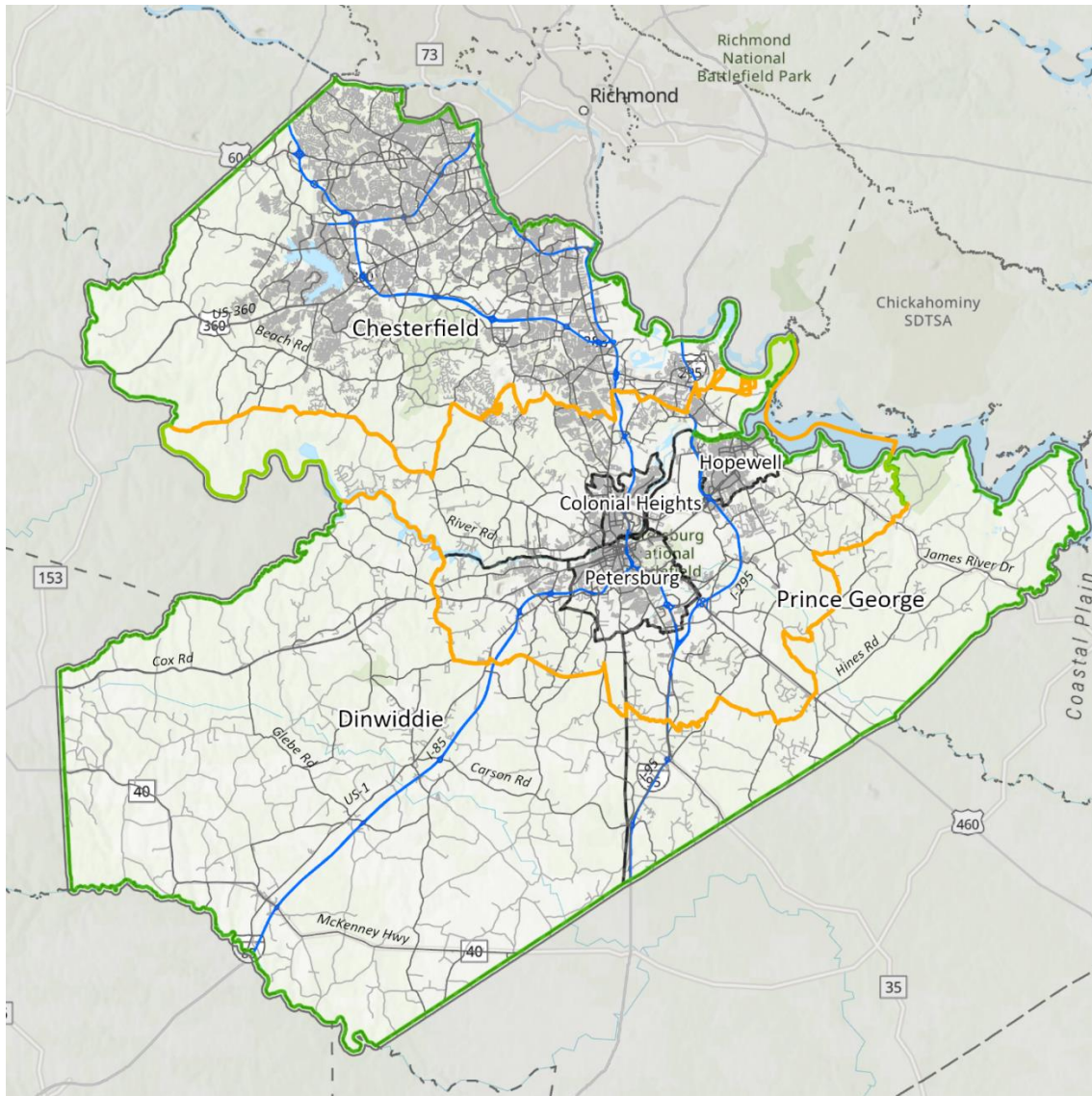


Tri-Cities Regional Transportation Safety Plan

May 2023



Prepared for:



Prepared by:



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Introduction

Virginia adopted the vision of Toward Zero Deaths, meaning that all roadway users in the Commonwealth should arrive safely at their destination. To move this forward, the Virginia Department of Transportation (VDOT), in collaboration with State and regional partners developed the 2022-2026 [Strategic Highway Safety Plan](#) (SHSP).¹ The SHSP is a five-year, action-based plan that frames the major safety issues within emphasis areas and identifies strategies and actions to address them. The SHSP prioritizes implementing a [Safe System Approach](#) that is gaining momentum in the United States based on success from associated Vision Zero efforts in Europe. Implementation of the SHSP with a Safe System Approach requires the engagement, cooperation, and effort from the 5Es of highway safety: Engineering, Education, Enforcement, Emergency Response and Medical Services, and Everyone.

The collaborative approach in the SHSP is also vital because roadway fatalities and serious injuries occur on roadways owned and maintained by both the Commonwealth and local agencies. While the SHSP outlines an overarching statewide approach, local and regional safety plans have been shown to address the issues specific to a jurisdiction, further targeting safety improvements.

The Tri-Cities Metropolitan Planning Organization (TCAMPO) includes the three cities of Petersburg, Colonial Heights, and Hopewell as well as some small portions of the surrounding three counties of Chesterfield, Dinwiddie, and Prince George Counties. The entire Study Area, which will be referred to in this study as the “Tri-Cities Region”, will include the TCAMPO as well as the remainder of the three counties outside the MPO boundary. Figure 1 shows the Study Area. The TCAMPO, and the member jurisdictions have committed to support the statewide effort toward reducing fatalities and serious injuries on roadways within their jurisdictions.

The Tri-Cities Regional Transportation Safety Plan is a data-driven effort, outlining the primary factors preventing people from arriving safely at their destinations as well as locations where safety improvements could make a difference. The planning process included the following:

- Engagement of multidisciplinary stakeholders to review and discuss safety issues.
- Identification of safety priority areas including bicycles and pedestrians, distracted driving, unbelted driving, impaired driving, young drivers, infrastructure (e.g., intersections and roadway departure), and speeding.
- Identification of crash locations with the potential for safety improvements.
- Identification of solutions to address behavioral and infrastructure needs.

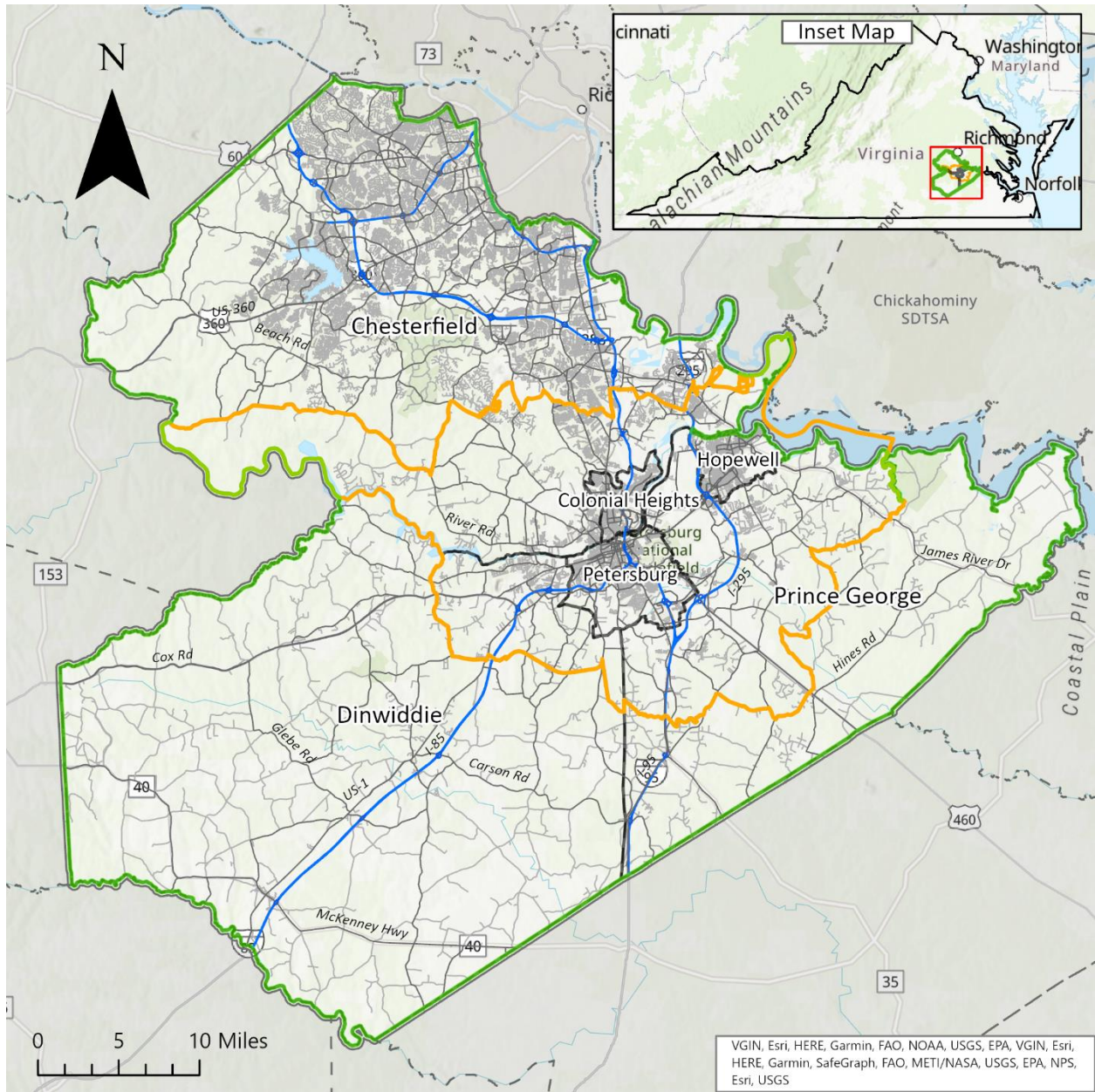
This Safety Plan includes the following sections:

- **Regional Crash Analysis** : This section reviews the specific characteristics of crashes in the region with a focus towards fatal and injury crashes. The analysis will include specific characteristics of crashes with emphasis areas cross matrices analysis, identification of High Injury Network corridors (HIN), Health Opportunity Index (HOI), USDOT identified disadvantaged areas, and Virginia Pedestrian Safety Action Plan (PSAP) priority corridors.

¹ [The Virginia 2022-2026 Strategic Highway Safety plan \(https://www.virginiadot.org/info/resources/SHSP/FR1_VA_SHSP_2022_acc061622.pdf\)](https://www.virginiadot.org/info/resources/SHSP/FR1_VA_SHSP_2022_acc061622.pdf)

- Sub-Regional Safety Assessments: This section examines the geographic locations of crashes in the Tri-Cities Region and in all member jurisdictions, including within the TCAMPO boundary. Similar analysis measures from the regional section will be presented. The jurisdictional analysis will be presented in the following order:
 - Section 1: Tri-Cities Area MPO
 - Section 2: Chesterfield County
 - Section 3: Dinwiddie County
 - Section 4: Prince George County
 - Section 5: City of Petersburg
 - Section 6: City of Colonial Heights
 - Section 7: City of Hopewell

- Next Steps: This section outlines information that the region should consider for reducing the number of fatalities, serious injuries, and minor injuries on its roadways. The region may complete supporting documentation to this report with detailed implementation steps. The following subsections are included:
 - Proven Countermeasures: This section describes possible countermeasures with measurable safety benefits that could be implemented by stakeholders in the region.
 - Implementation Options: This section reviews options for implementing proposed countermeasures. This includes policies, programs, and projects that address behavioral and infrastructure needs.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Figure 1 Study Area Map (Source: VDOT)

Tri-Cities Region Crash Analysis

This section examines the number of crashes and injuries in the Tri-Cities region. Please note that data presented in this section includes crashes that occur outside of the TCAMPO boundaries for the full jurisdictional areas. This examination accounts for five years of crash data (2017-2021) from VDOT. Crash severity is defined using the KABCO scale:

- K – fatal injury
- A – suspected serious injury
- B – suspected minor injury
- C – possible injury
- PDO – property damage only

Crash Frequency and Severity

Over the last five years, a total of 2,524 people died or were seriously injured (needed post-crash medical facility care) as a result of a crash within the Tri-Cities Region. 11,389 people had a suspected minor injury during this period. It's important to note that the number of people who were injured is not the same as the total of crash events that occurred. A single crash event may result in multiple injuries if a vehicle is carrying several occupants. Table 1 below shows a summary of fatal, serious injury, and minor injury crashes, broken down at the locality level.

Table 1 KAB Summary Table, 2017-2021 (Source: VDOT)

Locality	Fatal Crashes	Serious Injury Crashes	Minor Injury Crashes
Tri-Cities Region	240	1,809	7,997
TCAMPO	82	765	2,731
Chesterfield County	139	937	5,462
Dinwiddie County	42	230	527
Prince George County	30	272	427
City of Colonial Heights	5	75	418
City of Hopewell	5	68	601
City of Petersburg	19	227	562

Figure 2 shows the trend of fatal, serious, and minor injury (KAB) crashes during the past five years. 2018 had the highest number of KAB crashes, with 2,210, and the remaining years range from the 2020 low of 1,740 to 2,110. Fatal crashes were lowest in 2018, at 39. In 2021, fatal crashes increased to a five-year high of 58. From 2018 to 2020, serious injury crashes decreased and then rose slightly in 2021.

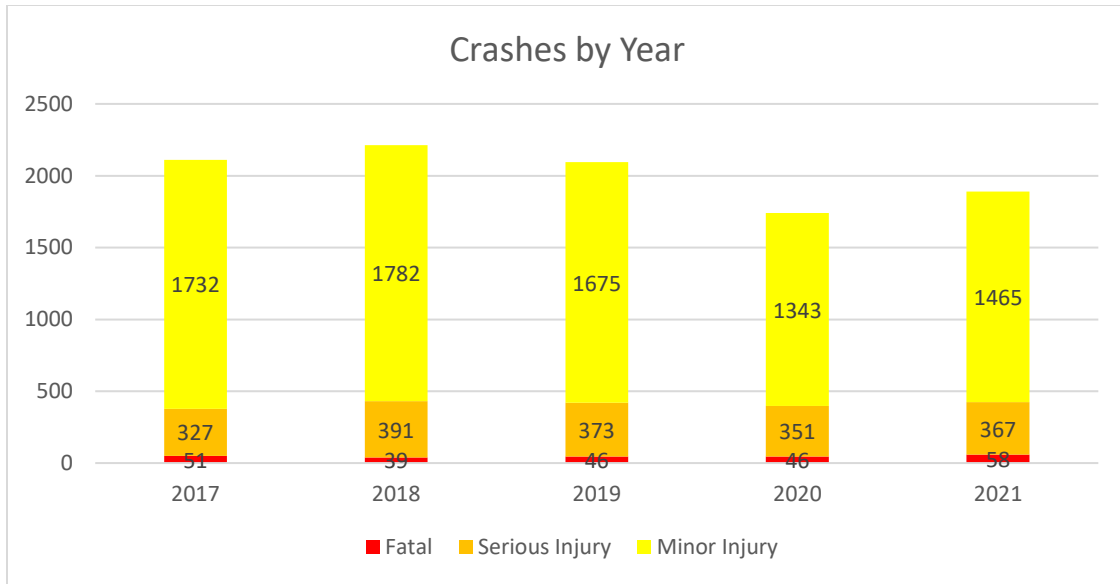


Figure 2: KAB Crashes by Year, 2017-2021 (Source: VDOT)

Crash Characteristics

A crash analysis helps to identify priority locations for safety investment and the types of countermeasures used to address identified issues. Crashes can be defined by many characteristics relating to the conditions and/or actions of drivers, vehicles, the roadway, and the environment. Investigating factors such as crash type, the involvement of pedestrians or bicyclists, and time of day on a localized or at the project level helps to determine applicable countermeasures. Crash data on a localized or project level can be viewed on map and downloaded for analysis through VDOT’s [ArcGIS Online](#) account. The investigation of behavioral crash patterns can be considered at a regional or corridor level as road user behavior is not necessarily confined to a specific corridor – a driver may exhibit high risk behavior as they traverse multiple roadways in the region. The implementation of behavioral countermeasures can reference density maps created by the Department of Motor Vehicles (DMV) Highway Safety Office (HSO) in conjunction with the maps provided in this report. This helps to identify priority locations that relate to behavioral crash patterns. Examples of the HSO annual maps provided for statewide, regional, and local enforcement, education, and outreach federal grants are provided in their [2023 Highway Safety Plan](#)².

The following analyses examine the crash characteristics in the region relating to the following priorities in Virginia’s SHSP:

- Emphasis areas in Virginia’s SHSP
- Time of day
- Overlap of behavioral crash factors (i.e., impaired driving, speed, occupant protection)
- High Injury Network and Health Opportunity Index analysis
- Pedestrian Safety Action Plan Corridors

The Virginia SHSP emphasis areas include the following (and further defined in Appendix A):

² FY23 Highway Safety Plan (<https://www.dmv.virginia.gov/safety/resources/pdf/fy23-hwysafetyplan.pdf>)

- Impaired Driving (Drinking, Drugged, Distracted and Drowsy)
- Speed (over posted limit or appropriate speed for traffic/weather conditions)
- Occupant Protection (unbelted occupants of passenger vehicles and trucks with seat belts)
- Roadway Departure (head-on, sideswipe opposite direction, fixed object, overturn crashes)
- Intersections (within 250 feet of intersections)
- Young Drivers (crashes involving drivers under 21)
- Aging Road Users (crashes involving drivers and pedestrians aged 65 and older)
- Bicyclists
- Motorcyclists
- Pedestrians

Table 2 shows the percent cross-representation of fatal and serious injury crashes categorized by emphasis areas in the SHSP. Note that the color scale is meant to be read vertically and the percentages are in relation to the column (refer to examples below); the column percentage sum may exceed 100 percent due to the overlap of multiple emphasis area factors (Note: all the cross-tabulations in this report are read the same way). It is important to note that there are strong overlaps between intersections, impaired driving, and speeding crashes.

- Intersections has the greatest overlap with most emphasis areas except for roadway departure, speeding, and occupant protection - where impaired driving has a higher cross representation.
- In roadway departure crashes, 44 percent involved an impaired driver and 42 percent involved speeding.
- Comparing young drivers and senior drivers, young drivers were more likely to be involved in a crash involving speeding, improper occupant protection, a roadway departure. Senior drivers were slightly more likely to be involved in a crash involving a motorcycle or an intersection.
- For non-motorized crashes, 57 percent of bicycle, and 60 percent of pedestrian crashes occurred in an intersection.

Table 2: KA Crash Proportions by Emphasis Area, Tri-Cities Region, 2017-2021 (Source: VDOT)

Region – KA	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant Protection	Intersection	Impaired
TOTAL – 2,049 ³	531	318	353	14	177	172	642	540	956	766
Roadway Departure		19%	14%	0%	0%	20%	34%	40%	6%	31%
Young	11%		10%	21%	10%	11%	17%	16%	18%	11%
Senior	9%	11%		14%	8%	17%	10%	11%	21%	10%
Bicycle	0%	1%	1%		1%	0%	0%	0%	1%	0.13%
Pedestrian	0%	5%	4%	7%		1%	5%	2%	11%	11%
Motorcycle	7%	6%	9%	0%	1%		6%	1%	9%	5%
Speeding	42%	35%	19%	7%	17%	24%		45%	24%	38%
Occupant Protection	40%	27%	17%	7%	5%	2%	38%		22%	35%
Intersection	11%	53%	58%	57%	60%	51%	36%	39%		43%
Impaired	44%	27%	22%	7%	46%	22%	46%	49%	34%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

Table 3 shows the same cross-representation of emphasis areas with the addition of minor injuries (B) in the analysis. With the addition of B level injuries, overlaps between intersections, impaired driving, and speeding crashes are still the most prevalent. The addition of the B level injury crashes to this analysis provides a larger set of crashes to consider when prioritizing potential locations and countermeasures. Short study periods, and lower daily traffic numbers, which can be found in more rural localities, results in fewer KA crashes to analyze.

³ The 2,049 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.

Table 3: KAB Crash Proportions by Emphasis Area, Tri-Cities Region, 2017-2021 (Source: VDOT)

Region – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant Protection	Intersection	Impaired
TOTAL – 10,046 ⁴	1,583	1,890	1,896	63	354	349	2,320	1,203	5,580	2,665
Roadway Departure		12%	7%	0%	0%	18%	27%	31%	3%	22%
Young	14%		12%	25%	7%	11%	19%	19%	20%	16%
Senior	9%	12%		19%	12%	16%	12%	12%	22%	13%
Bicycle	0%	1%	1%		0%	0%	0%	0%	1%	0%
Pedestrian	0%	1%	2%	2%		0%	2%	1%	4%	5%
Motorcycle	4%	2%	3%	2%	0%		3%	0%	3%	2%
Speeding	40%	24%	15%	6%	12%	23%		42%	15%	29%
Occupant Protection	24%	12%	8%	2%	3%	1%	22%		10%	19%
Intersection	10%	59%	65%	71%	64%	52%	35%	45%		51%
Impaired	38%	22%	19%	8%	37%	16%	33%	43%	24%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

Key takeaways from the above table are shown below:

- Intersections have the highest cross-representation in all emphasis areas except roadway departure.
- For occupant protection crashes, intersections (45 percent), impaired driving (43 percent), and speed (42 percent) have the highest cross-representation.
- For impaired driving crashes, intersections (51 percent), speeding (29 percent), and roadway departure (22 percent) have the highest cross-representation.
- For pedestrian crashes, 64 percent occurred in an intersection and 37 percent involved an impaired driver.
- For roadway departure crashes, 40 percent involved a speeding driver

Comparisons

Forty percent of KA roadway departure crashes in the Tri-Cities Region involved improper occupant protection use versus 24 percent of KAB crashes. Roadway departure is a factor in 31 percent, 34 percent, and 40 percent of KA impaired driving, speeding, and occupant protection crashes respectively, versus 22 percent, 27 percent, and 31 percent for KAB crashes respectively for the same categories.

⁴ The 10,046 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.

Venn Diagram Analysis

The following Venn diagrams provide another visualization of cross-representation of the most common crash factors observed in the data. These Venn diagrams consider all crashes within the Tri-Cities Region. Figure 3 shows that twenty percent of the KA crashes do not have speeding, impaired driving, or intersection involvement as a crash factor, while five percent of the crashes have all three. This chart is arranged such that each large “parent circle” represents the amount, and percentage, of crashes that exhibit a single (of the three) emphasis areas. *Example (figure 6): 226 KA crashes involved speeding alone. There were 122 crashes that involved speeding and intersections, but not impaired driving.*

Figure 4 shows that thirty-seven percent of KAB crashes have only intersections as a factor and another ten percent have only speeding involvement. These emphasis areas are represented in seventy-nine percent of KAB crashes, with three percent having involvement from all three emphasis areas. Twenty-one percent of crashes have no speeding, intersection, or impaired driving involvement.

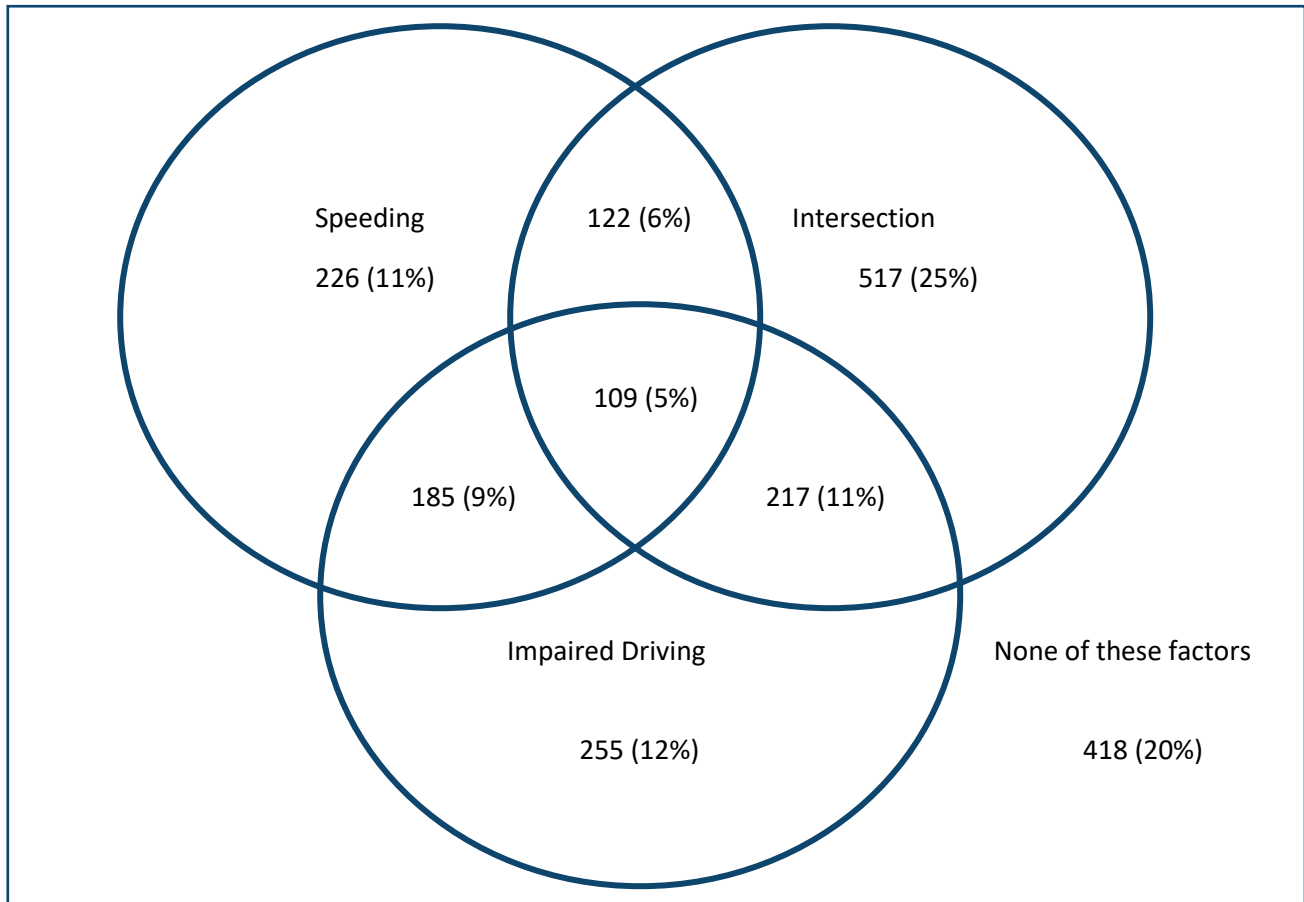


Figure 3: Venn Diagram Analysis of KA Crashes in Tri-Cities Region, 2017-2021 (Source: VDOT)

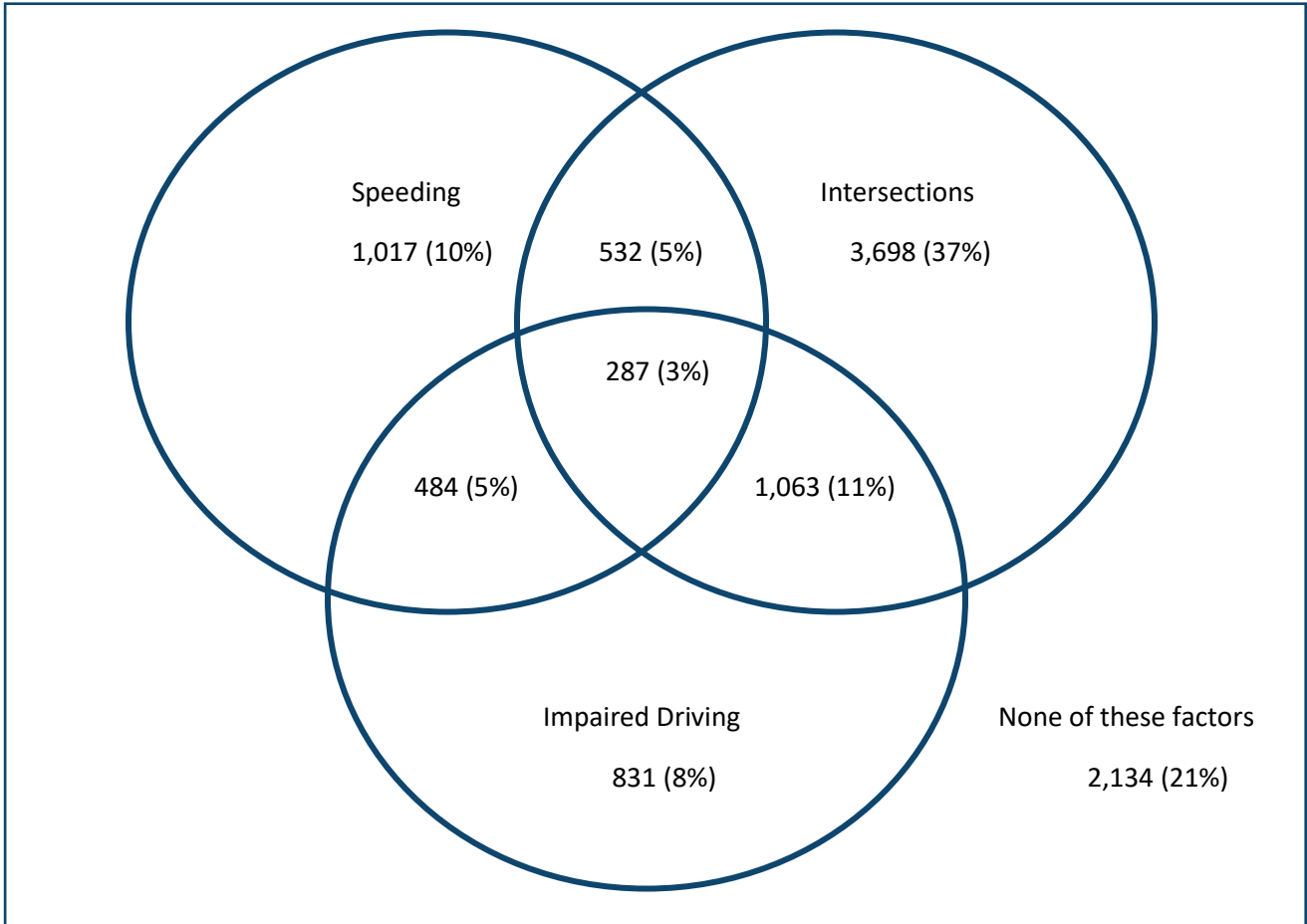


Figure 4: Venn Diagram Analysis of KAB Crashes in Tri-Cities Region, 2017-2021 (Source: VDOT)

Figure 5 shows KAB crashes within the Tri-Cities Region over the five-year (2017-2021) period based on the time of day they occurred. The highest number of crashes occurred during the PM peak with between 4:00 PM and 4:59 PM having the most – 115, followed by 3:00 PM to 3:59 PM with 114 crashes occurring during that hour. Figure 6 shows the percentage of crashes that occur between 9:00 PM and 5:59 AM.

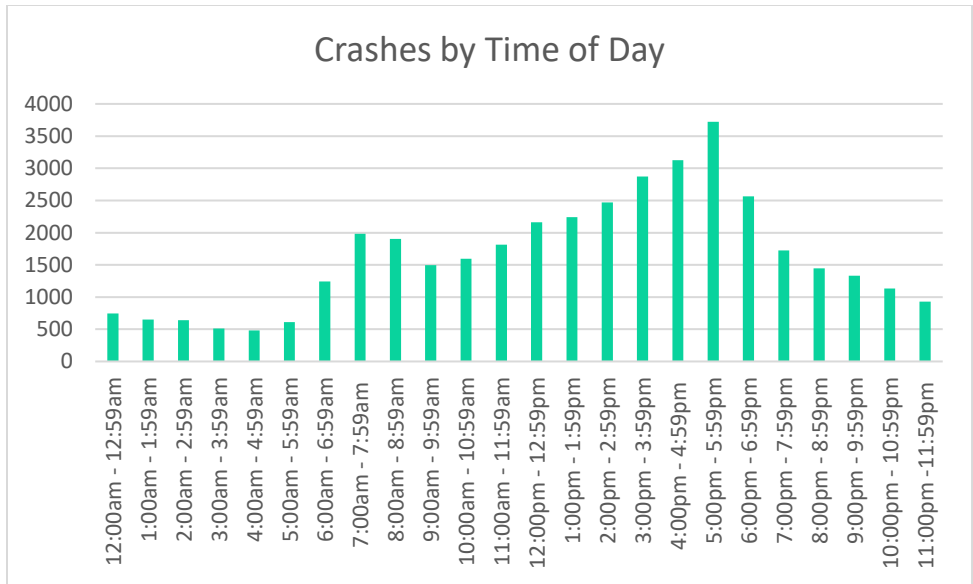


Figure 5: KAB Crashes by Time of Day in Tri-Cities Region, 2017-2021 (Source: VDOT)

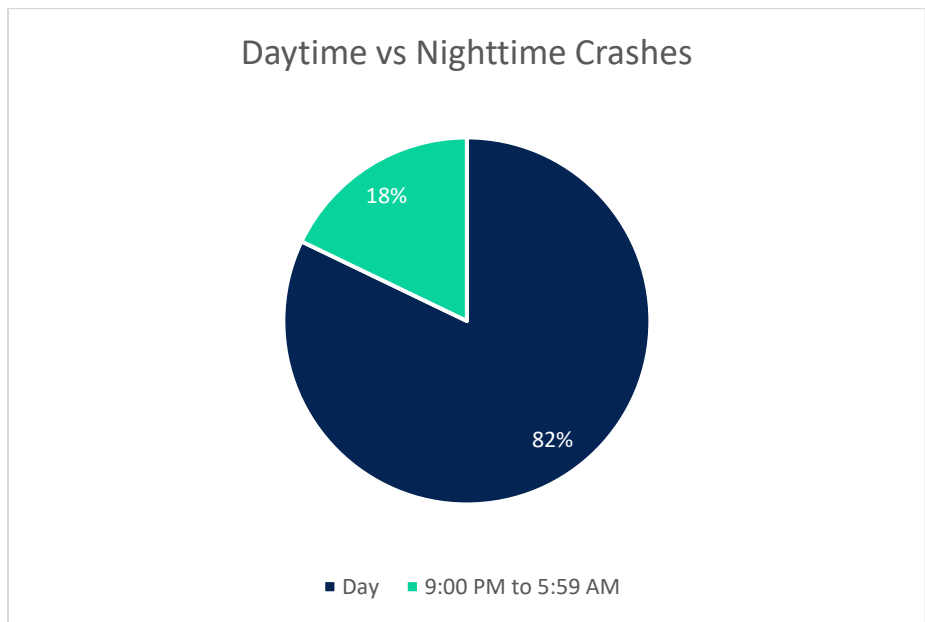


Figure 6: Daytime vs Nighttime KAB Crashes, Tri-Cities Region (2017-2021) (Source: VDOT)

High-Injury Network and Health Opportunity Index

The Tri-Cities Region safety analysis established a High Injury Network (HIN) for the region and assessed the propensity of severe crash outcomes using the [Health Opportunity Index](#) (HOI) for each census block. The HIN are roadway segments (corridors) with the highest proportion of fatalities and serious injury crashes. HOI⁵ was developed by the Virginia Department of Health (VDH) to promote health equity in the Commonwealth by factoring social, economic, educational, demographic, and environmental factors that are indicators of a community’s well-being and health status of a population. A lower HOI score indicates poorer health outcomes. Correlating the HOI with the HIN helps to prioritize road safety investments alongside those areas that have poor health outcomes.

Regional Health Opportunity Index (HOI)

The HIN maps for the Tri-Cities region (figure 7) utilize an HOI layer as a base map. Twenty-eight census tracts are identified as “Very Low” or “Low” in health outcomes.

Table 4: Census Tracts with Low and Very Low HOI, Tri-Cities Region (Source: VDOT)

TRACT ID	LOCATION	HOI SCORE	POPULATION (2019 ACS)
8201	Hopewell City	Very Low	1,249
8203	Hopewell City	Low	3,059
8205	Hopewell City	Low	4,200
8206	Hopewell City	Very Low	5,285
8304	Colonial Heights	Low	2,817
8305	Colonial Heights	Low	4,066
8501	Prince George County	Very Low	4,524
8502	Prince George County	Very Low	5,895
8101	Petersburg City	Very Low	2,716
8103	Petersburg City	Very Low	2,778
8105	Petersburg City	Very Low	3,184
8106	Petersburg City	Very Low	1,650
8107	Petersburg City	Very Low	2,205
8109	Petersburg City	Low	3,433
8110	Petersburg City	Low	4,232
8112	Petersburg City	Low	4,121
8113	Petersburg City	Very Low	2,834
1001.07	Chesterfield County	Low	2,395
1004.04	Chesterfield County	Low	2,119
1004.05	Chesterfield County	Low	2,388
1004.06	Chesterfield County	Very Low	1,651
1007.01	Chesterfield County	Low	5,587
1008.06	Chesterfield County	Low	4,072
1009.07	Chesterfield County	Low	2,579
1009.28	Chesterfield County	Low	6,890
8401	Dinwiddie County	Very Low	6,050
8404	Dinwiddie County	Very Low	746

⁵ HOI is presently being updated by VDH based on 2020 Census data. Updated HOI information should be provided in 2023 at the link provided. (<https://apps.vdh.virginia.gov/omhhe/hoi/dashboards>)

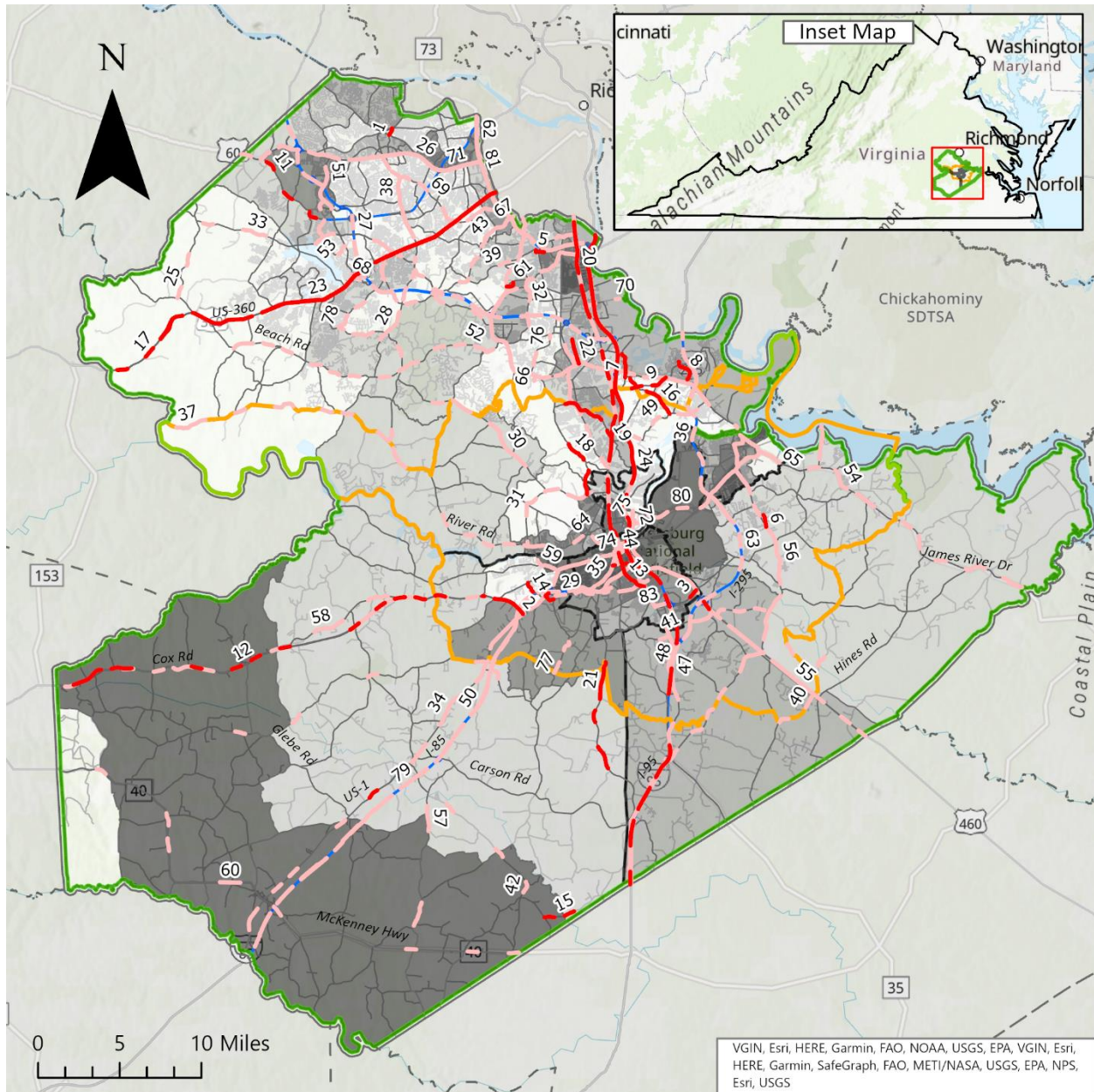
Error! Reference source not found. 7 shows a map of the HIN and HOI for the entire Tri-Cities Region. Segments are labeled based on their rank compared to the rest of the HIN. A lower number (1, 2, 3, etc.,) indicates a higher per mile fatality and serious injury crash density (concentration). Prior to associating crashes with a segment of the road network, all roads are separated into half mile segments to establish a consistent length. Crashes are associated with a segment and all segments that have a crash event are retained. The thresholds for HIN consideration are based on length of a segment and number of crashes. A minimum segment length of 1000ft is required, and KA segments need to reach a total of two crashes, while KAB segments need to reach a total of three crashes to be considered.

HIN weighting is achieved by multiplying the count of crashes on a given segment by the corresponding severity cost category and then dividing by the length of the segment. For example, a two-mile segment that has two K severity crashes and one B severity crash has a cost of \$27,174,127. After dividing this number by the length (two miles), the weighted score of \$13,587,063 per mile is achieved. The HIN is symbolized by two tones of red. The darker red represents Tier 1 and the lighter red is Tier 2. Segments with an above average KA or KAB score per mile are designated as Tier 1, Tier 2 is for segments that are below the average. To determine the breakpoint for the tiers, we find the average weighted score of the regional HIN dataset. The average score becomes the lower end of the roadways that will be visualized as a high injury segment or network. To find the breakpoint for Tier 1, we find the average weighted score of the remaining dataset. Everything at and above this average weighted score becomes Tier 1, and everything below becomes Tier 2. The Tier 1 breakpoint value is utilized for each jurisdiction so that there is standardization across the jurisdictional analyses. Subsequent sections show the HIN and HOI specific to each locality.

Table 5: Virginia 2020 Comprehensive Crash Costs (Source: VDOT)

SEVERITY	COMPREHENSIVE CRASH COSTS
K	\$13,457,654
A	\$790,242
B	\$258,819
C	\$145,744
O	\$13,743

Regional High Injury Network



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

High Injury Network (HIN)

- Tier 1 HIN
- Tier 2 HIN

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 7: Tri Cities Region KA High Injury Network (HIN), 2017-2021 (Source: VDOT)

Below, table 6 shows the fatal and serious injury crash High Injury Network for the region. The table uses the aforementioned weighted scoring system⁶ where each crash severity level is assigned a crash cost multiplier, then calculated on a per mile basis. Segments that have a high number of crashes over a short segment length have a higher score. The top ten segments cover 7.69 miles of roadway, and there are a total of 13 fatal and 18 incapacitating injury crashes. The Tri-Cities Region KA HIN accounts for 70 percent of all KA injuries and only 10 percent of road miles in the region.

Note: Asterisks (*) next to a route name indicate a segment that is found in both the KA and the KAB top ten segments table.

Table 6: Tri-Cities Region KA HIN, 2017-2021 (Source: VDOT)

ROUTE	UNIQUE ID ⁷	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL KA CRASHES
SC-674N* (CRANBECK RD FROM ROBIUS RD TO W HUGUENOT RD)	172	1	0.38	1	1	2
BUS US-460W* (AIRPORT ST FROM BOYDTON PLANK RD TO NEAR PLANE DR)	111	2	0.45	1	4	5
UR-9010W (WAGNER RD APPROX. 3,000 FT EAST OF NORMANDY DRIVE)	426	3	0.45	1	1	2
SC-3290N (FULL EXTENT OF WILLOWBRANCH DR)	278	4	0.46	1	1	2
SC-770E* (CHESTERWOOD DR FROM HOLLYWOOD DR TO TRANQUIL LN)	203	5	0.53	1	1	2
SC-674N (MT SINAI RD FROM PRINCE GEORGE DR TO NEAR SPRINGLAKE DR)	387	6	0.61	1	1	2
SC-732N (OLD STAGE RD FROM WARE BOTTOM SPRING RD TO NEAR OSBORNE RD)	194	7	1.22	2	1	3
SC-4841 E* (N KINGSTON AVE FROM BERMUDA HUNDRED RD TO HOGANS ALY)	304	8	1.24	2	1	3
SC-618E (OLD BERMUDA HUNDRED RD FROM CHARLOTTE CT TO E HUNDRED RD)	126	9	1.32	2	2	4
UR-9012E (GRAHAM RD FROM S SYCAMORE ST TO S CRATER RD)	428	10	1.03	1	5	6
TOTAL			7.69	13	18	31

⁶ [VDOT Virginia Traffic Crash Costs Memo](#)

⁷ Note: Unique IDs are generated separately for the KA and the KAB HIN. KAB HIN segments may appear in multiple tables if the roadway crosses jurisdiction lines. Full KA and KAB HINs can be found in the Appendices.

Similarly, figure 8 on the next page shows the HIN overlaid with the HOI index with B injury crashes factored into the HIN. Segments are again weighted based on a VDOT Virginia 2020 Traffic Crash Costs memo⁸.

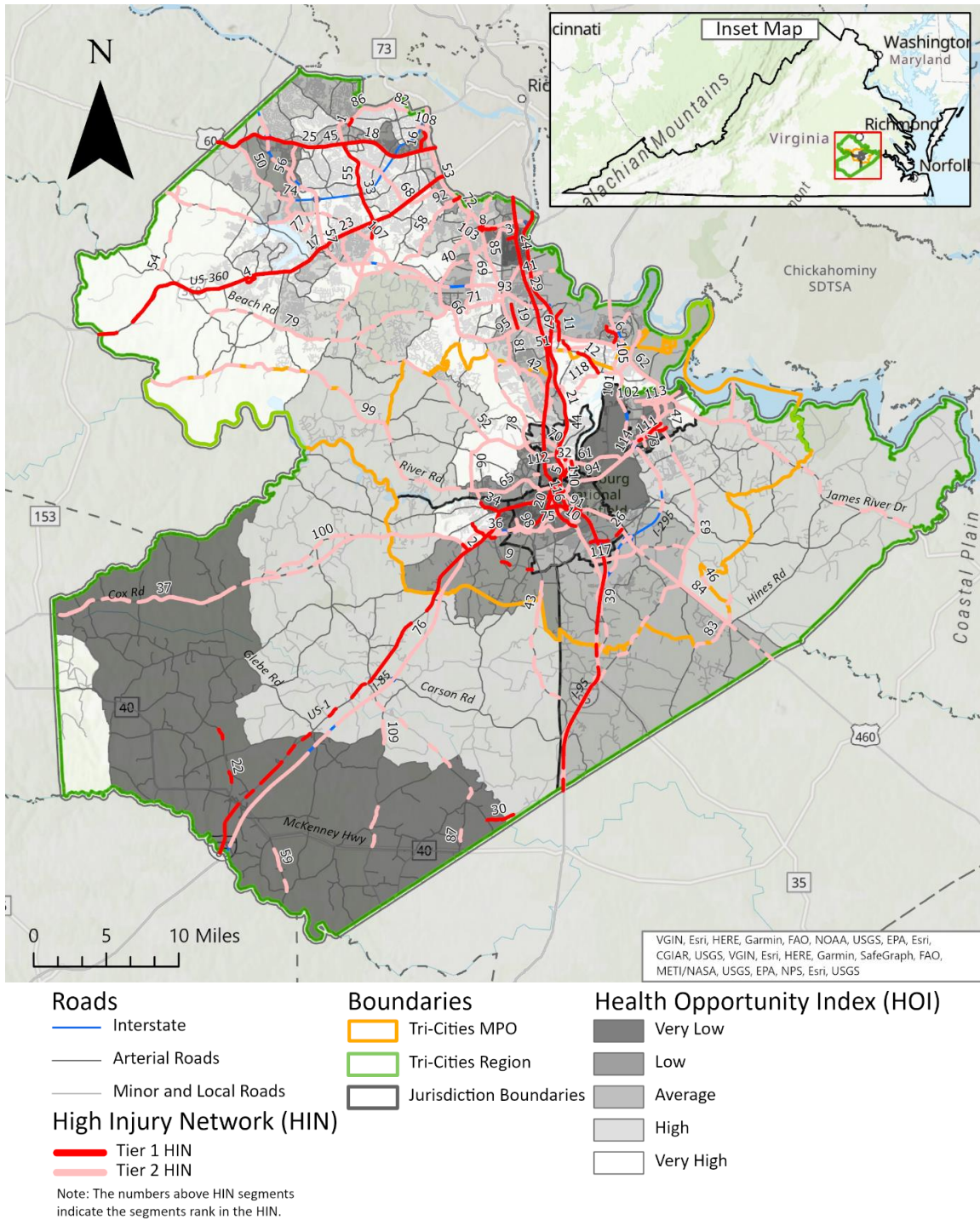


Figure 8: Tri-Cities Region KAB High Injury Network (HIN), 2017-2021 (Source: VDOT)

⁸ [VDOT Virginia Traffic Crash Costs Memo](#)

Table 7 below represents the top ten segments in the Tri-Cities Region for the fatal, serious, and minor injury (K, A, B severity) crash HIN analysis.

The length of the top ten KAB segments is 8.32 miles, and there are a total of 121 KAB Injury crashes. The Tri-Cities Region KAB HIN accounts for 72 percent of all KAB injuries, and only 15 percent of all road miles in the region. There are fewer fatal crashes (11) among the top ten KAB segments compared to the top ten KA segments (13).

Note: Asterisks (*) next to a route name indicate a segment that is found in both the KA and the KAB top ten segments table.

Table 7: KAB HIN for Tri-Cities Region, 2017-2021 (Source: VDOT)

ROUTE	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL MINOR INJURY	TOTAL KAB CRASHES
SC-674N* (CRANBECK RD FROM ROBIOUS RD TO W HUGUENOT RD)	294	1	0.38	1	1	4	6
BUS US-460W* (AIRPORT ST FROM BOYDTON PLANK RD TO NEAR PLANE DR)	208	2	0.45	1	4	1	6
SC-1610E (SWINEFORD RD)	489	3	0.46	1	0	3	4
SC-5190E (HAMPTON PARK DR FROM OTTERDALE RD TO NEAR ASHBROOK PKWY)	767	4	0.53	1	0	3	4
UR-2N (SOUTHPARK BLVD FROM E. ROSLYN RD TO NEAR CHARLES H. DIMMOCK PKWY)	947	5	0.47	0	3	36	39
SC-4841E* (N. KINGSTON AVE FROM HOGANS ALY TO BERMUDA HUNDRED RD)	741	6	1.24	2	1	2	5
COURTHOUSE RD (COURTHOUSE RD FROM OAKLAWN BLVD TO ASHLAND AVE AND CENTRAL AVE TO MARYVILLE AVE)	1195	7	0.75	1	1	4	6
SC-770E* (MEADOWDALE BLVD FROM HOLLYWOOD DR TO THE PARK AT LAKEWOOD)	351	8	1.03	1	1	23	25
FLANK RD (FROM CHURCH RD TO NEAR VAUGHAN RD)	1095	9	0.78	1	0	2	3
ALT US-301N (S. SYCAMORE ST FROM W. WYTHE ST TO S. CRATER RD)	186	10	2.24	2	7	14	23
TOTAL			8.32	11	18	92	121

Pedestrian Safety Action Plan Corridors

In 2018, VDOT published the first [Pedestrian Safety Action Plan \(PSAP\)](#)⁹. VDOT worked with a multidisciplinary group of stakeholders to identify and address pedestrian safety concerns through a data driven approach. This approach included identifying and addressing locations with a history of pedestrian safety crashes along with proactively addressing pedestrian crash risk through the identification of priority corridors. The PSAP complements and supports prioritizing many pedestrian safety efforts in Virginia, including the Virginia 2022–2026 SHSP, VDOT HSIP, SMART SCALE, Transportation Alternatives Program, and Safe Routes to School program. Prior VDOT analyses found a strong statewide spatial correlation of pedestrian crashes occurring in areas with lower HOI ratings. HOI was considered in the determination of PSAP corridor prioritization.

VDOT created an online [PSAP](#) tool that shows pedestrian corridors and crash clusters based on statewide and district ranking. Version 3 is based on pedestrian and bicyclist crashes that occurred between 2016 and 2020 and the priority corridors are organized into four tiers and shown in figures 12 and 13. The PSAP methodology was re-analyzed for the area and network within the Tri-Cities Region for regional comparison. Below, table 8 provides a summary of PSAP corridors in the counties of Chesterfield, Dinwiddie, Prince George, and the cities of Colonial Heights, Hopewell, and Petersburg. This table includes data for areas outside of the TCAMPO limits. A similar table is presented in the Tri-Cities MPO section which omits data from outside of the TCAMPO limits. District based prioritization provides more focus for local attention while the statewide priorities cast a broader comparison to capture more needs.

Table 8: Pedestrian Safety Action Plan Summary of Jurisdictional Miles (Source: VDOT)

PSAP CORRIDOR PRIORITY	CHESTERFIELD	DINWIDDIE	PRINCE GEORGE	COLONIAL HEIGHTS	HOPEWELL	PETERSBURG
DISTRICT 1%	0.81	--	--	1.85	1.83	2.27
DISTRICT 5%	22.98	0.75	0.37	12.50	9.60	21.65
STATEWIDE 1%	6.34	--	--	3.03	4.73	6.58
STATEWIDE 5%	35.47	3.36	4.40	10.22	11.25	29.57

Regional Pedestrian Safety Action Plan Highlights

A large share of all PSAP corridors are in the cities of Colonial Heights, Hopewell and Petersburg. 88 percent of the length of District 1% corridors, 64 percent of District 5% corridors, 69 percent of Statewide 1% corridors, and 54 percent of Statewide 5% corridors, are found in these three cities. Chesterfield County, however, has the most District 5% and Statewide 5% corridors of any jurisdiction, accounting for 34 and 38 percent respectively. Dinwiddie and Prince George counties have no District 1% or Statewide 1% corridors. Jurisdictions should focus safety improvements in areas where PSAP corridors are present, and with particular focus in areas where PSAP overlaps with the KAB HIN. Below, figure 9 shows the district prioritized PSAP segments for the Tri-Cities Region. Concentrations of segments are found within the cities of Petersburg, Hopewell, and Colonial Heights and the northern portion of Chesterfield County (outside of the TCAMPO).

⁹ Pedestrian Safety Action Plan (bit.ly/VDOTPSAP)

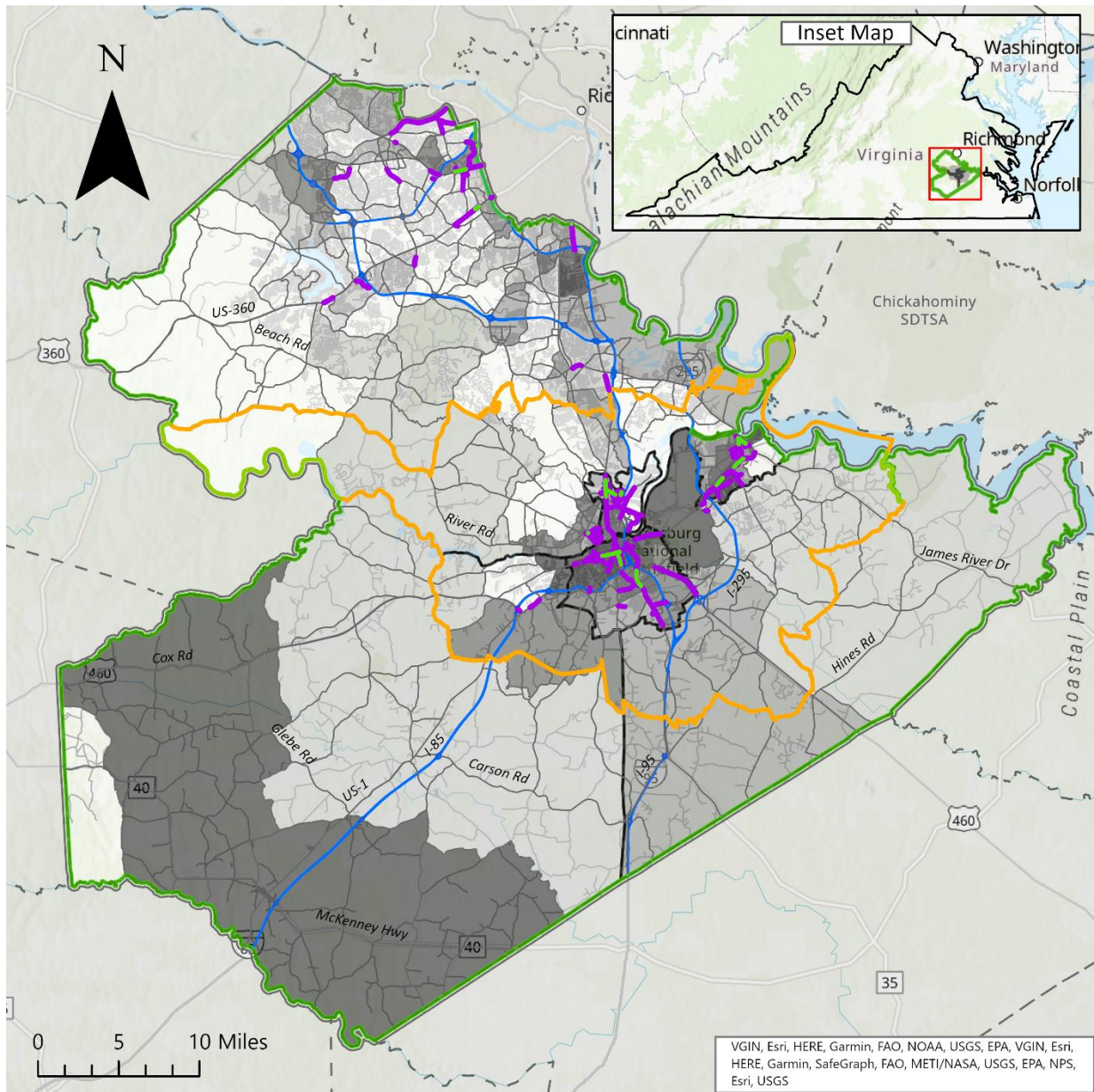
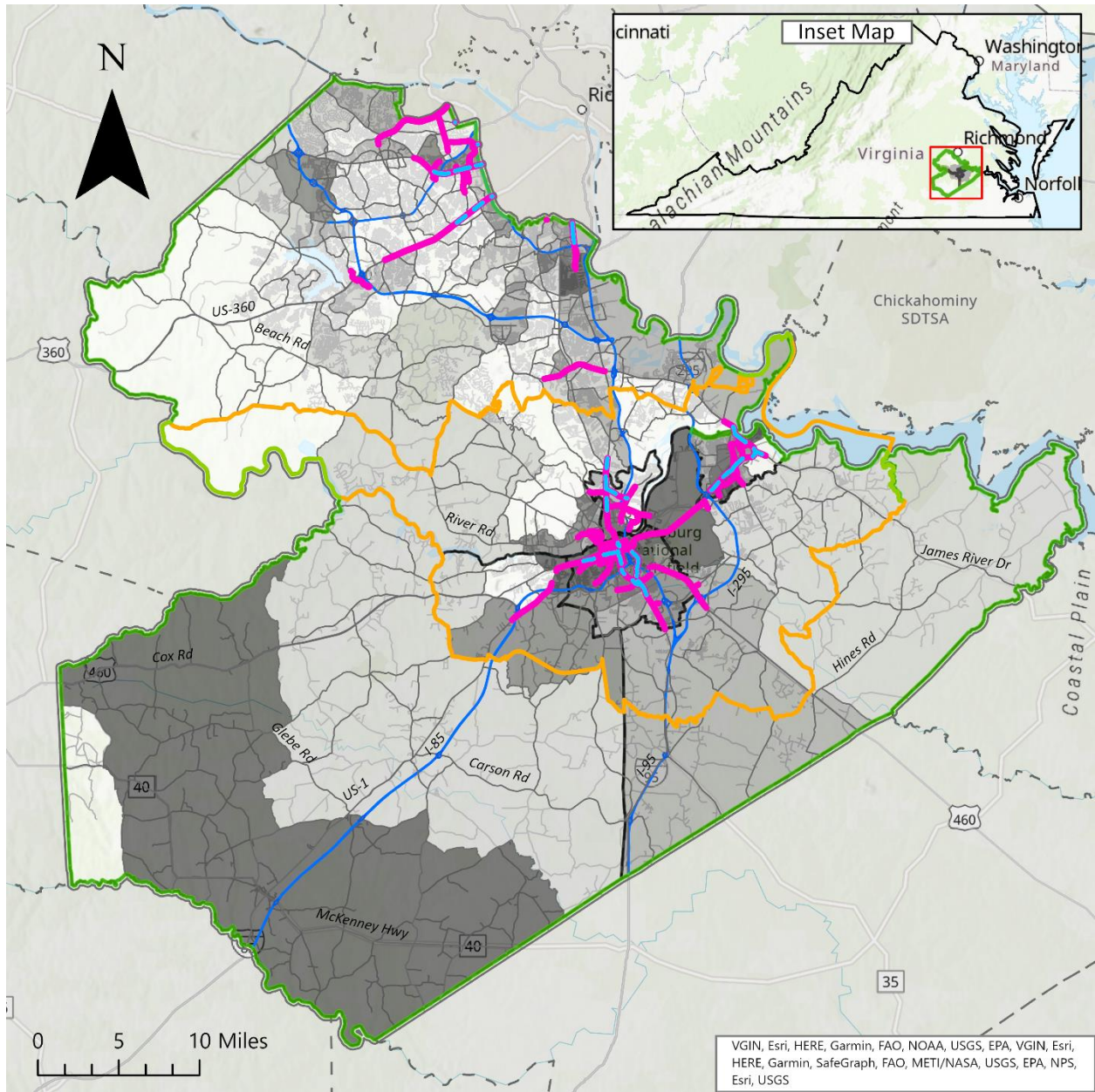


Figure 9. District PSAP Segments, Tri Cities Region (Source: VDOT)

Similarly, figure 10 below shows the statewide PSAP corridors for the Tri Cities Region. Again, most corridors are within the TCAMPO limits, and especially concentrated amongst the cities of Petersburg, Hopewell, and Colonial Heights. However, several PSAP corridors are identified east/northeast of VA-288 in Chesterfield County outside of the TCAMPO (as identified in the district priorities).



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

PSAP

- Statewide 1% Corridors
- Statewide 5% Corridors

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 10. Statewide PSAP Corridors, Tri-Cities Region (Source: VDOT)

USDOT – Underserved Census Tracts – Regional Highlights

The United States Department of Transportation (USDOT) defines disadvantaged Census Tracts, as exceeding the 50th percentile (75th for resilience) across at least four of the following six transportation disadvantaged indicators:

1. Transportation Access disadvantage – identifies communities that spend more, and longer, to get where they need to go.
2. Health disadvantage – identifies communities based on variables associated with adverse health outcomes, disability, as well as environmental exposure.
3. Environmental disadvantage - identifies communities with disproportionate pollution burden and inferior environmental quality.
4. Economic disadvantage – identifies areas and populations with high poverty, low wealth, lack of local jobs, low homeownership, low educational attainment, and high inequality.
5. Resilience disadvantage – identifies communities vulnerable to hazards caused by climate change.
6. Equity disadvantage – identifies communities with a high percentile of persons who speak English “less than well”.

The base map on Figure 14 displays census tracts with shading displaying Transportation Disadvantaged census tracts. Table 9 below shows census tracts that are identified as Transportation Disadvantaged by the USDOT. All jurisdictions have at least one census tract that is Transportation Disadvantaged. Census tracts that are identified as Transportation Disadvantaged may receive prioritization for funding through federal programs like [Safe Streets for All \(SS4A\)](#)¹⁰. Transportation safety improvements should be focused on census tracts that are identified in table 8.

Additional information on these indicators can be found at the [USDOT Equity Justice40 website](#)¹¹. The current USDOT Transportation Disadvantaged tool is still in the experimental stage, therefore this report references the USDOT tool from the 2022 Notice of Funding Opportunity¹².

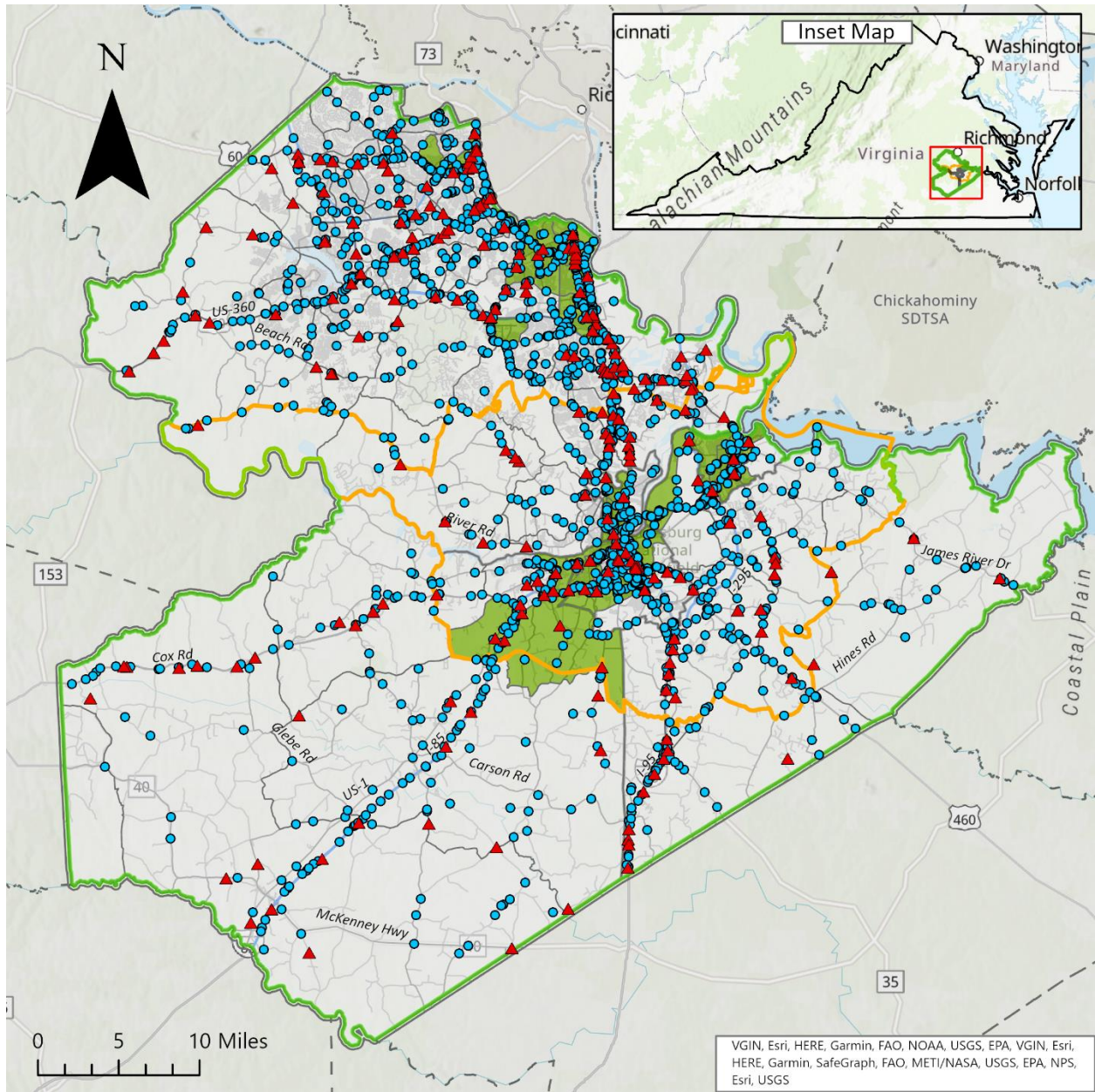
¹⁰ Safe Streets for All (<https://www.transportation.gov/grants/SS4A>)

¹¹ US Justice40 (<https://www.transportation.gov/equity-Justice40>)

¹² 2022 USDOT Transportation Disadvantaged Census Tracts mapping tool (<https://www.arcgis.com/apps/dashboards/d6f90dfcc8b44525b04c7ce748a3674a>)

Table 9: USDOT Disadvantaged Census Tracts in Tri-Cities Region (Source: VDOT)

TRACT ID	LOCATION	POPULATION (2019 ACS)
1001.07	Chesterfield	2,395
1003	Chesterfield	2,750
1004.04	Chesterfield	2,119
1004.05	Chesterfield	2,388
1004.06	Chesterfield	1,651
1004.07	Chesterfield	3,531
1008.04	Chesterfield	4,707
1008.05	Chesterfield	5,083
1008.06	Chesterfield	4,072
1008.07	Chesterfield	1,720
1008.17	Chesterfield	3,800
1009.07	Chesterfield	2,579
8304	Colonial Heights	2,871
8305	Colonial Heights	4,066
8302	Colonial Heights	3,431
8201	Hopewell City	1,249
8203	Hopewell City	3,059
8204	Hopewell City	6,233
8205	Hopewell City	4,200
8206	Hopewell City	5,285
8207	Hopewell City	2,430
8103	Petersburg City	2,778
8110	Petersburg City	4,232
8101	Petersburg City	2,716
8104	Petersburg City	1,367
8105	Petersburg City	3,184
8107	Petersburg City	2,205
8404	Dinwiddie County	746
8405	Dinwiddie County	4,154
8501	Prince George County	4,524



Crash Severity

- ▲ Fatal
- Incapacitating Injury

Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

Boundaries

- ▭ Tri-Cities MPO
- ▭ Tri-Cities Region
- ▭ Jurisdiction Boundaries

Trans. Disadvantaged Index

- ▭ Not Disadvantaged
- ▭ Disadvantaged

Figure 11: Transportation Disadvantaged Census Tracts in Tri-Cities Region, USDOT (Source: VDOT)

Section 1: Tri-Cities Area MPO (TCAMPO) Crash Analysis

TCAMPO Safety Target Setting and Trends

The Safety Performance Management Measures federal regulation supports the Highway Safety Improvement Program (HSIP) and requires State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) to set next year targets for five safety performance measures. These performance measures include the following:

1. Number of fatalities
2. Rate of fatalities
3. Number of serious injuries
4. Rate of serious injuries
5. Number of non-motorized fatalities and serious injuries

MPOs establish safety targets by either (1) agreeing to plan and program projects so that they contribute toward the accomplishment of the State DOT HSIP target or (2) committing to a quantifiable HSIP target for the metropolitan planning area. To provide MPOs with flexibility, MPOs may support all the State safety targets, establish their own specific numeric targets for all performance measures, or any combination. MPOs may support the State target for one or more individual performance measures and establish specific numeric targets for the other performance measures.

VDOT has developed statewide safety performance statistical models for each measure that incorporate multiple factors, including exposure to crash risk in Vehicle Miles Traveled (VMT), that are predicted for the next year safety targets. Statewide trends indicates that fatality measures continue to increase while serious injury measures will continue to level off until 2023. Given these findings, to be submitted to FHWA for 2023 targets, the Commonwealth transportation Board also set optimistic 2023 state targets that follow the SHSP objectives that show a decrease in fatalities and serious injuries as compared to 2020. For the Tri-Cities Area MPO, safety data within the boundaries are compiled and provided for the regions safety target determination as provided below (that is, jurisdictional data from outside of the TCAMPO boundary are excluded)

TCAMPO is currently using the targets based on the FHWA submitted trends.

Figure 12 below shows the five-year average fatalities from 2010 to 2020 for the TCAMPO area. Over that 11-year period there is an increasing trendline. Over the past five-year period the trend has leveled. Fatality rates per 100 million VMT follow the same yearly variations, but the trend increase is not as large.

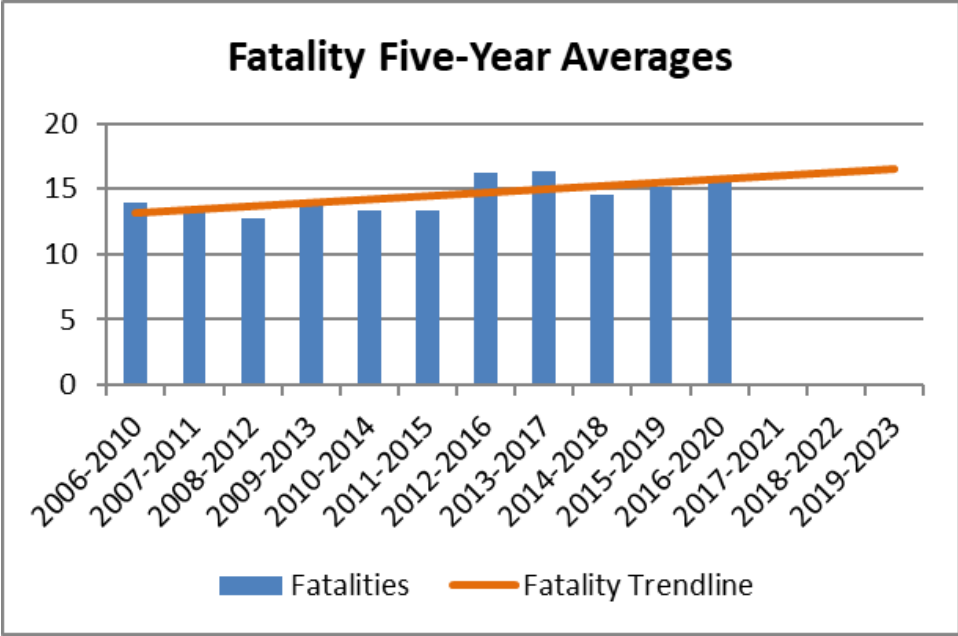


Figure 12: TCAMPO Five-Year Average Fatalities, 2010-2020 (Source: VDOT)

The serious Injury five-year average counts declined through 2017, but they have increased since then following statewide trends as shown in figure 13. The overall 11-year trend is downward, however, the trend is upward for the last five years of data.

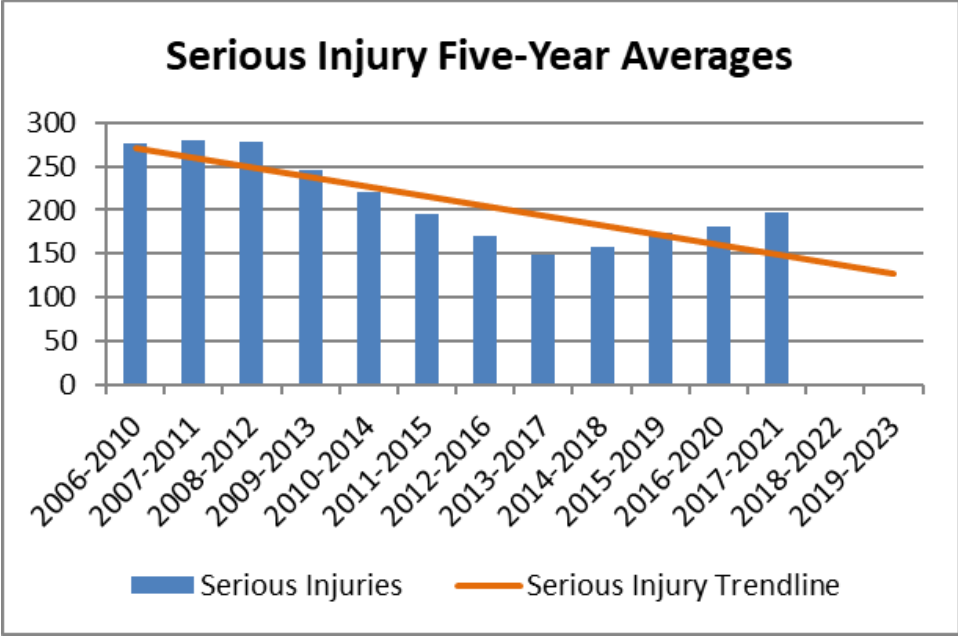


Figure 13: TCAMPO Five-Year Average Serious Injuries, 2010-2020 (Source: VDOT)

The bicyclist and pedestrian fatality and serious injury five-year average measure, shown in figure 14, has also been increasing over the eleven- and five-year periods. The increase has been in serious injuries and not fatalities.

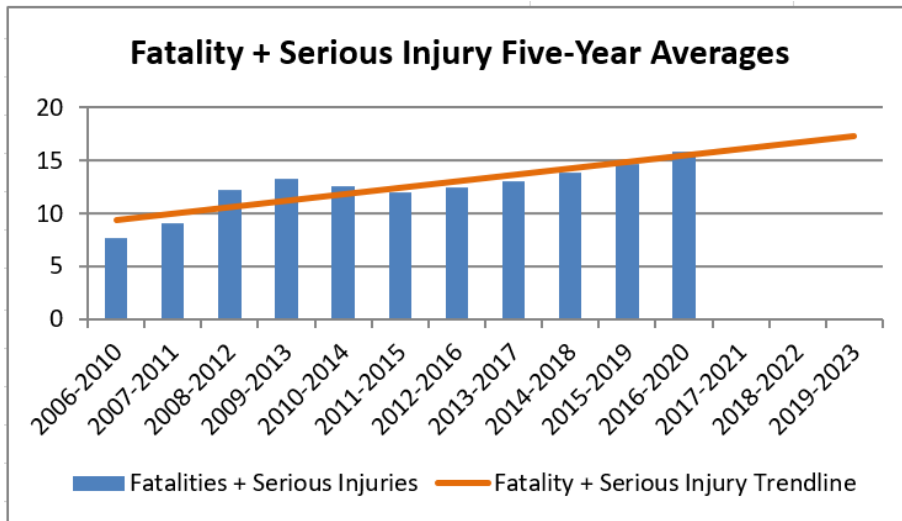


Figure 14: TCAMPO Bicyclist and Pedestrian Five-Year Average Fatalities and Serious Injuries, 2010-2020 (Source: VDOT)

Figure 15 shows the 2023 targets for total crashes per 100 million vehicle miles traveled (VMT) for MPOs/TPOs in Virginia. The TCAMPO target for 2023 is 160 crashes per 100 million vehicle miles traveled.

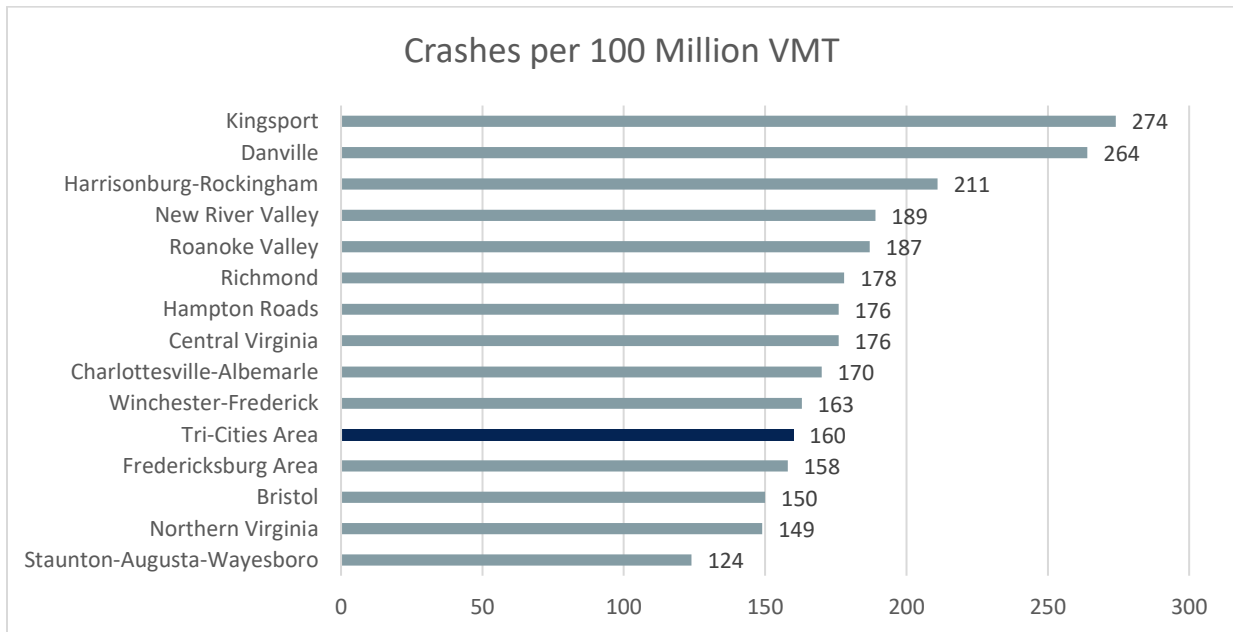


Figure 15: Crashes per 100 Million Vehicle Miles Traveled (Source: VDOT)¹³

¹³ Note: For multi-state MPOs, only crashes within Virginia are represented in this data.

Similarly, figure 16 shows the 2023 targets for fatal crashes per 100 million VMT for MPOs/TPOs in Virginia. TCAMPO has a fatal crash rate target of 1.50 fatal crashes per 100 million vehicle miles traveled.

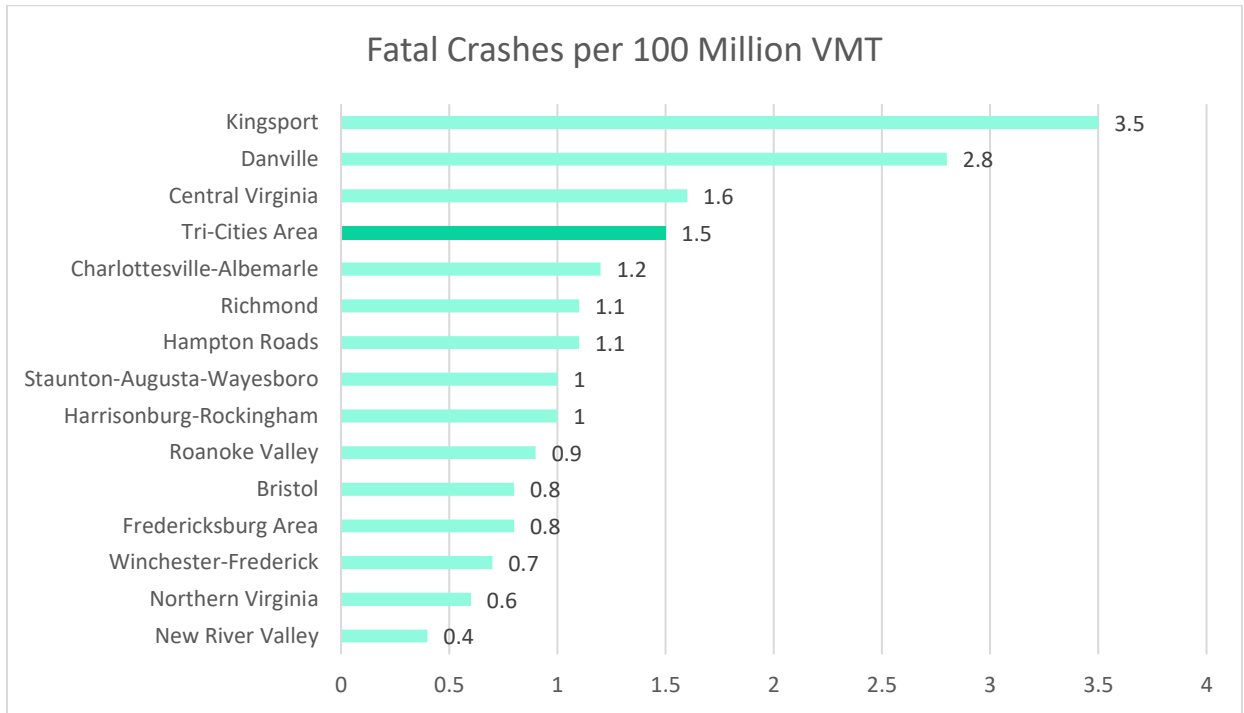


Figure 16: Fatal Crashes per 100 Million Vehicle Miles Traveled (Source: VDOT)¹⁴

Over the last five years in the TCAMPO, a total of 847 KA crashes resulted in 1,078 people died or were seriously injured (needed post-crash medical facility care). With the inclusion of B level crashes, a total of 5,037 people died, or had a serious or minor injury because of a crash.

Table 10: TCAMPO Crashes by Emphasis Area, 2017-2021 (Source: VDOT)

Emphasis Area	Fatal Crashes	Serious Injury Crashes	Minor Injury Crashes	Possible Injury Crashes	Property Damage Only Crashes
TOTAL	82	765	2,731	2,243	7,718
Roadway Departure	22	158	402	144	1,375
Young	7	113	487	385	1,401
Senior	18	134	500	440	1,156
Bicycle	0	5	22	1	1
Pedestrian	11	70	83	23	0
Motorcycle	12	63	70	16	35
Speeding	38	209	641	254	1,541
Occupant Protection	37	171	292	98	255

¹⁴ Note: For multi-state MPOs, only crashes within Virginia are represented in this data.

Emphasis Area	Fatal Crashes	Serious Injury Crashes	Minor Injury Crashes	Possible Injury Crashes	Property Damage Only Crashes
Intersection	31	411	1,592	1,860	4,188
Impaired	32	268	703	585	1,875

Figure 17 below shows KAB crashes by year, from 2017-2021. Between 10 and 27 fatal crashes occurred each year, while serious injuries show wider ranges of between 120 and 174 per year. 2021 has the highest fatal and serious injury crashes, and 2017 has the highest minor injury crash total.

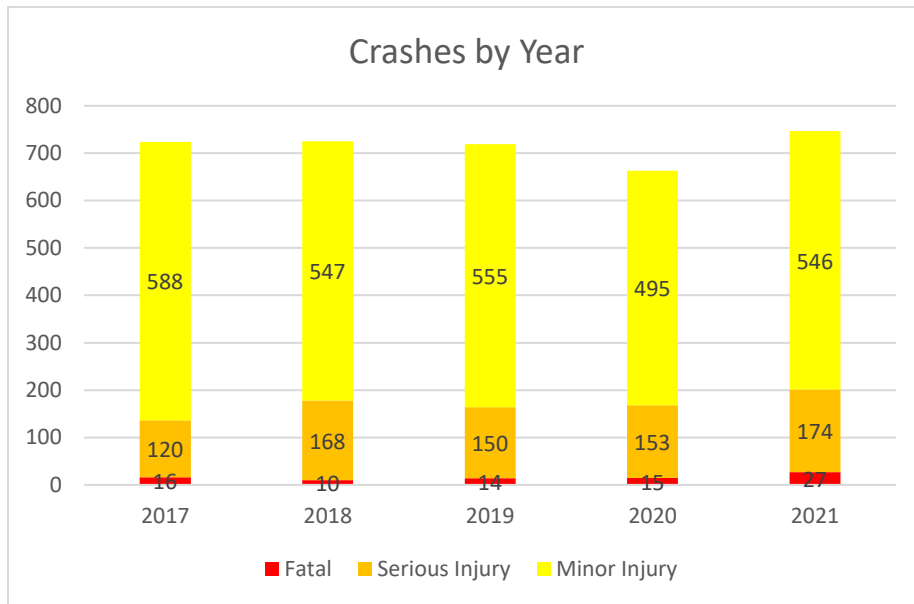


Figure 17: KAB Crashes in TCAMPO by Year, 2017-2021 (Source: VDOT)

Figure 18 below shows the distribution of KAB crashes by hour of day. Compared to figure 8, shown earlier in this document, similar peaks are observed during rush hour periods. The hours of 3:00pm to 4:00pm, 4:00pm to 5:00pm, and 5:00pm to 6:00pm account for 7.5, 7.7, and 8.4 percent of KAB crashes respectively. Comparatively, at the Tri Cities Region level, the same single-hour periods account for 7.3, 7.9, and 9.4 percent of KAB crashes. For the TCAMPO area the morning rush hour peak is observed from 8:00am to 9:00am – this hour accounts for 3.8 percent of KAB crashes. The morning rush hour peak for the Tri Cities Region occurs from 7:00am to 7:59am, when 5 percent of crashes occur.

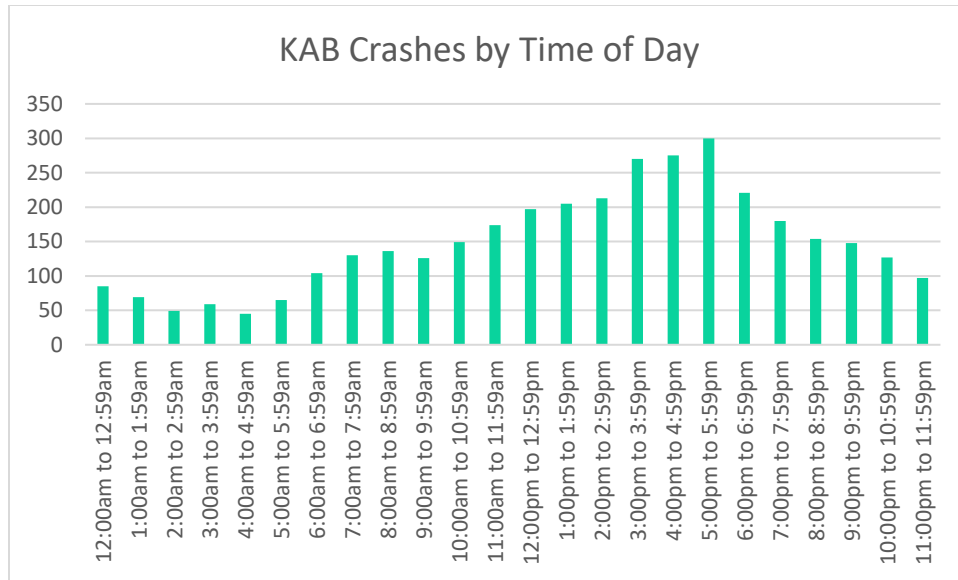


Figure 18: KAB Crashes by Time of Day, TCAMPO 2017-2021 (Source: VDOT)

Below, a pie chart shows the breakdown of KAB crashes by daytime hours versus nighttime hours. Nighttime hours are defined as being between 9:00PM and 5:59PM. As compared to the chart shown earlier in the document, there were 12 percent more nighttime crashes in TCAMPO as compared to the Tri Cities region. With 30 percent of crashes occurring during nighttime hours, the TCAMPO should emphasize safety improvements that reduce nighttime crashes.

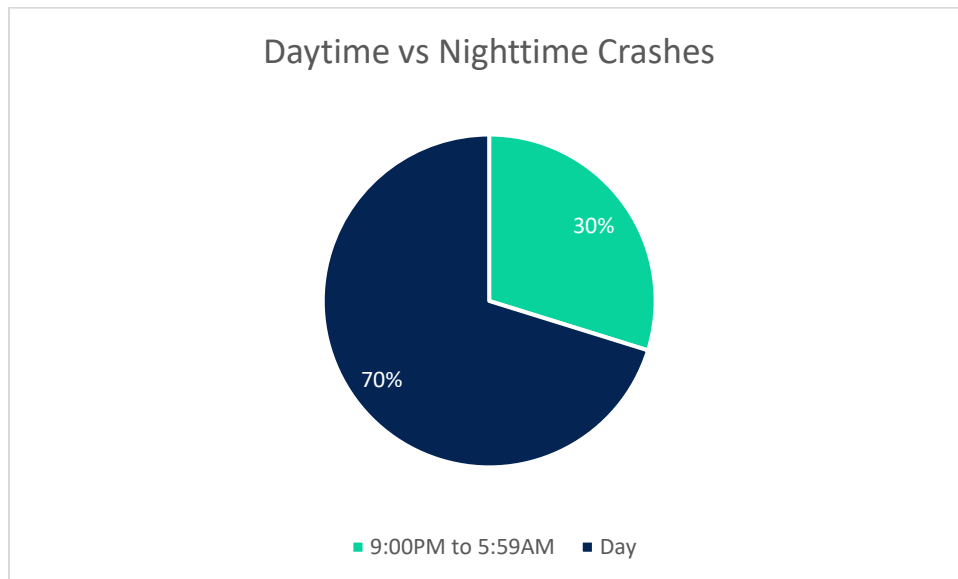


Figure 19: Daytime vs Nighttime KAB Crashes, TCAMPO 2017-2021 (Source: VDOT)

Key Highlights

Below, table 11 shows the KAB cross-matrix for the TCAMPO. Similar to the Tri-Cities Region, the three highest involved emphasis areas are intersection, impaired driving, and speeding.

TCAMPO – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant Protection	Intersection	Impaired
Total – 3,578 ¹⁵	582	607	652	27	164	145	888	500	2,034	1,003
Roadway Departure		12%	8%	0%	0%	18%	27%	25%	5%	20%
Young	13%		10%	22%	7%	10%	17%	15%	17%	14%
Senior	9%	11%		19%	12%	21%	12%	14%	21%	13%
Bicycle	0%	1%	1%		0%	1%	0%	0%	1%	0%
Pedestrian	0%	2%	3%	0%		0%	2%	1%	6%	6%
Motorcycle	4%	2%	5%	4%	0%		4%	0%	4%	2%
Speeding	41%	25%	16%	11%	10%	22%		43%	18%	29%
Occupant Protection	21%	12%	11%	0%	3%	1%	24%		13%	20%
Intersection	16%	57%	64%	74%	73%	51%	40%	53%		56%
Impaired	34%	23%	20%	7%	38%	16%	33%	41%	28%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

Table 11: KAB Crash Proportion by Emphasis Area, TCAMPO, 2017-2021 (Source: VDOT)

High Injury Network and Health Opportunity Index

Below, figure 20 shows the KAB HIN for TCAMPO. The cities of Petersburg, Hopewell and Colonial Heights are observed as having low Health Opportunity Index and significant overlap between these census tracts and the KAB HIN.

¹⁵ The 3,578 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.

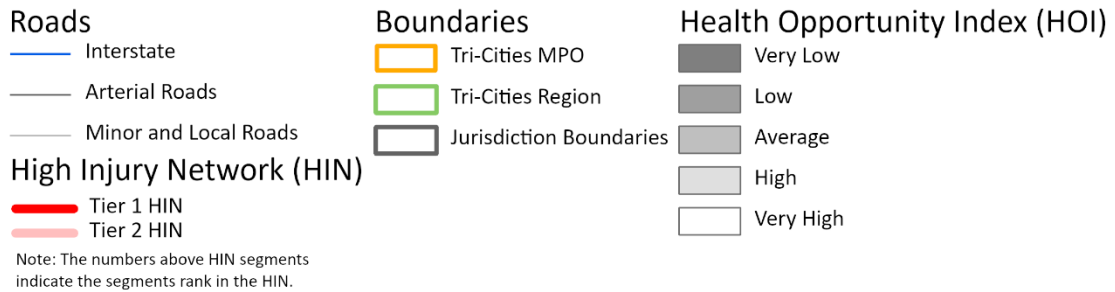
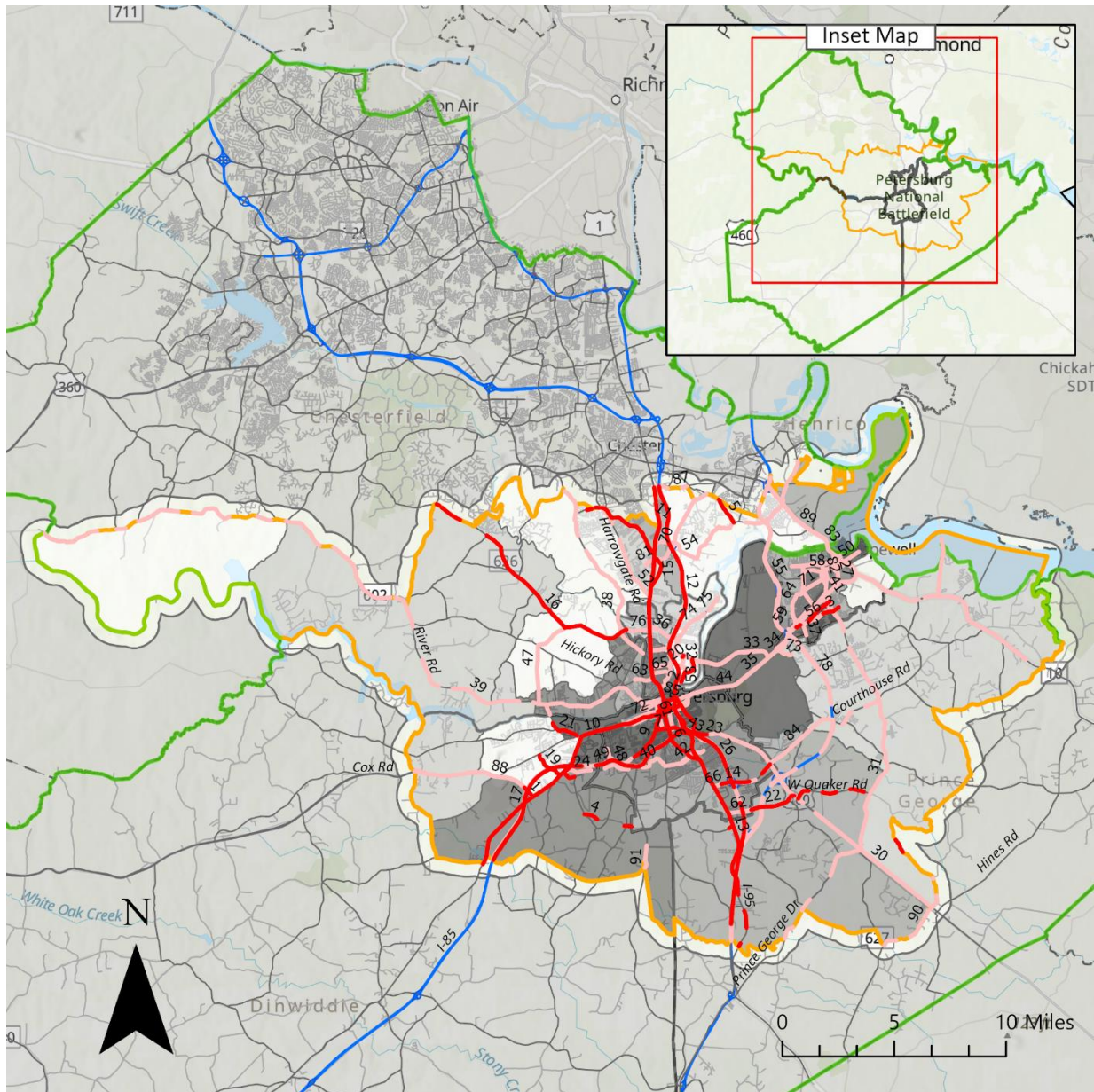


Figure 20. TCAMPO KAB HIN, 2017-2021 (Source: VDOT)

TCAMPO High Injury Network Segments and Corridors

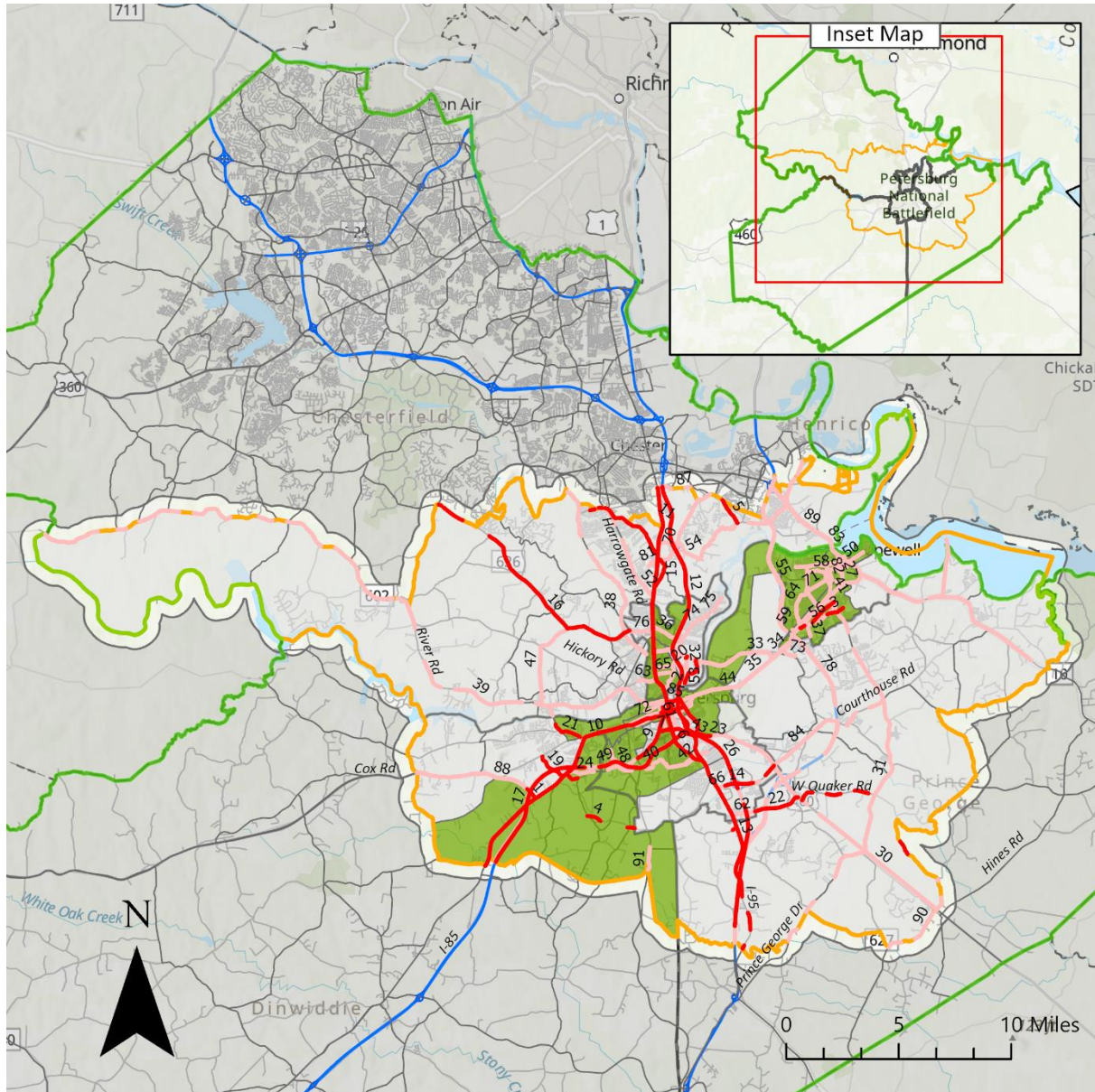
Below, table 12 shows the top ten KAB HIN network segments and corridors within the TCAMPO. The top ten segments and corridors are a total length of 27.49 miles and range from 0.45 to 17.20 miles in length. Across these ten roads, there were 19 fatal, 77 serious injury, and 247 minor injury crashes. US-1N extends across the entire TCAMPO and accounts for 62 percent of the length, 52 percent of fatal, 59 percent of serious injuries, and 58 percent of minor injury crashes among these top ten segments and corridors. The TCAMPO HIN network accounts for 78 percent of all KAB injuries and 19 percent of all road miles within the MPO.

Table 12. TCAMPO KAB HIN, 2017-2021 (Source: VDOT)

ROUTE NAME	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL MINOR INJURY	TOTAL KAB CRASHES
BUS US-460W (BOYDTON PLANK RD TO NEAR PLANE DR)	208	2	0.45	1	4	1	6
SOUTHPARK BLVD (E ROSLYN RD TO CHARLES H DIMMOCK PKWY)	947	9	0.47	0	3	36	39
COURTHOUSE RD (OAKLAWN BLVD TO REAVES LN AND BERRY ST TO NEAR MARYVILLE AVE)	1195	16	0.75	1	1	4	6
FLANK RD (CHURCH RD TO NEAR VAUGHN RD)	1095	18	0.78	1	0	2	3
SC-617N (ENON CHURCH RD TO NEAR REBEL RD/DIGE DR)	228	21	0.99	1	2	9	12
S. SYCAMORE ST (E WYTHE TO S CRATER RD)	186	19	2.24	2	7	14	23
UR-9012E (HALIFAX ST TO S CRATER RD)	988	22	1.40	1	5	9	15
GRANBY ST (COURTHOUSE RD TO ARLINGTON RD)	1208	23	1.07	1	0	5	6
HALIFAX ST (W TABB ST TO HALIFAX RD)	977	29	2.15	1	9	23	33
US-1N (FULL EXTENT OF TCAMPO)	168	39	17.20	10	46	144	200
TOTAL			27.49	19	77	247	343

TCAMPO High Injury Network and Transportation Disadvantaged Index

Below, figure 21 shows a map of the KAB HIN overlaid with the USDOT Transportation Disadvantaged Index for the Tri-Cities MPO. Overlap is observed among census tracts in Dinwiddie County, and the Cities of Petersburg, Hopewell, and Colonial Heights.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Trans. Disadvantaged Index

- Not Disadvantaged
- Disadvantaged

High Injury Network (HIN)

- Tier 1 HIN
- Tier 2 HIN

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 21. TCAMPO KAB HIN and Trans. Disadvantaged Index (Source: VDOT)

Pedestrian Safety Action Plan Corridors

Below, figures 22 and 23 show the District and Statewide PSAP corridors within the Tri-Cities MPO limits. Except for short segments in Dinwiddie and Prince George Counties, District PSAP corridors are mostly located in the Cities of Petersburg, Hopewell, and Colonial Heights. The Statewide corridors are distributed similarly. Again, strong overlap is observed between low HOI census tracts and Statewide PSAP corridors. Table 13 shows PSAP corridor summary of miles within TCAMPO, broken down by jurisdiction. District prioritized corridors provide focus to locations needing local attention, while the state prioritized corridors is broader comparison identifying more needs.

Table 13. TCAMPO PSAP (3.0) Corridor Miles Summary (Source: VDOT)

PSAP CORRIDOR PRIORITY	CHESTERFIELD	DINWIDDIE	PRINCE GEORGE	COLONIAL HEIGHTS	HOPEWELL	PETERSBURG
DISTRICT 1%	0.02	--	--	1.85	1.83	2.27
DISTRICT 5%	5.28	0.75	0.37	12.50	9.60	21.65
STATEWIDE 1%	0.98	--	--	3.03	4.73	6.58
STATEWIDE 5%	6.92	3.36	4.40	10.22	11.25	29.57

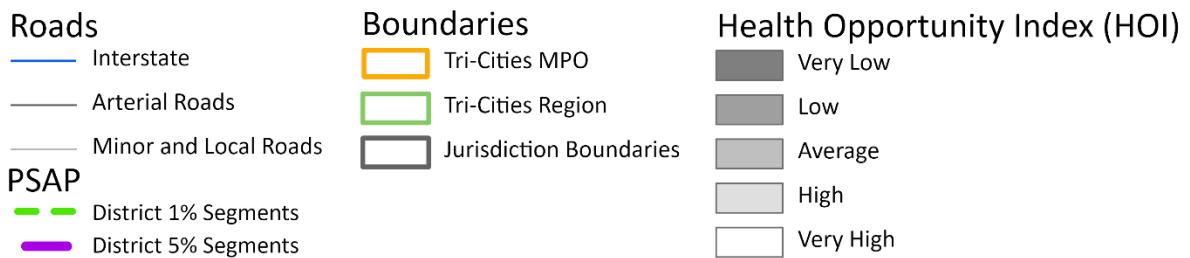
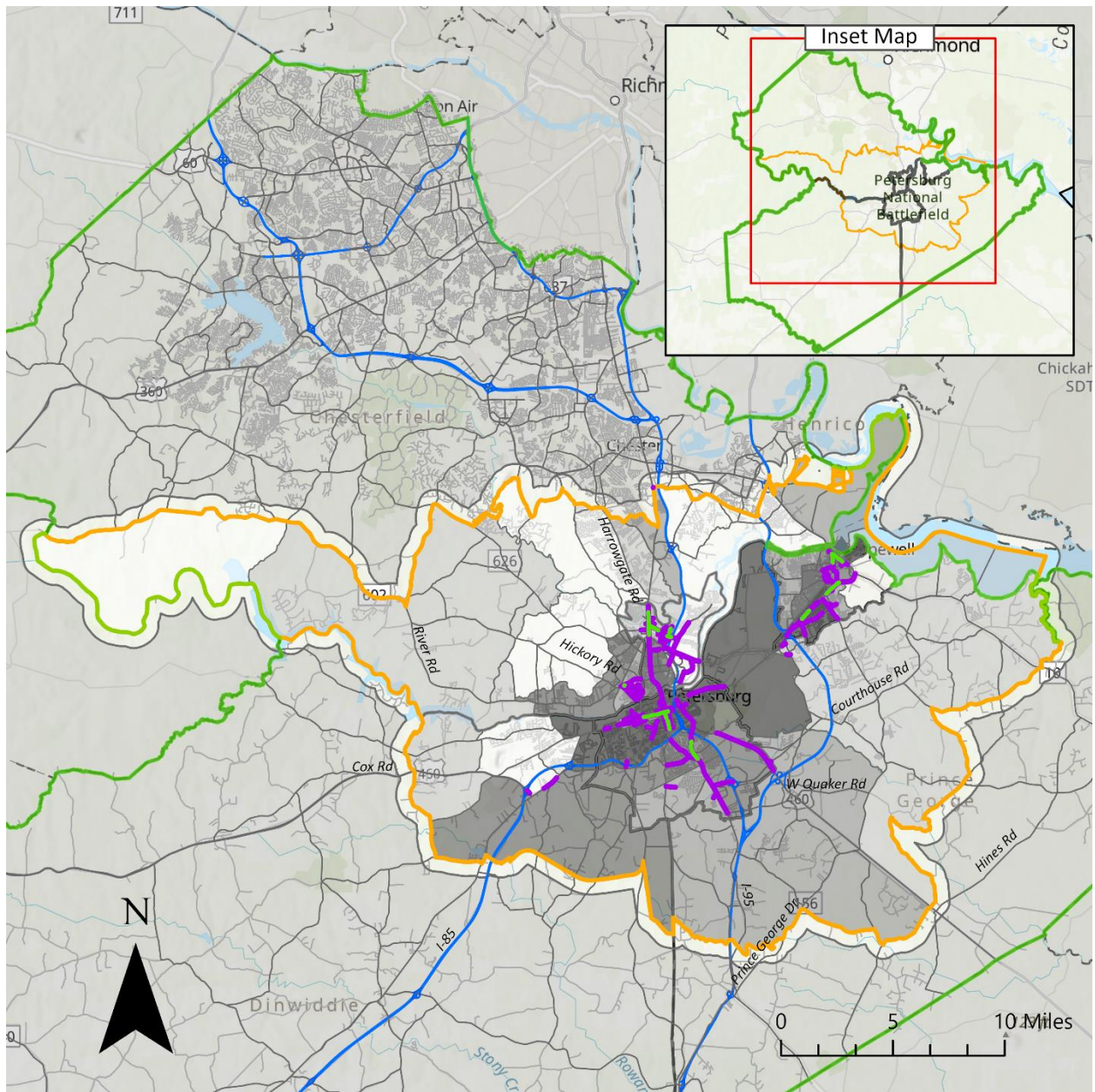


Figure 22. TCAMPO District PSAP Segments (Source: VDOT)

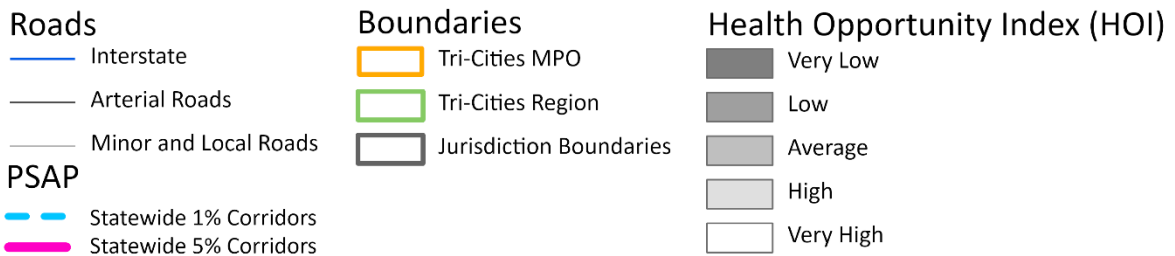
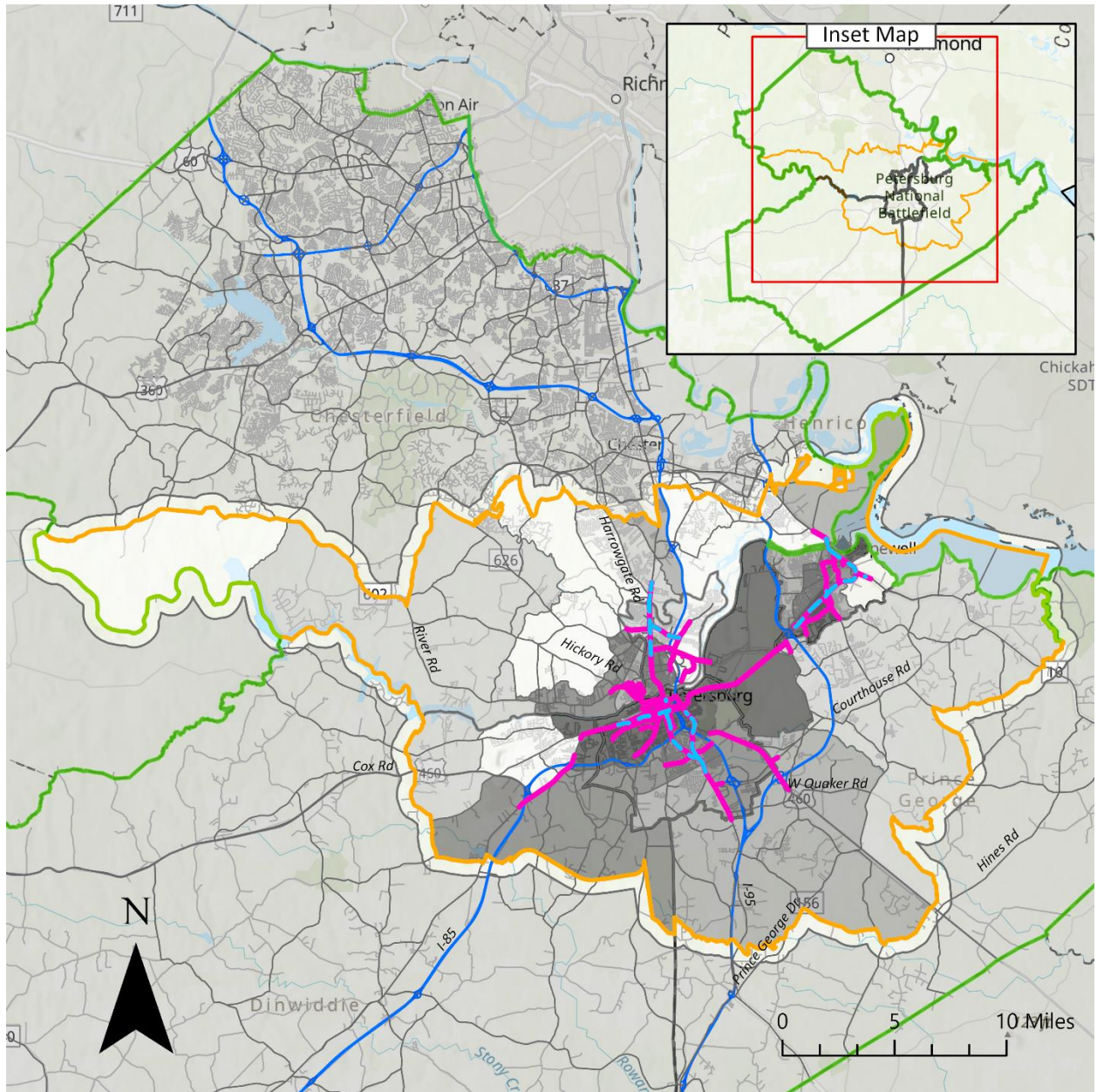


Figure 23. TCAMPO Statewide PSAP Corridors (Source: VDOT)

Jurisdictional Safety Assessments

The following sections show a separate data analysis for each incorporated jurisdiction, including the cross-representation of crash factors based on emphasis areas from Virginia’s 2022-2026 SHSP. These proportions inform the focus of Safe System efforts and collaboration between the 5Es to identify and prioritize actions. These sections also include the HIN maps and tables listing route segment names, lengths, and their weighted scores to inform resources and efforts. Similarly, the PSAP maps show priority corridors for vulnerable users and how they rank based on a regional and statewide levels of comparison. Mitigating the most severe crashes on the identified route segments help to reduce the likelihood of other possible injury and property damage crashes and their associated economic costs.

Table 14 shows the summary of KAB crashes over the last five years by emphasis area for the counties of Chesterfield, Dinwiddie, and Prince George. For each county, the ‘TCAMPO’ column shows the crashes that occurred within the TCAMPO, and the Tri-Cities Region column shows the crashes that occurred outside of the Tri-Cities limits.

Table 14: Tri-Cities Region vs TCAMPO KAB Crashes by Emphasis Area, 2017-2021 (Source: VDOT)

Emphasis Area	Chesterfield County– KAB Crashes		Dinwiddie County– KAB Crashes		Prince George County- KAB Crashes	
	TCAMPO	Tri Cities Region	TCAMPO	Tri Cities Region	TCAMPO	Tri Cities Region
Total Crashes	760	5,778	319	480	519	210
Roadway Departure	144	623	81	277	128	101
Young	142	1,177	62	79	82	27
Senior	139	1,135	66	79	96	30
Bicycle	9	35	1	0	0	1
Pedestrian	32	181	5	4	9	5
Motorcycle	43	178	8	15	26	11
Speeding	186	1,238	98	143	95	51
Occupant Protection	94	541	59	123	68	39
Intersection	327	3,451	161	91	209	40
Impaired	203	1,457	74	138	174	67

Table 15 shows the same table for the cities of Colonial Heights, Hopewell, and Petersburg, without a region column. The Tri-Cities MPO boundary encompasses the entirety of the cities of Colonial Heights, Hopewell, and Petersburg.

Table 15. TCAMPO-Cities KAB Crashes by Emphasis Areas, 2017-2021 (Source: VDOT)

Emphasis Area	City of Colonial Heights	City of Hopewell	City of Petersburg
Total Crashes	498	674	808
Roadway Departure	47	52	130
Young	99	96	126
Senior	102	120	129
Bicycle	6	7	4
Pedestrian	16	32	70
Motorcycle	16	22	30
Speeding	96	140	273
Occupant Protection	61	100	118
Intersection	265	613	459
Impaired	147	160	245

Section 2: Chesterfield County Crash Analysis

Key Highlights

Table 16 shows the emphasis area cross-matrix table for KAB crashes in Chesterfield County (including the areas outside the MPO boundaries). The three emphasis areas with the highest involvement are intersections, impaired driving, and speeding -- Chesterfield County should consider safety improvements that reduce KAB crashes in these emphasis areas.

- In pedestrian involved crashes, 37 percent of drivers were impaired
- In occupant protection crashes, 42 percent of KAB crashes involved a speeding driver and 44 percent involved an impaired driver
- In roadway departure crashes, 44 percent involved a speeding driver

Table 16: Chesterfield County KAB Crashes, 2017-2021 (Source: VDOT)

Chesterfield – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant Protection	Intersection	Impaired
Total - 6,538 ¹⁶	767	1,319	1,274	44	213	221	1,424	635	3,742	1,660
Roadway Departure		9%	5%	0%	0%	15%	24%	27%	2%	18%
Young	15%		12%	25%	7%	12%	21%	22%	22%	17%
Senior	9%	12%		16%	12%	13%	13%	13%	23%	13%
Bicycle	0%	1%	1%		0%	0%	0%	0%	1%	0%
Pedestrian	0%	1%	2%	2%		0%	2%	1%	3%	5%
Motorcycle	4%	2%	2%	2%	0%		4%	0%	3%	2%
Speeding	44%	23%	15%	7%	13%	23%		42%	13%	28%
Occupant Protection	23%	11%	6%	0%	4%	0%	19%		8%	17%
Intersection	8%	61%	66%	66%	58%	53%	34%	45%		50%
Impaired	38%	21%	18%	7%	37%	16%	33%	44%	22%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

Chart example: 15 percent of motorcycle crashes involved a roadway departure.

High Injury Network and Health Opportunity Index

Figure 24 below shows the KAB HIN and HOI for Chesterfield County. Half of the top ten segments and corridors for the Tri-Cities Region are found within Chesterfield County. Safety improvements should be focused on those roads that are identified in the KAB HIN.

¹⁶ The 6,538 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.

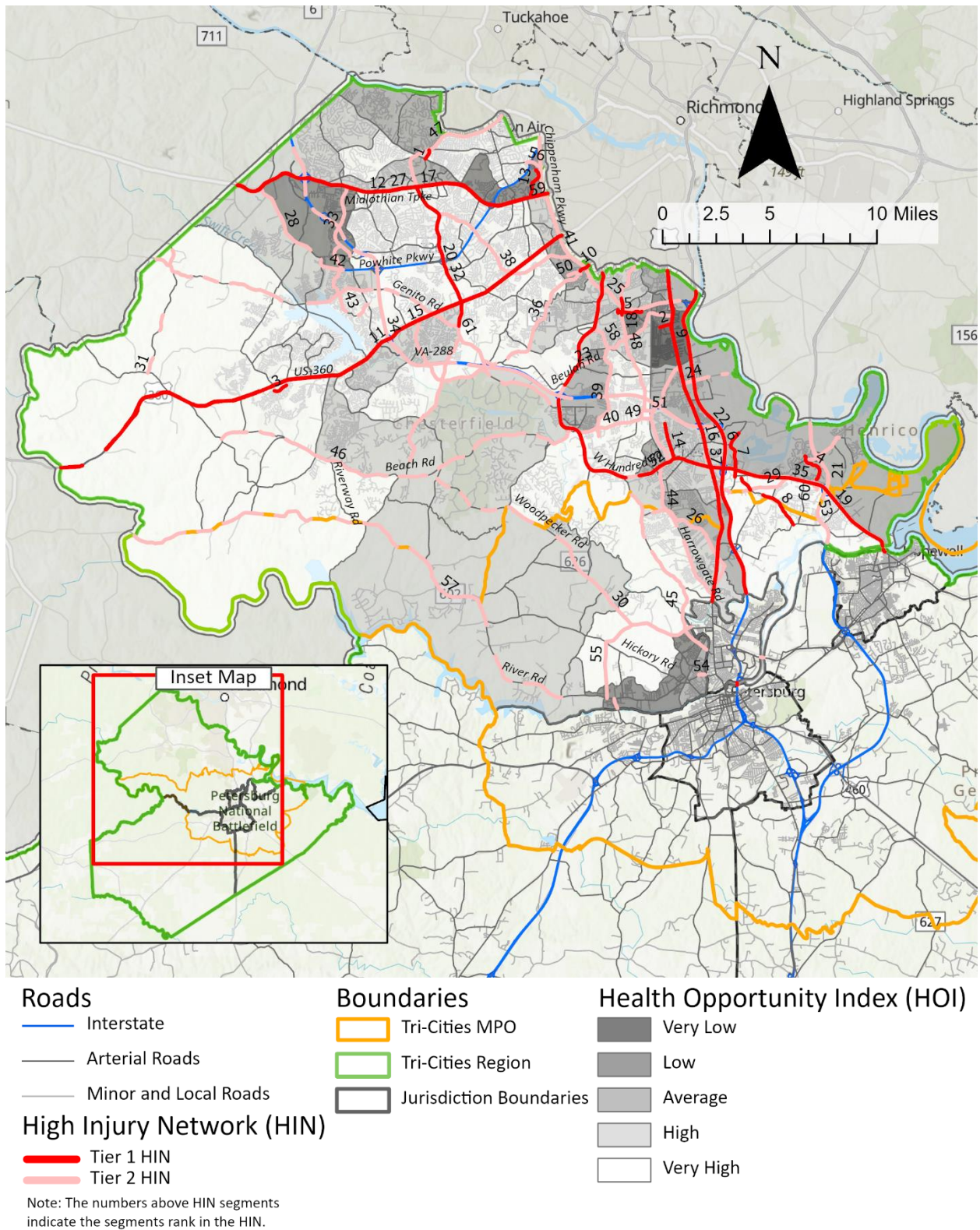


Figure 24: Chesterfield County KAB HIN and HOI, 2017-2021 (Source: VDOT)

Chesterfield County High Injury Network Segments and Corridors

Below, table 17 shows the top ten HIN segments within Chesterfield County. Segment and corridor range from 0.38 to 11.98 miles in length. The length of the top ten segments is 31.51 miles long, and from 2017-2021 there were 27 fatal crashes, 76 serious injury crashes, and 390 minor injury crashes on these roads. The Chesterfield County HIN accounts for 70 percent of all KAB injuries, and only 14 percent of all road miles in the county. The 'Tri-Cities Region Rank' column shows the ranking of these segments at the Tri-Cities Region level. For instance, the Hampton Park Dr segment is the third highest ranking segment in Chesterfield County, but at the Tri-Cities region level it is the fourth highest ranking segment. Five of these top ten segments and corridors are also top ten segments in the Tri-Cities Region.

Table 17: Chesterfield County KAB HIN, 2017-2021 (Source: VDOT)

ROUTE NAME	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL MINOR INJURY	TOTAL KAB CRASHES
CRANKBECK RD <i>(ROBLOUS RD TO W HUGUENOT RD)</i>	294	1	0.38	1	1	4	6
SWINEFORD RD <i>(JEFFERSON DAVIS HWY TO WESTERN EXTENT OF SWINEFORD)</i>	489	3	0.46	1	0	3	4
HAMPTON PARK DR <i>(NEAR ASHBROOK PKWY TO OTTERDALE RD)</i>	767	4	0.53	1	0	3	4
N KINGSTON AVE <i>(BERMUDA HUNDRED RD TO HOGANS ALY)</i>	741	6	1.24	2	1	2	5
MEADOWDALE BLVD <i>(THE PARK AT LAKEWOOD TO HOLLYWOOD DR)</i>	351	8	1.03	1	1	23	25
I-95S <i>(FULL EXTENT WITHIN CHESTERFIELD CO.)</i>	49	21	11.98	10	38	165	213
OLD STAGE RD <i>(WARE BOTTOM SPRING RD TO NEAR COXENDALE RD)</i>	335	11	1.80	2	1	5	8
RAMBLEWOOD DR <i>(ENON CHURCH RD TO NEAR WARE BOTTOM SPRING RD)</i>	228	12	2.23	2	4	18	24
US-1S <i>(FULL EXTENT WITHIN CHESTERFIELD CO.)</i>	173	24	11.48	7	27	16	190
BELMONT RD <i>(NEAR BELLE POND DR TO NEAR VA-150N)</i>	268	15	0.39	0	3	11	14
TOTAL			31.51 Mi	27	76	390	493

Chesterfield County High Injury Network and Transportation Disadvantaged Index

Below, figure 25 shows a map of the HIN overlaid with the USDOT Transportation Disadvantaged Index. All census tracts that are identified as Transportation Disadvantaged fall north of the TCAMPO limit, closer to the City of Richmond. Several HIN segments are observed in disadvantaged census tracks, including Swineford Rd, Meadowdale Blvd, US-95, US-1, US-60, and Boulders Parkway.

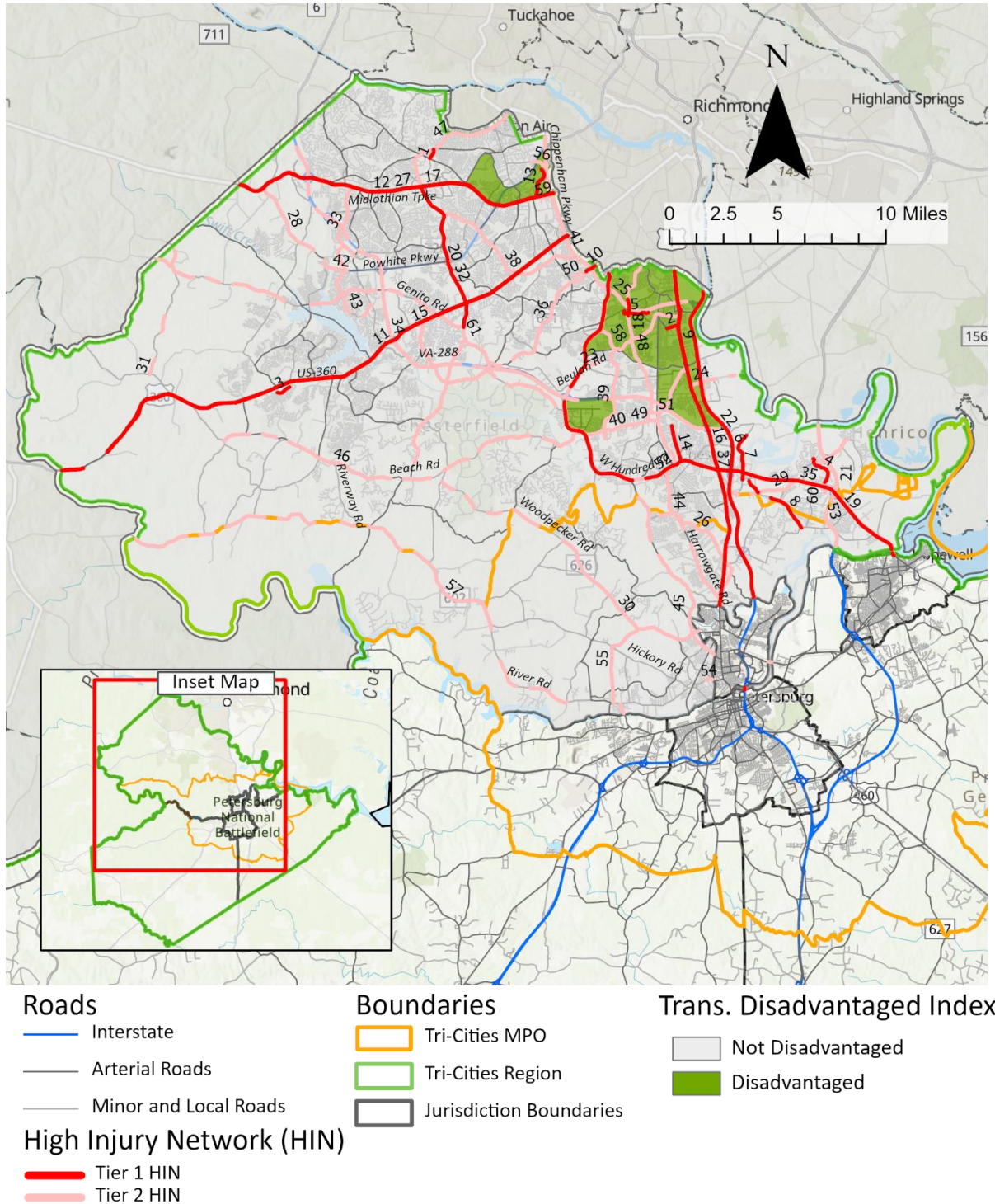


Figure 25. Chesterfield County KAB HIN and Transportation Disadvantaged Census Tracts (Source: VDOT)

Pedestrian Safety Action Plan Corridors

Below, figures 26 and 27 show the District and Statewide PSAP corridors. Comparing the District PSAP map with the KAB HIN map, overlap is observed primarily in the northern part of the county. Overlap is seen on US-360, Huguenot Rd, Boulder Pkwy, and US-1.

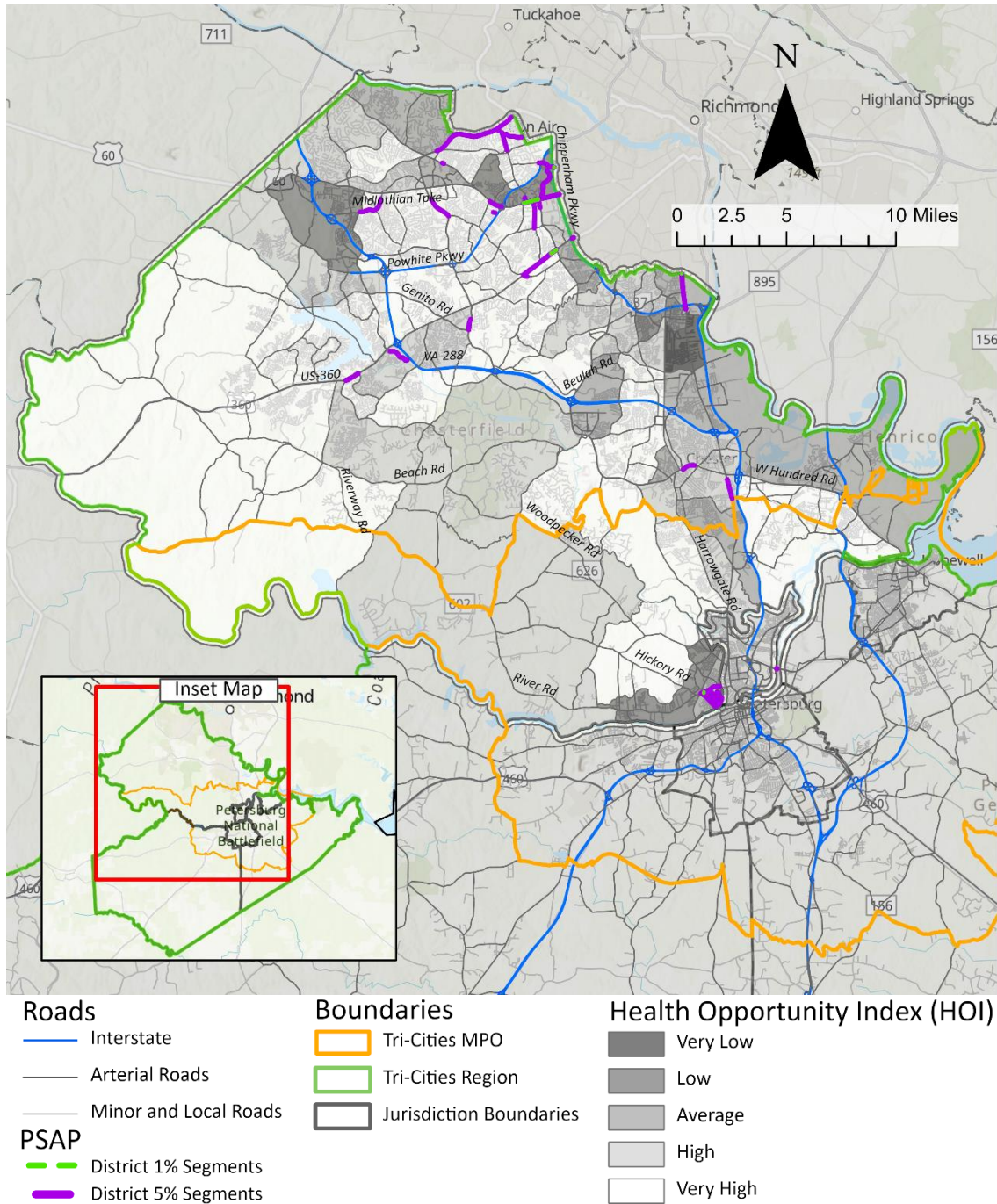


Figure 26: Chesterfield County District PSAP Segments (Source: VDOT)

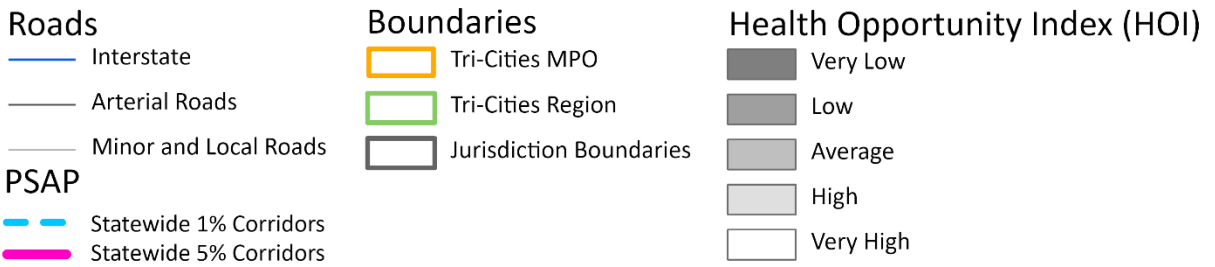
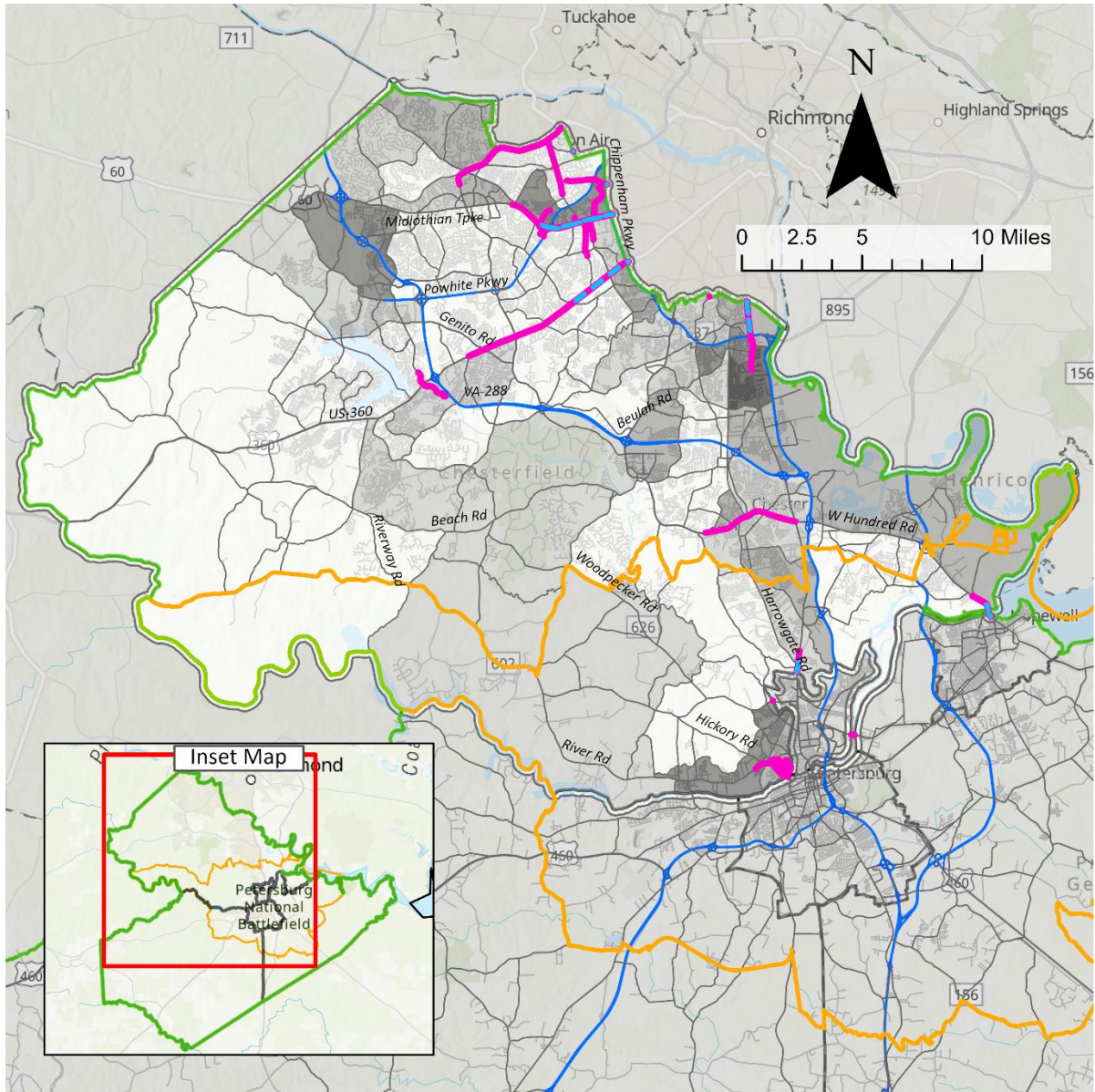


Figure 27: Chesterfield County Statewide PSAP Corridors (Source: VDOT)

Section 3: Dinwiddie County

Key Highlights

Below, table 18 shows the KAB cross-matrix for Dinwiddie County. The three emphasis areas with the highest cross representation in this chart are the intersection, impaired driving, and speeding emphasis areas.

- In motorcycle crashes, 39 percent involved a roadway departure
- In pedestrian involved crashes, 78 percent of crashes involved an impaired driver
- In senior involved crashes, 43 percent of crashes occurred within an intersection
- In roadway departure crashes, 33 percent of crashes involved a speeding driver

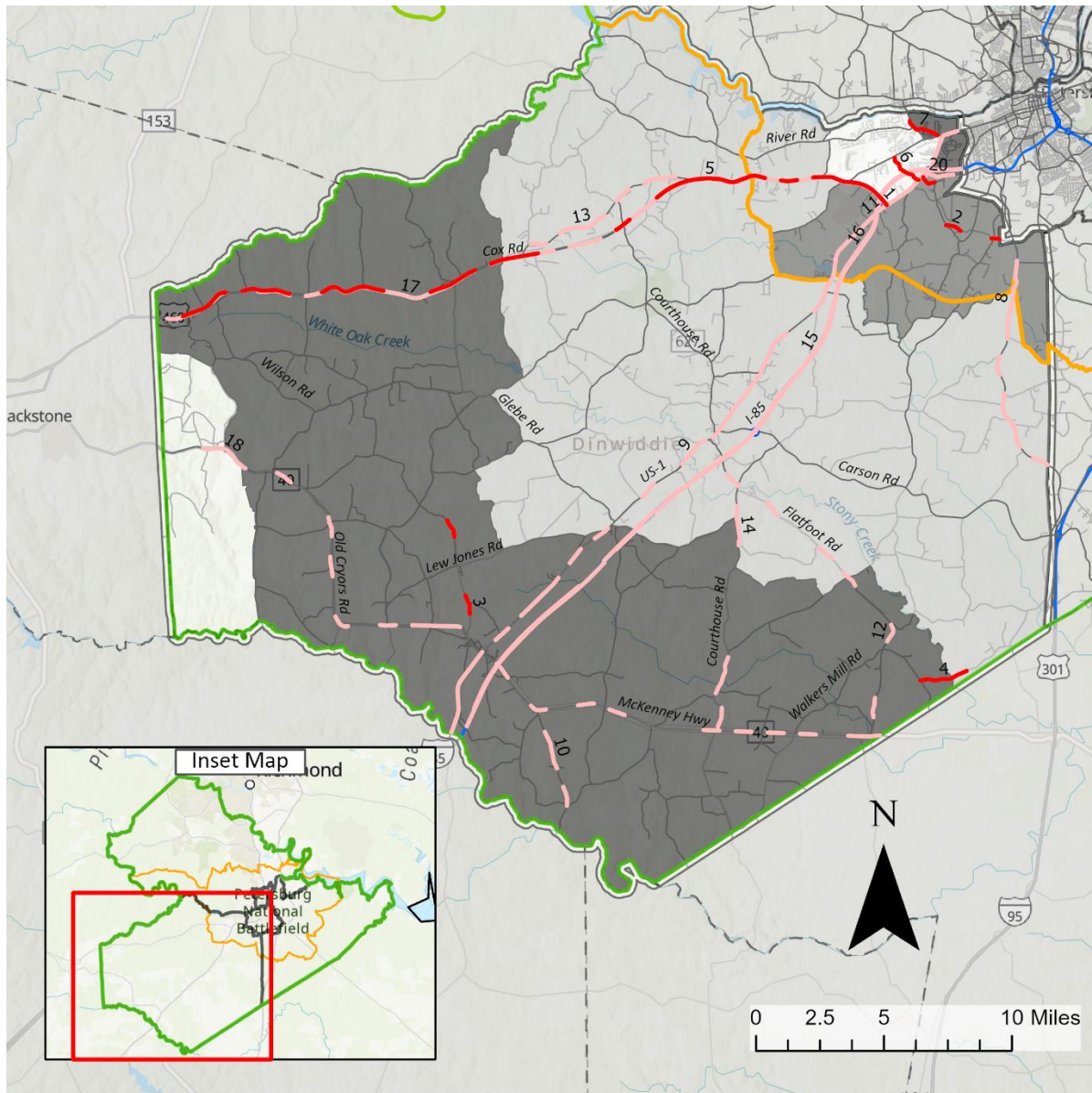
Table 18: Dinwiddie County KAB Cross-matrix, 2017-2021 (Source: VDOT)

Dinwiddie – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant Protection	Intersection	Impaired
Total - 799 ¹⁷	358	141	145	1	9	23	241	182	252	212
Roadway Departure		35%	25%	0%	0%	39%	49%	57%	8%	54%
Young	14%		13%	0%	11%	13%	19%	16%	21%	17%
Senior	10%	13%		0%	0%	17%	9%	11%	25%	12%
Bicycle	0%	0%	0%		0%	0%	0%	0%	0%	0%
Pedestrian	0%	1%	0%	0%		0%	1%	0%	1%	3%
Motorcycle	3%	2%	3%	0%	0%		3%	0%	3%	1%
Speeding	33%	33%	15%	0%	22%	35%		41%	21%	35%
Occupant Protection	29%	21%	14%	0%	0%	0%	31%		19%	35%
Intersection	6%	37%	43%	100%	22%	35%	22%	26%		23%
Impaired	32%	26%	17%	0%	78%	9%	31%	41%	19%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

High Injury Network and Health Opportunity Index

Figure 28 shows the KAB HIN and the Health Opportunity Index for Dinwiddie County. Several KAB HIN segments are observed within “Very Low” Health Opportunity Index census tracts, including Troublefield Rd, US-460, Ferndale Rd, Boydton Plank Rd, Flatfoot Rd, and Courthouse Rd.

¹⁷ The 799 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

High Injury Network (HIN)

- Tier 1 HIN
- Tier 2 HIN

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 28: Dinwiddie County KAB HIN and Health Opportunity Index (Source: VDOT)

Dinwiddie County High Injury Network Segments and Corridors

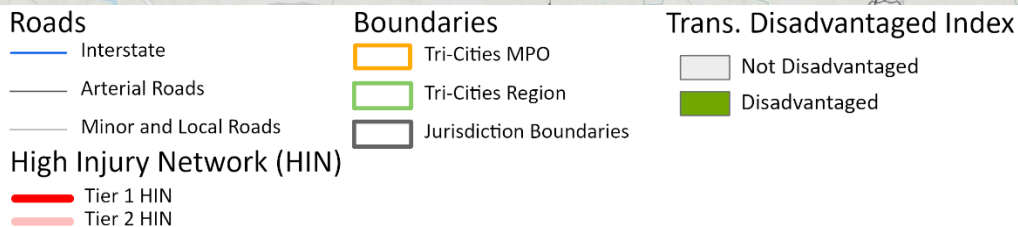
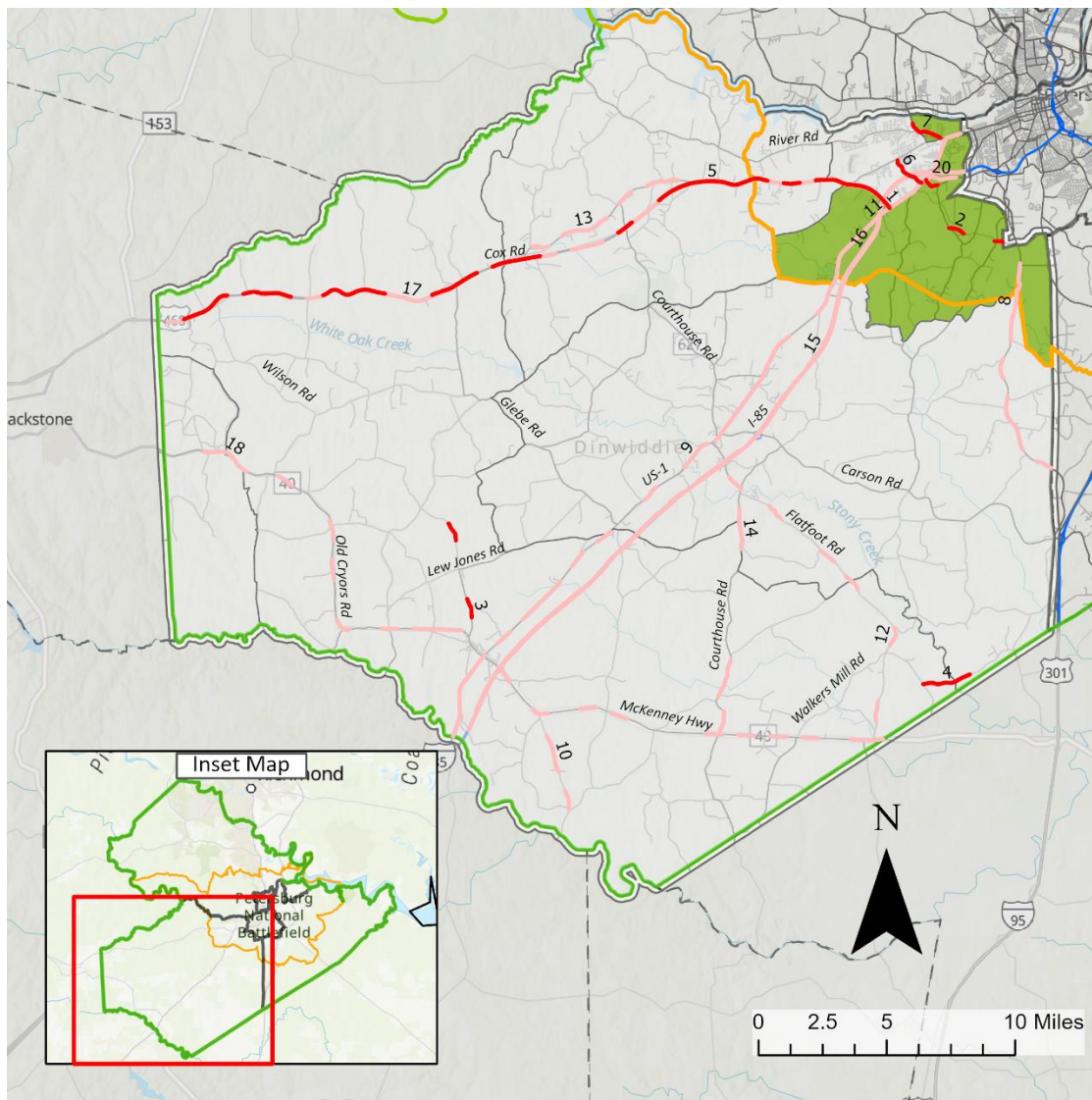
Table 19 below shows the top ten HIN segments and corridors within Dinwiddie County. The total length of these ten segments and corridors is 31.04 miles. These ten streets account for 19 fatalities, 38 incapacitating injuries, and 86 minor injuries, for a total of 143 KAB crashes. The Dinwiddie County HIN accounts for 72 percent of all KAB injuries, and 16 percent of road miles in the county.

Table 19: Dinwiddie County KAB HIN, 2017-2021 (Source: VDOT)

ROUTE NAME	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL MINOR INJURY	TOTAL KAB CRASHES
AIRPORT ST <i>(BOYDTON PLANK RD TO NEAR PLANE DR)</i>	208	2	0.45	1	4	1	6
FLANK RD <i>(CHURCH RD TO NEAR VAUGHN RD)</i>	1095	9	0.78	1	0	2	3
DEPOT RD <i>(NEAR ASHBURY RD TO NEAR OLD WHITE OAK RD)</i>	847	22	1.21	1	0	4	5
TROUBLEFIELD RD <i>(BLACK BRANCH RD TO NEAR SHANDS PARK)</i>	862	30	1.53	1	1	2	4
US-460W <i>(FULL EXTENT IN DINWIDDIE CO.)</i>	206	37	14.99	9	15	42	66
STERLING RD <i>(DELKEITH RD TO CHURCH RD)</i>	824	31	1.57	1	1	3	5
FERNDAL RD <i>(COX RD TO NEAR CROWDER RD)</i>	822	34	1.06	0	9	11	20
HALIFAX RD <i>(NEAR BRICK RD TO CARSON DR)</i>	825	43	5.42	3	6	8	17
US-1S <i>(NEAR KEELERS MILL RD TO NEAR COURTHOUSE RD, AND RITCHIE AVE TO NEAR SIMMONS AVE)</i>	173	24	2.21	1	2	11	14
RAINEY CREEK RD <i>(CUTBANK RD (S. EXTENT) TO NEAR CUTBANK RD (N. EXTENT))</i>	852	59	1.83	1	0	2	3
TOTAL			31.04	19	38	86	143

Dinwiddie County High Injury Network and Transportation Disadvantaged Index

Below, figure 29 shows the KAB HIN overlaid with the USDOT Transportation Disadvantaged Index for Dinwiddie County. All transportation disadvantaged census tracts in Dinwiddie County are within the TCAMPO limits, apart from tract 8405 which cross the boundary. The following HIN segments are found within a transportation disadvantaged census tract: Airport St, Flank Rd, Weakley Rd, US-460, Ferndale Rd, Halifax Rd, and Boydton Plank Road. All these segments are also within the top ten for KAB HIN segments in Dinwiddie County.



Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 29. Dinwiddie County KAB HIN and Trans. Disadvantaged Index (Source: VDOT)

Pedestrian Safety Action Plan Corridors

Figures 30 and 31 below show the District and Statewide PSAP corridors in Dinwiddie County. All District corridors are within the TCAMPO limits. District 5% corridors are found on Airport St and Boydton Plank Rd.

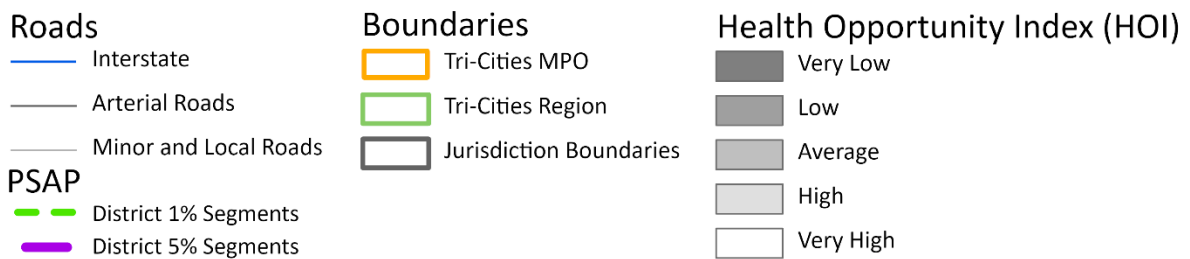
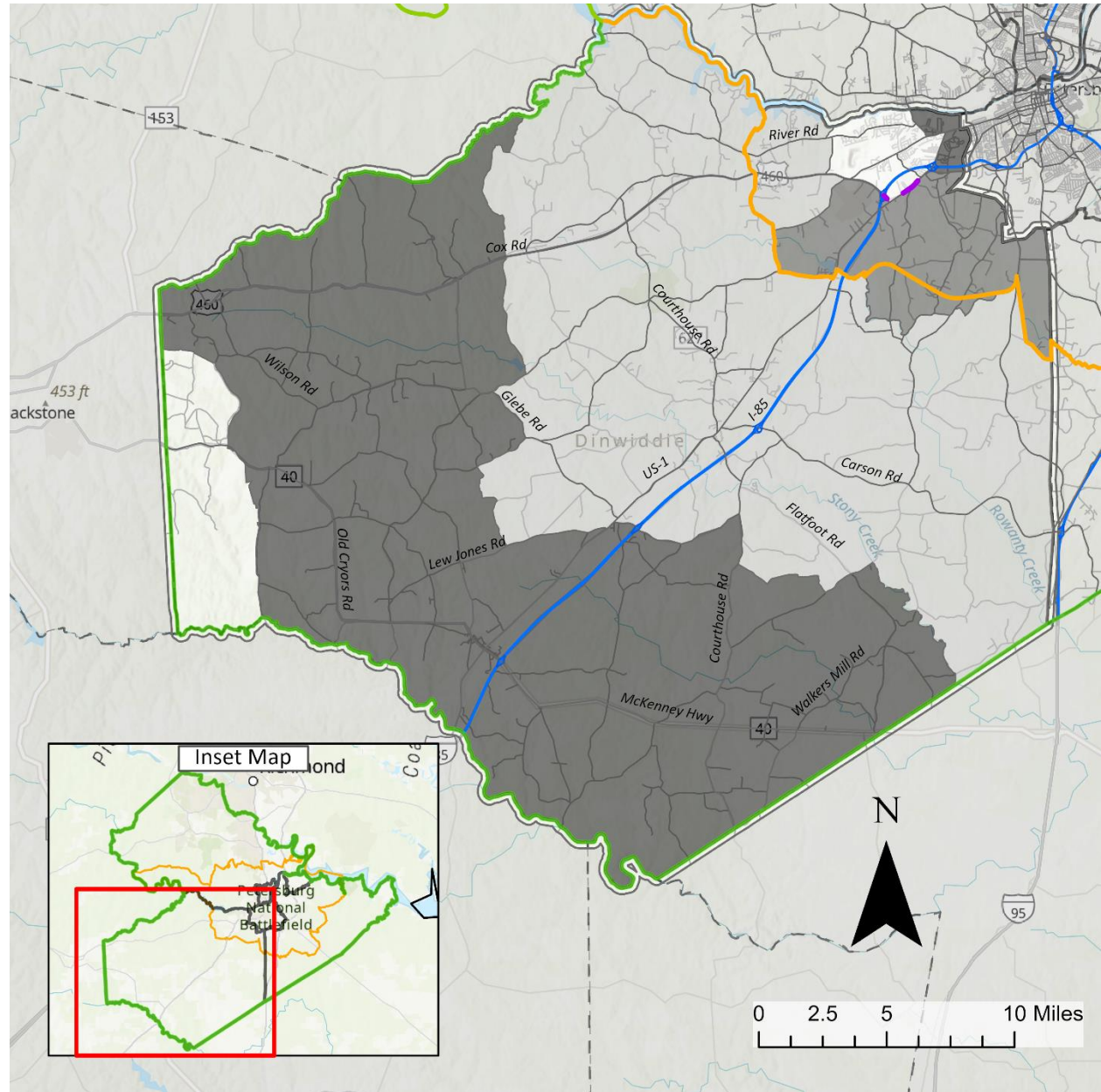


Figure 30. Dinwiddie County District PSAP Segments (Source: VDOT)

Similar to the District corridors, the Statewide corridors are all found within the TCAMPO limits. The Statewide 5% corridors shown on figure 31 are on Boydton Plank Rd and West Washington St.

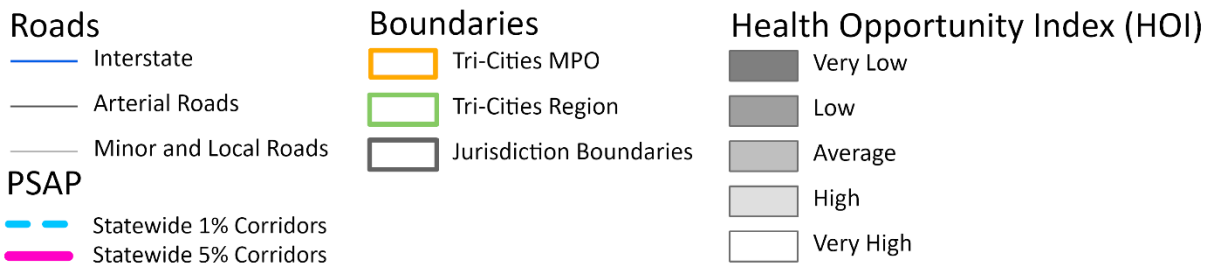
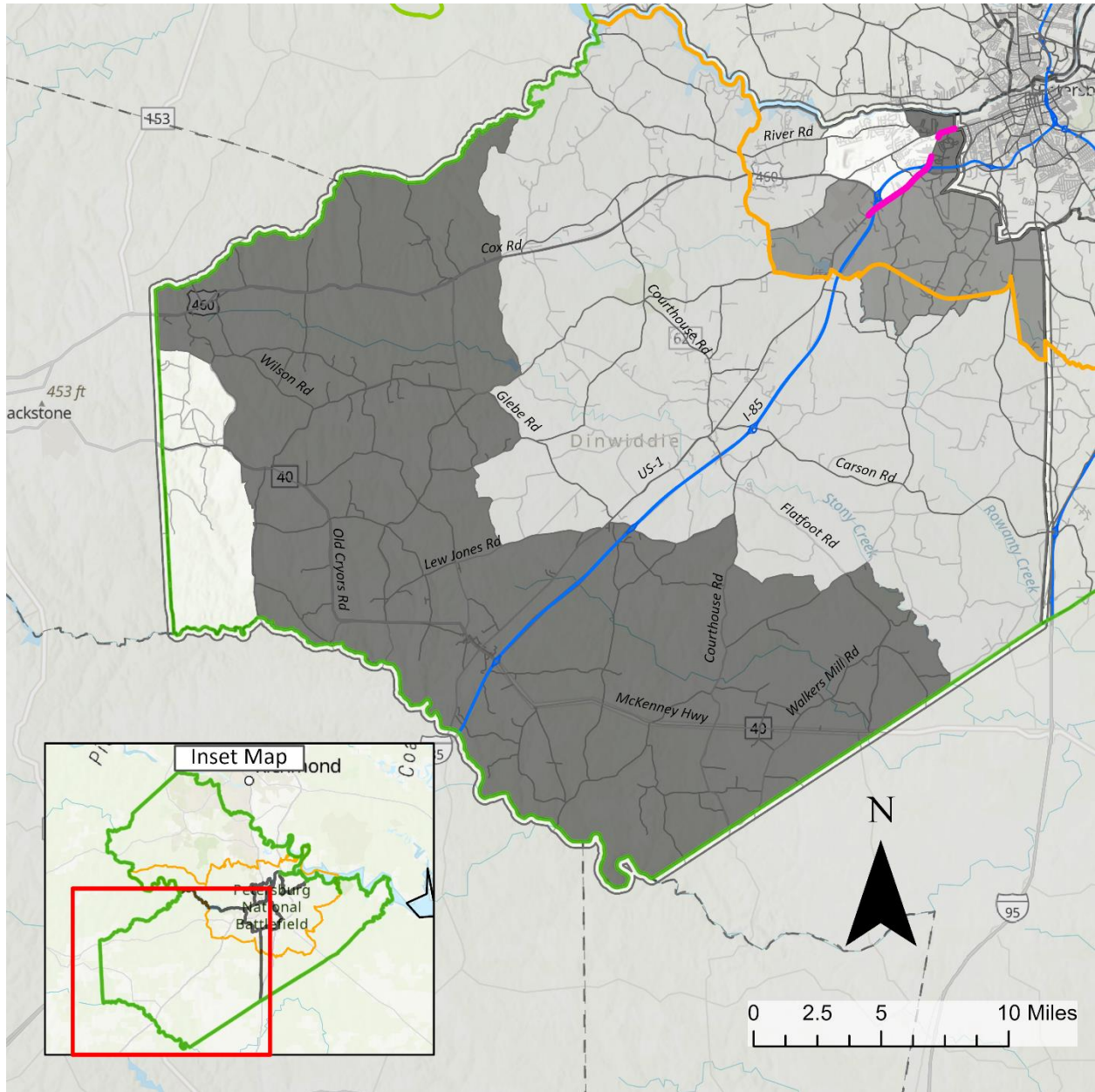


Figure 31: Dinwiddie County Statewide PSAP Corridors (Source: VDOT)

Section 4: Prince George County

Key Highlights

Table 20 below shows the KAB cross-matrix for Prince George County. The intersection, impaired driving, and roadway departure emphasis areas have the highest cross representation for Prince George County.

- In KAB speeding crashes, 45 percent involved a roadway departure
- 51 percent of occupant protection crashes involved an impaired driver
- 37 percent of impaired driving crashes involved a roadway departure

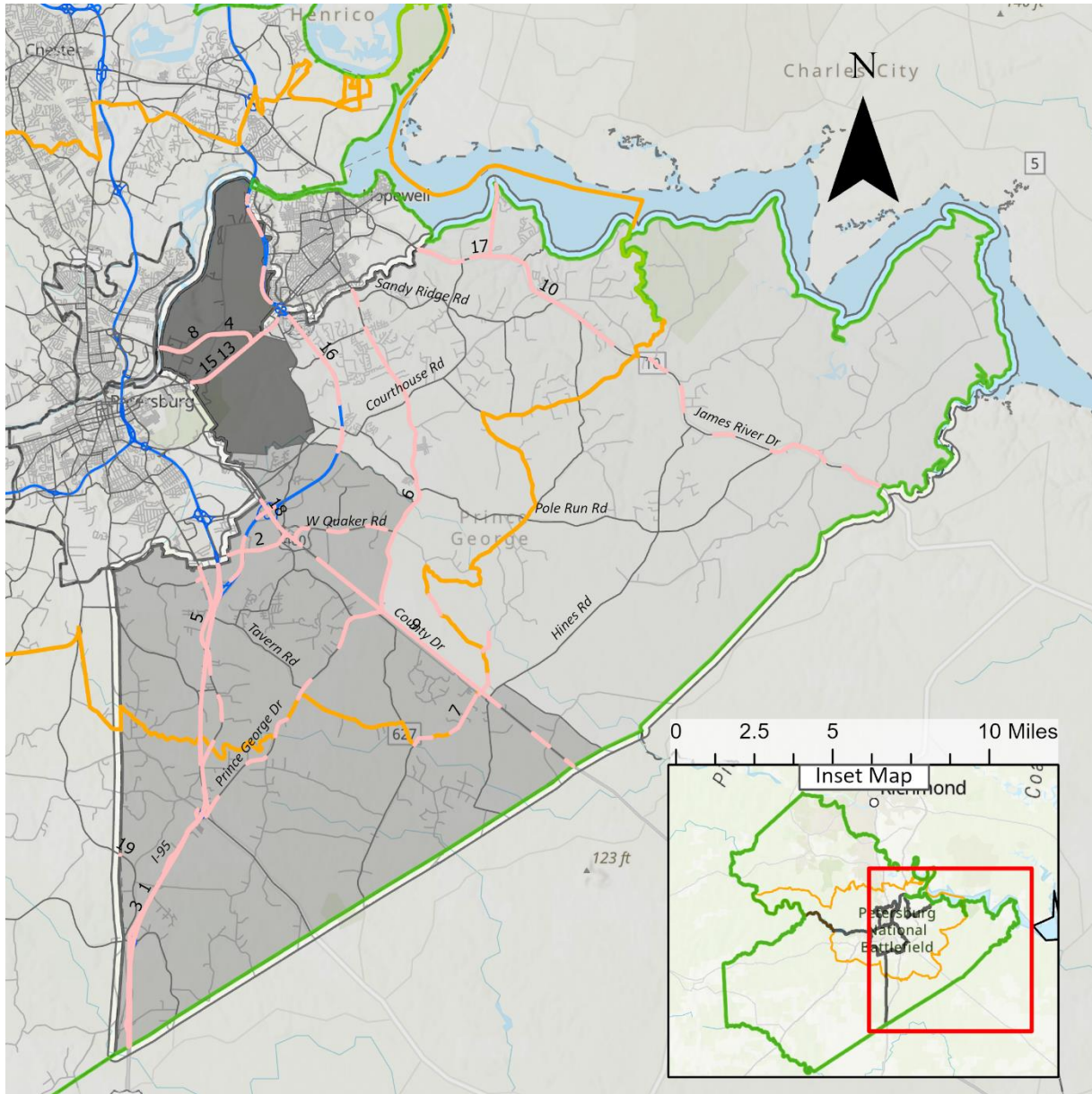
Table 20: Prince George County KAB Cross-Matrix, 2017-2021 (Source: VDOT)

Prince George – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant Protection	Intersection	Impaired
Total - 729 ¹⁸	229	109	126	1	14	37	146	107	249	241
Roadway Departure		28%	13%	0%	0%	35%	45%	43%	6%	37%
Young	13%		7%	0%	7%	5%	12%	15%	15%	13%
Senior	7%	8%		0%	14%	22%	8%	13%	23%	15%
Bicycle	0%	0%	0%		0%	0%	0%	1%	0%	0%
Pedestrian	0%	1%	2%	0%		0%	1%	0%	1%	1%
Motorcycle	6%	2%	6%	0%	0%		3%	1%	4%	2%
Speeding	29%	16%	10%	0%	7%	11%		34%	9%	22%
Occupant Protection	20%	15%	11%	0%	0%	3%	25%		10%	23%
Intersection	7%	35%	46%	0%	21%	30%	15%	24%		34%
Impaired	39%	29%	29%	0%	21%	16%	36%	51%	33%	
<i>Chart is read vertically. Values are in relation to the column. Color scale provided in this row.</i>										

High Injury Network and Health Opportunity Index

Figure 32 below shows the KAB HIN and HOI for Prince George County. High Injury segments in Low Health Opportunity Index census tracts include Oaklawn Boulevard, Temple Avenue, and parts of I-295. The eastbound and westbound directions of Temple Avenue are both top ten segments for Prince George County. Focusing safety improvements along these segments is recommended.

¹⁸ The 729 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

High Injury Network (HIN)

- Tier 1 HIN
- Tier 2 HIN

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 32: Prince George County KAB HIN, 2017-2021 (Source: VDOT)

Prince George County High Injury Network Segments and Corridors

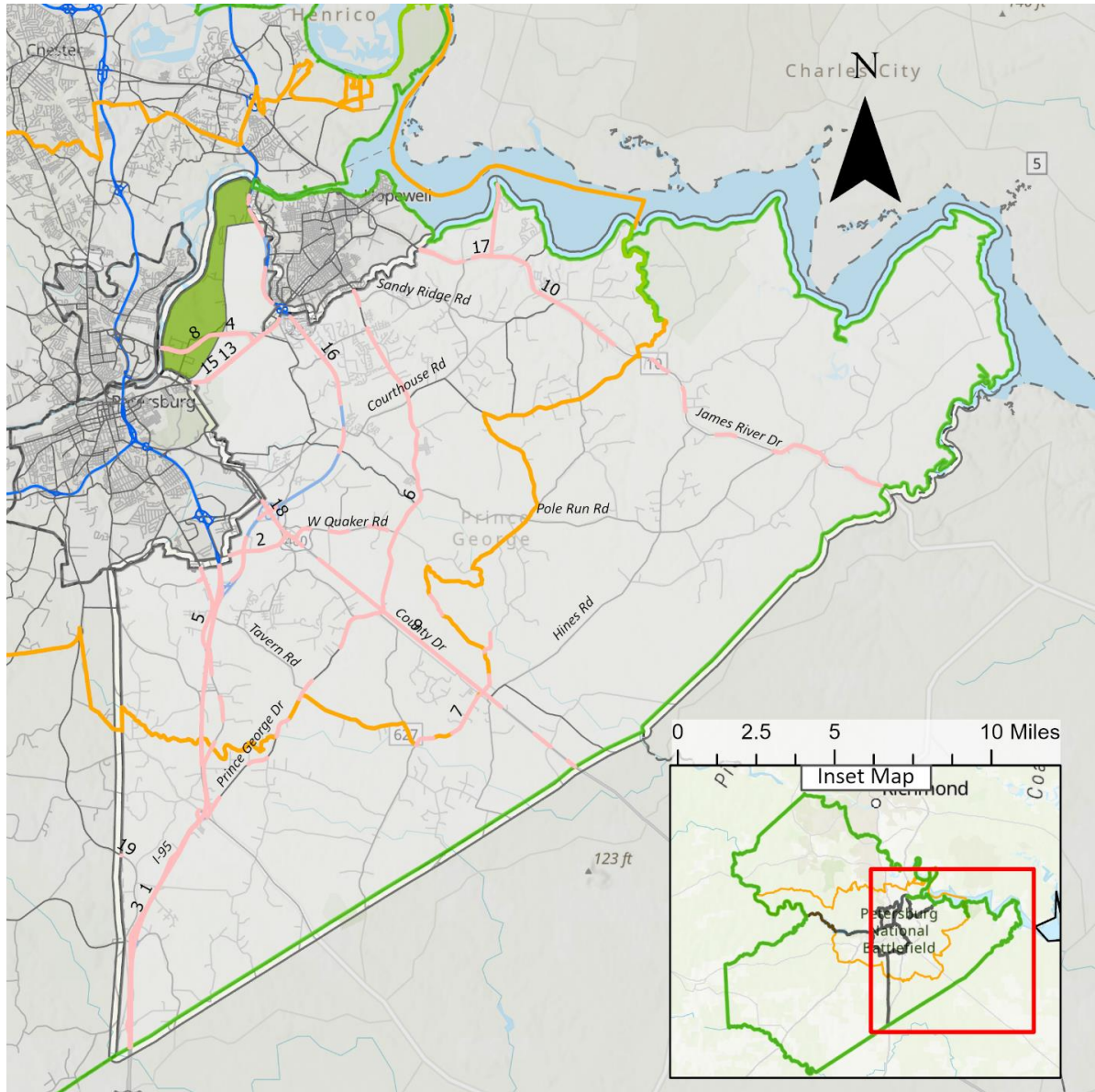
Table 21 below shows the KAB High Injury Network segments and corridors in Prince George County. The length of these top ten segments is 74.05 miles, and there were 24 fatal, 145 incapacitating, and 230 minor injuries among these ten roads. The Prince George County HIN accounts for 70 percent of all KAB injuries, and 17 percent of road miles in the county.

Table 21: Prince George County KAB HIN, 2017-2021 (Source: VDOT)

ROUTE NAME	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL MINOR INJURY	TOTAL KAB CRASHES
I-95S (FULL EXTENT OF PRINCE GEORGE CO.)	49	21	10.89	6	9	35	50
RIVES RD AND W. QUAKER RD (NEAR I-295 TO NEAR CENTENNIAL RD)	911	46	4.00	2	7	5	14
I-95N (FULL EXTENT OF PRINCE GEORGE CO.)	36	44	11.52	5	22	40	67
TEMPLE AVE (EB) (NEAR WHITEHILL RD TO OAKLAWN BLVD)	112	61	2.07	0	12	22	34
US-301N (FULL EXTENT OF PRINCE GEORGE CO.)	184	39	9.05	3	19	19	41
PRINCE GEORGE DR AND JORDAN PT RD (COURTLAND RD TO NEAR SANDY RIDGE RD AND VA-10 TO NEAR JORDAN PKWY)	141	63	13.95	4	32	44	80
ROBIN RD AND E. QUAKER RD (PUMPHOUSE RD TO NEAR STECH DR)	904	83	2.86	1	2	3	6
TEMPLE AVE (WB) (NEAR WHITEHILL RD TO NEAR RIVER RD)	111	81	2.10	0	8	15	23
US-460E (FULL EXTENT OF PRINCE GEORGE CO.)	198	84	7.85	1	20	24	45
VA-10E (FULL EXTENT OF PRINCE GEORGE CO.)	79	62	9.76	2	14	23	39
TOTAL			74.05	24	145	230	399

Prince George County High Injury Network and Transportation Disadvantaged Index

Below, figure 33 shows the KAB HIN overlaid with the USDOT Transportation Disadvantaged Index. Transportation Disadvantaged census tracts and low scoring Health Opportunity Index census tracts are in similar locations. Similarly, Temple Ave is shown on figure 33 intersecting with tract 8501. Approximately 4,541 people live within this census tract.



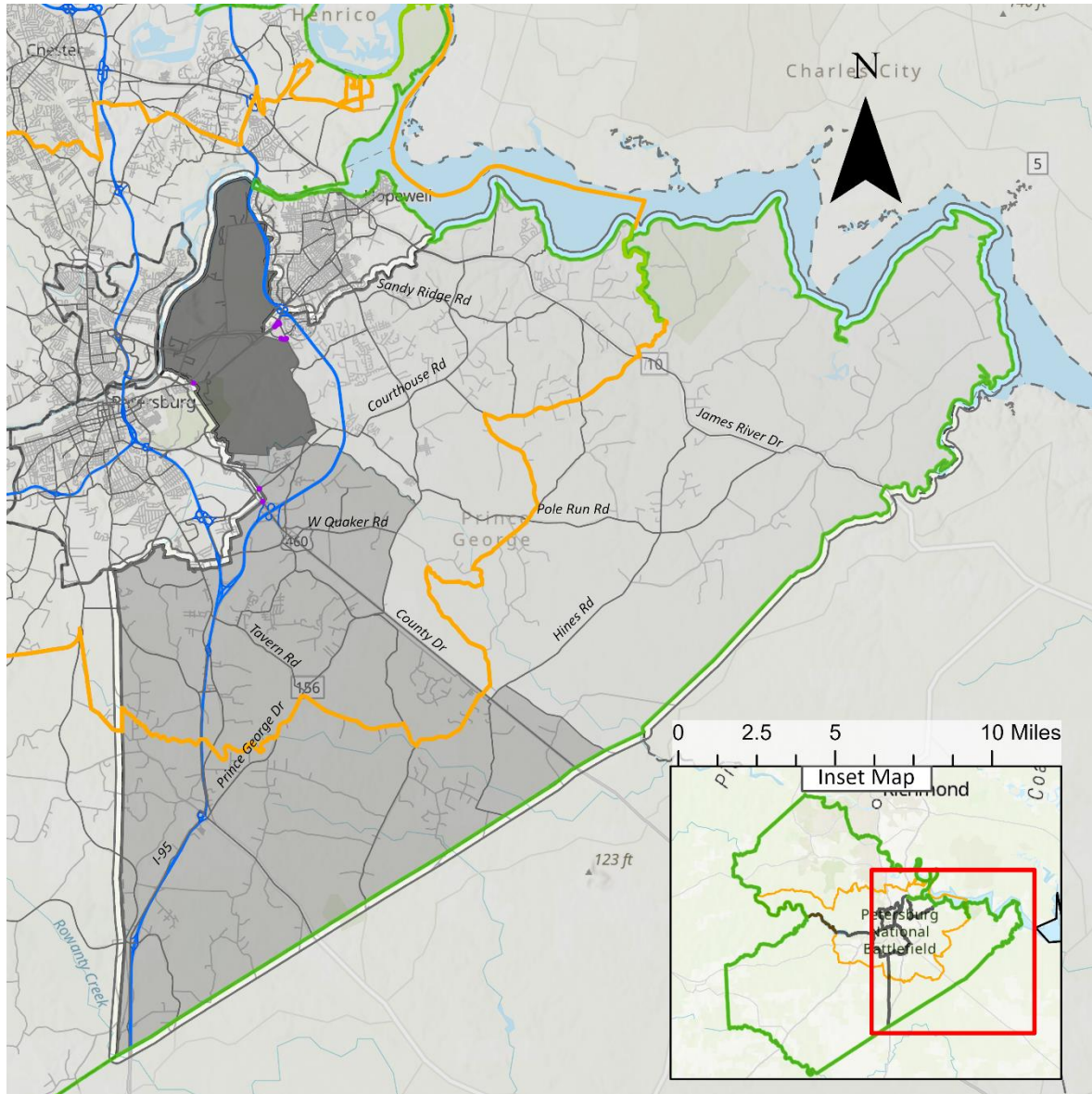
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| <p>Roads</p> <ul style="list-style-type: none"> — Interstate — Arterial Roads — Minor and Local Roads <p>High Injury Network (HIN)</p> <ul style="list-style-type: none"> — Tier 1 HIN — Tier 2 HIN | <p>Boundaries</p> <ul style="list-style-type: none"> Tri-Cities MPO Tri-Cities Region Jurisdiction Boundaries | <p>Trans. Disadvantaged Index</p> <ul style="list-style-type: none"> Not Disadvantaged Disadvantaged |
|--|---|---|

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 33. Prince George County KAB HIN and Trans. Disadvantaged Index (Source: VDOT)

Pedestrian Safety Action Plan Corridors

Figures 34 and 35 below show the PSAP corridors in Prince George County. All District PSAP corridors are found within the TCAMPO limits. The District PSAP corridors are along short segments of US-460, Courthouse Rd, and Oaklawn Blvd where the roads enter Prince George County, and longer portions of Crossings Blvd and Jefferson Park Rd.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

PSAP

- District 1% Segments
- District 5% Segments

Boundaries

- Tri-Cities MPO
- Study Area
- County Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 34: Prince George County District PSAP Segments (Source: VDOT)

Like the District PSAP corridors, the Statewide corridors are all found within the TCAMPO limits. Statewide 5% and District 5% corridors overlap considerably with Statewide corridors shown on S. Crater Rd, US-460, Courthouse Rd, Oaklawn Blvd, Temple Ave, and Jefferson Park Rd.

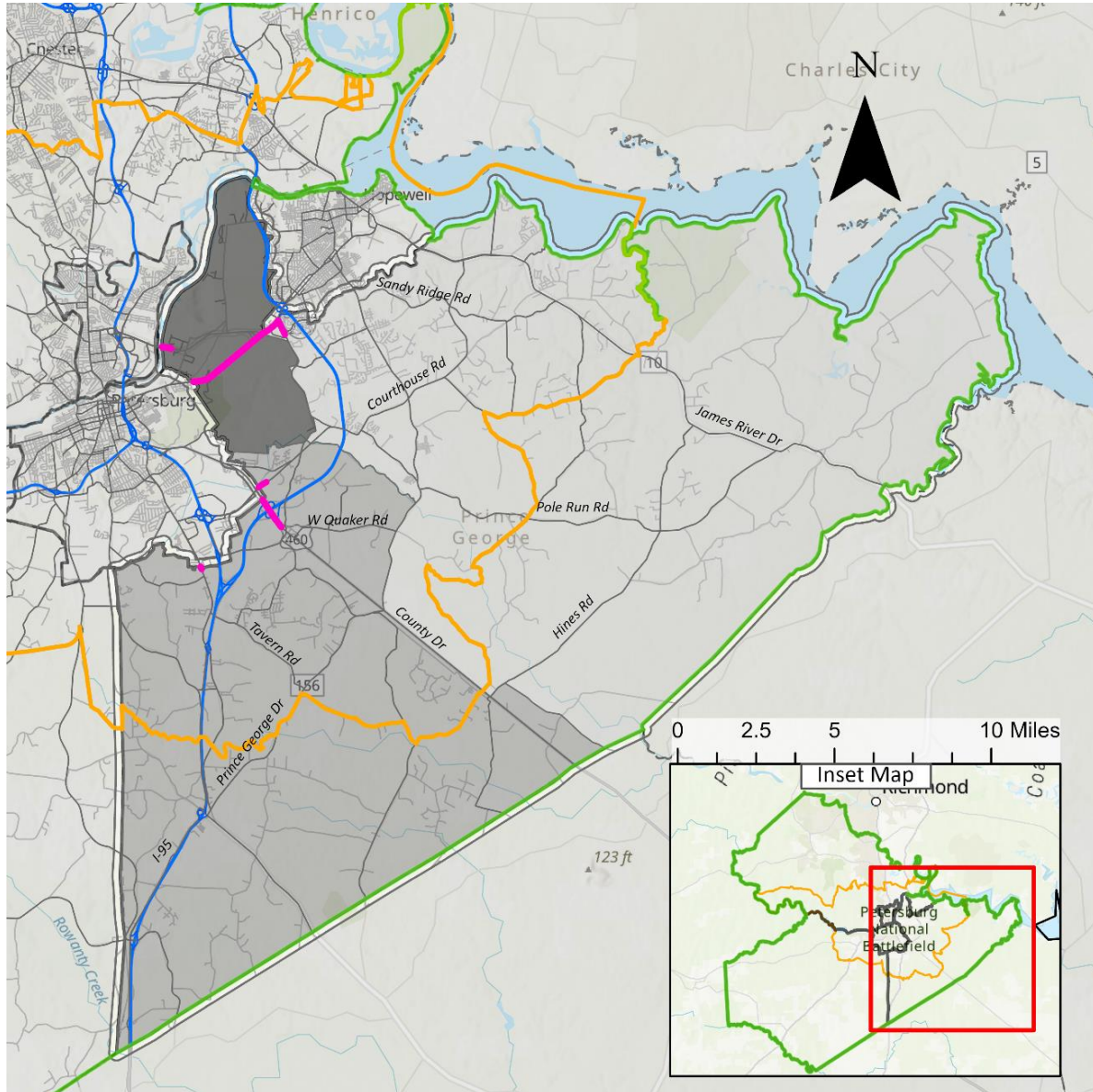


Figure 35: Prince George County Statewide PSAP (Source: VDOT)

Section 5: City of Colonial Heights

Key Highlights

Table 22 below shows the KAB cross-matrix for the City of Colonial Heights. The entirety City of Colonial Heights is within the Tri-Cities MPO limits. The three emphasis areas with the highest cross representation are intersections, impaired driving, and speeding.

- For bicycle crashes, 83 percent occurred within an intersection
- In pedestrian involved crashes, 50 percent of 16 crashes involved an impaired driver
- In roadway departure crashes, 47 percent involved a speeding driver

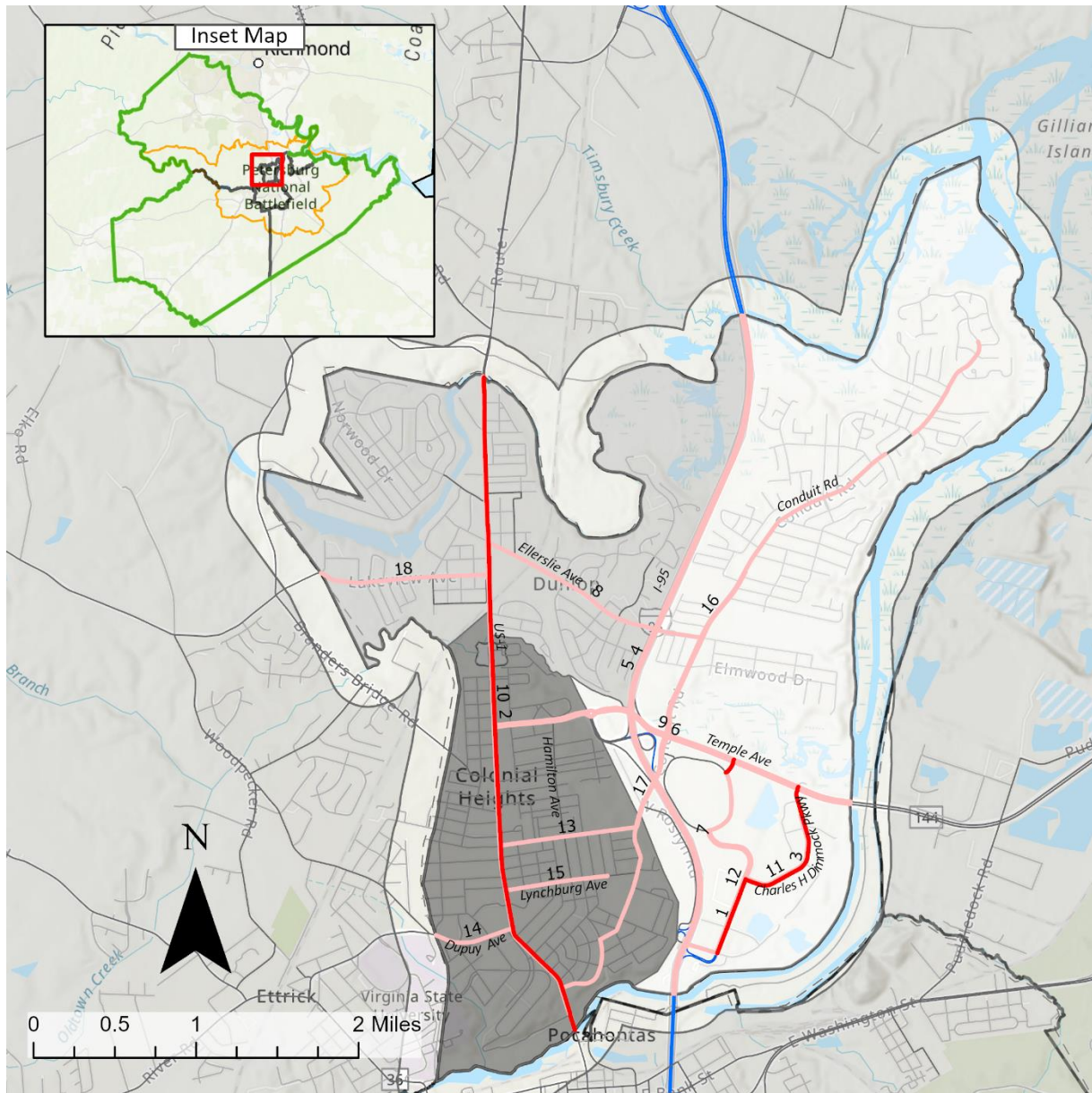
Table 22: Colonial Heights KAB Cross-Matrix, 2017-2021 (Source: VDOT)

Colonial Heights in TCAMPO – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant protection	Intersection	Impaired
Total – 498 ¹⁹	47	99	102	6	16	16	96	61	265	147
Roadway Departure		6%	4%	0%	0%	6%	23%	20%	3%	12%
Young	13%		11%	17%	13%	6%	21%	25%	21%	26%
Senior	9%	11%		33%	0%	19%	14%	11%	26%	15%
Bicycle	0%	1%	2%		0%	0%	0%	0%	2%	1%
Pedestrian	0%	2%	0%	0%		0%	1%	2%	5%	5%
Motorcycle	2%	1%	3%	0%	0%		2%	0%	4%	1%
Speeding	47%	20%	13%	0%	6%	13%		46%	12%	27%
OP	26%	15%	7%	0%	6%	0%	29%		12%	16%
Intersection	19%	56%	68%	83%	75%	63%	34%	52%		54%
Impaired	36%	38%	22%	17%	50%	13%	41%	39%	30%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

High Injury Network and Health Opportunity Index

Figure 36 below shows the KAB HIN and HOI for the City of Colonial Heights. Two census tracts in Colonial Heights are identified for “Low” Health Opportunity Index. Several segments and corridors pass through these tracts, including US-1, parts of Temple Avenue, East Westover Avenue, Dupuy Avenue and Lynchburg Avenue.

¹⁹ The 498 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

High Injury Network (HIN)

- Tier 1 HIN
- Tier 2 HIN

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 36: Colonial Heights KAB HIN, 2017-2021 (Source: VDOT)

Colonial Heights High Injury Network Segments and Corridors

Below, table 23 shows the KAB HIN segments and corridors for the City of Colonial Heights. The top ten segments account for 20.5 miles of roadway within Colonial Heights. Additionally, 5 fatal, 59 incapacitating, and 307 minor injuries occurred from 2017-2021 on these ten roadway segments and/or corridors. The Colonial Heights HIN accounts for 95 percent of all KAB injuries, and 26 percent of all road miles in the city.

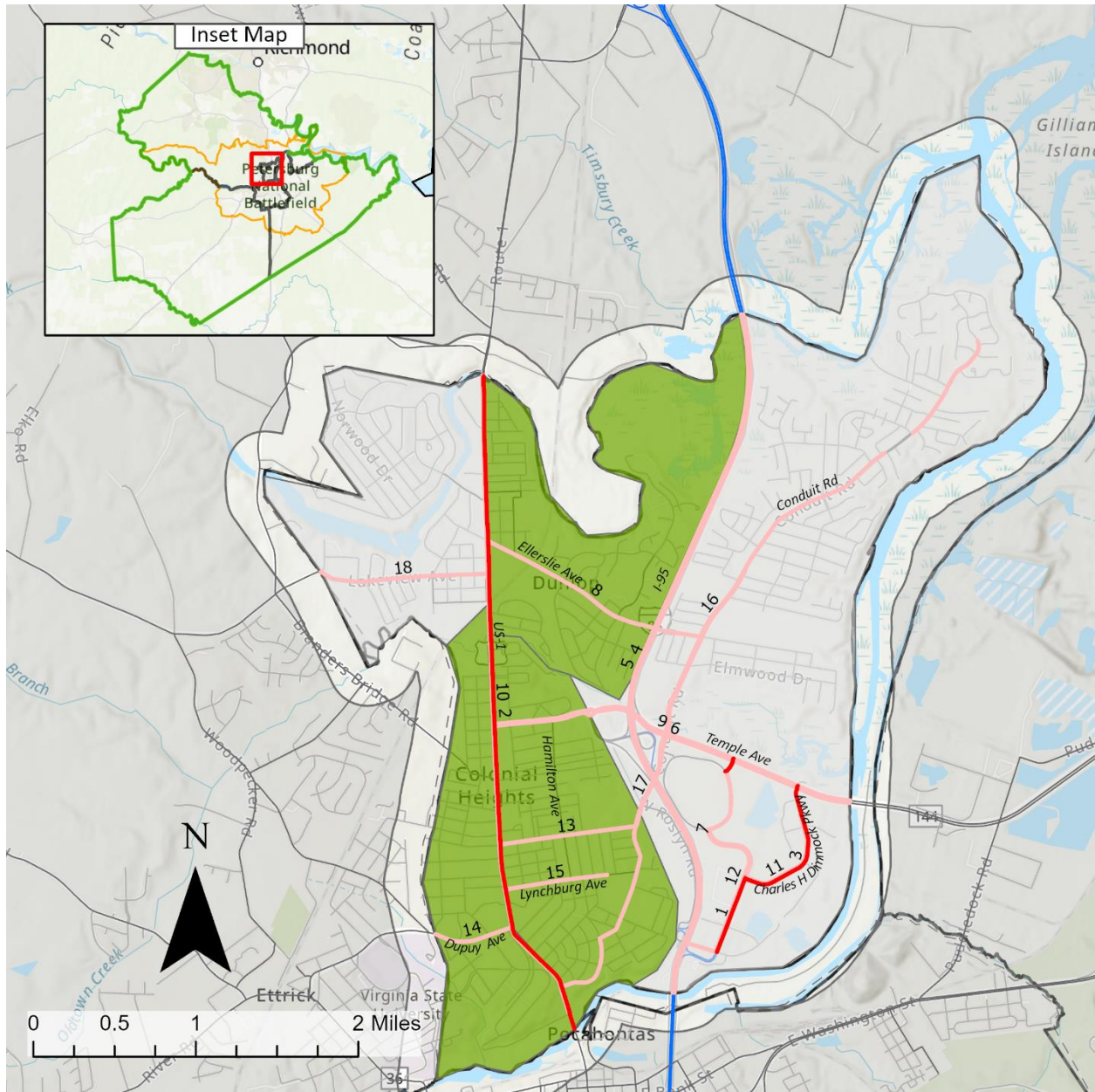
Table 23: Colonial Heights KAB HIN, 2017-2021 (Source: VDOT)

ROUTE NAME	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL MINOR INJURY	TOTAL KAB CRASHES
SOUTPARK BLVD <i>(E. ROSLYN RD TO CHARLES H. DIMMOCK PKWY)</i>	947	5	0.47	0	3	36	39
US-1N <i>(FULL EXTENT OF COLONIAL HEIGHTS)</i>	168	29	3.30	3	8	30	41
CHARLES H. DIMMOCK PKWY <i>(SOUTPARK BLVD TO TEMPLE AVE)</i>	945	32	0.72	0	6	8	14
I-95N <i>(FULL EXTENT OF COLONIAL HEIGHTS)</i>	36	44	3.53	1	9	44	54
I-95S <i>(FULL EXTENT OF COLONIAL HEIGHTS)</i>	49	21	3.53	1	7	50	58
TEMPLE AVE (EB) <i>(US-1 TO NEAR CHARLES H. DIMMOCK PKWY)</i>	112	61	1.86	0	4	43	47
SOUTPARK BLVD <i>(I-95 TO SOUTPARK CIR)</i>	1149	60	0.87	0	5	10	15
ELLERSLIE AVE <i>(US-1 TO CONDUIT RD)</i>	955	70	1.16	0	5	14	19
TEMPLE AVE (WB) <i>(US-1 TO NEAR CHARLES H. DIMMOCK PKWY)</i>	111	81	1.85	0	2	37	39
US-1S <i>(FULL EXTENT OF COLONIAL HEIGHTS)</i>	173	24	3.23	0	10	35	45
TOTAL			20.50	5	59	307	371

Colonial Heights High Injury Network and Transportation Disadvantaged Index

Below, figure 37 shows the KAB HIN and USDOT Transportation Disadvantaged Index for the City of Colonial Heights. HIN segments are observed in each of the three transportation disadvantaged census

tracts. A total of 10,368 people live in these census tracts. Top ten segments within a disadvantaged census tract include US-1, I-95, Temple Avenue, and Ellerslie Avenue. Where possible, safety improvements should be focused along these corridors.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Trans. Disadvantaged Index

- Not Disadvantaged
- Disadvantaged

High Injury Network (HIN)

- Tier 1 HIN
- Tier 2 HIN

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 37. Colonial Heights KAB HIN and Trans. Disadvantaged Index (Source: VDOT)

Pedestrian Safety Action Plan Corridors

Below, figures 38 and 39 show the District and Statewide corridors in the City of Colonial Heights. District corridors are shown along US-1, Epperslie Avenue, Temple Avenue, Conduit Road, and several neighborhood streets near located just north, and south of Epperslie Ave. District 1% corridors are found along US-1, Epperslie Avenue, and Dunlop Farms Blvd.

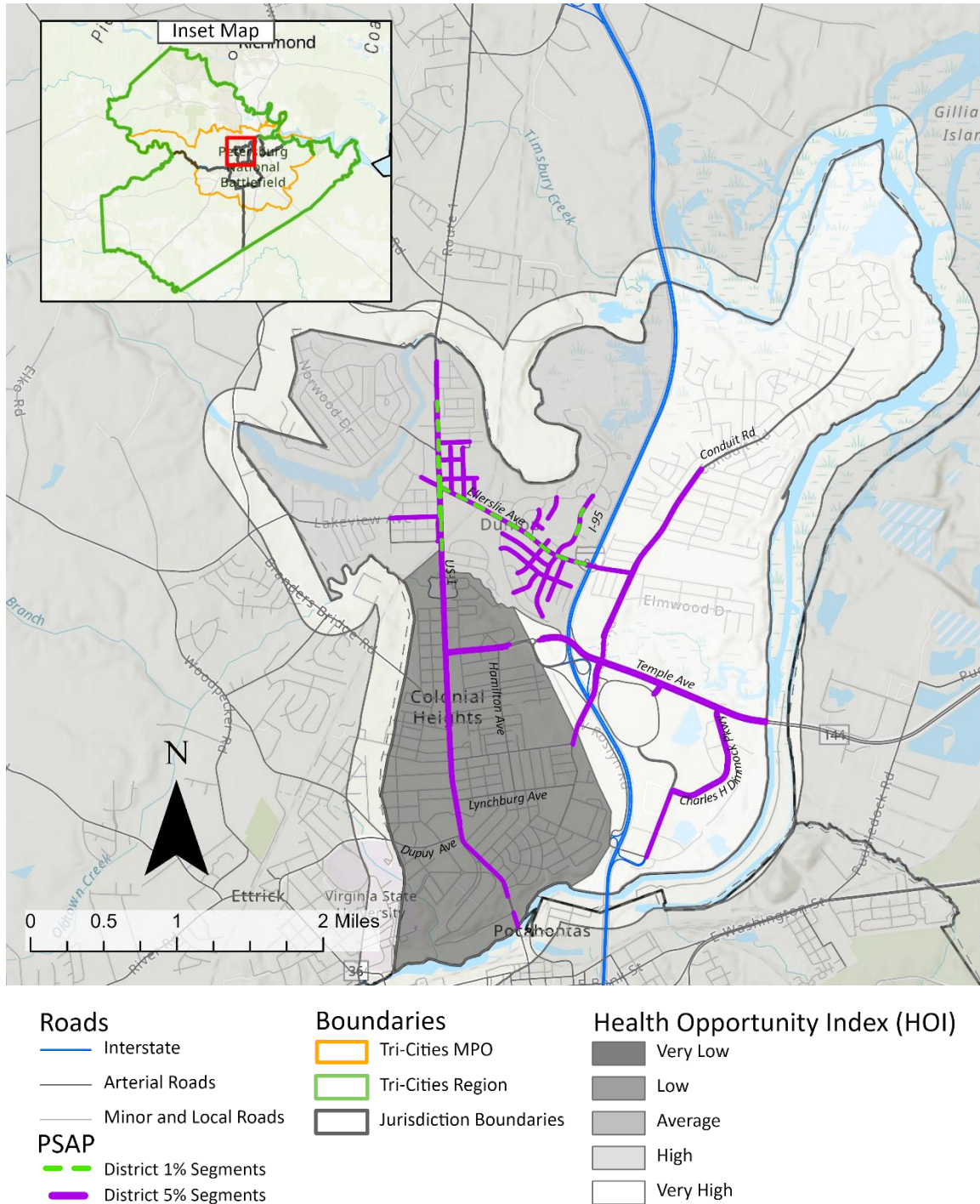
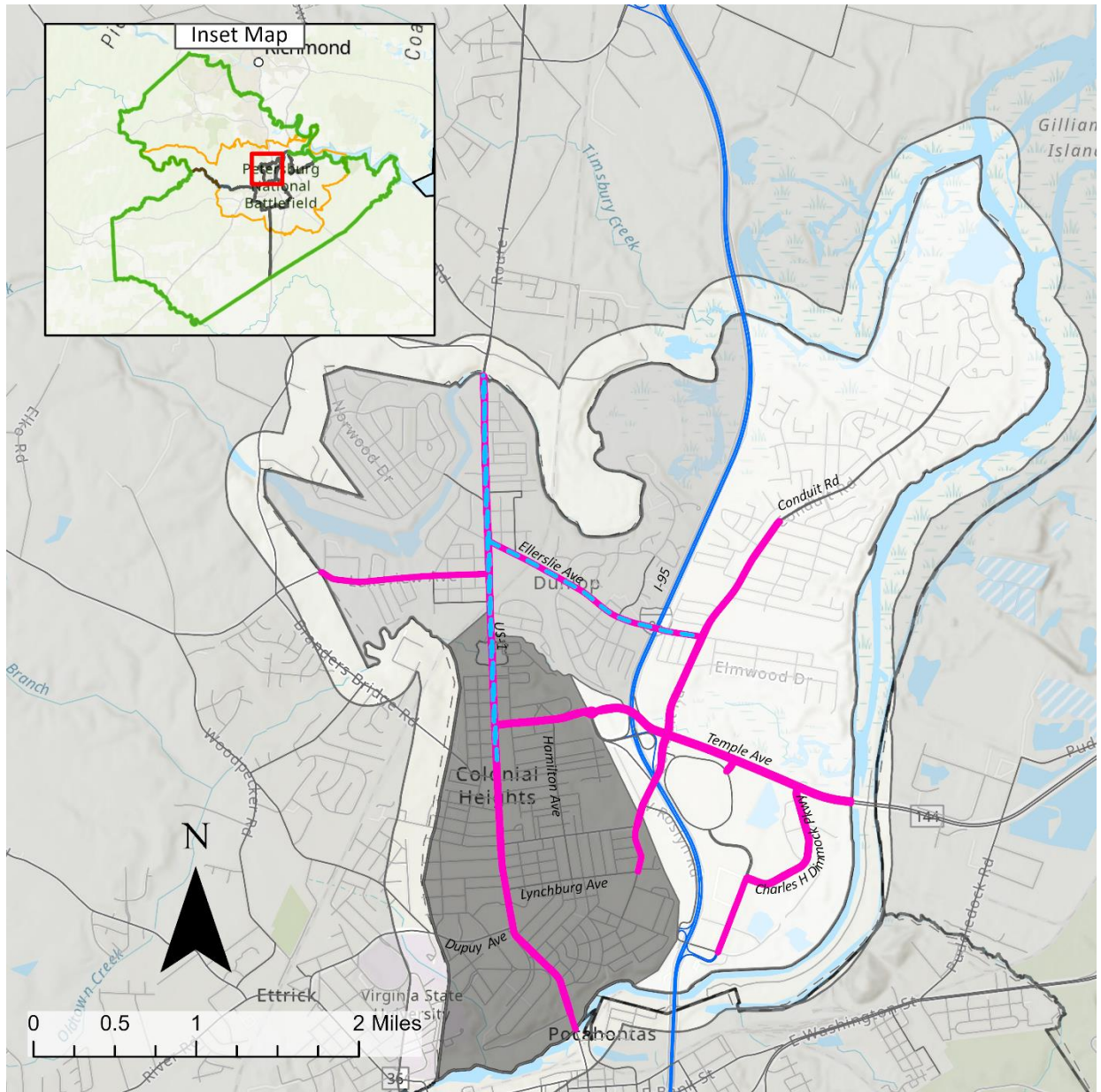


Figure 38: Colonial Heights District PSAP Segments (Source: VDOT)

Strong overlap is shown between Statewide corridors and District corridors, particularly among arterial roads. Similar to the District corridor map, Ellerslie Ave and US-1 are identified as Statewide 1% corridors.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

PSAP

- Statewide 1% Corridors
- Statewide 5% Corridors

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 39: Colonial Heights Statewide PSAP Corridors (Source: VDOT)

Section 6: City of Hopewell

Key Highlights

Below, table 24 shows the KAB cross-tab matrix for the City of Hopewell. Like the City of Colonial Heights crash statistics, no crashes needed to be excluded from this chart since the entirety of the city falls within the TCAMPO limits. The highest cross representation can be found in the intersection, impaired and speeding, emphasis areas. Of note is the involvement of the intersection emphasis area, with four columns showing a 90 percent or greater level of involvement. The influence of an intersection extends 250 feet from the center of the intersection. As environments become more urban, intersections become more common, and the distance from one intersection (the length of a block) becomes shorter. Therefore, it is expected that a city will have a higher percentage of its crashes occurring within the area of an intersection. The City of Hopewell has the highest intersection involvement of the Tri-Cities MPO, and the entire study area.

- 100 percent of bicycle crashes occurred within an intersection
- 91 percent of pedestrian crashes occurred within an intersection
- 93 percent of senior and 92 percent of young driver involved crashes occurred in an intersection
- In roadway departure crashes, 40 percent of crashes involved a speeding driver

Table 24: Hopewell KAB Cross-Matrix, 2017-2021 (Source: VDOT)

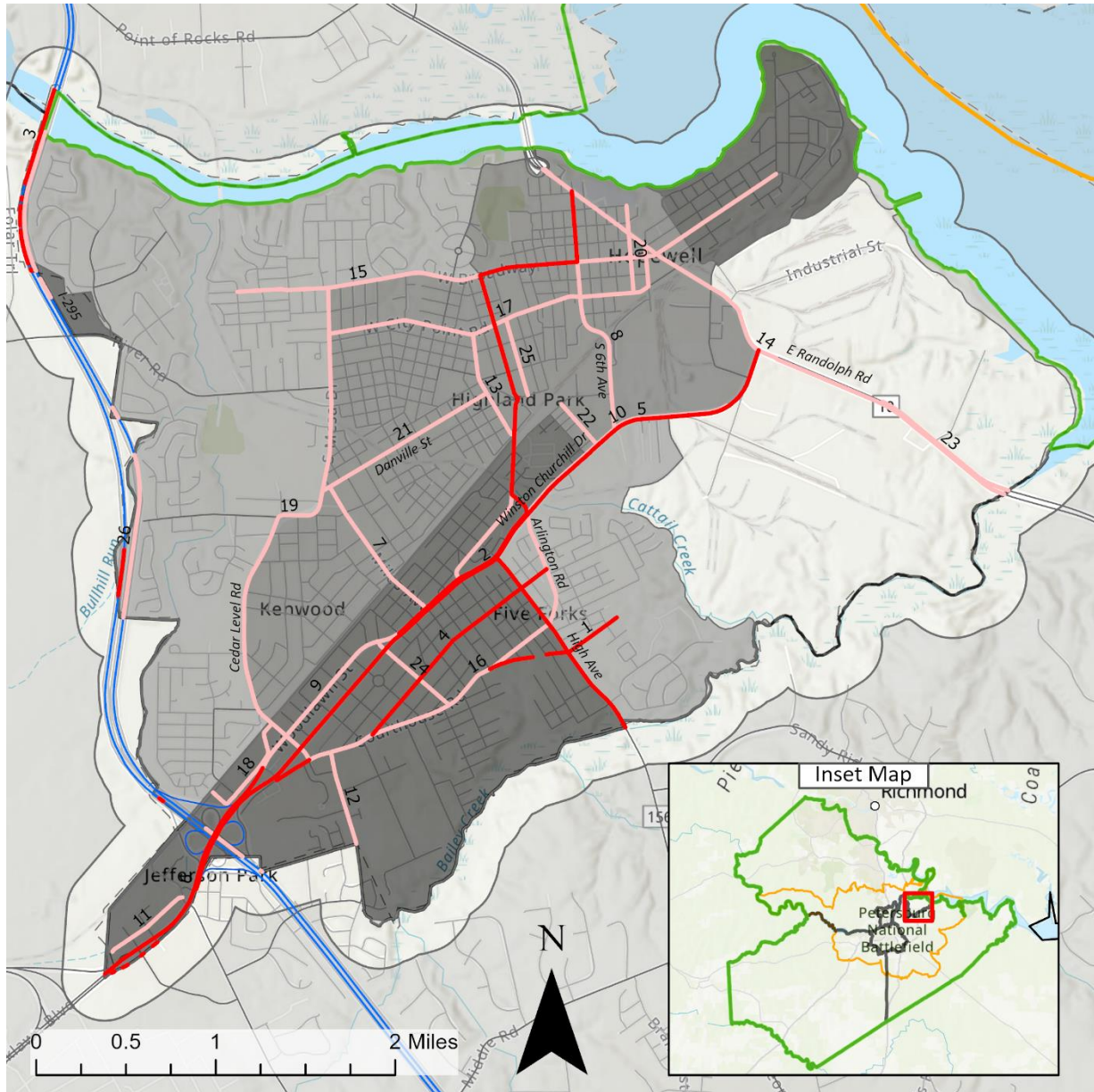
Hopewell in TCAMPO – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant protection	Intersection	Impaired
Total – 674 ²⁰	52	96	120	7	32	22	140	100	613	160
Roadway Departure		4%	3%	0%	0%	9%	15%	10%	6%	13%
Young	8%		8%	29%	3%	14%	14%	12%	14%	13%
Senior	6%	9%		29%	13%	23%	8%	15%	18%	13%
Bicycle	0%	2%	2%		0%	0%	1%	0%	1%	1%
Pedestrian	0%	1%	3%	0%		0%	4%	2%	5%	4%
Motorcycle	4%	3%	4%	0%	0%		4%	1%	3%	3%
Speeding	40%	20%	9%	14%	16%	23%		38%	19%	31%
OP	19%	13%	13%	0%	6%	5%	27%		14%	24%
Intersection	71%	92%	93%	100%	91%	86%	82%	84%		88%
Impaired	38%	22%	17%	14%	19%	18%	36%	38%	23%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

High Injury Network and Health Opportunity Index

Below, figure 40 shows the KAB HIN and HOI for the City of Hopewell. Top ten segments within census tracts that score “Very Low” in Health Opportunity Index include, Courthouse Road, Churchill Avenue,

²⁰ The 674 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.

Granby Street, High Avenue, Oaklawn Avenue, and Woodlawn Street. Safety improvements should be focused along these segments and corridors.



<p>Roads</p> <ul style="list-style-type: none"> — Interstate — Arterial Roads — Minor and Local Roads <p>High Injury Network (HIN)</p> <ul style="list-style-type: none"> — Tier 1 HIN — Tier 2 HIN 	<p>Boundaries</p> <ul style="list-style-type: none"> Tri-Cities MPO Tri-Cities Region Jurisdiction Boundaries 	<p>Health Opportunity Index (HOI)</p> <ul style="list-style-type: none"> Very Low Low Average High Very High
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Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 40: Hopewell KAB HIN, 2017-2021 (Source: VDOT)

City of Hopewell High Injury Network Segments and Corridors

Below, table 25 shows the top ten KAB HIN segments and corridors in the City of Hopewell. Across the top ten segments of the network, there were 5 fatalities, 41 incapacitating injuries, and 347 minor injuries. Lengths of the top ten segments range from 0.75 to 4.21 miles long. The City of Hopewell HIN accounts for 91 percent of all KAB injuries, and 20 percent of all road miles in the city.

Table 25: Hopewell KAB HIN, 2017-2021 (Source: VDOT)

ROUTE NAME	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL K	TOTAL A	TOTAL B	TOTAL KAB
COURTHOUSE RD (OAKLAWN BLVD TO ASHLAND AVE AND BERRY ST TO MARYVILLE AVE)	1195	7	0.75	1	1	4	6
OAKLAWN BLVD (FULL EXTENT OF HOPEWELL)	90	65	4.21	1	19	139	159
I-295S (FULL EXTENT OF HOPEWELL)	71	101	0.92	1	0	1	2
GRANBY ST (COURTHOUSE RD TO ARLINGTON RD)	1208	14	1.07	1	0	5	6
VA-156 (NEAR LOCUST ST TO VA-10)	141	63	2.30	1	7	34	42
OAKLAWN BLVD (CROSSINGS BLVD TO ARLINGTON RD)	95	94	1.97	0	6	58	64
MILES AVE AND OAKLAWN BLVD (DANVILLE ST TO OAKLAWN BLVD AND OAKLAWN BLVD TO ARLINGTON RD)	965	38	1.21	0	4	30	34
S. 6TH AVE (WINSTON CHURCHILL DR TO W. BROADWAY)	972	47	0.80	0	1	23	24
WOODLAWN ST (COLONIAL CORNER DR TO KENWOOD AVE)	94	48	0.87	0	1	25	26
WINSTON CHURCHILL DR (SB) (ARLINGTON RD TO NEAR HERCULES RD)	143	49	1.06	0	2	28	30
TOTAL			15.17	5	41	347	393

City of Hopewell High Injury Network and Transportation Disadvantaged Index

Below, figure 41 shows the KAB HIN and the USDOT Transportation Disadvantaged Index overlay map for the City of Hopewell. Six of the seven census tracts in Hopewell are identified as transportation disadvantaged by the U.S. Department of Transportation. All top ten segments for the City of Hopewell are within a transportation disadvantaged census tract.

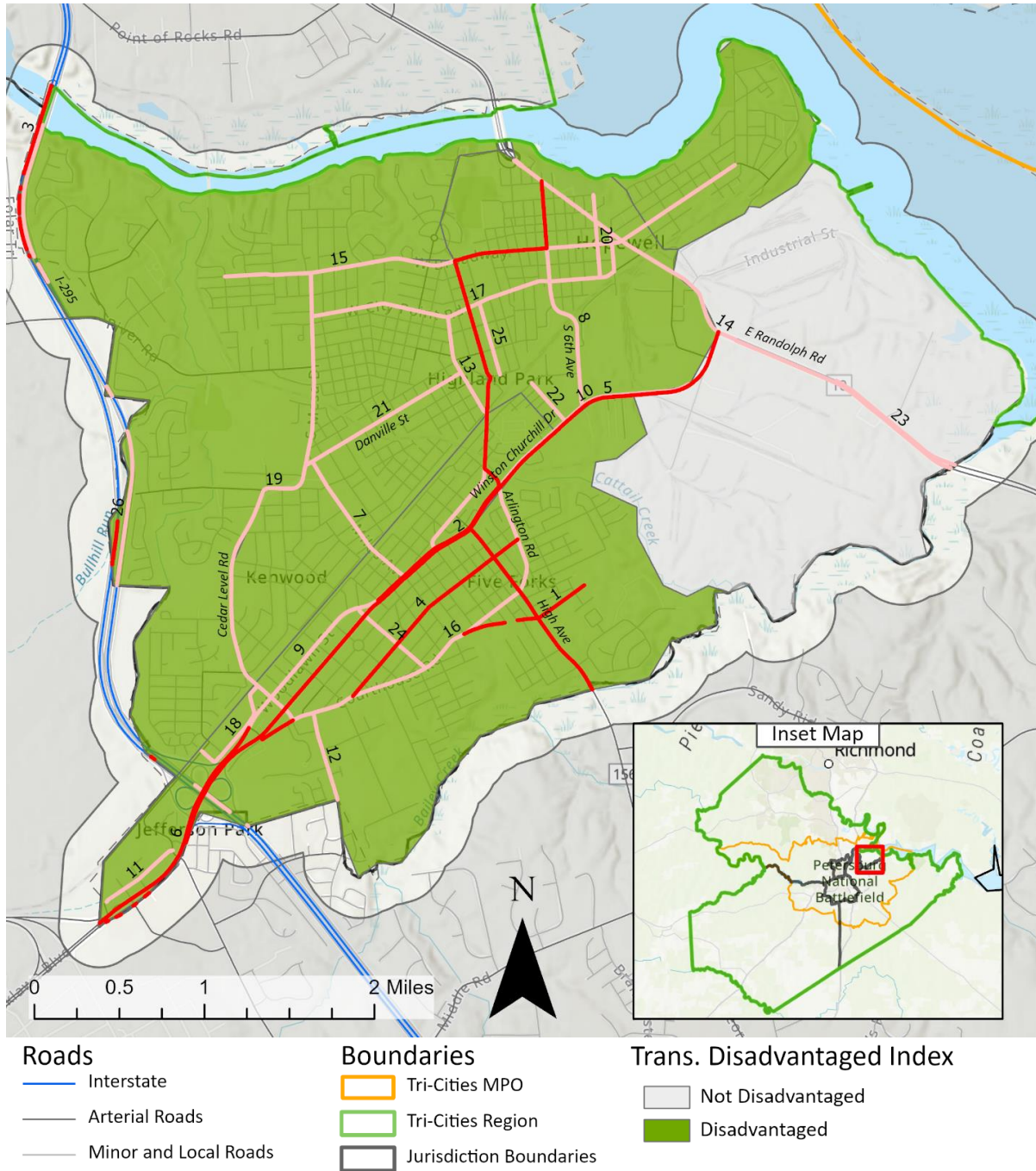


Figure 41. City of Hopewell KAB HIN (Source: VDOT)

Pedestrian Safety Action Plan Corridors

Below, figures 42 and 43 show the PSAP corridors for the City of Hopewell. Significant overlap is observed between PSAP corridors and the KAB High Injury Network. District 1% corridors are present on Woodlawn Street, Winston Churchill Drive, E Randolph, and 6th Avenue.

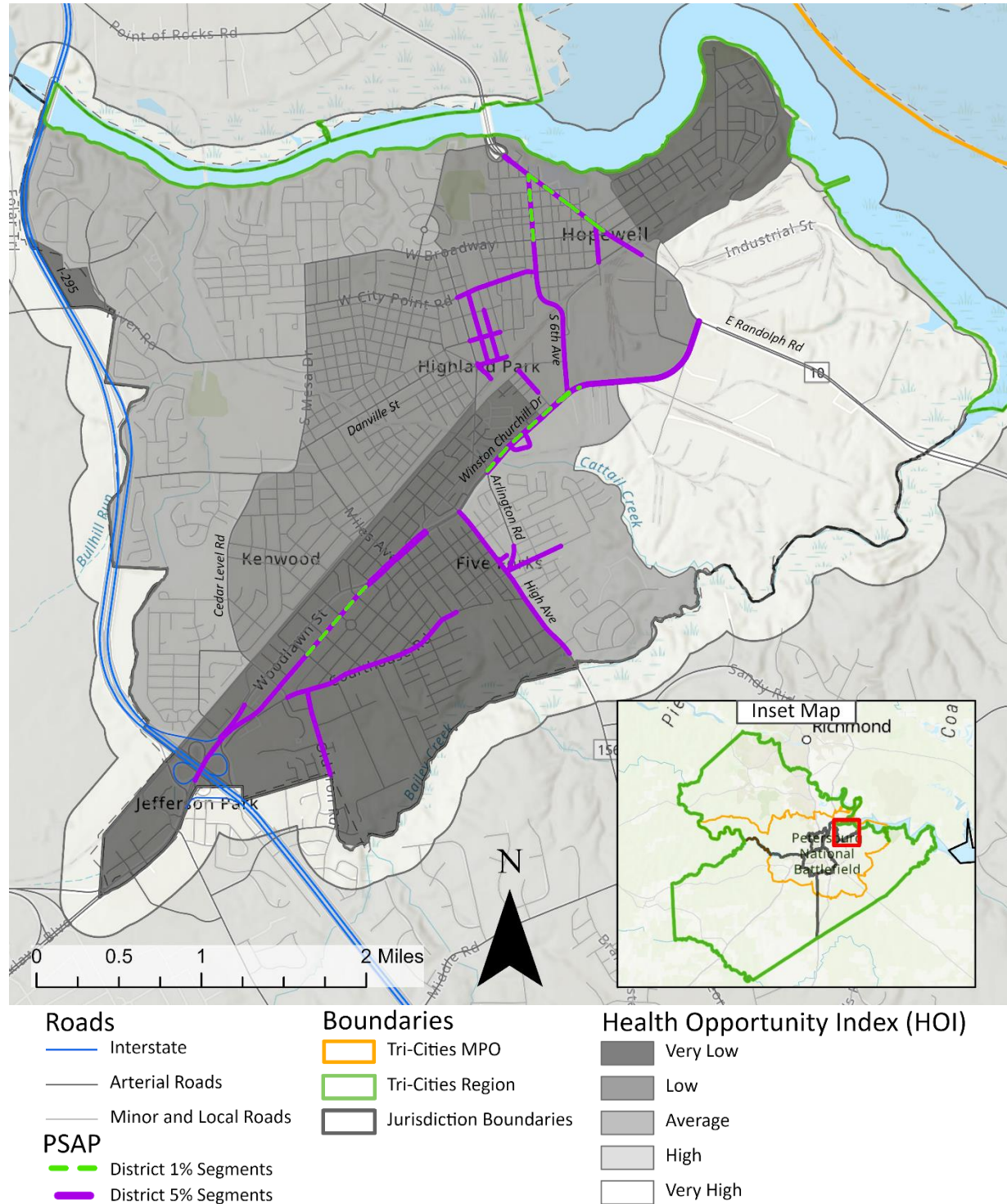
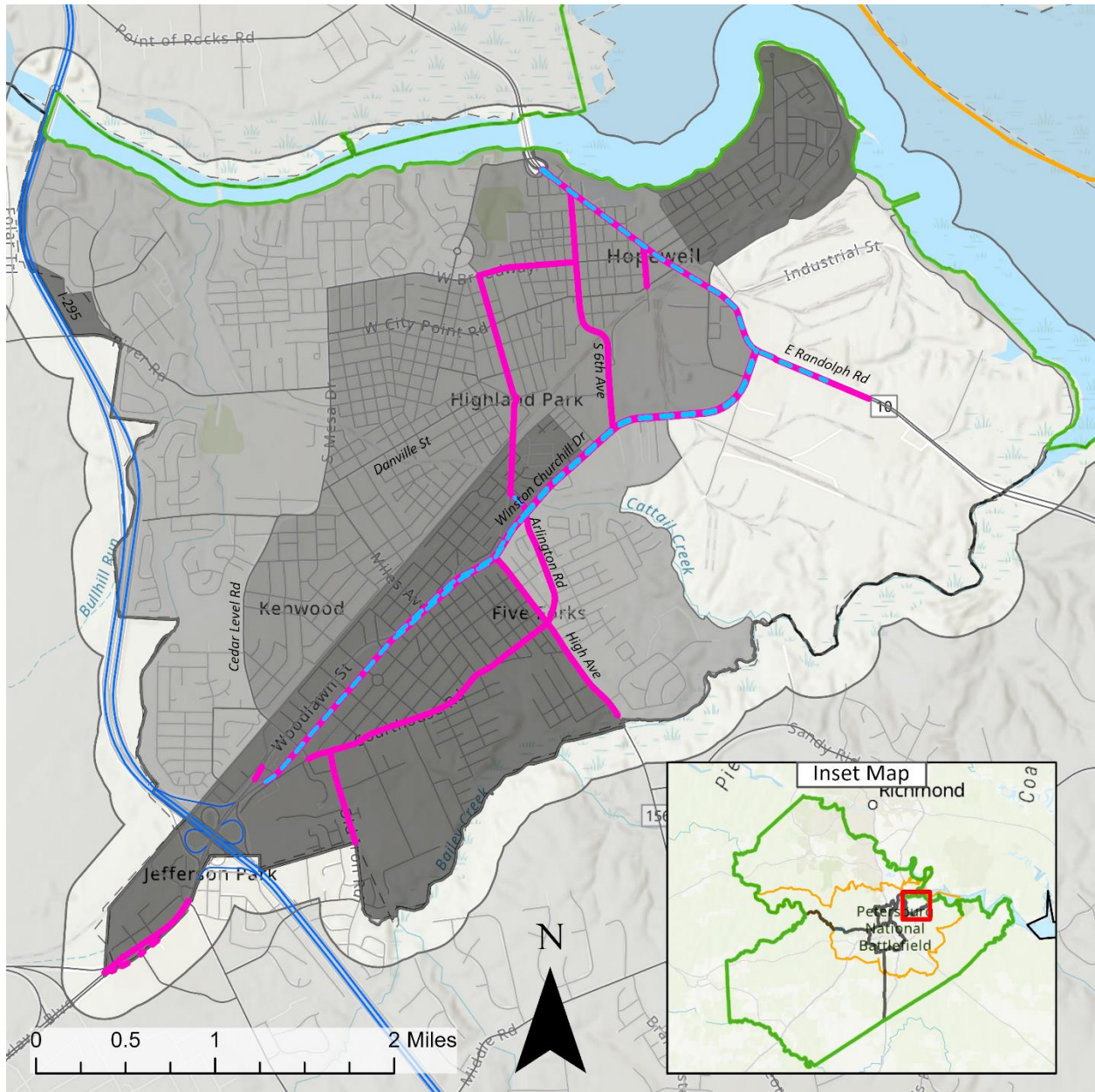


Figure 42: Hopewell District PSAP (Source: VDOT)



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

PSAP

- Statewide 1% Corridors
- Statewide 5% Corridors

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 43: Hopewell Statewide PSAP (Source: VDOT)

Section 7: City of Petersburg

Key Highlights

Below, table 26 shows the KAB cross-matrix for the City of Petersburg. The City of Petersburg has the highest KAB crash total of the three TCAMPO cities. The highest involvement is with the intersection, speeding and impaired driving emphasis areas. The single highest cross representation is between pedestrians and intersections, with 79 percent of all pedestrian crashes occurring within an intersection.

- In pedestrian crashes, 79 percent occurred within an intersection. This is the highest percentage cross representation in table 25
- In impaired driving crashes, 34 percent involved a speeding driver
- In roadway departure crashes, 48 percent involved a speeding driver

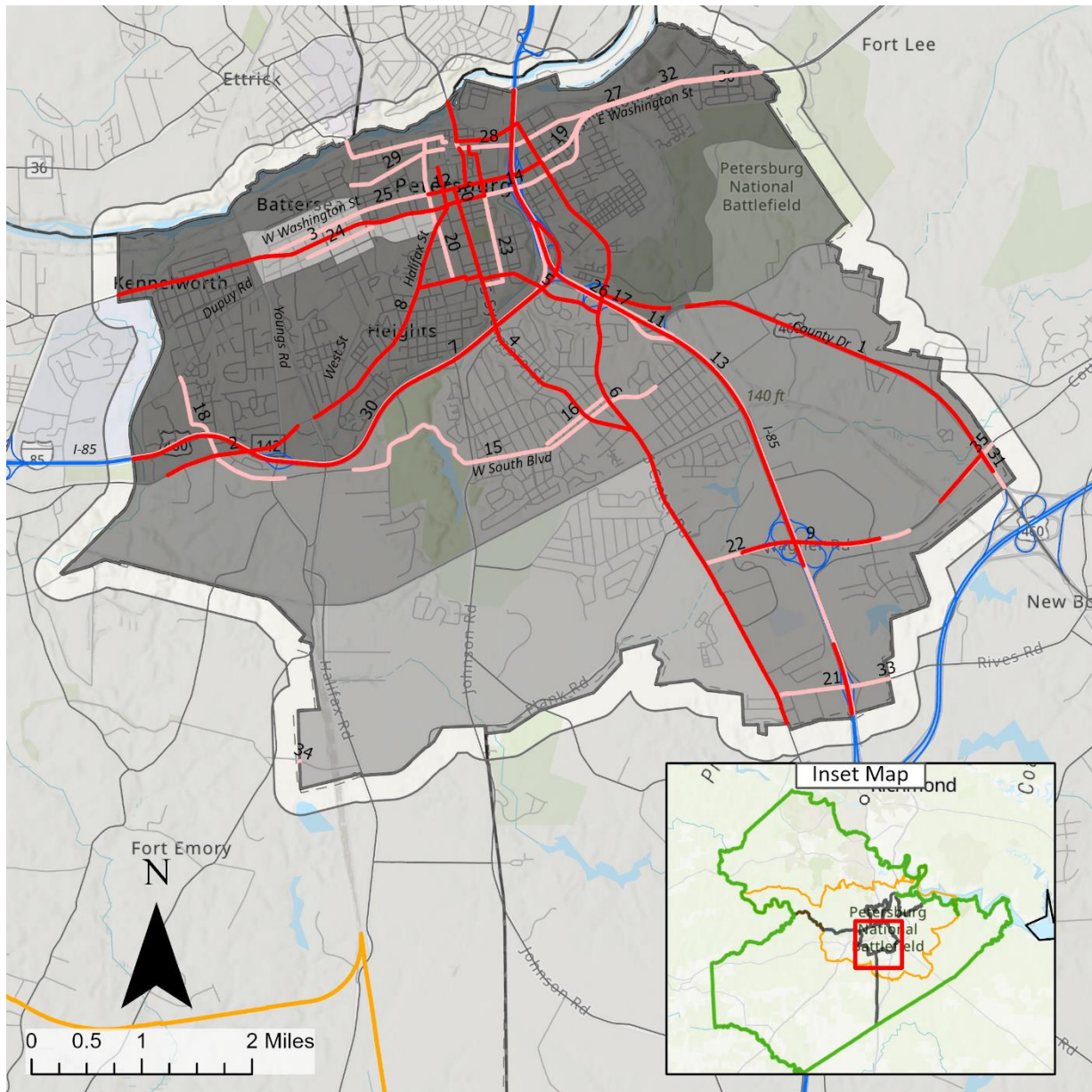
Table 26: Petersburg KAB Cross-Matrix, 2017-2021 (Source: VDOT)

Petersburg in TCAMPO – KAB	Roadway Departure	Young	Senior	Bicycle	Pedestrian	Motorcycle	Speeding	Occupant protection	Intersection	Impaired
Total - 808 ²¹	130	126	129	4	70	30	273	118	459	245
Roadway Departure		12%	9%	0%	0%	10%	23%	25%	5%	16%
Young	12%		9%	50%	7%	7%	15%	10%	16%	10%
Senior	9%	10%		25%	13%	27%	13%	12%	17%	12%
Bicycle	0%	2%	1%		0%	0%	0%	0%	1%	0%
Pedestrian	0%	4%	7%	0%		0%	3%	1%	12%	11%
Motorcycle	2%	2%	6%	0%	0%		4%	0%	4%	2%
Speeding	48%	33%	28%	0%	10%	37%		49%	25%	34%
OP	22%	10%	11%	0%	1%	0%	21%		14%	19%
Intersection	16%	58%	62%	75%	79%	57%	42%	55%		67%
Impaired	30%	19%	22%	0%	39%	20%	30%	39%	36%	
Chart is read vertically. Values are in relation to the column. Color scale provided in this row.										

High Injury Network and Health Opportunity Index

Figure 44 below shows the KAB HIN and HOI for the City of Petersburg. Segments are labeled to show their ranking in table 26. Several top ten segments are within census tracts with “Very Low” Health Opportunity Index, including Boydton Plank Rd, West Washington and 2nd St, Sycamore St, Graham Rd, South Crater Rd and Bollingbrook Street, I-85, Halifax Street and North Adams Street.

²¹ The 808 crashes that are analyzed in this table include crashes that did not involve any of the listed emphasis areas. Please also note that one crash may involve multiple emphasis areas – for example a crash involving a speeding, impaired, young driver would be recorded under three emphasis areas.



Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 44: Petersburg KAB HIN, 2017-2021 (Source: VDOT)

City of Petersburg High Injury Network Segments and Corridors

Below, table 27 shows the top ten HIN segments and corridors in the City of Petersburg. Between 2017 and 2021, 16 fatal, 105 incapacitating, and 217 minor injuries occurred across these top ten HIN segments and corridors. The City of Petersburg HIN accounts for 84 percent of all KAB injuries, and 23 percent of all road miles in the city.

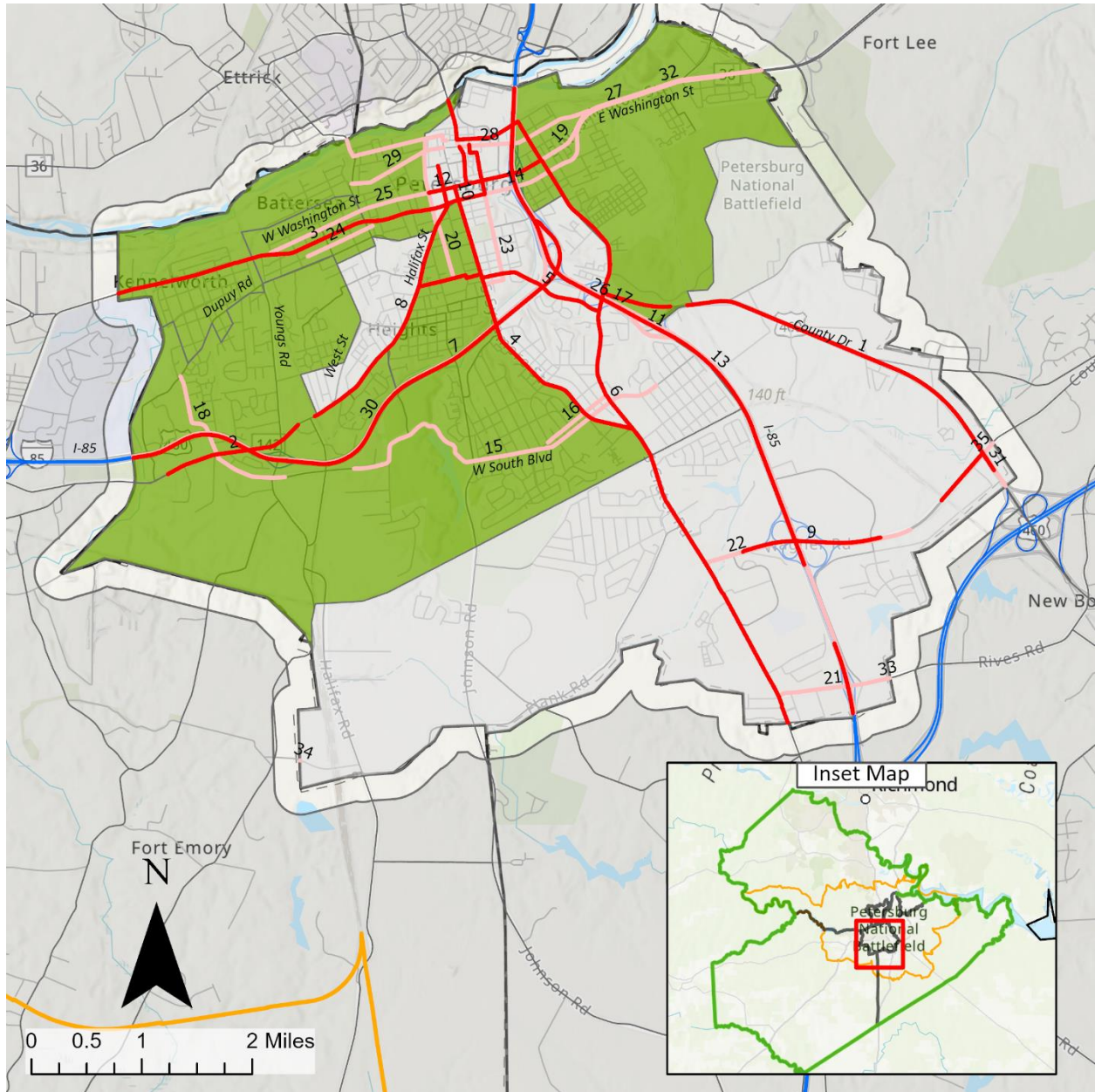
Table 27: Petersburg KAB HIN, 2017-2021 (Source: VDOT)

ROUTE NAME	UNIQUE ID	TRI-CITIES REGION RANK	LENGTH (MI)	TOTAL FATAL CRASHES	TOTAL SERIOUS INJURY	TOTAL MINOR INJURY	TOTAL KAB CRASHES
US-460E (NEAR COURTHOUSE RD TO NEAR WINFIELD RD)	198	84	2.64	3	16	20	39
BOYDTON PLANK RD (NEAR TYNES RD TO WESTFALL DR)	110	36	1.03	1	3	7	11
US-1N (FULL EXTENT OF PETERSBURG)	168	29	3.46	3	14	22	39
S. SYCAMORE ST (S. CRATER RD TO W. WYTHE ST)	186	10	2.24	2	7	14	23
UR-9012E (HALIFAX ST TO S. CRATER RD)	988	13	1.40	1	5	9	15
US-301N (FULL EXTENT OF PETERSBURG)	184	39	5.40	2	32	64	98
I-85N (FULL EXTENT OF PETERSBURG)	24	76	4.11	2	15	51	68
HALIFAX ST (HALIFAX RD TO W. TABB ST)	977	20	2.15	1	9	23	33
WAGNER RD (NEAR POPLAR DR TO US-460)	984	26	1.46	1	1	2	4
ALT US-301P (E. WYTHE ST TO E. BANK ST)	188	28	0.38	0	3	5	8
TOTAL			24.27	16	105	217	338

City of Petersburg High Injury Network and Transportation Disadvantaged Index

Below, figure 45 shows the KAB High Injury Network and USDOT Transportation Disadvantaged Index overlay map for the City of Petersburg. Strong overlap is observed in the northwest and northeast parts of the City of Petersburg between “Very Low” HOI census tracts and transportation disadvantaged

census tracts. Seven of the top ten KAB HIN segments are within a transportation disadvantaged census tract, including Boydton Plank Road, W. Washington and 2nd Street, Sycamore Street, and Graham Road.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

Boundaries

- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Trans. Disadvantaged Index

- Not Disadvantaged
- Disadvantaged

High Injury Network (HIN)

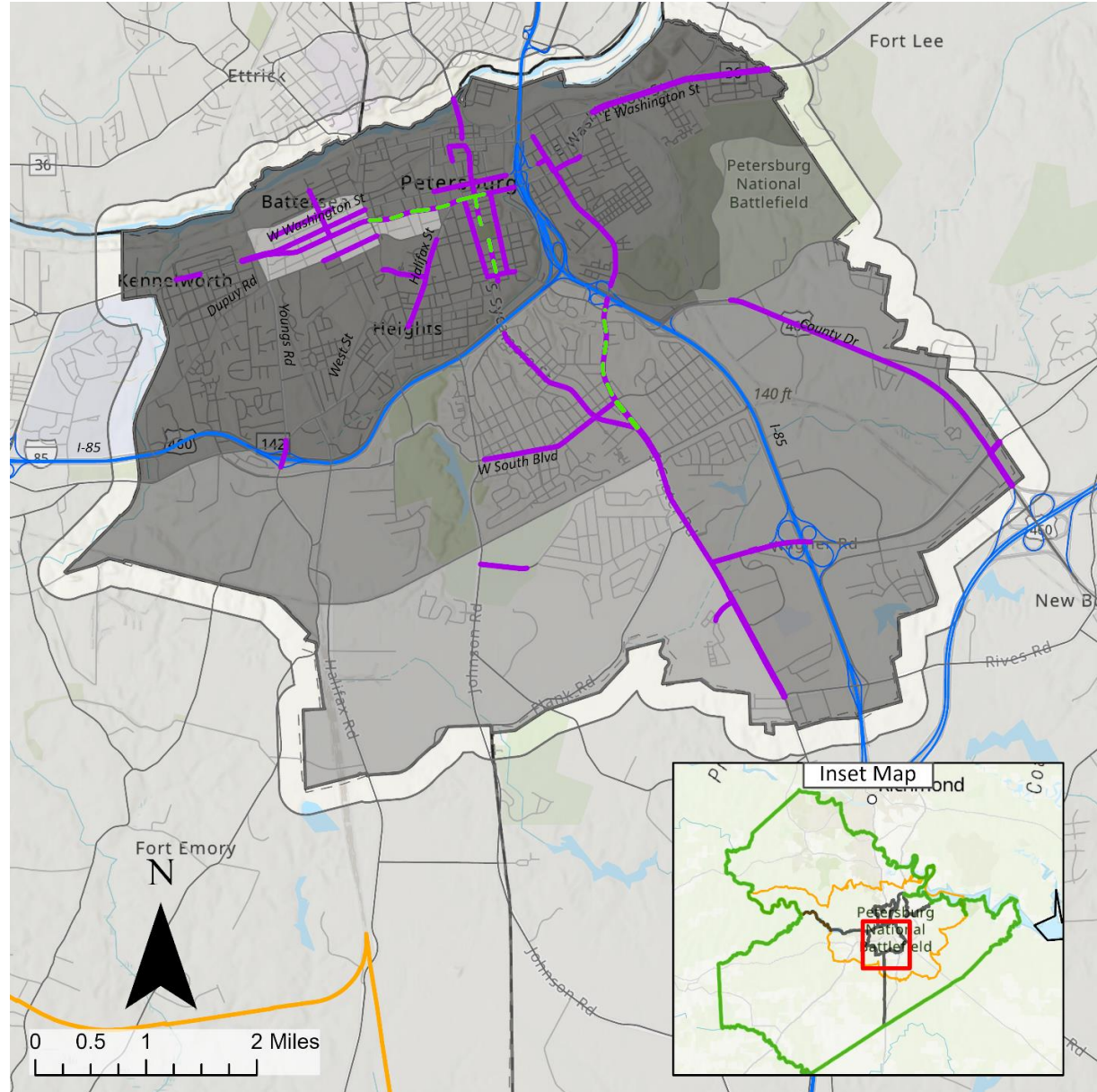
- Tier 1 HIN
- Tier 2 HIN

Note: The numbers above HIN segments indicate the segments rank in the HIN.

Figure 45. City of Petersburg KAB HIN and Trans. Disadvantaged Index (Source: VDOT)

Pedestrian Safety Action Plan Corridors

Below, figures 46 and 47 show the PSAP corridors in the City of Petersburg. There is significant overlap between the KAB HIN and district and statewide corridors. West Wythe Street, South Crater Road and South Adams Street are identified as District 1% corridors. District 5% corridors include parts of West Washington Street, South Sycamore Street, Halifax Street, US-460, and South Boulevard.



Roads

- Interstate
- Arterial Roads
- Minor and Local Roads

PSAP

- District 1% Segments
- District 5% Segments

Boundaries

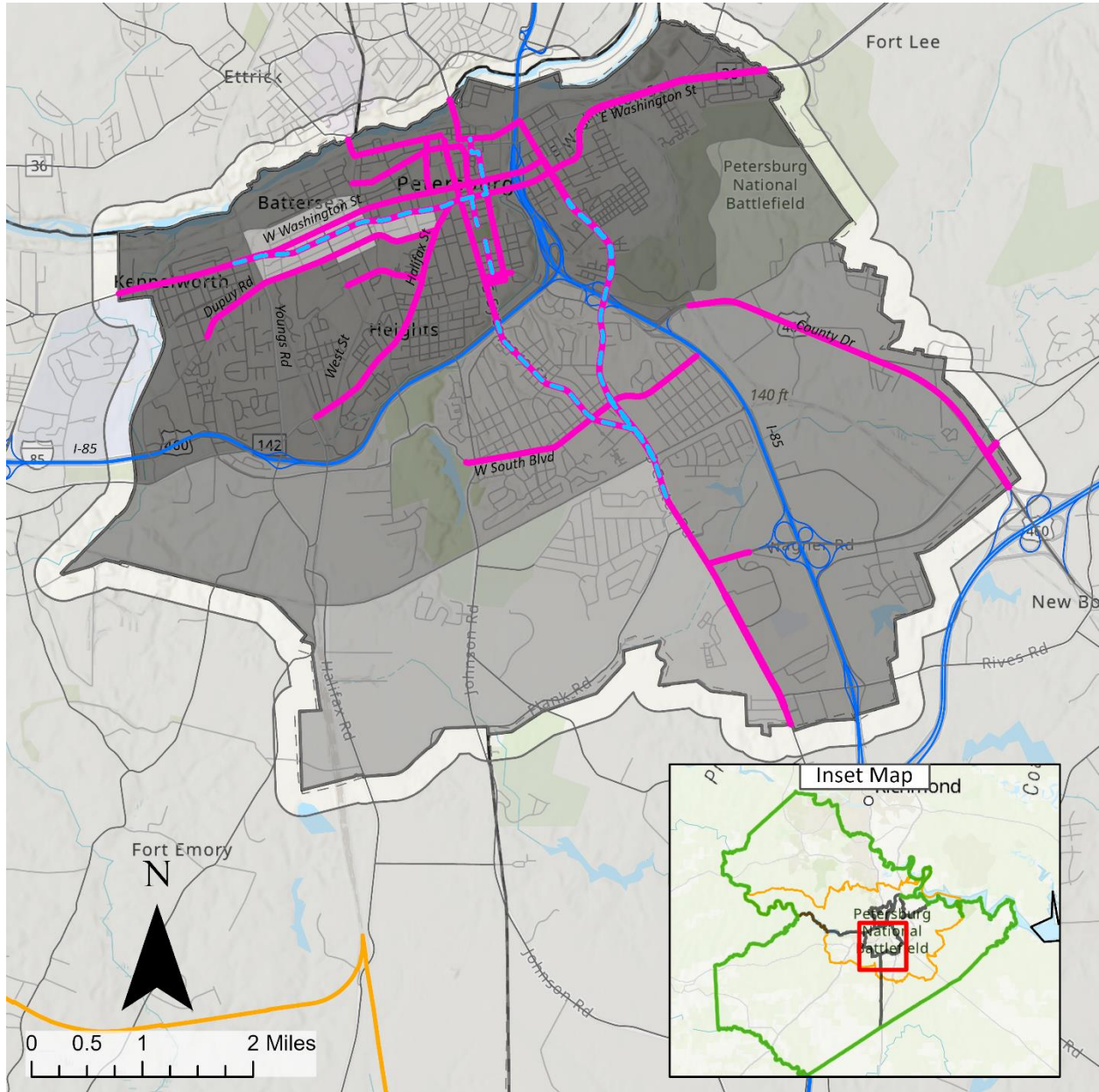
- Tri-Cities MPO
- Tri-Cities Region
- Jurisdiction Boundaries

Health Opportunity Index (HOI)

- Very Low
- Low
- Average
- High
- Very High

Figure 46: Petersburg District PSAP Segments (Source: VDOT)

Statewide 1% corridors are overserved on Washington Street, South Crater Road, South Sycamore Street, and South Adams Street. West South Road, County Drive, South Crater Road, and several other roads are identified as Statewide 5% corridors.



- | | | |
|---|---|---|
| <p>Roads</p> <ul style="list-style-type: none"> — Interstate — Arterial Roads — Minor and Local Roads <p>PSAP</p> <ul style="list-style-type: none"> — Statewide 1% Corridors — Statewide 5% Corridors | <p>Boundaries</p> <ul style="list-style-type: none"> Tri-Cities MPO Tri-Cities Region Jurisdiction Boundaries | <p>Health Opportunity Index (HOI)</p> <ul style="list-style-type: none"> Very Low Low Average High Very High |
|---|---|---|

Figure 47: Petersburg Statewide PSAP Corridors (Source: VDOT)

General Countermeasures

There are several resources that list behavioral and infrastructure countermeasures effective in reducing fatalities and serious injuries. These resources include the following:

- National Highway Traffic Safety Administration (NHTSA) [Countermeasures That Work](#).
- National Cooperative Highway Research Program (NCHRP) [500 Series Reports](#).
- Federal Highway Administration (FHWA) [Proven Safety Countermeasures](#).

At the State level, VDOT published a list of preferred crash modification factors (CMFs) for certain countermeasures based on the FHWA [CMF Clearinghouse](#)²² published studies. A CMF is a multiplicative factor used to calculate the expected number of crashes at a given site after implementing a specific countermeasure. For example, a 0.80 CMF indicates an expected 20 percent reduction in crashes. VDOT also presently prioritizes nine proven safety countermeasures in its Systemic Safety Plan, which aligns with emphasis areas of the SHSP. A compilation of effective pedestrian treatments is included in the Virginia PSAP.

The following sections list proven behavioral and infrastructure strategies for consideration by stakeholders within the region. The sources listed above may be referenced for more detailed information. There are many additional countermeasures that have been tried and documented, but the following sections highlight those that have proven successful at local and regional levels.

Behavioral Countermeasures

- Intersections
 - Provide information to older populations on how to safely traverse challenging intersections. Older populations were overrepresented in intersection crashes, particularly in the Cities of Petersburg, Colonial Heights and Hopewell.
- Impaired Driving
 - High-visibility saturation patrols
 - Publicized sobriety checkpoints (Drive Sober or get Pulled Over)
 - Preliminary breath test devices (increases arrests)
 - DWI courts
 - Limits on diversion & plea agreements (increases conviction)
 - Court monitoring
 - Mass media campaigns
 - Enforcement of drug-impaired driving
 - Educate drivers on the dangers of cell phone usage while driving
 - Enforce existing cell phone and other handheld devices usage laws
- Speeding
 - Communications and outreach supporting enforcement
 - Implement automated enforcement (e.g., speed safety cameras) as permitted in School and Work Zones
 - High-visibility enforcement
 - Implement diversion and plea agreement restrictions, traffic violator school

²² VA-State-Preferred-CMF-List (https://www.vdot.virginia.gov/business/resources/vhsip/VA-State-Preferred-CMF-List_acc050222.pdf)

- Installation of variable speed limits
- Seat belts and Child Restraints
 - Short-term, high-visibility seat belt law enforcement
 - Integrated nighttime seat belt enforcement
 - School-based programs
 - Education and enforcement of seat belt use laws
 - Publicize and engage in National Highway Traffic Safety Administration (NHTSA) Click-It or Ticket campaigns
- Young Drivers
 - Education and enforcement of graduated driver licensing (GDL) law
 - Parental roles in teaching and managing young drivers
 - Enforcement of GDL and zero-tolerance laws
 - Communications and outreach
 - GDL intermediate license nighttime restrictions
- Older Drivers
 - General communications and education
 - License screening and testing
 - Referring older drivers to licensing agencies
 - License restrictions
- Bicycles
 - Encourage bicycle helmet use for adults and children
 - Safe routes to school education, encouragement, and infrastructure projects
 - Active lighting and rider conspicuity
 - *Share the road* awareness programs
 - Driver training
 - Education on motorist passing bicyclist laws
- Pedestrians
 - Communications and outreach addressing impaired pedestrians
 - Driver training and education on pedestrian safety
 - Child school bus safety education
 - Encourage the use of reflectors, reflective clothing, and lights while walking at night

Infrastructure Countermeasures

- Intersections
 - Improve access management
 - Install roundabouts and/or traffic circles
 - Improve sight distance for users exiting minor streets
 - Provide enhanced and advance warning signage for unsignalized intersections
 - Install intersection lighting
 - Install red-light cameras
 - Install backplates with reflective borders (traffic signal heads)
 - Add left and right turn lanes
 - Install high-visibility crosswalks at intersections to enhance pedestrian safety

- Speeding
 - Set appropriate, context sensitive speed limits
 - Provide appropriate corridor speed progression and adequate change and clearance intervals at signalized intersections
 - Implementation of variable speed limits
 - Development of speed feedback signs
 - Implementation of traffic calming techniques
- Roadway departure
 - Use of six-inch pavement marking edge lines
 - Apply High Friction Surface Treatment (HFST) to roadways, especially in locations where clusters of wet-weather roadway departure crashes have occurred
 - Install SafetyEdgeSM (wedge of pavement on outside edge to enable drop off recovery)
 - Enhanced delineation for horizontal curves
 - Chevron signs or delineators
 - Retroreflective strips on signposts
 - In-lane curve warning pavement markings
 - Dynamic curve warning signs (including speed radar feedback signs)
 - Install longitudinal rumble strips and stripes
 - Install median barriers and high-visibility guardrails
- Bicycles
 - Install painted on-street bike lanes, off-street shared use (pedestrian and bicycle) paths, and cycle-tracks (on-street barrier separated bike lanes) where possible.
 - Install *share the road* signs
 - Install “Bikes May Use Full Lane” signage
 - Institute road diets
- Pedestrians
 - Crosswalk visibility enhancements (e.g., high visibility crosswalk markings, enhanced signing, and pavement markings)
 - Leading pedestrian interval
 - Install sidewalks, walkways, and curb ramps
 - Install Rectangular Rapid Flashing Beacons (RRFBs)
 - Pedestrian hybrid beacons
 - Pedestrian refuge islands
 - Implement road diets
 - Install lighting/crosswalk illumination measures
- FHWA [Proven Safety Countermeasures](https://highways.dot.gov/safety/proven-safety-countermeasures)²³ and [Virginia Highway Safety Improvement Program](https://www.virginiadot.org/business/ted_app_pro.asp)²⁴
 - High-visibility backplates on signals (up 15-percent crash reduction)
 - Flashing yellow arrow on signals (up to 20-percent crash reduction)
 - Curve signs (up to 40-percent crash reduction)
 - Pedestrian crossings (up to 55-percent crash reduction)

²³ FHWA [Proven Safety Countermeasures](https://highways.dot.gov/safety/proven-safety-countermeasures) (<https://highways.dot.gov/safety/proven-safety-countermeasures>)

²⁴ Virginia Highway Safety Improvement Program (https://www.virginiadot.org/business/ted_app_pro.asp)

- Unsignalized intersection signing and marking enhancements (up to 10-percent crash reduction)
- Shoulder wedge (up to 20-percent crash reduction)
- Center line rumble strips (up to 60-percent crash reduction)
- Edge line rumble strips (up to 50-percent crash reduction)
- Road conversion (dial) (up to 47 percent crash reduction)

General Implementation Options

The overall goal of safety analysis and planning is to help the TCAMPO region progress toward its safety performance targets by reducing fatalities and serious injuries from motor vehicle crashes. This progress can occur through the implementation of policies, programs, and projects that address both behavioral and infrastructure needs. The sections below outline suggestions, with specific action items, to advance safety efforts in the region. Additionally, with the recently passed federal transportation funding bill and the 2020 Virginia transportation bill both providing more behavioral and infrastructure safety program resources, TCAMPO is well positioned to develop highway safety actions, initiatives, and projects to mitigate the impact of crashes.

Organizational

Safety Culture

The TCAMPO region has several transportation priorities, but a Safe System Approach highlights the importance of prioritizing transportation safety. Shifts in leadership, staff, and stakeholder thinking can bring about this safety focus. A good resource for leading the shift is *Zero Road Deaths and Serious Injuries: Leading a Paradigm Shift to a Safe System*²⁵, a report that describes a paradigm shift in road safety policy being led by a handful of countries. Another resource is FHWA's *Safe System Approach*²⁶ webpage, which includes a subsection on *safety culture*²⁷.

- TCAMPO staff read these resources and propose next steps for the region through technical committees and policy boards.

Education

Ensuring local jurisdictions, transportation and safety stakeholders, and elected officials understand the key safety issues, needs, and opportunities identified in this analysis will be an important first step to educating everyone about the role they can play in safety planning and programming.

- TCAMPO staff present a summary of this analysis to stakeholders.
- TCAMPO gives safety briefings to the police board on a regular basis.

Safety Committee/Working Group

Holding regularly scheduled meetings with regional transportation and safety stakeholders may help advance discussions about safety implementation activities, evaluate successes and challenges, and sustain momentum on safety policies, programs, and projects. A full multidisciplinary committee would

²⁵ Zero Road Deaths and Serious Injuries, (<https://www.oecd.org/publications/zero-road-deaths-and-serious-injuries-9789282108055-en.htm>)

²⁶ Zero Deaths and Safe System, (<https://highways.dot.gov/safety/zero-deaths>)

²⁷ Zero Deaths – Safety, (https://safety.fhwa.dot.gov/zerodeaths/safety_culture.cfm)

consist of member from law enforcement, emergency services, engineering, research, health departments, advocacy groups and government. Coordinating with these wide-ranging disciplines ensures viewpoint diversity and diverse stakeholder engagement.

- Create a multidisciplinary safety committee/working group.
- Conduct regularly scheduled meetings and engagement.

Action Plan

The Virginia 2022-2026 SHSP includes action plans for each of the emphasis areas. Safety action plans outline specific approaches to determine which countermeasures will be implemented, by whom, and in what timeframe. Developing a regional action plan can provide an organizational structure to address behavioral and infrastructure implementation priorities.

- Convene a stakeholder committee and discuss the benefits and feasibility of developing a Regional Safety Action Plan with implementation details
- Develop a comprehensive safety action plan with prioritized list of projects and safety programs for implementation

Behavioral

Countermeasures Being Implemented

Behavioral strategies and actions are already being implemented in the region. Other proven solutions, including those that are presented in this document, could be implemented to address highway behavioral and active transportation safety issues. The table below shows the Selective Enforcement projects being implemented by each jurisdiction. Dinwiddie County is not implementing Selective Enforcement projects. See the 2023 Virginia Highway Safety Plan for further information on these programs²⁸.

Table 28. Active Countermeasures by Jurisdiction (Source: VDOT)

Locality	Program
Chesterfield County	Selective Enforcement - Alcohol
	Selective Enforcement - Speed
	Selective Enforcement – Pedestrian and Bicycle
Prince George County	Selective Enforcement - Alcohol
	Selective Enforcement - Speed
	Selective Enforcement – Occupant Protection
City of Petersburg	Selective Enforcement - Alcohol
City of Hopewell	Selective Enforcement - Speed
City of Colonial Heights	Selective Enforcement - Alcohol

The Richmond VDOT region is also engaged in coordinating and/or assisting with at least five NHTSA Standardized Child Passenger Safety Technician Courses, four Child Passenger Technician Refreshes Courses, one Renewal Course and two Child Passenger Safety Special Needs Certification Courses.

²⁸ Virginia Highway Safety Plan (<https://www.dmv.virginia.gov/safety/resources/pdf/fy23-hwysafetyplan.pdf>)

- Compile local and regional activities and programs, with consideration of the above resources, to determine priority regional behavioral countermeasures to support and implement.
- Track and share results of behavioral strategies and actions across the region.

Resource/Information Sharing

Statewide campaigns are led every year around vulnerable road users, occupant protection, impaired drivers, speeding and young drivers. Utilizing and sharing the resources developed for these campaigns at the regional and local level can help spread the word about transportation safety. It also saves time and resources as information is already available and can be customized to meet the specific needs in the region.

- Implement statewide and regional campaigns and schedules through Virginia’s SHSP²⁹ initiative and DMV’s HSP to identify outreach and education opportunities. For example, the Metropolitan Washington Street Smart Campaign.

Emphasis Area Crash Mapping

The regional and city HIN and KA and KAB crash maps could be shared with law enforcement to better target education and enforcement efforts. Additional emphasis area maps could be developed to supplement the maps and data prepared by Virginia DMV for NHTSA funded grant programs. The DMV prepares an interactive map through the Traffic Records Electronic Data System (TREDS)³⁰ for all jurisdictions and behavioral program maps for all legislative boundaries.

- Shares HIN and PSAP maps with local enforcement partners to collaborate on a safe-system and 5E approaches.
- Develop maps for behavioral emphasis area HINs as needed using DMV online tools³¹ or VDOT’s Crash Analysis Tool³².

Infrastructure

Policies

At the regional level, there are opportunities to institutionalize safety principles into the planning and programming process. For example, many MPOs and localities have instituted complete streets policies to ensure transportation projects are identified and later designed with the safety of all users in mind. *Zero Road Deaths and Serious Injuries: Leading a Paradigm Shift to a Safe System* provides policy ideas to implement.

- Read *Zero Road Deaths and Serious Injuries* and other Safe System related resources and propose next steps for the region³³.

²⁹ Toward Zero Deaths, (<https://tzdva.org/>)

³⁰ Traffic Records Electronic Data System, (<https://www.treds.virginia.gov/UI/Security/Login.aspx>)

³¹ Virginia Department of Motor Vehicles (https://www.dmv.virginia.gov/safety/#crash_data/index.asp)

³² VDOT Crash Analysis Tool,

(<https://app.powerbigov.us/view?r=eyJrjoiMjhlZjFhZDA0NTIjMC00MDA1LWVhOTMtYWYwM2NiMmRiMmRkIiwidC16IjYyMGFINWE5LTRYzEtNGZhMC04NjQxLTVkOWYzODZjNzMwOSJ9>)

³³ World Road Association (PIARC) Road Safety Manual provides good safe system implementation information and additional references. The Vision Zero Network also provides MPO resources.

Priority Locations

This study identifies the HIN as well as pedestrian crash risk roadway segments with the potential for safety improvement. Additional network screening results for safety project locations are published for the VTRANS mid-term needs. The site includes a mapping tool with a drop-down selection that identifies roads based on a category of need. The VTRANS safety needs³⁴ locations have been normalized by traffic exposure to identify critical segments and intersections. There are other needs related to safety that may also be helpful for planning treatments. For example, the “Need – Pedestrian Access (RN)” selection identifies where additional pedestrian facilities may be beneficial. Thus, overlaying with the HIN will help refine problem identification. The TCAMPO, in coordination with the VDOT District Office and member agencies, can prioritize locations and identify systemic or spot treatments to address the key needs.

- Establish priority locations for VDOT STARS and OIPI (SMART SCALE) Project Pipeline Studies
- Engage in STARS and Pipeline studies, particularly those that are multi-jurisdictional, to promote safety considerations with alternatives analysis. TCAMPO staff can conduct or facilitate road safety assessments (RSAs or other safety analyses) with 5E stakeholders to identify improvements to submit for funding.

Project Selection

MPOs are required to set annual safety performance targets and demonstrate progress toward meeting those targets through transportation projects. To make progress toward meeting targets, TCAMPO should select transportation projects that address the safety issues identified in this study or in any future analysis.

- Elevate and support safety considerations during project planning studies for SMART SCALE, TAP, Revenue Sharing, etc. applications.
- Adopt safety as a high priority for regional projects and support local project prioritized based on safety needs (for example, KAB crashes impacted).

Safety Planning

Changes to population, commercial and residential development, and other factors over time impact where and why crashes occur. It will be important for the TCAMPO to regularly study crash trends and roadway data to revise the priority list and emphasis areas, as necessary. Updates to this analysis should be considered on a three- to five-year cycle.

- Update analysis every three to five years with the latest data from the above referenced VDOT GIS and Crash Analysis Tool.
- Revise priority list and emphasis areas based on updated analysis.
- Update countermeasures options using the latest Federal and State recommendations.

³⁴ The VTRANS pedestrian safety needs published in 2021 use the PSAP Version 2 top one percent locations, so the PSAP version 3 and this study provide the most up to date information. (<https://vtrans.org/interactvtrans/map-explorer>)

Appendices

Appendix A – Virginia Strategic Highway Safety Plan (SHSP) Emphasis Areas

[Virginia's 2022-2026 Strategic Highway Safety Plan \(SHSP\)](#) identified eleven emphasis areas (EAs) for targeted countermeasure implementation. These eight driving behaviors, crash types/locations, and user groups encompass a large percentage of contributing factors to fatal and serious injury crashes in Virginia. The definitions of these EAs from the SHSP are as follows:

- 1) **Impaired Driving:** Impaired driving encompasses crash statistics for the 4 Ds – drinking, drugs, distracted, and drowsy. A crash is classified with an impaired driving factor when one of the drivers involved in the crash is identified as being affected by any one of these four Ds.
- 2) **Speed:** Speeding crashes are defined as driving too fast for conditions or exceeding the posted speed limit.
- 3) **Occupant Protection:** A crash is classified with an occupant protection factor when one of the injured individuals was not utilizing a seat belt or child car seat.
- 4) **Roadway Departure:** Roadway departure crashes involve vehicles leaving the travel lane (to the left or right), encroaching into the opposite lanes, or onto the shoulder and roadside environment.
- 5) **Intersections:** A crash is classified as occurring at an intersection if it occurs at a location where two or more roads cross or merge. These are locations where there is an inherent possibility for conflict between all road users.
- 6) **Young Drivers:** In Virginia's SHSP, young drivers are defined as persons between the ages of 15 and 20. A crash is classified with this factor if one or more of the involved drivers meets the young driver criteria.
- 7) **Aging Road Users:** A crash involving a driver or pedestrian who is aged 65 or older.
- 8) **Bicycles:** A bicycle crash is one that involves one or more bicycles.
- 9) **Pedestrians:** A pedestrian crash is one that involves one or more pedestrians.
- 10) **Heavy Trucks:** A crash involving a heavy vehicle body type. This includes commercial vehicles, large trucks (semi-trailers, single-unit trucks with two or three axels) and buses
- 11) **Motorcyclists:** A crash involving a motorcycle, scooter, or moped operator.

Appendix B – KA High Injury Network, 2017-2021

Tri-Cities Region

Rank	Route Name	Unique ID	Fatal Crash (K) Count	Incapacitating Crash (A) Count	Length (Miles)
1 (Tier 1)	SC-674N	172	1	1	0.38
2 (Tier 1)	BUS US-460W	111	1	4	0.45
3 (Tier 1)	UR-9010W	426	1	1	0.45
4 (Tier 1)	SC-3290N	278	1	1	0.46
5 (Tier 1)	SC-770E	203	1	1	0.53
6 (Tier 1)	SC-674N	387	1	1	0.61
7 (Tier 1)	SC-732N	194	2	1	1.22
8 (Tier 1)	SC-4841E	304	2	1	1.24
9 (Tier 1)	SC-618E	126	2	2	1.32
10 (Tier 1)	UR-9012E	428	1	5	1.03
11 (Tier 1)	SC-652N	154	2	1	1.64
12 (Tier 1)	US-460W	110	9	16	8.99
13 (Tier 1)	ALT US-301N	96	2	7	2.24
14 (Tier 1)	SC-603N	319	1	1	1.02
15 (Tier 1)	SC-680E	346	1	1	1.03
16 (Tier 1)	SC-617N	125	2	4	2.23
17 (Tier 1)	US-360E	100	12	34	14.15
18 (Tier 1)	SC-625N	131	2	4	2.34
19 (Tier 1)	SC-619N	127	2	7	2.54
20 (Tier 1)	US-1S	91	8	39	10.95
21 (Tier 1)	SC-604N	320	3	6	3.66
22 (Tier 1)	SC-609N	119	1	2	1.23
23 (Tier 1)	US-360W	103	9	41	12.63
24 (Tier 1)	I-95S	28	19	64	25.27
25 (Tier 2)	SC-605N	118	1	1	1.22
26 (Tier 2)	US-60E	92	5	25	7.66
27 (Tier 2)	VA-288S	84	8	22	11.39
28 (Tier 2)	SC-653N	155	4	9	5.58
29 (Tier 2)	VA-142E	56	1	4	1.54
30 (Tier 2)	SC-626N	132	4	16	6.16
31 (Tier 2)	SC-600N	112	1	3	1.49
32 (Tier 2)	SC-642N	146	1	3	1.49
33 (Tier 2)	SC-604E	115	4	10	5.97
34 (Tier 2)	US-1N	89	16	86	27.81
35 (Tier 2)	UR-9002N	419	1	9	2.15
36 (Tier 2)	I-295S	36	3	10	5.24
37 (Tier 2)	SC-602E	113	4	16	7.41
38 (Tier 2)	SC-653S	156	2	10	3.88

Rank	Route Name	Unique ID	Fatal Crash (K) Count	Incapacitating Crash (A) Count	Length (Miles)
39 (Tier 2)	SC-638E	143	1	5	1.95
40 (Tier 2)	SC-618N	369	1	2	1.69
41 (Tier 2)	SC-629E	374	2	7	3.69
42 (Tier 2)	SC-626N	329	1	2	1.71
43 (Tier 2)	SC-651E	152	3	15	6.07
44 (Tier 2)	ALT US-301P	98	0	3	0.28
45 (Tier 2)	UR-1E	397	0	6	0.56
46 (Tier 2)	UR-9046E	433	0	2	0.19
47 (Tier 2)	US-301N	95	5	51	13.12
48 (Tier 2)	I-95N	19	11	76	25.40
49 (Tier 2)	SC-746N	198	1	8	2.65
50 (Tier 2)	I-85N	13	7	43	17.21
51 (Tier 2)	SC-950N	211	1	5	2.34
52 (Tier 2)	SC-655E	159	3	16	7.18
53 (Tier 2)	SC-1921N	246	1	4	2.25
54 (Tier 2)	VA-10E	39	8	65	21.57
55 (Tier 2)	US-460E	105	6	56	17.35
56 (Tier 2)	VA-156N	78	5	40	14.22
57 (Tier 2)	SC-619N	325	1	4	2.46
58 (Tier 2)	SC-751E	356	1	5	2.58
59 (Tier 2)	SC-600N	317	0	9	1.06
60 (Tier 2)	VA-40E	48	2	7	4.86
61 (Tier 2)	SC-641E	145	1	10	3.21
62 (Tier 2)	VA-150N	66	2	28	7.41
63 (Tier 2)	I-295N	34	3	10	7.38
64 (Tier 2)	VA-36E	44	2	30	7.83
65 (Tier 2)	VA-10W	41	4	37	13.05
66 (Tier 2)	SC-1542N	228	0	2	0.26
67 (Tier 2)	SC-651W	153	0	3	0.39
68 (Tier 2)	SC-754S	200	0	4	0.53
69 (Tier 2)	SC-647E	148	1	11	3.73
70 (Tier 2)	SC-613E	122	0	5	0.70
71 (Tier 2)	US-60W	94	2	21	7.90
72 (Tier 2)	Southpark BLVD	467	0	5	0.72
73 (Tier 2)	UR-9004E	420	0	18	2.64
74 (Tier 2)	BUS US-460P	108	0	9	1.36
75 (Tier 2)	UR-2N	399	0	3	0.47
76 (Tier 2)	SC-632N	137	0	5	0.80
77 (Tier 2)	SC-613E	324	1	7	3.88
78 (Tier 2)	SC-654N	158	1	6	3.84

Rank	Route Name	Unique ID	Fatal Crash (K) Count	Incapacitating Crash (A) Count	Length (Miles)
79 (Tier 2)	I-85S	16	4	32	16.89
80 (Tier 2)	VA-144N	57	1	23	6.78
81 (Tier 2)	VA-150S	72	1	28	7.90
82 (Tier 2)	UR-9031N	431	0	3	0.53
83 (Tier 2)	UR-9010E	425	0	4	0.71
TOTAL			224	1,204	435.86

Appendix C – KAB High Injury Network, 2017- 2021

Tri-Cities Region

Rank	Route Name	Unique ID	Fatal Crash (K) Count	Incapacitating Crash (A) Count	Minor Crash (B) Count	Length (Miles)
1 (Tier 1)	SC-674N	294	1	1	4	0.38
2 (Tier 1)	BUS US-460W	208	1	4	1	0.45
3 (Tier 1)	SC-1610E	489	1	0	3	0.46
4 (Tier 1)	SC-5190E	767	1	0	3	0.53
5 (Tier 1)	UR-2N	947	0	3	36	0.47
6 (Tier 1)	SC-4841E	741	2	1	2	1.24
7 (Tier 1)	Courthouse RD	1195	1	1	4	0.75
8 (Tier 1)	SC-770E	351	1	1	23	1.03
9 (Tier 1)	Flank RD	1095	1	0	2	0.78
10 (Tier 1)	ALT US-301N	186	2	7	14	2.24
11 (Tier 1)	SC-732N	335	2	1	5	1.80
12 (Tier 1)	SC-617N	228	2	4	18	2.23
13 (Tier 1)	UR-9012E	988	1	5	9	1.40
14 (Tier 1)	Granby ST	1208	1	0	5	1.07
15 (Tier 1)	SC-651W	268	0	3	11	0.39
16 (Tier 1)	SC-3430N	672	1	0	8	1.15
17 (Tier 1)	US-360E	192	12	34	324	20.45
18 (Tier 1)	US-60E	178	5	25	272	12.11
19 (Tier 1)	SC-609N	220	1	2	7	1.35
20 (Tier 1)	UR-9002N	977	1	9	23	2.15
21 (Tier 1)	I-95S	49	19	64	297	31.56
22 (Tier 1)	SC-644N	847	1	0	4	1.21
23 (Tier 1)	US-360W	196	9	41	265	18.86
24 (Tier 1)	US-1S	173	8	41	203	17.06
25 (Tier 1)	US-60W	182	2	21	299	11.35
26 (Tier 1)	UR-9010W	984	1	1	2	1.46
27 (Tier 1)	SC-637S	250	0	2	18	0.62
28 (Tier 1)	ALT US-301P	188	0	3	5	0.38

Rank	Route Name	Unique ID	Fatal Crash (K) Count	Incapacitating Crash (A) Count	Minor Crash (B) Count	Length (Miles)
29 (Tier 1)	US-1N	168	16	84	314	37.35
30 (Tier 1)	SC-680E	862	1	1	2	1.53
31 (Tier 1)	SC-603N	824	1	1	3	1.57
32 (Tier 1)	UR-1E	945	0	6	8	0.72
33 (Tier 1)	SC-653S	273	2	10	72	5.69
34 (Tier 1)	SC-600N	822	0	9	11	1.06
35 (Tier 1)	BUS US-460P	203	0	9	21	1.36
36 (Tier 2)	VA-142E	110	1	4	8	2.05
37 (Tier 2)	US-460W	206	9	16	45	16.14
38 (Tier 2)	UR-9036E	965	0	4	30	1.21
39 (Tier 2)	US-301N	184	5	51	83	14.46
40 (Tier 2)	SC-641E	256	1	10	51	3.90
41 (Tier 2)	SC-613E	223	0	5	26	1.21
42 (Tier 2)	SC-619N	231	2	7	25	4.42
43 (Tier 2)	SC-604N	825	3	6	8	5.42
44 (Tier 2)	I-95N	36	11	76	293	32.69
45 (Tier 2)	TE-229376	1	0	1	16	0.57
46 (Tier 2)	SC-629	911	2	7	5	4.00
47 (Tier 2)	UR-9049N	972	0	1	23	0.80
48 (Tier 2)	VA-36P(2)	94	0	1	25	0.87
49 (Tier 2)	VA-156S	143	0	2	28	1.06
50 (Tier 2)	SC-652N	269	2	1	26	4.16
51 (Tier 2)	SC-618E	229	2	2	16	3.94
52 (Tier 2)	SC-626N	239	4	16	45	9.48
53 (Tier 2)	VA-150N	121	2	28	107	9.63
54 (Tier 2)	SC-605N	217	1	1	1	1.82
55 (Tier 2)	SC-653N	271	4	9	96	10.93
56 (Tier 2)	SC-950N	402	1	5	21	2.92
57 (Tier 2)	VA-288S	154	8	23	83	18.93
58 (Tier 2)	SC-651E	266	3	15	95	10.02
59 (Tier 2)	SC-654N	852	1	0	2	1.83
60 (Tier 2)	Southpark BLVD	1149	0	5	10	0.87
61 (Tier 2)	VA-144S	112	0	17	66	4.06
62 (Tier 2)	VA-10E	79	8	65	315	32.16
63 (Tier 2)	VA-156N	141	5	40	80	16.46
64 (Tier 2)	Plaza DR	1241	0	2	5	0.40
65 (Tier 2)	VA-36E	90	2	30	203	14.32
66 (Tier 2)	VA-10W	84	4	37	216	19.51
67 (Tier 2)	Bermuda Crossroad LN	1012	0	1	6	0.34

Rank	Route Name	Unique ID	Fatal Crash (K) Count	Incapacitating Crash (A) Count	Minor Crash (B) Count	Length (Miles)
68 (Tier 2)	SC-647E	262	1	11	72	6.13
69 (Tier 2)	SC-642N	257	1	3	23	3.28
70 (Tier 2)	UR-9032E	955	0	5	14	1.16
71 (Tier 2)	VA-145E	115	0	22	60	5.13
72 (Tier 2)	VA-150S	130	1	28	95	9.63
73 (Tier 2)	UR-3N	962	0	2	4	0.42
74 (Tier 2)	SC-652S	270	0	0	12	0.50
75 (Tier 2)	UR-9004E	978	0	18	19	3.19
76 (Tier 2)	I-85N	24	7	43	122	26.73
77 (Tier 2)	SC-1921N	532	1	4	15	3.44
78 (Tier 2)	SC-625N	238	2	4	29	6.38
79 (Tier 2)	SC-655E	278	3	16	52	11.39
80 (Tier 2)	17Th AVE S	1162	0	1	8	0.50
81 (Tier 2)	VA-144N	111	1	23	112	10.60
82 (Tier 2)	SC-683E	302	0	3	13	1.01
83 (Tier 2)	SC-618N	904	1	2	3	2.86
84 (Tier 2)	US-460E	198	6	56	92	27.23
85 (Tier 2)	SC-637N	249	0	13	89	6.14
86 (Tier 2)	VA-147E	119	0	10	78	5.18
87 (Tier 2)	SC-626N	839	1	2	2	2.87
88 (Tier 2)	VA-145W	118	0	1	20	1.11
89 (Tier 2)	Glenroy ST	1300	0	3	2	0.54
90 (Tier 2)	SC-600N	209	1	4	11	3.65
91 (Tier 2)	I-95N Dist/Coll at mp50	37	0	4	7	0.94
92 (Tier 2)	SC-2305E	581	0	1	7	0.49
93 (Tier 2)	SC-2001E	539	0	0	7	0.34
94 (Tier 2)	VA-36W	95	0	11	66	4.94
95 (Tier 2)	SC-1505E	466	0	0	5	0.25
96 (Tier 2)	SC-1107E	418	0	0	5	0.25
97 (Tier 2)	UR-1W	946	0	1	8	0.56
98 (Tier 2)	Fort Lee RD	1297	0	2	7	0.67
99 (Tier 2)	SC-602E	211	4	16	38	14.98
100 (Tier 2)	SC-751E	874	1	5	4	3.64
101 (Tier 2)	I-295S	71	3	10	36	11.51
102 (Tier 2)	UR-9042E	968	0	3	31	2.08
103 (Tier 2)	SC-3025E	647	0	2	13	0.99
104 (Tier 2)	Tim Price WAY	1088	0	0	5	0.27
105 (Tier 2)	SC-2434N	600	0	1	6	0.48
106 (Tier 2)	VA-36P	93	0	1	6	0.48

Rank	Route Name	Unique ID	Fatal Crash (K) Count	Incapacitating Crash (A) Count	Minor Crash (B) Count	Length (Miles)
107 (Tier 2)	SC-604E	213	3	10	69	13.74
108 (Tier 2)	SC-686W	308	0	0	12	0.65
109 (Tier 2)	SC-619N	833	1	4	3	3.63
110 (Tier 2)	Southpark BLVD	1107	0	1	11	0.76
111 (Tier 2)	UR-9043N	969	0	2	26	1.75
112 (Tier 2)	UR-9024E	952	0	2	6	0.67
113 (Tier 2)	UR-9040E	967	0	3	20	1.65
114 (Tier 2)	UR-6N	964	0	2	3	0.52
115 (Tier 2)	BUS US-460E	200	0	2	10	0.92
116 (Tier 2)	UR-9031N	995	0	3	0	0.53
117 (Tier 2)	UR-9008E	980	0	3	5	0.82
118 (Tier 2)	SC-746N	341	1	8	45	7.04
TOTAL	--		217	1,253	5,765	649.41

TCAMPO KAB HIN

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
1 (Tier 1)	BUS US-460W	208	2	1	4	1	0.45
2 (Tier 1)	UR-2N	947	5	0	3	36	0.47
3 (Tier 1)	Courthouse RD	1195	7	1	1	4	0.75
4 (Tier 1)	Flank RD	1095	9	1	0	2	0.78
5 (Tier 1)	SC-617N	228	12	1	2	9	0.99
6 (Tier 1)	ALT US-301N	186	10	2	7	14	2.24
7 (Tier 1)	UR-9012E	988	13	1	5	9	1.40
8 (Tier 1)	Granby ST	1208	14	1	0	5	1.07
9 (Tier 1)	UR-9002N	977	20	1	9	23	2.15
10 (Tier 1)	US-1N	168	29	10	46	144	17.20
11 (Tier 1)	US-1S	173	24	3	20	69	6.31
12 (Tier 1)	I-95S	49	21	9	29	151	16.29
13 (Tier 1)	US-301N	184	39	3	41	75	8.99
14 (Tier 1)	UR-9010W	984	26	1	1	2	1.46
15 (Tier 1)	SC-619N	231	42	2	5	18	3.53
16 (Tier 1)	SC-626N	239	52	4	11	41	7.31
17 (Tier 1)	I-85N	24	76	4	23	74	9.25
18 (Tier 1)	ALT US-301P	188	28	0	3	5	0.38
19 (Tier 1)	SC-603N	824	31	1	1	3	1.57

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
20 (Tier 1)	UR-1E	945	32	0	6	8	0.72
21 (Tier 1)	SC-600N	822	34	0	9	11	1.06
22 (Tier 1)	SC-629E	911	46	2	7	5	3.61
23 (Tier 1)	BUS US-460P	203	35	0	9	21	1.36
24 (Tier 2)	VA-142E	110	36	1	4	8	2.05
25 (Tier 2)	UR-9036E	965	38	0	4	30	1.21
26 (Tier 2)	I-95N	36	44	6	33	148	16.88
27 (Tier 2)	UR-9049N	972	47	0	1	23	0.80
28 (Tier 2)	VA-36P(2)	94	48	0	1	25	0.87
29 (Tier 2)	VA-156S	143	49	0	2	28	1.06
30 (Tier 2)	US-460E	198	84	4	33	61	12.16
31 (Tier 2)	VA-156N	141	63	5	35	74	15.06
32 (Tier 2)	Southpark BLVD	1149	60	0	5	10	0.87
33 (Tier 2)	VA-144S	112	61	0	16	66	4.06
34 (Tier 2)	Plaza DR	1241	64	0	2	5	0.40
35 (Tier 2)	VA-36E	90	65	2	30	203	14.32
36 (Tier 2)	UR-9032E	955	70	0	5	14	1.16
37 (Tier 2)	UR-3N	962	73	0	2	4	0.42
38 (Tier 2)	SC-625N	238	78	2	4	25	5.99
39 (Tier 2)	SC-602E	211	99	3	11	27	9.21
40 (Tier 2)	UR-9004E	978	75	0	18	19	3.19
41 (Tier 2)	17Th AVE S	1162	80	0	1	8	0.50
42 (Tier 2)	Glenroy ST	1300	89	0	3	2	0.54
43 (Tier 2)	I-95N Dist/Coll at mp50	37	91	0	4	7	0.94
44 (Tier 2)	VA-36W	95	94	0	11	66	4.94
45 (Tier 2)	SC-1107E	418	96	0	0	5	0.25
46 (Tier 2)	UR-1W	946	97	0	1	8	0.56
47 (Tier 2)	SC-600N	209	90	1	3	11	3.65
48 (Tier 2)	Fort Lee RD	1297	98	0	2	7	0.67
49 (Tier 2)	I-85S	31	127	2	12	48	9.69
50 (Tier 2)	UR-9042E	968	102	0	3	31	2.08
51 (Tier 2)	VA-36P	93	106	0	1	6	0.48
52 (Tier 2)	VA-144N	111	81	0	16	83	7.11
53 (Tier 2)	Southpark BLVD	1107	110	0	1	11	0.76
54 (Tier 2)	SC-746N	341	118	1	8	45	6.59
55 (Tier 2)	I-295N	67	129	3	8	16	10.68
56 (Tier 2)	UR-9043N	969	111	0	2	26	1.75

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
57 (Tier 2)	UR-9024E	952	112	0	2	6	0.67
58 (Tier 2)	UR-9040E	967	113	0	3	20	1.65
59 (Tier 2)	UR-6N	964	114	0	2	3	0.52
60 (Tier 2)	BUS US-460E	200	115	0	2	10	0.92
61 (Tier 2)	UR-9031N	995	116	0	3	0	0.53
62 (Tier 2)	UR-9008E	980	117	0	3	5	0.82
63 (Tier 2)	UR-9020E	951	120	0	2	1	0.42
64 (Tier 2)	UR-9047N	971	125	0	2	33	2.38
65 (Tier 2)	UR-9066E	959	128	0	2	2	0.50
66 (Tier 2)	UR-9010E	983	130	0	4	7	1.22
67 (Tier 2)	UR-9033E	996	131	0	3	3	0.77
68 (Tier 2)	2Nd AVE N	1168	133	0	1	3	0.39
69 (Tier 2)	Rome ST	1328	134	0	2	2	0.52
70 (Tier 2)	SC-620N	233	149	0	5	30	3.01
71 (Tier 2)	Danville ST	1199	138	0	2	6	0.81
72 (Tier 2)	US-1P(3)	172	141	0	5	11	1.81
73 (Tier 2)	SC-1337N	941	145	0	0	7	0.51
74 (Tier 2)	UR-9035S	957	150	0	3	22	2.30
75 (Tier 2)	UR-9035N	956	154	0	4	27	2.94
76 (Tier 2)	UR-9030E	954	155	0	1	8	0.84
77 (Tier 2)	Westover AVE	1264	160	0	0	3	0.24
78 (Tier 2)	I-295S	71	101	1	8	31	8.96
79 (Tier 2)	Blackstone AVE	1181	162	0	0	5	0.42
80 (Tier 2)	I-95S Dist/Coll at mp50	50	163	0	2	4	0.86
TOTAL	--	--		79	585	2,129	264.25

Chesterfield County KAB HIN

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
1 (Tier 1)	SC-674N	294	1	1	1	4	0.38
2 (Tier 1)	SC-1610E	489	3	1	0	3	0.46
3 (Tier 1)	SC-5190E	767	4	1	0	3	0.53
4 (Tier 1)	SC-4841E	741	6	2	1	2	1.24
5 (Tier 1)	SC-770E	351	8	1	1	23	1.03
6 (Tier 1)	I-95S	49	21	10	38	165	11.98
7 (Tier 1)	SC-732N	335	11	2	1	5	1.80
8 (Tier 1)	SC-617N	228	12	2	4	18	2.23
9 (Tier 1)	US-1S	173	24	7	27	156	11.48

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
10 (Tier 1)	SC-651W	268	15	0	3	11	0.39
11 (Tier 1)	US-360E	192	17	12	34	323	20.14
12 (Tier 1)	US-60E	178	18	5	25	271	11.68
13 (Tier 1)	SC-3430N	672	16	1	0	8	1.15
14 (Tier 1)	SC-609N	220	19	1	2	7	1.35
15 (Tier 1)	US-360W	196	23	9	41	264	18.74
16 (Tier 1)	US-1N	168	29	5	32	177	12.55
17 (Tier 1)	US-60W	182	25	2	21	299	11.10
18 (Tier 1)	SC-637S	250	27	0	2	18	0.62
19 (Tier 1)	VA-10E	79	62	6	45	252	19.52
20 (Tier 1)	SC-653S	273	33	2	9	71	5.69
21 (Tier 2)	I-295S	71	101	2	3	14	3.60
22 (Tier 2)	I-95N	36	44	3	33	162	11.96
23 (Tier 2)	SC-641E	256	40	1	10	51	3.90
24 (Tier 2)	SC-613E	223	41	0	5	26	1.21
25 (Tier 2)	VA-150N	121	53	2	23	86	7.63
26 (Tier 2)	SC-619N	231	42	2	7	25	4.42
27 (Tier 2)	TE-229376	1	45	0	1	16	0.57
28 (Tier 2)	SC-652N	269	50	2	1	26	4.16
29 (Tier 2)	SC-618E	229	51	2	2	16	3.94
30 (Tier 2)	SC-626N	239	52	4	15	45	9.48
31 (Tier 2)	SC-605N	217	54	1	1	1	1.82
32 (Tier 2)	SC-653N	271	55	4	9	96	10.93
33 (Tier 2)	SC-950N	402	56	1	5	21	2.92
34 (Tier 2)	VA-288S	154	57	8	22	83	18.93
35 (Tier 2)	VA-10W	84	66	4	34	208	17.57
36 (Tier 2)	SC-651E	266	58	3	15	92	10.02
37 (Tier 2)	Bermuda Crossroad LN	1012	67	0	1	6	0.34
38 (Tier 2)	SC-647E	262	68	1	11	72	6.11
39 (Tier 2)	SC-642N	257	69	1	3	23	3.28
40 (Tier 2)	VA-145E	115	71	0	22	60	5.13
41 (Tier 2)	VA-150S	130	72	1	28	95	9.57
42 (Tier 2)	SC-652S	270	74	0	0	12	0.50
43 (Tier 2)	SC-1921N	532	77	1	4	15	3.44
44 (Tier 2)	VA-144N	111	81	1	13	60	6.65
45 (Tier 2)	SC-625N	238	78	2	4	28	6.38
46 (Tier 2)	SC-655E	278	79	3	16	52	11.39
47 (Tier 2)	VA-147E	119	86	0	10	77	4.99
48 (Tier 2)	SC-637N	249	85	0	13	88	6.14
49 (Tier 2)	VA-145W	118	88	0	1	20	1.11

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
50 (Tier 2)	SC-2305E	581	92	0	1	7	0.49
51 (Tier 2)	SC-2001E	539	93	0	0	7	0.34
52 (Tier 2)	SC-1505E	466	95	0	0	5	0.25
53 (Tier 2)	I-295N	67	129	1	3	10	3.58
54 (Tier 2)	SC-1107E	418	96	0	0	5	0.25
55 (Tier 2)	SC-600N	209	90	1	3	11	3.65
56 (Tier 2)	SC-686W	308	108	0	0	12	0.61
57 (Tier 2)	SC-602E	211	99	4	16	38	14.98
58 (Tier 2)	SC-3025E	647	103	0	2	13	0.99
59 (Tier 2)	Tim Price WAY	1088	104	0	0	5	0.27
60 (Tier 2)	SC-2434N	600	105	0	1	6	0.48
61 (Tier 2)	SC-604E	213	107	3	10	68	13.74
TOTAL	--	--		128	635	3,843	312.64

Dinwiddie County KAB HIN

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
1 (Tier 1)	BUS US-460W	208	2	1	4	1	0.45
2 (Tier 1)	Flank RD	1095	9	1	0	2	0.78
3 (Tier 1)	SC-644N	847	22	1	0	4	1.21
4 (Tier 1)	SC-680E	862	30	1	1	2	1.53
5 (Tier 1)	US-460W	206	37	9	15	42	14.99
6 (Tier 1)	SC-603N	824	31	1	1	3	1.57
7 (Tier 1)	SC-600N	822	34	0	9	11	1.06
8 (Tier 2)	SC-604N	825	43	3	6	8	5.42
9 (Tier 2)	US-1S	173	24	1	2	11	2.21
10 (Tier 2)	SC-654N	852	59	1	0	2	1.83
11 (Tier 2)	US-1N	168	29	5	30	83	17.64
12 (Tier 2)	SC-626N	839	87	1	2	2	2.87
13 (Tier 2)	SC-751E	874	100	1	5	4	3.64
14 (Tier 2)	SC-619N	833	109	1	4	3	3.63
15 (Tier 2)	I-85N	24	76	5	28	71	22.62
16 (Tier 2)	I-85S	31	127	4	27	56	19.76
17 (Tier 2)	US-460E	198	84	2	20	48	16.53
18 (Tier 2)	VA-40E	96	157	2	7	17	11.05
19 (Tier 2)	BUS US-460E	200	115	0	0	3	0.44
20 (Tier 2)	VA-142E	110	36	0	1	1	1.02
TOTAL	--	--		40	162	374	130.25

Prince George County KAB HIN

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
1 (Tier 2)	I-95S	49	21	6	9	35	10.89
2 (Tier 2)	SC-629E	911	46	2	7	5	4.00
3 (Tier 2)	I-95N	36	44	5	22	40	11.52
4 (Tier 2)	VA-144S	112	61	0	12	22	2.07
5 (Tier 2)	US-301N	184	39	3	19	19	9.05
6 (Tier 2)	VA-156N	141	63	4	32	44	13.95
7 (Tier 2)	SC-618N	904	83	1	2	3	2.86
8 (Tier 2)	VA-144N	111	81	0	8	15	2.10
9 (Tier 2)	US-460E	198	84	1	20	24	7.85
10 (Tier 2)	VA-10E	79	62	2	14	23	9.76
11 (Tier 2)	I-295N	67	129	2	7	7	7.61
12 (Tier 2)	SC-1337N	941	145	0	0	7	0.51
13 (Tier 2)	VA-36E	90	65	0	2	26	2.46
14 (Tier 2)	VA-106N	107	171	0	8	11	3.74
15 (Tier 2)	VA-36W	95	94	0	3	6	1.66
16 (Tier 2)	I-295S	71	101	0	7	21	6.79
17 (Tier 2)	VA-10W	84	66	0	1	2	0.87
18 (Tier 2)	US-460W	206	37	0	1	0	0.74
TOTAL	--	--		26	174	310	98.43

City of Colonial Heights KAB HIN

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
1 (Tier 1)	UR-2N	947	5	0	3	36	0.47
2 (Tier 1)	US-1N	168	29	3	8	30	3.30
3 (Tier 1)	UR-1E	945	32	0	6	8	0.72
4 (Tier 2)	I-95N	36	44	1	9	44	3.53
5 (Tier 2)	I-95S	49	21	1	7	50	3.53
6 (Tier 2)	VA-144S	112	61	0	4	43	1.86
7 (Tier 2)	Southpark BLVD	1149	60	0	5	10	0.87
8 (Tier 2)	UR-9032E	955	70	0	5	14	1.16
9 (Tier 2)	VA-144N	111	81	0	2	37	1.85
10 (Tier 2)	US-1S	173	24	0	10	35	3.23
11 (Tier 2)	UR-1W	946	97	0	1	8	0.56
12 (Tier 2)	Southpark BLVD	1107	110	0	1	11	0.76
13 (Tier 2)	UR-9024E	952	112	0	2	6	0.67
14 (Tier 2)	UR-9020E	951	120	0	2	1	0.40
15 (Tier 2)	UR-9066E	959	128	0	2	2	0.50
16 (Tier 2)	UR-9035S	957	150	0	3	22	2.30

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
17 (Tier 2)	UR-9035N	956	154	0	4	27	2.94
18 (Tier 2)	UR-9030E	954	155	0	1	8	0.84
TOTAL	--	--		5	75	392	29.49

City of Hopewell KAB HIN

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
1 (Tier 1)	Courthouse RD	1195	7	1	1	4	0.75
2 (Tier 1)	VA-36E	90	65	1	19	139	4.21
3 (Tier 1)	I-295S	71	101	1	0	1	0.92
4 (Tier 1)	Granby ST	1208	14	1	0	5	1.07
5 (Tier 1)	VA-156N	141	63	1	7	34	2.30
6 (Tier 1)	VA-36W	95	94	0	6	58	1.97
7 (Tier 2)	UR-9036E	965	38	0	4	30	1.21
8 (Tier 2)	UR-9049N	972	47	0	1	23	0.80
9 (Tier 2)	VA-36P(2)	94	48	0	1	25	0.87
10 (Tier 2)	VA-156S	143	49	0	2	28	1.06
11 (Tier 2)	Plaza DR	1241	64	0	2	5	0.40
12 (Tier 2)	UR-3N	962	73	0	2	4	0.42
13 (Tier 2)	17Th AVE S	1162	80	0	1	8	0.50
14 (Tier 2)	VA-10E	79	62	0	5	40	2.55
15 (Tier 2)	UR-9042E	968	102	0	3	31	2.08
16 (Tier 2)	UR-9043N	969	111	0	2	26	1.75
17 (Tier 2)	UR-9040E	967	113	0	3	20	1.65
18 (Tier 2)	UR-6N	964	114	0	2	3	0.52
19 (Tier 2)	UR-9047N	971	125	0	2	33	2.38
20 (Tier 2)	2Nd AVE N	1168	133	0	1	3	0.39
21 (Tier 2)	Danville ST	1199	138	0	2	6	0.81
22 (Tier 2)	Westover AVE	1264	160	0	0	3	0.24
23 (Tier 2)	VA-10W	84	66	0	2	3	0.73
24 (Tier 2)	Blackstone AVE	1181	162	0	0	5	0.42
25 (Tier 2)	14Th AVE S	1160	169	0	0	4	0.35
TOTAL	--	--		5	68	541	30.35

City of Petersburg KAB HIN

Rank	Route Name	Unique ID	Region Rank	Fatal Crash Count	Incapacitating Crash Count	Minor Crash Count	Length (Miles)
1 (Tier 1)	US-460E	198	84	3	16	20	2.64
2 (Tier 1)	VA-142E	110	36	1	3	7	1.03
3 (Tier 1)	US-1N	168	29	3	14	22	3.46
4 (Tier 1)	ALT US-301N	186	10	2	7	14	2.24
5 (Tier 1)	UR-9012E	988	13	1	5	9	1.40
6 (Tier 1)	US-301N	184	39	2	32	64	5.40
7 (Tier 1)	I-85N	24	76	2	15	51	4.11
8 (Tier 1)	UR-9002N	977	20	1	9	23	2.15
9 (Tier 1)	UR-9010W	984	26	1	1	2	1.46
10 (Tier 1)	ALT US-301P	188	28	0	3	5	0.38
11 (Tier 1)	I-95S	49	21	2	10	44	4.82
12 (Tier 1)	BUS US-460P	203	35	0	9	21	1.36
13 (Tier 2)	I-95N	36	44	2	12	47	5.43
14 (Tier 2)	BUS US-460E	200	115	0	2	7	0.48
15 (Tier 2)	UR-9004E	978	75	0	18	19	3.19
16 (Tier 2)	Glenroy ST	1300	89	0	3	2	0.54
17 (Tier 2)	I-95N Dist/Coll at mp50	37	91	0	4	7	0.94
18 (Tier 2)	Fort Lee RD	1297	98	0	2	7	0.67
19 (Tier 2)	VA-36P	93	106	0	1	6	0.48
20 (Tier 2)	UR-9031N	995	116	0	3	0	0.53
21 (Tier 2)	UR-9008E	980	117	0	3	5	0.82
22 (Tier 2)	UR-9010E	983	130	0	4	7	1.22
23 (Tier 2)	UR-9033E	996	131	0	3	3	0.77
24 (Tier 2)	Rome ST	1328	134	0	2	2	0.52
25 (Tier 2)	US-1P(3)	172	141	0	5	11	1.81
26 (Tier 2)	I-95S Dist/Coll at mp50	50	163	0	2	4	0.86
27 (Tier 2)	VA-36E	90	65	0	5	12	2.37
28 (Tier 2)	US-301P	187	175	0	1	3	0.56
29 (Tier 2)	UR-9046E	998	177	0	2	7	1.22
30 (Tier 2)	I-85S	31	127	0	4	23	4.02
31 (Tier 2)	US-460W	206	37	0	0	3	0.41
32 (Tier 2)	VA-36W	95	94	0	2	2	1.31
TOTAL	--	--		20	202	459	58.60