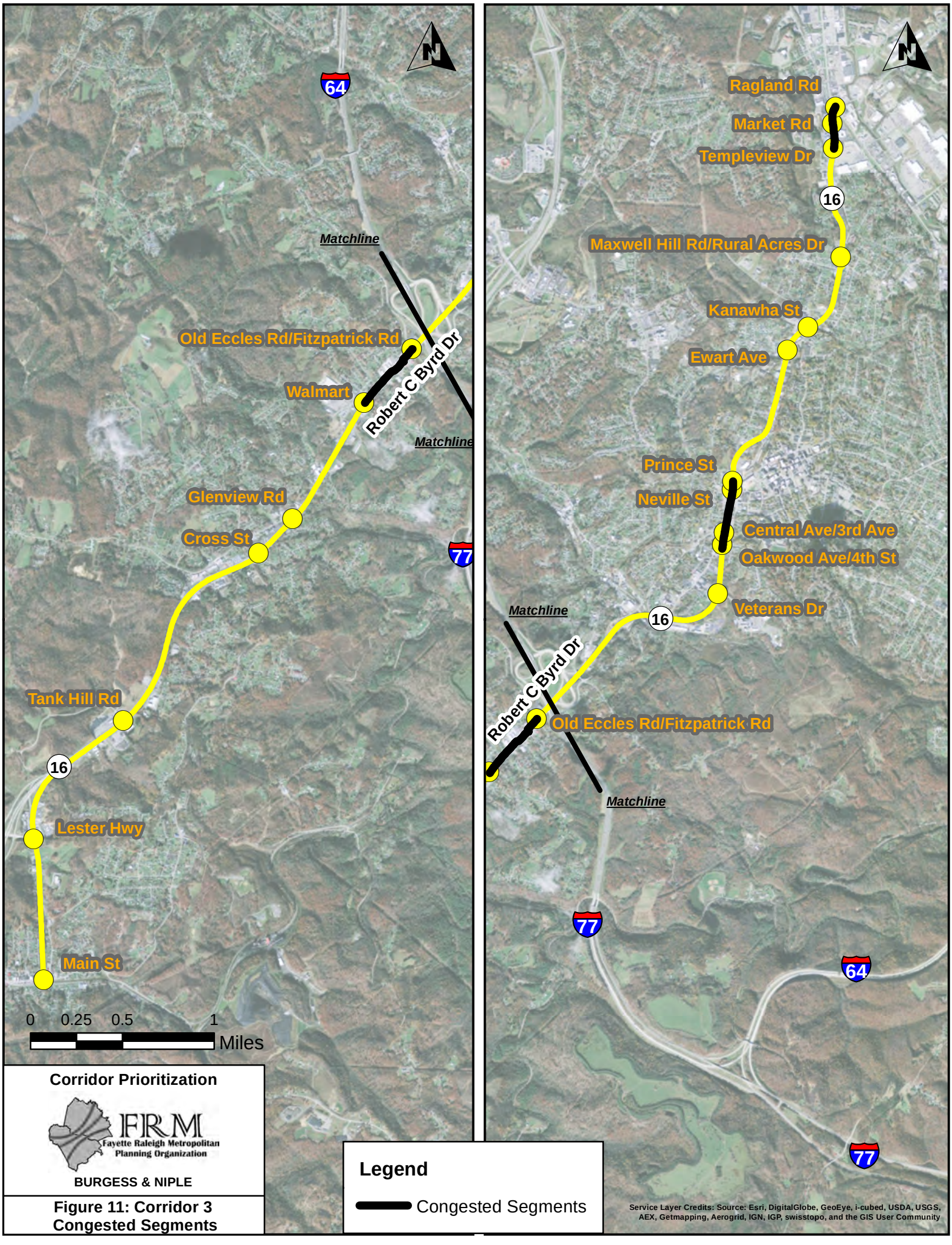

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Figure 11: Corridor 3 Congested Segments

Legend

Congested Segments

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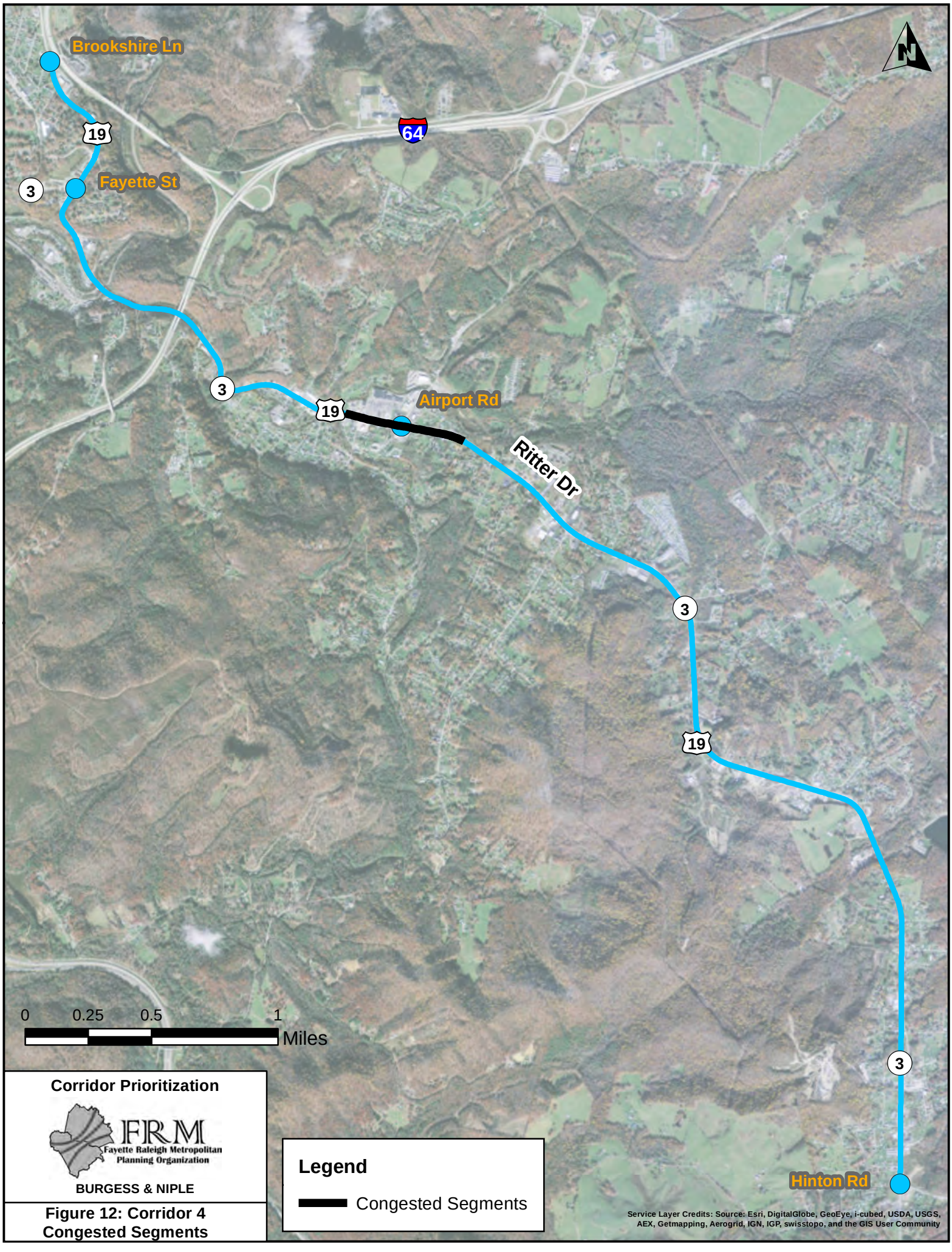
Brookshire Ln
19
64
Fayette St
3
3
19
Airport Rd
Ritter Dr
3
19
3
Hinton Rd
N
0
0.25
0.5
1
Miles
Corridor Prioritization
FRM
Fayette Raleigh Metropolitan Planning Organization
BURGESS & NIPLE
Figure 12: Corridor 4 Congested Segments
Legend
Congested Segments
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

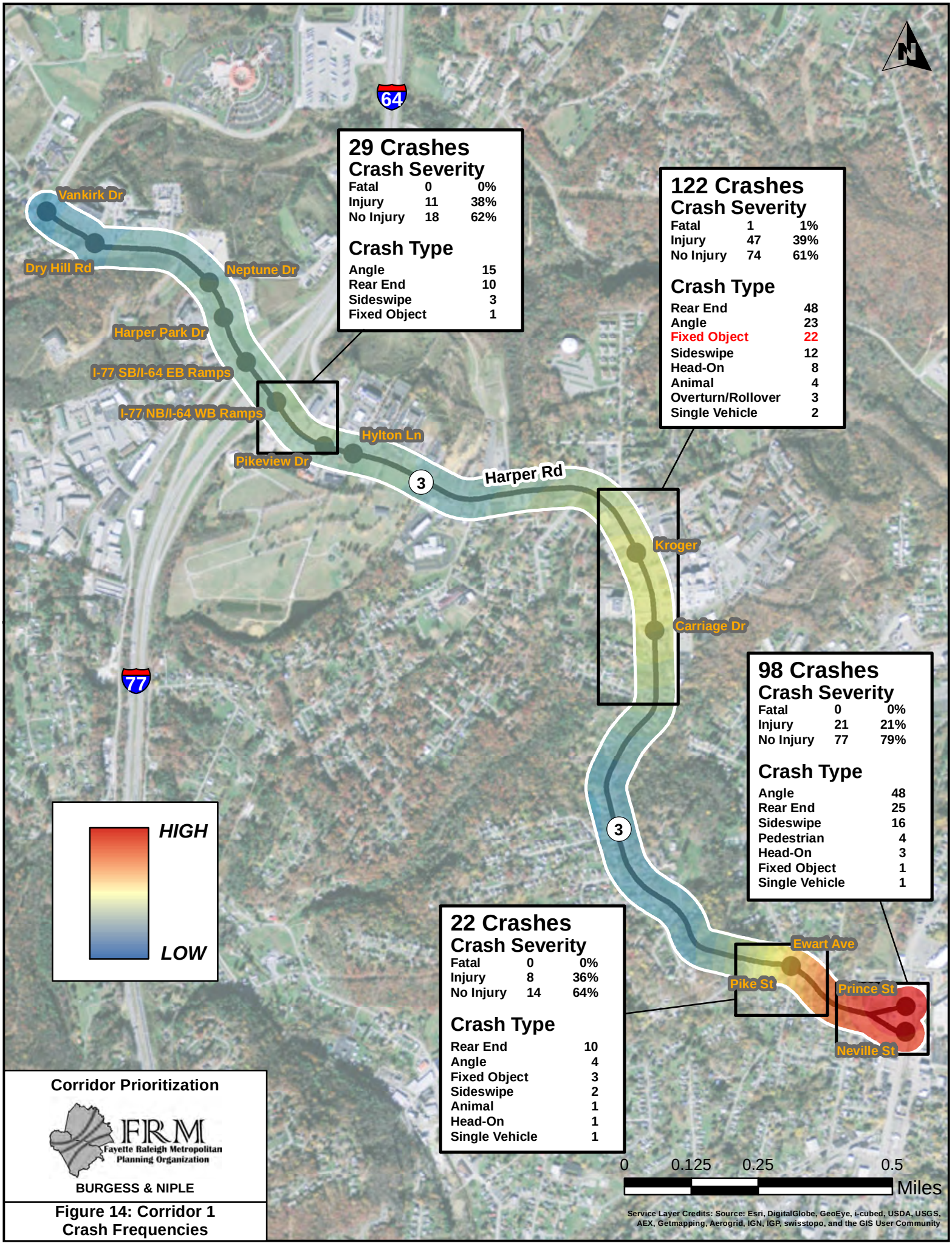

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Figure 14: Corridor 1 Crash Frequencies

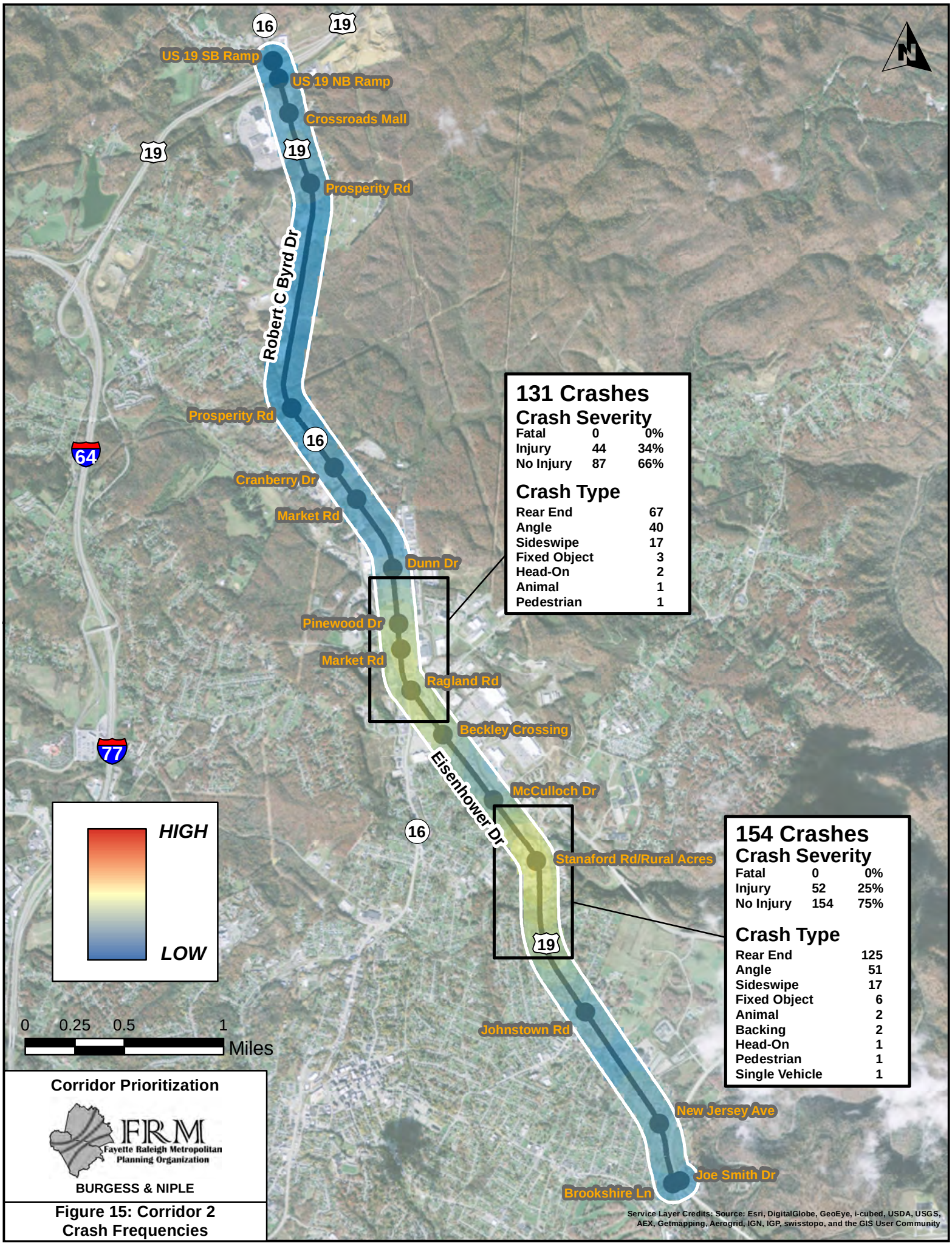
US 19 SB Ramp
US 19 NB Ramp
Crossroads Mall
Prosperity Rd
Robert C Byrd Dr
Prosperity Rd
Cranberry Dr
Market Rd
Dunn Dr
Pinewood Dr
Market Rd
Ragland Rd
Beckley Crossing
Eisenhower Dr
McCulloch Dr
Stanaford Rd/Rural Acres
Johnstown Rd
New Jersey Ave
Joe Smith Dr
Brookshire Ln
16
19
64
77
131 Crashes
Crash Severity
Fatal 0 0%
Injury 44 34%
No Injury 87 66%
Crash Type
Rear End 67
Angle 40
Sideswipe 17
Fixed Object 3
Head-On 2
Animal 1
Pedestrian 1
154 Crashes
Crash Severity
Fatal 0 0%
Injury 52 25%
No Injury 154 75%
Crash Type
Rear End 125
Angle 51
Sideswipe 17
Fixed Object 6
Animal 2
Backing 2
Head-On 1
Pedestrian 1
Single Vehicle 1
HIGH
LOW
0 0.25 0.5 1
Miles
Corridor Prioritization
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Figure 15: Corridor 2 Crash Frequencies
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

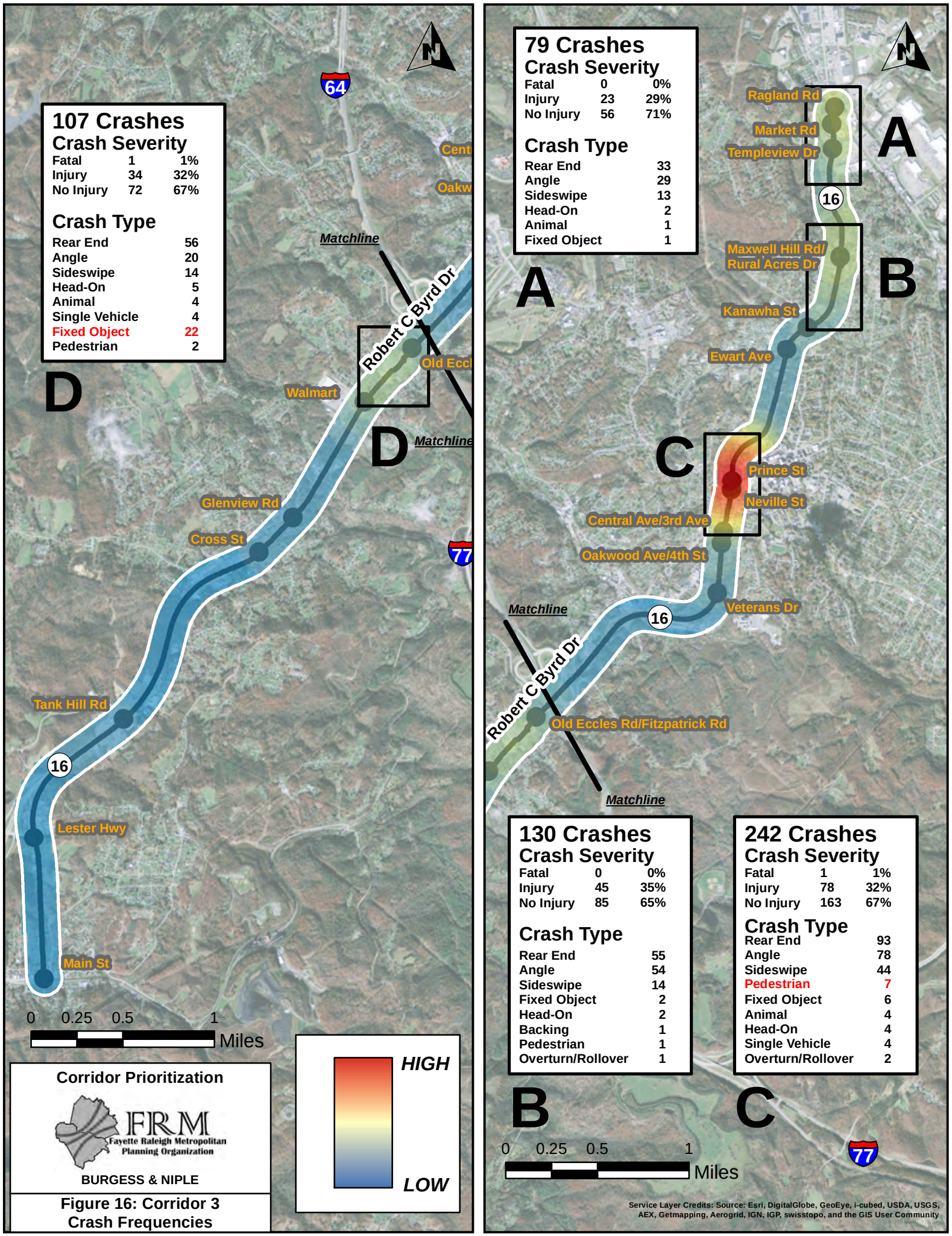

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Figure 16: Corridor 3 Crash Frequencies

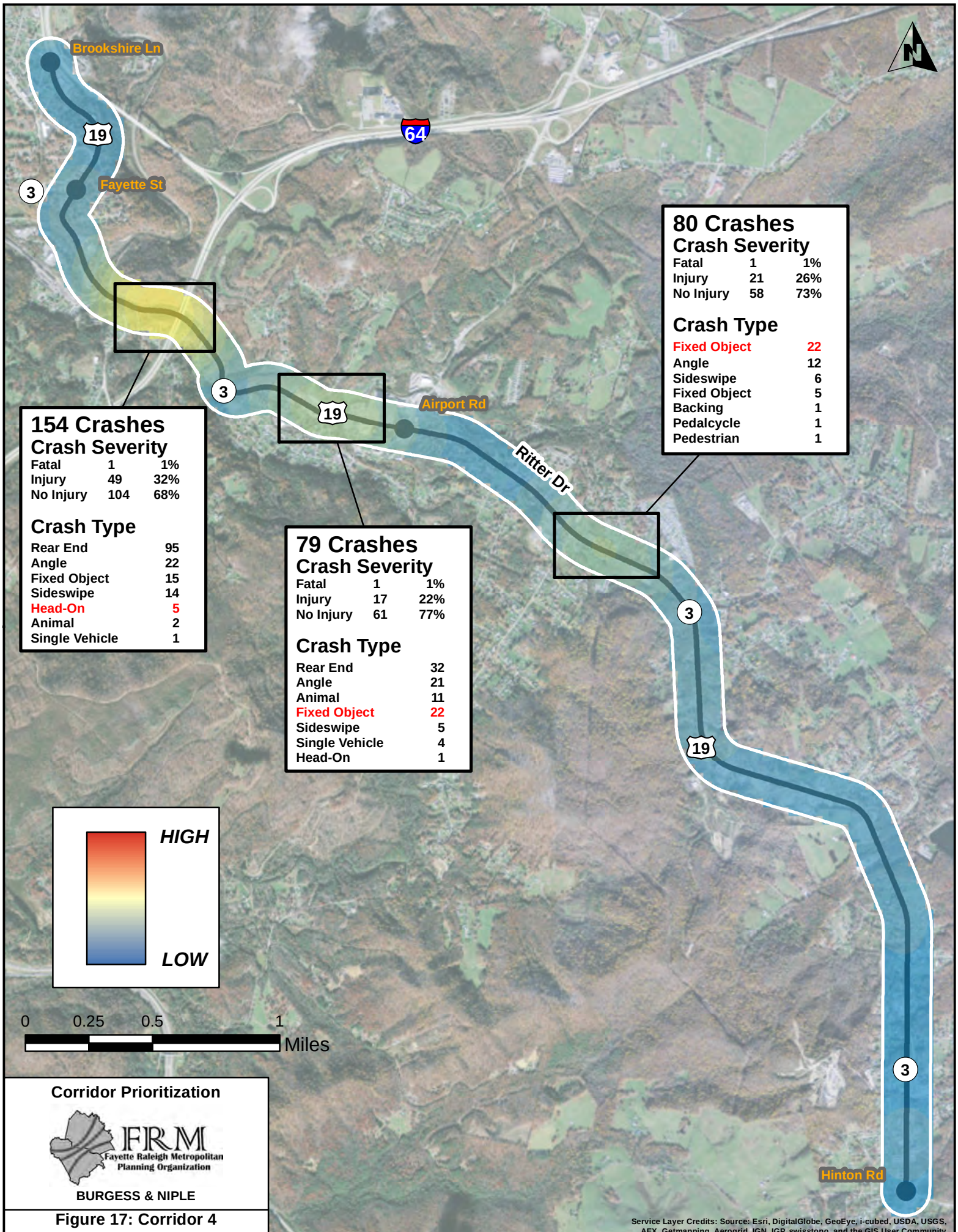
Brookshire Ln
19
64
3
Fayette St
80 Crashes
Crash Severity
Fatal 1 1%
Injury 21 26%
No Injury 58 73%
Crash Type
Fixed Object 22
Angle 12
Sideswipe 6
Fixed Object 5
Backing 1
Pedalcycle 1
Pedestrian 1
154 Crashes
Crash Severity
Fatal 1 1%
Injury 49 32%
No Injury 104 68%
Crash Type
Rear End 95
Angle 22
Fixed Object 15
Sideswipe 14
Head-On 5
Animal 2
Single Vehicle 1
3
19
Airport Rd
Ritter Dr
79 Crashes
Crash Severity
Fatal 1 1%
Injury 17 22%
No Injury 61 77%
Crash Type
Rear End 32
Angle 21
Animal 11
Fixed Object 22
Sideswipe 5
Single Vehicle 4
Head-On 1
3
19
HIGH
LOW
0 0.25 0.5 1
Miles
3
Hinton Rd
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Figure 17: Corridor 4 Crash Frequencies
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Traffic Volumes

Average daily traffic (ADT) volumes were obtained from the online West Virginia Traffic Counts database. While no turning movement counts were collected as part of this corridor prioritization review, the ADT volumes were beneficial in comparing relative traffic volumes between the corridors. **Figure 18** through **Figure 21** summarize the ADT for the four corridors. The highest traffic volumes in each corridor were as follows:

- Corridor 1: Near Hylton Lane – 15,200
- Corridor 2: Near Ragland Road – 25,500
- Corridor 3: Near Glenview Road – 25,500
- Corridor 4: Near Airport Road – 20,100

Current Conditions Analysis

To identify problem locations and to compare the magnitude of current traffic congestion and safety problems in the corridors, the data was overlaid in layers on **Figure 22** through **Figure 25**.

This information was used to prioritize corridors for further study. Locations with higher traffic volumes, higher crash frequencies, and/or a number of congested segments were generally considered to be higher priority than other segments. When determining the geographic limits of corridors recommended for further study, the limits of existing signal systems were considered so that potential signal timing improvements could be made to the entire system providing better coordination and traffic progression.

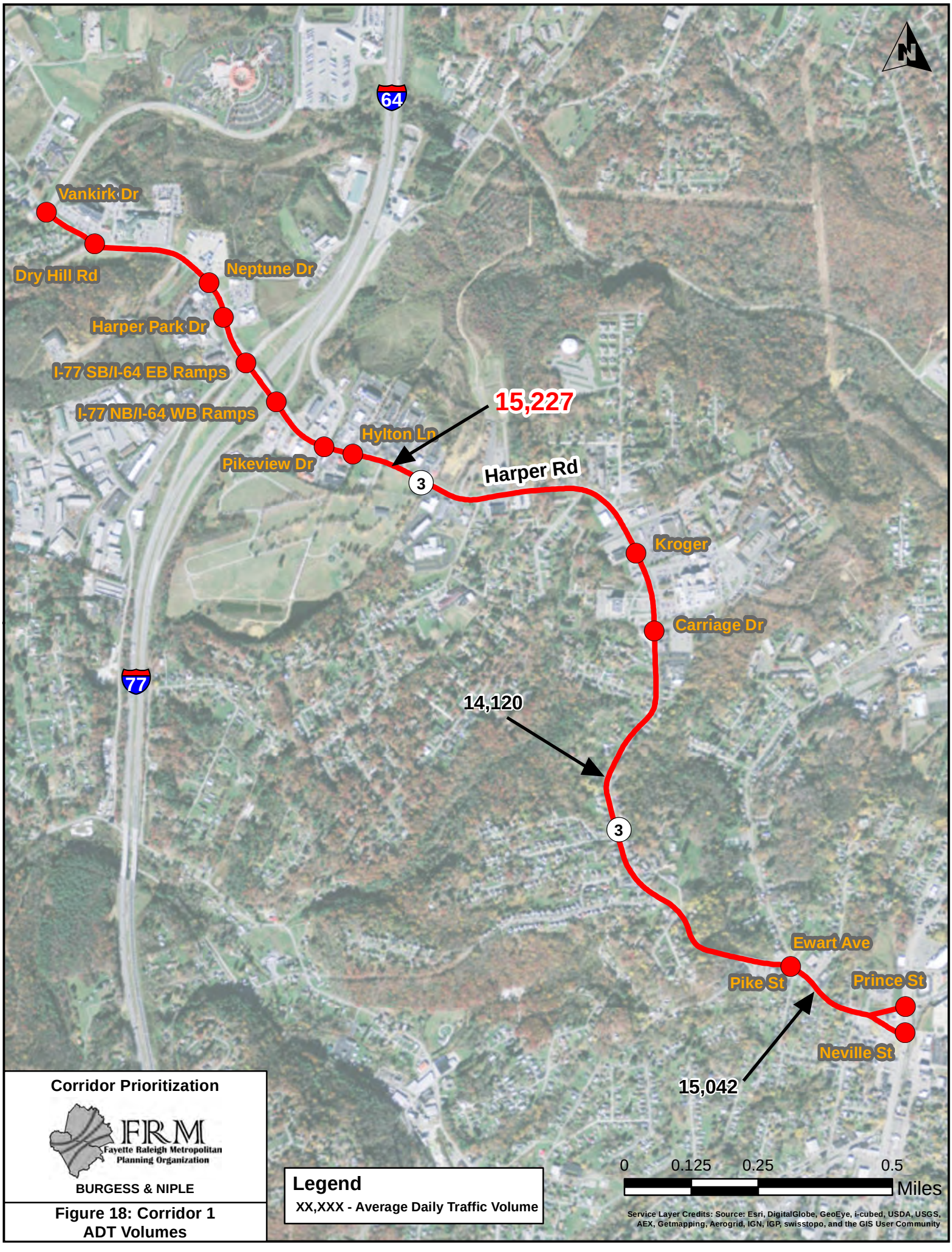

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Figure 18: Corridor 1 ADT Volumes

Legend

XX,XXX - Average Daily Traffic Volume

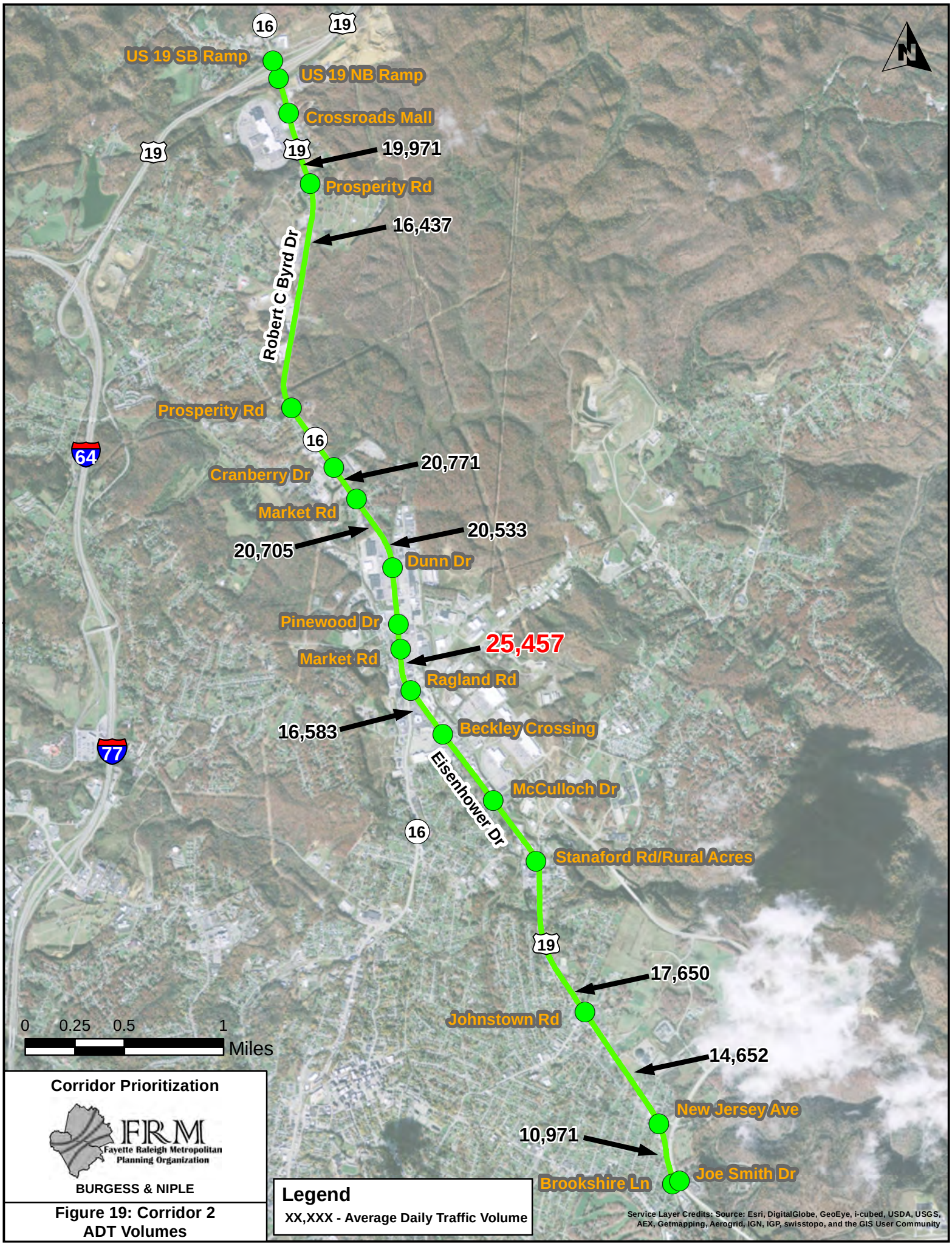
US 19 SB Ramp
US 19 NB Ramp
Crossroads Mall
19,971
Prosperity Rd
16,437
Robert C Byrd Dr
Prosperity Rd
Cranberry Dr
20,771
Market Rd
20,705
20,533
Dunn Dr
Pinewood Dr
Market Rd
25,457
Ragland Rd
16,583
Beckley Crossing
Eisenhower Dr
McCulloch Dr
Stanaford Rd/Rural Acres
17,650
Johnstown Rd
14,652
New Jersey Ave
10,971
Brookshire Ln
Joe Smith Dr
16
19
64
77
0 0.25 0.5 1
Miles
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Figure 19: Corridor 2
ADT Volumes
Legend
XX,XXX - Average Daily Traffic Volume
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

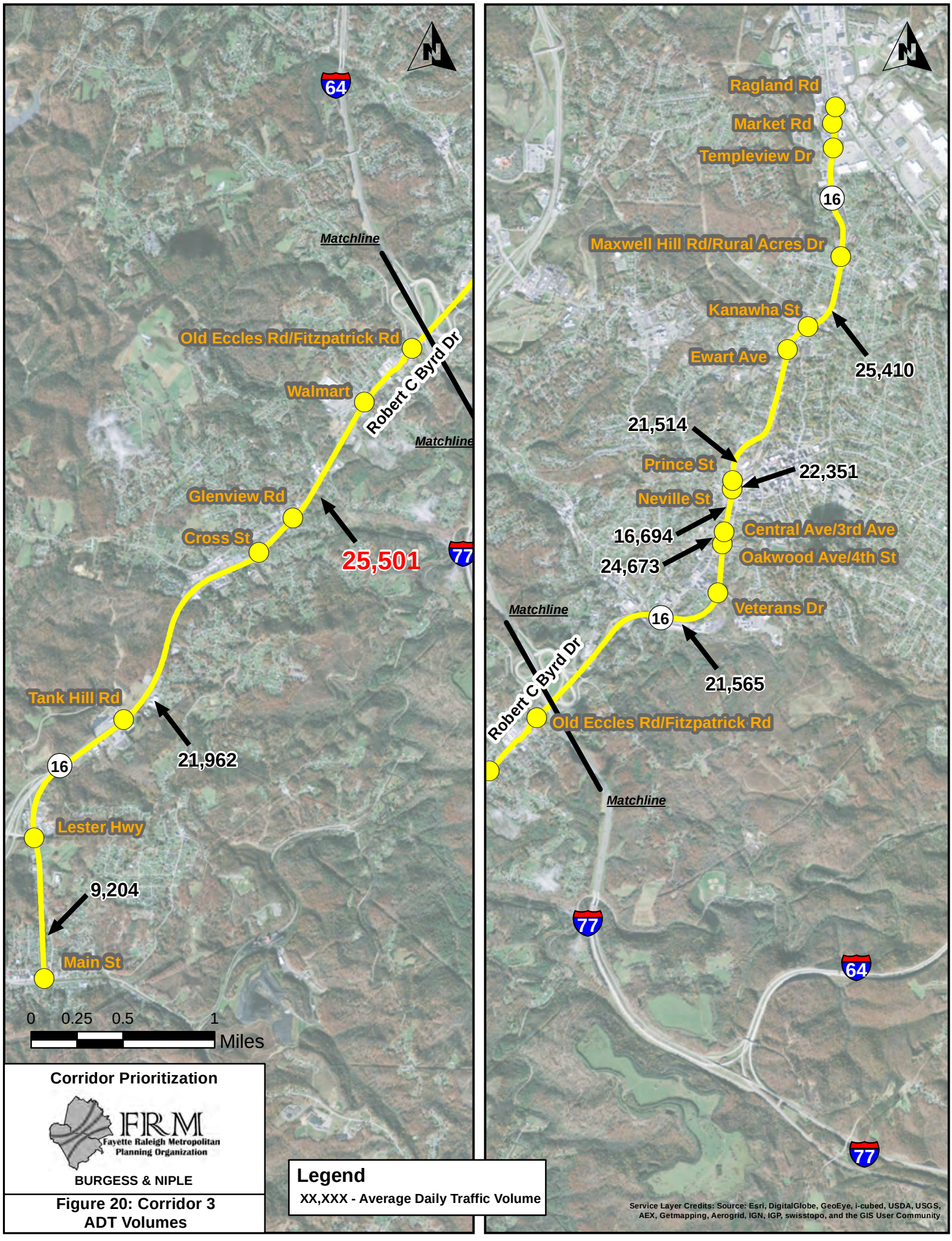

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Figure 20: Corridor 3 ADT Volumes

Legend

XX,XXX - Average Daily Traffic Volume

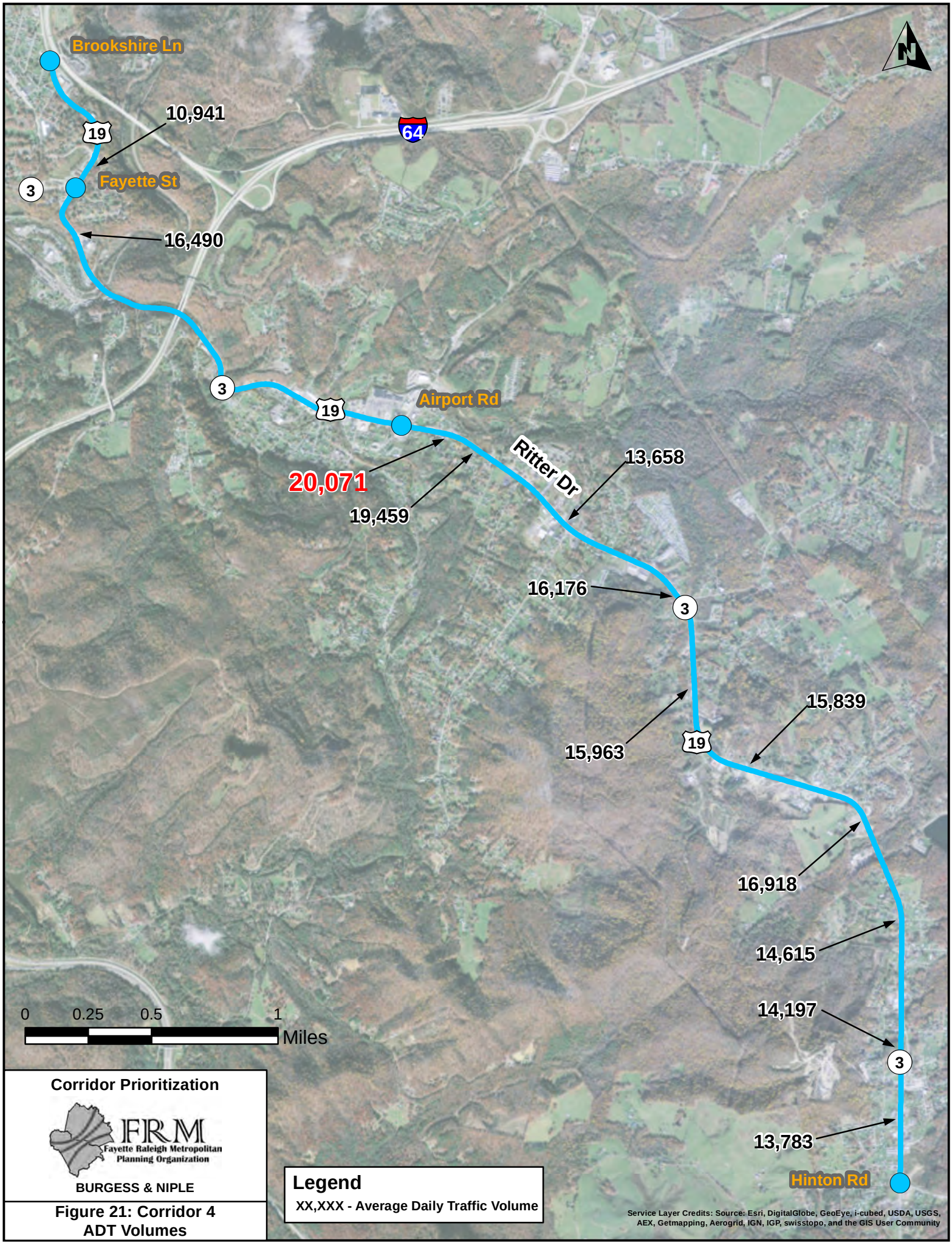
Brookshire Ln
10,941
19
64
3
Fayette St
16,490
3
19
Airport Rd
20,071
19,459
Ritter Dr
13,658
16,176
3
15,963
19
15,839
16,918
14,615
14,197
3
13,783
Hinton Rd
0
0.25
0.5
1
Miles
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Figure 21: Corridor 4
ADT Volumes
Legend
XX,XXX - Average Daily Traffic Volume
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

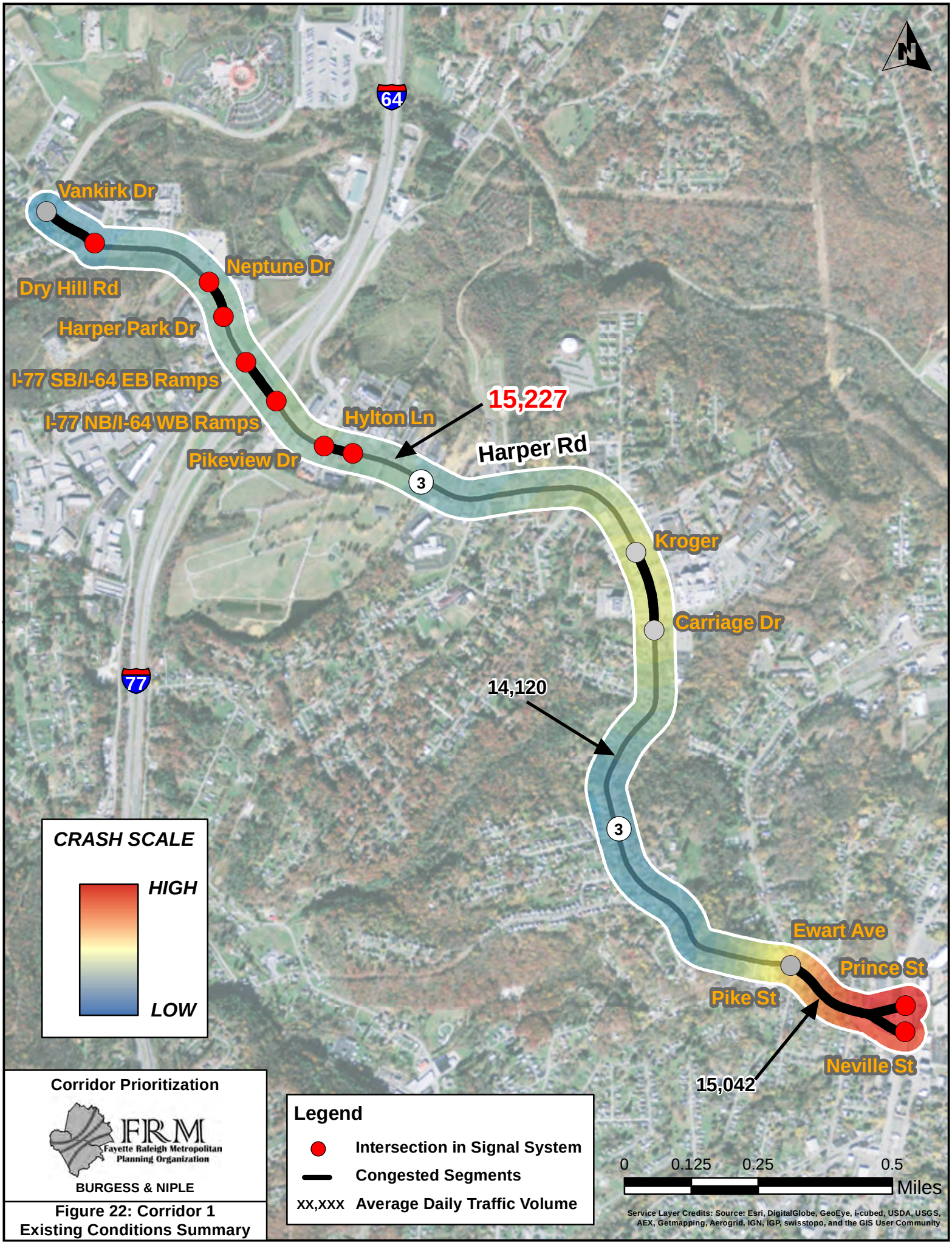

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Figure 22: Corridor 1 Existing Conditions Summary

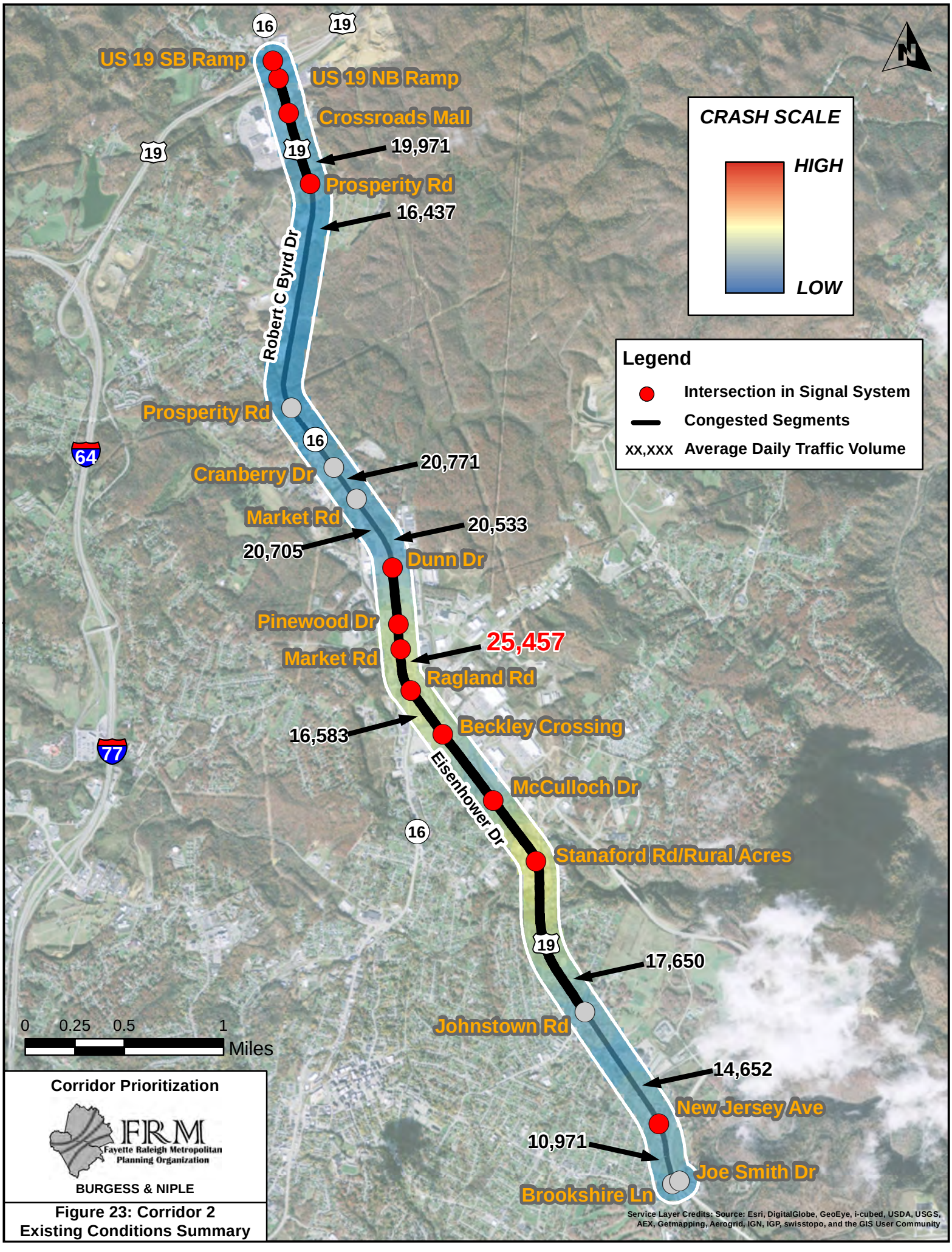
US 19 SB Ramp
US 19 NB Ramp
Crossroads Mall
19,971
Prosperity Rd
16,437
Robert C Byrd Dr
Prosperity Rd
Cranberry Dr
20,771
Market Rd
20,533
20,705
Dunn Dr
Pinewood Dr
25,457
Market Rd
Ragland Rd
16,583
Beckley Crossing
Eisenhower Dr
McCulloch Dr
Stanaford Rd/Rural Acres
17,650
Johnstown Rd
14,652
New Jersey Ave
10,971
Joe Smith Dr
Brookshire Ln
CRASH SCALE
HIGH
LOW
Legend
Intersection in Signal System
Congested Segments
xx,xxx Average Daily Traffic Volume
0 0.25 0.5 1
Miles
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Figure 23: Corridor 2
Existing Conditions Summary
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

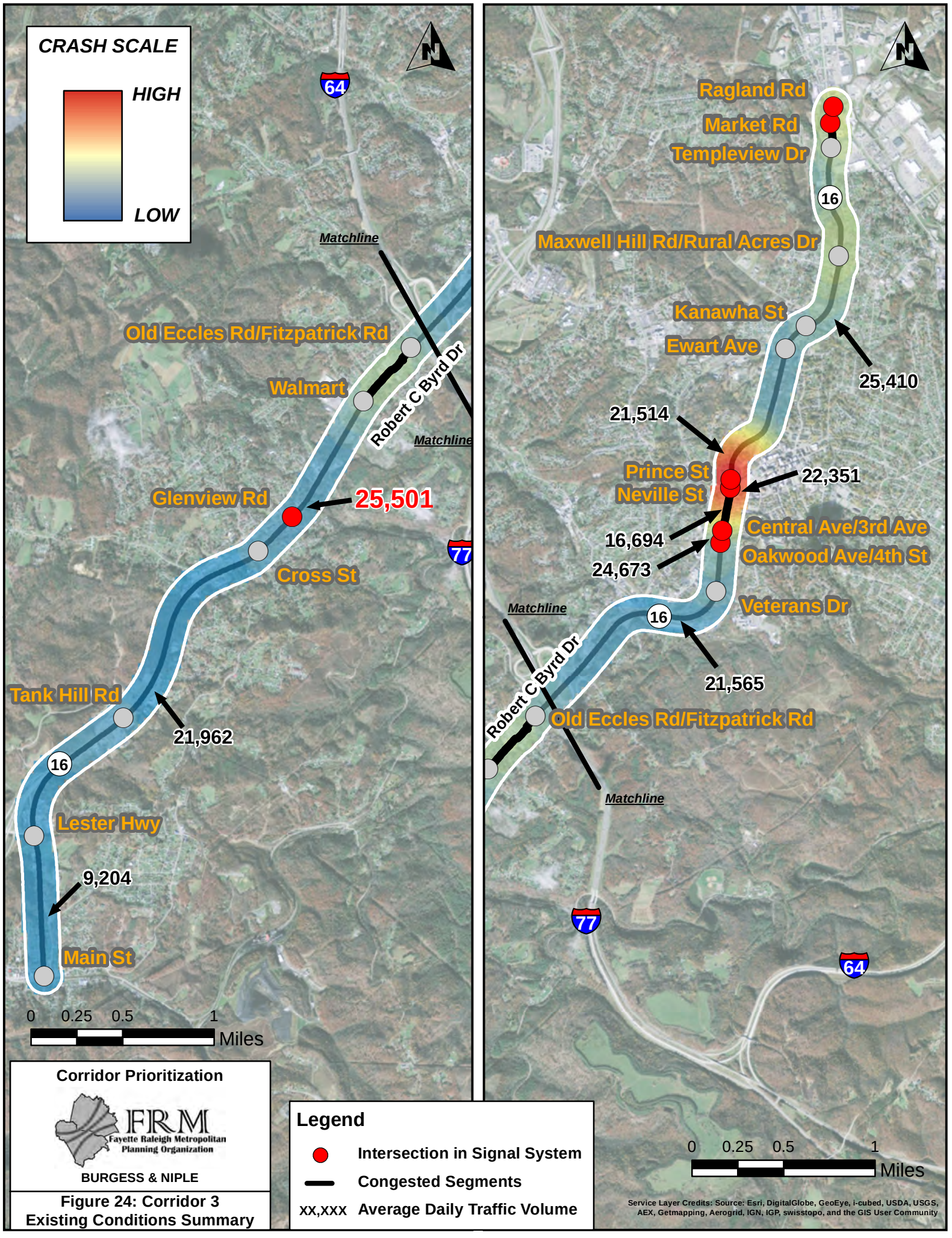
CRASH SCALE
HIGH
LOW
Matchline
Old Eccles Rd/Fitzpatrick Rd
Walmart
Robert C Byrd Dr
Matchline
Glenview Rd
25,501
Cross St
Tank Hill Rd
21,962
16
Lester Hwy
9,204
Main St
64
77
0 0.25 0.5 1
Miles
Ragland Rd
Market Rd
Templeview Dr
16
Maxwell Hill Rd/Rural Acres Dr
Kanawha St
Ewart Ave
25,410
21,514
Prince St
Neville St
22,351
16,694
24,673
Central Ave/3rd Ave
Oakwood Ave/4th St
Veterans Dr
Matchline
16
21,565
Robert C Byrd Dr
Old Eccles Rd/Fitzpatrick Rd
Matchline
77
64
0 0.25 0.5 1
Miles
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
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Figure 24: Corridor 3
Existing Conditions Summary
Legend
Intersection in Signal System
Congested Segments
xx,xxx Average Daily Traffic Volume

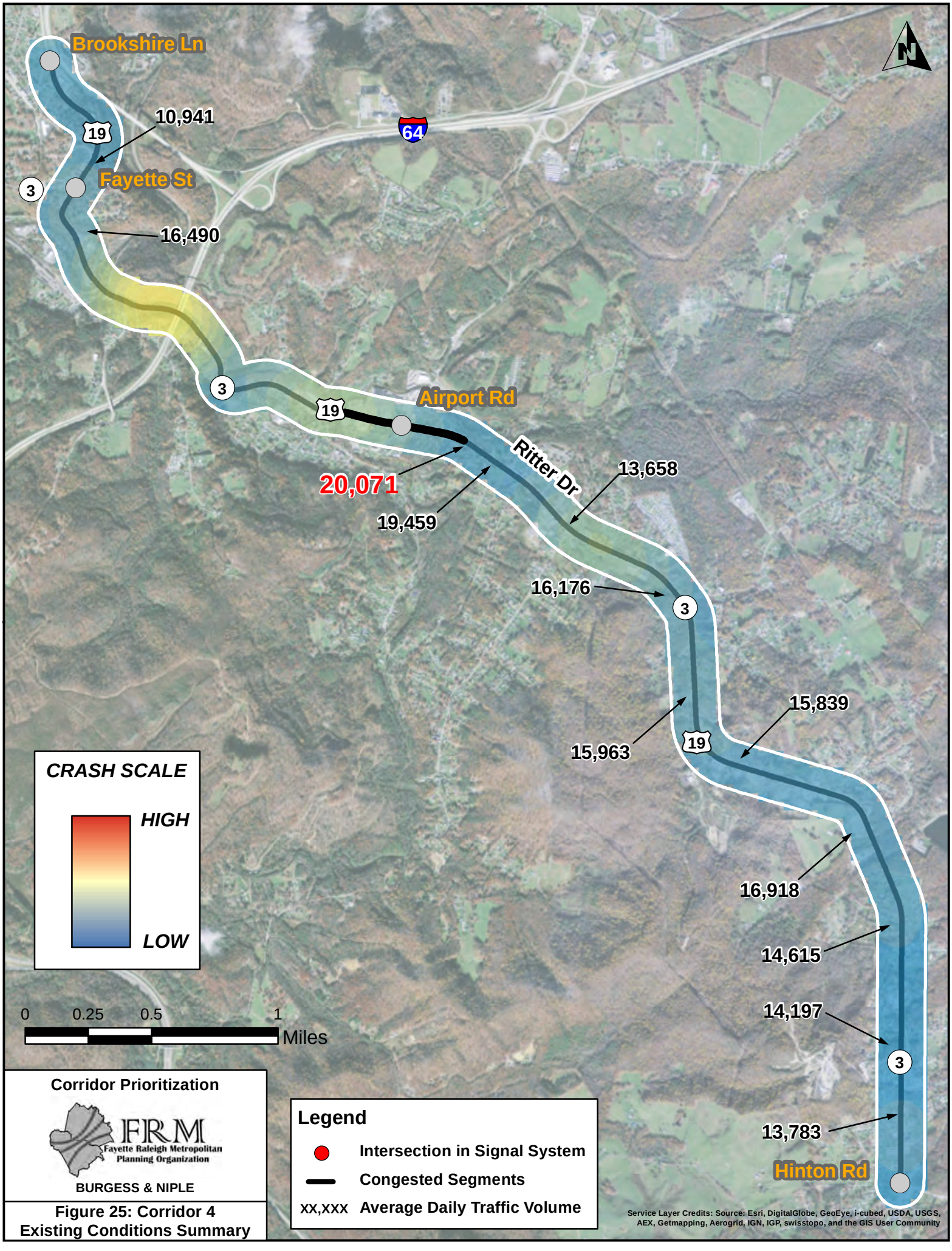

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Figure 25: Corridor 4 Existing Conditions Summary

Corridor Priorities

The existing conditions summaries and input from stakeholders were used to prioritize the corridors as illustrated in **Figure 26** through **Figure 29** and summarized below:

- Priority #1 – US 19 from Dunn Drive to Johnstown Road and WV 16 from US 19 to Templeview Drive/Beckley Crossing
    - Given the high traffic volumes and significant congestion in this area, these segments were considered the highest priority for study.
    - The segments along WV 16 (in Corridor 3) were added because of proximity and the connected signal system.
    - When studying, consideration should be given to the new Z-Way that is being constructed as a parallel route to US 19.
- Priority #2 – WV 16 from Maxwell Hill Road/Rural Acres Drive to Veterans Drive and WV 3 from Pike Street/Ewart Street to WV 16
    - More crashes occurred on WV 16 near Prince Street and Neville Street than along any other corridor segment analyzed as part of this prioritization study.
    - Any improvement options proposed along WV 16 as part of the first corridor study for the intersections at US 19/Ragland Road, Market Road, and Templeview Drive/Beckley Crossing should be considered when studying this portion of WV 16.
    - The intersection of WV 3 with Pike Street/Ewart Street was added to this corridor study segment because of its proximity to WV 16.
- Priority #3 – WV 16 from Old Eccles Road/Fitzpatrick Road to Cross Street
    - Existing conditions analyses revealed that this segment had congestion and a relatively high crash frequency, including a fatality, compared to other corridor segments that were reviewed.
    - Special consideration should be given to the new signal at Glenview Drive and signal progression in this segment of WV 16.
- Priority #4 – US 19 from WV 3/Fayette Street to C and O Dam Road
    - Existing conditions analysis showed that this segment was congested and had a high crash frequency compared to other corridor segments that were reviewed. The segment had three fatalities.
    - This segment was given a lower priority than other segments because of the planned improvements in the vicinity. Currently in the design phase, a new roadway will connect US 19 near Airport Road to Interstate 64 at the Eisenhower Drive interchange. This new connection will likely result in less traffic using the existing US 19 segment between Eisenhower Drive and Airport Road likely improving safety and reducing congestion along the existing roadway. A second project consists of the widening of US 19 from Airport Road in Beaver to WV 3 (Hinton Road) in Shady Springs. The widening project, which is currently in design, will add capacity to the existing roadway which will improve traffic flow and likely reduce the number of crashes.
- Priority #5 – US 19 from US 19 (Corridor L) Southbound Ramp to Prosperity Road (northern intersection)
    - While there were not many crashes on this segment, existing travel time data indicated there is congestion.
    - The construction of the Z-Way with a terminus at the intersection of Industrial Drive/Pinewood Drive and US 19 may increase volume in this segment of US 19.

- Priority #6 – WV 3 from Dry Hill Road to Carriage Drive and Dry Hill Road from Vankirk Drive to WV 3
    - While the existing conditions analyses indicated a number of congested segments and a moderate crash frequency, including one fatality, new signal timings have been developed for this corridor but were not implemented at the time of this study. It is believed that improved signal timings, in conjunction with other potential roadway modifications as a result of proposed development, specifically near the Pikeview Drive and Hylton Lane intersections, may reduce congestion and improve safety in this corridor. Therefore, it was given the lowest priority for study.
    - These segments of WV 3 had lower daily traffic volumes than other segments analyzed in this prioritization review, leading to a lower priority ranking.

The next step in the corridor study process is to collect intersection turning movement traffic counts for the highest priority locations and begin further study. A prioritization for collecting intersection turning movement counts is included in **Appendix G**. Some intersections have already been collected as part of other study efforts and are not included in this list. However, consideration should be given to the timeframe in which further study for the corridors, especially the lower priority corridors, will be conducted. Collecting counts too soon before the study process begins may result in obsolete or unusable count data.

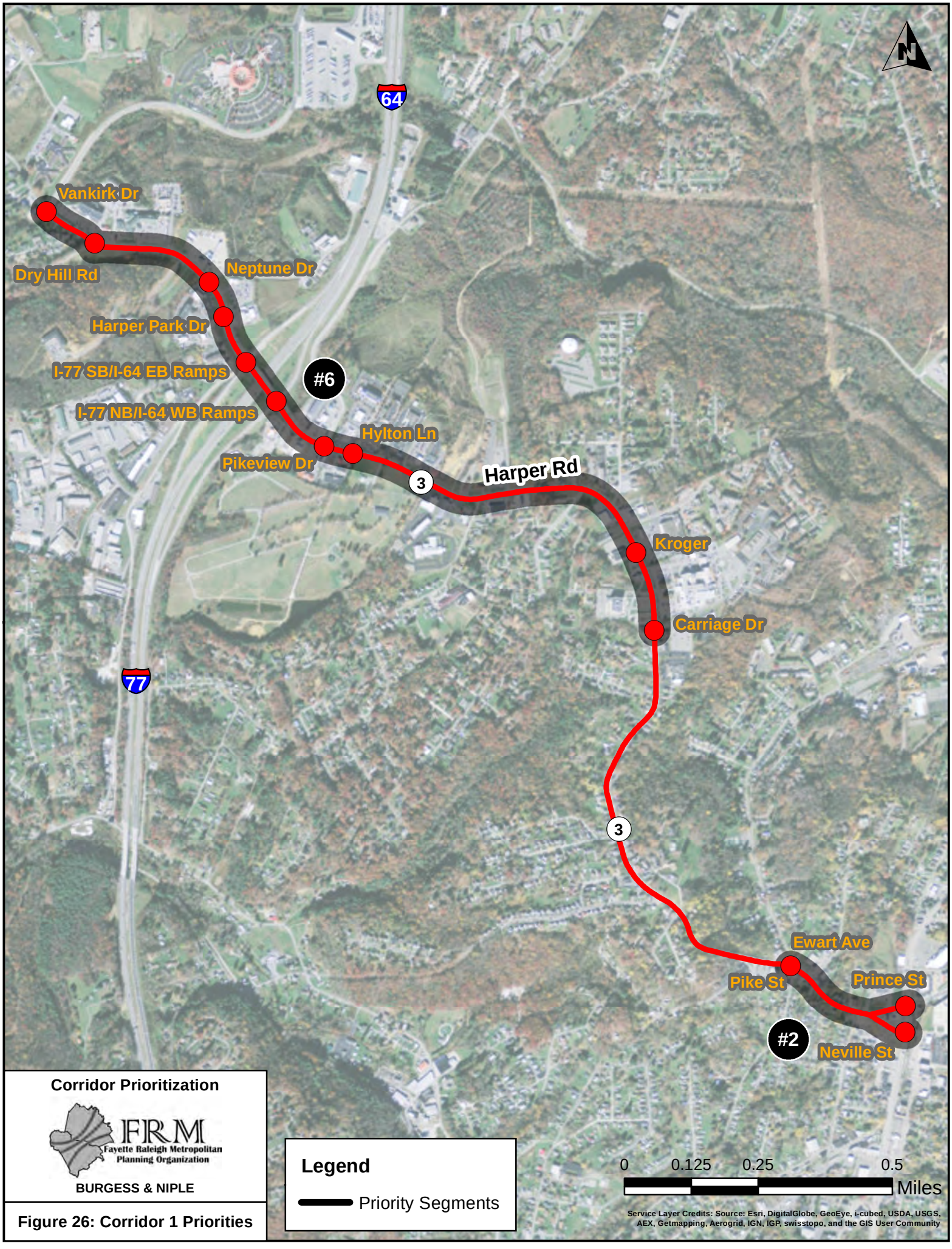

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Figure 26: Corridor 1 Priorities

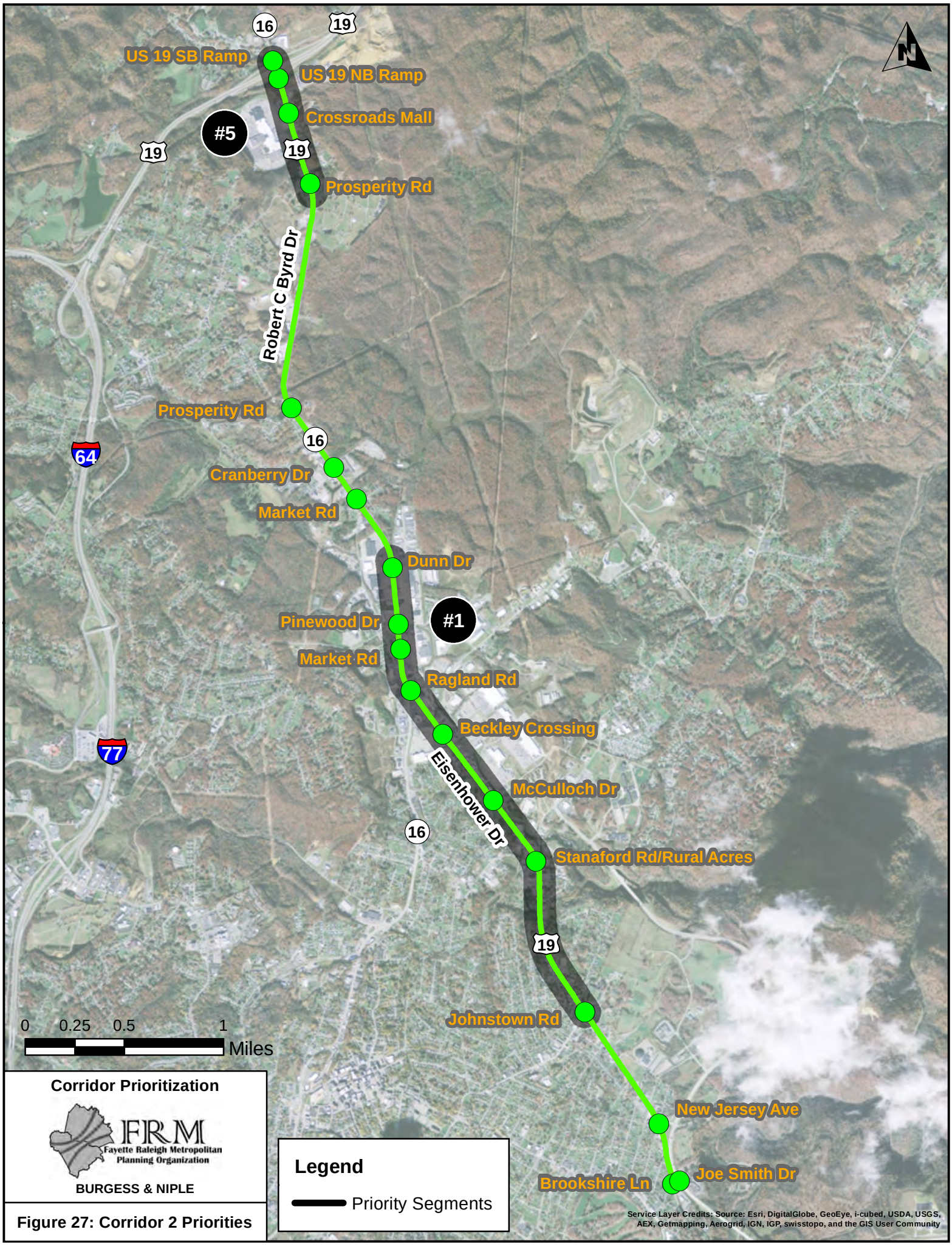

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Figure 27: Corridor 2 Priorities

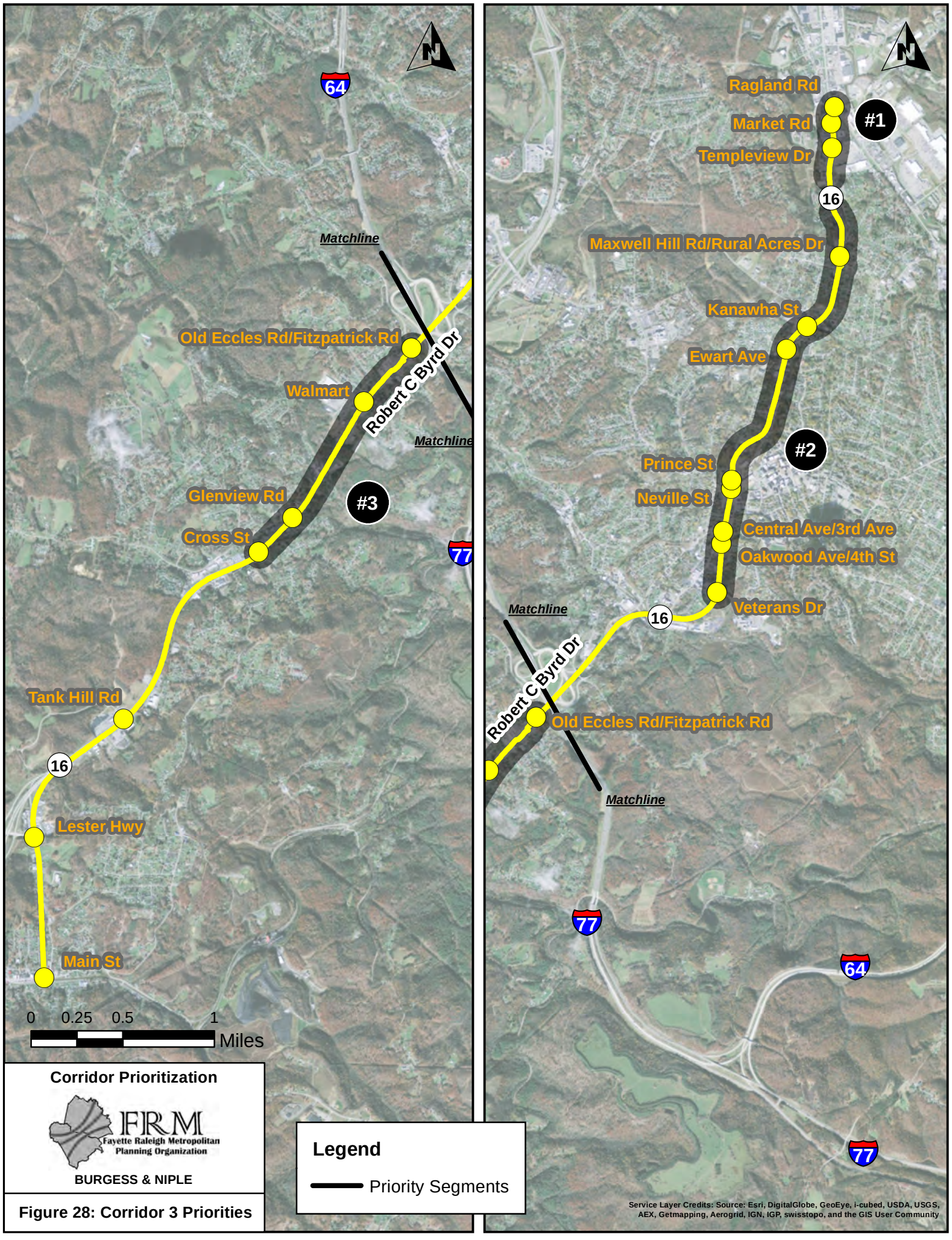

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Figure 28: Corridor 3 Priorities

Legend

Priority Segments

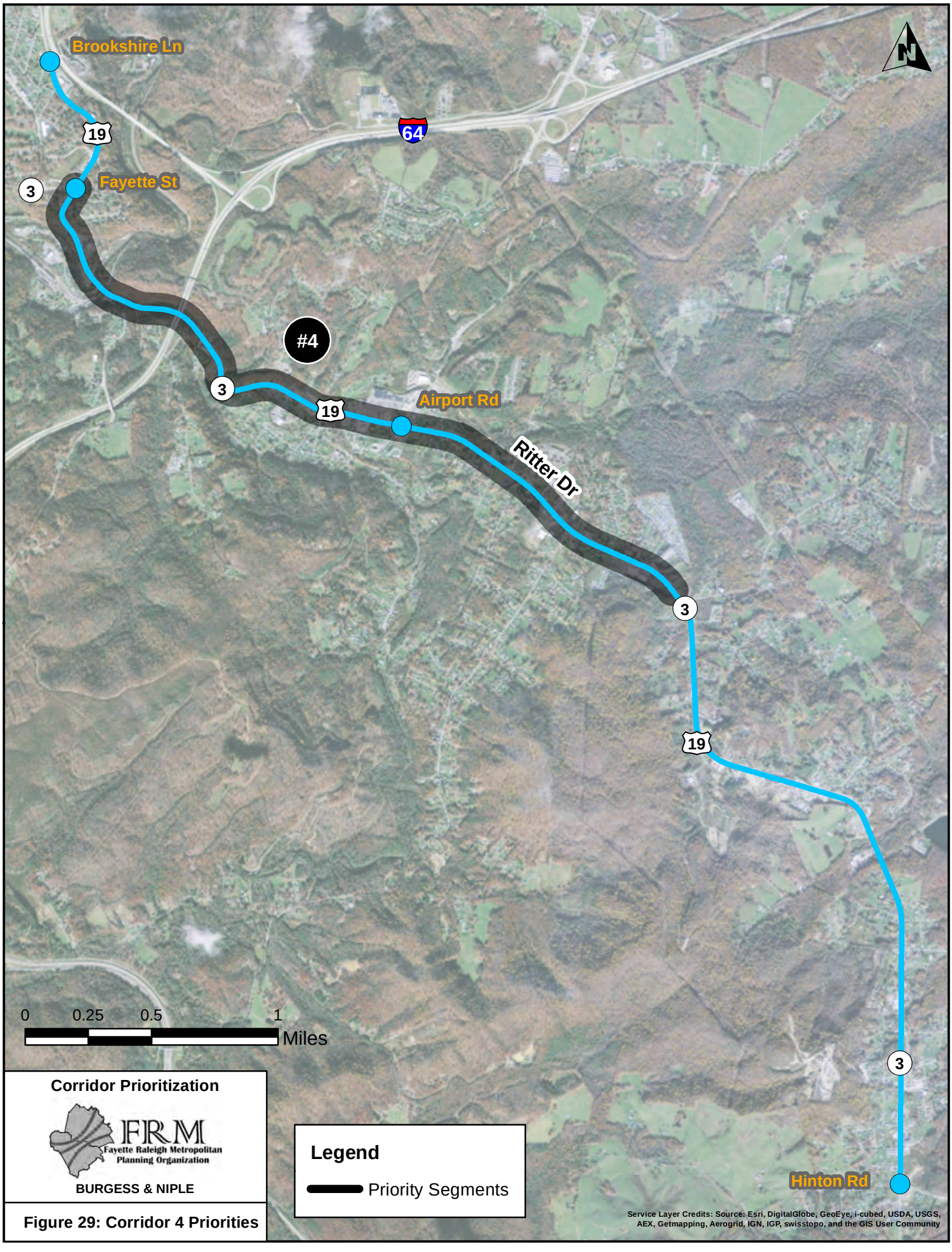

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Figure 29: Corridor 4 Priorities