NEW JERSEY

Vulnerable Road User Safety Assessment

November 2023

This page left intentionally blank

Contents

List of Figures

List of Tables

List of Tables (continued)

Abbreviations and Acronyms

BIL	Bipartisan Infrastructure Law
BSBPP	Bureau of Safety, Bicycle, and Pedestrian Programs
CD	Concept Development
CMAQ	Congestion Mitigation and Air Quality
CPM	Capital Program Management
DDSA	Data Drive Safety Analysis
DVRPC	Delaware Valley Regional Planning Commission
EJ	Environmental Justice
EJ Screen	Environmental Justice Screening and Mapping Tool
EPA	Environmental Protection Agency
ePDO	Equivalent Property Damage Only
FARS	Fatality Analysis Reporting System
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
HSIP	Highway Safety Improvement Program
HSM	Highway Safety Manual
LSP/HRRRP	Local Safety Program/High-Risk Rural Roads Program
MMUCC	Model Minimum Uniform Crash Criteria
MPO	Metropolitan Planning Organization
MUTCD	Manual of Uniform Traffic Control Devices
NACTO	National Association of City Transportation Officials
NJ 2020 SHSP	New Jersey 2020 Strategic Highway Safety Plan
NJDHTS	New Jersey Division of Highway Traffic Safety
NJDOT	New Jersey Department of Transportation
NJTPA	North Jersey Transportation Planning Authority
OVRU	Other Vulnerable Road User
PedSafe	Pedestrian Safety Guide and Countermeasure Selection System
PMGA	Planning, Multimodal and Grants Administration
PUFFIN	Pedestrian User-Friendly Intelligent Intersection
RSA	Road Safety Audit

Abbreviations and Acronyms (continued)

SJTPO	South Jersey Transportation Planning Organization
SPR	Statewide Planning and Research
SRC	Safety Resource Center
SRTS	Safe Routes to School
SS4A	Safe Streets and Roads for All
SSA	Safe System Approach
STIP	Statewide Transportation Improvement Program
TAP	Transportation Alternatives Program
TMA	Transportation Management Associations
USDOT	United States Department of Transportation
VRU	Vulnerable Road User

Resource Web Links

BikeSafe	Bicycle Safety Guide and Countermeasure Selection System pedbikesafe.org
FHWA ePDO Methodology	FHWA ePDO Methodology
FHWA	Appropriate Speed Limits for All Road Users
FHWA	Crosswalk Visibility Enhancements
FHWA	Pedestrian Hybrid Beacons
FHWA	Separated Bike Lane Design Guide
FHWA	Speed Safety Cameras
FHWA	Rectangular Rapid Flashing Beacons (RRFB)
FHWA	Road Diets (Roadway Configuration)
NJTPA Bicycle Compatibility	NJTPA Bicycle Compatibility
Local Aid Resource Center	njdotlocalaidrc.com
NACTO	Bicycle Signal Heads
NACTO	Bike Boxes
NACTO	Mini Roundabout
NACTO	Protected Intersections
NACTO	Speed Management
NACTO	Two-Stage Turn Queue Boxes | National Association of City Transportation Officials (nacto.org)
NJDOT	DOT-Safety.ResourceCenter@dot.nj.gov
NJ Safe Routes Resource Center	saferoutesnj.org
NJ Crossing Guards	New Jersey Crossing Guards (njcrossingguards.org)
PedSafe	Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)

Resource Web Links (continued)

State Police NJ Fatal Accident	State Police NJ Fatal Accident
NJ Bicycle and Pedestrian Resource	njbikeped.org
Toward Zero Deaths NJ	saferoadsforallnj.com
USDOT Benefit- Cost Analysis	USDOT Benefit-Cost Analysis
USDOT	Safe System Approach
WSDOT	STEP - Action Plan

Executive Summary

Driving Toward ZERO Deaths

The New Jersey Department of Transportation (NJDOT) completed a Vulnerable Road User (VRU) Safety Assessment to highlight current safety outcomes and corresponding industry strategies. A person walking, biking, or rolling (e.g., via a scooter, skateboard, wheelchair) is defined by the Federal Highway Administration (FHWA) as a VRU, as shown in **Figure 1**. This also includes people working within the right-of-way during construction projects.

FIGURE 1: TYPES OF VULNERABLE ROAD USERS

Collectively, these non-motorists could face severe consequences if a collision occurs while traveling near motorized traffic. As NJDOT's 2020 Strategic Highway Safety Plan (NJ 2020 SHSP) states, **"Zero fatalities on all of New Jersey's public roads is our collective goal and can be achieved."** To get there, NJDOT and its partners will work toward the principles and objectives of the Safe System Approach (SSA) adopted by the United States Department of Transportation (USDOT) – using the SSA through their portfolio of projects as shown in **Figure 2**. NJDOT has been committed to the spirit of the multimodal, equitable processes of the SSA for many years, since becoming a pioneer state for Complete Streets in 2009. NJDOT has taken steps to increase funding transparency, interagency multimodal safety collaboration, safety target setting, and safety strategy planning to benefit VRUs as seen in **Figure 3**. In particular, the VRU Safety Assessment stresses the importance of achieving a future transportation system where "Responsibility is Shared." All levels of government, industry, non-profit/advocacy, researchers, and the public are vital to preventing transportation-related fatalities and serious injuries.

FIGURE 2: NJDOT HSIP PORTFOLIO

FIGURE 3: NJDOT AGENCY EVOLUTION IN SUPPORT OF NON-MOTORISTS

FIGURE 4: NEW JERSEY PARTNERS IN SAFETY

The VRU Safety Assessment addresses federal requirements to use a data-driven process to identify areas of high risk; consult with appropriate planning and operating authorities (including NJDOT's partners in **Figure 4**); and propose resulting safety strategies to improve safety in high-risk areas. As illustrated by **Figure 5** on the right, NJDOT develops 25% of state capital projects with a primary safety focus; with 60% of those projects focused on VRUs. An early focus on safety concepts supports the potential for safety project success stories, which are featured throughout this report. Through this VRU Safety Assessment, NJDOT aims to increase the spotlight on the resources already available and implement infrastructure safety and educational countermeasures across all New Jersey roadways.

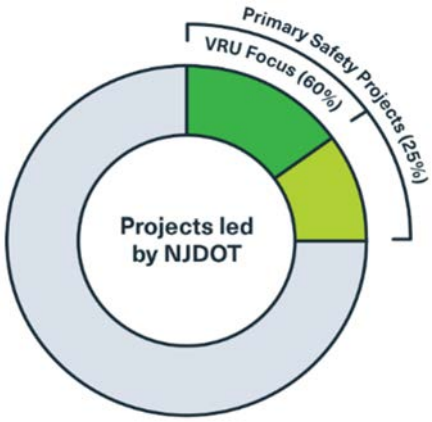


FIGURE 5: NEW JERSEY SAFETY PROJECTS WITH VRU FOCUS

Concurrent with the VRU Safety Assessment, NJDOT has been supporting safe travel for all through the New Jersey Safety Resource Center (SRC). The SRC is a one-stop destination for roadway safety guidance and information to help make roadways safer. The SRC uses the SSA as its foundation to provide information about safety projects and programs, navigating local funding and grant opportunities, training from industry experts, safety campaign materials, and resources. The SRC also coordinates meetings and events as instruments to facilitate knowledge sharing in support of the New Jersey's vision for safety and supports the implementation of the NJ 2020 SHSP. The VRU Safety Assessment identifies opportunities for the SRC to capitalize upon continued advancements in safety for all users. These opportunities were determined through consultation with stakeholders. NJDOT will continue to use the SRC proactively to promote safety and opportunities to reduce fatalities and serious injuries to people who walk, bike, or roll.

Introduction

From 2016 to 2020, NJDOT reported 2,772 non-motorist fatalities and serious injuries out of a total of 12,324 statewide traffic fatalities and serious injuries. Thus, non-motorists account for 22 percent of all fatalities and serious injuries in New Jersey.

SOURCE: 2022 NJDOT HSIP ANNUAL REPORT, FARS

In response to the Bipartisan Infrastructure Law (BIL), all states are required to develop a Vulnerable Road User (VRU) Safety Assessment (23 U.S.C. 148(l)). The New Jersey Department of Transportation (NJDOT) has developed the VRU Safety Assessment to support on-going activities that are critical to the state's goal of zero fatalities on all public roads by 2050. This VRU Safety Assessment includes a targeted analysis, a summary of project collaboration, and safety strategies that align with NJDOT's 2020 Strategic Highway Safety Plan (NJ 2020 SHSP). This VRU Safety Assessment is an addendum to the NJ 2020 SHSP. The next SHSP update (2025) will integrate the VRU Safety Assessment in the SHSP.

As defined by the USDOT, a VRU may include people walking, biking, or rolling (e.g., via a scooter, skateboard, wheelchair), and also includes construction workers in work zones (motorcyclists are not included) – or succinctly a non-motorist[1]. Each of us is a non-motorist when we finish parking our car and walk the last leg of the trip to work, make a short trip to the bus or train, or are just enjoying some outdoor exercise or recreation. In many places, our non-motorized trips may feel comfortable. However, many non-motorists travel near fast-moving vehicles. One mistake by the driver or the non-motorist could lead to a person being struck by a vehicle with collision forces that cause significant human injury and in some cases are fatal.

NJDOT has previously recognized the needs of people walking, biking, or rolling, primarily through their Pedestrians and Bicyclists emphasis area in the NJ 2020 SHSP. The VRU Safety Assessment further underscores the importance of protecting people who walk, bike, or roll, as they are the victims of 22 percent of the fatalities and serious injuries in New Jersey (as described in the **Overview of VRU Safety Performance** section of this report). This report delves into crash outcomes and resources that demonstrate the collective actions of New Jersey's transportation agencies and

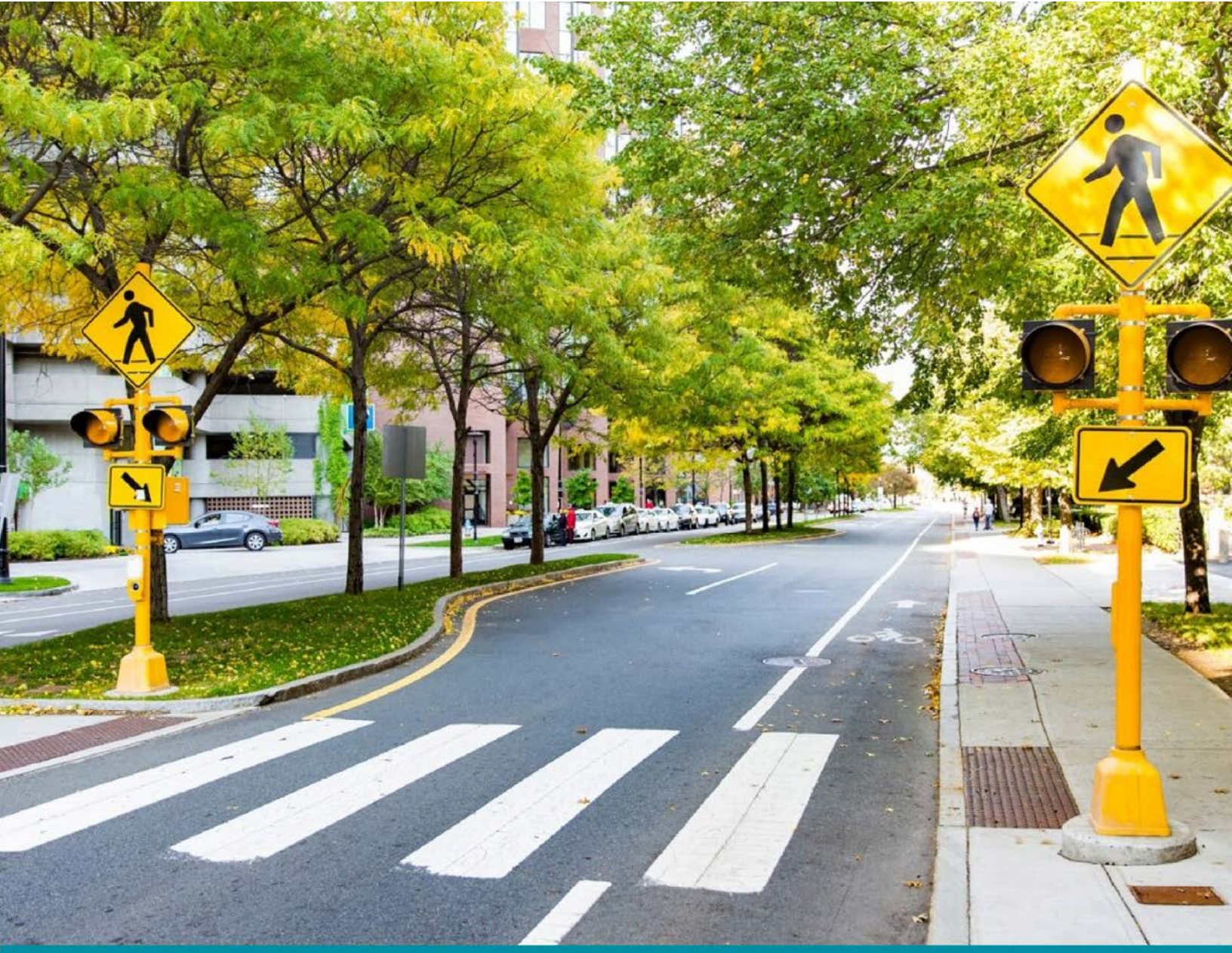
[1] People identified as VRUs are considered to be vulnerable while traveling or working on and along the roadway because they are unprotected by any sort of physical shield. VRUs are at greater risk of serious injury in the event of a collision with a motor vehicle and are therefore in need of protection. The use of the acronym VRU in this report is not meant to dehumanize the victims of traffic crashes. It is used merely to save space and avoid distracting from the discussion of a very serious issue: the large numbers of pedestrians, cyclists, transit users, road workers, first responders, and crossing guards who are killed on our roadways every year.

stakeholders (see the **Program of VRU Projects and Strategies** section) to build a trend toward the state's goal of zero fatalities on all public roads by 2050.

Consistent with guidance provided by the Federal Highway Administration (FHWA), the VRU Safety Assessment is organized into four chapters: (1) Overview of VRU Safety Performance, (2) Summary of Quantitative Analysis, (3) Consultation, and (4) Program of VRU Projects and Strategies. The VRU Safety Assessment integrates the principles and objectives of the Safe System Approach (SSA) and references them for the context of the activities documented. SSA is, "a holistic and comprehensive approach that provides a guiding framework to make places safer for people."[2] Fundamentally, SSA prioritizes limiting the impact energy of a crash by managing speeds, protecting users, and urgently caring for those in a crash. Additional details on SSA principles (the six statements circling **Figure 6**) and objectives (the five statements in the inner ring of **Figure 6**) are included in **Appendix A**.

FIGURE 6: SAFE SYSTEM APPROACH PRINCIPLES AND OBJECTIVES (SOURCE: USDOT)

[2] USDOT Safe System Approach



Overview of VRU Safety Performance

Driving Toward ZERO Deaths

NJDOT collects, processes, and reviews crash record data continuously to identify opportunities for Safer Roads. This analysis was conducted using the 2016–2020 pedestrian and bicyclist crash dataset.

Safe System Approach

Updating NJTR-1 to include a suspected serious injury category consistent with MMUCC supports a focus on multiple SSA principles (particularly that "Humans are vulnerable") as practitioners now better recognize the injury severities of crash victims. Moving forward, highway safety planning will use these additional suspected serious injury crashes in deploying strategies that address crash contributing factors and high injury locations.

Historic Comparison of VRU Safety Performance to Overall Safety Performance

VRU fatality and serious injury outcomes were compared to the fatality and serious injury trends of all transportation users. Data was gathered from NJDOT's 2022 Highway Safety Improvement Program (HSIP) Annual Report and the Fatality Analysis Report System (FARS). Beginning in 2019, serious injuries recorded on the State of New Jersey Police Crash Investigation Report (NJTR-1) changed to follow the "Suspected Serious Injuries" definition in the Model Minimum Uniform Crash Criteria (MMUCC), 4th Edition, per 23 CFR 490.207(c). As a result of the required revision to the NJTR-1 form, crash injuries not previously assigned to the serious injury classification were assigned to the suspected serious injury classification, resulting in a significantly higher number of suspected serious injuries reported compared to previous years.

Focusing on the VRU data in **Table 1**, pedestrian and bicyclist fatalities are primarily a flat trend ranging between a low of 181 and a high of 200 per year. In 2018 and years prior, the number of serious, non-motorist injuries was between 202 and 234. In the years 2019 and 2020, suspected serious injuries increased to 630 and 550, respectively. The suspected serious injury frequency from 2019 to 2020 decreased by approximately 80, and future data will be reviewed to assess if this represents a continued downward trend.

TABLE 1: 2016 TO 2020 SAFETY PERFORMANCE MEASURES

Performance Measures	2016	2017	2018	2019	2020
Fatalities (all modes)	602	624	563	558	586
Suspected Serious Injuries (all modes)	1,019	1,137	1,284	3,047	2,904
Number non-motorized fatalities	181	200	191	187	192
Number of non-motorized suspected serious injuries	205	202	234	630	550

Notable findings when comparing non-motorist crash outcomes with total crashes include:

- For the 5-year period, non-motorists represent 22 percent of fatalities and serious injuries.
- Each year 30 to 34 percent of all fatalities were non-motorized users.
- Each year 17 to 21 percent of all serious injuries were non-motorized users.
- New Jersey State Police documented 243 non-motorist fatalities and 697 total fatalities in 2021 and 208 non-motorist fatalities and 694 total fatalities in 2022 [3]
- New Jersey State Police data shows 2023 year-to-date fatalities as of 9/6/2023 are down 19 percent for non-motorists from the year-to-date estimate in 2021.[4]

[3] State Police NJ 2022 Fatal Crashes [Data gathered 9/6/2023]
[4] State Police NJ 2023 Fatal Crashes [Data gathered 9/6/2023]

Safety Performance Targets

Consistent with FHWA requirements, NJDOT establishes annual safety performance targets. The primary target related to the VRU Safety Assessment is the total number of non-motorized fatalities and serious injuries averaged over a rolling 5-year period. The target for this category was set at 791.8 per year for 2020–2024. The non-motorist safety performance target was set through careful consideration of previous trends, recently built projects, and the current socioeconomic environment. NJDOT revisits safety performance targets annually. It is NJDOT's goal to reach zero fatalities on all public roads by 2050.

NJDOT's approach to target setting pushes for a reduction in non-motorist fatalities and serious injuries from 827 to 714 (over 100 fewer crash victims) over 2 years. Setting drastically reduced targets emphasizes the principle that "Death and Serious Injuries are Unacceptable."

In the 2019–2020 period, non-motorists experienced an average of 779 fatalities and serious injuries, which is lower than the rolling average target. However, for the year 2024, NJDOT has a one-year target of 714 non-motorist fatalities and serious injuries. In comparison to the 2024 single-year target, the safety performance target was not achieved. To work toward meeting NJDOT's non-motorist safety targets, agency staff and organizational partners must collaborate and take action to address VRU supportive infrastructure and education strategies. The **Summary of Quantitative Analysis** and **Program of VRU Projects and Strategies** sections further describe on-going collaborations and actions that address progress towards safety performance targets.

Non-Motorist-Involved Crash Trends

NJDOT completed an analysis of crash trends for VRU fatalities and serious injuries from 2016–2020. The crash trend analysis reviewed five key crash factors: (1) Crash Location Relative to an Intersection, (2) Hour of Occurrence, (3) Lighting Condition, (4) Posted Speed Limit, and (5) Roadway Jurisdiction. The following infographic depicts the key findings of that analysis, and a full narrative of the crash trend analysis is provided in **Appendix B**.

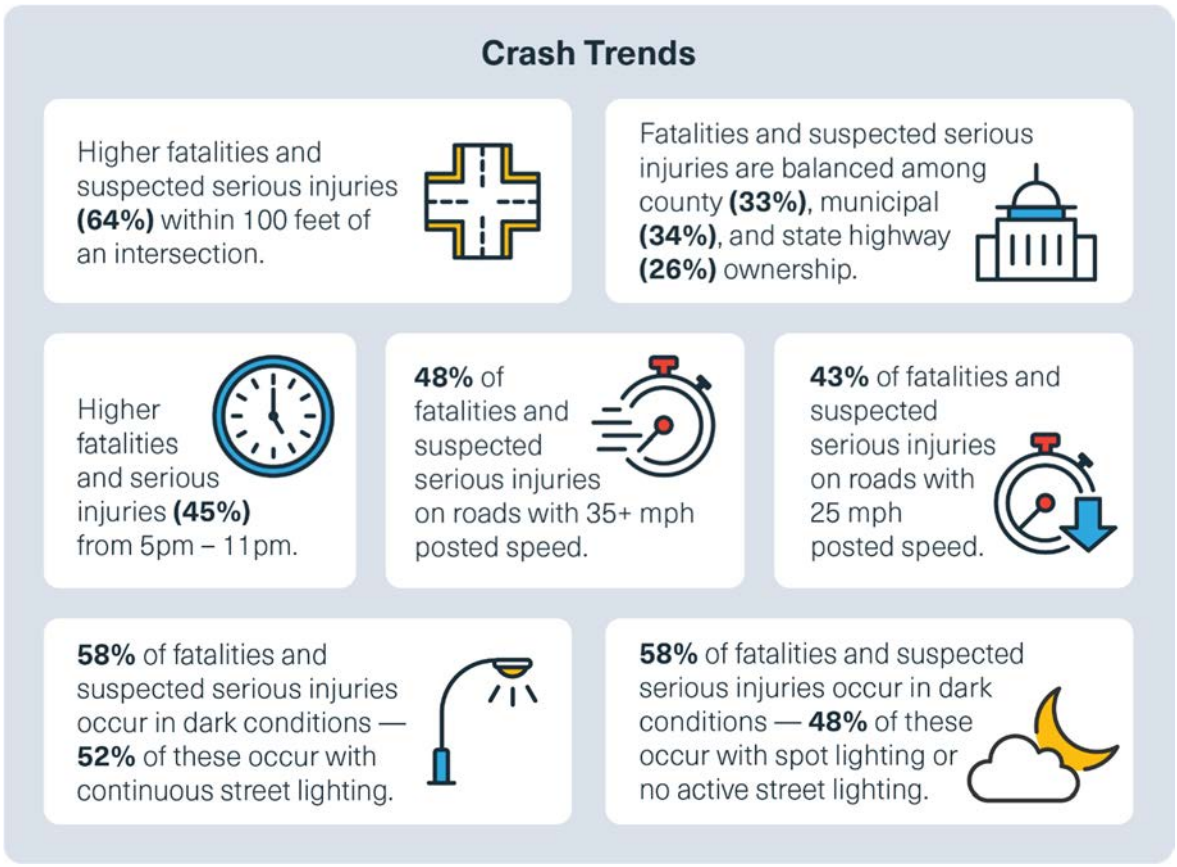


FIGURE 7: NON-MOTORIST-INVOLVED CRASH TRENDS (2016 – 2020)

Summary of Quantitative Analysis

Driving Toward ZERO Deaths

NJDOT and its partner agencies are working on several initiatives to increase proactive crash analysis assessments for all users, including non-motorists.

NJDOT addresses roadway safety through network screening (also known as hot spot analysis), systemic safety analysis, and systematic safety applications.

Reviewing a combination of geometric, non-motorist use, and motorist speed patterns addresses several SSA objectives and shows that "Redundancy is Crucial" because you can reduce serious crash outcomes if even one of these safety objectives provides the needed protection from an impact.

Figure 8 depicts the key differences between each safety approach — with systemic and systematic approaches making greater user of proactive safety. **Appendix C** expands on the high-risk locations identified by this approach and consideration of demographics.

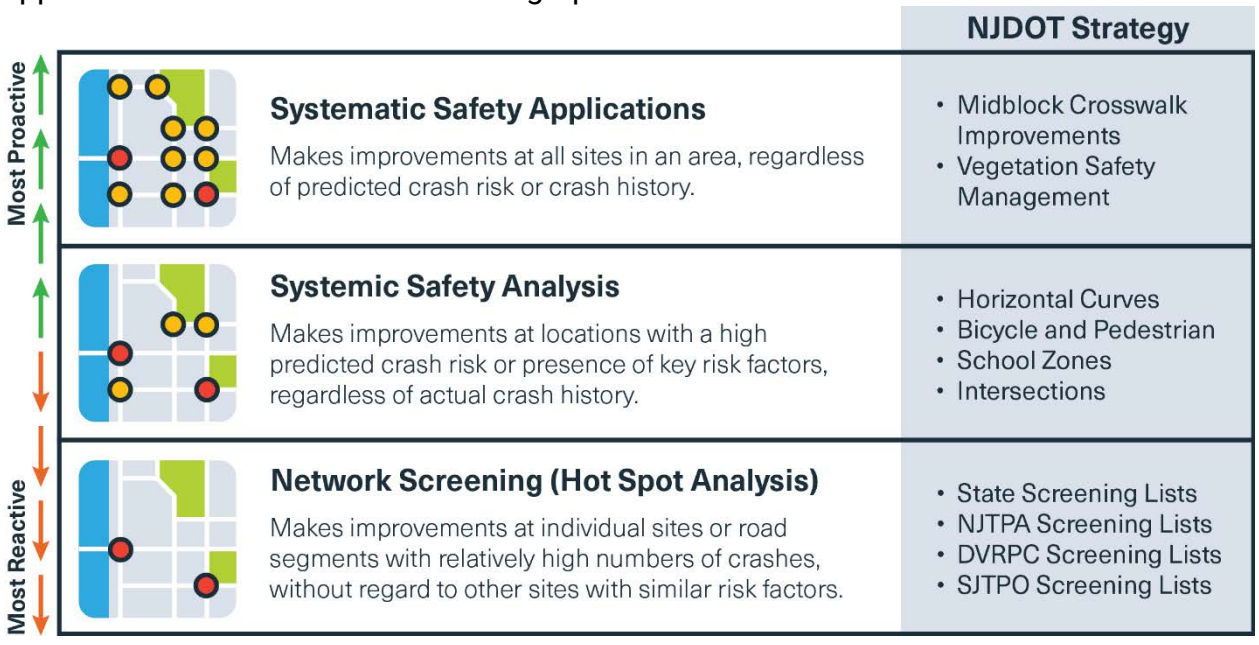


FIGURE 8: NJDOT QUANTITATIVE SAFETY ANALYSES

Systemic and Systematic Approaches

NJDOT has four systemic safety analysis projects that are developing systemic safety scores based on primary and secondary risk factors. Systemic safety analysis projects include:

- Horizontal Curves Systemic Analysis [Complete]
- Bicycle and Pedestrian Systemic Analysis [In-Progress]
- School Zones Systemic Analysis [In-Progress]
- Intersections [In-Progress]

Risk factors in systemic safety projects include a balance of roadway geometry and network design, level of multimodal volume, traffic control, adjacent land use, and human factors. The more risk factors present, the higher the systemic score will be. NJDOT's analysis comprehensively covers the state's roadway network — so systemic safety factors will be used in developing new safety project concepts and enhancements to the design for projects already in the program.

In some cases, systemic analyses lead to agency-wide opportunities to deploy low-cost strategies — systematic deployments. NJDOT has developed a systematic plan for enhancing midblock crosswalks at all approved locations on the state system. NJDOT also has a systematic safety program for vegetation safety management to address clear zones, improve sight distance, and reduce fixed objects for all Interstates and limited access roadways.

Network Screening Methodology

While the systemic analysis results are not available at this time, NJDOT has recently updated pedestrian-bicycle network screening lists. These lists identify high-risk crash locations for this VRU Safety Assessment and support NJDOT's on-going strategy for funding local road safety projects (see the **Program of VRU Projects and Strategies** section to learn more). The analysis is based on the FHWA equivalent Property Damage Only (ePDO) network screening strategy[5]. In summary, crash data from calendar years 2016–2020 (inclusive) were used to summarize crash outcomes from all severity levels[6] with crashes associated to (1) roadway mileposts for linear corridors, or (2) at roadway intersections. **Table 2** shows the conversion chart to calculate the ePDO of each crash event where the ePDO weight is based on USDOT's Benefit-Cost Analysis

[5] For more detail on the FHWA ePDO methodology: FHWA ePDO Methodology
[6] As defined in MMUCC – K=Fatal Injury, A=Suspected Serious Injury, B=Suspected Minor Injury, C=Possible Injury, O=No Apparent Injury

Guidance[7] . As an example, one fatal crash or suspected serious injury crash is equivalent to approximately 57 property damage-only crashes.

TABLE 2: ePDO SCORE WEIGHTS FOR NETWORK SCREENING

Equivalent Property Damage Only (ePDO) Score Weights		
Crash Severity	**KABCO Scale**	**ePDO Value (K=A)[8]**
Fatal	K	56.9173
Suspected Serious Injury	A	56.9173
Suspected Minor Injury	B	17.1973
Possible Injury	C	10.8476
Property Damage Only	PDO	1.0000

The analysis was completed independently for roadways under NJDOT jurisdiction versus roadways under jurisdiction of local agencies. The local road network screening lists are divided by Metropolitan Planning Organization (MPO) boundary, with all local roads falling into one of the following three metropolitan boundaries: North Jersey Transportation Planning Authority (NJTPA), Delaware Valley Regional Planning Commission (DVRPC), and South Jersey Transportation Planning Organization (SJTPO). As a result — sixteen local hot spot network screening lists were developed in the quantitative analysis of high-risk areas:

- NJDOT – Pedestrian Segment
- NJDOT – Pedestrian Intersection
- NJDOT – Bike Segment
- NJDOT – Bike Intersection
- NJTPA – Ped-Bike Corridor
- NJTPA – Pedestrian Corridor
- NJTPA – Ped-Bike Intersection
- NJTPA – Pedestrian Intersection
- DVRPC – Ped-Bike Corridor
- DVRPC – Pedestrian Corridor
- DVRPC – Ped-Bike Intersection
- DVRPC – Pedestrian Intersection
- SJTPO – Ped-Bike Corridor
- SJTPO – Pedestrian Corridor
- SJTPO – Ped-Bike Intersection
- SJTPO – Pedestrian Intersection

[7] USDOT Benefit-Cost Analysis

[8] Note: Cost values from USDOT are per outcome and have been converted to per crash event; fatality impact costs have been capped at the cost burden of a suspected serious injury crash event.

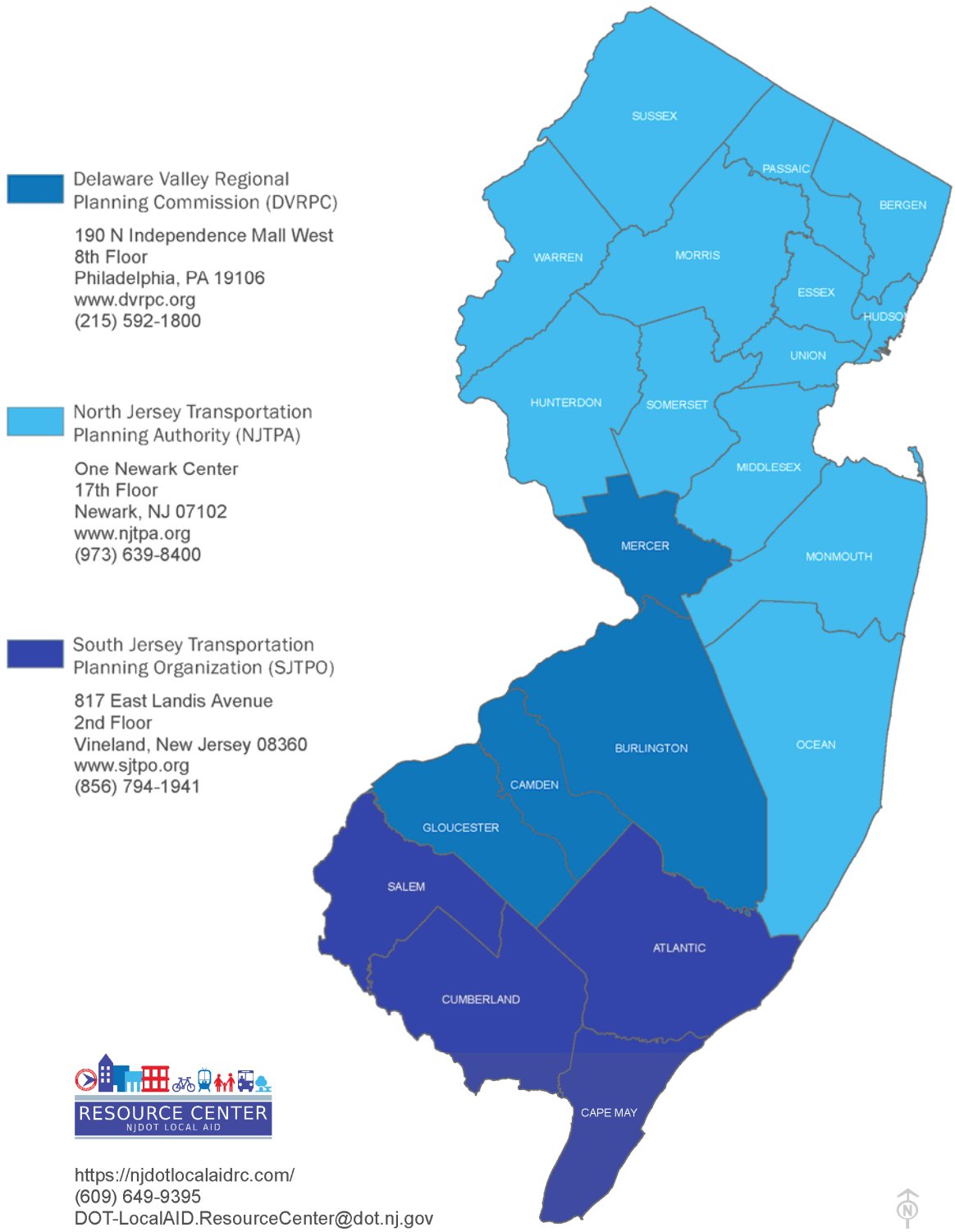


FIGURE 9: NEW JERSEY'S METROPOLITAN PLANNING ORGANIZATIONS (MPO)

High-Risk Determination

The state and local network screening lists described in the **Network Screening Methodology** section was used to select areas where VRUs are at high risk. For NJDOT's facilities, high-risk safety locations are identified using the Safety Management System which includes a screening of the state system using historical crash data (hot spot) and systemic analysis (proactive). The local network screening lists have been used previously in directing HSIP funds through the Local Safety Program with a focus on equitable distributions to each region. Agencies with jurisdiction over these corridors and intersections were invited to the project consultation process. The high-risk locations are described in **Appendix C.**

NJDOT and MPO partners focused the high-risk determination of this VRU Safety Assessment primarily toward engagement with appropriate agencies and stakeholders. The **Consultation** and **Program of VRU Projects and Strategies** sections describe local engagement opportunities and shared responsibility for the identification of VRU safety needs and the application of countermeasures. New Jersey is already making progress in deploying proven safety countermeasures through existing partner collaborations that use nearly $25 million per year in Local Safety Program / High Risk Rural Roads Program (LSP/HRRRP) funding.

Demographic Consideration

NJDOT reviews demographics and other potential markers of underserved communities to understand the impact of projects and activities. NJDOT has chosen to streamline demographic reviews from system/statewide planning activities (like this report) through project delivery. Consistent with that agencywide approach, this analysis used the U.S. Environmental Protection Agency's (EPA) Environmental Justice (EJ) Screen Tool for demographic consideration. The corridors and intersections in the network screening activity were each compared to the data in EJ Screen using up to a half-mile buffer around the site. **Appendix C** provides details of high-risk safety locations correlated with racial, ethnic, and income diversity.

Consultation

To go beyond the data and hear local experiences, NJDOT partnered with the three MPO jurisdictions for the consultation effort. NJDOT held two virtual meetings for each MPO region and its local partners to share about the VRU planning process and hear about local experiences with VRU safety and best practices. To extend outreach, NJDOT also encouraged feedback through an online survey. A summary of the collaboration and consultation process in this project is outlined below.

Introductory Consultation

One virtual consultation meeting was held with each of the three MPOs (NJTPA, SJTPO, and DVRPC) in late May 2023. The purpose of these meetings was to introduce the VRU safety assessment process, including the federal requirements to complete a robust assessment.

In addition to MPO staff, communities with higher VRU crash histories (as identified on the local network screening lists) were invited to participate in the virtual webinar.

During this initial consultation, NJDOT staff described the VRU Safety Assessment, provided an explanation about the consultation process, and shared an overview of the development of the plan itself. Additionally, each group was engaged using a variety of interactive polls. This allowed the project team to receive immediate feedback related to key issues and barriers affecting VRU safety.

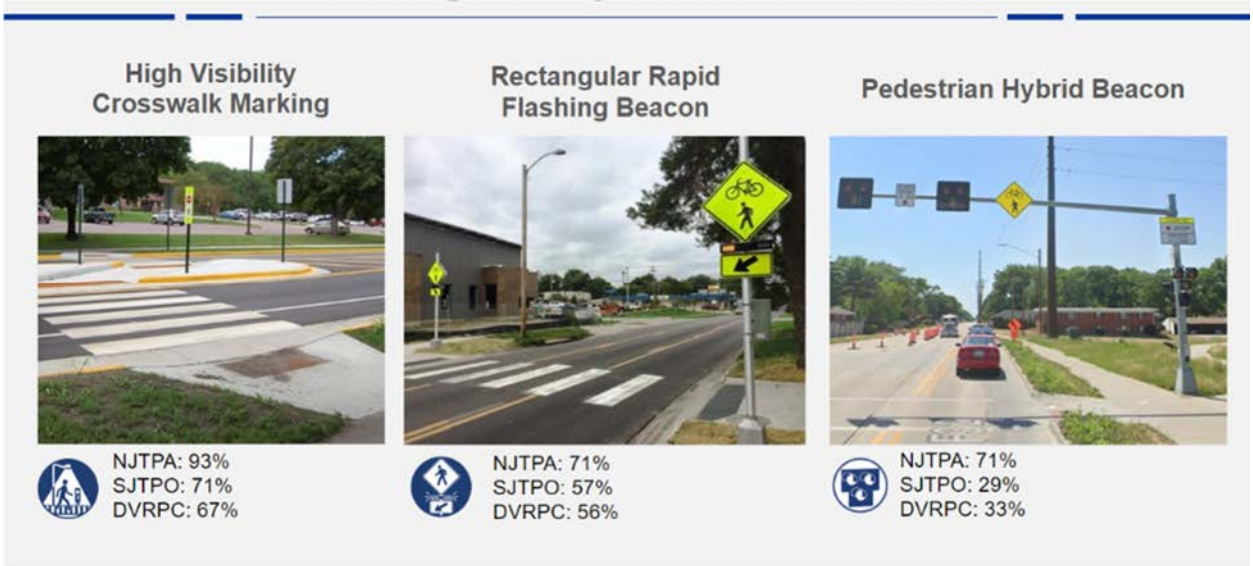


FIGURE 10: POLLING RESULTS REGARDING USE OF NON-MOTORIST CROSSING SAFETY COUNTERMEASURES POLL FROM CONSULTATION

Key takeaways from the meetings include understanding opportunities for further education amongst MPO member communities concerning newer VRU safety strategies, a consensus among stakeholders that VRUs need more attention within their communities, questions on automated speed and red-light enforcement, and some

high-level trends on infrastructure safety countermeasures implemented across the state.

Follow-up Consultation

Additional consultation meetings were held with NJTPA and DVRPC between July and August 2023. These virtual meetings followed the initial consultation and provided an update on proven safety countermeasures, a high-level look at crash data within each MPO region, and an interactive discussion on VRUs and local agencies' success stories.

These meetings included a look at crash data for fatal and serious injury VRU crashes, including the breakdown of conditions for crashes from 2016 through 2020, with data such as time of event, posted speed limit, and jurisdiction.

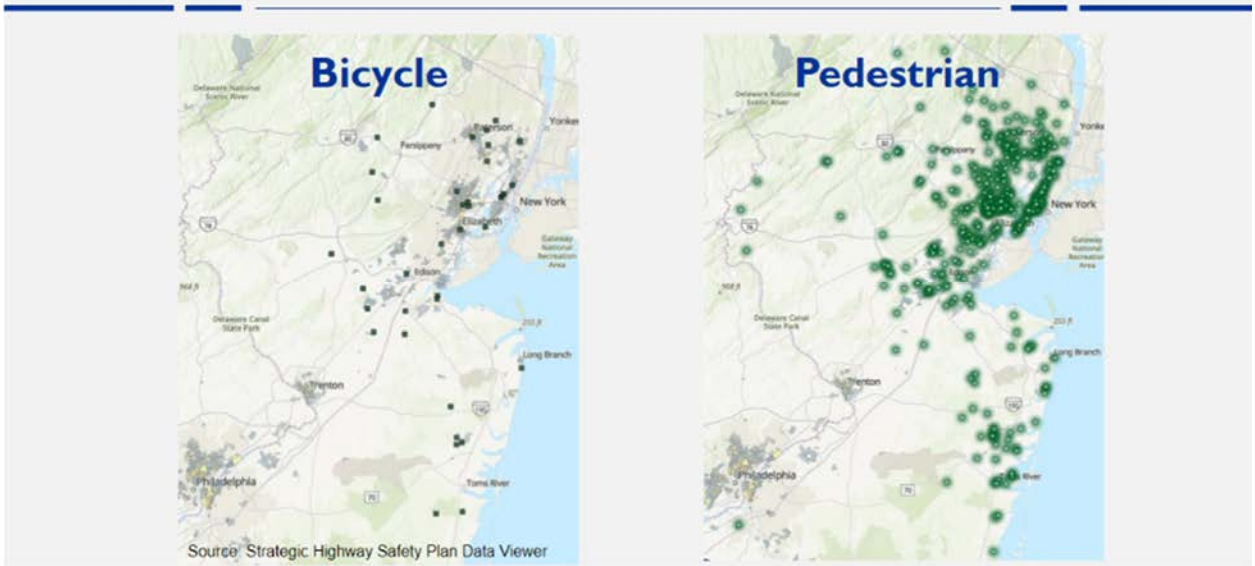


FIGURE 11: MAP OF NEW JERSEY FATAL CRASHES 2015–2020 SHARED DURING FOLLOW-UP CONSULTATION

The follow-up meetings helped the VRU Safety Assessment team better understand how NJDOT resource centers are utilized, how safety strategies in the education and enforcement area are utilized by local agencies, and how each agency brings a safety-first mindset to transportation projects. Feedback from the meetings also has been documented through safety success stories captured in this report.

Survey

To provide additional engagement opportunities, an online survey was distributed to county and municipal engineers registered with NJDOT's Local Aid Resource Center. The survey's intent was to collect information that would inform an understanding of local agency strategies for improving safety conditions for VRUs. The survey questions were closely related to the discussions held in introductory and follow-up consultation meetings to provide a feedback channel for individuals who could not attend.

The survey contained less than 20 questions and focused on countermeasures, processes, procedures, and community sentiment around VRUs. The survey required respondents to describe their organization or agency but did not require them to provide a name. This tactic protected anonymity to encourage honest and open responses.

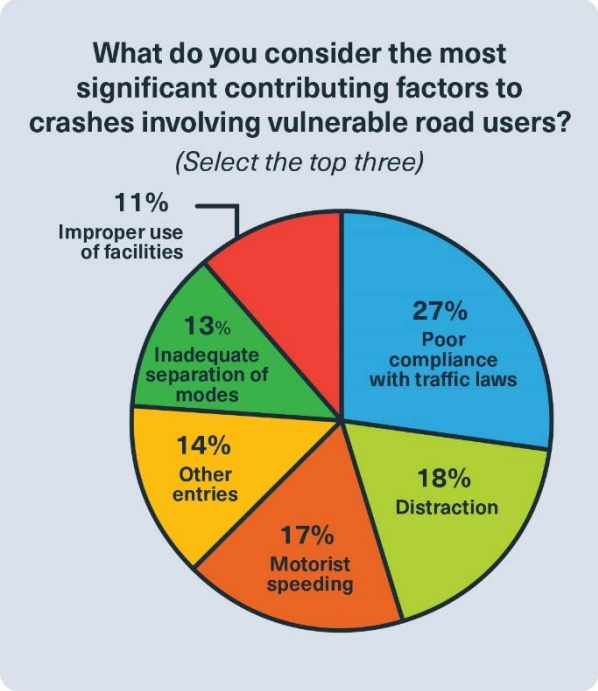


FIGURE 12: LOCAL FEEDBACK ON CONTRIBUTING FACTORS TO VRU-INVOLVED CRASHES

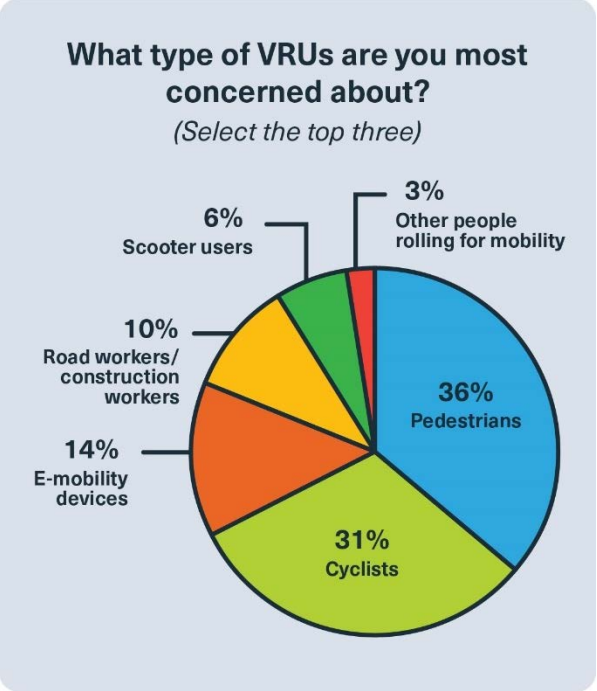


FIGURE 13: LOCAL FEEDBACK ON VRU CONCERNS

The survey was conducted for approximately two months and received 30 responses. The survey was publicized to the three MPOs via email, to attendees at all virtual consultation meetings, local jurisdictions, and engineering contacts. While the survey was anonymous, the respondents are affiliated with a variety of counties, cities, townships, MPOs, and consultants. The results show that all respondents are concerned with VRU safety with 67 percent being very concerned. The types of VRUs with the highest concern are pedestrians (36 percent) and cyclists (31 percent). A few overarching themes were evident in the responses, including:

- Seventy-three percent of responses consider user behavior as the primary contributing factor to VRU-involved crashes. Survey findings note 27 percent voted for “Poor compliance with traffic laws”, 17 percent selected for “Motorist speeding”, 18 percent selected for “Distraction”, and 11 percent selected for “Improper use of facilities” as the primary contributing factor to VRU crashes.
- Nearly 57 percent of responding communities have plans for bicycle corridors or networks to increase the number of safer facilities for non-motorists.
- Nearly 68 percent of responding communities do not have a process for identifying a high-injury network in their community.

Program of VRU Projects and Strategies

NJ Strategic Highway Safety Plan

Driving Toward ZERO Deaths

With an increasing focus on creating multi-modal transportation systems, the state continues to establish itself as a leader in the development and implementation of strategies to reduce the severity and frequency of crashes involving bicyclists, pedestrians, and other VRUs. The following section summarizes various strategies that NJDOT, MPOs, and local jurisdictions have adopted to enhance safety, promote awareness, and create a more inclusive transportation environment. This includes planning documents and data tools, implementation through funding and assistance programs, and education and awareness efforts. Finally, the infrastructure safety countermeasures, consistent with the SSA, being implemented across the state are highlighted.

Planning and Technical Assistance

NJDOT Plans and Tools

The New Jersey 2020 Strategic Highway Safety Plan (NJ 2020 SHSP) provides overarching planning guidance to support New Jersey's goal of zero fatalities on all public roads by 2050. The NJ 2020 SHSP has seven emphasis areas including one for Pedestrians and Bicyclists and another for Other Vulnerable Road Users (OVRU). In the context of the SHSP, OVRUs are mature drivers, motorcyclists, younger drivers, individuals in work zones, and other road workers. Key VRU strategies from the NJ 2020 SHSP have been documented as a progress report tracked by NJDOT, shown in **Figure 14**. Completed priority actions for select NJ 2020 SHSP emphasis areas include trainings for school crossing guards, a work zone safety report, a Complete Streets task force, a VRU laws white paper, Street Smart NJ implementation, transit stops road

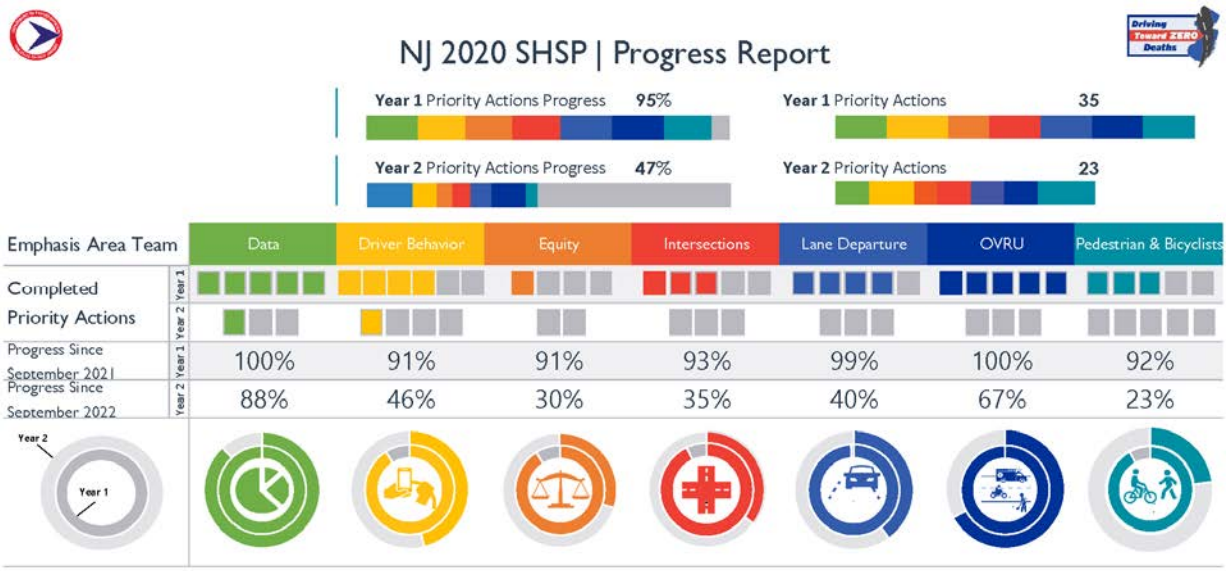


FIGURE 14: NJ 2020 STRATEGIC HIGHWAY SAFETY PLAN IMPLEMENTATION PROGRESS AS OF SEPTEMBER 2023

safety audits, safe system approach training, review of best practices on accommodating and protecting pedestrians/bicyclists on all roads, and a review of infrastructure improvements for mature travelers. The SHSP website provides updates at Toward Zero Deaths NJ (saferoadsforallnj.com).

Other VRU statewide plans and tools include: the Bicycle and Pedestrian Master Plan, Bicycle and Pedestrian Action Plans and toolboxes, a Complete Street Design Guide and Complete and Green Streets for All: A Model Policy and Guide. Data resources include Safety Voyager and the Strategic Highway Safety Plan Crash Data Viewer.

A list of NJDOT plans and tools including web links and brief descriptions can be found in **Appendix D**.

Success Stories

The New Jersey Department of Transportation (NJDOT) is the steward of the New Jersey Complete Streets policy, a nationally recognized initiative to support safe access for all users by integrating multimodal transportation network options in the design and construction of facilities. New Jersey adopted the Complete Streets policy in 2009, making it one of the first states in the country to do so. NJDOT confirms that a majority of capital projects comply with the existing Complete Streets policy. Using a series of Complete Streets checklists developed to implement the policy, staff in the Bureau of Safety, Bicycle and Pedestrian Programs serve as subject matter experts and evaluate projects as they advance through study, concept, design, and construction. Working with the project manager, consultants, and designers, the team assesses the need for safety and connectivity and collaborates with internal and external stakeholders to find viable solutions. Projects are now reflecting better results for Complete Streets across the state leading to safer, more connected experiences for travelers.

NJDOT Funding and Assistance Programs

NJDOT utilizes numerous state and federal funding and technical assistance programs to assist with VRU safety implementation efforts throughout New Jersey. A select list of frequently used funding programs is highlighted below:

Highway Safety Improvement Program (HSIP)

HSIP is a core federal-aid program intended to achieve a significant reduction in traffic fatalities and serious injuries by funding a variety of improvements that mitigate, remedy, and improve specific hazardous roadway conditions as well as influence roadway user behaviors. HSIP funds are subdivided among various program areas.

Congestion Mitigation and Air Quality (CMAQ)

The CMAQ program funds activities that improve air quality and reduce congestion in non-attainment areas.

Bicycle and Pedestrian Planning Assistance

This program provides consulting experts with experience in local bicycle and pedestrian planning to complete studies at no cost to local agencies as part of NJDOT's CMAQ funds.

Statewide Planning and Research (SPR)

SPR federal funding for planning and research activities has been utilized by NJDOT to fund the resource centers discussed in the **Education** strategy section.

Transportation Alternatives Program (TAP)

TAP provides federal funding for bicycle and pedestrian improvements.

Safe Routes to School (SRTS) Support Program

The SRTS Support Program offers the potential to fund infrastructure and encouragement and education programs (as discussed in **Safe Routes Resource Center** section). Focusing on SRTS Support Program infrastructure funding – projects include planning, design, and construction of sidewalks, crosswalks, signals, traffic-calming, and bicycle facilities within 2 miles of K-12 schools.

The SRTS Design Assistance Program provides professional consultant services to assist local agencies with the development of plans, specifications, and estimates for their SRTS projects.

Safe Streets to Transit

This program funds pedestrian and bicycle safety improvements in the vicinity of transit facilities and along routes to bus stops and rail stations.

A list of NJDOT planning, funding and technical assistance programs including web links and brief descriptions can be found **in Appendix D**.

Local Planning Efforts

Local jurisdictions across the state are also doing their part to improve conditions for people biking, walking, and rolling. Six local jurisdictions have received more than $4 million in Safe Streets and Roads for All (SS4A) funding to develop Comprehensive Safety Action Plans. One community, the City of Vineland, received a $20 million award for implementing a safety project consisting of a road diet that will reduce and narrow travel lanes, install bike lanes, and improve sidewalks and streetlighting along Chestnut Avenue. Per the survey distributed though the consultation process, 24 percent of respondents have Bicycle Master Plans, 23 percent have Safe Routes to Schools Plans and 16 percent have an ADA Transition Plan.

A list of local planning efforts and brief descriptions can be found in **Appendix D.**

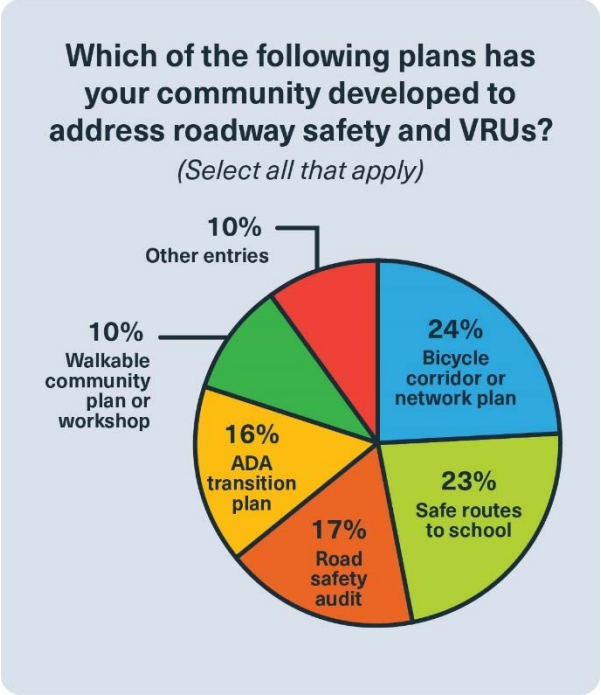


FIGURE 15: VRU-RELATED PLANS / ASSESSMENTS CONDUCTED BY LOCAL NEW JERSEY AGENCIES

Education

NJDOT Resource Centers

There are numerous existing resources that provide strategies for improving conditions for VRUs. NJDOT offers four resource centers: the Safety Resource Center (SRC), the Local Aid Resource Center, the Bicycle and Pedestrian Resource Center, and the Safe Routes Resource Center. Each one has an abundance of information for state and local agencies to consider in their projects, programs, or policies:

Safety Resource Center

DOT-Safety.ResourceCenter@dot.nj.gov

NJDOT SRC acts as a one-stop destination for roadway safety information, tips, and other tools to help New Jersey reach zero fatalities on roadways by 2050. It provides information about safety projects and programs, navigating funding and grant opportunities, training from industry experts, safety campaign materials, resources organized around the SSA, and more. For example, NJDOT hosted nine "Lunch & Learn" sessions in 2022 and 2023 offering professional development hours to participating professional engineers.

SAFETY RESOURCE CENTER GOALS:

1) To provide information, inspiration, and motivation that we expect to be put toward the implementation of roadway safety measures that reduce crashes, injuries, and deaths.
2) To work with our fellow New Jerseyans to strengthen the safety of our roadways and reach zero fatalities on our roadways by 2050.
3) To help create a safer environment for all users of New Jersey's transportation network, including motorists, bicyclists, pedestrians, motorcyclists, and others.
4) To help our fellow New Jerseyans understand the important role they play in the continued improvement of roadway safety in our state.

Local Aid Resource Center

njdotlocalaidrc.com

NJDOT Local Aid Resource Center assists local public agencies with allocating funding to advance investments that lead to successful projects.

Bicycle and Pedestrian Resource Center

njbikeped.org

The New Jersey Bicycle and Pedestrian Resource Center assists in creating safer and more accessible places to walk, bicycle, or travel by low-speed, wheeled devices through primary research, education, and dissemination of information about best practices in policy, planning, and design.

Safe Routes Resource Center

saferoutesnj.org

The New Jersey Safe Routes Resource Center provides information to schools and communities to help them prioritize and implement opportunities for students and their caregivers to walk, bike, or roll to and from campus. The center supports NJDOT's Safe Routes to School Program with information on funding, educational opportunities, research, policies, and training for Safe Routes Coordinators.

NJDOT continues to explore new opportunities for education on transportation safety. For example, NJDOT is preparing an in-depth SSA training for internal and external stakeholders. The training will start with the FHWA-approved material and then incorporate New Jersey case studies with the goal of developing a comprehensive SSA training focused on local projects and examples. This training will be pilot tested in summer 2024 followed by strategic communication efforts to increase partners' awareness about the SSA and NJDOT's training opportunities.

Statewide Strategies for Education

There are existing strategies for education and awareness through the New Jersey Division of Highway Traffic Safety (NJDHTS), which works to improve public awareness of traffic safety laws. NJDHTS is also an active participant in the NJ 2020 SHSP implementation process through its driver behavior and data emphasis areas. The New

Jersey Motor Vehicle Commission manages driver education and includes laws and behaviors related to people walking, biking, or rolling. Finally, public awareness campaigns have been used to educate and inform the public about highway safety issues.

NJDOT's SRTS Program funds coordinators at each of the state's eight Transportation Management Associations (TMAs). The TMAs are non-profit, public/private partnerships that provide commuter information and services to businesses and local governments. The funded coordinator positions work with schools and communities on safety education, Walk & Roll to School events, School Travel Plans and applications to the SRTS Program.

The Bipartisan Infrastructure Law (BIL) allows states to use up to ten percent of their HSIP funding for outreach and safety campaigns. NJDOT added a new HSIP program area in the Statewide Transportation Improvement Program and Transportation Capital Program for Federal Fiscal Year 2024 (FFY24) referred to as "Specified Safety Programs." This HSIP program area may include funding for public awareness campaigns. This program will focus on stakeholder engagement and funding for equipment, education, and outreach.

A list of statewide strategies for education and brief descriptions can be found in **Appendix D**.

Collaboration

Internal Collaboration

NJDOT continuously collaborates with other divisions within the Department to advance the state's goal of zero fatalities on all public roads by 2050. Quarterly meetings are conducted between NJDOT Planning, Programming, Operations, and Project Development to monitor and assist as projects move through the project delivery process.

External Collaboration

NJDOT continuously collaborates with New Jersey's three MPOs and local jurisdictions as needed. NJDOT administers the LSP/HRRRP by providing extensive support and assistance to each of the three MPOs. The Assistant Commissioner of PMGA leads quarterly meetings with BSBPP, NJDOT Division of Local Aid & Economic Development, NJDOT Bureau of Environmental Program Resources, and the MPOs to monitor and administer the LSP/HRRRP.

NJDOT provides funding for local road safety audits (RSAs) in all three MPOs. NJDOT also provides funding for Local Road Safety Plans with SJTPO. NJTPA and DVRPC are

completing Local Road Safety Plans through SS4A grants; NJDOT will provide support in these endeavors, as requested.

NJDOT continuously coordinates with NJDHTS in the annual safety target-setting process and in SHSP implementation efforts.

NJDOT actively supports more than 200 safety stakeholders participating in numerous SHSP action teams, working groups, and committees focused on implementing the SHSP. These stakeholders include representatives from public, private, non-profit, and advocacy groups throughout New Jersey.

NJDOT sponsors the biennial New Jersey Complete Streets Summit where participants from various sectors participate and learn about various related topics, including institutionalizing policies, implementation best practices and lessons learned, and the Complete Streets movement.

Additionally, NJDOT collaborates with stakeholders through the NJ Bicycle & Pedestrian Resource Center including the New Jersey Bicycle and Pedestrian Advisory Council, which meets regularly for information-sharing and collaboration specific to these vulnerable road users.

MPOs Regional Collaboration

Each of New Jersey's three MPOs provide resources for improving conditions for VRUs in their regions. A number of these resources are possible through NJDOT LSP/HRRRP discussed in the section on **HSIP Funding** under **Local Projects**. A list of the MPO resources with brief descriptions can be found in **Appendix D**. A few highlights are summarized below.

NJTPA concluded a Regional Active Transportation Plan in June 2023 that aims to establish a safe and functional regional network of pedestrian and bicycle facilities to better connect where people live to where they need to go. NJTPA completed a level of Bicycle Compatibility and Connectivity Analysis covering the MPO region and provides an interactive map for viewing the results. To assist with implementation and for outreach purposes, they provide Complete Streets technical assistance and a demonstration library that can be used to temporarily install a new bicycle or pedestrian facility. Broader educational outreach includes the Street Smart NJ campaign, which provides educational and outreach materials to communities to improve pedestrian safety. Since 2013, over 200 communities have taken part in a Street Smart NJ campaign.

DVRPC convenes a Regional Safety Task Force to identify safety goals and strategies with input from traditional and non-traditional planning partners. The MPO is also initiating a Comprehensive Safety Action Plan with funding from the SS4A program. They offer numerous data resources including bicycle and pedestrian counts, a regional crash data viewer, Bicycle Level of Traffic Stress and Connectivity Analysis, AccessScore and RideScore analyses, and the Greater Philadelphia Pedestrian Portal. For implementation, they offer funding though the Regional Trails Program and the Safe

Routes to Transit Program. They also assist with experimental pop-up demonstrations, including treatments such as separated bike lanes, advisory bike lanes, and curb extensions, by providing materials, user counts, and outreach services.

SJTPO offers planning resources though the Cumberland County Bike/Ped Safety Action Plan and SJTPO Region Local Road Safety Plan, which was funded through NJDOT HSIP planning funds. The MPO offers assistance with implementation through the Design Assistance Program for Safety Projects for any project that is funded through HSIP. They also provide educational outreach through the Traffic Safety Education Program.

Overall, each MPO offers resources to help local jurisdictions move from planning to implementation of VRU safety improvements.

Infrastructure Safety Projects

FHWA Proven Safety Countermeasures

NJDOT administers the HSIP portfolio by developing problem statements to be considered for graduation to projects, provides guidance and support on HSIP eligible projects, and provides Safety and Complete Streets subject matter expertise on all active projects in the Department. NJDOTs guidance and support regularly addresses the use of FHWA proven safety countermeasures. FHWA has identified 28 countermeasures that are considered proven through data-driven results and should be deployed widely throughout the country. Of these, eight are specific to improving conditions for biking or walking. Some are recognized as crosscutting, providing benefits to multiple travel modes. A few of these crosscutting countermeasures include improved lighting, local road safety plans, and RSAs. Additional safety countermeasures can also improve safety for VRUs, such as setting appropriate speed limits or installing roundabouts that are designed with facilities for biking or walking. A complete list of infrastructure safety countermeasures is presented in **Appendix E.**

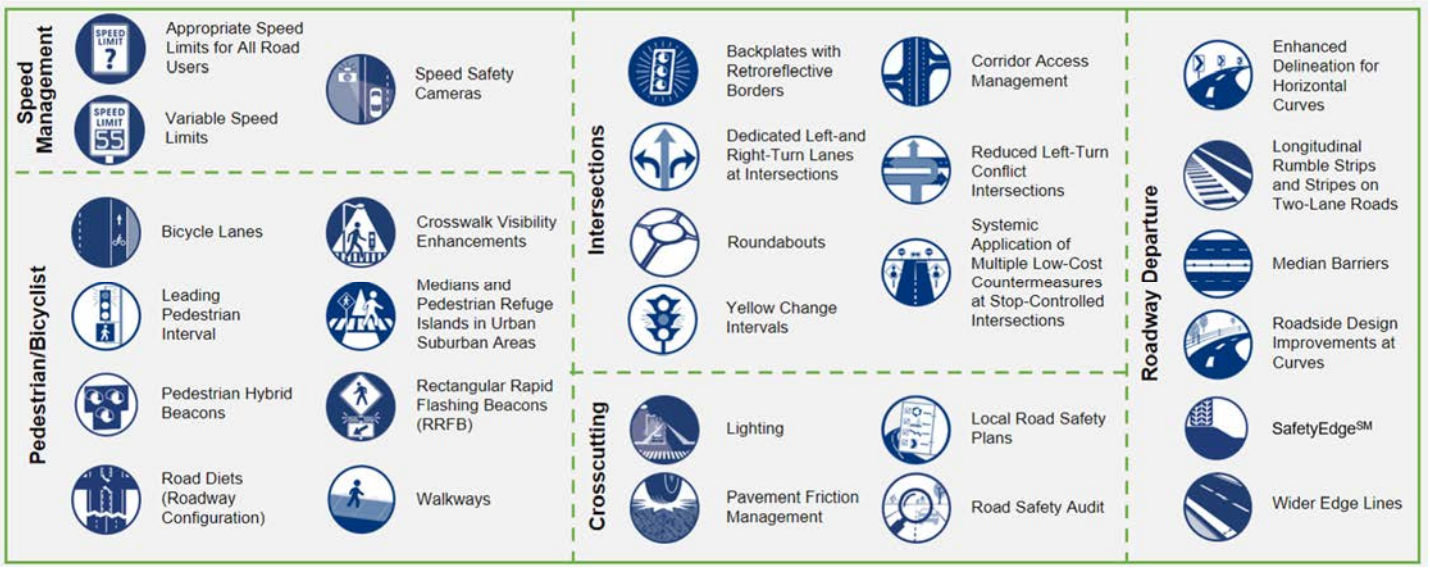


FIGURE 16: PROVEN SAFETY COUNTERMEASURES (SOURCE: FHWA)

State Projects

NJDOT is addressing the needs of non-motorized road users by focusing the HSIP on activities that improve safety and comfort for people biking and walking. NJDOT's HSIP funding is programmed to state and local projects through the Statewide Transportation Improvement Program (STIP) program line items. Additionally, the STIP includes individual projects in various phases of work. All HSIP projects include countermeasures and address the needs of all roadway users, to the maximum extent possible.

The New Jersey 2016 HSIP Manual and Implementation Guide requires safety projects to follow the Capital Project Delivery process and the implementation of substantive safety improvements. HSIP projects are required to complete a Data Driven Safety Analysis (DDSA) during the Concept Development (CD) phase, including a Highway Safety Manual (HSM) analysis or other agreed-upon analyses in cases where HSM analysis is not applicable. As described in the Summary of Quantitative Analysis chapter, safety improvements may be identified through hot spot, systemic, and systematic safety approaches.

Most projects are designing for VRUs even if they are not HSIP-funded. For example, even relatively straight forward pavement preservation projects often include pedestrian design elements.

Success Stories: New Jersey Department of Transportation

NJDOT initiated a Pedestrian Safety Improvement project along the Route NJ 129 corridor in the City of Trenton in Mercer County. The project includes both short-term improvements - using state funds - and long-term solutions to improve safety for pedestrians and cyclists at three signalized intersections on Route NJ 129, at Lalor Street, Cass Street, and Hamilton Avenue. Initial short-term improvements were installed - including a Red Clearance Extension system with passive and active pedestrian detection. Passive detection automatically calls the pedestrian phase when a pedestrian is detected. Active pedestrian detection provides for any extra time needed to safety cross using the crosswalk. Additional improvements include revising the traffic signal timing at each intersection to provide pedestrians more time to cross, adding signal backplates to increase visibility, and installing upgraded, advanced warning signs over the roadway to replace ground-mounted signs. The long-term project is an HSIP-eligible project in development.

Success Stories: New Jersey Department of Transportation

Route NJ 26 was a pavement resurfacing project proposing upgrades to the sidewalks and ADA compliance, but no changes to the road configuration and no bicycle lanes. NJDOT staff met the project manager on-site during construction and as they discussed the project, several people rode by on bicycles. After witnessing the need for accommodation, the project manager agreed to add bike lanes within the existing roadway width and issued a change order for the project.

Local Projects

HSIP Funding

The New Jersey LSP/HRRRP together provide Federal HSIP funding for the design, construction, and construction inspection of safety improvements on county and local roadways. Local roadways are eligible for HSIP improvements through an application process through their respective MPOs.

The MPOs collaborate with local officials for the submission of candidate projects. Each MPO screens and verifies the applications for eligibility and completeness. The MPO then submits copies of the applications to the LSP. NJDOT staff on the LSP assist local agencies throughout the process of identifying and developing safety projects on roadways under local jurisdiction, and as appropriate makes recommendations for HSIP funding. The LSP staff also programs the year best suited for construction authorization based on project complexity, size, and/or level of design assistance needs. Selected projects are administered by county and municipal governments with oversight by NJDOT's Division of Local Aid & Economic Development. Updates on the LSP/ HRRRP are provided to BSBPP at quarterly meetings.

Success Stories: Princeton, NJ

Princeton implemented a road diet, narrowing Witherspoon Street from 40 to 22 feet wide, and reduced the posted speed limit. They added a mid-block crosswalk, raised crosswalks, and curb extensions to improve conditions for people walking and biking. Residents have responded favorably to the changes.

Local Projects

During the consultation process, local jurisdictions provided information about which infrastructure safety countermeasures have and have not been used within their transportation networks. Participants also discussed typical obstacles for implementing countermeasures: regulatory processes, financial limitations, concerns about lack of sufficient right-of-way, public opposition to loss of parking, and difficult or costly ongoing maintenance. Despite obstacles, several communities have also been successful in implementing these types of countermeasures.

The consultation survey revealed that local jurisdictions are implementing a variety of infrastructure safety countermeasures along corridors and at crossings. Some of the most popular treatments include road diets, added or enhanced walkways, high visibility crosswalks, and rectangular rapid flashing beacons.

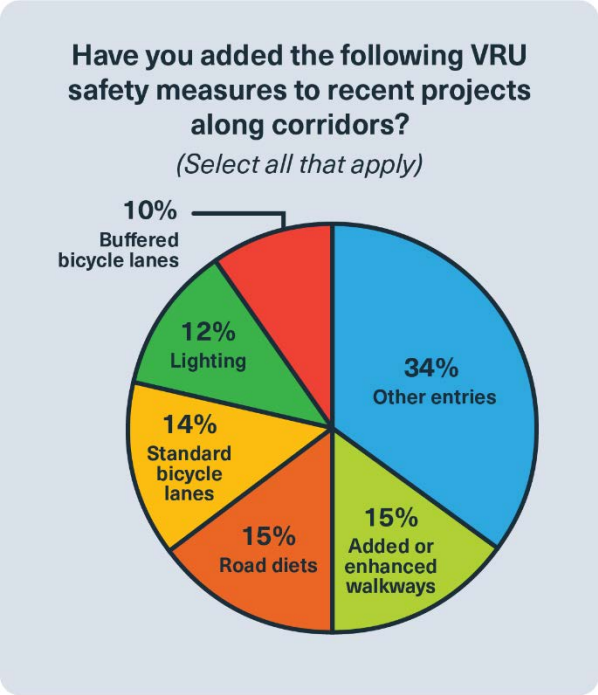


FIGURE 17: LOCAL NEW JERSEY COMMUNITY IMPLEMENTATION OF CORRIDOR STRATEGIES

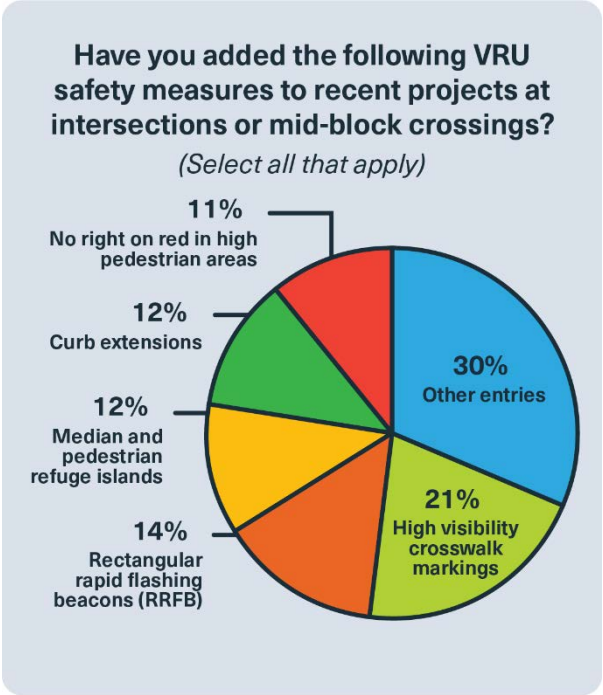


FIGURE 18: LOCAL NEW JERSEY COMMUNITY IMPLEMENTATION OF INTERSECTION AND MID-BLOCK CROSSING STRATEGIES

Success stories included:

- Voorhees Township added rectangular rapid flashing beacons and a high visibility crosswalk at a busy non-signalized intersection to accommodate pedestrian crossings.
- City of Somers Point used an NJDOT Bikeways grant to add buffered bike lanes on a county road.
- Hoboken has implemented Complete Streets consistent with their 2019 Street Design Guide through substantial coordination and review of alternatives. The complete streets have improved ADA compliance, shortened crossings through curb extensions, and integrated green stormwater infrastructure through rain gardens.

Success Story Highlight City of Plainfield, NJ

Plainfield installed high visibility crosswalks and reduced curb radii at several intersections. They also installed speed tables at over 20 locations throughout the city, and more than 25 additional locations are currently being studied. These elements were proven effective at reducing driver speeds and improving the visibility of pedestrians.

Success Story Highlight Township of Millburn, NJ

Millburn implemented a Complete Streets project in the downtown area with a road diet that reduced the number of through lanes on Millburn Avenue, installed curb extensions, and established turn restrictions and leading pedestrian intervals at multiple signals. Results were significant and positive; traffic speeds were reduced and pedestrian crashes were reduced drastically.

Conclusion

New Jersey's commitment to creating a safer environment for pedestrians, cyclists, and other VRUs began with NJDOT becoming a Complete Streets pioneer in 2009. NJDOT has taken steps to increase funding transparency, interagency multimodal safety collaboration, safety target setting, and safety strategy planning to benefit VRUs The VRU Safety Assessment is consistent with NJDOT's approach to working toward zero deaths on all New Jersey roadways. This report provides a focused overview of **Overview of VRU Safety Performance**, **Summary of Quantitative Analysis**, **Consultation** with local authorities, and a **Program of VRU Projects and Strategies**. A key result of this work is the documentation of NJDOT's strategy for systematic and systemic safety approaches to focus resources on non-motorist safety treatments – in addition to longstanding work on state and local network screening focused on non-motorist crashes.

NJDOT will advance safety for non-motorists through numerous existing resources in the areas of planning and technical assistance, education, collaboration, and infrastructure safety projects. NJDOT intends to strategically apply its resource centers and HSIP funding through initiatives like the Safety Resource Center – to promote a shared responsibility mindset needed to bring a Safe System Approach. And by collaborating and continuing to leverage resources, New Jersey is creating a safer, more sustainable transportation network for all users – particularly for those who walk, bike, or roll.

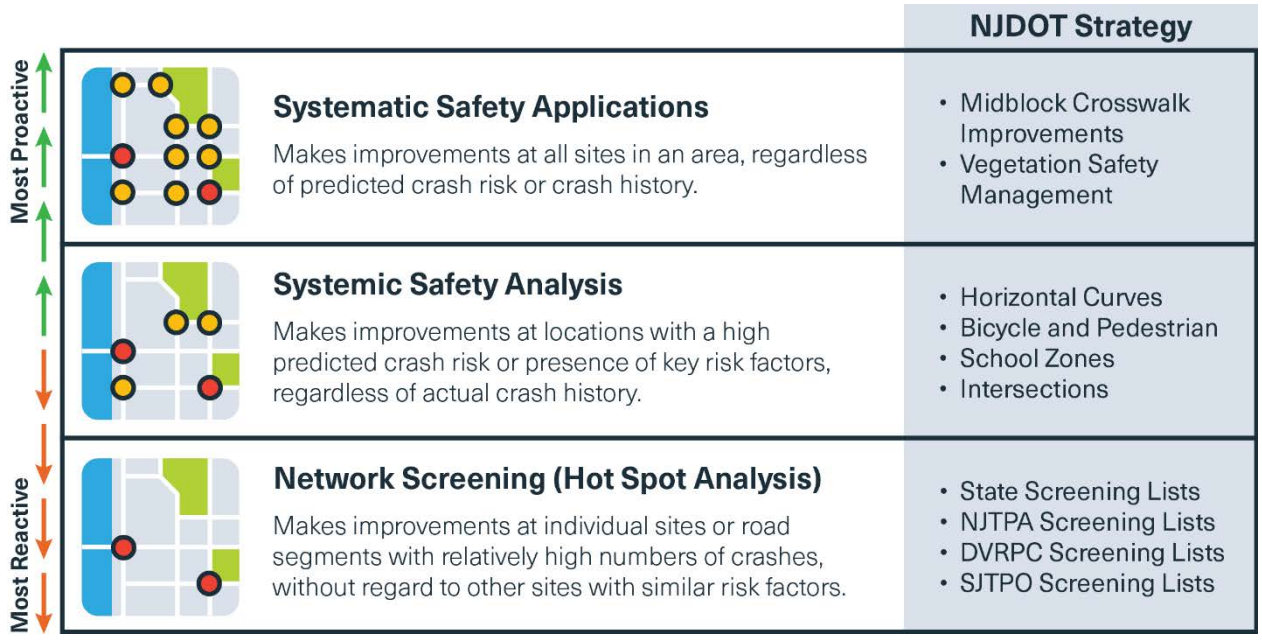


FIGURE 19: NJDOT QUANTITATIVE SAFETY ANALYSES AND HIGH-RISK TARGETS

Appendices

Table of Appendices

Appendix A: Safe System Approach Primer

The VRU Safety Assessment report continually references a strategic direction to zero fatalities and zero serious injuries for transportation users based in the Safe System Approach. This appendix provides a high-level review of the Safe System Approach as part of the USDOT National Roadway Safety Strategy. The Safe System Approach is an internationally recognized philosophy that has been adopted at a nationwide scale with state, regional, and local roles in implementation. At its core, the Safe System Approach is organized around six principles and five objectives that guide decision making concerning safety so tremendous advances in fatality and serious injury reduction can be achieved — as have been seen by other safe system adopters:

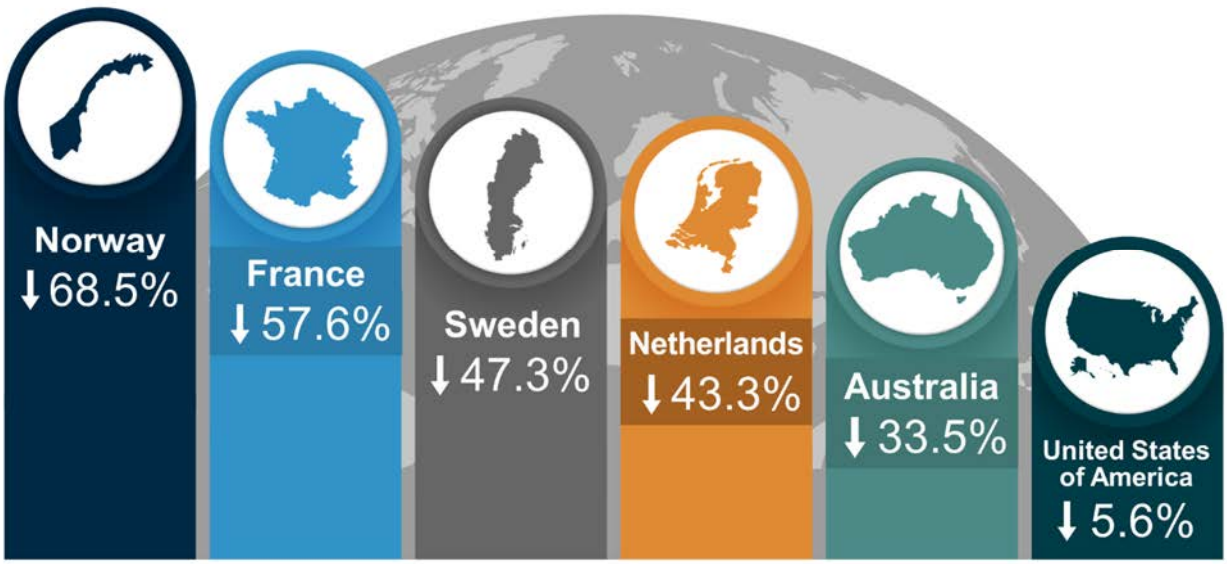


FIGURE 20: SAFE SYSTEM ADOPTERS – CHANGE IN FATALITIES FROM 2000 TO 2019
SOURCES: FHWA, WHO

Safe System Approach Principles

- **Death and Serious Injury is Unacceptable** — While any crash is undesirable, the Safe System Approach prioritizes crashes that result in death and serious injuries, since no one should experience either when using the transportation system.
- **Humans Make Mistakes** — People will inevitably make mistakes that can lead to crashes, but the transportation system can be designed and maintained to accommodate human mistakes and injury tolerances to ultimately avoid death and serious injuries.
- **Humans Are Vulnerable** — People have limits for tolerating crash forces before death and serious injury occur; therefore, it is critical to design and operate a

transportation system that is human-centric and accommodates human vulnerabilities.

- **Responsibility is Shared** — All stakeholders (transportation system users and managers, vehicle manufacturers, etc.) must ensure that crashes do not lead to fatal or serious injuries.
- **Safety is Proactive** — Proactive tools should be used to identify and mitigate latent risks in the transportation system, rather than waiting for crashes to occur and reacting afterward.
- **Redundancy is Crucial** — Reducing risks requires that all parts of the transportation system are strengthened, so that if one part fails, the other parts still protect people.

Safe System Approach Objectives

- **Safer Road Users** — The Safe System Approach addresses the safety of all road users, including those who walk, bike, drive, ride transit, and travel by other modes.
- **Safer Vehicles** — Vehicles are designed and regulated to minimize the occurrence and severity of collisions using safety measures that incorporate the latest technology.
- **Safer Speeds** — Humans are unlikely to survive high-speed crashes. Reducing speeds can accommodate human injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.
- **Safer Roads** — Designing to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur. Examples include physically separating people traveling at different speeds, providing dedicated times for different users to move through a space, and alerting users to hazards and other road users.
- **Post-Crash Care** — When a person is injured in a collision, they rely on emergency first responders to quickly locate them, stabilize their injury, and transport them to medical facilities. Post-crash care also includes forensic analysis at the crash site, traffic incident management, and other activities.

Appendix B: VRU Crash Trend Analysis

A crash data evaluation was performed for trends among VRU user types. NJDOT has already begun a statewide systemic analysis for bicycle and pedestrians crash risk – with this dataset focused on the safety outcomes for the combination of pedestrian and bicyclist crashes. The results of that study are forthcoming — but an in-progress dataset was utilized in developing an analysis of crash trends of VRU fatalities and serious injuries between 2016 and 2020 for this VRU Safety Assessment interim submittal. The crash trend analysis reviewed five key crash factors: (1) Crash Location Relative to an Intersection, (2) Hour of Occurrence, (3) Lighting Condition, (4) Posted Speed Limit, and (5) Roadway Jurisdiction.

Trends for Crash Location Relative to an Intersection

Bicycle and pedestrian crash data was reviewed for crash location relative to an intersection. The data was clustered into categories including: (1) At Intersection, (2) 100 feet or less from an intersection, (3) between 101 and 500 feet to an intersection, (4) between 501 and 999 feet from an intersection, (5) 1,000 feet or greater from an intersection, and (6) unknown location. The unknown location makes up between 15 percent and 23 percent of all records – so some of the location trends may be affected by data quality. The primary finding is that 64 percent of VRU fatalities and suspected serious injuries occur within 100 feet of an intersection. This crash location trend supports the importance of the use of VRU safety crossing strategies in the design of safe roads. Pedestrians and bicyclists can contribute to a safe system by traveling the extra distance to an intersection crossing – but safe roads need to make intersections a safe place (both in safety performance and perception) to encourage pedestrian and bicyclist use.

TABLE 3: PEDESTRIAN FATALITIES & SUSPECTED SERIOUS INJURIES BY INTERSECTION LOCATION (2016 – 2020)

Distance from Intersection	Fatalities	Percentage	Suspected Serious Injuries	Percentage	Total Crashes	Percentage
At Intersection	309	(32%)	784	(44%)	1093	(40%)
≤100'	200	(20%)	453	(25%)	653	(24%)
101' – 500'	164	(17%)	218	(12%)	382	(14%)
501'-999'	37	(4%)	36	(2%)	73	(3%)
≥1000'	44	(4%)	27	(2%)	71	(3%)
Unknown	225	(23%)	267	(15%)	492	(18%)
Total	**979**		**1785**		**2764**	

Trends for Time of Crash

Crash data was reviewed for time of crash. Roughly 45 percent of non-motorist fatalities and serious injuries occur from 5 p.m. to 11 p.m. Generally, evening activities occur during this time and motorist and non-motorist levels are higher. The hours between 11 p.m. and 5 a.m. resulted in a surprising 19 percent of fatalities (nine percent higher than the level of serious injuries in that time period), which may indicate opportunities for safer user behavior (e.g., influence of driver or VRU impairment) and safer roads with high levels of lighting and VRU protective infrastructure.

TABLE 4: PEDESTRIAN FATALITIES & SUSPECTED SERIOUS INJURIES BY HOUR OF OCCURRENCE (2016 – 2020)

Hours of Occurrence	Fatalities	Percentage	Suspected Serious Injuries	Percentage	Total Crashes	Percentage
5 AM - 10 AM	145	(15%)	304	(17%)	449	(16%)
10 AM - 5 PM	187	(19%)	504	(28%)	691	(25%)
5 PM - 11 PM	458	(47%)	797	(45%)	1255	(45%)
11 PM - 5 AM	189	(19%)	171	(10%)	360	(13%)
Unknown	0	(0%)	9	(1%)	9	(0%)
Total	**979**		**1785**		**2764**	

Trends for Lighting Condition

Bicycle and pedestrian crash data were reviewed for lighting condition at the crash site. A number of categories separated the crash records for both natural lighting (e.g., daylight, dark, dusk, and dawn) and looked at the presence of street lighting at times when it would operate. The two primary findings focus on 1) risks when street lighting is present, and 2) risks that could be addressed by street lighting. A major conclusion is that fatalities and serious injuries occurred 58 percent in lower natural light conditions (i.e., not daylight). However, to consider the appropriate infrastructure or education response, the analysis needs to break up that 58 percent to consider the use of street lighting. In case 1 where continuous street lighting is present, which makes up 52 percent of fatalities and serious injuries in dark natural lighting (30 percent of fatalities and serious injuries in all lighting conditions) the potential solutions need to look at whether the street lighting is pedestrian scale and if conditions at crash sites have good retroreflectivity of signs, striping, and other traffic controls. The data indicates a large proportion of crashes in dark natural lighting, yet continuous street lighting conditions, but continuous street lighting is still an industry-supported countermeasure to crashes in dark conditions; lighting cannot be the only safety feature utilized or severe crashes will still occur in some instances.

The second primary finding is that the crash data indicates that 29 percent of fatalities and serious injuries (48 percent of fatalities and suspected serious injuries occurring during dark natural lighting) occur with only spot or no street lighting operating on the corridor. Street lighting practices should be assessed to determine if enhancements can be made to pedestrian scale visibility through lighting, particularly in cases where fatalities and serious injuries have occurred. In addition to lighting, safety strategies at the educational level may address these dark and low visibility crashes by avoiding potential vehicle and non-motorist conflict or increasing non-motorist visibility through defensive cycling and walking.

TABLE 5: PEDESTRIAN FATALITIES & SUSPECTED SERIOUS INJURIES BY LIGHTING CONDITION (2016 – 2020)

Lighting Condition	Fatalities	Percentage	Suspected Serious Injuries	Percentage	Total Crashes	Percentage
Daylight	275	(28%)	857	(48%)	1132	(41%)
Dark (street lights on, Cont.)	315	(32%)	514	(29%)	829	(30%)
Dark (street lights on, spot)	158	(16%)	168	(9%)	326	(12%)
Dark (no street lights)	136	(14%)	102	(6%)	238	(9%)
Dusk	28	(3%)	62	(3%)	90	(3%)
Dark (street lights off)	33	(3%)	37	(2%)	70	(3%)
Dawn	19	(2%)	36	(2%)	55	(2%)
Unknown	15	(2%)	9	(1%)	24	(1%)
Total	**979**		**1785**		**2764**	

Trends for Speed Limit

Bicycle and pedestrian crash data was reviewed for the posted speed limits at the crash site. The review of speed limit data provides some insight into forces on VRUs but without data on the speed at the point of impact, conclusions and trends assume compliance with the speed limit. A plurality of fatalities (28 percent) and suspected serious injuries (51 percent) occur on roads with 25 mph posted speed limits. Qualitatively, those crash outcome levels appear to correlate with the large magnitude of roads that are posted 25 mph out of the entire transportation system. Yet, a case can be made that to address those suspected serious injuries at that magnitude, streets need to be designed and retrofit with appropriate traffic calming measures to manage the impact of speed on non-motorists.

Another notable trend is that fatality outcomes are higher as a percentage than the suspected serious injury outcomes in the range of 40 mph, 45 mph, 50 mph, and 55 mph posted speed limits. At higher speed of impact (as would be expected with these speed limits), research has shown that survivability drops dramatically. A potential trend of high fatality propensity at posted speed limits of 40 mph and above suggests the importance of safe roads with separate facilities and crossings at that level of potential kinetic energy of impact. With 48 percent of fatalities and suspected serious injuries occurring at 35 mph posted speed limits and above, removal of conflicts at those speeds is needed either by reducing vehicles speeds, separating non-motorists, or both.

TABLE 6: PEDESTRIAN FATALITIES & SUSPECTED SERIOUS INJURIES BY MAJOR ROAD SPEED LIMIT (2016 – 2020)

Major Road Speed Limit	Fatalities	Percentage	Suspected Serious Injuries	Percentage	Total Crashes	Percentage
5	3	(0%)	4	(0%)	7	(0%)
10	4	(0%)	4	(0%)	8	(0%)
15	4	(0%)	11	(1%)	15	(1%)
20	0	(0%)	2	(0%)	2	(0%)
25	278	(28%)	912	(51%)	1190	(43%)
30	40	(4%)	74	(4%)	114	(4%)
35	103	(11%)	259	(15%)	362	(13%)
40	102	(10%)	165	(9%)	267	(10%)
45	117	(12%)	102	(6%)	219	(8%)
50	138	(14%)	127	(7%)	265	(10%)
55	75	(8%)	34	(2%)	109	(4%)
60	0	(0%)	0	(0%)	0	(0%)
65	46	(5%)	24	(1%)	70	(3%)
70	0	(0%)	0	(0%)	0	(0%)
75	0	(0%)	0	(0%)	0	(0%)
80	0	(0%)	0	(0%)	0	(0%)
Unknown / None	69	(7%)	67	(4%)	136	(5%)
Total	**979**		**1785**		**2764**	

Note: Speed limit is "Unknown" when it isn't listed in the crash report. A speed limit is "None" when the crash occurs on a facility with no speed limit, such as a residential driveway.

Trends for Roadway Jurisdiction

Bicycle and pedestrian crash data was reviewed for the roadway jurisdiction at the crash site. The roadway jurisdiction review included three categories that comprise a vast majority of fatalities and suspected serious injuries: county roads, municipal roads, and state highways. The outcome proportions in each category are relatively balanced, but all three categories of jurisdiction play an important role in the sharing of responsibility integral to the Safe System Approach. Sections on **Consultation** and **Program of VRU Projects and Strategies** note the significant, ongoing effort to address safety performance for roads of jurisdiction types in New Jersey, but with significant participation among county, municipal, and state DOT representatives.

The only other notable observation is the higher percentage of fatalities on the state highway system than the county or municipal systems. The influence of speed is a likely contributor, but again the proposed **Program of VRU Projects and Strategies** addresses proactive actions by NJDOT to systematically and systemically address VRU safety outcomes.

TABLE 7: PEDESTRIAN FATALITIES & SUSPECTED SERIOUS INJURIES BY ROADWAY JURISDICTION (2016 – 2020)

Roadway Jurisdiction	Fatalities	Percentage	Suspected Serious Injuries	Percentage	Total Crashes	Percentage
County	253	(26%)	660	(37%)	913	(33%)
Municipal	207	(21%)	723	(41%)	930	(34%)
State Highway	377	(39%)	332	(19%)	709	(26%)
Private Property	58	(6%)	21	(1%)	79	(3%)
Interstate	34	(3%)	14	(1%)	48	(2%)
State/Interstate Authority	39	(4%)	24	(1%)	63	(2%)
US Govt Property	2	(0%)	1	(0%)	3	(0%)
County Authority Park or Institution	1	(0%)	5	(0%)	6	(0%)
Municipal Authority Park or Institution	2	(0%)	3	(0%)	5	(0%)
State Park or Institution	1	(0%)	1	(0%)	2	(0%)
Unknown	5	(1%)	1	(0%)	6	(0%)
Total	**979**		**1785**		**2764**	

Appendix C: VRU High-Risk Locations & Demographic Considerations

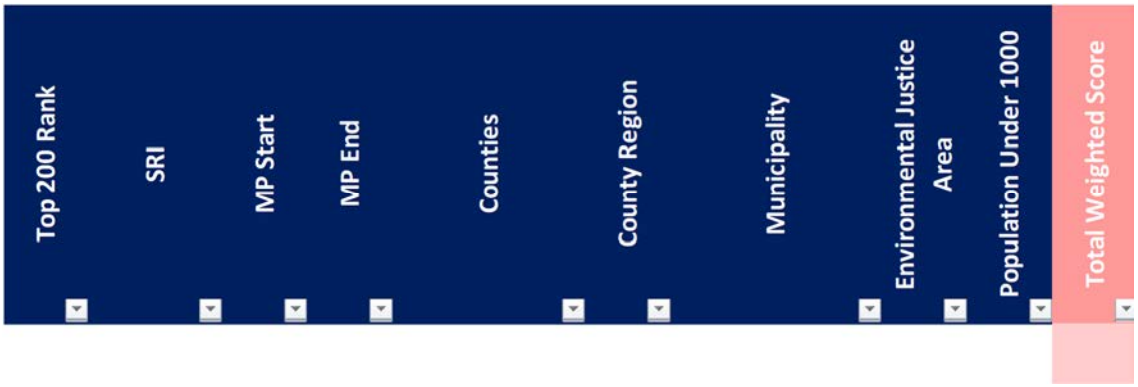
Based on the network screening strategy described in the **Network Screening Methodology** section of the report, each New Jersey segment and intersection was reviewed using a hot-spot network screening approach to identify VRU, high-risk crash areas and denote if those locations are underserved based on race, ethnicity, and income.

The state system network screening lists were also developed for 2-mile segments and intersections. NJDOT identifies high-risk safety locations using the Safety Management System which includes a screening of the state system using historical crash data (hot spot) and systemic analysis (proactive). The state system network screening lists direct NJDOT safety projects and strategies. NJDOT also identifies countermeasures that can be deployed using a systematic or system-wide approach. The state system network screening lists are maintained privately within NJDOT and were shared exclusively with NJDOT staff in supporting VRU high-risk locations, projects, and strategies.

2023 NJDOT Pedestrian Segment Network Screening List

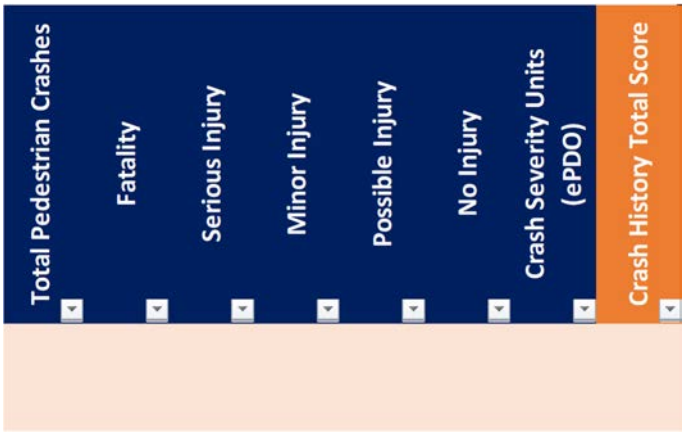
General Location and Demographics – Each segment in the network screening list is assigned a ranking based on a Total Weighted Score of Crash History, Roadway Features, and Demand Factors (shown in subsequent Tables). The higher the weighted score the closer the ranking of that segment will be to rank #1. Segments are defined for their location by a State Route ID, starting mile post, ending milepost, the name of the county or counties the segment is within, whether the segment is in the North, Central, or South region, and any municipality crossed. The general location and demographics information also denotes if the segment is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Segments traversing areas with populations under 1,000 persons are also noted.

TABLE 8: NJDOT – PEDESTRIAN SEGMENT NETWORK SCREENING LIST [GENERAL LOCATION AND DEMOGRAPHICS]



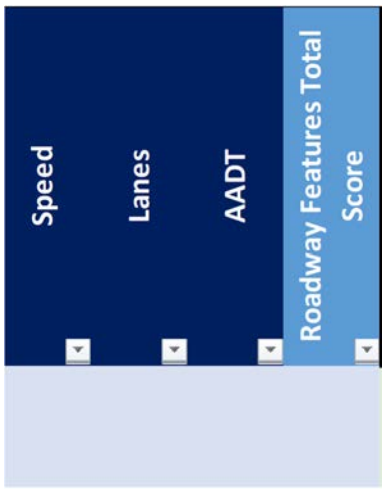
Crash Data – A segment-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Crash Severity Units (ePDO) column. A crash history score is derived from this crash data using NJDOT's approved methodology.

TABLE 9: NJDOT – PEDESTRIAN SEGMENT NETWORK SCREENING LIST [CRASH DATA]



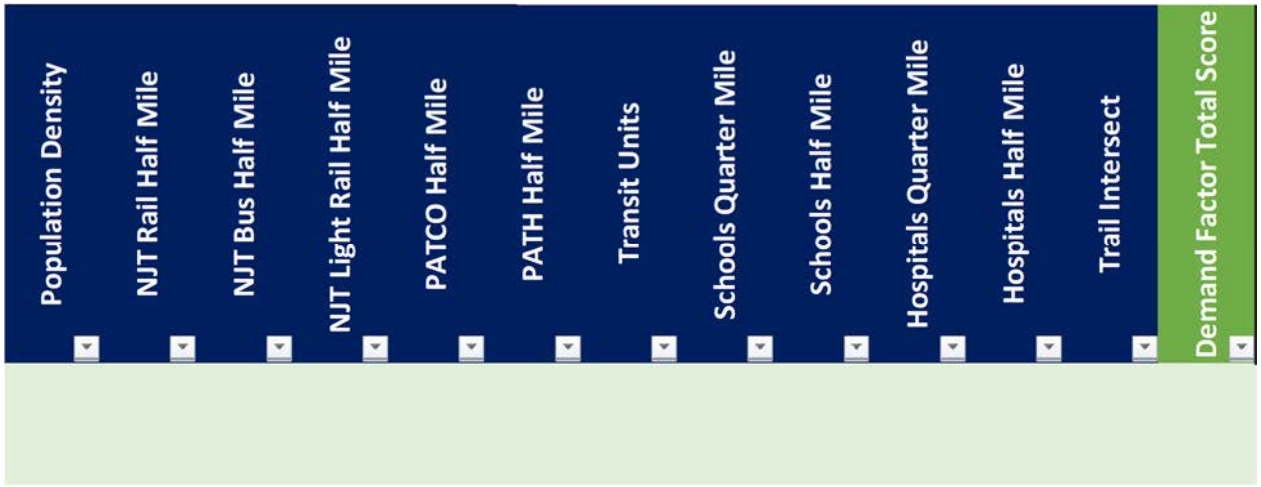
Roadway Features – At the segment-level, data on roadway features is reported to describe the segment and as part of a Roadway Features Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the posted speed limit, the number of lanes on the segment, and the AADT.

TABLE 10: NJDOT – PEDESTRIAN SEGMENT NETWORK SCREENING LIST [ROADWAY FEATURES]



Demand Factor – At the segment-level data on roadway users is reported to describe the segment and as part of a Demand Factor Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the population density, proximity to transit facilities, proximity to schools and hospital facilities, and intersections with trails.

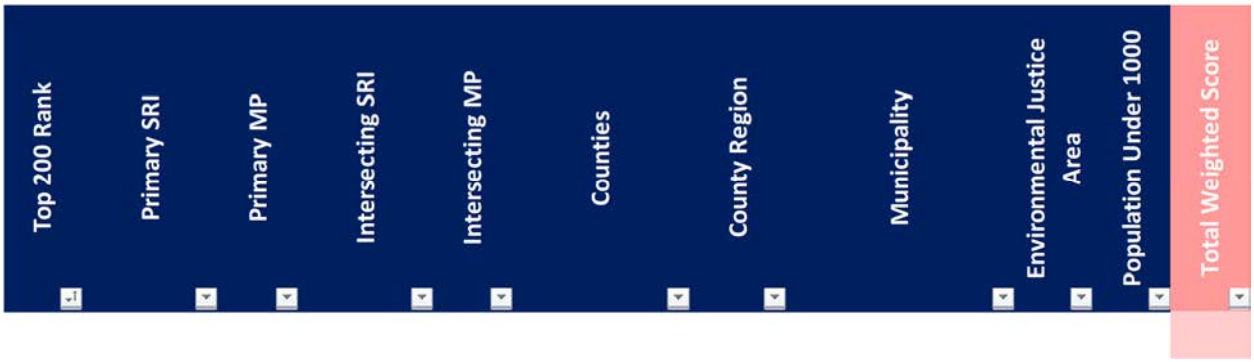
TABLE 11: NJDOT – PEDESTRIAN SEGMENT NETWORK SCREENING LIST [DEMAND FACTOR TOTAL SCORES]



2023 NJDOT Pedestrian Intersection Network Screening List

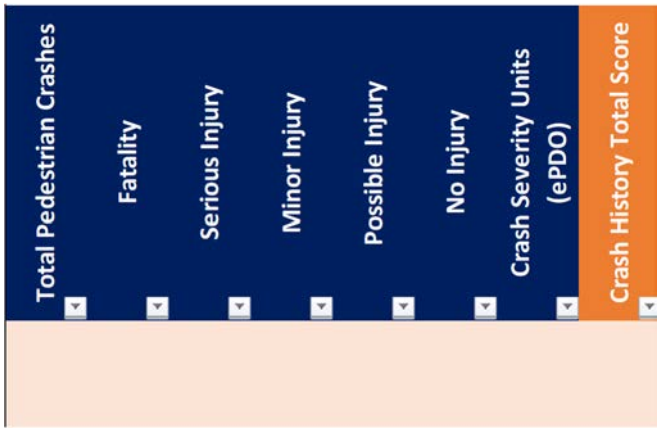
General Location and Demographics – Each intersection in the network screening list is assigned a ranking based on a Total Weighted Score of Crash History, Roadway Features, and Demand Factors (shown in subsequent Tables). The higher the weighted score the closer the ranking of that segment will be to rank #1. Intersections are defined for their location by primary State Route ID and mile post, and intersecting State Route ID and milepost, the name of the county or counties the segment is within, whether the segment is in the North, Central, or South region, and any municipality crossed. The general location and demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections located within areas with populations under 1,000 persons are also noted.

TABLE 12: NJDOT – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION AND DEMOGRAPHICS]



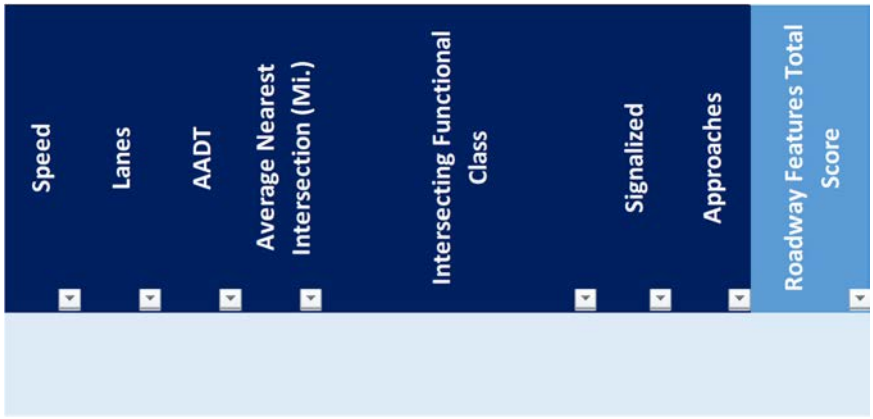
Crash Data – An intersection-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Crash Severity Units (ePDO) column. A crash history score is derived from this crash data using NJDOT's approved methodology.

TABLE 13: NJDOT – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [CRASH DATA]



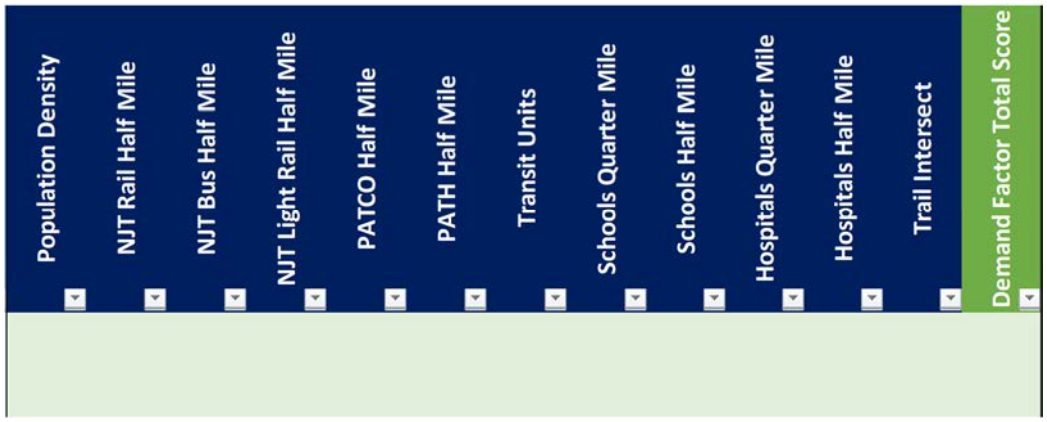
Roadway Features – At the intersection-level, data on roadway features is reported to describe the intersection and as part of a Roadway Features Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the posted speed limit, the number of lanes on the segment, AADT, the average distance to the nearest intersection, functional class of the intersecting roadways, whether the intersection is signalized, and the number of approaches at the intersection.

TABLE 14: NJDOT – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [ROADWAY FEATURES]



Demand Factor – At the intersection-level, data on roadway users is reported to describe the intersection and as part of a Demand Factor Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the population density, proximity to transit facilities, proximity to schools and hospital facilities, and intersections with trails.

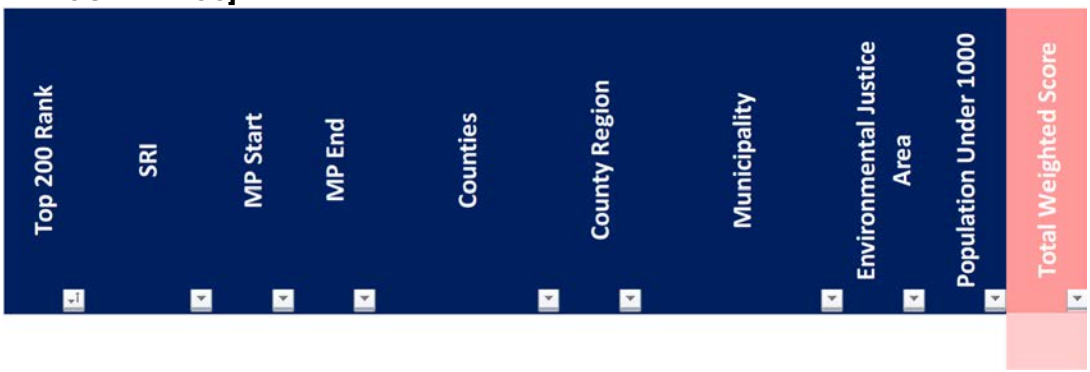
TABLE 15: NJDOT – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [DEMAND FACTOR TOTAL SCORES]



2023 NJDOT Bike Segment Network Screening List

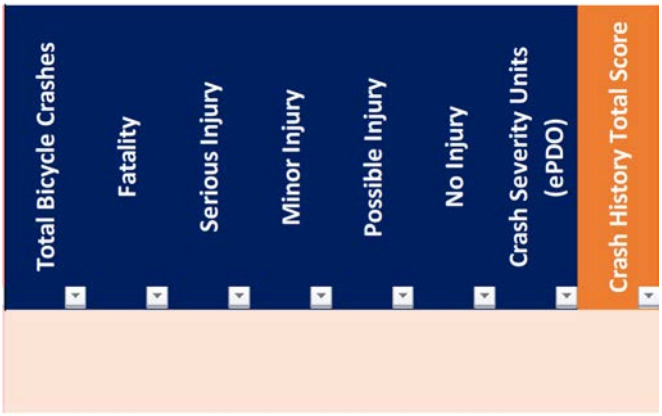
General Location and Demographics – Each segment in the network screening list is assigned a ranking based on a Total Weighted Score of Crash History, Roadway Features, and Demand Factors (shown in subsequent Tables). The higher the weighted score the closer the ranking of that segment will be to rank #1. Segments are defined in their location by a State Route ID, starting mile post, ending milepost, the name of the county or counties the segment is within, whether the segment is in the North, Central, or South region, and any municipality crossed. The general location and demographics information also denotes if the segment is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Segments traversing areas with populations under 1,000 persons are also noted.

TABLE 16: NJDOT – BIKE SEGMENT NETWORK SCREENING LIST [GENERAL LOCATION AND DEMOGRAPHICS]



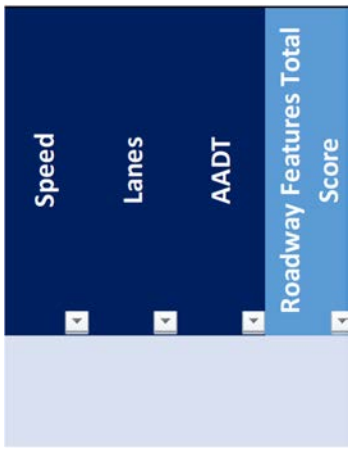
Crash Data – A segment-level frequency of total bicycle crashes and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Crash Severity Units (ePDO) column. A crash history score is derived from this crash data using NJDOT's approved methodology.

TABLE 17: NJDOT – BIKE SEGMENT NETWORK SCREENING LIST [CRASH DATA]



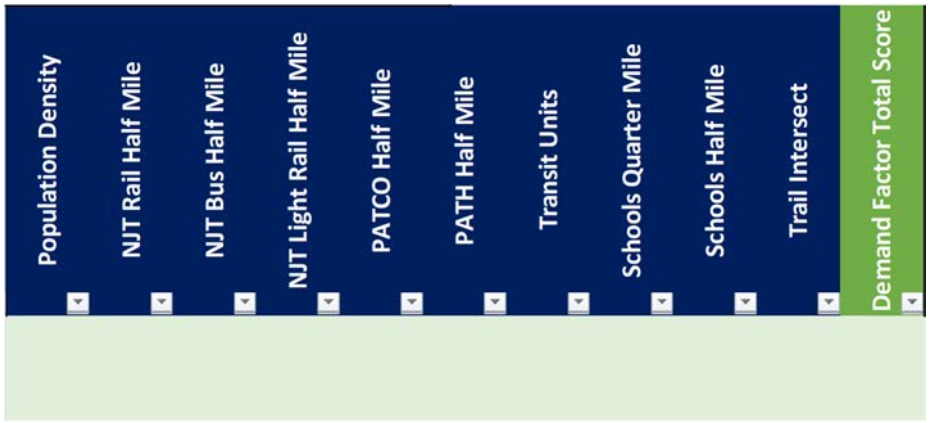
Roadway Features – At the segment-level, data on roadway features is reported to describe the segment and as part of a Roadway Features Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the posted speed limit, the number of lanes on the segment, and the AADT.

TABLE 18: NJDOT – BIKE SEGMENT NETWORK SCREENING LIST [ROADWAY FEATURES]



Demand Factor – At the segment-level, data on roadway users is reported to describe the segment and as part of a Demand Factor Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the population density, proximity to transit facilities, proximity to schools, and intersections with trails.

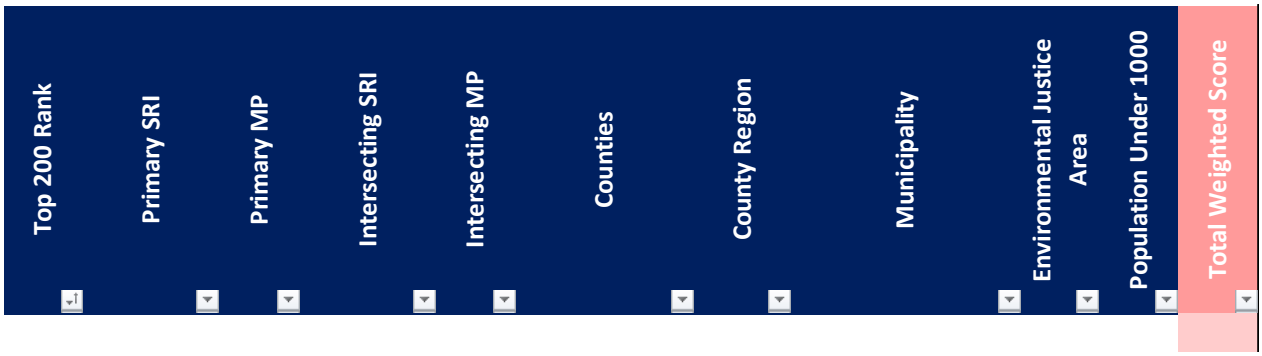
TABLE 19: NJDOT – BIKE SEGMENT NETWORK SCREENING LIST [DEMAND FACTOR TOTAL SCORES]



2023 NJDOT Bike Intersection Network Screening List

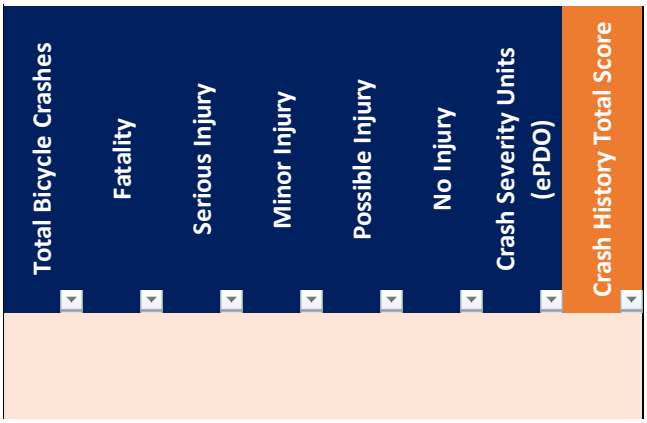
General Location and Demographics – Each intersection in the network screening list is assigned a ranking based on a Total Weighted Score of Crash History, Roadway Features, and Demand Factors (shown in subsequent Tables). The higher the weighted score the closer the ranking of that segment will be to rank #1. Intersections are defined for their location by primary State Route ID and mile post, and intersecting State Route ID and milepost, the name of the county or counties the segment is within, whether the segment is in the North, Central, or South region, and any municipality crossed. The general location and demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections located within areas with populations under 1,000 persons are also noted.

TABLE 20: NJDOT – BIKE INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION AND DEMOGRAPHICS]



Crash Data – An intersection-level frequency of total bicycle crashes and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Crash Severity Units (ePDO) column. A crash history score is derived from this crash data using NJDOT's approved methodology.

TABLE 21: NJDOT – BIKE INTERSECTION NETWORK SCREENING LIST [CRASH DATA]



Roadway Features – At the intersection-level, data on roadway features is reported to describe the intersection and as part of a Roadway Features Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the posted speed limit, the number of lanes on the segment, AADT, the average distance to the nearest intersection, functional class of the intersecting roadways, whether the intersection is signalized, and the number of approaches at the intersection.

TABLE 22: NJDOT – BIKE INTERSECTION NETWORK SCREENING LIST [ROADWAY FEATURES]

Speed	Lanes	AADT	Average Nearest Intersection (Mi.)	Intersecting Functional Class	Signalized	Approaches	Roadway Features Total Score

Demand Factor – At the intersection-level, data on roadway users is reported to describe the intersection and as part of a Demand Factor Total score. The methodology to calculate this score has been developed by NJDOT and places weight on the population density, proximity to transit facilities, proximity to schools, and intersections with trails.

TABLE 23: NJDOT – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [DEMAND FACTOR TOTAL SCORES]

Population Density	NJT Rail Half Mile	NJT Bus Half Mile	NJT Light Rail Half Mile	PATCO Half Mile	PATH Half Mile	Transit Units	Schools Quarter Mile	Schools Half Mile	Trail Intersect	Demand Factor Total Score

2023 Local Network Screening Lists

The Local Network Screening Lists are based on a programmatic analysis of statewide locations utilizing data supplied by third party sources. The Local Network Screening Lists visualizations shared in this report show a partial, unranked portion of high-risk safety locations. The Network Screening Lists are organized by the MPO representing local agency operated segments and intersections within their planning boundary. All three MPOs plan to have complete 2023 updates of the Local Network Screening Lists posted to their web page this year – links to the page intended to store the complete Local Network Screening Lists are provided.

NJTPA

NJTPA hosts the region's local network screening lists at this web page: Network Screening Lists | NJTPA | North Jersey Transportation Planning Authority

NJTPA – Ped-Bike Corridor

General Location– Each corridor in the local network screening list is assigned a ranking based ePDO score. The higher the ePDO score the closer the ranking of that corridor will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Corridors are defined for their location by a State Route ID, starting mile post, ending milepost, route name, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 24: NJTPA – PED-BIKE CORRIDOR NETWORK SCREENING LIST [GENERAL LOCATION]

County	Municipality	SRI	Mile Post - From	Mile Post - To	Corridor Length	Route
SOMERSET	HILLSBOROUGH TWP	18101042__	1.43	2.43	1.00	HAMILTON RD
WARREN	HOPE TWP	00000521__	1.30	2.30	1.00	ROUTE 521
ESSEX	ROSELAND BORO	07000611__	4.10	5.10	1.00	ESSEX COUNTY 611
ESSEX	SOUTH ORANGE TWP	07000638__	1.27	2.27	1.00	ESSEX COUNTY 638
OCEAN	SEASIDE HEIGHTS BORO	15000053__	0.18	1.18	1.00	OCEAN COUNTY 53
MORRIS	PEQUANNOCK TWP	14311016__	0.30	0.31	0.01	LOCKWOOD AVE
MORRIS	LINCOLN PARK BORO	14161183__	1.99	2.14	0.15	BEAVER BROOK RD
MERCER	PRINCETON	11061002__	6.86	6.91	0.05	PENNINGTON-ROCKY HILL RD
SOMERSET	NORTH PLAINFIELD BORO	00000531Z_	0.62	1.19	0.57	ROUTE 531 Z
BERGEN	MAYWOOD BORO	020000621_	1.72	2.72	1.00	BERGEN COUNTY 62 I
BERGEN	OAKLAND BORO	00000202__	71.42	72.42	1.00	US 202
ESSEX	WEST CALDWELL BORO	07000613__	1.92	2.92	1.00	ESSEX COUNTY 613
BERGEN	ROCKLEIGH BORO	00000501__	52.48	53.07	0.59	ROUTE 501
MORRIS	CHATHAM BORO	14041089__	0.30	0.46	0.16	ELMWOOD AVE
ESSEX	CALDWELL BORO	00000506__	1.85	2.85	1.00	ROUTE 506
SUSSEX	HAMPTON TWP	19000622__	1.90	2.90	1.00	SUSSEX COUNTY 622
BERGEN	DEMAREST BORO	020000802_	3.43	4.35	0.92	BERGEN COUNTY 80 II
MORRIS	MENDHAM TWP	14321074__	1.01	1.94	0.93	WASHINGTON VALLEY RD
HUDSON	WEST NEW YORK TOWN	09081254__	1.15	2.15	1.00	BERGENLINE AVE
SOMERSET	MONTGOMERY TWP	18000601__	2.91	3.91	1.00	SOMERSET COUNTY 601

Crash Data – A corridor-level frequency of total pedestrian and bicycle crashes and pedestrian and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 25: NJTPA – PED-BIKE CORRIDOR NETWORK SCREENING LIST [CRASH DATA]

Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
1	1	0	0	0	0	56.917	5.247
2	0	0	0	2	0	21.695	2.000
2	0	0	2	0	0	34.395	3.171
7	0	1	3	2	1	131.204	12.003
1	0	0	1	0	0	17.197	1.585
1	1	0	0	0	0	56.917	5.247
1	0	0	1	0	0	17.197	1.585
1	0	0	1	0	0	17.197	1.585
7	0	0	5	2	0	107.682	9.927
3	0	0	1	2	0	38.893	3.585
3	1	0	0	2	0	78.613	7.247
1	0	1	0	0	0	56.917	5.247
1	0	0	1	0	0	17.197	1.585
1	0	0	1	0	0	17.197	1.585
6	1	0	4	1	0	136.554	12.589
1	0	0	0	1	0	10.848	1.000
1	0	1	0	0	0	56.917	5.247
1	0	0	1	0	0	17.197	1.585
40	1	2	12	13	12	530.138	47.766
1	0	1	0	0	0	56.917	5.247

Demographics - The demographics information also denotes if the corridor is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Corridors traversing areas with populations under 1,000 persons are also noted.

TABLE 26: NJTPA – PED-BIKE CORRIDOR NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
NO	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	YES
YES	YES
YES	NO
YES	YES
YES	YES
NO	YES
YES	YES
NO	YES
YES	YES
NO	YES
YES	YES
NO	NO
YES	YES
NO	NO

Roadway Features – At the corridor-level, data on roadway features is reported to describe the corridor's ownership, function, and cross section. Lane count and the Divided By columns describe the sidewalk-to-sidewalk distance or the roadside-to-roadside distance typical to the 1-mile analyzed. The Jurisdiction attribute denotes a road as either municipal or county owned. The functional class attribute breaks out levels of mobility and access ranging from principal arterial to local road.

TABLE 27: NJTPA – PED-BIKE CORRIDOR NETWORK SCREENING LIST [ROADWAY FEATURES]

NJDOT SLD - Lane Count	NJDOT SLD - Jurisdiction	NJDOT SLD - Functional Class	ARD - Divided By
2	Municipal	Major Collector	N/A
2	County	Major Collector	N/A
4	County	Minor Arterial	N/A
2	County	Minor Arterial	Painted Median
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
4	Municipal	Major Collector	N/A
2	Municipal	Major Collector	N/A
2	Municipal	Minor Arterial	Painted Median
2	County	Minor Arterial	N/A
2	County	Principal Arterial - Other	N/A
4	County	Principal Arterial - Other	N/A
2	County	Principal Arterial - Other	N/A
2	Municipal	Local	N/A
4	County	Principal Arterial - Other	N/A
2	County	Major Collector	N/A
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	Municipal	Minor Arterial	Painted Median
2	County	Major Collector	Painted Median

NJTPA – Pedestrian Corridor

General Location– Each corridor in the local network screening list is assigned a ranking based ePDO score. The higher the ePDO score the closer the ranking of that corridor will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Corridors are defined for their location by a State Route ID, starting mile post, ending milepost, route name, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 28: NJTPA – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [GENERAL LOCATION]

County	Municipality	SRI	Mile Post - From	Mile Post - To	Corridor Length	Route
MIDDLESEX	PISCATAWAY TWP	00000529__	2.96	3.96	1.00	ROUTE 529
MORRIS	LONG HILL TWP	14000657__	1.46	2.46	1.00	MORRIS COUNTY 657
BERGEN	RIVER EDGE BORO	02521060__	0.26	1.06	0.80	VALLEY RD
MIDDLESEX	SAYREVILLE BORO	00000535__	30.13	31.13	1.00	ROUTE 535
WARREN	WASHINGTON BORO	21211016__	0.00	0.10	0.10	NEW ST
BERGEN	FAIRVIEW BORO	02000048__	0.06	0.96	0.90	BERGEN COUNTY 48
SOMERSET	BOUND BROOK BORO	18000687__	0.00	0.53	0.53	SOMERSET COUNTY 687
OCEAN	BRICK TWP	00000528__	35.35	36.35	1.00	ROUTE 528
BERGEN	RIDGEWOOD VILLAGE	00000507__	19.05	20.05	1.00	ROUTE 507
HUNTERDON	LEBANON TWP	00000513__	17.52	18.52	1.00	ROUTE 513
BERGEN	FORT LEE BORO	02191169__	0.12	0.40	0.28	BRIDGE PLAZA NORTH
MORRIS	PARSIPPANY-TROY HILLS	14291211__	0.06	0.07	0.01	N/A
BERGEN	WOODCLIFF LAKE BORO	02000071__	2.87	3.87	1.00	BERGEN COUNTY 71
BERGEN	LEONIA BORO	02291082__	0.77	0.91	0.14	GLENWOOD AVE
HUDSON	KEARNY TOWN	00000508__	12.50	13.50	1.00	ROUTE 508
MORRIS	RANDOLPH TWP	14000662__	0.22	1.14	0.92	MORRIS COUNTY 662
ESSEX	EAST ORANGE CITY	00000508__	7.94	8.94	1.00	ROUTE 508
SOMERSET	MANVILLE BORO	00000533__	28.10	29.10	1.00	ROUTE 533
MONMOUTH	RED BANK BORO	13401007__	0.21	0.40	0.19	CHESTNUT AVE
MORRIS	CHATHAM TWP	14041124__	1.23	1.36	0.13	RIVER RD

Crash Data – A corridor-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 29: NJTPA – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [CRASH DATA]

Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
5	1	1	1	2	0	152.727	14.0794
1	0	0	0	1	0	10.848	1
1	0	1	0	0	0	56.917	5.247
6	1	1	1	3	0	163.575	15.0794
1	0	0	0	1	0	10.848	1
3	0	0	0	3	0	32.543	3
2	0	1	0	1	0	67.765	6.247
5	1	1	2	1	0	159.077	14.6648
3	0	1	0	2	0	78.613	7.247
1	0	1	0	0	0	56.917	5.247
10	2	1	1	4	2	233.340	21.3264
1	0	1	0	0	0	56.917	5.247
1	0	0	0	0	1	1.000	0
1	0	0	1	0	0	17.197	1.5854
10	0	1	2	6	1	157.397	14.4178
1	1	0	0	0	0	56.917	5.247
28	1	2	6	17	2	460.345	42.2534
5	0	1	1	3	0	106.657	9.8324
2	0	0	0	2	0	21.695	2
1	0	0	0	1	0	10.848	1

Demographics - The demographics information also denotes if the corridor is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Corridors traversing areas with populations under 1,000 persons are also noted.

TABLE 30: NJTPA – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
NO	NO
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	YES
NO	NO
YES	YES
YES	NO
NO	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	YES

Roadway Features – At the corridor-level, data on roadway features is reported to describe the corridor's ownership, function, and cross section. Lane count and the Divided By columns describe the sidewalk-to-sidewalk distance or the roadside-to-roadside distance typical to the 1-mile analyzed. The Jurisdiction attribute denotes a road as either municipal or county owned. The functional class attribute breaks out levels of mobility and access ranging from principal arterial to local road.

TABLE 31: NJTPA – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [ROADWAY FEATURES]

NJDOT SLD - Lane Count	NJDOT SLD - Jurisdiction	NJDOT SLD - Functional Class	ARD - Divided By
2	County	Principal Arterial - Other	N/A
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	County	Major Collector	N/A
2	County	Minor Arterial	N/A
2	County	Principal Arterial - Other	N/A
2	County	Major Collector	N/A
1	Municipal	Minor Arterial	N/A
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	Municipal	Major Collector	N/A
2	County	Minor Arterial	Painted Median
2	County	Major Collector	N/A
4	County	Principal Arterial - Other	Painted Median
4	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	Municipal	Major Collector	N/A

NJTPA – Ped-Bike Intersection

General Location– Each intersection in the local network screening list is assigned a ranking based ePDO ranking. The higher the ePDO score the closer the ranking of that segment will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Segments are defined for their location by major route State Route ID, route name, and milepost, by minor route State Route ID, route name, and milepost, the name of the county or counties the intersection is within, and any municipality the intersection is within.

TABLE 32: NJTPA – PED-BIKE INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION]

		Major Route			Minor Route		
unty	Municipality	SRI	Milepost	Route Name	SRI	Milepost	Route Name
MONMOUTH	HAZLET TWP	130000071__	1.68	MONMOUTH COUNTY 71	13311435__	0.00	Verdun Place
MORRIS	HARDING TWP	14000663__	2.23	MORRIS COUNTY 663	14000604__	4.02	Long Hill Road
UNION	ELIZABETH CITY	20000623__	1.34	UNION COUNTY 623	200413861_	0.29	West Grand Street
OCEAN	JACKSON TWP	00000527__	12.55	ROUTE 527	15111014__	2.03	Grawtown Road
BERGEN	TEANECK TWP	02000060__	1.18	BERGEN COUNTY 60	02601141__	0.00	American Legion Drive
SOMERSET	BRANCHBURG TWP	18000614__	0.93	SOMERSET COUNTY 614	18000641__	0.00	Burnt Mills Road
SOMERSET	BRIDGEWATER TWP	18000620__	7.33	SOMERSET COUNTY 620	18061540__	0.00	Cushing Drive
PASSAIC	PATERSON CITY	16081533__	0.00	BROADWAY	16081447__	0.24	Broadway
PASSAIC	WANAQUE BORO	00000511__	21.90	ROUTE 511	16011104__	1.19	2nd Avenue
UNION	ROSELLE BORO	20000619__	2.09	UNION COUNTY 619	20041292__	2.12	West 2nd Avenue
HUNTERDON	HOLLAND TWP	00000519__	20.83	ROUTE 519	10151068__	0.57	Gridley Cir
UNION	LINDEN CITY	00000514__	40.84	ROUTE 514	N/A	N/A	N/A
BERGEN	MONTVALE BORO	02000053__	5.51	BERGEN COUNTY 53	02000094__	3.23	East Grand Avenue
HUNTERDON	CLINTON TOWN	10051006__	0.00	HANCOCK ST	00000173__	13.27	Old Highway 22
ESSEX	MILLBURN TWP	00000527__	71.19	ROUTE 527	00000577__	0.92	Springfield Avenue
OCEAN	TUCKERTON BORO	15000603__	0.00	OCEAN COUNTY 603	00000009__	62.75	US 9
SOMERSET	MONTGOMERY TWP	18000630__	1.03	SOMERSET COUNTY 630	18131030__	1.93	Harlingen Road
BERGEN	SADDLE BROOK TWP	02000067__	1.48	BERGEN COUNTY 67	02000042__	1.07	Outwater Lane
MORRIS	MONTVILLE TWP	14000621__	3.18	MORRIS COUNTY 621	14211331__	0.00	Old Changebridge Road
MIDDLESEX	SOUTH PLAINFIELD BORO	12000647__	2.30	MIDDLESEX COUNTY 647	12171280__	0.41	Cedarwood Drive

Crash Data – An intersection-level frequency of total pedestrian and bicycle crashes and pedestrian and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 33: NJTPA – PED-BIKE INTERSECTION NETWORK SCREENING LIST [CRASH DATA]

Crashes by Severity (2016-2020)							
Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
2	0	0	1	1	0	28.04	2.59
2	1	0	1	0	0	74.11	6.83
3	0	1	0	2	0	78.61	7.25
1	0	1	0	0	0	56.92	5.25
5	1	0	2	1	1	103.16	9.42
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
7	0	1	1	5	0	128.35	11.83
6	1	0	2	3	0	123.85	11.42
2	0	1	1	0	0	74.11	6.83
1	1	0	0	0	0	56.92	5.25
1	0	1	0	0	0	56.92	5.25
1	0	0	1	0	0	17.20	1.59
1	0	0	0	0	1	1.00	0.00
6	0	1	1	4	0	117.51	10.83
1	0	1	0	0	0	56.92	5.25
1	0	1	0	0	0	56.92	5.25
3	0	1	0	2	0	78.61	7.25
1	0	0	1	0	0	17.20	1.59
1	0	1	0	0	0	56.92	5.25

Demographics - The demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections traversing areas with populations under 1,000 persons are also noted.

TABLE 34: NJTPA – PED-BIKE INTERSECTION NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
NO	NO
YES	YES
NO	NO
YES	YES
NO	NO
NO	YES
YES	YES
YES	YES
YES	YES
NO	NO
YES	YES
NO	YES
NO	NO
YES	YES
YES	YES
YES	NO
YES	YES
NO	YES
YES	YES

NJTPA – Pedestrian Intersection

General Location– Each intersection in the local network screening list is assigned a ranking based ePDO ranking. The higher the ePDO score the closer the ranking of that segment will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Intersections are defined for their location by major route State Route ID, route name, and milepost, by minor route State Route ID, route name, and milepost, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 35: NJTPA – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION]

		Major Route			Minor Route		
County	Municipality	SRI	Milepost	Route Name	SRI	Milepost	Route Name
HUDSON	HARRISON TOWN	09000697__	0.91	HUDSON COUNTY 697	00000508__	12.78	Harrison Avenue
HUDSON	NORTH BERGEN TWP	09081042__	0.30	43RD ST	09081079__	0.29	Grand Avenue
ESSEX	IRVINGTON TWP	00000509__	17.36	ROUTE 509	N/A	N/A	N/A
PASSAIC	PATERSON CITY	16081503__	0.77	ELLISON ST	16081493__	0.10	Summer Street
BERGEN	BERGENFIELD BORO	02031030__	0.00	LEVETT AVE	02000S70__	0.31	South Prospect Avenue
BERGEN	FAIR LAWN BORO	00000507__	15.32	ROUTE 507	02000076__	0.32	Fair Lawn Avenue
MONMOUTH	FREEHOLD BORO	00000537__	52.38	ROUTE 537	00000079__	1.59	East Main Street
BERGEN	HACKENSACK CITY	020000561_	4.60	BERGEN COUNTY 56 I	02231058__	0.06	Lehigh Street
UNION	WESTFIELD TOWN	20101107__	1.00	LAWRENCE AVE	20201065__	0.10	Sinclair Place
MONMOUTH	MIDDLETOWN TWP	13312100__	1.23	TINDALL RD	13311119__	0.00	Park Avenue
ESSEX	NEWARK CITY	07141241__	0.50	12TH AVE	07141895__	2.93	Bergen Street
MIDDLESEX	PISCATAWAY TWP	00000529__	5.77	ROUTE 529	12171257__	0.00	Summers Avenue
HUDSON	KEARNY TOWN	00000507__	0.97	ROUTE 507	09071119__	0.00	Arlington Avenue
HUDSON	JERSEY CITY	09061686__	0.98	BERGEN AVE	09061090__	0.30	Boyd Avenue
BERGEN	RAMSEY BORO	02000087__	7.27	BERGEN COUNTY 87	02481109__	0.00	Maple Street
UNION	ELIZABETH CITY	20041330__	0.00	ELIZABETHTOWN PLAZA	20041421__	0.20	West Jersey Street
BERGEN	GARFIELD CITY	02000042__	0.30	BERGEN COUNTY 42	N/A	N/A	N/A
ESSEX	VERONA TWP	00000506__	4.87	ROUTE 506	07201053__	0.00	Hillcrest Ter
ESSEX	EAST ORANGE CITY	07171203__	1.60	MAIN ST	07141876__	1.14	North Munn Avenue
HUDSON	BAYONNE CITY	09011166__	0.95	AVENUE A	09011026__	0.10	West 22nd Street

Crash Data – An intersection-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 36: NJTPA – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [CRASH DATA]

Crashes by Severity (2016-2020)							
Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
5	0	0	1	3	1	50.74	4.59
1	0	0	0	1	0	10.85	1.00
3	0	0	0	3	0	32.54	3.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
2	0	0	0	2	0	21.70	2.00
1	0	1	0	0	0	56.92	5.25
1	0	1	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
3	0	0	2	1	0	45.24	4.17
1	0	0	1	0	0	17.20	1.59
1	1	0	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	1	0	0	0	0	56.92	5.25
2	0	0	0	2	0	21.70	2.00
1	0	0	0	1	0	10.85	1.00

Demographics - The demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections traversing areas with populations under 1,000 persons are also noted.

TABLE 37: NJTPA – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
YES	YES
YES	YES
YES	NO
YES	YES
YES	YES
YES	YES
YES	YES
NO	NO
NO	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	YES
YES	YES
YES	YES
NO	YES
YES	YES
YES	YES

DVRPC

DVRPC hosts the region's local network screening lists at this web page: New Jersey Local Safety Program | DVRPC

DVRPC – Ped-Bike Corridor

General Location – Each corridor in the local network screening list is assigned a ranking based ePDO score. The higher the ePDO score the closer the ranking of that corridor will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Corridors are defined for their location by a State Route ID, starting mile post, ending milepost, route name, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 38: DVRPC – PED-BIKE CORRIDOR NETWORK SCREENING LIST [GENERAL LOCATION]

County	Municipality	SRI	Mile Post - From	Mile Post - To	Corridor Length	Route
CAMDEN	CHERRY HILL TWP	04000626__	2.40	3.40	1.00	CAMDEN COUNTY 626
CAMDEN	CAMDEN CITY	04081307__	0.20	0.38	0.18	N 30TH ST
BURLINGTON	WILLINGBORO TWP	03381163__	0.00	0.27	0.27	GARRETT LN
MERCER	PRINCETON	11142145__	0.30	1.30	1.00	CHESTNUT ST
MERCER	HAMILTON TWP	00000033__	0.61	1.61	1.00	NJ 33
BURLINGTON	BORDENTOWN TWP	00000545__	12.29	13.29	1.00	ROUTE 545
MERCER	TRENTON CITY	11111430__	0.00	0.16	0.16	HANCOCK ST
BURLINGTON	MOORESTOWN TWP	00000537__	9.81	10.81	1.00	ROUTE 537
BURLINGTON	BORDENTOWN CITY	00000528__	0.50	1.50	1.00	ROUTE 528
BURLINGTON	EVESHAM TWP	03131206__	0.50	1.50	1.00	BRADDOCK MILL RD
CAMDEN	VOORHEES TWP	04341083__	0.19	0.61	0.42	PARADISE DR
BURLINGTON	PEMBERTON TWP	03000669__	0.00	1.00	1.00	BURLINGTON COUNTY 669
CAMDEN	MOUNT EPHRAIM BORO	00000168__	6.90	7.90	1.00	NJ 168
BURLINGTON	PALMYRA BORO	03271015__	0.09	0.30	0.21	WEART BLVD
CAMDEN	BELLMAWR BORO	04000659__	0.88	1.88	1.00	CAMDEN COUNTY 659
CAMDEN	PINE HILL BORO	04281033__	0.30	0.56	0.26	11TH AV
GLOUCESTER	CLAYTON BORO	08011004__	0.40	0.93	0.53	COSTILL AV
MERCER	LAWRENCE TWP	11071193__	0.00	0.39	0.39	CRAVEN LN
GLOUCESTER	WESTVILLE BORO	08211024__	0.90	0.93	0.03	E OLIVE ST
BURLINGTON	SOUTHAMPTON TWP	03331016__	0.18	1.18	1.00	RIDGE RD

Crash Data – A corridor-level frequency of total pedestrian and bicycle crashes and pedestrian and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 39: DVRPC – PED-BIKE CORRIDOR NETWORK SCREENING LIST [CRASH DATA]

Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
1	0	0	0	0	1	1.00	0.00
1	0	0	0	0	1	1.00	0.00
1	0	0	1	0	0	17.20	1.59
2	0	0	1	0	1	18.20	1.59
3	0	0	2	1	0	45.24	4.17
2	0	0	1	0	1	18.20	1.59
2	0	0	0	0	2	2.00	0.00
4	0	0	1	2	1	39.89	3.59
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	1	0	0	17.20	1.59
2	0	1	0	1	0	67.76	6.25
2	0	0	0	1	1	11.85	1.00
1	0	0	0	1	0	10.85	1.00
3	0	1	2	0	0	91.31	8.42
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	1	0	0	0	0	56.92	5.25
1	0	0	1	0	0	17.20	1.59

Demographics - The demographics information also denotes if the corridor is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Corridors traversing areas with populations under 1,000 persons are also noted.

TABLE 40: DVRPC – PED-BIKE CORRIDOR NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
YES	YES
YES	YES
YES	NO
YES	YES
YES	NO
YES	YES
NO	YES
YES	YES
NO	YES
YES	NO
YES	NO
YES	YES
YES	YES
YES	YES
YES	NO
YES	YES
YES	NO
YES	YES
YES	NO

Roadway Features – At the corridor-level, data on roadway features are reported to describe the corridor's ownership, function, and cross section. Lane count and the Divided By columns describe the sidewalk-to-sidewalk distance or the roadside-to-roadside distance typical to the 1-mile analyzed. The Jurisdiction attribute denotes a road as either municipal or county owned. The functional class attribute breaks out levels of mobility and access ranging from principal arterial to local road.

TABLE 41: DVRPC – PED-BIKE CORRIDOR NETWORK SCREENING LIST [ROADWAY FEATURES]

NJDOT SLD - Lane Count	NJDOT SLD - Jurisdiction	NJDOT SLD - Functional Class	ARD - Divided By
2	County	Minor Arterial	N/A
2	Municipal	Local	Painted Median
2	Municipal	Local	Painted Median
2	Municipal	Minor Collector	N/A
2	N.J.D.O.T.	Principal Arterial - Other	N/A
2	County	Major Collector	N/A
2	Municipal	Local	N/A
2	Municipal	Minor Arterial	N/A
2	County	Major Collector	Unknown
2	Municipal	Local	N/A
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
3	N.J.D.O.T.	Principal Arterial - Other	N/A
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	Municipal	Local	N/A
2	Municipal	Local	Painted Median
2	Municipal	Local	N/A
2	Municipal	Major Collector	N/A

DVRPC – Pedestrian Corridor

General Location – Each corridor in the local network screening list is assigned a ranking based ePDO score. The higher the ePDO score the closer the ranking of that corridor will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Corridors are defined for their location by a State Route ID, starting mile post, ending milepost, route name, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 42: DVRPC – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [GENERAL LOCATION]

County	Municipality	SRI	Mile Post - From	Mile Post - To	Corridor Length	Route
MERCER	TRENTON CITY	11111535__	0.00	0.34	0.34	BRIDGE ST
CAMDEN	RUNNEMEDE BORO	04301102__	0.41	0.46	0.05	WEST 3RD AVE
GLOUCESTER	DEPTFORD TWP	00000534__	0.18	1.18	1.00	ROUTE 534
CAMDEN	BERLIN BORO	00000534__	11.72	12.72	1.00	ROUTE 534
MERCER	HAMILTON TWP	11031389__	0.00	0.05	0.05	ELMWOOD AV
CAMDEN	COLLINGSWOOD BORO	00000561__	48.38	49.38	1.00	ROUTE 561
BURLINGTON	EVESHAM TWP	03000607__	0.56	1.56	1.00	BURLINGTON COUNTY 607
CAMDEN	VOORHEES TWP	04341406__	0.10	0.78	0.68	LAUREL RD
CAMDEN	LINDENWOLD BORO	04000673__	2.71	3.71	1.00	CAMDEN COUNTY 673
CAMDEN	WOODLYNNE BORO	04371125__	0.40	0.70	0.30	WOODLYNNE AVE
CAMDEN	PENNSAUKEN TWP	04000662__	0.67	0.85	0.18	CAMDEN COUNTY 662
BURLINGTON	WILLINGBORO TWP	03000634__	1.18	2.18	1.00	BURLINGTON COUNTY 634
CAMDEN	GLOUCESTER CITY	04141106__	0.00	0.32	0.32	OXFORD AV
GLOUCESTER	WASHINGTON TWP	08000603__	7.97	8.74	0.77	GLOUCESTER COUNTY 603
CAMDEN	CAMDEN CITY	04081604__	1.52	1.81	0.29	S 4TH ST
CAMDEN	CHERRY HILL TWP	04091417__	0.34	0.43	0.09	WARREN ST
GLOUCESTER	GLASSBORO BORO	00000553__	40.22	41.22	1.00	ROUTE 553
GLOUCESTER	WOODBURY HEIGHTS BORO	00000553__	48.41	49.41	1.00	ROUTE 553
MERCER	HOPEWELL TWP	00000029__	15.80	16.80	1.00	NJ 29
BURLINGTON	PEMBERTON TWP	03291385__	0.54	1.01	0.47	PEMBERTON BLVD

Crash Data – A corridor-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 43: DVRPC – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [CRASH DATA]

Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
1	1	0	0	0	0	56.92	5.25
1	0	0	0	0	1	1.00	0.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
2	0	0	2	0	0	34.39	3.17
2	0	0	0	2	0	21.70	2.00
1	0	0	1	0	0	17.20	1.59
4	0	1	3	0	0	108.51	10.00
1	0	1	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00
5	1	0	2	2	0	113.01	10.42
1	0	0	0	0	1	1.00	0.00
2	1	0	1	0	0	74.11	6.83
2	0	0	2	0	0	34.39	3.17
1	0	1	0	0	0	56.92	5.25
5	0	2	1	1	1	142.88	13.08
2	0	1	1	0	0	74.11	6.83
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00

Demographics - The demographics information also denotes if the corridor is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Corridors traversing areas with populations under 1,000 persons are also noted.

TABLE 44: DVRPC – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	NO
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	NO
YES	YES

Roadway Features – At the corridor-level, data on roadway features is reported to describe the corridor's ownership, function, and cross section. Lane count and the Divided By columns describe the sidewalk-to-sidewalk distance or the roadside-to-roadside distance typical to the 1-mile analyzed. The Jurisdiction attribute denotes a road as either municipal or county owned. The functional class attribute breaks out levels of mobility and access ranging from principal arterial to local road.

TABLE 45: DVRPC – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [ROADWAY FEATURES]

NJDOT SLD - Lane Count	NJDOT SLD - Jurisdiction	NJDOT SLD - Functional Class	ARD - Divided By
2	Municipal	Minor Collector	N/A
2	Municipal	Major Collector	N/A
2	County	Principal Arterial - Other	N/A
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	County	Minor Arterial	Painted Median
2	Municipal	Minor Arterial	N/A
2	County	Minor Arterial	N/A
2	Municipal	Major Collector	N/A
2	County	Major Collector	Painted Median
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	Municipal	Major Collector	Curbed Median
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	County	Minor Arterial	Painted Median
2	N.J.D.O.T.	Principal Arterial - Other	N/A
2	Municipal	Local	N/A

DVRPC – Ped-Bike Intersection

General Location– Each intersection in the local network screening list is assigned a ranking based ePDO ranking. The higher the ePDO score the closer the ranking of that segment will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Segments are defined for their location by major route State Route ID, route name, and milepost, by minor route State Route ID, route name, and milepost, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 46: DVRPC – PED-BIKE INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION]

		Major Route			Minor Route		
County	Municipality	SRI	Milepost	Route Name	SRI	Milepost	Route Name
MERCER	HAMILTON TWP	00000533__	0.40	ROUTE 533	11000620__	0.80	Arena Drive
CAMDEN	HADDON TWP	04000630__	1.68	CAMDEN COUNTY 630	04121009__	0.00	Champion Avenue
MERCER	TRENTON CITY	11111002__	0.00	GIRARD AV	11031969__	4.85	North Clinton Avenue
CAMDEN	CAMDEN CITY	04081110__	0.50	MORTON ST	04081111__	0.15	Norris Street
MERCER	EWING TWP	11000636__	2.06	MERCER COUNTY 636	11021391__	0.29	Buttonwood Drive
CAMDEN	COLLINGSWOOD BORO	00000561__	47.49	ROUTE 561	04121110__	0.00	Lees Avenue
CAMDEN	HADDONFIELD BORO	04000669__	6.14	CAMDEN COUNTY 669	04171126__	0.00	West Park Avenue
BURLINGTON	BURLINGTON TWP	03061231__	0.00	BAILLY DR	03061201__	0.92	Ridgewood Way
BURLINGTON	FLORENCE TWP	03000656__	5.51	BURLINGTON COUNTY 656	03151020__	0.00	Olive Street
BURLINGTON	MOUNT HOLLY TWP	03000612__	11.35	BURLINGTON COUNTY 612	03231193__	0.27	Pemberton Road
MERCER	PRINCETON	11142086__	1.50	HODGE RD	11142133__	0.24	Linden Lane
CAMDEN	PENNSAUKEN TWP	04000610__	2.12	CAMDEN COUNTY 610	04000616__	0.59	Cove Road
GLOUCESTER	ELK TWP	00000538__	12.53	ROUTE 538	08000667__	0.00	Willow Grove Road
BURLINGTON	WILLINGBORO TWP	03000630__	4.13	BURLINGTON COUNTY 630	03381290__	0.60	East River Drive
CAMDEN	STRATFORD BORO	04000727__	2.39	CAMDEN COUNTY 727	04321088__	1.00	Longwood Drive
CAMDEN	LINDENWOLD BORO	00000534__	7.92	ROUTE 534	04000686__	0.00	Gibbsboro Road
CAMDEN	CHERRY HILL TWP	04000626__	2.58	CAMDEN COUNTY 626	04000627__	0.98	Cooper Landing Road
CAMDEN	MOUNT EPHRAIM BORO	04000658__	0.45	CAMDEN COUNTY 658	04251017__	0.00	Baird Avenue
CAMDEN	WATERFORD TWP	00000534__	16.92	ROUTE 534	04000714__	0.95	Tremont Avenue
CAMDEN	GLOUCESTER TWP	00000534__	4.37	ROUTE 534	04151086__	0.37	State Street

Crash Data – An intersection-level frequency of total pedestrian and bicycle crashes and pedestrian and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 47: DVRPC – PED-BIKE INTERSECTION NETWORK SCREENING LIST [CRASH DATA]

Crashes by Severity (2016-2020)							
Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
2	0	1	0	1	0	67.76	6.25
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	1	0	0	17.20	1.59
1	0	1	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	1	0	0	0	56.92	5.25
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00

Demographics - The demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections traversing areas with populations under 1,000 persons are also noted.

TABLE 48: DVRPC – PED-BIKE INTERSECTION NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	YES
NO	YES
YES	NO
YES	YES
YES	YES
NO	NO
YES	YES
NO	NO
YES	NO
YES	YES
YES	YES
YES	YES
YES	YES
NO	YES
YES	YES

DVRPC – Pedestrian Intersection

General Location– Each intersection in the local network screening list is assigned a ranking based ePDO ranking. The higher the ePDO score the closer the ranking of that segment will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Segments are defined for their location by major route State Route ID, route name, and milepost, by minor route State Route ID, route name, and milepost, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 49: DVRPC – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION]

		Major Route			Minor Route		
County	Municipality	SRI	Milepost	Route Name	SRI	Milepost	Route Name
CAMDEN	COLLINGSWOOD BORO	00000561__	47.66	ROUTE 561	04121052__	0.15	East Collings Avenue
BURLINGTON	PALMYRA BORO	03271011__	0.00	W THIRD ST	00000543__	5.95	Broad Street
MERCER	TRENTON CITY	00000033__	0.59	NJ 33	11111193__	0.00	Monmouth Avenue
CAMDEN	CAMDEN CITY	04081587__	0.50	COOPER ST	04081412__	0.08	North 6th Street
GLOUCESTER	WOODBURY CITY	00000045__	26.70	NJ 45	N/A	N/A	N/A
BURLINGTON	WILLINGBORO TWP	03000629__	0.38	BURLINGTON COUNTY 629	03000634__	0.55	Sunset Road
MERCER	EWING TWP	11000627__	0.36	MERCER COUNTY 627	11021262__	0.00	Hazelhurst Avenue
MERCER	PRINCETON	00000027__	0.00	NJ 27	00000206__	53.95	Bayard Lane
BURLINGTON	BORDENTOWN CITY	00000528__	0.00	ROUTE 528	00000545__	14.57	Farnsworth Avenue
BURLINGTON	WESTAMPTON TWP	03000630__	7.44	BURLINGTON COUNTY 630	03371099__	0.76	Greenwich Drive
MERCER	EAST WINDSOR TWP	11011029__	0.20	YORK SHIRE DR	N/A	N/A	N/A
CAMDEN	MOUNT EPHRAIM BORO	04000658__	0.87	CAMDEN COUNTY 658	00000168__	7.97	Black Horse Pike
GLOUCESTER	MONROE TWP	08000654__	0.93	GLOUCESTER COUNTY 654	08111011__	0.00	Lake Avenue
GLOUCESTER	WASHINGTON TWP	08000630__	0.33	GLOUCESTER COUNTY 630	N/A	N/A	N/A
CAMDEN	BELLMAWR BORO	04041079__	0.10	BELMONT RD	N/A	N/A	N/A
MERCER	LAWRENCE TWP	00000546__	9.98	ROUTE 546	00000001__	5.98	Herbert Highway
CAMDEN	GLOUCESTER CITY	04000635__	0.00	CAMDEN COUNTY 635	00000551__	31.16	Broadway
GLOUCESTER	DEPTFORD TWP	00000534__	0.26	ROUTE 534	08021207__	0.00	Walker Avenue
CAMDEN	GLOUCESTER TWP	04151001__	0.53	KEARSLEY RD	04151803__	0.56	Cedar Grove Drive
CAMDEN	VOORHEES TWP	04000673__	5.28	CAMDEN COUNTY 673	04000670__	0.32	Burnt Mill Road

Crash Data – An intersection-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 50: DVRPC – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [CRASH DATA]

Crashes by Severity (2016-2020)							
Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
2	0	0	1	1	0	28.04	2.59
1	0	0	0	1	0	10.85	1.00
2	0	0	2	0	0	34.39	3.17
2	0	0	1	0	1	18.20	1.59
2	0	0	0	1	1	11.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	1	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	1	0	0	0	0	56.92	5.25
1	0	1	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00

Demographics - The demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections traversing areas with populations under 1,000 persons are also noted.

TABLE 51: DVRPC – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
NO	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	NO
YES	YES
YES	YES
YES	YES
NO	NO
YES	YES
YES	YES
YES	YES
NO	YES
YES	YES
YES	NO
YES	YES
YES	YES
YES	NO
YES	NO

SJTPO

SJTPO hosts the region's local network screening lists at this web page: Local Safety Program (Infrastructure) – SJTPO

SJTPO – Ped-Bike Corridor

General Location – Each corridor in the local network screening list is assigned a ranking based ePDO score. The higher the ePDO score the closer the ranking of that corridor will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Corridors are defined for their location by a State Route ID, starting mile post, ending milepost, route name, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 52: SJTPO – PED-BIKE CORRIDOR NETWORK SCREENING LIST [GENERAL LOCATION]

	Municipality	SRI	Mile Post - From	Mile Post - To	Corridor Length	Route
CAPE MAY	MIDDLE TWP	05000657__	0.00	1.00	1.00	CAPE MAY COUNTY 657
CUMBERLAND	VINELAND CITY	06141230__	0.00	0.08	0.08	MOYER ST
ATLANTIC	LONGPORT BORO	01151100__	0.76	1.76	1.00	ATLANTIC AVE
CAPE MAY	SEA ISLE CITY	05091008__	0.10	1.08	0.98	PLEASURE AV
ATLANTIC	EGG HARBOR TWP	00000575__	5.67	6.67	1.00	ROUTE 575
CUMBERLAND	MILLVILLE CITY	06101562__	0.60	0.87	0.27	KIMBERLY DR
ATLANTIC	PORT REPUBLIC CITY	01000634__	4.63	5.63	1.00	ATLANTIC COUNTY 634
CUMBERLAND	MAURICE RIVER TWP	00000548__	0.50	1.50	1.00	ROUTE 548
ATLANTIC	BUENA VISTA TWP	01051119__	0.00	0.50	0.50	CIMINO BLVD
CAPE MAY	NORTH WILDWOOD CITY	05071003__	0.83	1.68	0.85	CENTRAL AVE
SALEM	PITTSGROVE TWP	17000638__	0.00	1.00	1.00	SALEM COUNTY 638
ATLANTIC	ATLANTIC CITY	01000629__	4.45	5.45	1.00	ATLANTIC COUNTY 629
CUMBERLAND	UPPER DEERFIELD TWP	00000552__	0.40	1.40	1.00	ROUTE 552
ATLANTIC	GALLOWAY TWP	01111191__	2.86	3.86	1.00	LEIPZIG AV
CUMBERLAND	SHILOH BORO	06000620__	4.08	4.61	0.53	CUMBERLAND COUNTY 620
ATLANTIC	VENTNOR CITY	01000629__	2.89	3.89	1.00	ATLANTIC COUNTY 629
ATLANTIC	PLEASANTVILLE CITY	01191215__	0.78	1.02	0.24	FRANKLIN AVE
CAPE MAY	DENNIS TWP	05000625__	0.03	1.03	1.00	CAPE MAY COUNTY 625
CUMBERLAND	BRIDGETON CITY	06011076__	1.30	1.43	0.13	AMERICAN AV
CAPE MAY	LOWER TWP	05000648__	0.99	1.99	1.00	CAPE MAY COUNTY 648

Crash Data – A corridor-level frequency of total pedestrian and bicycle crashes and pedestrian and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 53: SJTPO – PED-BIKE CORRIDOR NETWORK SCREENING LIST [CRASH DATA]

Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
2	0	0	1	1	0	28.04	2.585
1	0	0	0	0	1	1.00	0.000
6	0	1	3	1	1	120.36	11.003
1	0	0	0	1	0	10.85	1.000
4	0	1	0	2	1	79.61	7.247
1	0	1	0	0	0	56.92	5.247
1	0	1	0	0	0	56.92	5.247
1	0	0	1	0	0	17.20	1.585
1	0	1	0	0	0	56.92	5.247
5	0	1	1	1	2	86.96	7.832
1	0	0	0	1	0	10.85	1.000
2	0	0	1	0	1	18.20	1.585
3	0	0	1	1	1	29.04	2.585
1	0	1	0	0	0	56.92	5.247
1	0	1	0	0	0	56.92	5.247
4	0	1	1	2	0	95.81	8.832
1	0	0	1	0	0	17.20	1.585
1	0	0	0	0	1	1.00	0.000
1	0	0	1	0	0	17.20	1.585
2	0	0	1	1	0	28.04	2.585

Demographics - The demographics information also denotes if the corridor is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Corridors traversing areas with populations under 1,000 persons are also noted.

TABLE 54: SJTPO – PED-BIKE CORRIDOR NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
NO	YES
YES	NO
YES	YES
YES	YES
YES	NO
YES	YES
YES	NO
NO	YES
YES	NO
YES	YES
YES	YES
YES	YES
YES	YES
NO	NO
YES	NO
YES	YES
YES	NO
YES	NO
YES	YES
YES	YES

Roadway Features – At the corridor-level, data on roadway features is reported to describe the corridor's ownership, function, and cross section. Lane count and the Divided By columns describe the sidewalk-to-sidewalk distance or the roadside-to-roadside distance typical to the 1-mile analyzed. The Jurisdiction attribute denotes a road as either municipal or county owned. The functional class attribute breaks out levels of mobility and access ranging from principal arterial to local road.

TABLE 55: SJTPO – PED-BIKE CORRIDOR NETWORK SCREEN LIST [ROADWAY FEATURES]

NJDOT SLD - Lane Count	NJDOT SLD - Jurisdiction	NJDOT SLD - Functional Class	ARD - Divided By
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
4	Municipal	Minor Arterial	N/A
2	Municipal	Local	N/A
1	County	Minor Arterial	Painted Median
2	Municipal	Local	N/A
2	County	Minor Arterial	N/A
2	County	Major Collector	N/A
2	Municipal	Local	N/A
1	Municipal	Major Collector	Grass Median
2	County	Local	N/A
1	County	Principal Arterial - Other	Painted Median
2	County	Minor Arterial	N/A
2	Municipal	Local	N/A
2	County	Minor Collector	N/A
2	County	Principal Arterial - Other	N/A
2	Municipal	Major Collector	N/A
2	County	Minor Arterial	N/A
1	Municipal	Local	N/A
2	County	Major Collector	N/A

SJTPO – Pedestrian Corridor

General Location – Each corridor in the local network screening list is assigned a ranking based ePDO score. The higher the ePDO score the closer the ranking of that corridor will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Corridors are defined for their location by a State Route ID, starting mile post, ending milepost, route name, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 56: SJTPO – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [GENERAL LOCATION]

County	Municipality	SRI	Mile Post - From	Mile Post - To	Corridor Length	Route
ATLANTIC	ABSECON CITY	01000651__	10.29	11.29	1.00	ATLANTIC COUNTY 651
SALEM	PENNSVILLE TWP	00000551__	3.19	4.19	1.00	ROUTE 551
ATLANTIC	LINWOOD CITY	01081359__	0.87	1.02	0.15	POPLAR AVE
CUMBERLAND	UPPER DEERFIELD TWP	06131072__	0.10	0.30	0.20	VILMS RD
ATLANTIC	ATLANTIC CITY	01021087__	0.09	0.23	0.14	N CAROLINA AV
ATLANTIC	VENTNOR CITY	01221006__	0.00	0.07	0.07	WINCHESTER AV
CUMBERLAND	MILLVILLE CITY	06101153__	0.22	0.67	0.45	DOCK ST
CUMBERLAND	VINELAND CITY	00000540__	33.86	34.86	1.00	ROUTE 540
ATLANTIC	EGG HARBOR TWP	01081361__	1.54	2.12	0.58	ROBERT BEST RD
ATLANTIC	GALLOWAY TWP	01111153__	0.04	0.14	0.10	RUTGERS CT
CUMBERLAND	COMMERCIAL TWP	06021066__	0.40	0.54	0.14	DAFFODIL RD
CAPE MAY	LOWER TWP	05051309__	0.06	0.41	0.35	LENNOX AV
ATLANTIC	HAMMONTON TOWN	01131056__	0.32	0.95	0.63	WASHINGTON ST
ATLANTIC	NORTHFIELD CITY	01181082__	0.10	0.19	0.09	NORTHFIELD AV
CAPE MAY	OCEAN CITY	05081275__	0.20	1.20	1.00	CENTRAL AVE
ATLANTIC	PLEASANTVILLE CITY	01191081__	0.00	0.44	0.44	GLENDALE
ATLANTIC	SOMERS POINT CITY	00000585__	0.21	1.21	1.00	ROUTE 585
CUMBERLAND	BRIDGETON CITY	06011076__	1.30	1.43	0.13	AMERICAN AV
CAPE MAY	WOODBINE BORO	00000550__	10.02	11.02	1.00	ROUTE 550
ATLANTIC	MARGATE CITY	01151100__	1.39	2.39	1.00	ATLANTIC AVE

Crash Data – A corridor-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 57: SJTPO – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [CRASH DATA]

Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
1	0	1	0	0	0	56.92	5.25
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	1	0	0	0	56.92	5.25
1	0	0	1	0	0	17.20	1.59
3	0	0	0	2	1	22.70	2.00
1	0	1	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	1	0	0	0	56.92	5.25
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
2	0	1	1	0	0	74.11	6.83

Demographics - The demographics information also denotes if the corridor is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Corridors traversing areas with populations under 1,000 persons are also noted.

TABLE 58: SJTPO – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
YES	YES
NO	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
NO	YES
YES	YES
YES	NO
YES	YES
YES	YES
YES	YES
YES	NO
YES	YES
YES	YES
YES	YES
YES	YES

Roadway Features – At the corridor-level, data on roadway features is reported to describe the corridor's ownership, function, and cross section. Lane count and the Divided By columns describe the sidewalk-to-sidewalk distance or the roadside-to-roadside distance typical to the 1-mile analyzed. The Jurisdiction attribute denotes a road as either municipal or county owned. The functional class attribute breaks out levels of mobility and access ranging from principal arterial to local road.

TABLE 59: SJTPO – PEDESTRIAN CORRIDOR NETWORK SCREENING LIST [ROADWAY FEATURES]

NJDOT SLD - Lane Count	NJDOT SLD - Jurisdiction	NJDOT SLD - Functional Class	ARD - Divided By
2	County	Minor Arterial	N/A
2	County	Minor Arterial	N/A
2	Municipal	Major Collector	N/A
2	Municipal	Local	N/A
2	Municipal	Local	N/A
1	Municipal	Local	N/A
2	Municipal	Major Collector	N/A
2	Municipal	Major Collector	N/A
2	Municipal	Major Collector	N/A
2	Municipal	Local	N/A
2	Municipal	Local	N/A
2	Municipal	Local	N/A
2	Municipal	Local	N/A
2	Municipal	Local	N/A
2	Municipal	Principal Arterial - Other	N/A
2	Municipal	Local	Grass Median
2	County	Principal Arterial - Other	Painted Median
1	Municipal	Local	N/A
2	County	Major Collector	N/A
4	Municipal	Minor Arterial	N/A

SJTPO – Ped-Bike Intersection

General Location– Each intersection in the local network screening list is assigned a ranking based ePDO ranking. The higher the ePDO score the closer the ranking of that segment will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Intersections are defined for their location by major route State Route ID, route name, and milepost, by minor route State Route ID, route name, and milepost, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 60: SJTPO – PED-BIKE INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION]

		Major Route			Minor Route		
County	Municipality	SRI	Milepost	Route Name	SRI	Milepost	Route Name
CAPE MAY	WILDWOOD CITY	05000621__	5.65	CAPE MAY COUNTY 621	05141032__	0.37	Roberts Avenue
ATLANTIC	ATLANTIC CITY	01021386__	0.24	MICHIGAN AVE	01021380__	1.17	Arctic Avenue
CUMBERLAND	MILLVILLE CITY	06000667__	0.60	CUMBERLAND COUNTY 667	N/A	N/A	N/A
SALEM	SALEM CITY	17000665__	3.00	SALEM COUNTY 665	17121067__	0.25	Wesley Street
ATLANTIC	BRIGANTINE CITY	01031189__	2.93	BAY SHORE AVE	01031021__	0.42	Lafayette Boulevard
ATLANTIC	PLEASANTVILLE CITY	00000585__	7.21	ROUTE 585	01191187__	0.00	East Pleasant Avenue
CAPE MAY	SEA ISLE CITY	05000619__	11.00	CAPE MAY COUNTY 619	05091051__	0.08	52nd Street
CAPE MAY	LOWER TWP	05051014__	0.40	SHIRLEY AV	05051019__	0.14	Holly Lane
ATLANTIC	VENTNOR CITY	01151100__	3.47	ATLANTIC AVE	N/A	N/A	N/A
CAPE MAY	NORTH WILDWOOD CITY	05071052__	0.10	25TH AV	05071002__	1.18	Surf Avenue
CUMBERLAND	VINELAND CITY	06000672__	0.82	CUMBERLAND COUNTY 672	06141029__	3.58	Chestnut Avenue
CAPE MAY	WILDWOOD CREST BORO	05151041__	0.30	DENVER AV	N/A	N/A	N/A
CUMBERLAND	BRIDGETON CITY	00000552__	0.30	ROUTE 552	06011156__	0.41	East Avenue
ATLANTIC	EGG HARBOR TWP	00000575__	6.35	ROUTE 575	01081531__	0.00	Gravel Bend Road
CAPE MAY	OCEAN CITY	05081013__	1.08	WEST AVE	05000656__	3.97	Bay Avenue
CAPE MAY	AVALON BORO	05011003__	0.20	32ND ST	05011096__	0.05	Railroad Avenue
ATLANTIC	HAMMONTON TOWN	00000542__	0.24	ROUTE 542	01131013__	0.61	Grape Street
ATLANTIC	NORTHFIELD CITY	01000662__	4.65	ATLANTIC COUNTY 662	N/A	N/A	N/A
ATLANTIC	SOMERS POINT CITY	00000585__	0.30	ROUTE 585	01211028__	0.18	New Jersey Avenue
SALEM	PENNSVILLE TWP	00000049__	1.80	NJ 49	N/A	N/A	N/A

Crash Data – An intersection-level frequency of total pedestrian and bicycle crashes and pedestrian and bicycle crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 61: SJTPO – PED-BIKE INTERSECTION NETWORK SCREENING LIST [CRASH DATA]

Crashes by Severity (2016-2020)							
Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
3	0	0	1	1	1	29.04	2.59
2	0	0	0	2	0	21.70	2.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	1	0	0	17.20	1.59
2	0	0	0	1	1	11.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
1	0	1	0	0	0	56.92	5.25
1	0	0	0	0	1	1.00	0.00
2	0	0	0	2	0	21.70	2.00
1	0	0	0	1	0	10.85	1.00

Demographics - The demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections traversing areas with populations under 1,000 persons are also noted.

TABLE 62: SJTPO – PED-BIKE INTERSECTION NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
YES	YES
YES	YES
YES	NO
NO	NO
YES	NO
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	NO
NO	YES
NO	YES
YES	YES
YES	YES
YES	YES
YES	YES

SJTPO – Pedestrian Intersection

General Location– Each intersection in the local network screening list is assigned a ranking based ePDO ranking. The higher the ePDO score the closer the ranking of that segment will be to rank #1. Ranking are omitted here because this is an unordered excerpt of the full network screening lists. Segments are defined for their location by major route State Route ID, route name, and milepost, by minor route State Route ID, route name, and milepost, the name of the county or counties the segment is within, and any municipality crossed.

TABLE 63: SJTPO – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [GENERAL LOCATION]

		Major Route			Minor Route		
County	Municipality	SRI	Milepost	Route Name	SRI	Milepost	Route Name
ATLANTIC	VENTNOR CITY	01000629__	3.39	ATLANTIC COUNTY 629	01221112__	0.00	Dorset Avenue
CUMBERLAND	MILLVILLE CITY	06101010__	0.69	HIGH ST	06101271__	0.43	Mcneal Street
CAPE MAY	MIDDLE TWP	05000615__	4.34	CAPE MAY COUNTY 615	N/A	N/A	N/A
ATLANTIC	ATLANTIC CITY	01021381__	1.45	MADISON AVE	01021386__	0.34	Michigan Avenue
CAPE MAY	WILDWOOD CITY	05141024__	0.50	BENNETT AV	05151003__	0.97	Pacific Avenue
ATLANTIC	PLEASANTVILLE CITY	01000646__	6.46	ATLANTIC COUNTY 646	00000585__	8.10	North Main Street
CAPE MAY	OCEAN CITY	05081123__	0.34	8TH ST	05081017__	0.11	Central Avenue
CAPE MAY	SEA ISLE CITY	05000619__	11.48	CAPE MAY COUNTY 619	05091060__	0.21	43rd Street
CUMBERLAND	VINELAND CITY	06141029__	1.10	CHESTNUT AVE	N/A	N/A	N/A
ATLANTIC	ABSECON CITY	01000651__	12.13	ATLANTIC COUNTY 651	N/A	N/A	N/A
CAPE MAY	LOWER TWP	05000603__	5.20	CAPE MAY COUNTY 603	05051261__	0.00	Langs Avenue
ATLANTIC	SOMERS POINT CITY	00000585__	0.30	ROUTE 585	01211028__	0.18	New Jersey Avenue
ATLANTIC	BRIGANTINE CITY	01031123__	0.00	SEASIDE RD	01031147__	0.66	Harbor Beach Cove
SALEM	SALEM CITY	17000623__	7.95	SALEM COUNTY 623	17000658__	9.30	Yorke Street
ATLANTIC	GALLOWAY TWP	00000561__	4.31	ROUTE 561	01111056__	1.12	Chris Gaupp Drive
ATLANTIC	MARGATE CITY	01151100__	1.69	ATLANTIC AVE	01161098__	0.43	Adams Avenue
CUMBERLAND	BRIDGETON CITY	00000049__	25.40	NJ 49	N/A	N/A	N/A
ATLANTIC	LONGPORT BORO	01151100__	0.94	ATLANTIC AVE	01151102__	0.07	28th Street
ATLANTIC	HAMILTON TWP	00000575__	9.00	ROUTE 575	N/A	N/A	N/A
SALEM	PENNSVILLE TWP	17081113__	0.20	ENLOW PL	N/A	N/A	N/A

Crash Data – An intersection-level frequency of total pedestrian crashes and pedestrian crash events by highest injury severity are provided in the network screening lists. The injury severity information is combined through weighting from the FHWA ePDO methodology to yield the values in the Weighted Score (ePDO) and Weighted Score (eC) column.

TABLE 64: SJTPO – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [CRASH DATA]

Crashes by Severity (2016-2020)							
Total Crashes	K	A	B	C	O	Weighted Score (ePDO)	Weighted Score (eC)
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	1	0	0	17.20	1.59
2	0	0	1	1	0	28.04	2.59
1	0	0	0	0	1	1.00	0.00
1	0	0	0	1	0	10.85	1.00
1	1	0	0	0	0	56.92	5.25
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	0	0	1	0	10.85	1.00
1	0	0	1	0	0	17.20	1.59
2	0	0	0	2	0	21.70	2.00
1	0	0	0	0	1	1.00	0.00
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	1	0	0	17.20	1.59
1	0	0	0	1	0	10.85	1.00
1	0	0	0	0	1	1.00	0.00
1	0	1	0	0	0	56.92	5.25
1	0	0	0	0	1	1.00	0.00

Demographics - The demographics information also denotes if the intersection is in an environmental justice area (assessed via EJ Screen data and NJ DOT thresholds on race, ethnicity, and income factors). Intersections traversing areas with populations under 1,000 persons are also noted.

TABLE 65: SJTPO – PEDESTRIAN INTERSECTION NETWORK SCREENING LIST [DEMOGRAPHICS]

Is EJ Area?	Is Census Block Group Pop. < 1,000?
YES	YES
YES	YES
NO	YES
YES	YES
YES	YES
YES	NO
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	YES
YES	NO
YES	YES
YES	YES
NO	YES
YES	NO
YES	YES

Limitations Statement for State and Local Network Screening Lists

Because of limitations in the data supplied and the method used to develop the list, users should be aware that the rankings of locations and data for locations may be incorrect and/or incomplete. Analysis and engineering judgement should be used when applying insights and assessing network locations. The New Jersey Department of Transportation makes no guarantees as to the accuracy, completeness, or content of the information. This list is subject to updates as more information becomes available. The materials and information contained in the 2023 Network Screening Lists are provided "as is." No warranty of any kind, implied, expressed, or statutory, including but not limited to the warranties of non-infringement of third-party rights, title, merchantability, fitness for a particular purpose, and freedom from computer virus, is given with respect to the contents of this Networks Screening List or its hyperlinks to other internet resources.

DRAFT Systemic Pedestrian and Bicycle Safety on State Routes Report

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Executive Summary

To identify roadway features that are overrepresented at fatal and serious injury (KSI) pedestrian and bicycle crash locations, an analysis of the roadway network was performed. This analysis followed guidance set forth in NCHRP Research Report 893: Systemic Pedestrian Safety Analysis (2018), Steps 3 and 4. The analysis compared 2016 to 2020 KSI pedestrian and bicycle crash locations to the network of State roads (NJ and US routes), examining each group to determine if certain features were overrepresented at crash locations. This process is a critical step in the Systemic Analysis process; identifying primary and Secondary Risk Factors that will be incorporated into the proposed systemic scoring methodology.

The State roadway network was divided into 1/10th mile segments using the New Jersey Department of Transportation's (NJDOT) Straight Line Diagram (SLD) database. In total, there are 21,704 segments within the State Roadway Network (SRN), of which 708 segments experienced a KSI bicycle or pedestrian crash between 2016 and 2020. Each 1/10th mile segment was then assigned a series of attributes using SLD, New Jersey Department of Environmental Protection (NJDEP), NJ TRANSIT, NJDOT Pavement Management System (PMS), NJ Office of GIS (NJOGIS) data, and US Census data. The attributes assigned were:

- Total Intersections per 1/10th Mile Segment
- Unsignalized Intersections per 1/10th Mile Segment
- Signalized Intersections per 1/10th Mile Segment
- Side Street Intersection Approaches per 1/10th Mile Segment
- Whether the segment was within an NJDEP Overburdened Community
- Number of Through Lanes on Segment
- Number of Schools within 1/4th Mile of Segment
- Pavement Condition using Pavement Management Systems Data
- Posted Speed Limit
- Median Width of Segment
- Median Type of Segment
- Bus Stops within 50' of Segment
- Pavement Width
- AADT
- Municipal Population Density of Segment
- Functional Classification
- Area Type (Urban vs Rural)
- Presence of Approved Mid-Block Crosswalk
- Heavy Vehicle Volume

The prevalence of these features among KSI pedestrian and bicycle crash segments was then compared to their relative frequency across the SRN. Features that were more common among KSI pedestrian and bicycle crash segments than across the SRN were deemed a "Risk Factor." Risk Factors were broken into two groups: Primary Risk Factors and Secondary Risk Factors. Primary Risk Factors are those that exhibit overrepresentation by 5% or more compared to the SRN. Secondary Risk Factors exhibit overrepresentation by 1 – 5% compared to the SRN. By identifying the Risk Factors associated with fatal and serious injury pedestrian and bicycle crashes and where those Risk Factors exist on the SRN, systemic analysis offers a proactive approach to addressing pedestrian and bicycle crashes.

The results of this analysis are summarized in Table 1.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Table 1: Systemic Scoring System based on Overrepresentations

Variable	Primary Risk Factor – 2 Points (Full Points in Systemic Scoring Methodology)	Secondary Risk Factor – 1 Point (Half Points in Systemic Scoring Methodology)
Total Intersections per 1/10th Mile Segment	Two (2) to four (4) intersections within a 1/10th segment	None
Unsignalized Intersections per 1/10th Mile Segment	None	Two (2) and three (3) unsignalized intersections within a 1/10th mile segment
Signalized Intersections per 1/10th Mile Segment	One (1) and two (2) signalized intersections within a 1/10th mile segment	None
Side Street Intersection Approaches per 1/10th Mile Segment	Four (4) to eight (8) side street intersection approaches within a 1/10th mile segment	None
Whether the segment was within an NJDEP Overburdened Community	Segment lies within an NJDEP Overburdened Community	None
Number of Through Lanes on Segment	Four (4) to six (6) through lanes (total of both directions)	None
Number of Schools within 1/4th Mile of Segment	One (1) and two (2) schools within 1/4th mile of a segment	None
Pavement Condition using Pavement Management Systems Data	*Fair* or *Poor* pavement condition as determined by IRI value	None
Posted Speed Limit	Posted speed limit between 30 MPH and 40 MPH	None
Median Width of Segment	None	Median width between 10' and 29'
Median Type of Segment	Presence of positive median	Presence of curbed median
Bus Stops within 50' of Segment	Two (2) or more bus stops within 50' of a segment	None
Pavement Width	Average segment pavement widths of 40' – 79'	None
AADT	AADT between 15,000 VPD and 44,999 VPD	None
Municipal Population Density of Segment	Municipal population density greater than or equal to 3,186 persons/mile^2 (300% the population density of New Jersey)	None
Functional Classification of Segment	Other Principal Arterial	None
Area Type (Urban vs Rural)	Urban	None
Presence of Approved Mid-Block Crosswalk	None	None
Heavy Vehicle Volume	Heavy Vehicle Volume between 1,000 and 2,499 vehicles per day	None

GIS Analysis

To create the Roadway Network layer for the crash analysis the State Routes were copied from the NJ Roadway Network, maintained by NJDOT. The routes were split into 1/10th mile segments starting from the beginning of each route. Roadway attributes were then assigned to the segments based on either a count of features (schools, intersections, bus stops, etc) within proximity of the segment or predominant value for linear features (functional class, speed limit, etc).

The school location data was point based. Due to the size of some school properties the entire lot of the school property was used for the assessment as that was found to reflect schools more accurately near the road segments.

2

Michael Baker INTERNATIONAL

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Crashes were placed spatially using latitude and longitude data. Once placed they were assigned an SRI and a milepost value based on the closest location to the network. The roadway attributes assigned to the crash location would be based on where the milepost was located.

Features Analyzed and Availability of Data

Features analyzed in this effort were developed from a variety of sources and methodologies. The source for each feature included in the analysis are listed in Table 2.

Table 2: Roadway Feature Data Sources

Feature	Source	Means of Mapping to Roadway Network
Intersection Presence and Approach information	SLD database (pt_int_approach)	Varies based on field assessed
Overburdened Communities	NJOGIS data	Yes/No field based on predominant value
Lane Count	SLD (ln_lane_count)	Assigning predominant value (combined primary and secondary values)
Schools	NJOGIS data	Total number of schools within 1/4 mile segment (school parcels as opposed to centroids due to distance from the road of some schools)
International Roughness Index	NJDOT Pavement Management System data	Assigning predominant value in the primary direction
Posted Speed Limit	SLD (ln_speed)	Assigning predominant value*
Median Width	SLD (ln_median_width)	Assigning predominant value
Median Type	SLD (ln_median_type)	Assigning predominant value
Bus Stops	NJ TRANSIT data	Total number of bus stops within 50' of segment
Pavement Width	SLD (ln_pave_width)	Assigning predominant value (combined primary and secondary values)
AADT	Highway Performance Monitoring System (HPMS) data	Assigning predominant value
Population Density	US Census data	Assigning predominant value (municipal population density)
Functional Classification	SLD (ln_f_system)	Assigning predominant value
Area Type	SLD (ln_urban_code)**	Assigning predominant value
Approved Mid-Block Crosswalks	NJDOT Traffic Regulation Orders	Yes/No for each segment
Heavy Vehicle Volumes	Highway Performance Monitoring System (HPMS) data (Single-Unit & Combination-Unit volumes)	Assigning predominant value

*Note: The predominant value simply means the value that is present on the majority of the 1/10th mile segment of road.
** Note: Urban boundaries are currently being updated by Michael Baker. The data used to determine this field was an in progress version from September, 2023. The urban boundaries are expected by NJDOT and FHWA in spring, 2024.

Several features were considered for inclusion within the systemic analysis, but were ultimately excluded due to a lack of available *accurate and contemporary* data at a local, or Statewide level. The features considered include:

- Presence of sidewalk
- Parking present on shoulder
- Marked crosswalk presence and condition
- Condition of existing adjacent pedestrian facilities
- Presence of work zone
- Presence of lighting (pedestrian-scale or highway)
- Pedestrian volumes
- Heavy vehicle presence

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

- Adjacent land use (commercial, residential, park-space, etc)
- Presence of nearby pedestrian trip generator
- Presence of worn paths ("desire" paths)
- Intersection stopping sight distance (real or minimum required)
- Community concerns (location identified in local planning documents)

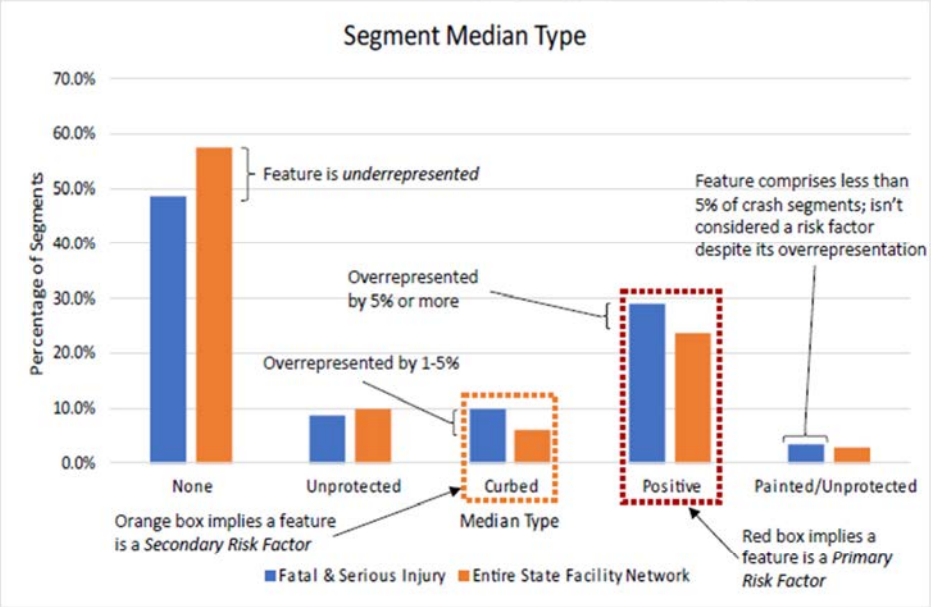
Risk Factor and Overrepresented Features Analysis

Methodology

A roadway feature was determined to be a Risk Factor if it comprises more than 5% of KSI pedestrian and bicycle crash segments and it:

- Exhibits combined overrepresentation of 5% or more compared to the SRN (Primary Risk Factors)
- Exhibits combined overrepresentation of 1 – 5% compared to the SRN (Secondary Risk Factors)

If a feature exhibited overrepresentation of less than 1% or was underrepresented, it was not considered a risk factor. This methodology was employed in the DVRPC's & SJTPO's systemic analysis of horizontal curves in 2020. The methodology described is illustrated in the figure below, which examines segments by roadway median type.



Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Intersections per Segment

As intersections are planned points of conflict in a roadway system, they have become a focal point roadway safety. According to the Federal Highway Administration (FHWA), more than one-quarter of traffic fatalities and approximately one-half of traffic injuries occur at intersections[1].

Figure 1 displays the percentage of 1/10th mile segments with at least one intersection; the figure compares segments that have experienced a fatal or serious injury pedestrian or bicycle crash to the entire network of State roads (NJ & US routes). KSI pedestrian and bicycle crash segments were significantly more likely to have an intersection within the 1/10th segment than the SRN (80.4% of crash segments vs 48.9% of SRN). The presence of an intersection is likely an overrepresented feature at KSI crash locations.

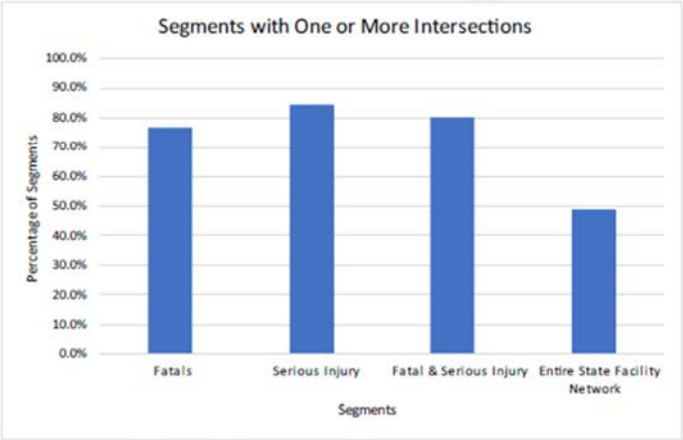


Fig. 1

Figure 2 provides additional context for this feature, showing the percentage of segments with each number of intersections within the 1/10th mile segment. Segments with two (2) to four (4) intersections are overrepresented by a combined 22.9%. Due to this overrepresentation, the presence of two (2) to four (4) intersections within a segment is recommended as a *Primary Risk Factor*.

[1] Federal Highway Administration. (2023, February 1). *About intersection safety*. About Intersection Safety | FHWA. Retrieved May 2, 2023, from https://highways.dot.gov/safety/intersection-safety/about

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

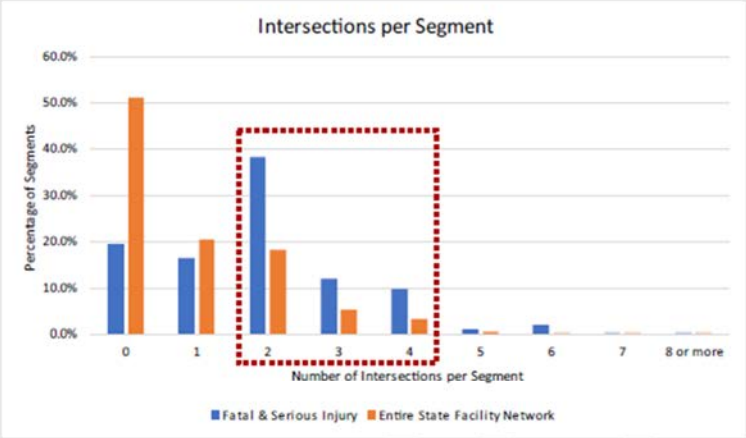


Fig. 2

Unsignalized Intersections per Segment

The number of unsignalized intersections within a 1/10th mile segment was assessed and the results are displayed in Figures 3 and 4. The figure compares segments that have experienced a KSI pedestrian or bicycle crash to the entire network of NJ & US roads. The analysis revealed that segments that experienced a crash were more likely to have at least one unsignalized intersection; 49.6% of crash segments vs 39.8% of the State Roadway Network. This difference indicates that the presence of unsignalized intersections is likely overrepresented at KSI pedestrian and bicycle crash locations.

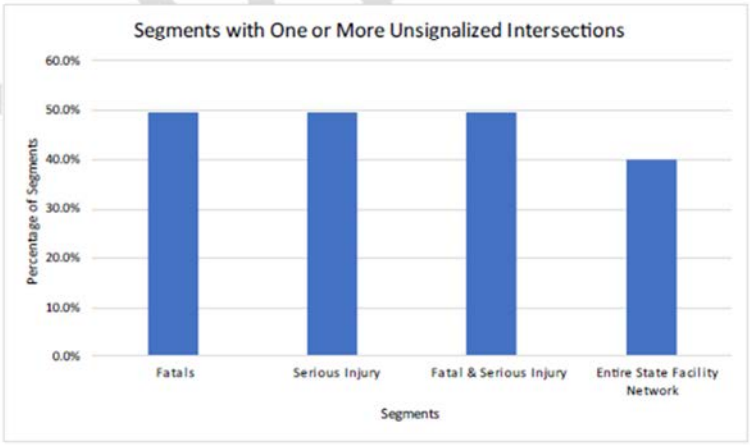


Fig. 3

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Figure 4 demonstrates that the segments with unsignalized intersections are overrepresented among KSI pedestrian and bicycle crash locations compared to the SRN. Segments with two (2) and three (3) unsignalized intersections are overrepresented by a combined 7%. Due to this overrepresentation, the presence of two (2) and three (3) intersections within a segment is recommended as a *Secondary Risk Factor*.

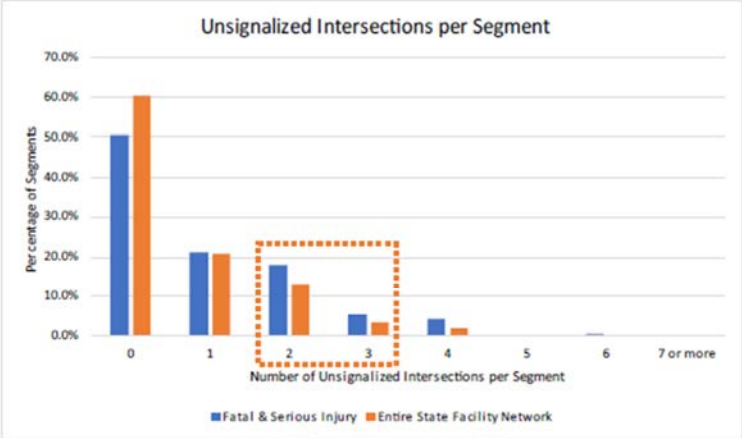


Fig. 4

Signalized Intersections per Segment

Signalized intersections are a common crossing point for pedestrians and cyclists, as well as the site of complex and heaving turning vehicle volumes on busy roads. The number of signalized intersections within a 1/10th mile segment was assessed and the results are displayed in Figures 5 and 6. The figure compares segments that have experienced a KSI pedestrian or bicycle crash to the entire network of NJ & US roads. The analysis revealed that segments that experienced a crash were more likely to have at least one signalized intersection; 47.5% of crash segments vs 13.9% of the State Roadway Network. This difference indicates that the presence of signalized intersections is likely overrepresented at KSI pedestrian and bicycle crash locations.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

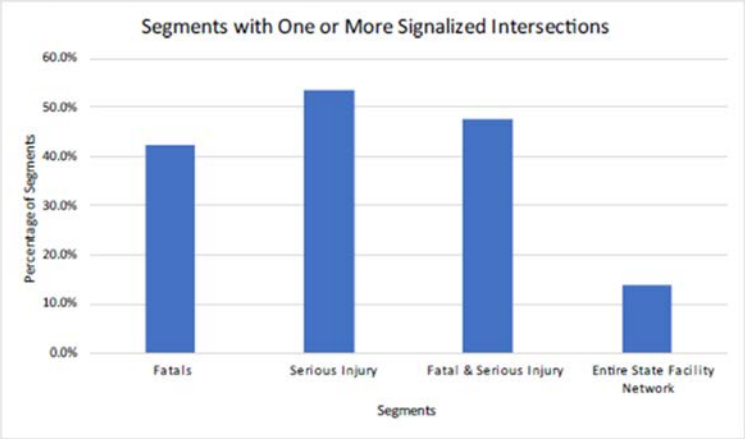


Fig. 5

Figure 6 provides additional context for this feature, showing the breakdown of 1/10th mile segments by the number of signalized intersections. Segments with one (1) and two (2) signalized intersections are overrepresented by a combined 30.9%. Due to this overrepresentation, the presence of one (1) and two (2) signalized intersections within a segment is recommended as a *Primary Risk Factor*.

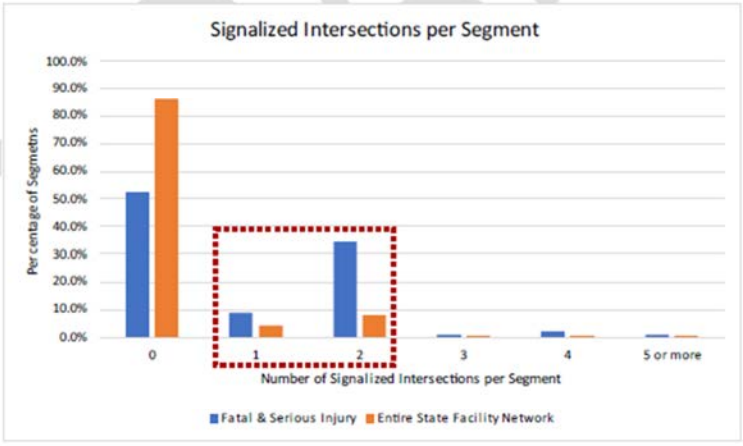


Fig. 6

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Side Street Intersection Approaches per Segment

Intersections become more complex for drivers, pedestrians, and cyclists alike as the number of approaches increases. Figure 7 displays the percentage of 1/10th mile segments with at least four (4) side street intersection approaches; the figure compares segments that have experienced a fatal or serious injury pedestrian or bicycle crash to the entire network of State roads. Fatal and serious injury pedestrian and bicycle crash segments were significantly more likely to have four (4) or more side street intersection approaches within their 1/10th mile length than the SRN. Approximately 55.1% of KSI pedestrian and bicycle crash segments had four (4) or more side street intersection approaches compared to only 22.6% of the SRN. Therefore, the presence of four (4) or more side street intersection approaches is likely an overrepresented feature at KSI crash locations.

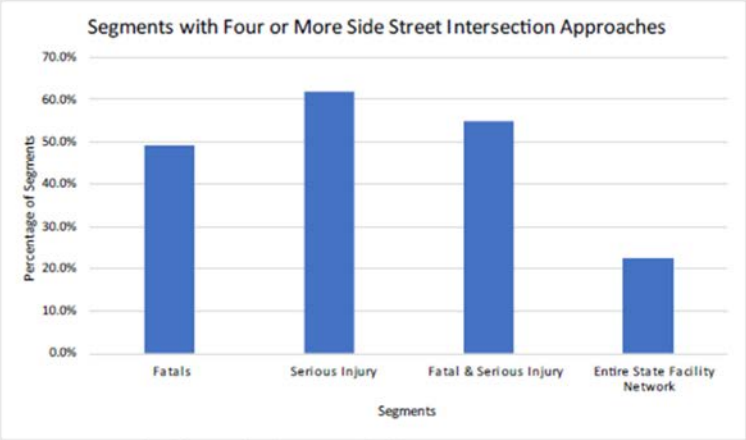


Fig. 7

Figure 8 provides additional context for this feature. The analysis revealed that fatal and serious injury pedestrian and bicycle crashes become more common relative to the SRN as the number of side street intersection approaches within a segment increases. Segments with four (4) to eight (8) side street intersection approaches are overrepresented by a combined 29%. Due to this overrepresentation, the presence of four (4) to eight (8) side street intersection approaches within a segment is recommended as a *Primary Risk Factor*.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

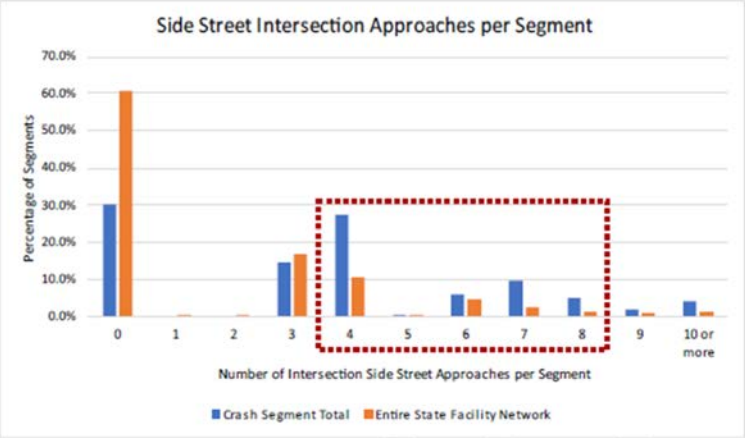


Fig. 8

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Segment within NJDEP Overburdened Community

The New Jersey Department of Environmental Protection's (NJDEP) Overburdened Communities program is designed to identify and address the environmental and public health challenges faced by low-income communities and communities of color in New Jersey. The program aims to address the cumulative impacts of pollution on these communities by targeting resources and assistance to areas with a high concentration of environmental stressors, such as industrial facilities, waste disposal sites, and transportation infrastructure. Overburdened Communities were identified using 5-year American Community Survey Data 2016 – 2021 and calculations were performed at the Census Block Group level[2].

The study assessed whether KSI crashes occurred more frequently within NJDEP Overburdened Communities compared to the State Roadway Network. All NJDEP Overburdened Community types (Limited English, Low Income, Minority, and any combination of the three) were considered in the analysis. Segments were considered to be in an Overburdened Community if half of their 1/10th mile length fell within the bounds of an Overburdened Community.

The results of the assessment are shown in Figure 9. Segments within an NJDEP Overburdened Community are overrepresented by 23.3%. Due to this overrepresentation, the presence of an NJDEP Overburdened Community within a segment is recommended as a *Primary Risk Factor*.

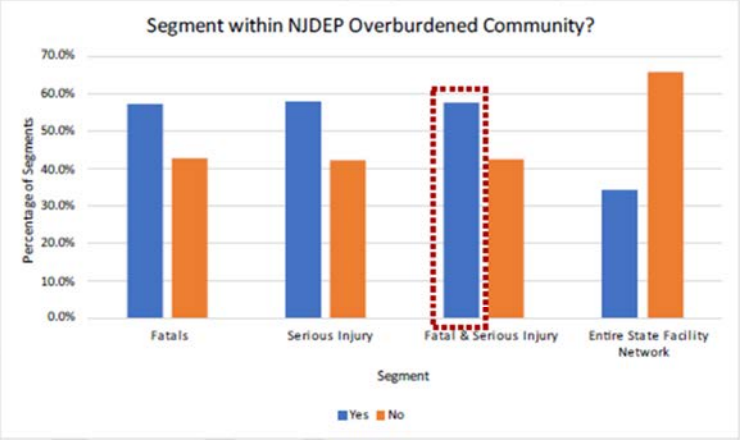


Fig. 9

[2] https://dep.nj.gov/wp-content/uploads/ej/obc-faq-factsheet-revised.pdf

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Number of Through Lanes

The predominant number of through lanes on a segment was analyzed to determine if the wider roads were more common among fatal and serious injury pedestrian and bicycle crash locations. The results of this analysis are displayed in Figures 10 and 11. The analysis revealed that between 2016 and 2020, KSI pedestrian and bicycle crashes were more common on roads with four (4) or more through lanes (total of both directions). With 68.6% of KSI pedestrian and bicycle crashes occurring on road segments four (4) or more lanes, the number of lanes is clearly linked to KSI crashes. Roads with four (4) or more lanes are overrepresented among KSI crashes, as they make up only 48.2% of the network of State roads in New Jersey.

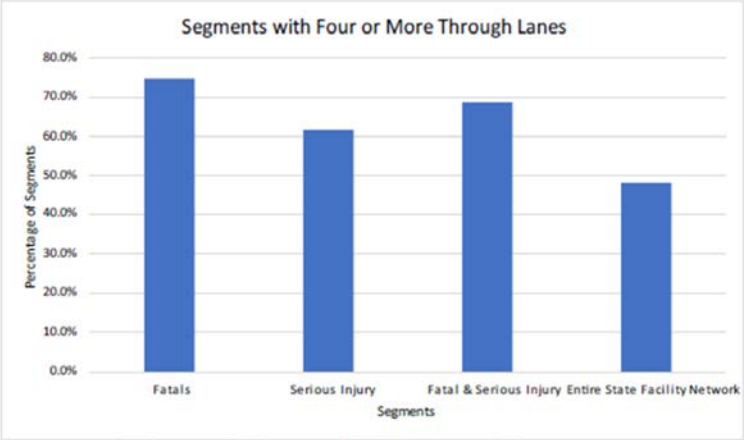


Fig. 10

The overrepresentation of segments with four (4) or more lanes among KSI pedestrian and bicycle crash locations is logical, as the number of lanes typically increases the complexity of a roadway and is a byproduct of higher volumes. Both the complexity of a facility and its volume are closely associated with its propensity for crashes.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Figure 11 provides additional context for this feature, summarizing the prevalence of different numbers of through lanes among KSI crash locations and the State Roadway Network. Segments with four (4) to six (6) through lanes (total of both directions) are overrepresented by a combined 18.6%. Due to this overrepresentation, the presence four (4) to six (6) through lanes (total of both directions) within a segment is recommended as a *Primary Risk Factor*.

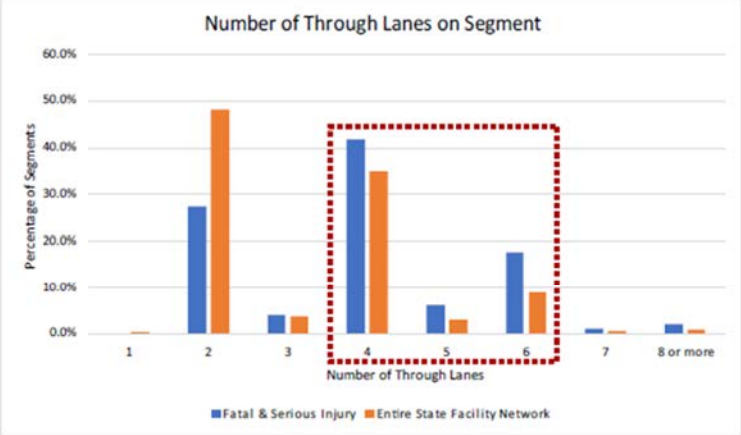


Fig. 11

Schools within 1/4th Mile of Segment

Schools are important and versatile facets of local communities. Aside from educating students, schools often fill roles that have that have little to do with educating students. Schools often function as an event space for extracurriculars after school, serve as a polling place during elections, and even as summer camps when school isn't in session. These functions generate pedestrian trips and make understanding how the presence of a school correlates to fatal and serious injury pedestrian and bicycle crashes particularly relevant. Figures 12 and 13 explore this relationship.

The analysis revealed that between 2016 and 2020, KSI pedestrian and bicycle crashes were more common on segments within 1/4th of a mile of a school. KSI pedestrian and bicycle crash segments were examined to determine their proximity to a school using the School Point Location of NJ (Public, Private and Charter) layer created and maintained by the New Jersey Office of GIS. A similar analysis was performed on the entire network of State roads. This assessment determined that 40.3% of KSI pedestrian and bicycle crash segments were within a quarter (.25) mile of a school, while only 25.4% of the State Roadway Network could make the same claim. This indicates that the presence of a school is overrepresented at KSI pedestrian and bicycle crash locations.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

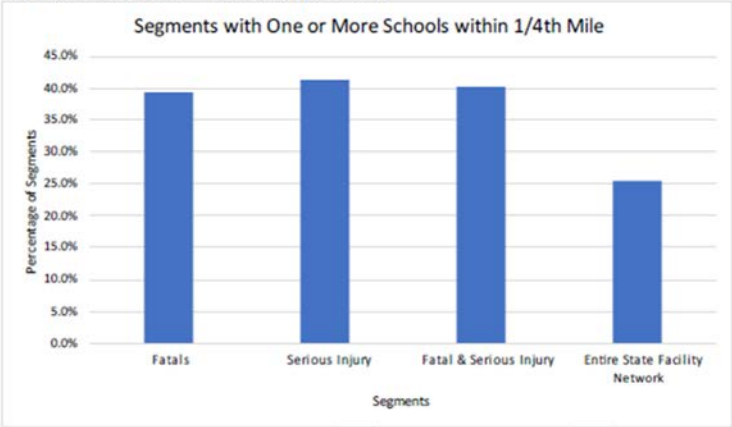


Fig. 12

Figure 13 provides additional context for this feature. Segments within 1/4th miles of one (1) and two (2) schools are overrepresented by a combined 12.3%. Due to this overrepresentation, the presence one (1) and two (2) within a segment is recommended as a *Primary Risk Factor*.

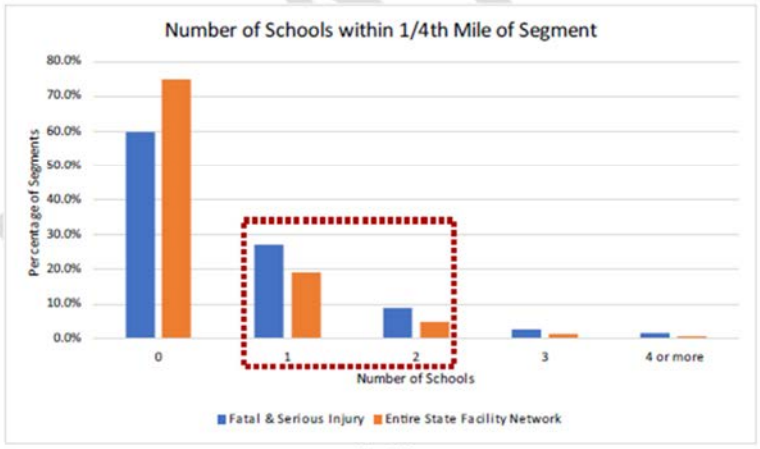


Fig. 13

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Pavement Condition (IRI Value)

The condition of a segment's pavement was to determine if roads with poor pavement condition were more common among fatal and serious injury pedestrian and bicycle crash locations. The results of this analysis are displayed in Figure 14. This analysis utilized NJDOT Pavement Management System's data to assess roadway condition. The PMS data assessed roadway condition using the International Roughness Index (IRI)[3] and categorized roadway segments as having *Good*, *Fair*, or *Poor* pavement condition. Table 2 describes the thresholds for each pavement condition rating in the PMS database.

Table 2: NJDOT Pavement Management System Condition Thresholds

Pavement Condition	International Roughness Index Values (Inch/Mile)
Good	≤ 95
Fair	95 < Segment IRI Value < 170
Poor	≥ 170

Pavement condition was assessed both for its role in the nominal safety of a roadway and as surrogate measure of the *overall* condition of the roadway from a maintenance standpoint. It was assumed that roads with poor pavement condition are likely to have other maintenance related issues like poor lighting, worn pavement markings, degraded signage, and ADA non-compliant pedestrian facilities.

The analysis revealed that between 2016 and 2020, KSI pedestrian and bicycle crashes were more common on roads with *Fair* or *Poor* pavement conditions compared to the SRN. Segments with *Fair* or *Poor* pavement condition as determined by IRI value are overrepresented by a combined 16%. Due to this overrepresentation, the presence of *Fair* or *Poor* pavement conditions is recommended as a *Primary Risk Factor*.

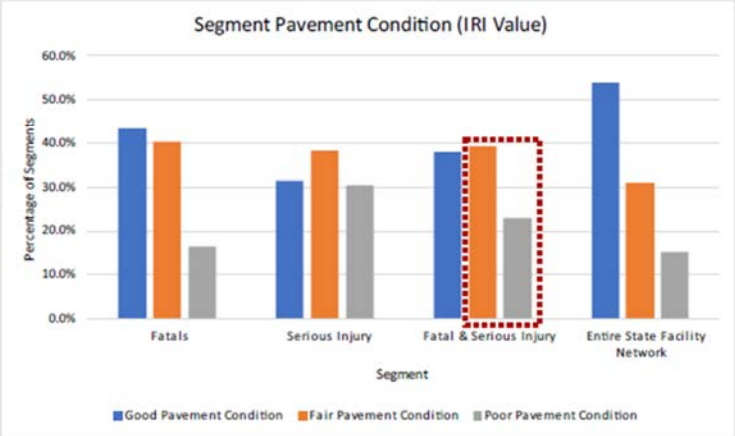


Fig. 14

[3] The International Roughness Index (IRI) is a standard method used to measure the roughness or unevenness of a roadway surface. It is a numerical value calculated based on the vertical deviations of the pavement surface from a straight line, measured in millimeters per meter of distance. The IRI is widely used as a measure of pavement condition, with higher values indicating rougher surfaces and potentially more uncomfortable or dangerous driving conditions. The IRI can also be used to identify areas of pavement in need of repair or maintenance.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Posted Speed Limit

The relationship between crash severity and vehicle operating speeds is well documented. As vehicle speeds increase, the force of impact also increases, resulting in more severe injuries and damage to the pedestrians, cyclists, and vehicle occupants involved. Moreover, the likelihood of a crash occurring also increases with higher speeds, as drivers have less time to react to unexpected events and stop their vehicles. Studies have shown that even small increases in speed can have a significant impact on the severity of a crash[4].

Though the relationship between crash severity and vehicle speed is clear, the analysis performed indicates that KSI pedestrian and bicycle crashes occur more commonly on roads with *lower* speed limits. Figures 15 and 16 explore this relationship. This discrepancy is the likely the result of differences in pedestrian and cyclist exposure to high-speed facilities (45 MPH and above). Facilities with posted speed limits of 45 MPH and above are less likely to be in areas with high pedestrian and bicycle volumes. While facilities with lower posted speed limits are likely to be in urban areas where pedestrians and bicycle trips are abundant. It is important to remember that the posted speed limit of a facility does not necessarily equate to the facility's vehicle operating speeds. It is possible that operating speeds exceed the posted speed limit on many State facilities, and that a study with more data could provide additional insight into the relationship between operating speeds and pedestrian and bicycle crashes.

Figure 15 shows that posted speeds limits below 45 MPH are clearly overrepresented at KSI crash locations, with approximately 46.6% of crash segments occurring within these areas. In contrast, only 28.2% of the entire State Roadway Network has a posted speed limit of below 45 MPH. The proposed systemic scoring system should consider whether a segment possesses a posted speed limit of less than 45 MPH to address the overrepresentation of these areas in KSI crashes.

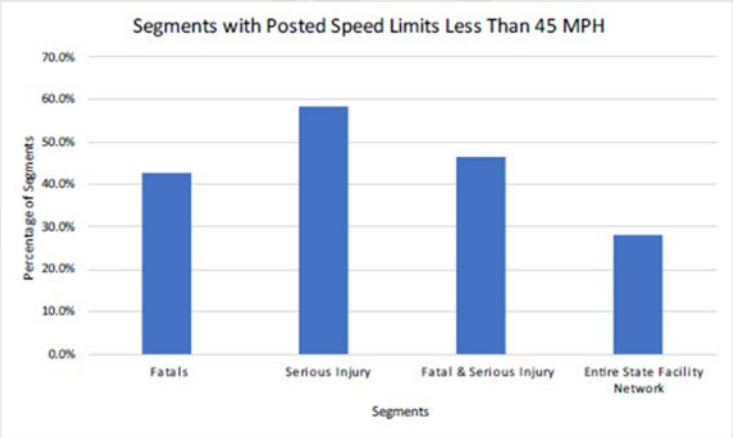


Fig. 15

Figure 16 provides additional context for this feature, summarizing the prevalence of different posted speed limits among KSI pedestrian and bicycle crash locations and the State Roadway Network. Segments with posted speed limits between 30 MPH and 40 MPH are overrepresented by a combined 17.2%. Posted speed limits of 25 MPH or less were not included

[4] Donnell, E., Kersavage, K., & Fontana Tierney, L. (2018, January). *Self-Enforcing Roadways: A Guidance Report*. FHWA. https://www.fhwa.dot.gov/publications/research/safety/17098/index.cfm

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

because they comprise less than 5% of the KSI pedestrian and bicycle crash segments. Due to this overrepresentation, the presence of a posted speed limit between 30 MPH and 40 MPH on a segment is recommended as a *Primary Risk Factor*.

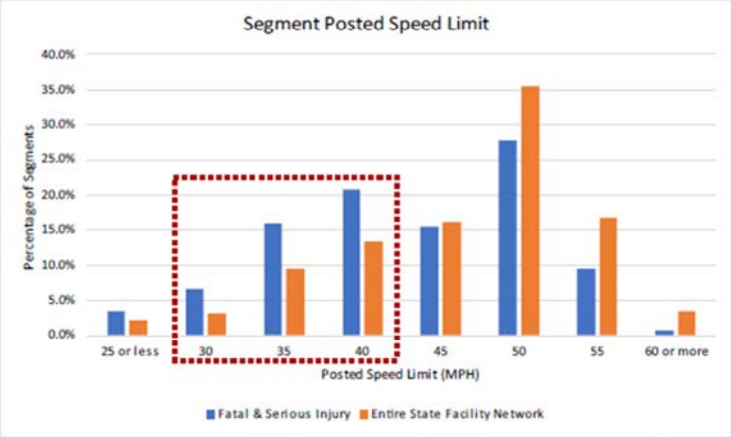


Fig. 16

Median Width

Figure 17 displays the percentage of 1/10th mile segments by median width; the figure compares segments that have experienced a fatal or serious injury pedestrian or bicycle crash to the SRN. Segments with median widths of 10' to 29' are overrepresented by a combined 3.7%. Due to this overrepresentation, the presence of medians between 10' and 29' in width is recommended as a *Secondary Risk Factor*.

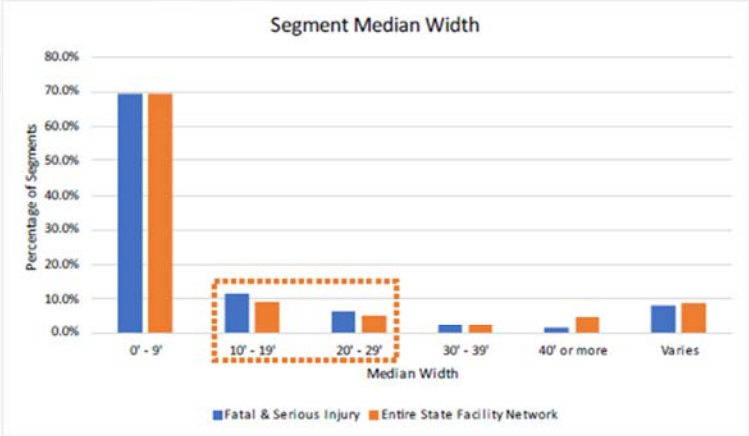


Fig. 17

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Median Type

Medians are a crucial element of roadway design; they can influence safety and the context of the road. The presence of a median is typically correlated with its functional classification, posted speed limit, and volume, all of which influence pedestrian safety on the roadway. Moreover, positive medians ("Jersey" barriers) often are installed as safety measure for vehicles and a deterrent for pedestrians crossing mid-block, acting as a barrier that pedestrians must hurdle before completing their crossing. Positive barriers are particularly impactful at locations with long distances between controlled crossing points.

Figure 18 displays how KSI pedestrian and bicycle crashes vary by median type compared to the SRN. Segments with curbed or positive medians were overrepresented by 3.9% and 5.3% respectively. Due to this overrepresentation, the presence of a curbed median is recommended as *Secondary Risk Factor* and the presence of a positive median is recommended as a *Primary Risk Factor*. The presence of curbed or positive medians are regarded as separate risk factors because they represent discrete choices. Median types are not a continuum like posted speed limits or roadway width.

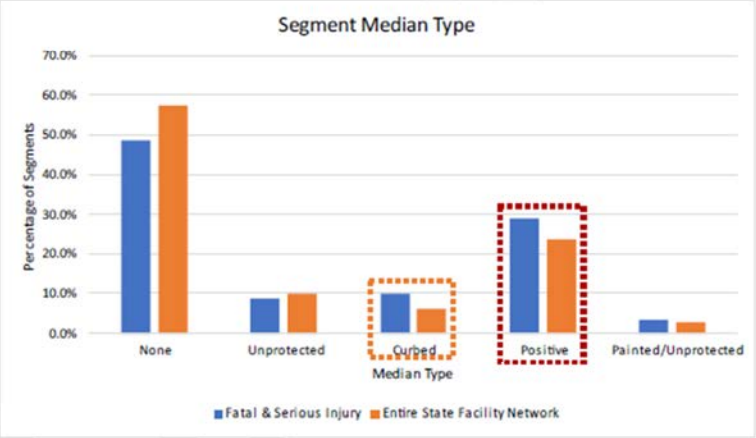


Fig. 18

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Bus Stops within 50' of Segment

Bus stops are centers of pedestrian and bicycle activity and provide a vital service for those without access to a personal vehicle. Historically, bus stops are often associated with higher rates of pedestrian and bicycle crashes, likely due to increased pedestrian and bicycle activity in the vicinity of bus stops[5]. Moreover, bus stops are often located in dense areas where pedestrian volumes are high and interactions between vulnerable road users and vehicles are frequent. The presence of a bus stop has an impact on pedestrian safety; the placement of bus stops may affect the visibility of pedestrians and cyclists, increasing the risk of crashes. Figure 19 and Figure 20 explore the relationship between KSI pedestrian and bicycle crashes and the presence of bus stops.

The analysis revealed that between 2016 and 2020, KSI pedestrian and bicycle crashes were more common on segments with one (1) or more bus stops within 50'. KSI pedestrian and bicycle crash segments were examined to determine their proximity to a school using the Bus Stops of NJ Transit by Line layer created and maintained by NJ Transit and housed on the NJGIN Open Data website. A similar analysis was performed on the SRN. This assessment determined that 69.8% of KSI pedestrian and bicycle crash segments had one (1) or more bus stops within 50', while only 41.4% of the State Roadway Network could make the same claim. This indicates that the presence of a bus stop is overrepresented at KSI pedestrian and bicycle crash locations.

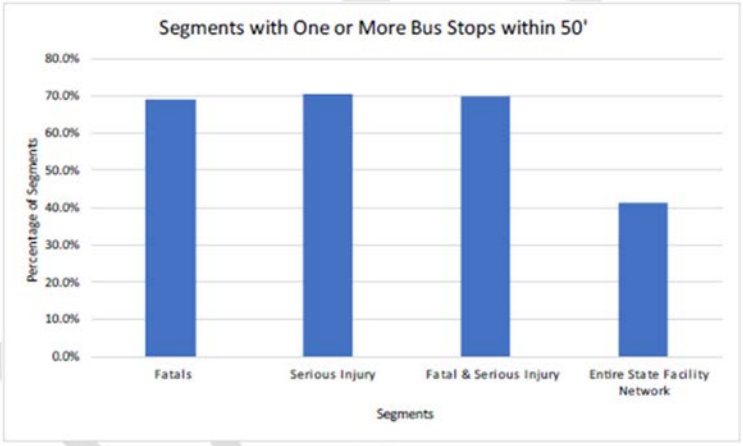


Fig. 19

Figure 20 provides additional context for this feature, summarizing the prevalence of KSI pedestrian and bicycle crashes near bus stops. Segments with two (2) or more bus stops within 50' are overrepresented by a combined 27.9%. Due to this overrepresentation, the presence of two (2) or more bus stops within 50' of a segment is recommended as a *Primary Risk Factor*.

[5] Ulak, M. B., Kocatepe, A., Yazici, A., Ozguven, E. E., & Kumar, A. (2020). A stop safety index to address pedestrian safety around bus stops. *Safety Science*, *133*, 105017. https://doi.org/10.1016/j.ssci.2020.105017

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

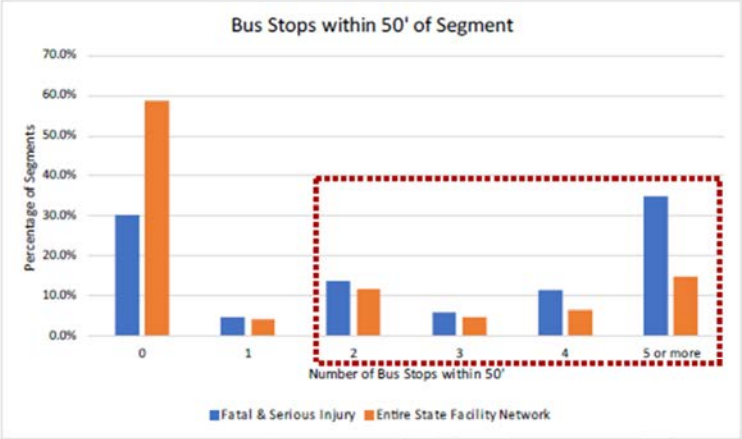


Fig. 20

Pavement Width

The width of pavement is generally associated with road volumes and operating speeds. Typically, wider roads have higher volumes and operating speeds, which are associated with worse safety outcomes for pedestrians and cyclists. Furthermore, wider roads increase the exposure of pedestrians and bicyclists to traffic. This increases the physical distance that pedestrians must cross and the amount of time they are vulnerable to traffic, further compromising their safety.

Pavement width was analyzed to determine if crash segments were more likely to occur on wider roads compared to the SRN. Figure 21 displays the percentage of 1/10th mile segments with a pavement width of 40' or greater; the figure compares segments that have experienced a fatal or serious injury pedestrian or bicycle crash to the entire network of State roads. Crash Segments were typically wider than the SRN, with 74.7% of Crash Segments possessing a pavement width of 40' or more compared to only 51.8% of the SRN. The presence of pavement widths of 40' or more is likely an overrepresented feature at KSI crash locations.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

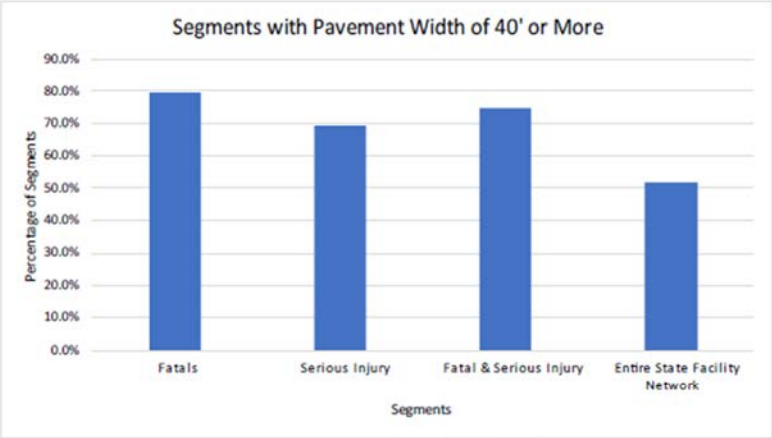


Fig. 21

Figure 22 provides additional context for this feature, summarizing the prevalence of different pavement widths among KSI pedestrian and bicycle crash locations and the SRN. Segments with pavement widths between 40' and 79' are overrepresented by a combined 20.2%. Due to this overrepresentation, the presence pavement widths between 40' and 79' within a segment is recommended as a *Primary Risk Factor*.

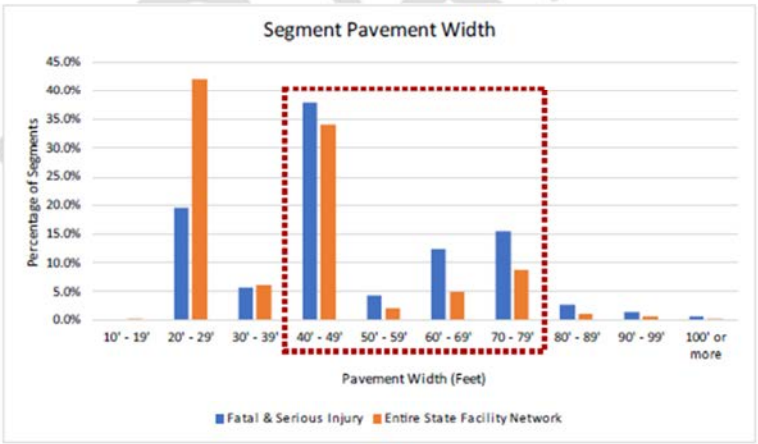


Fig. 22

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

AADT

AADT on KSI Crash Segments and the SRN was reviewed to assess if fatal and serious injury pedestrian and cyclist crashes were more likely on high volume roads. AADT data for roadway segments was gathered from the SLD Database. Figure 23 displays the percentage of segments with an AADT of 15,000 Vehicles Per Day (VPD) or greater on KSI pedestrian and bicycle crash segments and the network of State roads. The analysis revealed that segments that experienced a KSI pedestrian or bicycle crash typically had higher volumes than the SRN. Approximately 77.4% of KSI Crash Segments had a volume of 15,000 VPD or more compared to 56.5% of the SRN, indicating that higher volume roads are overrepresented among fatal and serious injury pedestrian and bicycle crash locations.

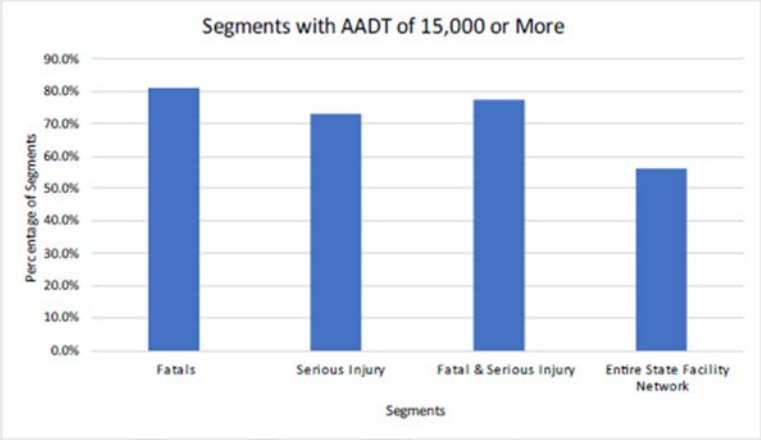


Fig. 23

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Figures 24 and 25 provide a more detailed picture of AADT on KSI Crash Segments and the SRN. Segments with an AADT between 15,000 and 44,999 VPD are overrepresented by a combined 20.9%. Due to this overrepresentation, the presence of AADT between 15,000 and 44,999 VPD within a segment is recommended as a *Primary Risk Factor*.

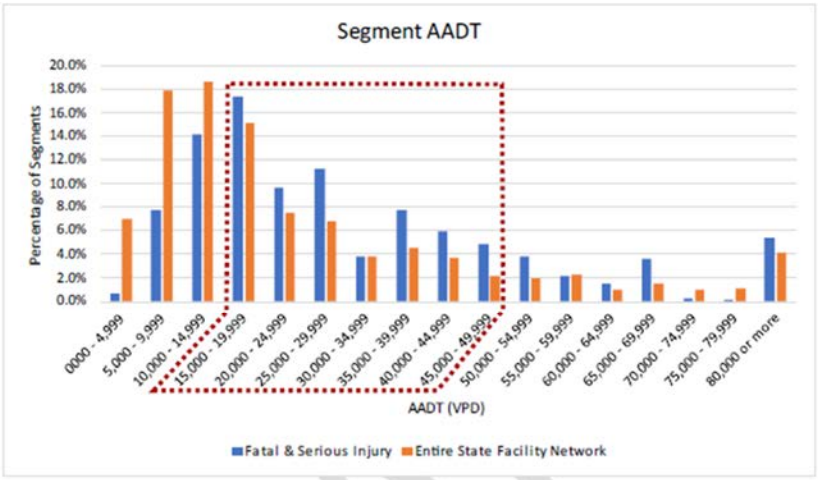


Fig. 24

Figure 25 displays a cumulative distribution curve for the AADT on KSI Crash Segments and the SRN. The cumulative distribution curve reiterates the results of Figure 24, showing that volumes on crash segments are generally higher than on State roads.

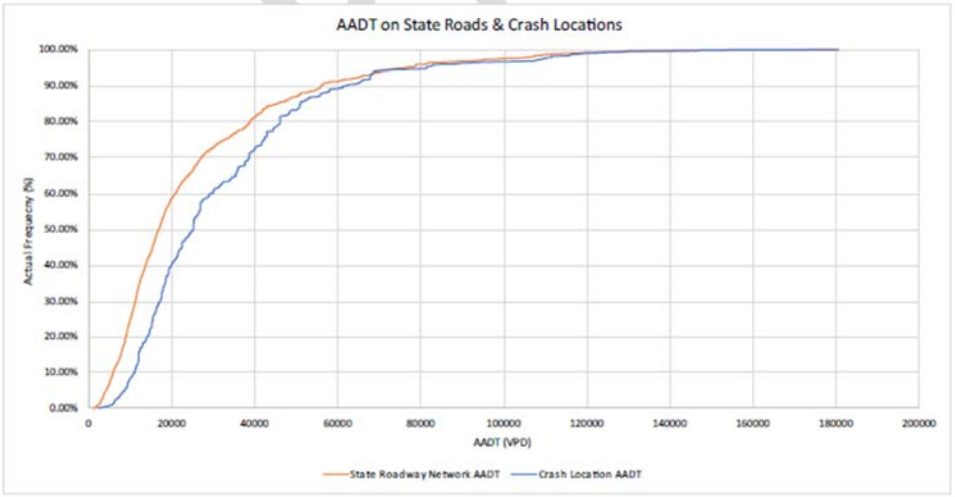


Fig. 25

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Municipal Population Density

Municipal population density on KSI Crash Segments and the SRN was reviewed to assess if fatal and serious injury pedestrian and cyclist crashes were more likely in densely populated areas of New Jersey. Population density data was developed using a combination of US Census and NJGIN data. Municipal population densities were compared to New Jersey's population density (1,062 $\frac{Persons}{Mile^2}$). The population density of New Jersey was determined using US Census Population Estimates for July 1, 2022 (9,261,699 persons) and the State's size of 8,722 miles^2.

Figure 26 illustrates the percentage of segments within a municipality with a population density three times greater (300%) than that of New Jersey or approximately 3,186 $\frac{Persons}{Mile^2}$. The analysis revealed that KSI pedestrian and bicycle crashes were more frequent on State facilities in densely populated municipalities. Around 48.0% of KSI Crash Segments occurred in municipalities with a population density equivalent to 300% of the State's population density, while only 23.1% of roadway segments across the entire SRN were in municipalities with such high population density.

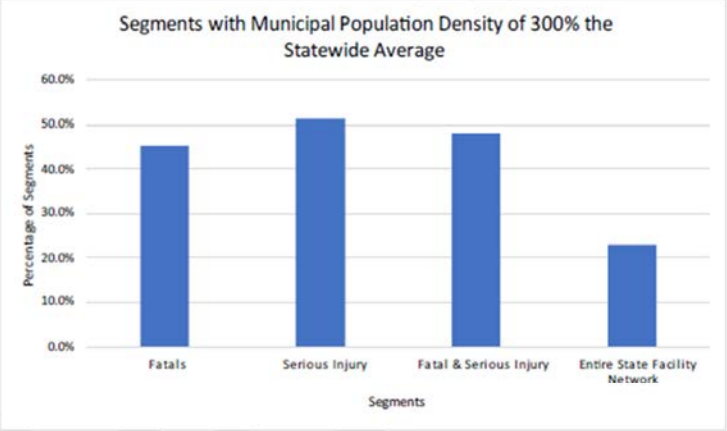


Fig. 26

Figure 27 provides additional context for this feature, summarizing the prevalence of different population densities among KSI crash locations and the SRN. The analysis revealed that fatal and serious injury pedestrian and bicycle crashes become more common as the density of a municipality increases. Between 200% and 300% of New Jersey's population density, KSI Crash Segments are slightly overrepresented when compared to the entire network of State facilities. Segments within a within a municipality possessing a population density more than 300% (3,186 $\frac{Persons}{Mile^2}$) that of New Jersey are overrepresented by 24.9%. Due to this overrepresentation, the presence of a municipal population density of 3,186 $\frac{Persons}{Mile^2}$ is recommended as a *Primary Risk Factor*.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

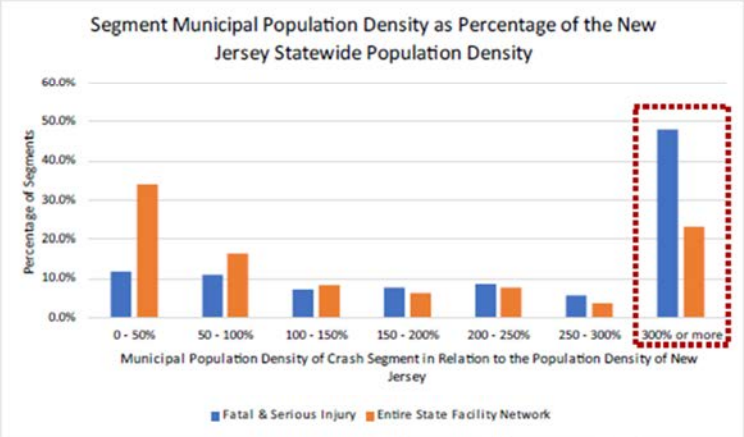


Fig. 27

Functional Classification

Road functional classification is a system used to categorize roads based on their intended purpose and level of importance within the transportation network. The classification of a road is typically determined by its design, traffic volume, and the types of land use it serves. Figure 28 displays the percentage of 1/10th mile segments by functional classification; the figure compares segments that have experienced a fatal or serious injury pedestrian or bicycle crash to the SRN. Segments classified as Other Principal Arterials are overrepresented by 19.4%. Due to this overrepresentation, the presence of an Other Principal Arterial is recommended as a *Primary Risk Factor.*

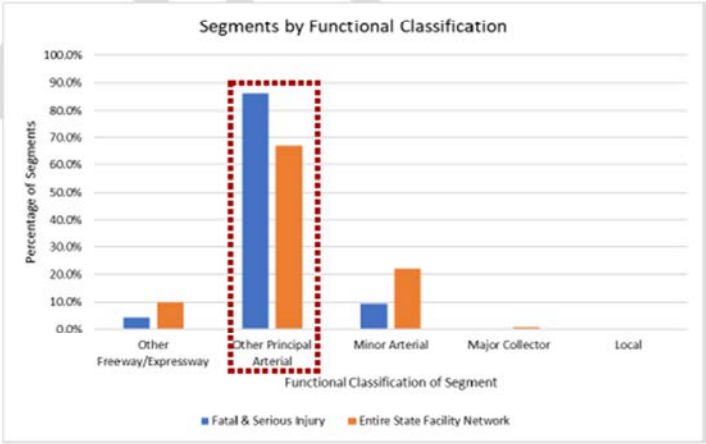


Fig. 28

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Area Type

Area type (urban vs rural) on KSI Crash Segments and the SRN was reviewed to assess whether fatal and serious injury pedestrian and cyclist crashes were more likely to occur in urban areas than rural areas. Urban and rural areas were determined using urban boundaries prepared by Michael Baker for NJDOT and FHWA using data from the 2020 Census. The urban and rural boundaries, once receiving approval from MPOs, NJDOT, and FHWA, will be added to the SLD's Urban Code Table. The data used for this field represents an in-progress version of the urban boundaries, from August 2023. Minimal changes are expected during FHWA's review process prior to final approval. Figure 29 displays the percentage of 1/10th mile segments by area type; the figure compares segments that have experienced a fatal or serious injury pedestrian or bicycle crash to the SRN. Segments classified as residing within an urban area are overrepresented by 13.5%. Due to this overrepresentation, the presence of urban areas is recommended as a *Primary Risk Factor*.

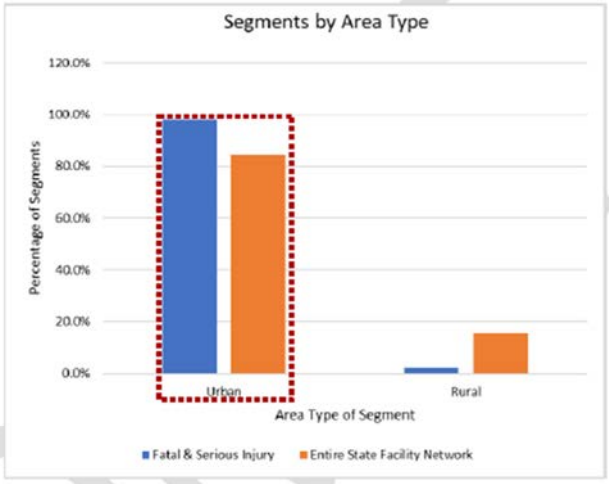


Fig. 29

Approved Mid-Block Crosswalks

Mid-block crosswalks are critical to the safety of pedestrians and cyclists, especially where roads are wide and safe crossing points are few and far between. On the State Roadway Network, there are 63 approved mid-block crosswalks according to NJDOT's Traffic Regulation Orders (TROs) webpage. The routes with the most approved mid-block crosswalks are US 9 (10 mid-block crosswalks), NJ 36 (eight mid-block crosswalks), and NJ 35 (six mid-block crosswalks).

The presence of an approved mid-block crosswalk on KSI Crash Segments and the SRN was reviewed to assess whether fatal and serious injury pedestrian and cyclist crashes were more likely near mid-block crossing locations. Figure 30 displays the percentage of 1/10th mile segments by presence of an approved mid-block crosswalk. Between 2016 and 2020, only one KSI pedestrian or cyclist crash occurred on a segment with an approved mid-block crosswalk. Since the data does not indicate that KSI pedestrian and cyclist crashes are more likely at locations with an approved mid-block crosswalk, this feature is not recommended as a risk factor.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

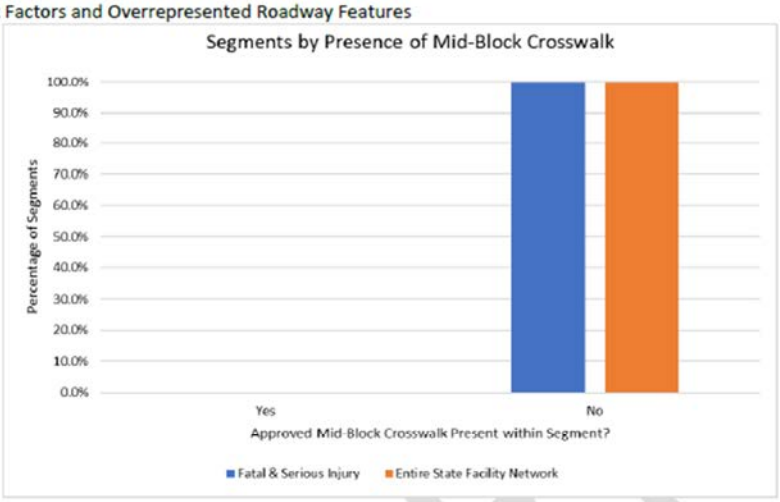


Fig. 30

Heavy Vehicle Volumes

Heavy vehicles present a unique danger to pedestrians and cyclists because they take longer to stop than smaller vehicles and often have limited visibility due to their size. Roads with high volumes of heavy vehicles often possess higher speed limits and overall traffic volumes. Additionally, roads designed to accommodate heavy vehicles often have large intersections and turning radii that facilitate turning movements for trucks. While this facilitates freight mobility throughout New Jersey, it can also encourage higher speeds by passenger cars and as a result more severe crashes.

Heavy vehicle volumes on KSI Crash Segments and the SRN were reviewed to assess whether fatal and serious injury pedestrian and bicycle crashes were more likely on roads with high truck volumes. Heavy vehicle volumes (single-unit and combination-unit trucks) on the SRN were collected from NJDOT's HPMS database. Included in the heavy vehicle volumes are the following vehicle types:

- 2-Axle, 4 Tire Single Unit Truck
- 2-Axle, 6 Tire Single Unit Truck
- 3-Axle Single Unit Truck
- 4-Axle Single Unit Truck
- 4 or Less Axle Single Trailer Truck
- 5 Axle Single Trailer Truck
- 6 or More Axle Single Trailer Truck
- 5 Axle Multi-Trailer Truck
- 6 Axle Multi-Trailer Truck
- 7 or More Axle Multi-Trailer Truck

Figure 31 displays the percentage of segments with a daily heavy vehicle volume of 1,000 VPD or greater on KSI Pedestrian and bicycle crash segments and the network of State roads. The analysis revealed that segments that experienced a KSI pedestrian or bicycle crash typically had a higher heavy vehicle volumes than the SRN. Approximately 49.2% of KSI Crash Segments had a daily heavy vehicle volume of 1,000 VPD or more compared to 38.3% of the SRN, indicating that routes with higher heavy vehicle volumes are overrepresented among fatal and serious injury pedestrian and bicycle crash locations.

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

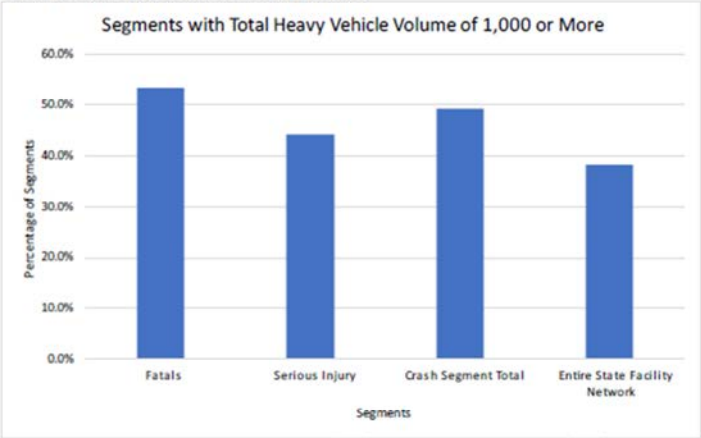


Fig. 31

Figure 32 provides a more detailed overview of heavy vehicle volumes on KSI Crash Segments and the SRN. Segments with a heavy vehicle volume between 1,000 and 2,499 VPD are overrepresented by a combined 12.5%. Due to this overrepresentation, the presence of a daily heavy vehicle volume between 1,000 and 2,499 VPD within a segment is recommended as a *Primary Risk Factor*.

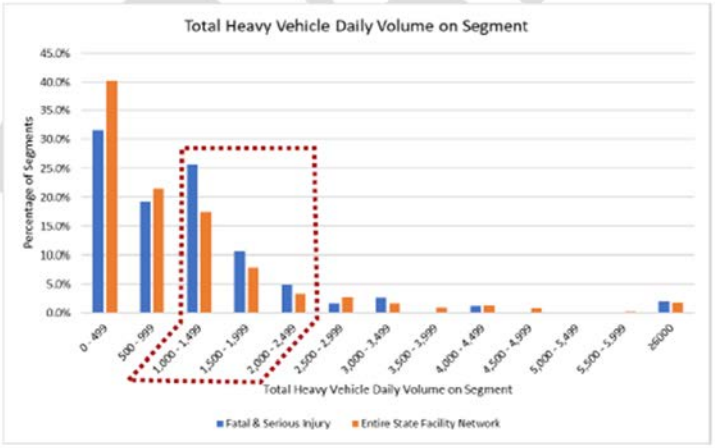


Fig. 32

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Treatable Risks

NCHRP 893: Systemic Pedestrian Safety Analysis defines risk factors as "any attribute, characteristic, or exposure of an individual or roadway that increases the likelihood of a crash."[6] Treatable risk factors are those for which a corresponding treatment is available. The features examined earlier within this report represent the set of risk factors for which a comprehensive and reasonably accurate statewide dataset was available. Table 3 links each of the risk factors examined thus far and links them to a treatable risk or risks.

Table 3: Treatable Risk Factors

Variable	Associated/Correlated Treatable Risk Factors
Total Intersections per 1/10th Mile Segment	• Complexity of roadway (distracting/confusing drivers and pedestrians) • Frequency of access points • Number of conflict points
Unsignalized Intersections per 1/10th Mile Segment	• Complexity of roadway (distracting/confusing drivers and pedestrians) • Frequency of access points • Number of conflict points
Signalized Intersections per 1/10th Mile Segment	• Complexity of roadway (distracting/confusing drivers and pedestrians) • Frequency of access points • Number of conflict points
Side Street Intersection Approaches per 1/10th Mile Segment	• Complexity of roadway (distracting/confusing drivers and pedestrians) • Frequency of access points • Number of conflict points
Whether the segment was within an NJDEP Overburdened Community	• Increased pedestrian exposure • Roadway condition and compliance with design standards • Missing pedestrian facilities
Number of Through Lanes on Segment	• Long crossing distances and times
Number of Schools within 1/4th Mile of Segment	• Increased pedestrian exposure (children walking to school)
Pavement Condition using Pavement Management Systems Data	• Roadway condition and compliance with design standards
Posted Speed Limit	• High speed traffic • Long stopping distances
Median Width of Segment	• Long crossing distances and times
Median Type of Segment	• High speed traffic • Long crossing distances and times • Infrequent crossing points
Bus Stops within 50' of Segment	• Increased pedestrian exposure (individuals using transit) • Poor pedestrian visibility at transit stops
Pavement Width	• Long crossing distances and times • High speed traffic
AADT	• High speed traffic • Increased exposure to traffic when crossing
Municipal Population Density of Segment	• Increased pedestrian exposure
Functional Classification of Segment	• Infrequent crossing points • High speed traffic
Urban Area	• Increased pedestrian activity exposure
Total Heavy Vehicle Volume	• Increased exposure to traffic when crossing • Long stopping distances

[6] Thomas, L., Sandt, L., Zegeer, C. V., Kumfer, W., Lang, K., Lan, B., Horowitz, Z., Butsick, A., Toole, J., & Schneider, R. J. (2018). Systemic Pedestrian Safety Analysis. In *Transportation Research Board eBooks*. https://doi.org/10.17226/25255

Systemic Safety: KSI Assessment, Mapping, and Data Coding

Risk Factors and Overrepresented Roadway Features

Conclusion

Using the methodology developed in NCHRP 893: Systemic Pedestrian Safety Analysis (2018), Steps 3 and 4, a Systemic Scoring System was developed (Table 1). Primary and Secondary Risk Factors were identified by determining whether they were overrepresented among KSI pedestrian and bicycle crash locations on NJ and US Routes. Risk Factors were then used to develop a Systemic Scoring System to be applied to the network of US and NJ Routes to identify potential treatment sites. The Systemic Scoring System will be applied to the State Roadway Network in GIS and each 1/10th mile segment will be assessed to determine if Primary and Secondary Risk Factors are present. This GIS network will be provided to NJDOT to use in its Vulnerable Road User assessment.

Appendix D: Existing New Jersey + Safety Resources

NJDOT Resource Centers

NJDOT Safety Resource Center

DOT-Safety.ResourceCenter@dot.nj.gov

NJDOT Safety Resource Center is the one-stop destination for roadway safety information, tips, and other tools to help New Jersey reach zero deaths on roadways. The Safety Resource Center includes information about safety projects and programs, navigating funding and grant opportunities, trainings from industry experts, safety campaign materials, resources, and more.

Local Aid Resource Center

njdotlocalaidrc.com

The Local Aid Resource Center assists local public agencies with allocating funding to advance investments that lead to successful projects.

The New Jersey Bicycle and Pedestrian Resource Center

njbikeped.org

The Bicycle and Pedestrian Resource Center assists in creating safer and more accessible places to walk, bicycle, or travel by other low speed-wheeled devices through primary research, education, and dissemination of information about best practices in policy and design.

New Jersey Safe Routes Resource Center

saferoutesnj.org

The Safe Routes Resource Center provides information to schools and communities to prioritize and implement opportunities for people to walk, bike, or travel by other wheeled devices. The Resource Center provides information on funding, educational opportunities, research, policies, and contacts for Safe Routes Regional Coordinators. The Safe Routes Academy provides training to the eight Transportation Management Associations in New Jersey to implement the Safe Routes to School Program. The Academy offers webinars for parents, teachers, students, municipal leaders, local volunteers, and anyone else interested in improving conditions for walking and bicycling. There is also a Crossing Guard Working Group which includes representatives from NJDOT, NJ Department of Highway Traffic Safety (NJDHTS), NJ Department of Health, J.A. Montgomery, NJ State Association of Chiefs of Police, the Brain Injury

Alliance, AAA, and the NJ Bike & Walk Coalition. Additionally, NJDHTS and the Occupational Safety and Health Administration have developed a crossing guard training program to train others to provide instruction for crossing guards. New Jersey Crossing Guards (njcrossingguards.org)

NJDOT Planning and Data Tools

Strategic Highway Safety Plan (SHSP)

Toward Zero Deaths NJ

saferoadsforallnj.com

The New Jersey SHSP is a document that serves as a framework to reduce serious injuries and fatalities on all public roads under state, county, or local jurisdiction. The emphasis areas of the plan include Equity, Lane Departure, Intersections, Driver Behavior, Pedestrians and Bicyclists, Vulnerable Road Users, and Data.

Bicycle and Pedestrian Advisory Council

The mission of the New Jersey Bicycle and Pedestrian Advisory Council (NJ BPAC) is to advise, coordinate, and collaborate with NJDOT and other state, regional, and local agencies on best practices that advance walking, bicycling, transit, and micromobility as safe transportation modes for all people, with a focus on equity, safety, public health, and resiliency goals.

Bicycle and Pedestrian Master Plan

Provides vision, goals, and strategies to achieve a transportation system in which walking and bicycling are routine, convenient, and secure throughout the state.

Bicycle Safety Action Plan & Toolbox

This plan and toolbox recommend actions to reduce bicyclist fatalities and serious injuries.

Pedestrian Safety Action Plan & Toolbox

This plan and toolbox recommend actions to reduce pedestrian fatalities and serious injuries.

Complete and Green Streets for All

This provides a model Complete Streets policy and guidance resource.

Safety Voyager

This online tool provides a quick and easy visual perspective of crash data. By providing 2D and 3D graphical displays, Safety Voyager quickly shows a comparative view of crashes with a defined area, municipality or county as determined by the user.

Strategic Highway Safety Plan Data Viewer

This mapping tool displays data such as fatal and serious injury crashes, road safety audits, and bicycle and pedestrian corridors. The data can assist all state MPOs in planning improvements in their local transportation system. This tool was developed for SHSP implementation. This mapping tool is administered though the NJTPA but provides statewide information.

NJDOT Implementation — Funding and Assistance Programs

Under four primary federal funding programs – and with state funding – NJDOT funds infrastructure projects for VRUs and key assistance programs.

Highway Safety Improvement Program (HSIP)

HSIP is a core federal-aid program intended to achieve a significant reduction in traffic fatalities and serious injuries by funding a variety of improvements that mitigate, remedy, and improve specific hazardous roadway conditions as well as influence roadway user behaviors. HSIP funds are subdivided among various program areas.

Congestion Mitigation and Air Quality (CMAQ)

The CMAQ program funds activities that improve air quality and reduce congestion in non-attainment areas.

Statewide Planning and Research (SPR)

SPR federal funding for planning and research activities has been utilized by NJDOT to fund the resource centers.

Transportation Alternatives Program (TAP)

TAP provides federal funding for bicycle and pedestrian improvements.

Within these four programs officially outlined in the State Transportation Improvement Program (STIP), NJDOT has funded the following assistance programs that offset costs to local agencies and stakeholders.

Bicycle and Pedestrian Planning Assistance

This program provides consulting experts with experience in local bicycle and pedestrian planning to complete studies at no cost to local agencies as part of NJDOT's CMAQ funds.

Safe Routes to School (SRTS) Support Program

The SRTS Support Program offers the potential to fund infrastructure and encouragement and education programs (as discussed in **Safe Routes Resource Center** section). Focusing on SRTS Support Program infrastructure funding – projects include planning, design, and construction of sidewalks, crosswalks, signals, traffic-calming, and bicycle facilities within 2 miles of K-12 schools.

The SRTS Design Assistance Program provides professional consultant services to assist local agencies with the development of plans, specifications, and estimates for their SRTS projects.

Safe Streets to Transit

This program funds pedestrian and bicycle safety improvements in the vicinity of transit facilities and along routes to bus stops and rail stations.

Road Safety Audits (DVRPC, SJTPO, NJTPA)

RSAs entail a formal safety performance examination by an independent, multidisciplinary team to report on safety issues and opportunities for improvement for all road users. These audits are funded by NJDOT using HSIP Planning funds in collaboration with the MPOs.

Local Safety Programs

This includes funding programs to make travel safer and more reliable for everyone. These programs are administered though the MPOs, using HSIP funds.

NJTPA Planning and Data Tools

Regional Active Transportation Plan

Currently in progress, the plan aims to provide a safe and functional regional network of pedestrian and bicycle facilities to better connect where people live to where they need to go.

Level of Bicycle Compatibility and Connectivity Analysis

This statewide study provides an analysis of the road network to guide efforts to create a regional connected bicycle network (aka level of traffic stress). An interactive map is available to review the data at Level of Bicycle Compatibility (arcgis.com).

Developing SS4A for Local Road Safety Plans

NJTPA will collaborate with up to seven counties to develop Local Safety Action Plans with funding from 2023 SS4A program awards. Local Safety Action Plans are useful for effectively addressing safety, regardless of funding.

NJTPA Implementation Assistance

Complete Streets Technical Assistance

This assistance program provides knowledge, skills, and resources to develop Complete Streets-related solutions, including Walkable Community Workshops.

Complete Streets Demonstration Library

This library provides delineator posts, barricades, traffic signs, paint, stencils, barriers, traffic cones and other materials available for loan to communities who want to implement a temporary demonstration project. The library supports and encourages greater use of the temporary demonstration project approach.

NJTPA Education Program

Street Smart NJ

This is a public awareness and behavioral change campaign to improve pedestrian safety.

DVRPC Planning and Data Tools

Regional Safety Task Force

This program brings together a multi-disciplinary group of professionals to identify safety goals, strategies and resources.

Safe Streets and Roads For All (SS4A)

The MPO received $1,472,000 to develop a Comprehensive Safety Action Plan.

Bicycle and Pedestrian Count Programs

This program counts bicyclists and pedestrians to understand and plan for the role bicyclists and pedestrians play in our transportation network.

Regional Crash Data Viewer

This tool maps and charts fatal and serious-injury crashes in the DVRPC region.

Bicycle LTS and Connectivity Analysis

Level of Traffic Stress (LTS) is a road classification scheme based on the comfort of bicyclists using that road. The Connectivity Analysis determines which segments provide the most connections through the region. Overall, this analysis identifies and ranks roads where bicycle facility improvements would have the greatest local and regional connectivity benefit.

Access Score

This web map displays an analysis of the infrastructure and demographic characteristics around transit stations that relate to how supportive of bicycling and walking the area is and how much bike/ped activity could be occurring there.

Greater Philadelphia Pedestrian Portal

This interactive tool includes a sidewalk inventory, map portal, and analysis to support pedestrian projects.

DVRPC Implementation Assistance

Expo: Experimental Pop-up Program

This program assists communities in testing innovative transportation solutions for pedestrian, bicycle, transit, and roadway issues.

Regional Trails Program

This program provides planning assistance and financial support for completion of a regional network of multiuse trails.

Safe Routes to Transit

The program matches eligible communities with DVRPC staff to design and fund pedestrian and bike improvements around rail stations.

SJTPO Planning and Data Tools

Cumberland County Bike/Ped Safety Action Plan

This plan employs a strategic, data-and community-driven approach to identify and advance multiple bicycle and pedestrian safety projects on county and local roadways within Vineland, Millville, and Bridgeton.

Local Road Safety Plans (in development)

These plans build upon the foundation that is established by the SHSP, are funded through HSIP, and will provide the basis for customized implementation of safety countermeasures across each county, at the municipal and county levels.

SJTPO Implementation Assistance

Design Assistance Program for Safety Projects

This program provides consultant support to assist communities with the design of projects approved for federal HSIP funds through the Local Safety Program.

SJTPO Education Program

Traffic Safety Education Program

Partners with organizations and schools to educate the public on traffic safety.

Local Efforts

Safe Streets and Roads For All – 2022 Awards

Comprehensive Safety Action Plans

- Monmouth County — $1,180,000
- Hudson County — $480,000
- Union County — $699,271
- Essex County Department of Public Works — $400,000
- City of Paterson — $400,000
- New Jersey Sports and Exposition Authority — $877,600

Implementation

- City of Vineland — $20,000,000

Statewide Strategies for Education

Division of Highway Traffic Safety

This state division assists with education, public awareness, and enforcement. This includes education on the following laws:

- Bike Helmet Law — Requires people 17 and younger to wear a helmet when riding a bicycle, scooter, or skateboard.
- Safe Passing Law — Requires motorists to use due caution when passing vulnerable road users, such as cyclists or pedestrians.
- Stop and Stay Stopped Law / Crosswalk Law — Requires motorists to stop for pedestrians in a marked crosswalk.
- Move Over Law — Requires drivers approaching stopped emergency or service vehicles to move over one lane, or to slow down below the posted speed limit if changing lanes is unsafe.

NJ Motor Vehicle Commission

This commission manages the state's Driver Education Program. The *2022 New Jersey Driver Manual* reiterates the need for motorists to watch for and yield to pedestrians and cyclists on the roadway while driving and entering and exiting a vehicle. The manual notes that bicycles, skateboarders, and inline skaters have the same rights and responsibilities as motor vehicles. Also, bicycles ridden after dark must have front and rear lights, and a rear reflector.

Media Campaigns

Media campaigns have been implemented for the safe passing laws in the past. In the future, the HSIP will fund a line item in the Statewide Transportation Improvement Program (STIP) for "specified safety programs," which may include media campaigns.

Appendix E: Infrastructure Safety Countermeasures

Infrastructure Safety Countermeasures

The following countermeasures have been utilized by either NJDOT and/or local jurisdictions in New Jersey to address VRU concerns. Strategies with a blue icon indicate that they are one of the FHWA's proven safety countermeasures. The countermeasures that lack an icon are still commonly used strategies that have been proven to improve safety for VRUs. A reference to each best practice resource is included.

TABLE 8: CORRIDOR INFRASTRUCTURE SAFETY COUNTERMEASURES — COMMONLY USED IN NJ

FHWA Countermeasure / Example Image	Countermeasure	Description	Reference
	**20 mph speed limit**	A 20-mph speed limit on local streets reduces the severity of crashes, especially for VRUs.	FHWA: Appropriate Speed Limits for All Road Users
	**Lighting**	Lighting enhances visibility of VRUs along corridors, intersections, and midblock crossings.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Sidewalk or Shared Use Paths**	Sidewalks provide pedestrians space separated from vehicles so they can safely travel within the public right-of-way. Shared use paths are used by both bicyclists and pedestrians.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)

FHWA Countermeasure / Example Image	Countermeasure	Description	Reference
	**Standard Bicycle Lanes**	Bicycle lanes provide an exclusive space for bicycles that is distinct from roadway vehicles through pavement markings and signage.	BikeSafe: Bicycle Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Buffered Bicycle Lanes**	Buffered bike lanes add a painted buffer along the bike lane, typically between the motorized travel lane and the bike lane. If on-street parking is present, a buffer may be added between the bike lane and the parking lane.	BikeSafe: Bicycle Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Separated Bicycle Lanes**	Separated bike lanes are exclusive facilities for bicyclists that are located within or directly adjacent to the roadway and are physically separated from motor vehicle traffic with a vertical element.	BikeSafe: Bicycle Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Advisory Bicycle Lanes or Shoulders**	Advisory bike lanes are a dashed lane on the edge of the road that is signed for bicyclists. Motorists share the center of the road and may encroach into the advisory lane after yielding to anyone using the lane, to make room for oncoming traffic.	Small Town and Rural Design Guide: Advisory Shoulder - Rural Design Guide Edge Lane Roads: Edge Lane Roads - Home (advisorybikelanes.com)

FHWA Countermeasure / Example Image	Countermeasure	Description	Reference
	**Road Diet**	Road diets convert an existing four-lane undivided roadway to a three-lane roadway with a two-way left-turn lane. This improves safety by providing fewer lanes for pedestrians and bicyclists to cross. It improves safety for all road users by reducing the number of conflict points and providing space to install additional features such as refuge islands, bicycle lanes, wider sidewalks, and landscaping.	FHWA: Road Diets (Roadway Configuration)
	**Traffic Calming Chicanes**	Chicanes are a serpentine curve in a road added by design to slow vehicular speeds.	NACTO: Speed Management
	**Midblock Medians**	Medians provide a place for amenities, landscaping, and stormwater management, while calming traffic by requiring motorists to shift horizontally along the route.	NACTO: Speed Management

FHWA Countermeasure / Example Image	Countermeasure	Description	Reference
	**Speed Cushion/Table**	Speed tables raise the entire wheelbase of a vehicle to reduce its speed. Tables are a continuous, flat-topped, mid-block feature that may be used in conjunction with a crosswalk. Speed cushions have separations in the middle.	NACTO: Speed Management

TABLE 9: CROSSING INFRASTRUCTURE SAFETY COUNTERMEASURES – COMMONLY USED IN NJ

FHWA Countermeasure / Example Image	Countermeasure	Description	Reference Documents
	**High Visibility Crosswalk Marking**	Continental style crosswalk markings are more visible from a distance than parallel line markings.	FHWA: Crosswalk Visibility Enhancements
	**Rectangular Rapid Flashing Beacon (RRFB)**	RRFBs improve safety for pedestrians crossing the street at uncontrolled marked crosswalks.	FHWA: Rectangular Rapid Flashing Beacons (RRFB)
	**Pedestrian Hybrid Beacon (PHB)**	PHBs help pedestrians and bicyclists safely cross higher-speed roadways at midblock crossings and uncontrolled intersections by calling a red signal for motorists.	FHWA: Pedestrian Hybrid Beacons
	**Median Pedestrian Refuge Island**	Crossing islands protect pedestrians crossing multilane roads by including a refuge area in the median. This allows pedestrians to focus on one direction of traffic at a time as they cross the roadway.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)

FHWA Countermeasure / Example Image	Countermeasure	Description	Reference Documents
	**Curb Extensions**	Curb extensions or bulb- outs shorten the distance of a crosswalk by extending the sidewalk or curb line into the parking lane. This reduces the effective street width and reduces the time that pedestrians are in the street.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Raised Crosswalks**	Raised pedestrian crossings make pedestrians more prominent in a driver's field of vision by having them cross the road at the same level as the sidewalk. It also reduces vehicle speeds and improves vehicle yielding.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Raised Intersections**	Raised intersections are flush with the sidewalk, reinforce slow speeds, and encourage motorists to yield to pedestrians at the crosswalk.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Right Turn on Red Restrictions**	Restricting right turns on red protects pedestrians in signalized intersections from right-turning vehicles.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)

FHWA Countermeasure / Example Image	Countermeasure	Description	Reference Documents
	**Leading Pedestrian Interval (LPI)**	LPIs provide pedestrians with the WALK signal three to seven seconds before the motorists are allowed to proceed through the intersection. This positions pedestrians in the crosswalk by the time the traffic signal turns green, before motorists can start turning.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)
	**Roundabouts**	Roundabouts reduce conflict points, promote slower speeds, improve safety, and improve operational performance. They can provide dedicated space for people biking or walking.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)

Additional Infrastructure Safety Countermeasures

In addition to the existing countermeasures New Jersey and local jurisdictions have been using, more strategies could be considered to further the effort of reaching zero deaths by 2050. The table below contains proposed infrastructure safety countermeasures based on successes that they have had in other communities. These countermeasures can serve as innovative solutions to a variety of issues with pedestrian and bicyclist safety and prioritize the well-being of all VRUs.

TABLE 10: INFRASTRUCTURE SAFETY COUNTERMEASURES – NOT COMMON IN NJ

Example Image	Countermeasure	Description	Reference
	**Minicircles**	Minicircles can be used at intersections to reduce speeds where traffic volumes do not warrant a stop sign or signal.	NACTO: Mini Roundabout
	**Bike Signals**	Bicycle signals may be used to separate bicycle through movements from vehicle right turning movements for increased safety. They can also be used to facilitate complex bicycle movements or help people on bicycles navigate complex intersections safely. A leading bicycle interval, which uses a bicycle signal lens to provide three to five seconds of green time before the corresponding vehicle green indication, can be used to increase the visibility of bicyclists to motorists.	FHWA: Separated Bike Lane Design Guide NACTO: Bicycle Signal Heads MUTCD IA-16

Example Image	Countermeasure	Description	Reference
	**Bike Boxes**	Bike boxes are designated areas at the head of a traffic lane at a signalized intersection that provides bicyclists a way to get ahead of queuing traffic during the red signal phase. Placed between the stop line and the pedestrian crosswalk, bike boxes increase the visibility of queued bicyclists and provide them with the ability to start up and enter the intersection in front of motor vehicles when the signal turns green.	NACTO: Bike Boxes FHWA: Separated Bike Lane Design Guide MUTCD IA-18
	**Two-Stage Turn Queue Boxes**	Two-stage turn queue boxes allow bicyclists to make left turns at multilane intersections from a right-side separated bike lane, or right turns from a left-side separated bike lane. Cyclists who arrive on a green light travel into the intersection and pull out into the two-stage turn queue box away from through-moving bicycles and in front of cross-street traffic.	NACTO: Two-Stage Turn Queue Boxes | National Association of City Transportation Officials (nacto.org)

Example Image	Countermeasure	Description	Reference
	**Protected Intersections**	Protected intersections provide dedicated space to each mode of travel and give bicyclists the right-of-way over motor vehicles. This design improves the level of comfort and safety for people of all ages and abilities. It can reduce the likelihood of highspeed vehicle turns, improve sightlines, and dramatically reduce the distance and time during which people on bikes are exposed to conflict. Key features include a corner island, forward bicycle queueing area, driver yield zone, and pedestrian refuge median.	NACTO: Protected Intersections
	**PUFFIN**	PUFFIN stands for Pedestrian User-Friendly Intelligent Intersection. It uses active detection and passive presence of pedestrians in crosswalks to determine whether the pedestrian phase of a traffic signal or beacon should be extended or canceled. It includes a maximum traffic green timer, which must expire prior to the walk phase.	PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)

Example Image	Countermeasure	Description	Reference
	**Curb Radius Reduction**	Tighter curb radii can improve sight lines between driver and pedestrian, shorten the crossing distance, bring crosswalks closer to the intersection, and reduce speeds of right-turning vehicles.	WSDOT: STEP - Action Plan
	**Speed Safety Cameras**	Automated enforcement systems capture traffic violations, and when appropriate, a traffic citation is issued and mailed to the owner of the vehicle. When users are provided with warning signs of the presence of automated enforcement systems, they are more likely to reduce speed.	FHWA: Speed Safety Cameras