TO: NJ Target Zero Action Plan Working Group Members
FROM: targetzero@rutgers.edu
July 16, 2025

Memorandum: Draft Safer Roads Actions

Instructions

This document contains a draft version of **Safer Roads** actions for the New Jersey Target Zero Comprehensive Safety Action Plan.

The purpose of this draft is to invite constructive input, particularly from Working Group members who have actively contributed to the development of these ideas. The actions outlined here were informed by submissions to the Target Zero Input Form, feedback from breakout discussions at previous meetings, and comments submitted via email to the Commission or Working Group. Actions are not listed in any priority or order.

This is a working draft that is **intentionally incomplete**. It is shared to invite input and ensure that additional perspectives help shape the details of each action item.

Comments are due by **5pm on Friday, August 8, 2025.**

Comments will be reviewed and incorporated, where appropriate, into the draft actions. **Not all actions listed will necessarily be included in the final action plan.** Final prioritization and inclusion of actions will be at the discretion of the agency members of the New Jersey Target Zero Commission.

How to Comment on Actions

- Comments are public and attributed to an Adobe-enabled account or a guest account with Adobe.
- To support precise feedback, all pages include both page numbers and line numbers for easy reference.
- You may also send comments via email to targetzero@rutgers.edu. Comments made via email should specify the page and line numbers.

Comments are encouraged to include, but are not limited to:

- Reactions to the text and suggestions for edits.
- Suggestions for new directions for specific actions.
- Additional leads on examples, similar programs, research, or other resources.
- Constructive criticism of the actions and their ability to be implemented.

- Suggestions on how best to involve Commission member agencies and other agencies or organizations, either as the lead oversight agency or in a supportive capacity.
- Assistance in determining the appropriate cost, timeframe, priority, and evaluation strategy.
    - Timeframes should be considered with respect to these draft ranges:
        - **Immediate:** Under 1 year
        - **Short:** 1–3 years
        - **Medium:** 4–8 years
        - **Long:** More than 8 years
    - Cost, priority, and evaluation criteria are more variable and are undergoing additional development. If you would like to comment on these, please provide details to help categorize these action item criteria.

If you feel Safer People actions are missing from this list, you can submit ideas through the Target Zero Input Form or via email to targetzero@rutgers.edu **no later than 5pm on Friday, August 8, 2025**.

Each action comprises of the following:

1. A table of criteria for organization of key information, such as relevant objectives, potential lead and partner agencies and organizations, etc.,
2. A description of the action item, comprising of one or more specific actions,
3. Notes, which provide relevant background information and a summary of findings from staff and student research.

This draft is one of multiple anticipated documents to be shared with the working group. Draft Actions are intended to be shared via link by primary objective:

The Safe System Approach

- Safer People
- Safer Roads
- Safer Speeds
- Safer Vehicles
- Post-Crash Care

Additional Draft Priorities

- Safer Land Use
- Better Funding Processes
- More Technical Assistance
- Better Data and Evaluation
- More Efficient Project Delivery

Contents

Restrict Right Turns on Red

Action Item	Restrict Right Turns on Red
Key Objective	Safer Roads
Other Objectives	
Lead Agency	
Support Agencies	
Other Partners	
Action Type	Legislative
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Restrict right turns on red movements statewide to reduce conflicts between motor vehicles, pedestrians, and bicyclists at intersections.
- Improve pedestrian and cyclist safety by eliminating a major source of turning conflicts and unexpected vehicle movements during pedestrian crossing phases.
- Research and provide guidance on permitting limited exceptions where turns on red would not pose risk of fatal or serious injury crashes.
- Develop and publicize educational materials and provide updates to the driver education curriculum and manual to reflect changes to State law.
- Develop guidance on installing signage to inform drivers of the statewide ban of turn on red.
- Align intersection design with Safe System principles by prioritizing visibility, predictability, and reduced conflict zones for vulnerable road users.
- Support equity and accessibility goals by minimizing vehicular unpredictability that disproportionately affects neurodivergent individuals and users with mobility or sensory impairments.
- Phase implementation using data-driven criteria, starting with high-crash locations and expanding to ensure consistency across jurisdictions.

Notes

Allowing right turns on red (RTOR) was introduced during the 1970s fuel crisis to cut down on idling. However, in today’s congested, multimodal environments, this maneuver presents substantial safety risks, particularly for people walking, biking, or using mobility aids. RTOR increases conflict points at intersections where vulnerable users typically have the legal right of way.

The original motivations for permitting RTOR in New Jersey and nationwide stemmed from the gas crises of the 1970s. The main idea was that by reducing idling at intersections to save on gas consumption and improve local air quality. The Mineta Transportation Institute found that any emissions benefits from RTOR are only found in certain contexts and are marginal at best. With the growing adoption of electric vehicles and the improved efficiency of internal combustion engines, the resulting emissions reductions are now minimal. Furthermore, modern vehicles, both electric and internal combustion engine, are heavier and have dramatically higher acceleration rates than the vehicles of past decades, further strengthening the case for prohibiting RTOR from a VRU-safety perspective.

Further, Mineta found RTOR makes intersections generally less safe for pedestrians, bicyclists, and drivers. They recommend generally prohibiting RTOR but acknowledge the signage burden of widespread adoption within cities. A statewide restriction could reduce the signage burden by only requiring signage where RTOR would be permissible by limited exception.

Though recent studies are scarce, the body of research shows that allowing rights on red compromises safety for people who walk and bike. Studies cited by the Insurance Institute for Highway Safety have found that RTOR is associated with a 60% increase in pedestrian crashes and a doubling of bicycle crashes. City-level data further reinforces this concern: following a local ban in San Francisco's Tenderloin neighborhood, close calls dropped by 80% and driver encroachments on sidewalks during red lights declined by 70%. The policy was expanded citywide based on these results. Similarly, Washington, D.C. implemented a citywide RTOR ban in 2025, citing persistent conflict between vehicles and vulnerable road users.

National crash data supports broader action. In California alone, 217 traffic deaths were linked to RTOR at signalized intersections between 2011 and 2022. Over half of these deaths involved a pedestrian or cyclist. When University of Toronto researchers equipped drivers with glasses that tracked their eye movements, they found that drivers generally kept a close eye on pedestrians – but their attention was "heavily skewed" toward the left at intersections, as they looked for a gap in traffic so they could turn right.

The risks of RTOR extend beyond physical safety. The 2025 Advancing Complete Streets for Neurodivergent Individuals: A Primer from the New Jersey Bicycle and Pedestrian Resource Center highlights how conflicting vehicular and pedestrian movements introduce unpredictability that can be especially disorienting for neurodivergent users. The report recommends minimizing these conflicts, specifically discouraging turns during pedestrian crossing phases, as a key strategy for improving clarity, comfort, and safety for people with autism and other cognitive processing differences.

Cambridge, MA has long banned RTOR citywide, showing that this policy is not new and can be part of standard urban street design. Local groups like the Asbury Park Complete Streets Coalition are pushing for the same in New Jersey. They say it might be complicated to change the rules, but protecting people is worth the effort.

Bicycle Signals and Improvements

Action Item	Leading Pedestrian Intervals
Key Objective	Safer Roads
Other Objectives	Safer People
Lead Agency	NJDOT
Support Agencies	MPOs
Other Partners	
Action Type	Design
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Add bicycle signals to the NJDOT Roadway Design Manual including engineering guidance for when they are beneficial for safety of all road users.
- Implement and improve bicycle signals at signalized intersections where they are appropriate to improve cyclist safety.
- Focus bicycle signal improvements specifically on exclusive bicycle phases and leading bicycle signal intervals.
- Ensure that bicycle signals are visible to both drivers and bicyclists and provide clear instructions.

Notes

Bicycle signals are a necessary part of the road for ensuring cyclist safety. At intersections, bicyclists are especially vulnerable to collisions. There are a variety of signals that can alert drivers to the presence of bicyclists and facilitate bicyclist navigation and safety. The Manual on Uniform Traffic Control Devices (MUTCD) provides standardization and guidance on bicycle signs, but these can often be overlooked by drivers. The most recent edition of the MUTCD includes standards for bicycle signals, which operate similar to traditional traffic signals. This new addition opens up many possibilities for bicycle signal improvements in New Jersey, where there are on average 2,000 bicycle-involved crashes per year and 585 youth (ages 19 and younger) bicycle-involved crashes a year.

A protected bicycle signal, for instance, involves a full signal phase for bicycles and a full turning phase for vehicles, preventing right hook crashes. With a protected bicycle signal, cyclists are permitted to cross an intersection, while motorists who are turning must wait. Exclusive bike phases are another method to protect cyclists. Exclusive Bicycle phases allow additional time for bicyclists to cross intersections while all vehicle traffic is stopped. For both treatments, bicycle signals can be active, with bicyclists pushing a button, or passive, which automatically detects the presence of a bicyclist. Studies show that bicycle signals improve bicycle safety at urban intersections, reducing conflicts with motorists and improving multimodal mobility.

The leading bicycle signal interval (LBI) is similar to a leading pedestrian interval (LPI), but gives bicyclists a several second head start to cross intersections. Leading bicycle signal intervals allow bicyclists to establish their presence on the road and possibly be clear of the intersection before vehicles start crossing. LBIs can be automatic or activated by bicyclists and are especially useful as "spot treatments" on intersections where turning vehicles may conflict with high bicycle traffic. A subtype of leading bicycle signal interval, split LBI, allows through bicycles and concurrent through vehicles to get a green indication, while turning vehicles are stopped. Although no crash reductions have been estimated yet for LBIs, it can be inferred that their success is similar to LPIs, which result in a 13% reduction in pedestrian-vehicle crashes.

New York City has implemented or piloted a variety of improved bicycle signals, including split LBI and fully split phase, which is when a dedicated turning lane for bicyclists has its own green turn arrow. Although the split LBI is still in its pilot phase, the fully split phase is wholly implemented and has reduced injury bicycle crashes by 54%.

Philadelphia and Washington, DC, have also implemented bicycle signals for especially complex and high-traffic intersections. Philadelphia has instituted an exclusive bicycle phase and lateral guidance markings on two major intersections, which has resulted in a reduction in turning vehicle conflicts with bicycles and ease of navigation for bicyclists. Washington, DC, began implementing bicycle signals for diagonal connections in a complex intersection, and has since expanded exclusive or split bicycle signals to 46 intersections. These signals have been shown to provide clearer direction to bicyclists in intersections and prevent collisions. In both locations, no formal studies or surveys have been conducted, but both have reported anecdotal success. These case studies display how bicycle signals can be used in New Jersey to reduce the number of pedestrian- and bicycle-involved crashes.

Bus Stop Safety Design and Improvements

Action Item	Bus Stop Design
Key Objective	Safer Roads
Other Objectives	Safer Land Use
Lead Agency	NJ TRANSIT
Support Agencies	NJ Dept. of Transportation, MPOs
Other Partners	Local & County bus/transit associations
Action Type	Design
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description:

- Redesign bus stops in areas with higher levels of pedestrian traffic to provide a safe space for them to wait for the bus.
- Plan and design areas around bus stops to be based on the target speed and volume of the road, not the existing conditions or the 85^{th} percentile.
- Plan bus stops for users of all types and abilities including the installation of accessibility features and install improved pedestrian-scale lighting for increased safety and security at bus stops.
- Prioritize resources at bus stops along high-injury networks and those with the higher number of boardings.
- Update NJDOT's access management code and desirable typical sections to include evidence-based interventions such as curb extensions, far-side stop placement, and safe driveway spacing.

Notes:

Pedestrians are at high risk near bus stops, especially where safety features are lacking. A 1998 study found that 89 percent of high-crash locations fall within 150 feet of a bus stop, rising to 90 percent within 70 feet of a crosswalk. The Safety | FHWA Pedestrian Safety Guide for Transit Agencies highlights best practices such as relocating bus stops to safer locations, adding sidewalks, and adjusting roadway design speeds to match pedestrian activity.

NACTO's Urban Street Design Guide recommends bus stops be designed based on target speed (typically 10–30 mph) and volume context rather than existing conditions. In high-traffic and high-speed areas, bus stops should be set as far back from the road as feasible. Placing bus stops farther back from vehicular travel lanes will ensure that pedestrians waiting for the bus are not up against a busy, arterial road where they are more likely to be involved in a lane departure or run-off-the-road traffic crash. Furthermore, in high foot-traffic areas, bus stop areas should be larger to accommodate the increased pedestrian demand. Adjusting how and where bus stops are designed can help support the Target Zero Goal by providing waiting areas that are functional, comfortable, and safe for transit users and other travelers.

FHWA research warns that driveways or curbside pull-outs near bus stops create "multiple-threat" situations where drivers cannot see crossing pedestrians. Bus bulb installations, curb extensions that allow buses to stop in-lane, can cut boarding delays by 15–30 seconds per stop, better ensure stops remain accessible, and reduce re-entry dangers. Elevated crossings, curb extensions, and refuge islands near stops further reduce pedestrian exposure and vehicle speeds. More recent studies confirm that general road safety features, such as medians, high-visibility crosswalks, and lighting, significantly lower crash rates. A 2024 crash causation analysis found these features, along with far-side stop placement and sidewalk availability, were strongly associated with fewer bus-stop-related crashes.

The North Jersey Transportation Planning Authority's (NJTPA) Bus Stop Safety Toolkit discusses techniques to improve pedestrian safety at bus stops. The report mentions that bus stops should have pedestrian-scale lighting, not typical roadway lighting. Roadway lighting is typically at 15-20 feet above the roadway, which does not provide adequate lighting for pedestrians on the sidewalk. Placing lights 12-20 feet above the sidewalk will provide better illumination for pedestrians and make them more visible to drivers. Doing so can help reduce pedestrian fatalities at bus stops and help us to reach zero traffic deaths.

The Bus Stop Safety Toolkit also discusses ways to ensure that bus stop design accounts for all types of transit users. Currently, the Americans with Disabilities Act requires bus stop designs to include accommodations for people with disabilities, but the NJTPA report recommends taking it a step further with universal design. **Universal design** would accommodate all users - pedestrians and cyclists - including people with disabilities as well as people with strollers, luggage, and children. In New Jersey, this now includes people with intellectual and developmental disabilities, including autism.

The Bus Stop Safety Toolkit, also mentions how to prioritize resources when updating bus stops to improve safety. Bus stops along high injury networks where vehicle speeds are higher and pedestrian fatalities are more common should be prioritized when making safety improvements. Examining boarding numbers is another tool that could be used when prioritizing resources. Looking at how many passengers board the bus at a particular stop can provide insight on to how many pedestrians are likely to gather at that bus stop. Doing so can help determine how much space is needed for people at each stop so they can wait to board in an area that is less likely to expose them to motor vehicles in the roadway.

In 2020, the New Jersey Department of Transportation released a Strategic Highway Safety Plan with a key emphasis on Transit Equity. This plan proposed a system for auditing 100 priority bus stops, selected based on crash data, bus stop audits, ridership levels, and existing infrastructure. These evaluations offered valuable insight into human behavior, safety indicators, and documentation methods that can be applied more broadly across public transportation stops. For example, learned insights can be applied to understand the needs and required resources of a popular bus stop on a busy, high-injury network roadway compared to a quiet bus stop at the end of a rural bus route. The plan underscores the critical importance of pedestrian and bicyclist safety in achieving the overarching goal of zero roadway fatalities.

With support from a consultant and advisory team, the New Jersey Strategic Highway Safety Plan developed a methodology for conducting audits and inventorying safety at transit stops. The methodology involves a systematic assessment using a weighted scoring framework to evaluate physical and contextual conditions that impact pedestrian safety. Key features documented include stop placement (near-side vs. far-side), presence of lighting and shelters, ADA accessibility, sidewalk conditions, traffic characteristics, crash history, ridership levels, and neighborhood socioeconomic data. Experts assign relative weights to these criteria, such as ADA compliance, ridership, and crash history, to generate a safety index for each stop.

This approach allows agencies to prioritize improvements where risk is highest and resources can have the greatest impact. This approach enables agencies to prioritize bicycle, pedestrian, ADA access, and other improvements for bus stops where the risk is highest and resources can deliver the greatest impact.

Increased Use of Complete and Green Streets Guidance

Action Item	Increased Use of Complete and Green Streets Guidance
Key Objective	Safer Roads
Other Objectives	
Lead Agency	NJDOT, NJDEP, MPOs
Support Agencies	
Other Partners	
Action Type	Policy
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	Update checklists for all project phases, including clean-up at end of construction; establish and communicate that compliance is mandatory; train in Complete and Green Streets and use of the checklists

Description

- Promote the adoption of Complete and Green Streets resolutions, policies, and ordinances by local jurisdictions using the Complete & Green Streets for All Model Complete Streets Policy & Guide.
- Increase use of the New Jersey Complete Streets Design Guide at the municipal, county and state levels to ensure all roadway and bridge projects include traffic safety infrastructure for all roadway users.
- Increase education and training for local government officials, engineers, and planners in use of both guides.
- Formally endorse the NACTO Urban Street Design Guide and Urban Bikeways Design Guide.
- Update the NJDOT Roadway Design Manual to incorporate guidance within Complete & Green Streets For All and ensure that the latest MUTCD, AASHTO, and NACTO guidance for non-motorized facilities are included. This should include universal design concepts to advance safe mobility options for individuals with intellectual and developmental disabilities.

- Increase state funding and technical assistance for local implementation of Complete and Green Streets, focused on prioritizing the needs of the underserved.

Notes

The NJDOT Complete Streets Design Guide presents methodologies for designing complete streets in a variety of settings, with attention to the specific needs of each type of municipality. It offers a comprehensive, community-tailored framework for applying these principles statewide. The Design Guide is intended to inform all projects that impact the public right-of-way, including the construction of new streets and improvements to existing roadways. The Design Guide can be used by municipal, county, and state agency staff, design professionals, private developers, community groups, and others involved in the planning and design of streets in New Jersey. To maximize its impact, it should be adopted as a formal requirement at all levels of government and be supported with additional funding and technical assistance, particularly for lower-resourced communities.

The Complete & Green Streets for All Model Complete Streets Policy & Guide is a one-stop resource for adopting and implementing Complete Streets policies and practices at the local level. The Guide is designed to provide assistance to anyone involved in developing or updating a policy. The document offers model policy language and ready-to-use checklists to assist with implementation. Word documents are provided so municipalities can cut and paste easily and craft Complete Streets policies that work for them.

Both the Complete Streets Design Guide and the Model Policy have been developed to assist in project selection, planning, design and development of proposed alternatives, as well as construction and maintenance. Additionally, formally endorsing the NACTO Urban Street Design Guide and Urban Bikeway Design Guide signals a strong commitment to advancing complete streets policies that prioritize safety, accessibility, and multimodal transportation. These guides provide cities with state-of-the-art, people-first design strategies rooted in real-world applications and best practices. The Urban Street Design Guide reimagines streets as vibrant public spaces, balancing movement and place-making, while the Urban Bikeways Design Guide offers comprehensive solutions for building safe, connected bike networks for riders of all ages and abilities. Endorsement empowers local agencies to implement proven design standards that support walkable, bikeable, and transit-friendly communities.

Adopting Complete Streets approaches is a proven way to create safer and more accessible transportation networks. Many NJ counties and municipalities have adopted Complete Streets policies, but with many of these older policies, there can be gaps in effective implementation. In contrast, policies developed using the Complete & Green Streets Design Guide tend to be more comprehensive, promoting more consistent implementation with fewer exemptions.

Complete Streets also advance broader goals. They direct improvements toward underserved neighborhoods, expand access to jobs and essential services, and grow economic benefits by improving retail performance and lowering healthcare costs. As the use of micromobility options such as e-bikes grows, Complete Streets are increasingly vital for providing safe and effective infrastructure for these lower-emission travel modes, which supports New Jersey's climate goals.

Early Action Safety Treatments

Action Item	Early Action Safety Treatments
Key Objective	Safer Roads
Other Objectives	
Lead Agency	Dept. of Transportation, MPOs
Support Agencies	Counties, municipalities
Other Partners	
Action Type	Design
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Implement early action safety treatments, or quick fixes, to proactively address driver and vulnerable road user safety concerns.
- Establish pilot programs for various safety treatments to identify key locations to test and measure the effectiveness of low-cost options for achieving reductions in crash rates and severity.
- Evaluate pilot programs to evaluate and establish rapid response programs to install interim safety treatments before larger engineering projects.
- Prioritize intersections, crosswalks, and school zones.

Notes

Early action, expedited safety enhancements, also known as quick fixes, are rapid changes to roadways and roadway operations that do not involve engineering alterations, environmental review, or the acquisition of right-of-way. Early action safety treatments typically involve new signage, striping, traffic signal timing, speed management changes or other modifications that do not require significant time to complete. These treatments usually have major impacts on safety. If the requested improvement falls within the limits of an existing capital project, the work oftentimes is added to that project's design documents and is built into the construction phase.

Early action is a crucial strategy for achieving Target Zero goals. The swift implementation of low-cost, high-impact countermeasures provides the opportunity to respond to existing safety issues with significantly less time or monetary cost than full-scale engineering projects. The development of pilot programs for low-cost countermeasures can help the state implement safety enhancements with the intention of monitoring and evaluating their effectiveness at addressing a historical safety issue.

Additionally, pilot programs can help agencies develop longer term rapid response programs whose duties involve identifying locations to implement early action safety treatments while longer-term permanent capital projects progress through planning, regulatory, design, engineering, and funding phases. Early action ensures that crashes can be reduced in the short term while more permanent fixes are implemented.

Crosswalk visibility and intersection lighting are quick fixes that can reduce pedestrian crashes up to 40% and 42%, respectively. Examples include advanced yield or stop signs which are proven to reduce pedestrian crashes. High-visibility crosswalks, which are crosswalks with ladder stipes and reflective thermoplastic striping that are more visible to drivers.

Early action safety treatments are proactive measures that may address road safety concerns before they escalate. Early action safety treatments can include expedited safety infrastructure enhancements like vertical deflections. Vertical and horizontal deflection treatments provide intuitive cues to drivers to moderate their speeds and reduce the risk of high-injury crashes. Vertical deflection involves the use of speed bumps, humps, cushions, and tables to compel drivers to approach the inflection point at a lower design speed. Horizontal deflections, such as lane narrowing, lane reduction, turn calming, and chicanes, compel drivers to focus more narrowly on maneuvering through the traffic calming element. Early action responses can provide traffic calming effects to streets with temporary and low-cost materials such as thermoplastic paint and removable bollards and speed cushions.

Vertical deflections create a change in the height of a roadway that prompts a driver to reduce their speed, and includes speed tables, speed slots, speed humps, speed cushions, and raised crosswalks and intersections. Philadelphia with support from PennDOT has been implementing vertical deflections to its roads as part of early action safety treatments since 2015. Additionally, early action safety treatments adopted by Philadelphia include lane narrowing and bollards for turn calming, neither of which require vertical deflection. Over the last ten years, the city has installed vertical deflection measures on over 350 blocks, often at the request of the residents. The Streets Department then conducts a two-week traffic study on the block, reviews crash data, and talks to neighbors to determine if the location meet its criteria for vertical deflection devices.

At larger intersections, a pedestrian hybrid beacon can result in a 55% reduction in pedestrian crashes. The beacon is activated by pedestrians, lights up when the pedestrian is passing, and remains dark until activated. Similarly, rapid rectangular flashing beacons are placed at uncontrolled, marked crosswalks to improve pedestrian safety. These beacons flash when activated by pedestrians, and are most appropriate for multilane crossings with speed limits less than 40 mph.

Changes to traffic lights are also quick fixes that can protect drivers and pedestrians. Leading pedestrian intervals prioritize the pedestrian by allowing them to enter the crosswalk 3-7 seconds before the traffic light changes to green. Leading pedestrian intervals are especially useful at intersections with a high turning volume and is found to result in a 13% reduction in pedestrian-vehicle crashes. Similarly, pedestrian countdown signals are useful in giving pedestrians a sense of how much time they have left to safely cross the intersection, avoiding altercations with vehicles. The exclusive pedestrian signal phase, useful in settings with both high volumes of pedestrians and high volumes of turning traffic, allows pedestrians to cross an intersection in any direction by stopping all traffic. Passive pedestrian detection systems identify when a pedestrian has approached an intersection and adjust traffic signals to accommodate them. These systems also monitor pedestrians within the crosswalk and can extend the green phase to allow pedestrians to finish crossing safely. Accessibility is important for pedestrians who may require non-visual cues. Accessible pedestrian signal (APS) push buttons. APS devices relay information about signals in audible and tactile formats.

Driver safety at intersections can also be enhanced by quick fixes. Strategically revising and synchronizing signal timing can reduce congestion and travel time while also improving safety for drivers and pedestrians. Signal timing revisions are best considered for corridors that have high traffic volume and in areas where traffic signals are closely spaced. Red light clearance extension is a system that extends the red clearance time to ensure that all vehicles have exited the intersection before cross traffic begins to move. This system greatly enhances safety and has been found to result in a 12% reduction in injury crashes. Left turn phasing is another strategy that protects drivers. Left turn phasing provides a protected green arrow for left turning vehicles and reduces conflicts with oncoming traffic. It is most appropriate for intersections with high left turn volume. Finally, installing new traffic signals at intersections helps all road users by managing pedestrian and vehicle flow and safety.

Signs and pavement markings are quick and low-cost ways to alert drivers to changes. Similar to enhancing crosswalks, school vicinity upgrades include adding reflective and fluorescent crossing signs to improve the safety of students. Adding, revising, and upgrading regulatory, warning, and guide signs provides clear information to drivers, while revising and upgrading pavement marking enhances safety by aiding navigating in complex intersections. Such treatments not only improve road safety but also advance pedestrian welfare.

See also: Intersection Improvements in Safer Roads and Traffic Calming in Safer Speeds

Integrate ASD/IDD into Universal Design

Action Item	Integrate ASD/IDD into Universal Design
Key Objective	Safer Roads
Other Objectives	Safer People
Lead Agency	NJDOT, MPOs
Support Agencies	Department of Human Services, Department of Health
Other Partners	
Action Type	Design
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Perform research through surveys and interviews with neurodivergent individuals to gain a deeper understanding of their needs when navigating the public realm.
- Update roadway design standards to accommodate neurodivergent individuals.
- Inventory planned and existing infrastructure to ensure it adheres to design standards that provide universal access to all individuals.

Notes

The ADA Standards for Accessible Design target how a building or facility should be physically designed for people with disabilities. While these standards apply to individuals with a physical and/or mental impairment, a lot of accessibility planning focuses on inclusive design for physical impairment, such as those who use assistive mobility devices. New Jersey Legislature Bill S147 requires the DOT to implement a Complete Streets policy that considers individuals with certain disabilities, including Autism Spectrum Disorder (ASD), and those with Intellectual and Development Disabilities (IDD).

Someone with ASD or IDD may have heightened sensory and perceptual experiences when interacting with the public realm, as well as altered cognitive functioning that makes it difficult to read and react to various scenarios, such as a speeding car. A study conducted by the Helen Hamlyn Centre for Design found that neurodivergent participants viewed streets as an unpredictable and uncomfortable place. Their largest concerns stemmed from sensory overload, claustrophobia, and safety, which are made worse by noise, pollution, and a lack of spaces dedicated to pedestrians. After performing research and analyses, researchers came up with a list of design opportunities to consider when designing public spaces with neurodivergent individuals in mind. These range from physical design to navigation systems, and a sense of belonging. Public spaces should have elements such as quiet spaces, places to sit, restrooms, nature, clear and informative navigation tools, and opportunities for connection while prioritizing safe streets and education.

A report from the NJDOT Bicycle and Pedestrian Resource Center found that a large number of individuals with ASD and IDDs face barriers in mobility, forcing them to rely on caregivers to travel and navigate daily. Improvements in the way that streets are designed that closely align with Complete Streets would provide these individuals with independence, significantly improving their quality of life. This report identifies the hardships faced by neurodivergent individuals in wayfinding, asking for help, sensory overstimulation, overcomplicated signage, and reading vehicle speeds. The additional challenge of navigating public transportation impacts their ability to access services such as education, food, healthcare, recreation, and employment responsibilities.

These findings indicate a few necessary considerations that street design should incorporate. Creating model language that includes individuals with ASD and IDDs in plans, studies, and informational resources would benefit all users of the public realm while normalizing the inclusion of all road users in planning. Logical and consistent wayfinding signs that combine images and text can help individuals navigate, and would be especially helpful if available in advance, such as through an interactive city map. These should incorporate visual, auditory, and tactile information, such as noise reduction, crossing signals, and shelter from weather. Design elements can be tested for effectiveness by individuals with ASD and IDD using innovative technology such as virtual reality, eye and movement tracking sensors, and interactive websites or apps.

Sidewalks should be wide and free from clutter, with seating options at a consistent distance that can be accessed by a range of users. Designing public spaces to promote and guide safe thoroughfare would be beneficial, with the addition of refuge spaces to stop and take breaks or remove oneself from a busy crowd of people. Finally, the provision of quiet spaces that are interactive and incorporate nature provides additional spaces that support all individuals. Any opportunities for optional human connection without being forced may create a positive impact for users of public spaces, too.

Intersection Improvements

Action Item	Intersection Improvements
Key Objective	Safer Roads
Other Objectives	Safer Speeds Safer People
Lead Agency	Dept. of Transportation
Support Agencies	
Other Partners	
Action Type	Design
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Increase statewide adoption of roundabouts where appropriate, including the adoption of a "roundabout first" policy intersection retrofit considerations.
- Revise design standards to eliminate existing and limit new "slip lanes" where they contravene safety priorities and apply turn calming countermeasures to restrict turning speeds to increase stopping for pedestrians and yielding for bike lane traffic and oncoming vehicles.
- Establish a statewide turn calming program to identify, redesign, and retrofit priority locations for left and right turn calming countermeasures.
- Increase statewide adoption of protected bike lane designs at intersections to increase visibility and reduce conflicts.
- Retrofit wide arterials exceeding a crossing distance of 60 feet with pedestrian refuge islands to increase safety for pedestrians when crossing at signalized and unsignalized intersections.

Notes

Roundabouts

Roundabouts are often a safer alternative to signal-controlled and stop-controlled intersections. Studies show that converting an unsignalized intersection to a roundabout can reduce crashes by 44 percent, with a CMF of 0.56 [CMF Clearinghouse](). States like

Colorado, Maryland, and Washington have adopted roundabout-first policies and seen safety gains. Roundabouts improve safety for drivers and pedestrians by eliminating head-on and T-bone collisions and slowing vehicle speeds. However, not all roundabouts are equal in terms of bike safety and ADA accessibility. Design matters for the safety of all users, including drivers, pedestrians, bicyclists, and persons with sight impairment and blindness. Newer PROWAG guidelines for people with disabilities, recommend detectable edge treatments, such as raised curbs or physical barriers, at locations where pedestrians could inadvertently enter the roadway. These features are especially critical for individuals with visual impairments, helping to ensure safer and more navigable public spaces. Some designs can confuse or endanger cyclists if bike accommodations are not included. Federal and state guidance now encourages designs that include separate bike lanes or shared-use paths around the circle. Public preferences, especially from pedestrian-focused surveys, also show support for well-designed roundabouts in place of signalized intersections.

Replacing a traditional, signalized or unsignalized intersection with a roundabout can be an effective alternative to promoting traffic safety. A roundabout intersection is characterized by tighter curves around a central island, a sloped center area to allow larger vehicles to maneuver through, and a one-way circulation of traffic. These characteristics help promote safer speeds and reduced conflict points at intersections, creating a safer road space for all road users. A study by the Insurance Institute for Highway Safety (IIHS) and the Federal Highway Administration (FHA) found that injury collisions were reduced by 75% and collisions resulting in fatalities were reduced by 37% at intersections converted to roundabouts. Some states have even gone as far as to adopt a "roundabout first" policy, where a roundabout is the primary method considered for control at an intersection. States that have adopted this policy include Colorado, Maryland, and Washington.

Roundabouts are safer than signalized or unsignalized intersections for numerous reasons. At a signalized intersection, there are 32 points where two vehicles may collide, whereas at a roundabout intersection there are only eight points. Furthermore, at a roundabout intersection drivers are forced to reduce speeds, which in turn will reduce the likelihood of crashes. Roundabouts also have safety benefits for pedestrians. When a pedestrian crosses the roundabout, they only have to cross traffic coming in one direction, the crossing distance is shorter than a traditional intersection, and vehicles are traveling at slower speeds. With that said, there are considerations that need to be made to ensure the safety of cyclists in roundabouts. Some roundabout designs can confuse or endanger cyclists if bike accommodations are not included. To address these concerns, roundabouts should be designed with a protected bike lane that is separate from travel lanes and the sidewalk.

Intersections with high crash rates should be examined to see the viability of converting them to a roundabout intersection. Doing so will not only reduce the number of crashes occurring at these intersections through design, but it will also encourage other forms of transportation at these locations. If there is pedestrian and cyclist friendly infrastructure, then more people will be inclined to walk or bike, which reduces the number of vehicles passing through the intersection. The reduction in personal vehicles on the road can help work towards the goals set out by the Target Zero Commission.

Turn Calming

Smaller corner radii compel drivers to make right turns at a slower speed and reduce pedestrian exposure while crossing a roadway. At an intersection with a larger corner radius, the crossing a pedestrian makes is larger, leaving the pedestrian exposed for a longer period of time in the intersection. A smaller corner radius reduces that risk for the pedestrian. Reducing an intersection's turn radius may also improve visibility between pedestrians and drivers and a provide a larger waiting area for pedestrians. Both of these increased the safety of pedestrians waiting at a corner, further reducing the risk of crashes occurring from right-turning vehicles.

When designing for a smaller turn radius, designs should accommodate for the largest design vehicle that frequently uses the intersection. Curb Radius Reduction notes that older cities in the Northeast use curb radii as small as 2 to 5 feet without problems. Research shows that larger radii lead to higher crash rates. For example, CMFs increase as radii grow: from 1.00 at 10 feet to 1.59 at 70 feet. Tighter corners force drivers to slow down and make turns more cautiously. NACTO and multiple studies confirm that reducing corner radii improves safety with low implementation cost. Toronto's experience showed that smaller radii reduced pedestrian risk. Even large vehicles like fire trucks can navigate tighter corners with correct turn paths or design flexibility, as demonstrated in European cities. A design vehicle is a vehicle that routinely uses the intersection. In many urban settings, this will be a small delivery truck. The use of mountable truck aprons or armadillos allow the smaller corner radius to still accommodate larger vehicles that use the intersection and prevent the larger vehicles from driving on the sidewalk while making turns.

Slip lanes, also known as channelized right turns, are a design treatment which prioritizes the continuous flow of right-turning vehicles at intersections. While intended to reduce rear-end crashes due to braking by right-turning vehicles in front of straight-through vehicles, they also bring unintended negative externalities, such as high-speed turns, reduced stop-on-red compliance, and reduced stop-for-pedestrians compliance. Slip lanes are often criticized by pedestrian and bikers for creating fast, car-dominated spaces. They reduce visibility and increase the crossing distance for pedestrians. Although some peer-reviewed studies show a slight safety benefit, such as a crash modification factor (CMF) of 0.97, which is minimal, other findings say slip lanes are linked to negative pedestrian outcomes. A study Pedestrian Safety at Slip Lanes and Alternative Turn Lane Treatments - Mark O'Brien, Andrew O'Brien, Jessie Liu, Giles Michaux, Hani Nahlawi, 2012 found that slip lanes accounted for 22 percent of crashes while making up only 30 percent of all turn lane treatments studied. Many U.S. cities have begun removing or redesigning slip lanes to improve pedestrian safety. Projects in places like Jersey City, Milwaukee, and Alexandria have closed slip lanes or replaced them with curb extensions or public space. While slip lanes may improve vehicle flow, they do not support walkability and pedestrian design.

Left turn calming countermeasures use physical design elements to slow vehicles and guide safer turning behavior at intersections. These features typically include rubber curbs, flexible bollards, and rubber speed bumps arranged to "harden" the centerline of the road. By narrowing the turning radius and creating a more defined path, these treatments discourage drivers from making wide, fast turns. Additional markings like painted wedges or boxes and "No Parking" zones further reinforce the intended turning path. The result is a more deliberate, slower turn that improves visibility and encourages yielding to pedestrians.

New York City's Department of Transportation (NYCDOT) has implemented these strategies through its Turn Calming Program, launched in 2016 as part of the city's Vision Zero initiative. The program has introduced left turn calming treatments at over 1,100 intersections citywide. NYCDOT uses several configurations, such as the *Basic Hardened Centerline*, *Complete Hardened Centerline*, and *Slow Turn Wedge*. These configurations are tailored to different intersection types and have led to a 54% reduction in median left turn speeds and a 33% drop in pedestrian severe injuries at treated locations. The program exemplifies how low-cost, quick-build infrastructure can deliver measurable safety improvements at scale.

Taken together, closing slip lanes, reducing corner radii, and implementing left-turn calming can create safer intersections and safer turning behaviors.

<u>Bike Lanes</u>

Improving intersection design to better accommodate for cyclists through the use of bike lanes is another effective way to increase safety for all road users at intersections. The implementation and use of better bicycling infrastructure through bike lanes can help with this. Currently, over 70% of cycle crashes that result in serious injury or fatality occur at intersections. Having better bicycling infrastructure with bike lanes can reduce this number and promote safer cycling conditions, both of which work towards the goals set out in the Target Zero Commission.

Major issues that arise for bicyclists is that bike lanes tend to stop at intersections, putting cyclists in a challenging position where they must merge with vehicle traffic. Ensuring that the bike lane does not end at an intersection can improve cyclist safety. As a bike lane approaches an intersection, the lane should be physically separated from vehicle traffic through a median. Doing so will prevent drivers making right-hand turns from driving into the bike lane and establishes a sperate lane of travel through the intersection for cyclists. Additionally, improving the geometric design by installing corner islands, turn wedges, and medians can be effective measures that promote cyclist safety. These measures also improve the connectivity of a municipality's bike network. Having a cohesive and uninterrupted bike network at intersections promotes bicycling in that community, which in turn could result in more people choosing to bike instead of drive. Less drivers on the road due to a well-connected bike network can improve safety on the road for all users, further working towards the Target Zero Commission's goals.

Pedestrian Refuge Islands

When looking to improve intersection safety through improvements and design, the installation of pedestrian refuge islands can be a useful tool. A pedestrian refuge island is a raised median in the center of a roadway crossing designed to serve as a "break" as pedestrians travel through wider crossings. In these wider crossing, pedestrians are able to cross half of the intersection at a time. Having this at wider intersections can be beneficial for those with mobility issues and at intersections that have shorter timeframes for pedestrians to cross. The NJDOT Pedestrian Compatible Planning and Design Guidelines recommend that roads should include a median with a pedestrian refuge area whenever the crossing distance exceeds 60 feet. Wide crossing distances may also be made shorter through supplemental curb extensions, lane reduction, or lane narrowing.

Pedestrian refuge islands can reduce the risk of a pedestrian being involved in a crash by 32%. Furthermore, the presence of a pedestrian refuge island makes a crossing more noticeable for drivers, which can encourage drivers to reduce their vehicles' speed. For maximum effectiveness, pedestrian refuge islands should be placed at intersections that have both substantial pedestrian and vehicle traffic. Guidelines by the Federal Highway Administration (FHA) suggest that these intersections are those that the travel speed is 35mph and over and ones that see over 9,000 vehicles a day.

When looking to install a pedestrian refuge island, there are several considerations that should be taken. The first is the size of the island. Islands should be no less than four feet in width and, in areas that can accommodate it, the ideal width is eight feet. Islands should also be well-lit and highlighted through reflectors or signage. Doing so will also make the crossing more noticeable to drivers. Islands should also always have a tip that extends beyond the crossing. Having this tip will both protect pedestrians from turning vehicles but also require turning vehicles to do make turns at lower speeds. There are also ADA considerations. For those with a wheelchair, the opening for the pedestrian refuge island should be level and the island should be wide enough to fit at least two wheelchairs on the island at the same time. There should also be detectible warnings at the openings of the island for those with vision impairments.

There are also aesthetic benefits to a pedestrian refuge island. A pedestrian refuge island can beautify streets with the use of trees, planters, and other greenery. These features of a pedestrian island can make streets more attractive to walk down and can assist in traffic calming measures as the refuge island is more noticeable to drivers. The creation of an attractive and safe walking environment through pedestrian refuge islands can assist in the goals established in the Target Zero Commission.

Pedestrian Signal Improvements

Action Item	Leading Pedestrian Intervals
Key Objective	Safer Roads
Other Objectives	Safer People
Lead Agency	NJDOT, MPOs
Support Agencies	Department of Highway Traffic Safety
Other Partners	
Action Type	Design
Timeframe	Short
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Identify intersections that would benefit from All Walk Phases (AWP) or Leading Pedestrian Interval (LPI) signals based on pedestrian use, higher turning volume, crash data, and/or vulnerable populations.
- Proactively install All Walk Phases and Leading Pedestrian Interval signals at identified intersections.
- Ensure that signage at intersections clearly reminds drivers to look out for and stop for pedestrians.

Notes

Although pedestrians have the right-of-way when in a crosswalk, drivers making turns, especially left turns, are linked to a significant number of pedestrian injuries and fatalities. Of the two pedestrian fatalities in Jersey City in 2025, for instance, both were caused by left-turning vehicles striking pedestrians in the crosswalk who had the right-of-way. Greater pedestrian protection in the form of pedestrian signals improvements and turn calming measures must be implemented to avoid such fatalities. Two safety improvement measures include All Walk Phases (AWP) and Leading Pedestrian Intervals (LPI).

All Walk Phases, also known as a "pedestrian scramble", "exclusive pedestrian intervals" or the "Barnes Dance", allow pedestrians to cross in any direction, including diagonally, while all vehicle traffic is stopped, thus eliminating conflicts with turning vehicles. Studies have shown that this phasing can reduce pedestrian crashes by 35-50% in areas with high pedestrian volumes. All Walk Phases should ideally involve shorterort cycle lengths and longer walk intervals to provide better service to pedestrians and to encourage better signal compliance. Intersections with pedestrian scramble phases often feature pedestrian crossing markings indicating pedestrians may walk diagonally across the intersection. All Walk Phases are especially effective in reducing the pedestrian fatalities experienced in Jersey City.

The Federal Highway Administration (FHWA) identifies Leading Pedestrian Intervals (LPI) as a proven safety countermeasure. LPIs provide people using the crosswalk additional time (typically 3 to 7 seconds) to cross an intersection while delaying the green indication for turning cars. This delay allows pedestrians the opportunity to establish themselves in the crosswalk, increasing visibility and safety. LPIs reduce conflict between pedestrians and drivers and increase the likelihood of motorists yielding to pedestrians. LPIs also create a more accessible intersection by providing more time to cross. Considerations for implementation at intersections include the number of pedestrians utilizing the crosswalk, crash history, visibility, and number of turning vehicles. Intersections that are proximal to schools, hospitals, or aged care facilities may benefit most from LPIs. Because the crosswalk infrastructure already exists, implementing LPI's as a traffic calming treatment is relatively low cost, and time efficient.

AWPs and LPIs can be scheduled into the light timing cycle or activated only when a pedestrian pushes the pedestrian crosswalk button. To notify drivers to approach the intersection with caution, AWP and LPI intersections will typically have signs telling drivers "no right turn on red," "right turn on red permitted between -- hours," or "turning vehicles stop for pedestrians."

Research from Oakland, CA shows that AWPs reduced crashes by 50%. At UC Berkeley, 70% of respondents said they felt safer with the pedestrian scramble phase in use; additionally, auto-operating speeds decreased by 40-44% on average. A London study has suggested that the installation of AWPs can reduce pedestrian casualties by 38%. Research performed in New York City shows that implementation of an LPI at an intersection resulted in a 28% decrease in pedestrian-vehicle crash rates compared to control sites. In Pennsylvania, the implementation of this traffic calming technique in 10 intersections resulted in a 58.7% decrease in pedestrian-vehicle crashes. As part of its Vision Zero goal, Jersey City is in the process of implementing LPIs and is considering implementing pedestrian scramble, which are expected to reduce pedestrian crashes by 13% and 36%, respectively.

In a 2018 evaluation of the effectiveness of LPIs across the nation, the FHWA found that this measure was effective in reducing crashes across Chicago, New York City, and Charlotte. Seattle has prioritized the use of LPIs as part of their Vision Zero plan to end traffic related deaths and injuries by 2030. By 2023, it was their goal to install LPIs at 100 intersections across the city for optimal effectiveness.

Safe Corridor Program

Action Item	Safe Corridor Program
Key Objective	Safer Roads
Other Objectives	
Lead Agency	NJDOT, MPOs
Support Agencies	NJ State Police, Department of Highway Traffic Safety
Other Partners	
Action Type	Enforcement
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Reassess and update the New Jersey Safe Corridor Program in response to findings in the 2023 assessment report.
- Identify high-risk corridors to designate in the program using criteria suggested in the report.
- Evaluate changes in traffic and development to direct resources where they are most needed.

Notes

The New Jersey Safe Corridor Program, established under P.L. 2003, c.131, was designed to enhance road safety on state highways with historically high crash rates. The initiative introduced "Safe Corridors," where fines for traffic violations were doubled, initially targeting segments of 14 roadways, such as U.S. Routes 1, 9, and 22, and state highways like Route 17 and Route 206. Safety Impact Teams (SITs), made up of a variety of experts, were tasked with studying these corridors. They offered short-term quick fixes to reduce crashes and fatalities. A Safe Corridor Coordinator acts as a liaison between NJDOT and municipalities with Safe Corridors. These measures were supported by grants from the doubled portion of the fines municipalities used for local enforcement and safety improvements, including purchasing radar equipment and funding patrol operations. The amount of money allocated to each participating municipality is based on the crash severity within their Safe Corridor

A 2023 assessment report of the program since inception found that the program had not met its goals because "enforcement and roadway improvements were not effective in reducing crashes on corridors with high rates of serious and fatal injury crashes…While there is value in the current program's attention to corridors with high crash totals, limitations exist in regard to validity of the selection and evaluation, methodology, assessment of direct impacts of citations and enforcement efforts without time and location details, citation and revenue flow, and connections between revenues and expenditures."

To improve the program, the 2023 report suggests adjusting corridor selection to utilize a severity-based methodology; tracking citation types, details, and times; enhancing outreach and training for tracking and improving corridors; and establishing a more clear link between revenues generated and funding allocations for the program. Additional changes include an annual or biannual updated analysis to identify roadways exhibiting the highest risks, ensuring resources are directed where they are most needed. The annual or biannual changes in safe corridor designations would identify the most dangerous roadways and address the issues.

The 2023 report offers an updated methodology for selecting Safe Corridors. The methodology includes Equivalent Property Damage Only, which considers number and types of crashes, Total Crashes, Fatal Crashes, and Serious Crashes.

Streamlined Approval and Installation of Regulatory Signs

Action Item	Signage Updates
Key Objective	Safer Roads
Other Objectives	Safer People
Lead Agency	Dept. of Transportation, MPOs
Support Agencies	Department of Highway Traffic Safety
Other Partners	
Action Type	Policy
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Review and streamline the signage approval processes for erecting, changing, relocating, maintaining, and removing signs.
- Establish a user-friendly reporting system to allow residents and municipalities the opportunity to submit signage concerns or requests.
- Audit existing roadway signage to identify problem areas that have repetitive, misleading or confusing signage and develop a system to efficiently remove or consolidate signage in problem areas.
- Improve overall signage to better serve pedestrians and bicyclists with a focus on universal accessibility, safety, and wayfinding.
- Emphasize upgrading and replacing existing bicycle signs with the clearer "4-foot Minimum Clearance to Pass (R4-19 NJ)" and "(Bicycles) Allowed Use of Full Lane (R9-20 NJ)" signs.

Notes

Drivers, bicyclists, and pedestrians using roadways can view and use many different signs. Necessary and useful signage, along with informal marketing and advertisement signs, can cause confusion and act as a distraction for road users. Outdated, misleading, and confusing signs may lead to an increase in collisions.

The Federal Highway Administration (FHWA) categorizes road signs into the following types:

- Warning Signs: e.g. Winding Road Ahead, Deer Crossing, Signal Ahead, and Advisory Speed on Exit Ramp
- Railroad and Light Rail Transit Grade Crossing Signs: e.g. Railroad Crossing, Look Both Ways at Track, and Do Not Pass Stopped Trains
- Temporary Traffic Control Signs: e.g. Workers Ahead, Detour, Exit Closed, and End Roadwork
- Regulatory Signs: e.g. Stop, Yield, No Parking, No Left Turn, Straight Ahead Only, HOV Lane Ahead, and One Way
- Guide Signs: e.g. Mile Marker, Exit Only Lane, Named Highway, and Destination Distance
- Motorist Services and Recreation Signs: e.g. Hospital, Rest Stop, Bathrooms, Picnic Area, Handicap Accessible Facility, and Parking
- Pedestrian and Bicycle Signs: e.g. Bicycle Route, Bicycle Safe Clearance, No Parking Bike Lane, Stop and Stay Stopped to Pedestrians, and Playground Ahead
- School zone signs

The Manual on Uniform Traffic Control Devices (MUTCD) provides guidance and minimum standards to promote consistency in traffic control devices across the US. By providing standards on elements such as size, shape, color, placement, and wording, the manual improves the efficiency of transportation while minimizing crashes and congestion related to confusion and distractions. The ability to mass produces these signs due to standardization also leads to design and production cost savings. The MUTCD is continually updated based on emerging research and success or challenges to reflect most effective traffic control practices.

New Jersey utilizes the signage standards set forth in the MUTCD. However, in a case where state conditions require more guidance than the MUTCD, the New Jersey Department of Transportation (NJTOD) manuals shall take precedence. The FHWA is actively updating its Standard Highway Signs manual to reflect new, revised, or discontinued signs as presented in the 11th edition of the MUTCD (December 2023 edition). While signage rules throughout the state can change depending on zoning and local regulations, generally, no sign can be erected, changed, relocated, or removed without a zoning permit. Tourism Districts, Commercial Districts, or others may have different requirements.

In 2022, New Jersey introduced a Safe Passing Law, requiring any motor vehicle driver to move over a lane and leave at least four feet of space between them and vulnerable road user, or slow to 25 mph and be prepared to stop until passing safely can be achieved. This law arose from a high number of deaths, injuries, and near misses between motor vehicles and other road users such as pedestrians and bicycle users. The MUTCD has released new signage to reflect clear and concise directions for drivers to legally share the road with vulnerable road uses, especially bicyclists (Bicycle Passing Clearance (R4-19) sign). While this signage is important on all roadways, it is especially important to erect signage on stretches of road with no bicycle infrastructure to keep drivers alert and prepared. Other effective areas for signage are in intersections, where biking infrastructure begins and ends, and on roadways that are more heavily used by bicyclists. Because this is a relatively new law, it is critical to consider ways to educate drivers on the law, and provide them with strategies to safely share roadways with vulnerable road users.

Additionally, a report from the New Jersey Bicycle and Pedestrian Resource Center notes that confusing signage, or the absence of signage, can make it more difficult for neurodivergent individuals to navigate the public realm. There should also be adequate signage to inform drivers when there is high pedestrian and bicycle activity such as near parks and schools, public transit stops, or along bicycle routes.

Statewide Greenway Network

Action Item	Statewide Greenway Network
Key Objective	Safer Roads
Other Objectives	
Lead Agency	NJDEP
Support Agencies	NJDOT, MPOs, FHWA, Highlands, Pinelands, Meadowlands, counties, municipalities
Other Partners	NJBWC, NJCF, etc.
Action Type	Design Policy
Timeframe	Medium
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Direct NJDOT and NJDEP to jointly create a Statewide Greenway Network Plan.
- Developing an interconnected network of traffic-separated or off-road walking and biking trails that provide medium- and long-distance connectivity across the state.
- Prioritize shared or multi-use paths when allocating funds for trail projects in order to accommodate all non-motorized travelers.
- Include trail network development in all safety implementation plans and develop a process to integrate these plans.

Notes

The term "greenway" is used to describe many types of preserved linear corridors in rural, suburban, and urban communities. Whether they are short neighborhood greenways or long distance multi-state greenways, they are located, established, and designed to serve a range of environmental, recreational, and transportation purposes (Source: NJDOT Planning for Greenways A Guidebook for New Jersey Communities). Greenways can be organized into interconnected systems and networks that cover a large area. Greenways increase mobility, promote healthy and active living, revitalize urban areas, and protect the natural environment. A 1995 survey of individuals who lived close to a greenway in North Carolina found that a majority were satisfied with the greenway, and another study in North Carolina found that there were fewer crimes on greenways than roads. Comprising both transportation and conservation, greenways fall under the New Jersey Department of Transportation and Department of Environmental Protection. Shared or multi-use paths are separated from motor vehicle traffic, have a firm surface, may be paved or unpaved, and can be used by pedestrians, bicyclists, skaters, wheelchair users, joggers, and other non-motorized users for transportation to key destinations or for recreation. Shared use paths often accompany greenways and can connect to existing roadways. The Infrastructure Investment and Jobs Act expanded programs specifically for bicycle and pedestrian funding

The East Coast Greenway is a major multi-state greenway project that connects smaller greenways and trails together. While its current form consists of a combination of on-road and off-road segments, the East Coast Greenway Alliance envisions a fully separated route connecting communities up and down the east coast from Maine to Florida. The East Coast Greenway passes through Jersey City, Newark, New Brunswick, and Trenton, and connects to the Delaware and Raritan Canal trail through suburban and rural New Jersey. It also connects to New York via ferry or the George Washington Bridge. The portion of the greenway in Essex and Hudson Counties is being converted from a former rail line. Notably, part of this greenway will pass through overburdened communities, providing access to open space and recreation, along with their health benefits. The Morris Canal Greenway is a proposed greenway in northern New Jersey that will run across six counties and connect to the Hudson-Essex Greenway, highlighting the increasing connectivity of greenways across the state.

These existing greenways can be enhanced by a statewide greenway network that connects communities throughout New Jersey. NJDOT and NJDEP should partner with MPOs and regional trail network advocacy groups, such as the North Jersey Trail Network Initiative, the Circuit Trails, Rails to Trails Conservancy, NJ Trails Action Network, the East Coast Greenway Alliance, and many others to establish a mapping and visioning working group. The working group may inventory existing greenways, map out a future network, identify priority corridors for development, and identify pathways for implementation, including funding and agency responsibilities. As some trails allow pedestrians and cyclists an option to traveling on roads with minimal safety infrastructure, investing in safety should be a top priority.

A gap analysis would strengthen a Greenway plan by identifying the highest impact gaps to create a priority list to guide resource investment. Pennsylvania's Department of Conservation and National Resources has identified priority trail gaps in their Strategic Plan and mapped their trail gaps to guide funding.

One study finds that residents value several different safety facilitators on greenways, including: wide paths, signage to separate users of different travel modes, traffic buffers, uninterrupted path sections, benches, and smooth pavement. Other safety measures include law enforcement bicycle patrols, community watch programs, emergency phones, and directional and informational signage. Safety should be embedded into greenway infrastructure and must be considered in any future greenway plans.

Lighting is an important safety feature along trails. Identification of pedestrian lighting gaps and use of after-dusk or 24-hour lighting, particularly important in transportation-focused areas

Street Lighting Improvements for Walking and Bicycling

Action Item	Street Lighting Improvements
Key Objective	Safer Roads
Other Objectives	
Lead Agency	NJDOT, county, municipal road owners
Support Agencies	Board of Public Utilities (within Dept of Treasury), utility companies, State Police
Other Partners	
Action Type	Design Legislative Policy
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Update guidelines for the implementation of streetlighting that enhances road and sidewalk visibility for drivers, pedestrians, bicyclists, transit riders, and micromobility users.
- Expand policies surrounding the provision and maintenance of street lighting to improve the visibility of vulnerable road users.
- Develop processes to facilitate transfer of utility-owned lighting fixtures to direct municipal control to reduce jurisdictional barriers to safety-related improvements.
- Support and continue to develop NJ Legislature Bill S334 to create and enforce an appropriate method and timeline for achieving full LED lighting conversions in all streetlights.

Notes

The US Department of Transportation (DOT) Federal Highway Administration recommends increasing nighttime visibility for safety because roadway fatalities throughout the nation are at least three times higher at night than in the daytime. A majority of these fatalities occur in intersections, involve pedestrians or bicyclists, or are due to roadway departures. The Minnesota and Florida DOT attributed a lack of street lighting to be a factor in high nighttime pedestrian and bicycle fatalities, enacting policies that allowed them to streamline funding into installing additional lighting and replace older lighting with LED bulbs.

A study comparing pedestrian fatalities during the daytime versus nighttime found that between 2009-2019, pedestrian fatalities at nighttime increased by 63.7%. Furthermore, pedestrians that were struck at nighttime were five to seven times more likely to be fatally injured than one struck during the daytime. A NJ study showed that pedestrian involved crashes in the dark with no lighting were twice as likely to be fatal than crashes in the dark with lighting. For bicyclists, they were more than 3 times as likely to be fatal after controlling for all other factors.

Another study conducted in Louisiana between 2010-2019 of pedestrian crash patterns on unlit streets found several factors that contribute to fatal or severe injury crashes. These are

- Lack of street lighting
- Adverse weather conditions
- Open roads with a relatively high posted speed limit
- Pedestrians or drivers experiencing alcohol impairment
- Pedestrians wearing dark clothing
- Pedestrians walking on the roadway itself
- Intersections

Implementing safer street design to slow vehicles and protecting pedestrians and bicyclists are some ways to protect vulnerable road users. Another solution to reducing nighttime pedestrian or bicycle fatalities would be to increase the provision and brightness of lighting along streets. When light poles along streets already exist, replacing the lightbulbs with technology such as LED lighting can be a relatively cost-effective yet efficient process. LED lighting is more versatile and customizable that high-pressure sodium or metal halide lamps in terms of color-correlated temperature and brightness, allowing LED conversions to improve color contrast and increase the distance at which pedestrians are visible to oncoming drivers. This presents a relatively quick fix to poorly lit streets that would increase the physical and perceived safety of pedestrians, reduce crash rates, and may even reduce crime rates. At the same time, the conversion to LED lighting will save municipalities money, reduce maintenance costs, and reduce the emission of greenhouse gasses.

However, in many cases where road lighting already exists, it is not designed to be sufficient for visibility of vulnerable road users. Planners and engineers should identify locations where lighting is not sufficient for pedestrian safety and assess where lighting improvements should be prioritized by undergoing after-dark walk audits.

In the New Jersey Legislature, Bill S334, dated March 25, 2025, requires municipalities, public utilities, and the state to install and replace all streetlights with LED lights within 5 years. Policy around streetlighting that provide requirements for the installation and maintenance of lighting may also support this goal and promote the safety and protection of vulnerable road users.

Unified HIN Strategy for State, County, and Local Roads

Action Item	Unified HIN Strategy for State, County, and Local Roads
Key Objective	Safer Roads
Other Objectives	Better Data and Evaluation
Lead Agency	Dept. of Transportation
Support Agencies	Div. of Highway Traffic Safety Turnpike Authority North Jersey Transportation Planning Authority South Jersey Transportation Planning Organization Delaware Valley Regional Planning Commission
Other Partners	
Action Type	
Timeframe	
Priority	
Cost	
Performance Metric/Evaluation Method	

Description

- Develop a strategy for unifying high injury network (HIN) projects across New Jersey.
- Identify the intersections between HINs and other areas of high importance in the state.

Notes

A high injury network (HIN) is a set of streets and corridors that have high concentrations of traffic injuries and fatalities. Identifying a HIN is necessary for implementing Vision Zero initiatives at the local, county, or state level. The New Jersey Department of Transportation (NJDOT) and New Jersey Division of Highway Traffic Safety (NJDHTS) continue to work on developing a statewide HIN, creating network screening lists of high risk rural, county, and state roads. In order to effectively manage all of the information that the statewide HIN conveys, and ensure that safety projects that overlap with these networks are prioritized, there will need to be a unified strategy between state, county, and local roads.

The legislation establishing the NJ Target Zero Commission includes as a duty of the Commission "to promote effective and transparent collection of traffic safety data and dissemination of such data via a publicly accessible data portal that includes, but is not limited to, the most dangerous intersections in the State, traffic crash data with information on non-fatal injuries and demographic data, and a high injury network that indicates the roadways, in the State, with the highest injury rates". The legislation also calls for the Commission to provide advice and assistance to county and municipal governments to develop their own target zero plans.

Local and County comprehensive safety action plans in New Jersey are compliant to the requirements of the Safe Streets and Roads for All federal discretionary grant program. As such, these plans include the development of high-injury networks to identify priority corridors and locations for investment. All 21 counties in New Jersey are or will be covered under a comprehensive safety action plan through various programs, including the federal Safe Streets and Roads for All discretionary grant program (including DVRPC's Regional Vision Zero), NJTPA's Local Safety Action Plans, SJTPO's Local Road Safety Plans, and Middlesex Vision Zero. Additionally, municipalities such as Jersey City and Hoboken employ high-injury networks in their data-driven Vision Zero Action Plans.

California has published a guidance document on their state's HINs, providing a list of considerations that agencies should consult after completing a HIN and highlighting case studies of local cities and how they applied their HINs. The guidance also put forward a statewide definition of a HIN so that there is consistency among statewide HIN designations. Incorporating a statewide definition into their process will allow the NJDOT to ensure that the most pressing HINs can be included and accounted for.

On a smaller scale, the Southern California Association of Governments (SCAG) created a regional HIN for the six counties under its jurisdiction. SCAG created a HIN for each county so that each county would receive a fair share of funding based on their data. SCAG also overlayed the HINs with other important networks and areas, like Disadvantaged Communities, Environmental Justice Areas, and Transit Priority Areas. This method of analysis helps SCAG to identify high priority areas, where traffic collisions intersect with other social and economic factors. The NJDOT and NJDHTS should adopt a similar approach for identifying how to prioritize specific HIN corridors for improvements.

To integrate the regional HIN county and local HINs, SCAG compared their HINs with the counties' respective HINs to confirm that their analyses were similar. SCAG also suggests deferring to the county-level HINs whenever possible because of their specificity regarding local contexts.

As NJDOT and NJDHTS develop a statewide HIN, they should develop strategies for integrating local HINs and ensuring that each corridor is considered fairly for projects. Analyzing where statewide HINs intersect with other areas of local importance, especially overburdened communities, will be necessary for prioritizing safety projects.