September
2025

Transportation Safety Action Plan

Crash Data Analysis Report—Part 2

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Crash Data Analysis Report—Part 2

prepared for

DUTCHESS COUNTY TRANSPORTATION COUNCIL

Better ways from here to there

prepared by

CAMBRIDGE SYSTEMATICS

date

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Disclaimer

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

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Table of Contents

List of Tables

List of Figures

Executive Summary

To support the development of a new Safety Action Plan (SAP), the Dutchess County Transportation Council (DCTC) completed a comprehensive network screening process to identify priority locations and road types for potential safety improvements across the county, regardless of road owner.

Hotspot Network Screening

We created a scored network consisting of intersections and road segments that are over-represented in fatal, serious injury, and vulnerable road user (VRU) crashes from 2019 to 2023. Each location was further scored for key demographic factors, its association with VRU high risk areas, and its association with roadway departure risk areas.

Three sets of priority networks came out of this effort: one for roads under the State's jurisdiction, one for roads under the County's jurisdiction, and one for roads under municipal (i.e., local) jurisdiction. In consultation with the various jurisdictions, each of the networks had similar, but slightly different selection criteria.

Systemic Network Screening

We assessed sites throughout the system that have the highest potential for safety improvements. Based on the NYSDOT 2023 Strategic Highway Safety Plan (SHSP) and Dutchess County's recent five-year crash trends (2019-2023), four focus crash types were identified: speed-related, intersection-related, pedestrian-related, and roadway departure crashes.

For each of these crash types, we identified facility types that have the highest concentration of these crash types. Because risk factors are often highly correlated with specific facility types, we can identify specific locations throughout the system that are at highest risk for future crashes among these crash types.

The resulting Systemic Screening results pinpoint dozens of intersections and segments organized by focus crash type and roadway type:

Crash Type	Focus Facilities
Speed-related Crashes	• Rural Arterials (excluding freeways) • Urban Major Collectors • Urban Arterials (excluding freeways) • Rural Major Collectors
Intersection-related Crashes	• Urban Signalized Cross-Intersections and Intersections with 5 or More Legs • Urban Signalized Y-Intersections and T-Intersections • Rural Stop-Controlled Cross-Intersections

Pedestrian-related Crashes	• Urban Signalized Cross-Intersections • Urban Signalized T-Intersections and Y-Intersections • Urban Stop-Controlled Cross-Intersections
Roadway departure Crashes	• Urban Arterials (excluding freeways) • Rural Arterials (excluding freeways) • Urban Major Collectors • Rural Major Collectors

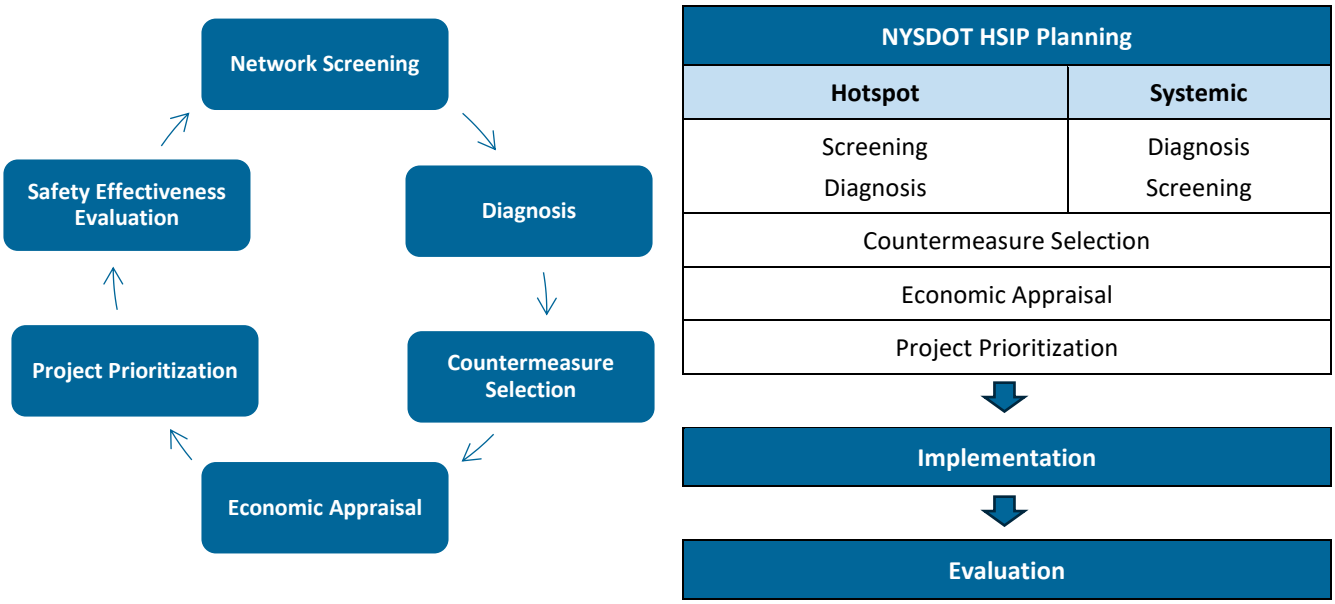
Road owners can use these findings to plan projects and proactively improve the safety of locations throughout the County.

1.0 Introduction

This report describes the network screening process carried out to identify roadway safety challenges in Dutchess County, consistent with national best practices and NYSDOT procedures.

The Roadway Safety Management Process (Figure 1-1) is a data-driven approach for applying proven analysis tools to identify, implement, and evaluate potential safety improvements at a network level. A key component of this approach is completing a network screening that identifies and prioritizes locations for future safety investments.

FIGURE 1-1 ROADWAY SAFETY MANAGEMENT PROCESS AND NYSDOT HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) PROCESS



Source: Highway Safety Manual (American Association of State Highway and Transportation Officials), NYSDOT

The NYSDOT *Highway Safety Improvement Program Procedures and Techniques* ("Red Book") has adapted the Roadway Safety Management Process and provides for two network screening approaches: Hotspot and Systemic.

- A **Hotspot Analysis** focuses on sites with the highest potential for safety improvements, based on crash history, traffic volumes, site characteristics, and other factors. It first identifies locations with the highest potential for safety improvements and then recommends appropriate countermeasures. This is also known as a *reactive* approach to safety.
- A **Systemic Analysis** also focuses on sites with the highest potential for safety improvements but does so from a systemwide perspective. Common crash types and contributing factors represented in the data are identified, then locations where those contributing factors may arise are identified. This is also known as a *proactive* approach to safety.

These two approaches are complementary and should each be conducted to support a comprehensive approach to safety management. This report describes the results of the Hotspot Analysis (in Section 2.0) and Systemic Analysis (in Section 0) network screenings for Dutchess County.

2.0 Hotspot Analysis

The Hotspot Analysis identified notable crash patterns and additional areas of high risk throughout the county. We identified intersections and segments that were over-represented in terms of their crash history during the most recent five-year period with complete crash data (2019-2023).

Three sets of priority networks came out of this effort: one for roads under the State's jurisdiction, one for roads under the County's jurisdiction, and one for roads under municipal jurisdiction. In consultation with the various jurisdictions, each of the networks had similar, but slightly different selection criteria.

In general, most of the analysis was completed using NYSDOT's CLEAR application, which can produce network screening information. Two network screening analyses were run to scrutinize (1) all crashes that resulted in a fatality or serious injury and (2) all crashes that involved a collision with a vulnerable road user (VRU). Each of those screenings produced a Potential for Safety Improvement (PSI) and a Level of Service of Safety (LOSS) from 1 to 4 for each segment and intersection, with a score of 4 representing locations that have the most potential for safety improvements and a score 1 representing locations that have the least potential for safety improvements.[1] In general, locations that scored a 3 or 4 were the ones considered for the priority safety networks.

We also reviewed relevant demographic and safety data for intersections and road segments to further differentiate between the locations with the most safety improvement potential. This included the following data:

- **Demographic Analysis:** Using census tract data, we identified locations that had over-represented concentrations of various population groups that would potentially benefit the most from increased traffic safety measures.
- **Vulnerable Road User (VRU) High-Risk Areas:** Using NYSDOT's Vulnerable Road User Safety Assessment, we assessed locations based on their level of Potential Safety Improvement (PSI), aggregated to the census tract level and categorized into high risk, medium risk, low risk, and no risk areas.
- **Roadway Departure Priority Areas and Head-On/Sideswipe Collision Priority Areas:** Using NYSDOT's Roadway Departure Safety Action Plan, we identified locations with concentrations of these crash types that were significantly higher than statewide densities.

The specific criteria for each network are outlined in each of their respective sections below.

[1] For more information on NYSDOT's CLEAR application and PSI and LOSS calculations, see the NYSDOT Red Book.

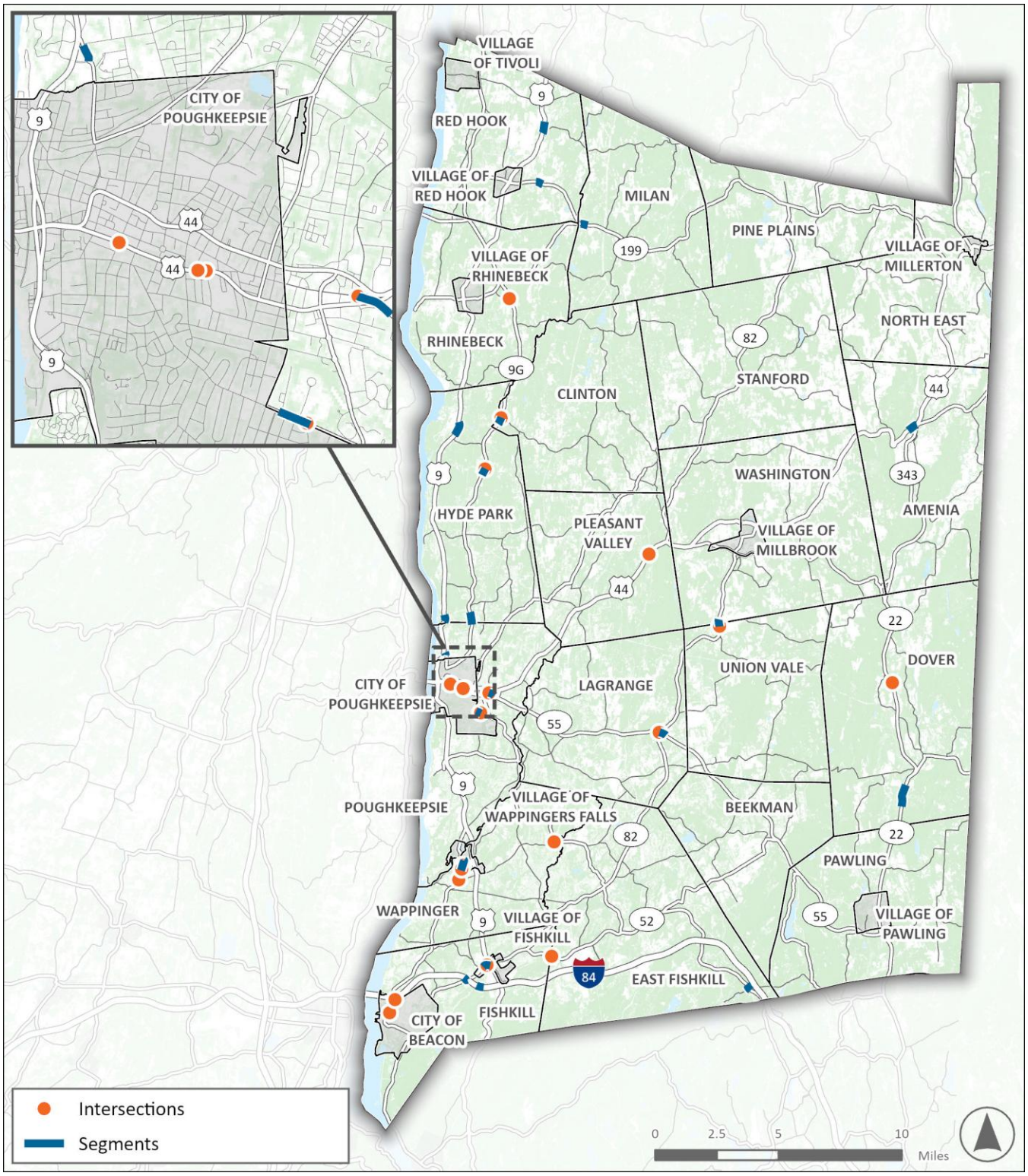
2.1 State Priority Safety Network

Segments or intersections on the State Priority Safety Network fulfill either of the following criteria:

- **Overall Hotspots**: Locations that have a PSI (from the fatal or serious injury network screening) of at least 0.05, at least two fatal or serious injury crashes, and a LOSS of at least three (from the fatal or serious injury network screening)
- **VRU Hotspots**: Locations that have a PSI (from the VRU screening) of at least 0.05, at least two fatal or serious injury crashes involving vulnerable road users, and a LOSS of at least three (from the VRU screening)

A map and table of the intersections and segments on the State Priority Network are seen in Figure 2-1 and Table 2-1. The table gives information on the location, the type of location (segment or intersection), the municipality in which it is located, and whether it is an Overall or VRU Hotspot, as described above. An online map of this analysis is available here. The locations listed in Table 2-1 are sorted (high to low) by PSI. Thus, locations at the top of the list have the highest potential for safety improvement as measured by PSI.

FIGURE 2-1 STATE PRIORITY SAFETY NETWORK LOCATIONS



Source: Analysis by Cambridge Systematics & NYSDOT and stakeholder feedback.

TABLE 2-1 STATE PRIORITY SAFETY NETWORK LOCATIONS

Location	Type	Municipality	Selection Criteria
Route 9G & Hollow Rd	Intersection	Town of Clinton	Overall Hotspot
Route 9G between S Creek Rd and Hollow Rd	Segment	Town of Clinton	Overall Hotspot
Route 9G between Cottage Rd and Bircher Ave	Segment	Town of Poughkeepsie, Town of Hyde Park	Overall Hotspot/ VRU Hotspot
Route 9D between Carmine Dr and E Main St	Segment	Village of Wappingers Falls	Overall Hotspot
Route 52 between Bedford Ave and Route 9 NB off-ramp	Segment	Village of Fishkill	Overall Hotspot
Route 52 between Holms Rd and Lavelle Ln	Segment	Town of East Fishkill	Overall Hotspot
South Ave (Route 9D) & East Academy St	Intersection	Village of Wappingers Falls	Overall Hotspot
Route 52 & Old Grange Rd	Intersection	Town of East Fishkill	Overall Hotspot
Route 55 between Route 82 and Camp Hillcroft Driveway	Segment	Town of LaGrange	Overall Hotspot
Church St (Route 44/55 EB) & S White St	Intersection	City of Poughkeepsie	Overall Hotspot
I-84 segment between Route 52 and Route 9	Segment	Town of Fishkill	Overall Hotspot
Route 9G between Marist Dr and W Cedar St	Segment	Town of Poughkeepsie	Overall Hotspot
Church St (Route 44/55 EB) & May St	Intersection	City of Poughkeepsie	Overall Hotspot
Route 9G between Patridge Hill Rd and S Cross Rd	Segment	Town of Hyde Park	Overall Hotspot
Route 82 & Route 55	Intersection	Town of LaGrange	Overall Hotspot
Ramp between Fairmont/Taft Ave and Route 55 EB	Segment	Town of Poughkeepsie	Overall Hotspot
Ramp between I-84 EB Exit 44 and Route 52, and Route 52 between Heath Rd and I-84 overpass	Segment	Town of Fishkill	Overall Hotspot
Route 22 & East Duncan Hill Rd	Intersection	Town of Dover	Overall Hotspot

Location	Type	Municipality	Selection Criteria
North Ave (Route 9D) & Van Ness Rd	Intersection	City of Beacon	Overall Hotspot
Route 376 & Myers Corners Rd	Intersection	Town of Wappinger	Overall Hotspot
Route 9G & Violet Hill Rd	Intersection	Town of Rhinebeck	Overall Hotspot
Church St (Route 44/55 EB) & Academy St	Intersection	City of Poughkeepsie	Overall Hotspot
Route 82 & Camby Rd	Intersection	Town of Union Vale	Overall Hotspot
Main St (Route 52) & Church St	Intersection	Village of Fishkill	Overall Hotspot
Route 199 between 217 Route 199 and Orlich Rd (east)	Segment	Town of Red Hook	Overall Hotspot
Hooker Ave (State Touring Route 983) & Cedar Ave	Intersection	Town of Poughkeepsie	Overall Hotspot
South Ave (Route 9D) & Franklindale Ave	Intersection	Village of Wappingers Falls	Overall Hotspot
South Ave (Route 9D) & Middlebush Rd	Intersection	Town of Wappinger	Overall Hotspot
North Ave (Route 9D) & Main St	Intersection	City of Beacon	Overall Hotspot
Route 82 between Camby Rd and 3534 Route 82	Segment	Town of Union Vale, Town of Washington	Overall Hotspot
Route 55 Ramp/Main St & Fairmont/Taft Ave	Intersection	Town of Poughkeepsie	Overall Hotspot
Route 9, 0.2 miles north and south of River Point Rd	Segment	Town of Hyde Park	Overall Hotspot
Route 199 between Rock City Rd and Battenfeld Rd	Segment	Town of Milan	Overall Hotspot
Route 22 between Furlong Rd and Wheeler Rd	Segment	Town of Dover	Overall Hotspot
Hooker Ave (State Touring Route 983) between Wilbur Blvd and Cedar Ave	Segment	Town of Poughkeepsie	Overall Hotspot
Taconic State Pkwy SB Ramp & Tinkertown Rd	Intersection	Town of Pleasant Valley	Overall Hotspot
Route 44 between Lake Amenia Rd and Route 22	Segment	Town of Amenia	Overall Hotspot
Route 9 between Old Post Rd N and Pitcher Ln	Segment	Town of Red Hook	Overall Hotspot

Location	Type	Municipality	Selection Criteria
Route 9G & S Cross Rd	Intersection	Town of Hyde Park	Overall Hotspot
Route 9 between Prospect St and Dinsmore Dr	Segment	Town of Hyde Park	Overall Hotspot

Source: Analysis by Cambridge Systematics & NYSDOT and stakeholder feedback.

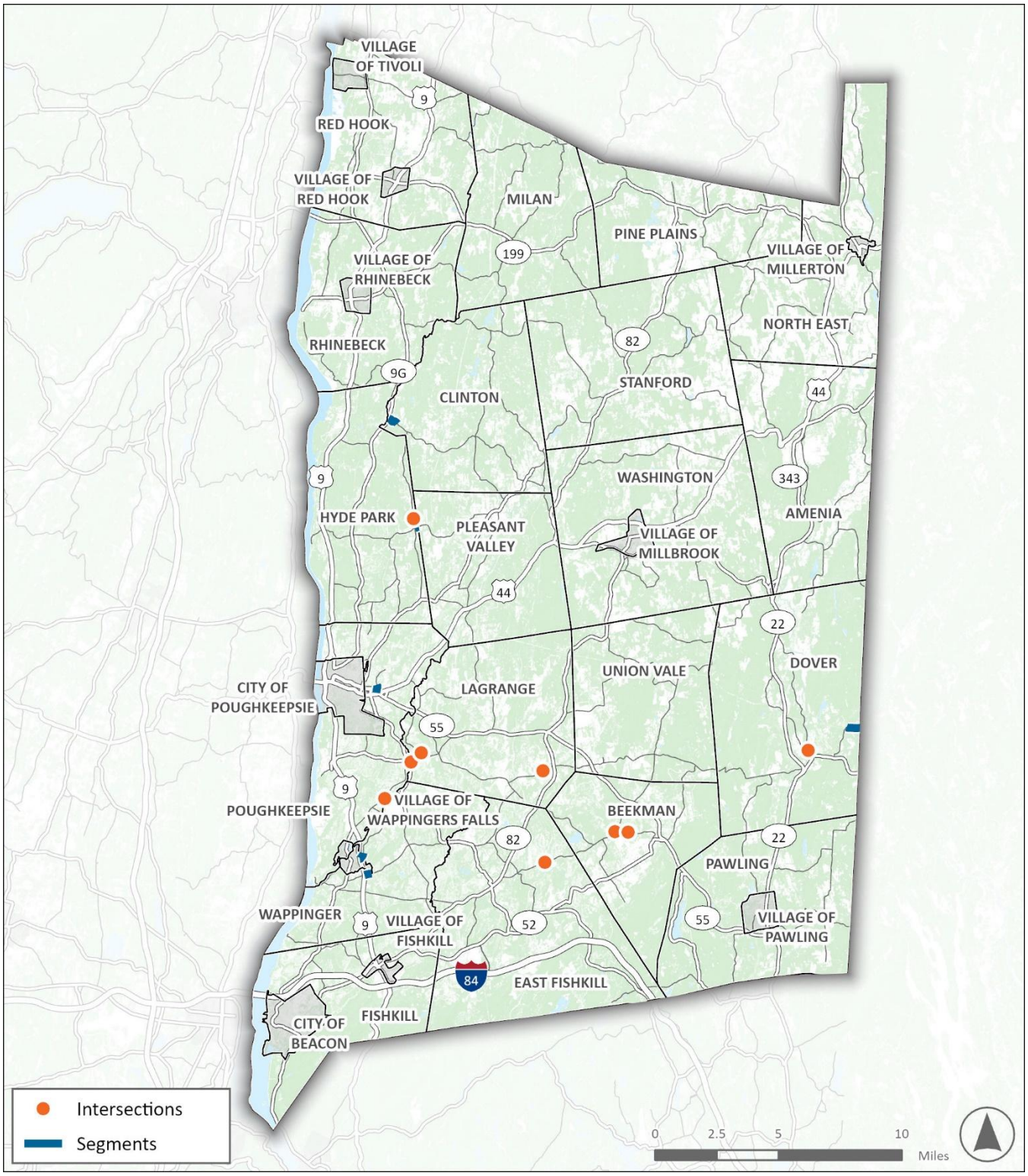
Note: These locations are sorted (high to low) by Potential for Safety Improvement (PSI).

2.2 County Priority Safety Network

To create the County Priority Safety Network, we combined and weighted NYSDOT CLEAR data with the additional datasets mentioned in the beginning of Section 2.0 to produce a scored roadway network. More technical information on where each of the scoring elements came from, how they were processed, and how they were weighted is available in Appendix A – Hotspot Analysis Technical Methodology. Any intersection or segment that had a score of at least 45 and at least two fatal or serious injury crashes was included.

A map and table of the intersections and segments on the County Priority Network are seen in Figure 2-2 and Table 2-2. The table gives information on the location, the type of location (segment or intersection), and the municipality in which it is located. An online map of this analysis is available here. The locations listed in Table 2-2 are sorted (high to low) by PSI. Thus, locations at the top of the list have the highest potential for safety improvement as measured by PSI.

FIGURE 2-2 COUNTY PRIORITY SAFETY NETWORK LOCATIONS



Source: Analysis by Cambridge Systematics and stakeholder feedback.

TABLE 2-2 COUNTY PRIORITY SAFETY NETWORK LOCATIONS

Location	Type	Municipality
Taft Ave (CR 38) between Main St and Friendly Ln	Segment	Town of Poughkeepsie
Vassar Rd (CR 77) & Willowbrook Hts	Intersection	Town of Poughkeepsie
Hollow Rd (CR 14) between Route 9G and W Cookingham Dr	Segment	Town of Clinton
Netherwood Rd (CR 41) between N/S Quaker Ln (CR 16) and the Town of Pleasant Valley line	Segment	Town of Hyde Park
N Quaker Ln (CR 16) & Cardinal Rd	Intersection	Town of Hyde Park
Noxon Rd (CR 21) & Emans Rd/Todd Hill Rd	Intersection	Town of LaGrange
Red Oaks Mill Rd (CR 44) & Walker Rd & Cochran Hill Rd	Intersection	Town of LaGrange
Beekman Rd (CR 9) & Beekman Poughquag Rd (CR 7)	Intersection	Town of Beekman
Beekman Poughquag Rd (CR 7) & Recreation Rd	Intersection	Town of Beekman
Beekman Rd (CR 9) & Pellbridge Dr	Intersection	Town of East Fishkill
Titusville Rd (CR 49) & Merry Hill Rd	Intersection	Town of LaGrange
Myers Corners Rd (CR 93) between Route 9 and Losee Rd	Segment	Town of Wappinger
New Hackensack Rd (CR 104) between Route 9 and Widmer Rd	Segment	Town of Wappinger, Village of Wappingers Falls
Dog Tail Corners Rd (CR 22) between SE Mountain Rd and the Town of Dover borderline	Segment	Town of Dover
Cricket Hill Rd (CR 26) & Old Route 22 (CR 6)	Intersection	Town of Dover

Source: Analysis by Cambridge Systematics and stakeholder feedback.

Note: These locations are sorted (high to low) by Potential for Safety Improvement (PSI). Crash data for the intersection at Cricket Hill Rd (CR 26) & Old Route 22 (CR 6) is incomplete in CLEAR due to location miscoding.

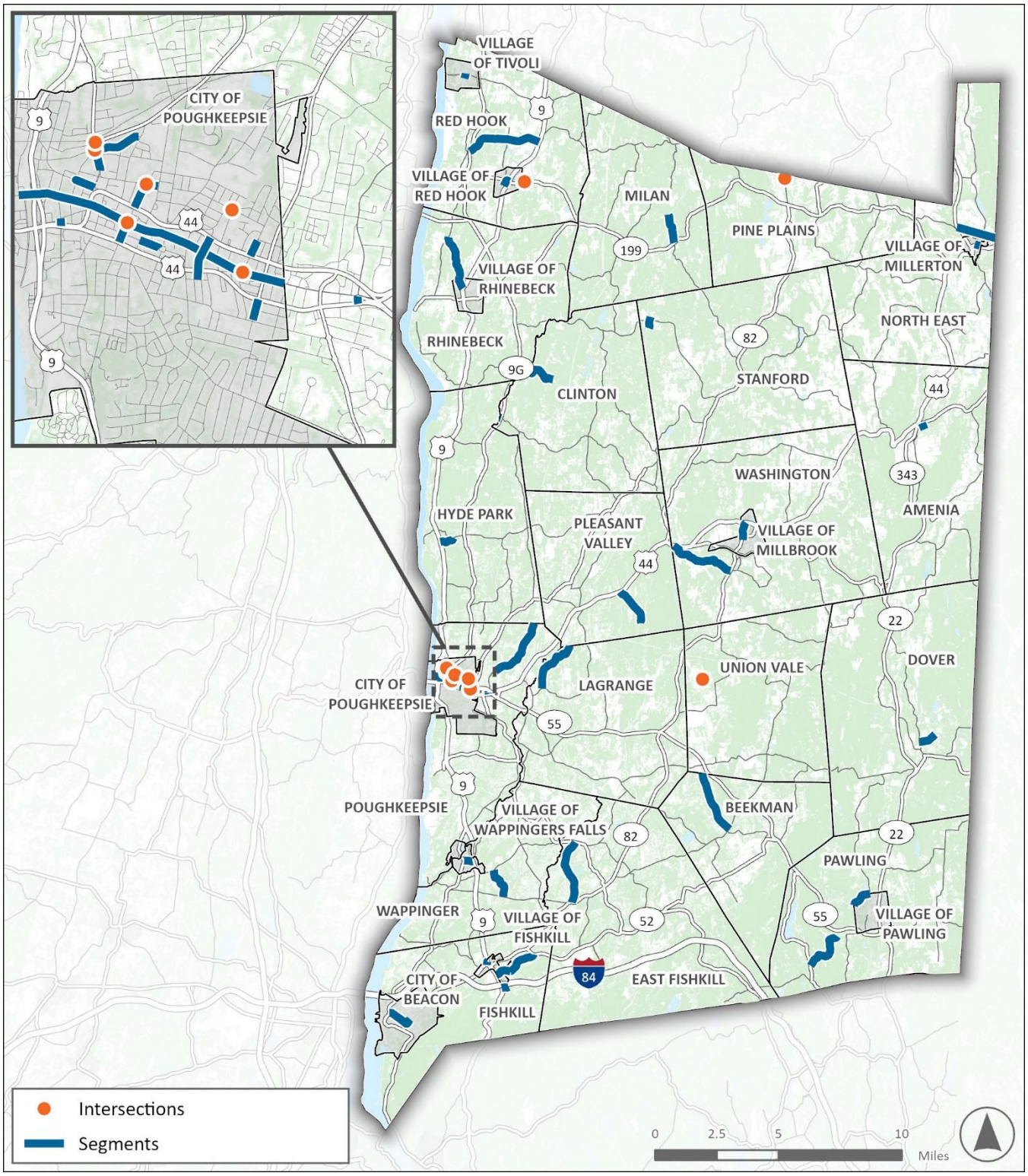
2.3 Municipal Priority Safety Network

Segments or intersections on the Municipal Priority Safety Network were developed and vetted primarily through outreach and feedback from each municipality. Each municipality in Dutchess County has at least one intersection or segment in this network. These locations generally have either high numbers of crashes or are known problem areas based on feedback from the municipality.

In addition, any location with a LOSS of four (from the fatal or serious injury network screening) and at least two fatal or serious injury crashes was included in the Municipal Priority Safety Network.

A map and table of the intersections and segments on the Municipal Priority Network are seen in Figure 2-3 and Table 2-3. The table gives information on the location, the type of location (segment or intersection), the municipality in which it is located, and its selection criteria, as described above. An online map of this analysis is available here. In Table 2-3, locations are first grouped by municipality. For each municipality, locations selected through data analysis are sorted (high to low) by PSI. Locations identified through municipal feedback are noted as such.

FIGURE 2-3 MUNICIPAL PRIORITY SAFETY NETWORK LOCATIONS



Source: Analysis by Cambridge Systematics and stakeholder feedback.

TABLE 2-3 MUNICIPAL PRIORITY SAFETY NETWORK LOCATIONS

Location	Type	Municipality	Selection Criteria
Main St between Route 9D and Herbert St	Segment	City of Beacon	Municipal Feedback
Main St & Corlies Ave	Intersection	City of Poughkeepsie	Data Analysis
Academy St between Route 44/55 EB and Main St	Segment	City of Poughkeepsie	Data Analysis
Catharine St between Route 44/55 WB and Mansion St	Segment	City of Poughkeepsie	Data Analysis
White St between Fox Ter and Route 44/55 WB	Segment	City of Poughkeepsie	Data Analysis
Brookside Ave between Washington St and Garden St	Segment	City of Poughkeepsie	Data Analysis
Washington St & Brookside Ave/Verazzano Blvd	Intersection	City of Poughkeepsie	Data Analysis
Washington St & Parker Ave	Intersection	City of Poughkeepsie	Data Analysis
Cannon St between S Hamilton St and S Clinton St	Segment	City of Poughkeepsie	Data Analysis
Corlies Ave between Route 44/55 WB and King St	Segment	City of Poughkeepsie	Data Analysis
Catharine St & Mansion St	Intersection	City of Poughkeepsie	Data Analysis
Mansion St & Pershing Ave	Intersection	City of Poughkeepsie	Data Analysis
Catharine St/Academy St & Main St	Intersection	City of Poughkeepsie	Data Analysis
Worrall Ave between Forbus St and Route 44/55 EB	Segment	City of Poughkeepsie	Data Analysis
Washington St between Mansion St and Parker Ave	Segment	City of Poughkeepsie	Data Analysis
Mansion St between Catharine St and N. Hamilton St	Segment	City of Poughkeepsie	Data Analysis
Mill St between N. Bridge St and Columbus Dr	Segment	City of Poughkeepsie	Data Analysis
S. Perry St between Union St and Route 44/55	Segment	City of Poughkeepsie	Data Analysis
Main St between N. Water St and the City line	Segment	City of Poughkeepsie	Municipal Feedback

Location	Type	Municipality	Selection Criteria
Mechanic St between E. Main St (Route 343) and Railroad Ave	Segment	Town of Amenia	Municipal Feedback
Baker Rd between Beekman Rd and the Town line	Segment	Town of Beekman	Municipal Feedback
Mills Cross Rd between the Town line and Route 9G	Segment	Town of Clinton	Data Analysis
Schultz Hill Rd between the Town line and 160 Schultz Hill Rd	Segment	Town of Clinton	Municipal Feedback
Reagans Mill Rd between Old State Route 22 and Berkshire Rd (including the intersection with Berkshire Rd)	Segment	Town of Dover	Municipal Feedback
Lake Walton Rd between Route 82 and Route 376	Segment	Town of East Fishkill	Municipal Feedback
Snook Rd between Route 9 and Monday Ln	Segment	Town of Fishkill	Data Analysis
Merritt Blvd between the Village line and Route 52	Segment	Town of Fishkill	Municipal Feedback
Pinewoods Rd between Route 9 and E. Market St	Segment	Town of Hyde Park	Municipal Feedback
Sleight Plass Rd between Overlook Rd and the Town line	Segment	Town of LaGrange	Municipal Feedback
North Rd between Route 199 and the Taconic State Pkwy	Segment	Town of Milan	Municipal Feedback
Beilke Rd/State Line Rd between Route 22 and the Town line	Segment	Town of North East	Municipal Feedback
Bundy Hill Rd between Route 292 and S. Harmony Hill Rd	Segment	Town of Pawling	Municipal Feedback
N. Main St, Hoffman Rd, & Silvernails Rd	Intersection	Town of Pine Plains	Municipal Feedback
Rossway Rd between Route 44 and the Taconic State Pkwy	Segment	Town of Pleasant Valley	Municipal Feedback

Location	Type	Municipality	Selection Criteria
Fairmont Ave between Route 44/55 EB and Main St	Segment	Town of Poughkeepsie	Data Analysis
Van Wagner Rd between Tucker Dr and the Town line	Segment	Town of Poughkeepsie	Municipal Feedback
Echo Valley Rd between Route 199 and Willard Rd (north)	Segment	Town of Red Hook	Data Analysis
Willard Rd/Blue Echo Rd & Echo Valley Rd	Intersection	Town of Red Hook	Data Analysis
Kelly Rd/Whalesback Rd/Rockefeller Ln between Route 9G and Route 9	Segment	Town of Red Hook	Municipal Feedback
Mount Rusten Rd between the Town line and River Rd	Segment	Town of Rhinebeck	Municipal Feedback
Willow Brook Rd between 0.2 miles south of the Taconic State Pkwy NB Exit 64 and 0.2 miles north of Bulls Head Rd	Segment	Town of Stanford	Municipal Feedback
N/S Smith Rd & Oswego Rd/Rickes Rd	Intersection	Town of Union Vale	Municipal Feedback
Spook Hill Rd between Myers Corners Rd and Old Hopewell Rd	Segment	Town of Wappinger	Municipal Feedback
South Rd between Route 44 and Route 82	Segment	Town of Washington	Municipal Feedback
Church St between Route 9 and Route 52	Segment	Village of Fishkill	Data Analysis
Merritt Blvd between Route 9 and the Village line	Segment	Village of Fishkill	Municipal Feedback
Front St between Harts Village Rd and Route 44/Sharon Turnpike	Segment	Village of Millbrook	Municipal Feedback
Century Blvd between Dutchess Ave and Maple Ave	Segment	Village of Millerton	Municipal Feedback
Lakeside Dr between W. Main St and Charles Colman Blvd	Segment	Village of Pawling	Municipal Feedback

Location	Type	Municipality	Selection Criteria
Church St/Saint John St between Garden St and Route 9	Segment	Village of Red Hook	Municipal Feedback
Montgomery St between Route 9 and the Village line	Segment	Village of Rhinebeck	Municipal Feedback
Montgomery St between Spring St and Pine St	Segment	Village of Tivoli	Municipal Feedback
E. Main St between Route 9D (South Ave) and Route 9	Segment	Village of Wappingers Falls	Municipal Feedback

Source: Analysis by Cambridge Systematics and stakeholder feedback.

Note: Locations selected through data analysis are sorted (high to low) by Potential for Safety Improvement (PSI) within each municipality.

3.0 Systemic Analysis

The Hotspot Analysis described in Section 0 identifies locations with a compelling history of crashes. Even though clear patterns were found through the development of the Priority Safety Network, individual incidents of severe crashes can be relatively rare and random. To complement the Hotspot Analysis, a Systemic Analysis was performed to identify safety improvements that can be applied across the entire system, not just in isolated locations.

The Systemic Analysis focuses on identifying risk factors commonly associated with severe crashes and involves a screening of the network based on site-specific risk levels. By considering where crashes are more likely to occur in the future, this analysis enables road owners to proactively prioritize locations with high crash risks for potential safety improvements, even in areas that may lack significant crash history.

The process of a systemic analysis, as described by FHWA, typically involves the following six steps:

1. Identify focus crash types, focus facility types, and risk factors
2. Screen and prioritize candidate locations for safety improvements
3. Identify and select countermeasures for each prioritized site
4. Prioritize systemic projects for transportation programs
5. Prepare, implement, and track systemic safety improvement projects
6. Evaluate systemic safety projects, countermeasures, programs, and overall performance

Considering the emphasis areas identified in the NYSDOT 2023 Strategic Highway Safety Plan (SHSP) and recent five-year crash trends in Dutchess County, the focus crash types selected for this systemic analysis included the following:

- Speed-related crashes
- Intersection-related crashes
- Pedestrian-related crashes
- Roadway departure crashes

To effectively reduce the frequency and severity of these four focus crash types, the systemic analysis was conducted separately for each type of crash. This includes the identification of the most prevalent crash locations and contributing factors. The in-depth analysis for each individual crash type is available in Appendix B – Systemic Analysis Technical Methodology.

Within the systemic analysis, Interstates and other freeways/expressways were *not* included as potential focus facility types, due to their unique role in the roadway network and the goal of this plan to serve as a resource for Dutchess County and local municipalities. This is not meant to discount the

importance of addressing safety on Interstates and freeways/expressways. NYSDOT covers these facilities as part of its state-level plans such as NYSDOT's Roadway Departure Safety Action Plan.

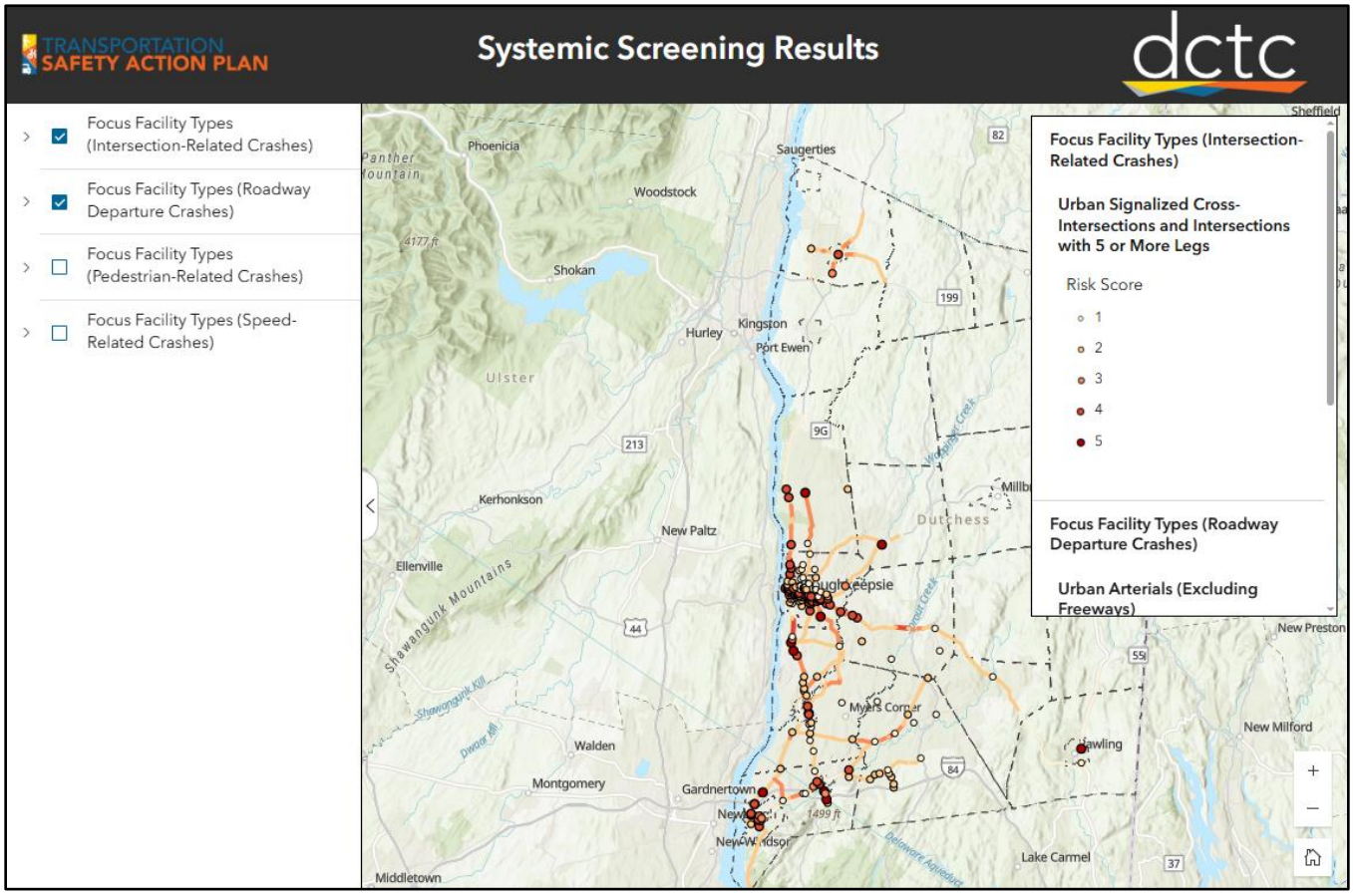
3.1 Systemic Screening Key Findings

Through the Systemic Screening process, focus facility types[2] and their associated risk factors were identified for each of the four focus crash types. An interactive online map was created that shows the locations identified for each focus crash and focus facility type, along with the location's risk factors (see screenshot below). Each risk factor was weighted equally, and a risk score was calculated for each location based on the total number of factors present. The map is available here: Online Systemic Screening Map. The table below shows the focus facilities for each crash type analyzed; there are three or four focus facilities for each crash type.

Crash Type	Focus Facilities
Speed-related crashes	• Rural Arterials (excluding freeways) • Urban Major Collectors • Urban Arterials (excluding freeways) • Rural Major Collectors
Intersection-related crashes	• Urban Signalized Cross-Intersections and Intersections with Five or More Legs • Urban Signalized Y-Intersections and T-Intersections • Rural Stop-Controlled Cross-Intersections
Pedestrian-related crashes	• Urban Signalized Cross-Intersections • Urban Signalized T-Intersections and Y-Intersections • Urban Stop-Controlled Cross-Intersections
Roadway departure crashes	• Urban Arterials (excluding freeways) • Rural Arterials (excluding freeways) • Urban Major Collectors • Rural Major Collectors

[2] NYSDOT's crash data is joined to the NYSDOT Roadway Inventory, which at the time of analysis referenced the 2010 urban area classifications. Facilities identified in this systemic analysis as urban or rural may have a different classification based on the 2020 urban area classifications.

FIGURE 3-1 ONLINE INTERACTIVE SYSTEMIC SCREENING RESULTS MAP



Source: Analysis by Cambridge Systematics

The DCTC and its partners can use this online map to visualize sites that are candidates for systemic countermeasures to address the identified risks. The countermeasures can be applied in the design of a single, location-specific project or bundled into a system-wide project across many locations. Project bundling allows facility owners to address a greater number of locations at a lower unit cost than through multiple smaller projects.

4.0 Summary & Next Steps

The DCTC and its partners at the State, County, and local level can use both the Hotspot and Systemic Analyses to identify potential projects throughout the county. The Safety Action Plan will feature two countermeasure toolkits – one of hotspot-oriented infrastructure countermeasures and another for systemic countermeasures – that can guide the development of such projects. The DCTC will also use the findings of the Hotspot Analysis to select locations for more in-depth investigations and project planning.

For the systemic screening locations, NYSDOT has approved a number of systemic treatments in its SHSP and the following Emphasis Area Plans:

- Pedestrian Safety Action Plan (2018)
- Vulnerable Road User Safety Assessment (2023)
- Roadway Departure Safety Action Plan (2024)

These plans include individual countermeasures and packages that are tailored to specific focus facilities and locations demonstrating identified risk factors. The countermeasure toolkits developed for the DCTC will include a compilation of countermeasures adopted in the NYSDOT Emphasis Area plans, Engineering Instruction bulletins, and other guidance.

Appendix A Hotspot Analysis Technical Methodology

This Appendix describes the technical methodology used to develop the Priority Safety Network. It outlines the data sources used, how they were processed and cleaned, and how they were combined and weighted into the final score for segments and intersections.

A.1 Scoring Elements

A.1.1 CLEAR Hotspot Screening

The Hotspot Screening aimed to identify notable crash patterns and additional areas of high risk throughout the county. We first identified intersections and segments that were over-represented in terms of their crash history over the most recent five-year period with complete crash data (2019-2023). This was done in two ways:

- Using all crashes that resulted in a fatality or serious injury
- Using all crashes that involved a collision with a vulnerable road user (VRU).

We completed the screening using NYSDOT's CLEAR Safety application, primarily through CLEAR's Network Screening module.

In CLEAR, areas that are over-represented in terms of their crash history are defined by their Potential for Safety Improvement (PSI). PSI was calculated using the Excess Expected Crash Frequency with Empirical Bayes Adjustment. This methodology allows for calculations to account for both differences in traffic volumes and possible bias due to regression-to-the-mean, accounting for changes to crash totals over the specific years included in the analysis. The final outputs of the CLEAR Safety tool are intersections and segments, analyzed using a sliding window, which analyzes a 0.3 mile window that moves at 0.1 mile increments across the roadway network.

Each intersection and segment has an associated PSI, which is then used to break the segments into four categories called a Level of Service of Safety (LOSS). The four LOSS categories and their definitions are listed in Table 4-1. The higher the LOSS, the greater impact a safety project would have if implemented at that location.

TABLE 4-1 LEVEL OF SERVICE OF SAFETY CATEGORIES

LOSS Level	PSI Percentiles	Description
Level 4	Above the 90th percentile	A high potential for crash reduction
Level 3	50th – 90th percentile	A moderate to high potential for crash reduction
Level 2	10th – 50th percentile	A low to moderate potential for crash reduction
Level 1	Lower than the 10th percentile	A low potential for crash reduction

Source: NYSDOT Highway Safety Improvement Program Procedures and Techniques.

Because of data availability issues, post-processing adjustments to the CLEAR Safety Network Screening module outputs were made to make corrections in the calculations for LOSS and PSI. Those issues and the methods to remedy those issues are described below in Table 4-2.

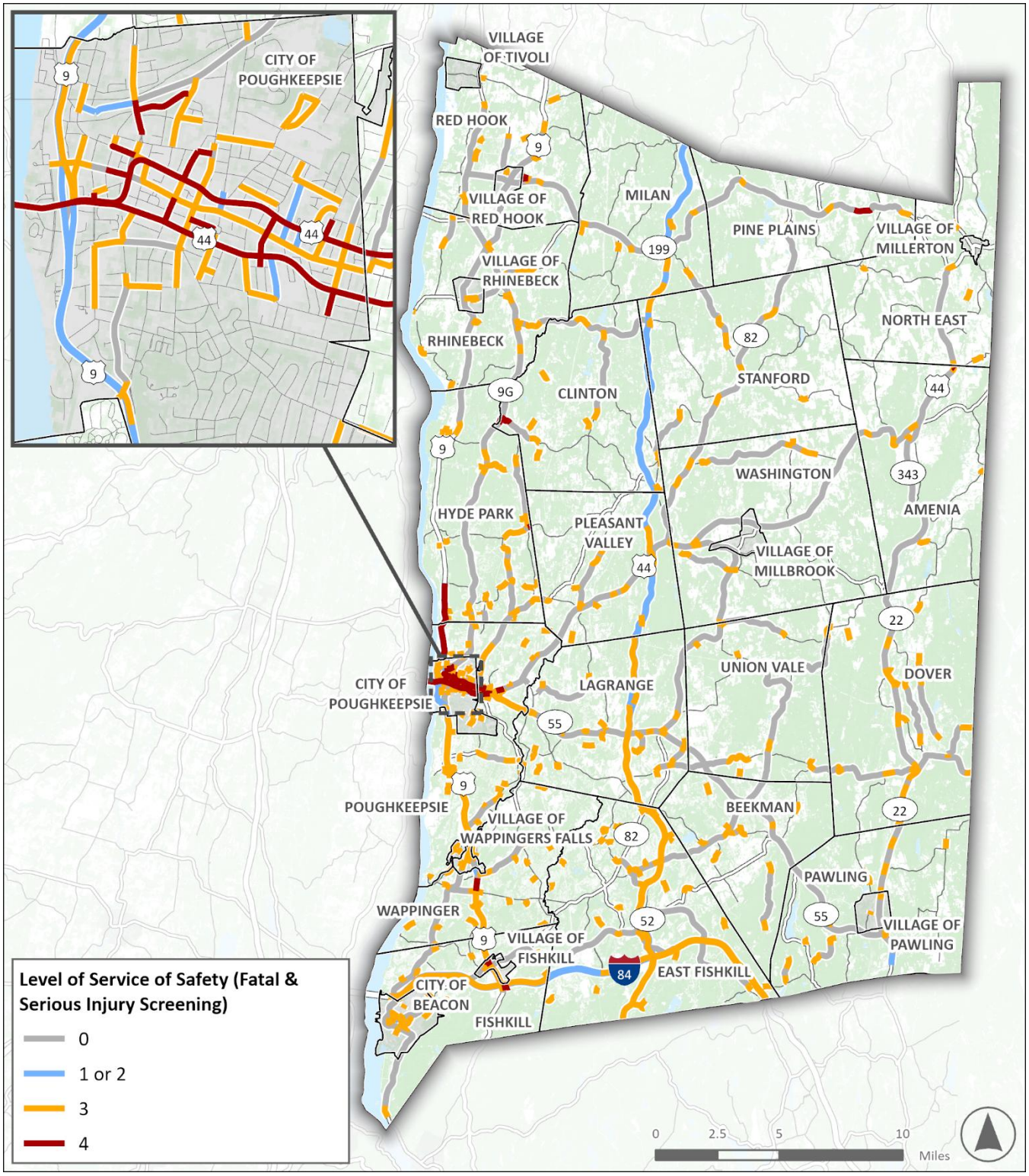
TABLE 4-2 CLEAR ISSUES AND REMEDIES

Issue	Remedy
The CLEAR Network Screening module could not accurately perform screenings on divided highways.	Identified all the divided highways in the county and ran those segments and intersections through the CLEAR Investigations module separately; then manually combined those results with the Network Screening results.
Some locations were lacking average annual daily traffic (AADT) data.	The AADT (either actual or estimated counts) from the NYSDOT Traffic Data Viewer were spatially joined to the segments to correct for this. Data from 2021 was the most recent data available from the Highway Data Services Bureau and is the midpoint of the five-year period (2019-2023) of crashes included in the network screening. A small number of AADT figures were still not able to be joined to the CLEAR export segments. In those cases, a NYSDOT-provided predicted number of crashes was used in the calculations.
There were segments whose Facility Type attributes did not correspond to those listed in the tool.	Aerial imagery was reviewed to assess the urban/rural context, number of lanes, and access control. An updated Facility Type was selected that matched those defining characteristics. The performance measures were then able to be calculated based upon the proper parameters.

The CLEAR Network Screening module runs screenings on intersections and ramps separately. Crashes at intersections should not be counted when analyzing segments, but the tool double-counted those crashes.	When reviewing the top-scoring segments, segments where there were not at least two fatal or serious injury crashes (excluding crashes at intersections) were removed from consideration. This was done outside of CLEAR after scoring the segments.

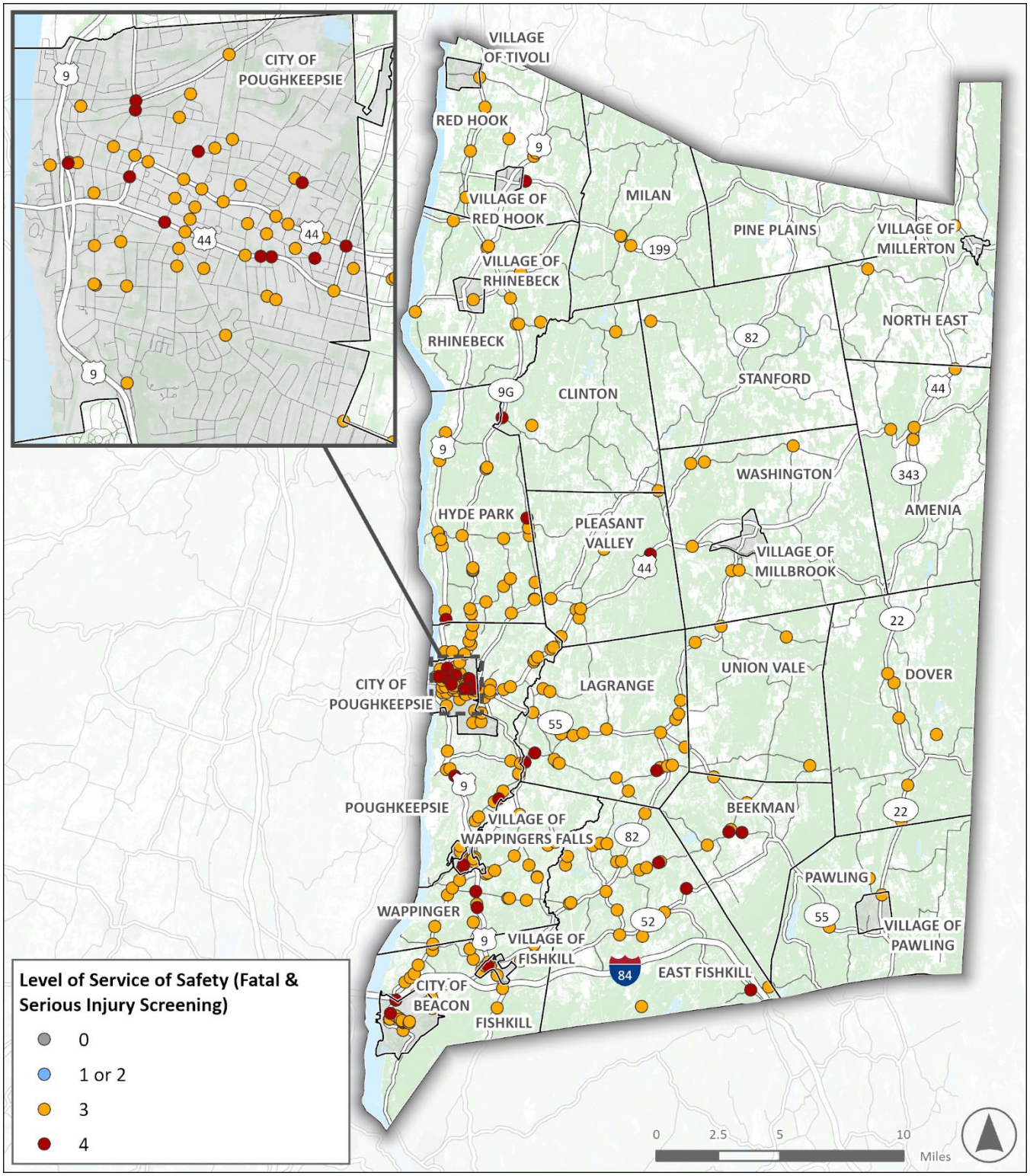
For the fatality and serious injury screening, segments and intersections identified in CLEAR are shown in Figure 4-1 and Figure 4-2, respectively. Segments and intersections identified in CLEAR for the vulnerable road user screening are seen in Figure 4-3 and Figure 4-4, respectively.

FIGURE 4-1 FATALITY AND SERIOUS INJURY SCREENING - SEGMENTS



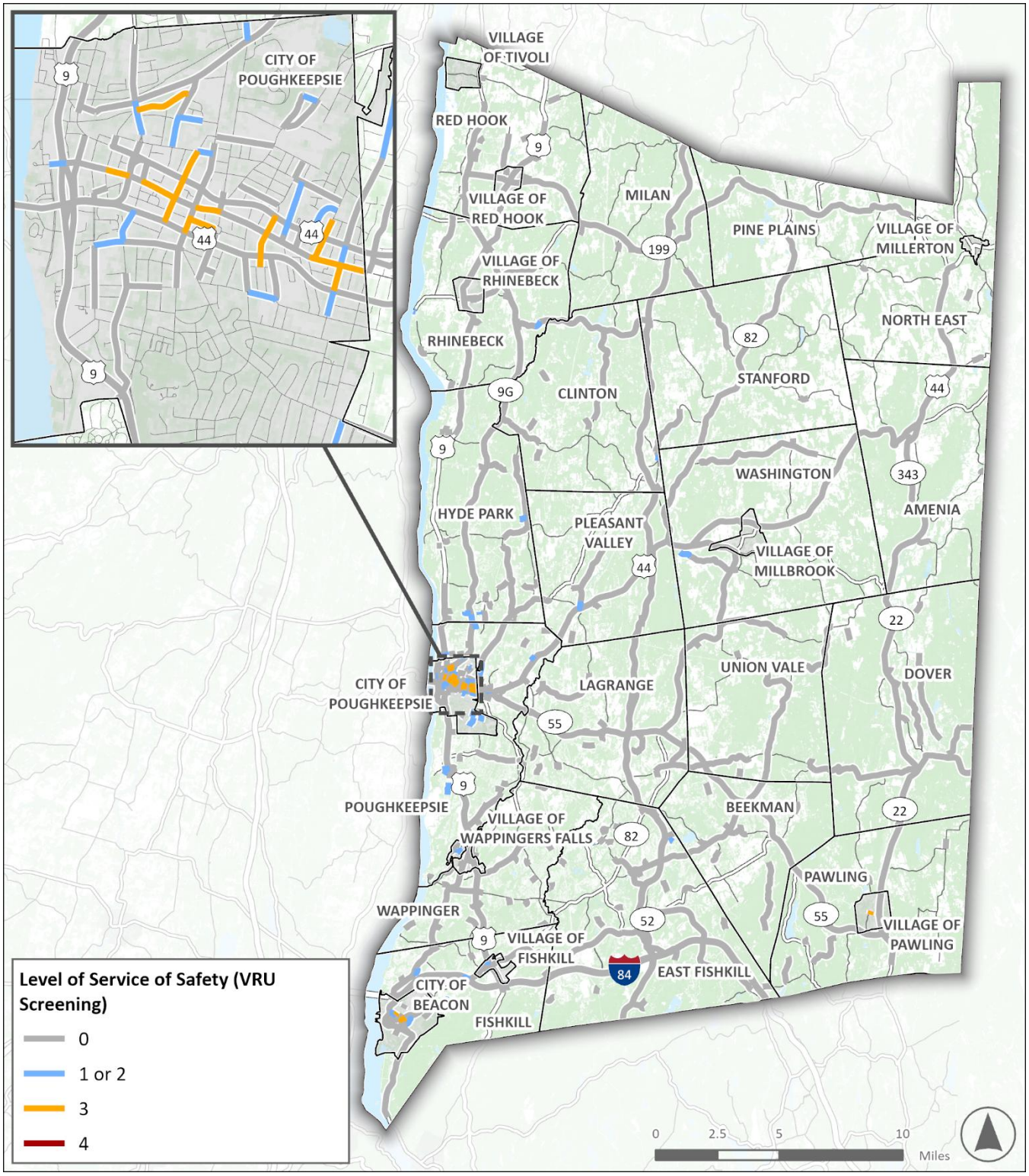
Source: NYSDOT CLEAR, 2019-2023; Analysis by Cambridge Systematics.

FIGURE 4-2 FATALITY AND SERIOUS INJURY CLEAR SCREENING - INTERSECTIONS



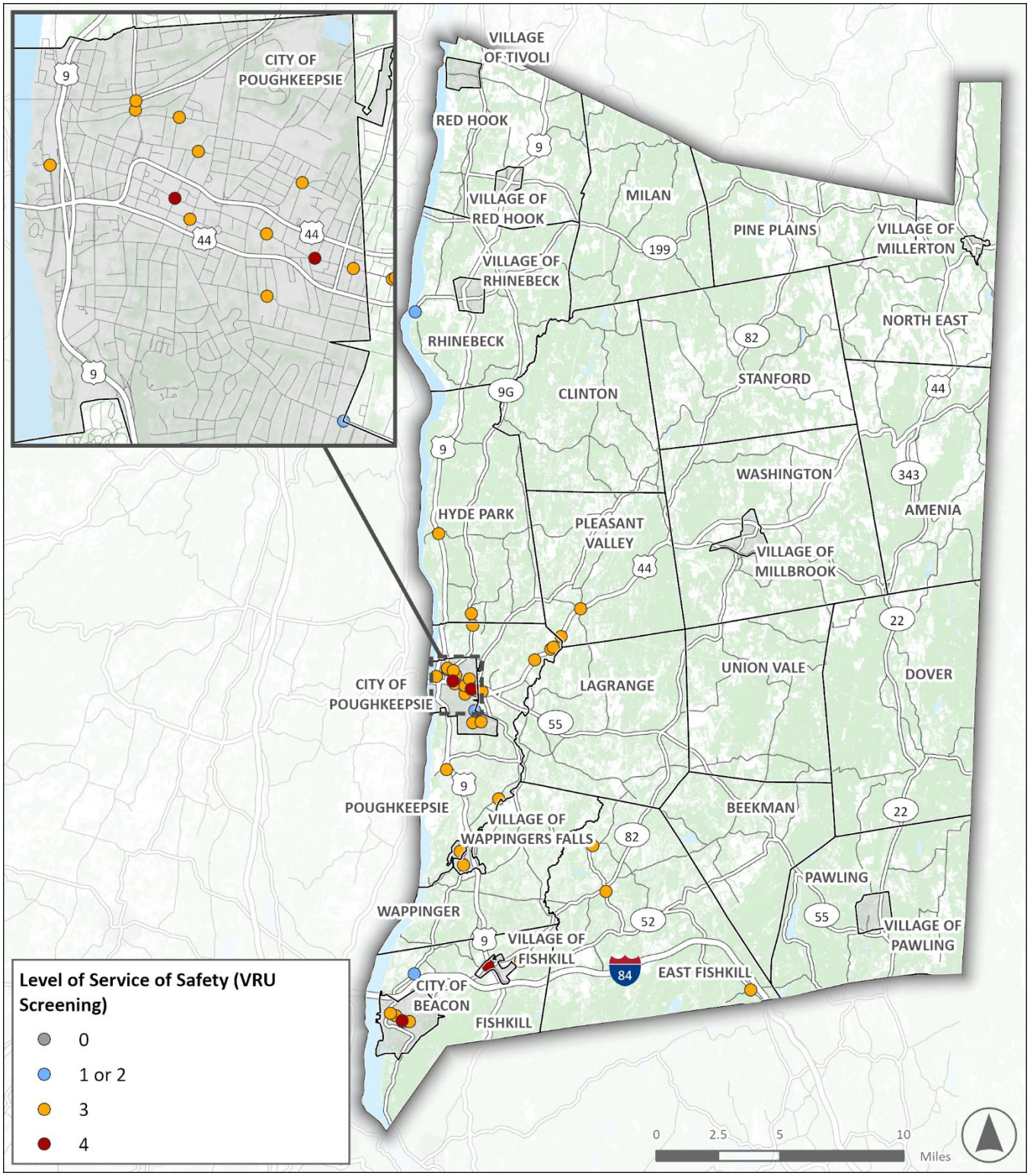
Source: NYSDOT CLEAR, 2019-2023; Analysis by Cambridge Systematics.

FIGURE 4-3 VULNERABLE ROAD USER SCREENING - SEGMENTS



Source: NYSDOT CLEAR, 2019-2023; Analysis by Cambridge Systematics.

FIGURE 4-4 VULNERABLE ROAD USER SCREENING - INTERSECTIONS



Source: NYSDOT CLEAR, 2019-2023; Analysis by Cambridge Systematics.

A.1.2 Demographic Analysis

To identify communities that would potentially benefit the most from increased traffic safety measures, we conducted a demographic analysis of the County's census tracts. This analysis was designed to be similar to the methodology used in DCTC's *Moving Dutchess Forward* plan, but with updated data where possible.

The analysis used data from the 2020 Census and 2018-2022 American Community Survey (ACS) to calculate scores for census tracts or municipalities within Dutchess Couty. Nine populations were reviewed: Black, Asian, Hispanic, youth, older adults, disabled, low income, foreign-born, and limited English proficiency. The concentration of each population was compared to the County average. Table 4-3 shows how each census tract was scored compared to the County average.

TABLE 4-3 DEMOGRAPHIC INDICATOR SCORING

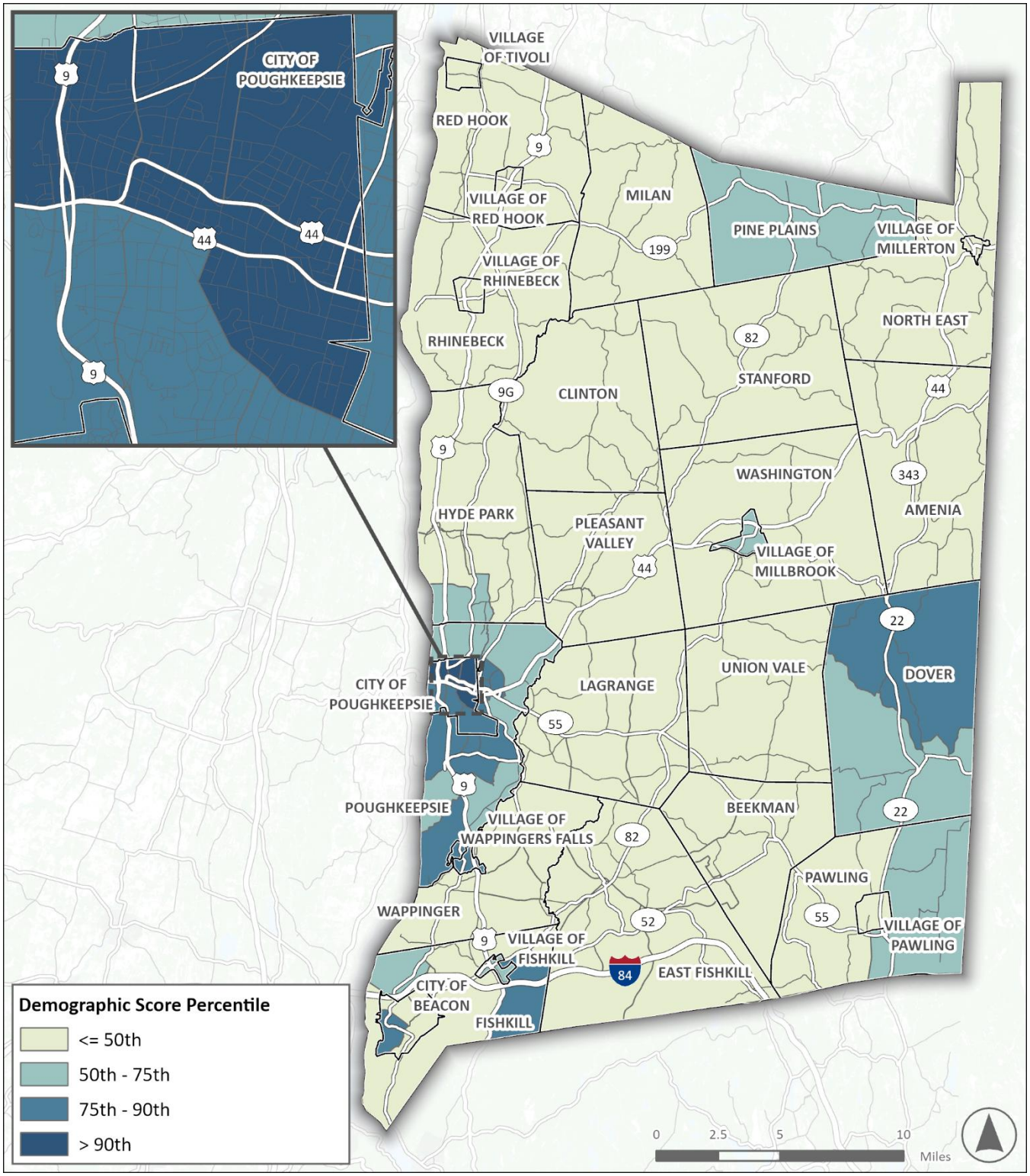
Concentration Compared to County Average	Points Applied
Less than or equal to the County average	0
Up to 5 percentage points above County average	1
5-10 percentage points above County average	2
10-20 percentage points above County average	3
More than 20 percentage points above County average	4

Source: Analysis by Byer Planning

We followed the *Moving Dutchess Forward* methodology to apply this data to our analysis. For the race/ethnicity and age categories, 2020 Census data at the tract level was used. For other categories, estimates for each focus population based on the ACS' latest 5-year estimates were used. Using a census-recommended methodology, the standard error (SE) and coefficient of variation (CV) for every estimate was calculated, and all data that had a CV of 30 percent or higher (indicating poor data quality) was omitted. Though the Census Bureau does not set a specific data quality threshold, they use 30 percent in their analysis examples. In two categories (Low Income and Limited English Proficiency), fewer than 50% of tracts met the data quality threshold. In those cases, estimates at the County Subdivision level (which includes cities and towns inclusive of any villages within their borders) were applied to all tracts within that municipality. Some neighborhood-level variation with this method was lost, but regional variation was captured that would be lost if none of the data met our quality threshold. The composite scores for each census tract were calculated by summing the scores for all nine indicators and are shown in Figure 4-5. The highest possible score a census tract could receive was 36, while the highest census tract score observed was 17.[3]

[3] *Three Census Tracts (6100, 6400.01, and 6400.02) which include current or former correctional facilities (e.g., Greenhaven Correctional in Town of Beekman) were excluded from the analysis.*

FIGURE 4-5 DEMOGRAPHIC SCORES OF CENSUS TRACTS IN DUTCHESS COUNTY



Source: Analysis by Byer Planning

Most of the resulting focus areas are located within the City and Town of Poughkeepsie. Additional focus areas are in the City of Beacon, Towns of Dover, Fishkill, Pawling, and Pine Plains, and Village of Millbrook.

A.1.3 Vulnerable Road User High-Risk Areas

As part of the New York Strategic Highway Safety Plan (SHSP), NYSDOT completed a Vulnerable Road User Safety Assessment (VRUSA) that examines crash locations across the state and quantitatively assesses risk by census tract based on crash data, factoring in demographic considerations. The VRU risk assessment is a key component of the VRUSA.

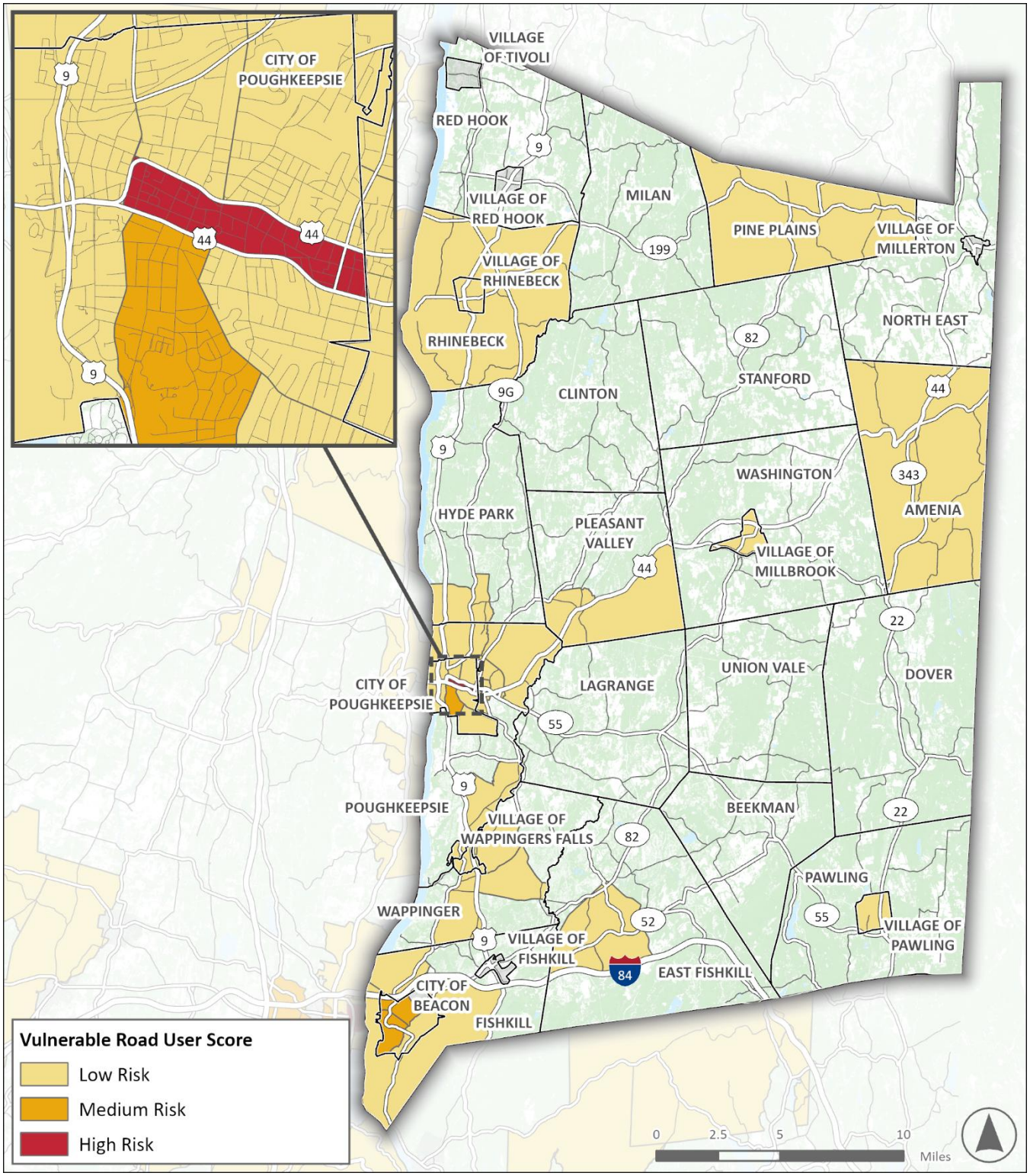
NYSDOT's risk assessment used CLEAR data from 2017 to 2021 to identify locations with higher-than-expected rates of fatal and serious injury VRU crashes, which were deemed Priority Investigation Locations (PILs). The Potential for Safety Improvement (PSI) was calculated for each PIL by estimating the difference between expected and predicted crash frequency. At the census tract level, the identified PILs and PSI values were aggregated, and a Vulnerable Road User Score was calculated. Finally, an additional weighting of 10% was applied to any census tract that fell within disadvantaged communities identified by either state or federal guidelines at the time, as well as state and federally recognized Tribal nations.

The Vulnerable Road User Scores were grouped into risk categories, as follows:

- **Low Risk:** 0.01 – 14.46
- **Medium Risk:** 14.46 – 42.08
- **High Risk:** Greater than 42.08

This measure of VRU Risk is seen in Figure 4-6 for Dutchess County. The highest VRU Risk is located in the 'Middle Main' section of the City of Poughkeepsie, which aligns with the large presence of pedestrians, bicyclists, and other vulnerable road users in that area.

FIGURE 4-6 VULNERABLE ROAD USER HIGH-RISK AREAS IN DUTCHESS COUNTY



Source: NYSDOT Vulnerable Road User Safety Assessment, 2023-2027.

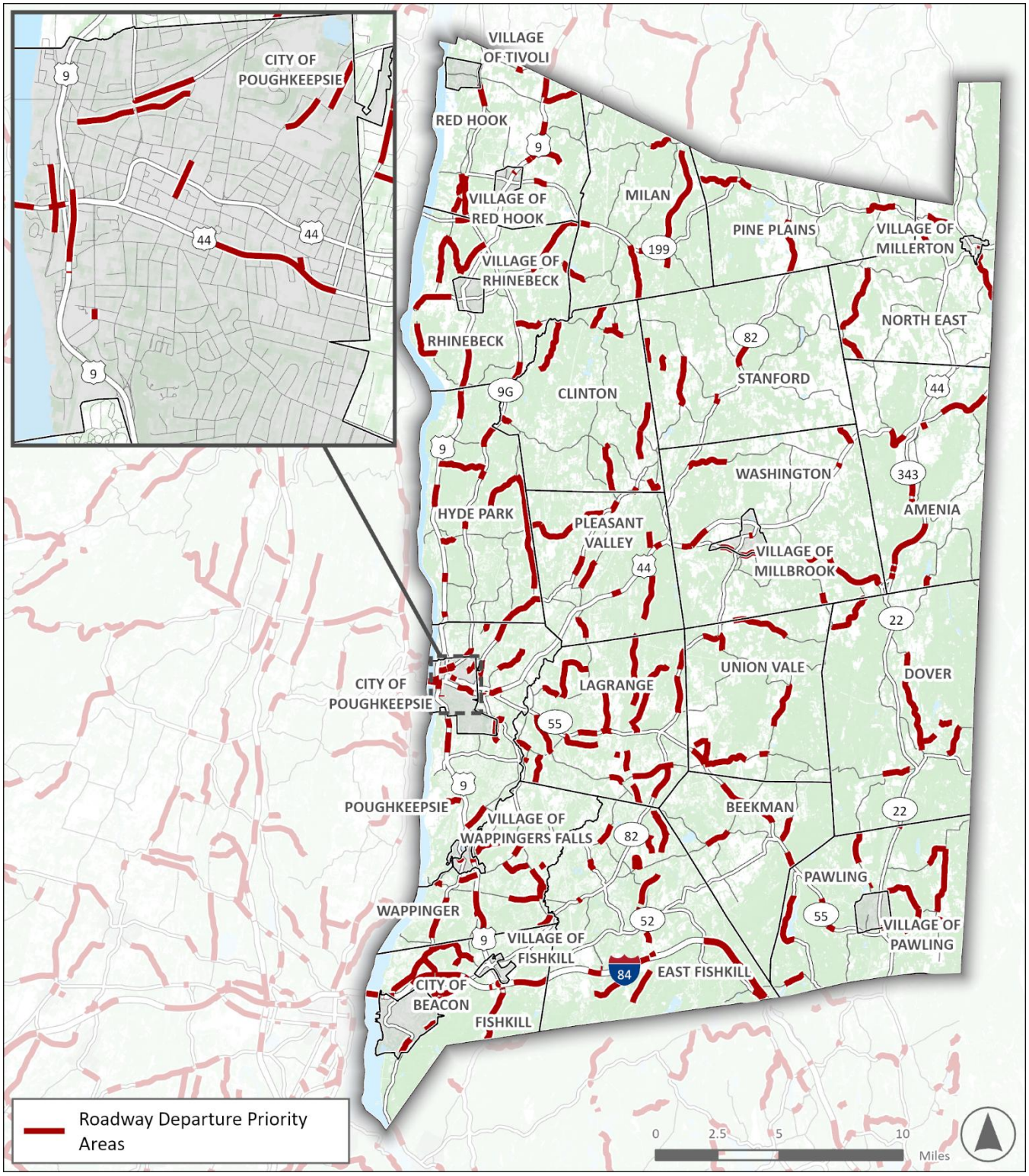
A.1.4 Roadway Departure Priority Areas and Head-On/Side-Swipe Collision Priority Areas

Since roadway departure crashes have long been a significant contributor to overall fatalities and serious injuries in New York State, the Federal Highway Administration and NYSDOT developed the New York State Roadway Departure Safety Action Plan with a focus on reducing roadway departures.

As part of the Action Plan, NYSDOT created crash-based hotspot maps for all roads in the state and all horizontal curves on State routes using crash density, measured in fatal and serious injury roadway departure crashes per mile. Any segment with a crash density at least one standard deviation above the average crash density across the state is considered a priority area and is highlighted in red on the maps. These maps help identify and prioritize areas for additional investigation and potential countermeasures, though the number of locations is expansive.

Figure 4-7 shows the priority areas for roadway departure crashes throughout Dutchess County. These locations are also available on an HSIP Action Plan Viewer, maintained by NYSDOT.

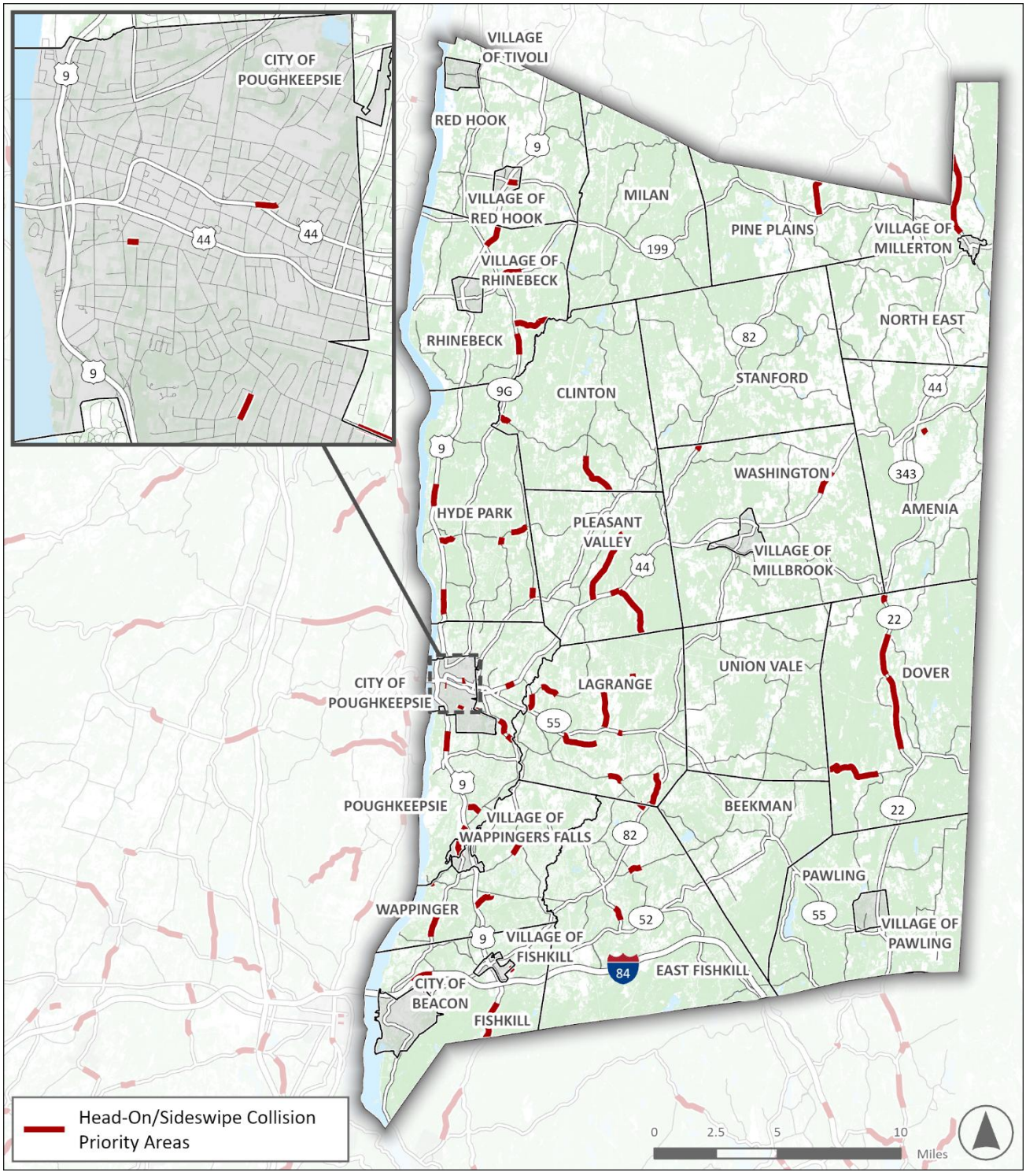
FIGURE 4-7 ROADWAY DEPARTURE PRIORITY AREAS



Source: New York State Roadway Departure Safety Action Plan, July 2024.

For head-on and sideswipe crashes, the priority areas are primarily concentrated in the western half of the county and in the Towns of Dover and North East in the eastern half, as shown in Figure 4-8.

FIGURE 4-8 HEAD-ON/SIDESWIPE COLLISION PRIORITY AREAS



Source: New York State Roadway Departure Safety Action Plan, July 2024.

A.2 Combining the Scoring Elements

Combining all the various elements together is the final step in identifying priority locations. This network represents a set of priority areas where DCTC and its partners can focus their efforts.

This process has three steps:

- **Step 1:** Mathematically combine and weight each of the elements listed above to calculate a combined safety score for roadway segments and intersections.
- **Step 2:** Identify the top-scoring locations from that mathematical exercise by smoothing out the weighted scores, filling in logical gaps in the network, incorporating feedback from community engagement efforts, and validating the top locations by ensuring that at least two fatal and serious injury crashes occurred at each location.
- **Step 3:** Refine the list of top locations with the Safety Action Plan team, road owners, and other key stakeholders.

The final screening elements, along with their weights, are shown in Table 4-4. Intersections and segments were scored in the same manner. The maximum score a location could receive was 100 points.

TABLE 4-4 NETWORK SCREENING ELEMENTS & WEIGHTS

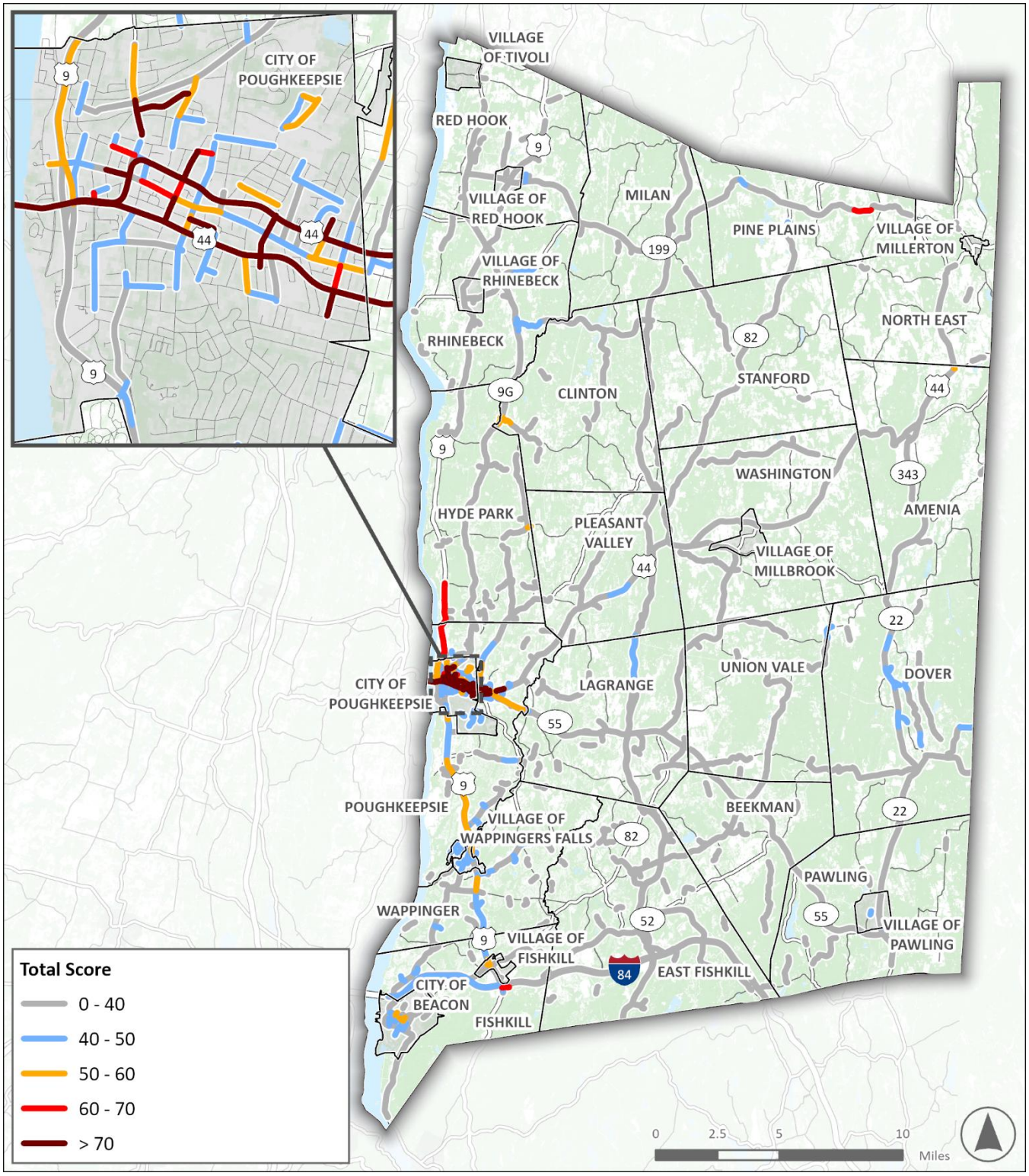
Screening Element	Maximum Points	Description	Points
LOSS – Fatal & Serious Injury Screening	50	LOSS (Fatal and Serious Injury Screening) of 4	50
		LOSS (Fatal and Serious Injury Screening) of 3	30
		LOSS (Fatal and Serious Injury Screening) less than 3	0
LOSS – VRU Screening	20	LOSS (VRU Screening) of 4	20
		LOSS (VRU Screening) of 3	10
		LOSS (VRU Screening) less than 3	0
VRU Risk Areas	5	High Risk	5
		Medium Risk	2.5
		Low Risk	1
		No Risk	0
Demographic Scores	15	90^{th} – 100^{th} percentile in the County	15
		75^{th} – 90^{th} percentile in the County	10
		50^{th} – 75^{th} percentile in the County	5
		Below 50^{th} percentile in the County	0
Roadway Departure Hotspot	5	Overlaps with a roadway departure hotspot	5
		Does not overlap with a roadway departure hotspot	0
Head-On / Sideswipe Hotspot	5	Overlaps with a head-on/sideswipe hotspot	5
		Does not overlap with a head-on/sideswipe hotspot	0

The final scored networks for both segments and intersections are shown in Figure 4-9 and Figure 4-10, respectively.

This network informed the development of the County Priority Safety Network and Municipal Priority Safety Network, discussed in Sections 2.2 and 2.3 of this report. For the State Priority Safety Network, NYSDOT provided lists of priority locations based on their own analysis of site-specific crash history, crash risk, and potential for safety improvement.

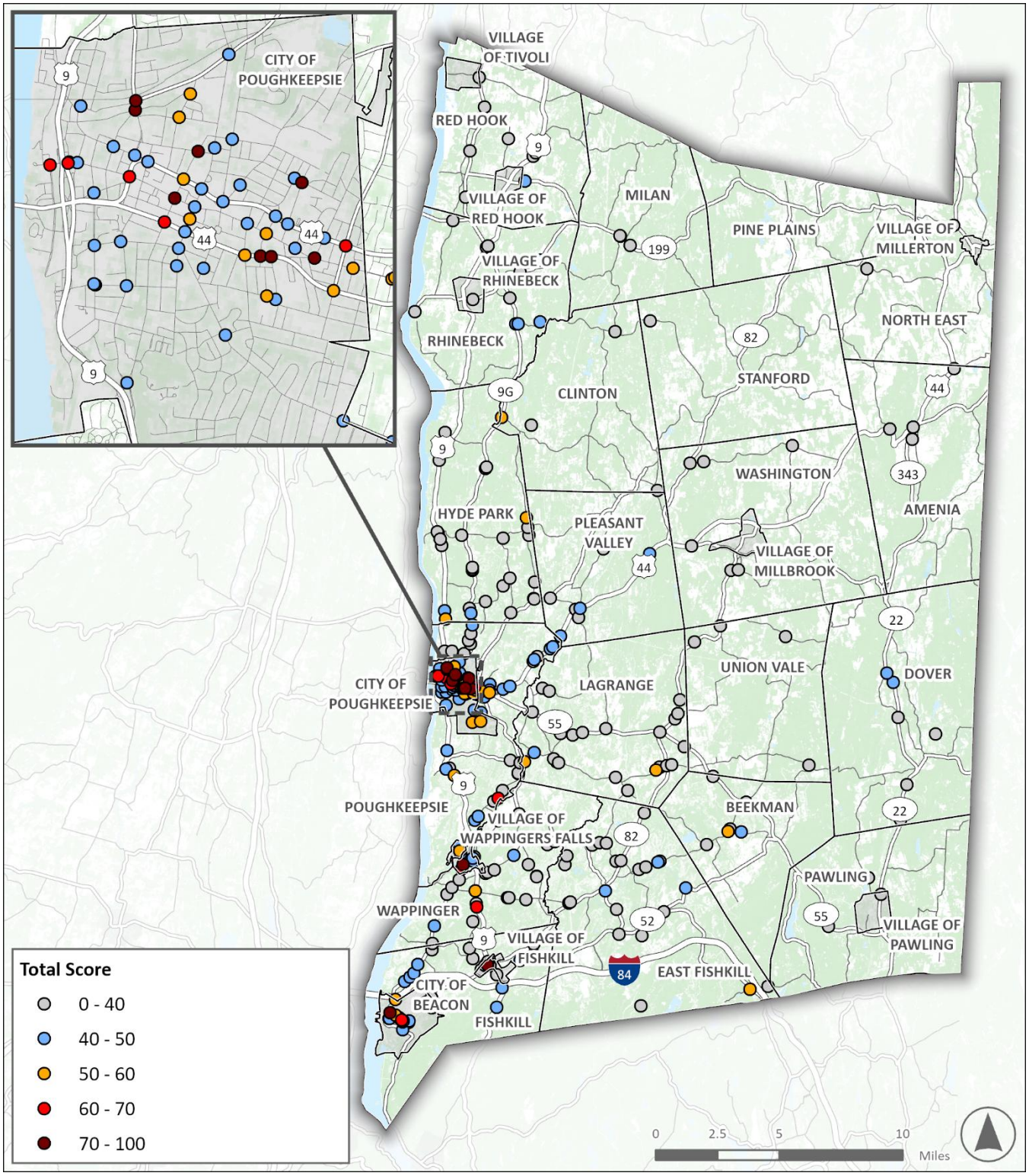
For the municipal priority safety network, each municipality was asked for feedback on the draft list of locations, given their knowledge of the area, and whether other locations were a greater concern from their point of view. We received confirmation from all municipalities before finalizing the municipal priority safety network.

FIGURE 4-9 SCORED SEGMENTS



Source: NYSDOT CLEAR, 2019-2023; Analysis by Cambridge Systematics.

FIGURE 4-10 SCORED INTERSECTIONS



Source: NYSDOT CLEAR, 2019-2023; Analysis by Cambridge Systematics.

Appendix B Systemic Analysis Technical Methodology

This Appendix describes the methodology used for the Systemic Analysis. Each of the four focus crash types identified in Section 0 is described in its own section. Each section is broken down into focus facility types and risk factors for each focus crash type.

Throughout this analysis, Interstates and other freeways/expressways were *not* included as potential focus facility types, since this plan is intended primarily as a resource for Dutchess County and local municipalities. Dutchess County does not have control over design decisions on Interstates, and Interstates are covered within State-level plans such as NYSDOT's Roadway Departure Safety Action Plan.

Additionally, *Principal Arterials (Other)* were combined with *Minor Arterials* into one *Arterial (Not Freeway)* category, since analyzing them separately yielded numerous situations where there were not enough fatal and serious injury crashes to properly determine risk factors.

Finally, in the context of this section*, KA Crashes* refers to Fatal and Serious Injury Crashes (referencing the KABCO Injury Classification Scale).

B.1 Intersection-Related Crashes

As a major focus area in NYSDOT's SHSP, intersection-related crashes remain the most common crash type in New York State. This pattern is also observed in Dutchess County. In 2023, intersection-related fatal and serious injury crashes were 46 percent higher than in 2019. From 2019-2023, intersection crashes represented 47 percent of all fatal and serious injury crashes in Dutchess County. This upward trend emphasizes the critical need to identify focus facility types and risk factors based on intersection crash data to prioritize sites for targeted safety improvements.

B.1.1 Focus Facility Types

Focus facility types are identified as those with the highest concentration of focus crashes within the system. Due to the inherent differences in roadway design standards and operational characteristics across facility types, risk factors are often highly correlated with specific facility types. Thus, for a more streamlined selection of risk factors, facility types were grouped into broad categories so the subsequent analysis could focus on identifying the specific risk factors associated with each category.

For intersection-related crashes, area type, geometry type, and traffic control type were chosen as key facility elements to refine the categorization of facility types. To account for vehicle exposure differences across facility types, crash data was normalized by the number of intersection sites within each facility type. Table 4-5 lists all the possible facility types that experienced at least one intersection-related fatal/serious injury crash between 2019 and 2023, ranked in descending order based on the number of intersection-related fatal/serious injury crashes per intersection.

As indicated by the distribution of intersection-related crashes, urban signalized cross-intersections and rural stop-controlled cross-intersections accounted for the highest proportion of fatal/serious injury crashes in urban and rural areas respectively (as highlighted in **red** in Table 4-5). After normalizing by the number of intersections, urban signalized cross-intersections remained the highest in both overall crash rates and fatal/serious injury crash rates among facility types with at least 15 intersection locations, while urban signalized T-intersections and Y-intersections had the second and third highest crash rates. Although Dutchess County has only two urban signalized intersections with five or more legs, the significantly high fatal/serious injury crash rates observed at this facility type warrant its inclusion as part of a broader category. Thus, urban signalized intersections with five or more legs were grouped with urban signalized cross-intersections into a combined category of urban signalized intersections with four or more legs. Urban signalized T-intersections and Y-intersections were grouped into a category of urban signalized 3-leg intersections. These two combined categories, along with rural stop-controlled cross-intersections, were identified as focus facility types for intersection-related crashes.

The final focus facility types (**bolded** in Table 4-5) for intersection-related crashes are:

- Urban Signalized Cross-Intersections, including Intersections with 5 or More Legs
- Urban Signalized Y-Intersections and T-Intersections
- Rural Stop-Controlled Cross-Intersections

TABLE 4-5 INTERSECTION-RELATED CRASH DISTRIBUTION BY INTERSECTION TYPE

Area Type	Geometry Type	Traffic Control Type	# of Intersections	# of Crashes	% of Total Crashes	# of KA Crashes	% of Total KA Crashes	# of Crashes Per Intersection	# of KA Crashes Per Intersection
Urban	**Five or more Legs and Not Circular**	**Signalized**	**2**	**78**	**0.5%**	**2**	**0.4%**	**39**	**1.00**
Urban	**Cross-Intersection**	**Signalized**	**179**	**5,053**	**30.6%**	**155**	**29.1%**	**28**	**0.87**
Rural	Cross-Intersection	Signalized	11	209	1.3%	6	1.1%	19.0	0.55
Rural	Y-Intersection	Signalized	2	8	0.1%	1	0.2%	4	0.50
Urban	T-Intersection	Other	4	9	0.1%	2	0.4%	2	0.50
Urban	**T-Intersection**	**Signalized**	**85**	**1,450**	**8.8%**	**33**	**6.2%**	**17**	**0.39**
Urban	**Y-Intersection**	**Signalized**	**16**	**216**	**1.3%**	**6**	**1.1%**	**14**	**0.38**
Rural	Cross-Intersection	Other	4	19	0.1%	1	0.2%	**5**	0.25
Urban	Cross-Intersection	Other	8	26	0.2%	2	0.4%	3	0.25
Urban	Cross-Intersection	Uncontrolled	12	44	0.3%	2	0.4%	4	0.17
Rural	**Cross-Intersection**	**Stop-Controlled**	**158**	**382**	**2.3%**	**21**	**3.9%**	**2**	**0.13**
Urban	Cross-Intersection	Stop-Controlled	329	1,252	7.6%	41	7.7%	4	0.12

Area Type	Geometry Type	Traffic Control Type	# of Intersections	# of Crashes	% of Total Crashes	# of KA Crashes	% of Total KA Crashes	# of Crashes Per Intersection	# of KA Crashes Per Intersection
Urban	Y-Intersection	Stop-Controlled	354	965	5.8%	33	6.2%	3	0.09
Rural	Y-Intersection	Yield Sign	48	96	0.6%	4	0.8%	2	0.08
Urban	Y-Intersection	Uncontrolled	74	361	2.2%	6	1.1%	5	0.08
Urban	T-Intersection	Stop-Controlled	2,260	4,365	26.5%	169	31.7%	2	0.07
Urban	Y-Intersection	Yield Sign	65	256	1.6%	4	0.8%	4	0.06
Rural	Y-Intersection	Stop-Controlled	293	436	2.6%	16	3.0%	2	0.05
Rural	Y-Intersection	Uncontrolled	20	39	0.2%	1	0.2%	2	0.05
Rural	T-Intersection	Yield Sign	32	29	0.2%	1	0.2%	1	0.03
Rural	T-Intersection	Stop-Controlled	764	745	4.5%	21	3.9%	1	0.03
Urban	T-Intersection	Uncontrolled	190	230	1.4%	5	0.9%	1	0.03
Urban	T-Intersection	Yield Sign	52	56	0.3%	1	0.2%	1	0.02

Source: *NYSDOT CLEAR, 2019-2023*

Note: ***Bolded*** *facility types are the selected focus facility types.*

B.1.2 Risk Factors

Following the identification of focus facility types, we examined characteristics that are common among the locations within these facility types and potentially associated with an increased risk of intersection-related crashes. Potential risk factors for intersection-related crash frequency and severity in Dutchess County (based on crash types and apparent crash factor information) are listed in Table 4-6 along with their possible attributes.

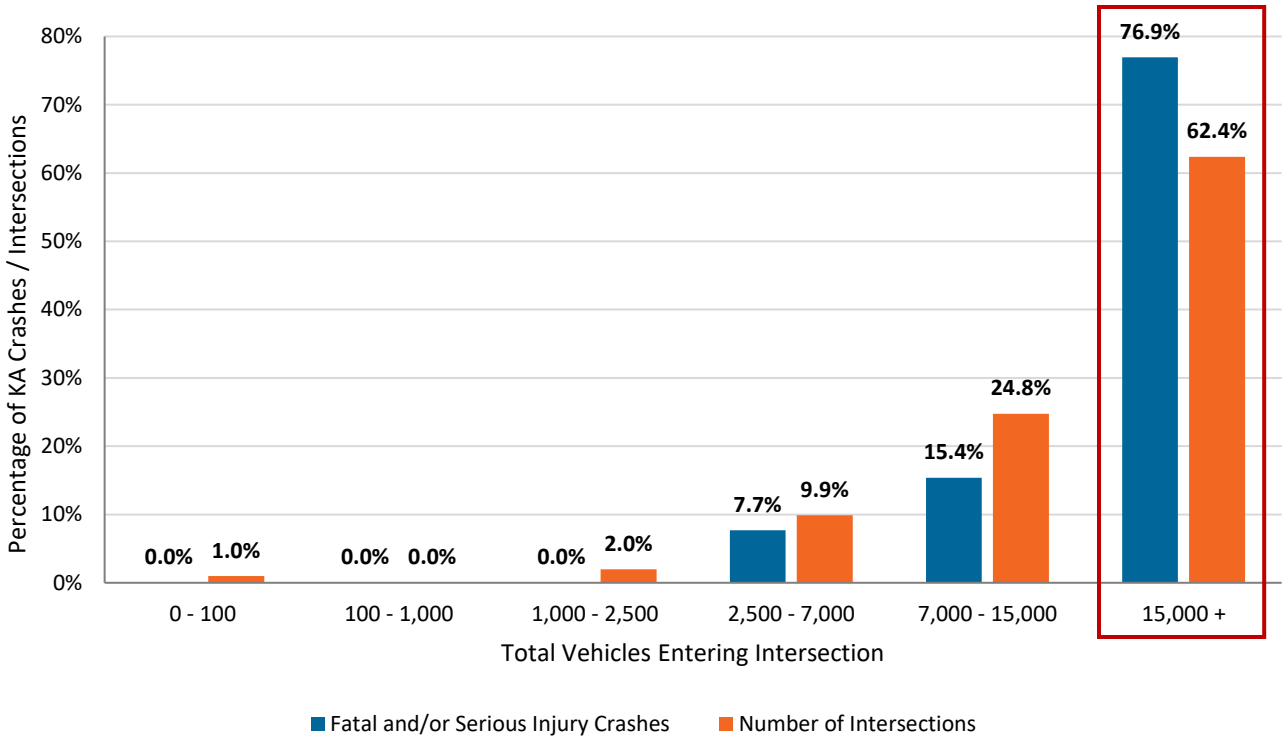
TABLE 4-6 POTENTIAL RISK FACTORS FOR INTERSECTION-RELATED CRASHES

Potential Risk Factors	Risk Factor Attributes
Presence of lighting	• Yes • No
Traffic control type	• Uncontrolled • Two-way stop • All-way stop • Yield sign • Signalized (with ped signal) • Signalized (w/out ped signal)
Left-turn lane type	• No left turn lanes • Conventional left turn lane(s) • U-turn followed by right turn • Right turn followed by U-turn • Right turn followed by left turn (e.g. jughandle near side) • Right turn followed by right turn (e.g. jughandle far side) • Left turn crossover prior to intersection (e.g. displaced left turn) • Other
Right-turn channelization type	• None • Painted island with receiving lane • Painted island without receiving lane • Raised island with receiving lane • Raised island without receiving lane

Potential Risk Factors	Risk Factor Attributes
Crosswalk type	• Unmarked crosswalk • Marked crosswalk • Marked crosswalk with supplemental devices (e.g. in-street yield signs, in-pavement warning lights, pedestrian bulb outs, etc.) • Marked crosswalk with refuge island • Marked with refuge island and supplemental devices (e.g. in-street yield signs, in-pavement warning lights, pedestrian bulb outs, etc.) • Pedestrian crossing prohibited at this approach • Other
Intersection skew angle (degree)	• 0 - 3 • 4 - 6 • 7 - 9 • > 9
Pedestrian signal type	• None • Activated by traffic signal (e.g., recall) • Pushbutton actuated • Other
Total entering vehicles (TEV)	• 0 - 100 • 100 - 1,000 • 1,000 - 2,500 • 2,500 - 7,000 • 7,000 - 15,000 • > 15,000

The overrepresentation method was applied to compare the proportion of fatal/serious injury crashes with a certain characteristic to the proportion of intersections sharing the same characteristic for each focus facility type. Figure 4-11 demonstrates an example of this analysis for intersections, examining the total number of entering vehicles for the combined focus facility type of urban signalized Y-intersections and T-intersections. Total entering vehicles were categorized into six groups based on natural breaks, and intersections with more than 15,000 entering vehicles had the highest concentration of fatal/serious injury crashes (compared to the number of intersections with that characteristic). Accordingly, total entering vehicles exceeding 15,000 was selected as a risk factor for these urban signalized 3-leg intersections.

FIGURE 4-11 RISK FACTOR ANALYSIS PLOT FOR TOTAL ENTERING VEHICLES ON URBAN SIGNALIZED Y-INTERSECTIONS AND T-INTERSECTIONS



Source: NYSDOT CLEAR, 2019-2023; analysis by Cambridge Systematics.

For rural stop-controlled cross-intersections, factors such as right-turn channelization type and pedestrian signal type were excluded from the analysis, as these features were absent at all analyzed locations. Risk factors were determined based on a comparison of crash distributions and facility characteristics distributions, where factors with a higher proportion of fatal/serious injury crashes were selected. Table 4-7, Table 4-8, and Table 4-9 show the risk factors identified for each focus facility type, along with the corresponding percentages of intersection-related crashes, fatal/serious injury crashes, and intersection locations, as well as the number of fatal/serious injury crashes per intersection.

TABLE 4-7 RISK FACTORS FOR INTERSECTION-RELATED CRASHES ON URBAN SIGNALIZED CROSS-INTERSECTIONS, AND INTERSECTIONS WITH 5 OR MORE LEGS

Urban Signalized Cross-Intersections and Intersections with 5 or More Legs

Risk Factors	Risk Factor Criteria	5,131 Crashes	157 KA Crashes	181 Intersections	KA Crashes Per Intersection
Right-Turn Channelization Type	Raised island with receiving lane	21%	17%	14%	1.08

Urban Signalized Cross-Intersections and Intersections with 5 or More Legs					
Risk Factors	**Risk Factor Criteria**	**5,131 Crashes**	**157 KA Crashes**	**181 Intersections**	**KA Crashes Per Intersection**
Crosswalk Type	Marked crosswalk	57%	63%	55%	1.00
Traffic Control Type	Signalized (with ped signal)	58%	62%	45%	1.12
Pedestrian Signal Type	Pushbutton actuated	56%	62%	45%	1.18
Total Entering Vehicles	> 15,000	64%	59%	45%	1.15
Intersection Skew Angle (degree)	4 - 6	16%	17%	11%	1.42

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-8 RISK FACTORS FOR INTERSECTION-RELATED CRASHES ON URBAN SIGNALIZED Y-INTERSECTIONS, AND T-INTERSECTIONS

Urban Signalized Y-Intersections and T-Intersections					
Risk Factors	**Risk Factor Criteria**	**1,666 Crashes**	**39 KA Crashes**	**101 Intersections**	**KA Crashes Per Intersection**
Left-Turn Lane Type	Conventional left turn lane(s)	73%	67%	60%	0.43
Crosswalk Type	Marked crosswalk	46%	51%	42%	0.48
Total Entering Vehicles	> 15,000	84%	77%	62%	0.48
Intersection Skew Angle (degree)	4 - 9	48%	51%	34%	0.59

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-9 RISK FACTORS FOR INTERSECTION-RELATED CRASHES ON RURAL STOP-CONTROLLED CROSS-INTERSECTIONS

		Rural Stop-Controlled Cross-Intersections			
Risk Factors	**Risk Factor Criteria**	**382 Crashes**	**21 KA Crashes**	**158 Intersections**	**KA Crashes Per Intersection**
Presence of Lighting	No	59%	76%	63%	0.16
Left-Turn Lane Type	Conventional left turn lane(s)	2%	5%	1%	0.5
Right-Turn Channelization Type	Raised island without receiving lane	1%	5%	2%	0.33
Crosswalk Type	Unmarked crosswalk	92%	100%	93%	0.14
Total Entering Vehicles	2,500 - 15,000	83%	86%	41%	0.28
Intersection Skew Angle (degree)	4 - 9	26%	57%	16%	0.48

Source: NYSDOT CLEAR, 2019-2023

B.2 Roadway Departure Crashes

Roadway departures are a leading cause of fatal and serious injury crashes both statewide and within Dutchess County. Over the past five years, roadway departure crashes accounted for more than 21 percent of KA crashes in Dutchess County, despite comprising only 12 percent of total crashes. This disparity indicates that roadway departure crashes have a high potential for severe outcomes.

B.2.1 Focus Facility Types

Although the exact locations of roadway departure crashes are difficult to predict, the types of facilities where those crashes tend to occur can be inferred from historical crash data. The distribution of roadway departure crashes and fatal/serious injury crashes from 2019 to 2023 was analyzed based on roadway functional class and urban/rural area type. In addition, crash rates per lane mile were calculated to normalize for differences in vehicle exposure across facility types. Table 4-10 shows the analysis results with facility types ranked in descending order based on fatal/serious injury crash rates. The final focus facility types (**bolded** in Table 4-10) for roadway departure crashes include:

- Urban Arterials (Excluding Freeways)
- Rural Arterials (Excluding Freeways)
- Urban Major Collectors
- Rural Major Collectors

TABLE 4-10 ROADWAY DEPARTURE CRASH DISTRIBUTION BY SEGMENT TYPE

Functional Class	Area Type	Total Lane Miles	# of Crashes	% of Total Crashes	# of KA Crashes	% of Total KA Crashes	# of Crashes Per Mile	# of KA Crashes Per Mile
Arterial - Interstate or Other Freeway	Rural	33	330	9%	15	8%	9.9	0.45
Arterial - Interstate or Other Freeway	Urban	83	540	15%	24	12%	6.5	0.29
Arterial - Not Freeway	**Urban**	**157**	**458**	**13%**	**34**	**17%**	**2.9**	**0.22**
Arterial - Not Freeway	**Rural**	**91**	**294**	**8%**	**18**	**9%**	**3.2**	**0.20**
Major Collector	**Urban**	**203**	**612**	**17%**	**36**	**18%**	**3.0**	**0.18**
Major Collector	**Rural**	**100**	**335**	**9%**	**14**	**7%**	**3.3**	**0.14**
Minor Collector	Urban	**10**	17	1%	1	1%	1.8	0.10
Minor Collector	Rural	154	174	5%	13	7%	1.1	0.08
Local	Rural	753	384	11%	21	11%	0.5	0.03
Local	Urban	941	470	13%	23	12%	0.5	0.02

Source: NYSDOT CLEAR, 2019-2023

*Note: **Bolded** facility types are the selected focus facility types.*

As stated previously, Interstates and other freeways/expressways were not considered for inclusion in this systemic analysis. Therefore, urban arterials (excluding freeways), rural arterials (excluding freeways), urban major collectors, and rural major collectors were identified as focus facility types for roadway departure crashes. Further analysis of risk factors associated with these four facility types is essential to reducing the frequency and severity of roadway departure crashes. It should also be noted that the systemic analysis does not preclude other facility types which may be candidates for similar treatments.

B.2.2 Risk Factors

Based on the collision types and apparent factors for roadway departure crashes in Dutchess County, it was hypothesized that shoulder width, posted speed limit, annual average daily traffic (AADT), number of through lanes, median width, median type, roadway type (divided or not), access control type, and truck route type were potential risk factors for roadway departure crashes on the selected focus facility types. The possible attributes of each potential risk factor are shown in Table 4-11.

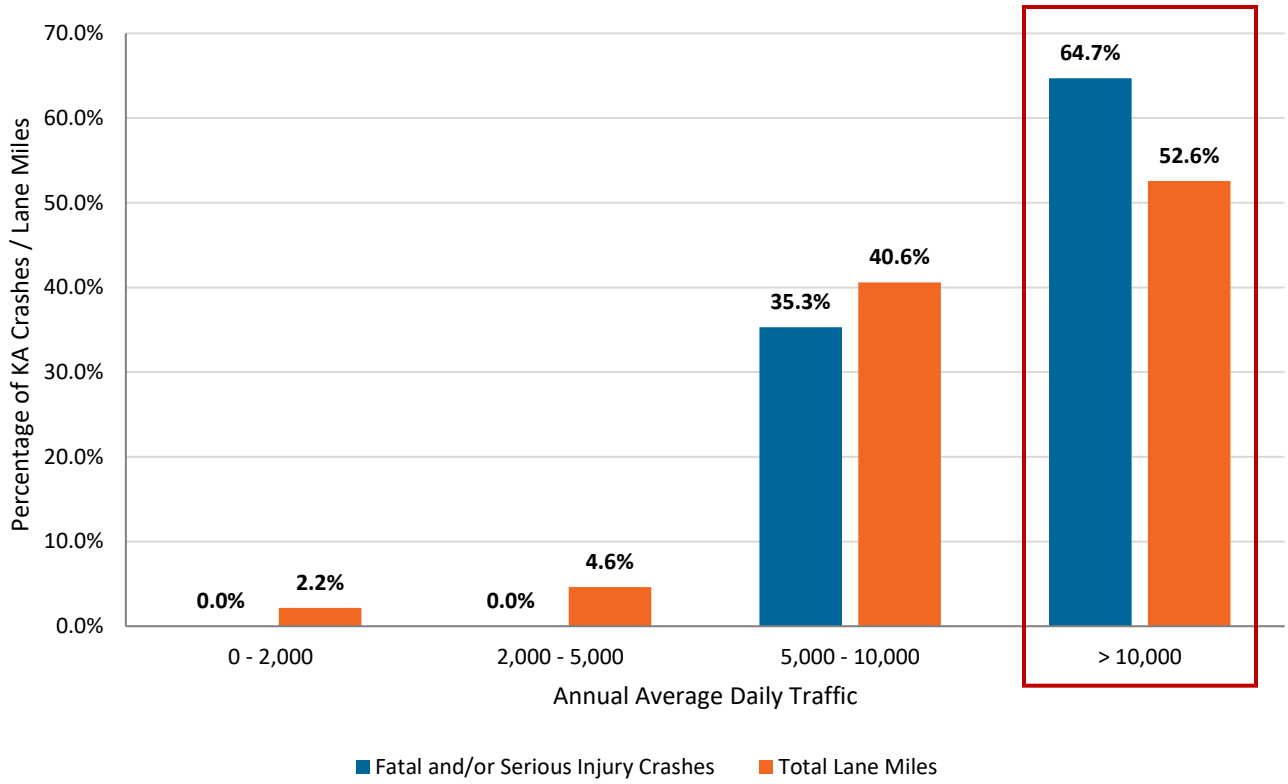
TABLE 4-11 POTENTIAL RISK FACTORS FOR ROADWAY DEPARTURE CRASHES

Potential Risk Factors	Risk Factor Attributes
Number of through lanes	• 1 • 2 • >= 3
Annual average daily traffic (AADT)	• 0 - 2,000 • 2,000 - 5,000 • 5,000 - 10,000 • > 10,000
Shoulder width (feet)	• 0 or NA • 1 - 4 • 5 - 8 • 9 - 12 • >= 13
Posted speed limit (MPH)	• < 35 • 35 - 40 • 45 - 50 • 55 - 60 • > 60
Divided	• Yes • No

Potential Risk Factors	Risk Factor Attributes
Median width (feet)	• 0 - 8 • 9 - 12 • 13 - 30 • 31 - 50 • > 50
Median types	• None • Unprotected • Curbed • Positive Barrier- unspecified • Positive Barrier - flexible • Positive Barrier - semi-rigid • Positive Barrier - rigid • Flush paved Median
Access control types	• Full • Partial
Truck route types	• Qualifying highway (National Network) • Access limited (restrictions) • Access highway

To confirm the suspected risk factors for each facility type, the proportions of fatal/serious injury roadway departure crashes that occurred on segments with specific characteristics were compared against the proportions of total lane miles with the same characteristics. Figure 4-12 illustrates this comparison for AADT on urban arterials (excluding freeways). Because segments with AADT exceeding 10,000 accounted for 65 percent of fatal/serious injury crashes but only 53 percent of total lane miles, this AADT range was identified as a risk factor for roadway departure crashes on this facility type.

FIGURE 4-12 RISK FACTOR ANALYSIS PLOT FOR AADT ON URBAN ARTERIALS



Source: NYSDOT CLEAR, 2019-2023; analysis by Cambridge Systematics.

Based on the analysis of each hypothesized characteristic, Table 4-12, Table 4-13, Table 4-14, and Table 4-15 list all risk factors identified for roadway departure crashes on urban arterials (excluding freeways), rural arterials (excluding freeways), urban major collectors, and rural major collectors to help prioritize higher-risk facility elements for safety improvements.

TABLE 4-12 RISK FACTORS FOR ROADWAY DEPARTURE CRASHES ON URBAN ARTERIALS

	Urban Arterials (Excluding Freeways)				
Risk Factors	**Risk Factor Criteria**	**458 Crashes**	**34 KA Crashes**	**157.3 Lane Miles**	**KA Crashes Per Mile**
Number of Through Lanes	4	1%	3%	<1%	1.19
AADT	0 - 5,000	14%	18%	15%	0.15
Shoulder Width (ft)	1 - 4	47%	47%	34%	0.17
Posted Speed Limit (MPH)	35 - 40	32%	36%	27%	0.17
Divided	Yes	27%	30%	23%	0.17

Urban Arterials (Excluding Freeways)					
Risk Factors	**Risk Factor Criteria**	**458 Crashes**	**34 KA Crashes**	**157.3 Lane Miles**	**KA Crashes Per Mile**
Median Type	Curbed; Flush paved Median	6%	10%	6%	0.20

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-13 RISK FACTORS FOR ROADWAY DEPARTURE CRASHES ON RURAL ARTERIALS

Rural Arterials (Excluding Freeways)					
Risk Factors	**Risk Factor Criteria**	**294 Crashes**	**18 KA Crashes**	**91.5 Lane Miles**	**KA Crashes Per Mile**
AADT	> 10,000	9%	11%	6%	0.40
Posted Speed Limit (MPH)	45 - 50	15%	20%	14%	0.30
Median Type	Positive Barrier-unspecified	6%	9%	6%	0.34

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-14 RISK FACTORS FOR ROADWAY DEPARTURE CRASHES ON URBAN MAJOR COLLECTORS

Urban Major Collectors					
Risk Factors	**Risk Factor Criteria**	**612 Crashes**	**36 KA Crashes**	**203.7 Lane Miles**	**KA Crashes Per Mile**
AADT	0 - 2,000	37%	61%	48%	0.16
Posted Speed Limit (MPH)	< 35; 45 - 50	19%	36%	21%	0.22

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-15 RISK FACTORS FOR ROADWAY DEPARTURE CRASHES ON RURAL MAJOR COLLECTORS

Rural Major Collectors					
Risk Factors	**Risk Factor Criteria**	**335 Crashes**	**14 KA Crashes**	**100.5 Lane Miles**	**KA Crashes Per Mile**
AADT	2,000 - 5,000	24%	26%	11%	0.27

Rural Major Collectors					
Risk Factors	**Risk Factor Criteria**	**335 Crashes**	**14 KA Crashes**	**100.5 Lane Miles**	**KA Crashes Per Mile**
Posted Speed Limit (MPH)	35 - 40	10%	15%	9%	0.18

Source: NYSDOT CLEAR, 2019-2023

B.3 Pedestrian-Related Crashes

Pedestrians are more susceptible to serious injuries and fatalities than other roadway users when hit by a vehicle. In Dutchess County, pedestrian-related crashes only accounted for one percent of all crashes between 2019 and 2023, but they accounted for 3.3 percent of all fatal and serious injury crashes. This confirms the high severity potential of pedestrian-related crashes.

B.3.1 Focus Facility Types

Upon analyzing pedestrian-related intersection crashes by intersection type, geometry type, and traffic control type, we identified three facility types with the highest fatal/serious injury crash frequency: urban signalized and stop-controlled cross-intersections, and urban stop-controlled T-intersections, as highlighted in **red** in Table 4-16.

However, after incorporating the number of intersections, pedestrian-related crashes and fatal/serious injury crashes were found to be significantly overrepresented at urban signalized cross-intersections and urban signalized Y-intersections and T-intersections, compared to other intersection types with at least 15 locations. Considering both the frequency of fatal/serious injury crashes and the normalized crash rates, urban signalized T-intersections and urban signalized Y-intersections were combined into a broader category of urban signalized three-leg intersections. This combined category, along with urban signalized cross-intersections and urban stop-controlled cross-intersections, were identified as the focus facility types for pedestrian-related intersection crashes.

The final focus facility types (**bolded** in Table 4-16) for pedestrian-related crashes were:

- Urban Signalized Cross-Intersections
- Urban Signalized T-Intersections and Y-Intersections
- Urban Stop-Controlled Intersections

TABLE 4-16 PEDESTRIAN-RELATED CRASH DISTRIBUTION BY INTERSECTION TYPE

Area Type	Geometry Type	Traffic Control Type	# of Intersections	# of Crashes	% of Total Crashes	# of KA Crashes	% of Total KA Crashes	# of Crashes Per Intersection	# of KA Crashes Per Intersection
Urban	T-Intersection	Other	4	1	1%	1	2%	0.25	0.25
Urban	**Cross-Intersection**	**Signalized**	**179**	**94**	**42%**	**15**	**28%**	**0.53**	**0.08**
Urban	Cross-Intersection	Uncontrolled	12	1	1%	1	2%	0.08	0.08
Urban	**Y-Intersection**	**Signalized**	**16**	**3**	**1%**	**1**	**2%**	**0.19**	**0.06**
Urban	**T-Intersection**	**Signalized**	**85**	**16**	**7%**	**4**	**7%**	**0.19**	**0.05**
Rural	T-Intersection	Yield Sign	32	1	1%	1	2%	0.03	0.03
Urban	Y-Intersection	Yield Sign	65	1	1%	1	2%	0.02	0.02
Urban	**Cross-Intersection**	**Stop-Controlled**	**329**	**18**	**8%**	**5**	**9%**	**0.06**	**0.02**
Urban	T-Intersection	Stop-Controlled	2260	62	28%	22	41%	0.03	0.01
Urban	T-Intersection	Uncontrolled	190	7	3%	1	2%	0.04	0.01
Rural	Y-Intersection	Stop-Controlled	293	2	1%	1	2%	0.01	<0.01
Urban	Y-Intersection	Stop-Controlled	354	8	4%	1	2%	0.02	<0.01

Source: *NYSDOT CLEAR, 2019-2023*

Note: ***Bolded*** *facility types are the selected focus facility types.*

B.3.2 Risk Factors

Since pedestrian exposure is a critical factor influencing the risk of pedestrian-related crashes, average daily pedestrian volume was collected from the Replica platform at the census tract level and applied to all intersections based on their location as a surrogate measure of pedestrian exposure. Additionally, based on the results of the statewide VRUSA discussed in Section A.1.3, locations within census tracts identified as high-risk areas for vulnerable road users were also examined as a potential risk factor for pedestrian-related fatal/serious injury crashes. The possible attributes of these two factors are listed in Table 4-17.

TABLE 4-17 POTENTIAL RISK FACTORS FOR PEDESTRIAN-RELATED CRASHES

Potential Risk Factors	Risk Factor Attributes
Pedestrian Daily Trip Count	• 0 - 900 • 901 - 1,400 • 1,401 - 2,000 • 2,001 - 2,600 • > 2,600
VRU High-Risk Area	• Yes • No

Similar to the risk factor analysis performed for intersection-related crashes, other facility characteristics hypothesized to contribute to the increased risk of severe pedestrian-related crashes included the presence of lighting, left-turn lane type, right-turn channelization type, crosswalk type, traffic control type, intersection skew angle, pedestrian signal type, and total entering vehicles (TEV), as shown in Table 4-18. By comparing the percentages of fatal/serious injury crashes with the distribution of intersections sharing each characteristic, risk factors for pedestrian-related crashes on urban signalized cross-intersections, urban signalized T-intersections and Y-intersections, and urban stop-controlled cross-intersections were determined as shown in Table 4-18, Table 4-19, and Table 4-20, respectively.

TABLE 4-18 RISK FACTORS FOR PEDESTRIAN-RELATED CRASHES ON URBAN SIGNALIZED CROSS-INTERSECTIONS

		Urban Signalized Cross-Intersections			
Risk Factors	Risk Factor Criteria	94 Crashes	15 KA Crashes	179 Intersections	KA Crashes Per Intersection
Presence of Lighting	No	5%	7%	2%	0.33

Urban Signalized Cross-Intersections

Risk Factors	Risk Factor Criteria	94 Crashes	15 KA Crashes	179 Intersections	KA Crashes Per Intersection
Left-Turn Lane Type	No left turn lanes	56%	60%	44%	0.11
Right-turn channelization types	None	89%	100%	83%	0.10
Crosswalk Type	Marked crosswalk	85%	93%	54%	0.14
Traffic Control Type	Signalized (with ped signal)	79%	80%	45%	0.15
Pedestrian Signal Type	Pushbutton actuated	77%	80%	45%	0.15
Total Entering Vehicles	0 - 100; 7,000 - 15,000	43%	47%	36%	0.11
Intersection Skew Angle (degree)	0 - 3	88%	93%	71%	0.11
Average Daily Pedestrian Trips within the Census Tract	900 - 1,400; > 2,600	36%	47%	37%	0.11
VRU High-Risk Area	Yes	46%	47%	12%	0.33

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-19 RISK FACTORS FOR PEDESTRIAN-RELATED CRASHES ON URBAN SIGNALIZED T-INTERSECTIONS AND Y-INTERSECTIONS

Urban Signalized T-Intersections and Y-Intersections

Risk Factors	Risk Factor Criteria	19 Crashes	5 KA Crashes	101 Intersections	KA Crashes Per Intersection
Right-Turn Channelization Type	None	95%	100%	88%	0.06
Crosswalk Type	Marked crosswalk	68%	80%	42%	0.10

Urban Signalized T-Intersections and Y-Intersections

Risk Factors	Risk Factor Criteria	19 Crashes	5 KA Crashes	101 Intersections	KA Crashes Per Intersection
Total Entering Vehicles	7,000 - 15,000	21%	40%	25%	0.08
Intersection Skew Angle (degree)	4 - 9	26%	60%	34%	0.09
Average Daily Pedestrian Trips within the Census Tract	1,400 - 2,000	42%	40%	18%	0.11
VRU High-Risk Area	Yes	26%	40%	4%	0.50

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-20 RISK FACTORS FOR PEDESTRIAN-RELATED CRASHES ON URBAN STOP-CONTROLLED CROSS-INTERSECTIONS

Urban Stop-Controlled Cross-Intersections

Risk Factors	Risk Factor Criteria	18 Crashes	5 KA Crashes	329 Intersections	KA Crashes Per Intersection
Presence of Lighting	Yes	100%	100%	83%	0.02
Left-Turn Lane Type	Conventional left turn lane(s)	22%	40%	6%	0.10
Crosswalk Type	Marked crosswalk	56%	60%	15%	0.06
Traffic Control Type	Two-way stop	100%	100%	83%	0.02
Total Entering Vehicles	7,000 - 15,000	39%	80%	20%	0.06
Intersection Skew Angle (degree)	7 - 9	33%	60%	2%	0.38
Average Daily Pedestrian Trips within the Census Tract	> 1,400	78%	80%	54%	0.02

Source: NYSDOT CLEAR, 2019-2023

B.4 Speed-Related Crashes

Speeding can directly increase the likelihood of a crash and the risk of fatal and serious injuries in the event of a crash. Over the past five years, crashes involving unsafe speeds have accounted for 22 percent of all KA crashes in Dutchess County.

B.4.1 Focus Facility Types

For speed-related crashes on roadway segments[4], a process similar to the focus facility type selection for roadway departure crashes was applied. Crash data was filtered by roadway functional class and area type (urban/rural), and roadway mileage was used as an exposure measure to normalize the crash data. As indicated by Table 4-21, after excluding Interstates and other freeways, which have relatively little roadway coverage in Dutchess County, rural arterials and urban major collectors had the highest concentrations of speed-related crashes and fatal/serious injury crashes relative to the lane miles on these facilities. In addition, the fatal/serious injury crash rates observed on urban arterials and rural major collectors were comparable to those of the selected focus facilities, but significantly higher than those of the remaining facilities. Given the prevalence of these two roadway types in Dutchess County, they were also included as focus facility types.

The final focus facility types (**bolded** in Table 4-21) for roadway departure crashes are:

- Rural Arterials (Excluding Freeways)
- Urban Major Collectors
- Urban Arterials (Excluding Freeways)
- Rural Major Collectors

[4] Only roadway segments were identified as focus facility type for speeding crashes since the majority of speeding crashes happen on segments. 67 percent of KA speeding crashes occur on segments compared to 33 percent occurring at intersections.

TABLE 4-21 SPEED-RELATED CRASH DISTRIBUTION BY SEGMENT TYPE

Functional Class	Area Type	Total Lane Miles	# of Crashes	% of Total Crashes	# of KA Crashes	% of Total KA Crashes	# of Crashes Per Mile	# of KA Crashes Per Mile
Arterial - Interstate or Other Freeway	Rural	33	190	8%	10	7%	5.6	0.30
Arterial - Interstate or Other Freeway	Urban	83	382	16%	22	16%	4.6	0.27
Arterial - Not Freeway	**Rural**	**91**	**168**	**7%**	**13**	**10%**	**1.8**	**0.14**
Major Collector	**Urban**	**204**	**387**	**16%**	**25**	**18%**	**1.9**	**0.12**
Arterial - Not Freeway	**Urban**	**157**	**312**	**13%**	**17**	**13%**	**2.0**	**0.11**
Major Collector	**Rural**	**100**	**254**	**11%**	**10**	**7%**	**2.5**	**0.10**
Minor Collector	Rural	154	110	5%	9	7%	0.7	0.06
Local	Rural	753	247	10%	16	12%	0.3	0.02
Local	Urban	941	310	13%	14	10%	0.3	0.02
Minor Collector	Urban	9	12	<1%	0	0%	1.2	0.00

Source: NYSDOT CLEAR, 2019-2023

*Note: **Bolded** facility types are the selected focus facility types.*

B.4.2 Risk Factors

Once the focus facility types were identified for speed-related crashes, roadway attributes and operational factors that have direct correlations with drivers' speeding behavior were analyzed. These factors included posted speed limit, annual average daily traffic (AADT), number of through lanes, median type, shoulder width, and access control type, as shown in Table 4-11.

Using the overrepresentation method, risk factors associated with an increased likelihood of severe speed-related crashes were identified separately for each focus facility type. For both rural major collectors and rural arterials, posted speed limits between 55 and 60 mph were associated with higher concentrations of fatal/serious injury crashes on roadway segments. In contrast, for urban major collectors and urban arterials, posted speed limits between 35 and 40 mph were identified as a risk factor, as segments with this characteristic had the highest fatal/serious injury crash rates per lane mile. Table 4-22, Table 4-23, Table 4-24, and Table 4-25 summarize the selected risk factors for different focus facility types and the corresponding fatal/serious injury crash rates per lane mile.

TABLE 4-22 RISK FACTORS FOR SPEED-RELATED CRASHES ON RURAL ARTERIALS

Rural Arterials (Excluding Freeways)					
Risk Factors	**Risk Factor Criteria**	**168 Crashes**	**13 KA Crashes**	**91.5 Lane Miles**	**KA Crashes Per Mile**
AADT	0 - 2,000; 10,000+	44%	62%	33%	0.26
Shoulder Width (ft)	1 - 4; >= 13	80%	85%	69%	0.17
Posted Speed Limit (MPH)	55 - 60	68%	77%	62%	0.18

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-23 RISK FACTORS FOR SPEED-RELATED CRASHES ON URBAN MAJOR COLLECTORS

Urban Major Collectors					
Risk Factors	**Risk Factor Criteria**	**387 Crashes**	**25 KA Crashes**	**203.7 Lane Miles**	**KA Crashes Per Mile**
AADT	2,000 - 10,000	78%	80%	74%	0.13
Shoulder Width (ft)	1 - 4	78%	76%	71%	0.13
Posted Speed Limit (MPH)	35 - 40; 55 - 60	50%	64%	48%	0.17

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-24 RISK FACTORS FOR SPEED-RELATED CRASHES ON URBAN ARTERIALS

Urban Arterials (Excluding Freeways)					
Risk Factors	**Risk Factor Criteria**	**312 Crashes**	**17 KA Crashes**	**157.3 Lane Miles**	**KA Crashes Per Mile**
Number of Through Lanes	2; 3	26%	29%	17%	0.19
AADT	> 10,000	66%	71%	53%	0.15
Shoulder Width (ft)	5 - 12	33%	47%	29%	0.18
Posted Speed Limit (MPH)	45 - 60	65%	77%	53%	0.16
Divided	Yes	23%	29%	16%	0.20
Median Type	Curbed; Unprotected	21%	24%	11%	0.24
Truck Route	Access highway	64%	71%	50%	0.15

Source: NYSDOT CLEAR, 2019-2023

TABLE 4-25 RISK FACTORS FOR SPEED-RELATED CRASHES ON RURAL MAJOR COLLECTORS

Rural Major Collectors					
Risk Factors	**Risk Factor Criteria**	**134 Crashes**	**13 KA Crashes**	**78.9 Lane Miles**	**KA Crashes Per Mile**
AADT	0 - 2,000	14%	30%	21%	0.14
Posted Speed Limit (MPH)	< 35; 55 - 60	85%	100%	79%	0.13
Truck Route Type	Access highway	28%	40%	24%	0.17

Source: NYSDOT CLEAR, 2019-2023