08 Traffic Calming

By design, traffic calming is a self-enforcing traffic management approach that forces motorists to alter their speed or direction of travel. The purpose of traffic calming is to improve safety, especially for pedestrians and bicyclists, and to improve the "livability" of streets for residents and visitors. Enhanced multimodal safety is one of the most fundamental benefits of traffic calming. By decreasing the volume and/or reducing the speed of motor vehicles, the number and severity of crashes is greatly diminished.

What techniques are used in traffic calming?

Traffic-calming techniques consist of engineering interventions, enforcement mechanisms, educational programs, and more. This chapter focuses on engineering techniques that make roadways in school zones safer. Traffic-calming measures are either passive or active, and can generally be divided into three (3) groups based on the goal they are designed to achieve: speed control, volume control, and safety enhancement.

Speed control measures include passive concepts such as gateways or streetscapes that change a driver's perception of a corridor, and active concepts that force a driver to physically alter their travel path and reduce their speed. Volume control is intended to minimize motor-vehicle volumes or cut-through traffic by restricting turns or deploying roadway closures or median barriers. Safety enhancements, such as in-pavement lighting or raised crosswalks, are designed to make drivers more aware of pedestrian spaces while reducing speeds, and are typically implemented in tandem with other techniques.

Education and enforcement programs should be used as proactive measures to mitigate risks and crashes before they occur, complementing engineering efforts.

National Traffic Calming ePrimer

The United States Department of Transportation (USDOT) and the Federal Highway Administration's (FHWA) National Roadway Safety Strategy has two elements that inform this chapter: The Safe System Approach and the FHWA Proven Safety Countermeasures.



Speed Hump in Princeton, NJ. Image: VTC

Safe System Approach

The Safe System Approach (SSA) is a framework for roadway safety that aims to eliminate all fatalities and serious injuries on our transportation network. It acknowledges that even one death on our roadways is unacceptable. Adopted by the New Jersey Department of Transportation (NJDOT) as part of its commitment to reach zero deaths on all roadways, SSA shifts the focus from individual behavior to system-wide responsibility. Instead of limiting safety to select projects, SSA embeds it into every aspect of transportation planning and design.



Image: U.S. Department of Transportation. (2022).

U.S. Department of Transportation
Federal Highway Administration

SSA is grounded in six guiding principles and five elements that are different from the traditional approach to safety. It recognizes that humans will make mistakes and so roadways must be designed in a way that prevents serious injuries and fatalities. This Guide utilizes the Safe System Approach as a guiding framework for road safety as it relates to school zones in New Jersey.

A practical complement to the Safe System Approach in the United States are the FHWA Proven Safety Countermeasures, a collection of interventions that make roads safer for all users. Many of the traffic-calming and road safety solutions discussed in the Guide are also FHWA Proven Safety Countermeasures. The Federal Highway Administration (FHWA) has identified 23 countermeasures and strategies with proven effectiveness in reducing crash rates and/or crash severity. These are context- and user-specific strategies or interventions that can make significant improvements to the safety of a road system when appropriately applied within a jurisdiction. They are identified by the FHWA symbol to the left.

SAFE SYSTEM APPROACH IN NEW JERSEY

In New Jersey, all counties and several municipalities have adopted, or are in the process of adopting, the Safe System Approach to eliminate traffic fatalities and serious injuries. As noted earlier, New Jersey has also adopted the SSA as part of its commitment to eliminate fatalities and serious injuries on New Jersey roads. The Safe System Approach is often adopted and implemented in coordination with Target Zero or safety initiatives.

All of New Jersey's 21 counties have adopted the Safe System Approach. Many municipalities, including Hoboken and West Orange, have adopted the Safe System Approach at the local level, and in partnership with their counties, are prioritizing data-driven safety strategies to inform roadway design improvements.

Principles of the Safe System Approach

Death/Serious Injury is Unacceptable: While no crashes are desirable, the Safe System Approach focuses on crashes that result in death and serious injuries, since no one should experience either when using the roadway system.

Humans Make Mistakes: People will inevitably make mistakes that can lead to crashes, but we can design and operate the roadway system to anticipate human mistakes to avoid death and serious injuries.

Humans Are Vulnerable: Humans are disproportionately at risk of injury or death in collisions with vehicles than drivers or passengers of those vehicles. The management of kinetic energy transfer to within survivable limits is important for understanding how to design and operate the road system consistently with the Safe System philosophy.

Safety is Proactive: In addition to crash-based analysis, transportation agencies should use proactive tools to identify and mitigate latent risks in the roadway system, rather than waiting for crashes to occur and reacting afterwards.

Redundancy is Crucial: Reducing risks requires that all parts of the roadway system are strengthened, so that if one part fails, people are still protected.

Responsibility is Shared: System managers, vehicle manufacturers, law enforcement, post-crash personnel, and system users all have a responsibility to promote safe behavior and ensure that crashes don't lead to fatal or serious injuries.

Elements of the Safe System Approach



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. All road users are considered equal regardless of how they choose to travel. Each road user has a responsibility to operate, to the best of their ability, within the boundaries set by system managers, and education and enforcement can help to modulate user behavior.



Safer Vehicles: Safe vehicles include "active" safety measures, to help prevent crashes from occurring, such as autonomous emergency braking; and "passive" safety measures, which protect occupants when a crash does occur, such as seat belts and airbags.



Safer speeds: Put simply, humans are unlikely to survive high-speed crashes. Adjusting speeds can accommodate human injury tolerances in 3 ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.



Safer Roads: Safe roads are designed and operated to prevent crashes and keep impacts on the human body at tolerable levels. Road design and operations should be thought of as a continuum, where safe system aligned design or countermeasures will improve safety performance (reduce crashes) incrementally.



Post-Crash Care: This includes and emphasizes the role of first responders, crash investigation, and medical care for all involved parties. Crash reporting practices, such as complete data collection and documentation of road user behavior and infrastructure and sharing data across agencies or organizations can help lead to a greater understanding of the holistic safety landscape, and thus lead to improved investments in safety.

NEW JERSEY'S GOAL: ZERO TRAFFIC FATALITIES

In January 2025, the Target Zero Commission Law (P.L.2024, c.109) established the New Jersey Target Zero Commission (TZC) and set a goal to eliminate fatalities and serious injuries on New Jersey roads.

The TZC developed the New Jersey Target Zero Action Plan, released in 2025, with a collaborative group comprising Commission members, policymakers, engineers, planners, advocates, law enforcement, academic institutions, local leaders, subject-matter experts, and members of the public. According to the bill, the TZC is tasked with the responsibility "to study, examine, and review all aspects of traffic safety with a particular focus on access, equity, and mobility for all road users using the safe system approach and to advise the Governor, the Legislature, and the Department of Transportation regarding policies, programs, research, and priorities to help achieve the goal of eliminating traffic fatalities and serious injuries." [1]

The Action Plan is organized under the five Safe System Approach elements - Safer People, Safer Roads, Safer Speeds, Safer Vehicles, and Post-Crash Care with two additional elements, Safer Land Use and Coordinated Implementation, to complete the Target Zero Framework for New Jersey. The Action Plan outlines 72 actions to reach the Target Zero goal and specifies which organizations lead and/or support each action. Each of the proposed actions fits into at least one of the seven elements within the New Jersey Target Zero Framework.

Visit https://dot.nj.gov/targetzero/ to learn more about implementation and updates.



Target Zero Commission October 2026 Public Hearing at Rowan University. Image: NJDOT



New Jersey's Target Zero Framework. Image: New Jersey Target Zero Action Plan

[1] https://dot.nj.gov/targetzero/pdf/NJ_Target_Zero_Action_Plan_2025.pdf

FHWA Proven Safety Countermeasures

A collection of 23 countermeasures and strategies provides solutions for key safety focus areas, including roadway departure, intersections, pedestrian safety, and crosscutting strategies that address multiple safety needs. These countermeasures are designed for all road users and all roadway types. Agencies are encouraged to implement these strategies to help achieve their safety goals.

Pedestrian


Crosswalk Visibility Enhancements


Leading Pedestrian Interval


Medians and Pedestrian Refuge Islands in Urban and Suburban Areas


Rectangular Rapid Flashing Beacons (RRFB)


Walkways


Pedestrian Hybrid Beacons

Roadway Departure


Enhanced Delineation for Horizontal Curves


Longitudinal Rumble Strips and Stripes on Two-Lane Roads


Median Barriers


Roadside Design Improvements at Curves


SafetyEdge℠


Wider Edge Lines

Intersections



Backplates with Retroreflective Borders



Roundabouts



Dedicated Left- and Right-Turn Lanes at Intersections



Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections



Corridor Access Management



Reduced Left-Turn Conflict Intersections



Yellow Change Intervals

Crosscutting



Lighting



Road Safety Audit



Local Road Safety Plans



Pavement Friction Management

Additional Safety Strategies

In addition to the proven safety countermeasures, there are additional safety strategies to consider while planning for safety to and from school zones. The additional safety strategies are roadway reconfigurations ("road diets"), bicycle lanes, appropriate speed limits, speed safety cameras, and variable speed limits.

Icon source: USDOT Federal Highway Administration

What does Traffic Calming do?

The deployment of traffic-calming strategies and plans often combines a range of techniques to make roadways safer depending on the context of the roadway and the resources available for deployment. Deployment often uses a combination of **passive** and **active** traffic-calming techniques.

Passive traffic-calming techniques can include visual prompts that give drivers the perception that they are entering a traffic-calmed area. Examples include streetscaping and/or landscaping, textured/colorized pavement, on-street parking, striped bicycle lanes or variable message signs with speed radar. Passive traffic calming also includes creating a physical environment where the driver reduces speed as a reaction to changes in the roadway. Examples include narrowed lanes, rumble strips, and on-street parking. Active traffic calming could include vertical deflection, i.e., raised roadway treatments that force the motorist to slow down, such as speed humps/tables, raised crosswalks, or raised intersections. Active traffic calming could also include horizontal deflection to limit the speed a vehicle can safely travel through an intersection or along a roadway, such as full or mini-roundabouts, chicanes, or center island medians. Lastly, active traffic calming could also include constrictions, horizontal extensions that limit vehicle speed by narrowing the travel way such as curb extensions, neck-downs, bulb-outs, or pedestrian island refuges.

Effective traffic-calming strategies often include using more than one measure. Traffic -calming decisions should be made using a systematic approach. Measures should be appropriately spaced and any secondary effects of the installations must be considered.

When this guide was first published in 2014, there were a handful of representative communities in New Jersey that had developed traffic-calming programs or implemented traffic-calming measures, including Hoboken, Maplewood, Fair Lawn, Woodbury, Haddonfield, Camden, Montclair, and Lawrence Township. In the decade since, traffic calming has been widely deployed in communities throughout New Jersey through statewide, countywide, and local safety initiatives.



> *"Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users."*
>
> **Institute of Traffic Engineers**

Types of Traffic-Calming Measures Best Suited for School Zones

The following section describes and illustrates various traffic-calming measures which can be employed in and around school zones. Each measure contains a description, a list of benefits and drawbacks associated with each measure, and an estimated cost range for each treatment. The intent is to provide the reader with a quick indication of what might be expected if each measure is implemented.

At the end of this chapter is a detailed matrix in the form of a table providing an overview of the more detailed descriptions provided in this section.

Gateways

Description: Asigning and/or landscaping treatment to alert motorists they are entering a lower speed environment and they should expect bicyclists, pedestrians, and other vulnerable road users. A gateway treatment can be used at entrances to school zones, neighborhoods, commercial areas, town centers, or busy places of activity. Gateways can be as simple as signs and landscaping. They are typically supplemented with other traffic-calming measures such as curb extensions, sometimes referred to as "bulb-outs" or "bump-outs", public art and raised crosswalks.
Benefits: Can simultaneously increase awareness of vulnerable road users and be an attractive streetscape element. They can be designed with the school, neighborhood, or community in mind by incorporating local branding.
Drawbacks: Can require routine maintenance.
Costs: Varies



Gateway to downtown Collingswood on Haddon Avenue, including aesthetic features and safety infrastructure, including a pedestrian refuge and bollards.

Pavement Markings/Stencils

Description: Pavement markings are another means to alert or inform a motorist of a condition or a potential situation. Painted lines and symbols need to be selected and placed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). One example is "SCHOOL" or "PED XING" pavement marking legends within the travel lanes. Crosswalks can be used to alert motorists of pedestrian activity. Bicycle lanes can be striped and on-street parking can be delineated. Pavement markings are also used in conjunction with signs and other measures.
Benefits: Low cost and easy to install. Can increase motorist awareness of pedestrians and bicyclists.
Drawbacks: Requires regular maintenance. Not visible when roads are snow-covered.
Costs: Low. Average quality markings cost $7.00/sf. Longer lasting markings $15.00/sf.



Pavement markings in Asbury Park delineating shared bicycle facilities and parking spaces. Image: VTC

Stationary Radar Signs/ Speed Display Boards/ Speed Feedback Signs

Description: Radar signs are interactive signs that draw motorists' attention to their speed and the road's legal speed limit. They work by informing motorists when they are exceeding the speed limit, and motorists may wonder if law enforcement can see their speed reading. They can be used in residential areas, school zones, construction zones, or other safety zones. Radar signs can be permanently mounted on signposts or in temporary installations using self-contained trailers.

Benefits: Radar signs are proven to reduce traffic speeds, even years after their initial installation. They are particularly effective on high-volume arterials, where physical measures would restrict traffic flow, as well as local roads and in school zones.

Drawbacks: Radar signs do not reduce traffic speeds as much as physical measures. Motorists' compliance is voluntary. Enforcement is still necessary.

Costs: $6,000 - $16,000 each



Temporary speed feedback trailer in Somerville, NJ.



Permanent speed feedback sign in Dunellen, NJ. Image: NJDOT

Signage

Description: Traffic signs are used to alert or inform motorists of a condition or a potential situation. Signs need to be selected and placed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Speed limit signs, pedestrian/bicycle/school crossing signs, and in-street pedestrian crossing signs are used by municipalities to warn motorists of high pedestrian activity, and can help to reduce speeds. Signs are also used in conjunction with other measures such as pavement markings.

Benefits: Typically low cost. Increases awareness.

Drawbacks: Can clutter the roadway especially on residential streets. In-street signs are prone to being struck or may need to be removed at night and placed back during the day. Overall effectiveness can vary.

Costs: $180-$540 for average sign



In-Street Stop for Pedestrians Sign with SCHOOL plaque mounted above the sign in Glen Ridge, NJ.

Textured and Colored Pavements

Description: Paving materials such as brick, cobbles, stamped concrete or concrete pavers can be used to delineate separate space for pedestrians or bicyclists. The variety of color and texture signal to drivers that they are traveling in a pedestrian-centric zone. Some projects include colored and textured pavement along the entire calmed roadway. However, limiting the special pavement to edges, such as on-street parking lanes or center line is preferred. Stamped concrete or concrete pavers are preferred to bricks or blocks for pedestrian zones or bicycle paths because they offer a smoother travel surface and can be more durable. Striping may still be necessary to maximize visibility for motorists in inclement weather or darkness.

Benefits: Textured pavements attract the driver's attention visually, audibly, and physically, and are ideal for residential and neighborhood shopping areas. They are permanent and effective and can add to the aesthetic identity of a neighborhood.

Drawbacks: Some materials, particularly cobblestones, present a hazardous riding surface to bicyclists and may be uncomfortable for pedestrians, especially those in wheelchairs. Loose or uneven installations of paving stones pose a tripping hazard to pedestrians and should be regularly inspected, increasing maintenance costs over ordinary asphalt or concrete pavement.

Costs: Low to Moderate. Costs vary depending on materials used and size of paving area.



Textured crosswalk in Dunellen, NJ.



Textured crosswalk in Jersey City, NJ. Image: VTC

Landscaping

Description: Landscaping defines pedestrian and vehicle areas, reduces the visual width of the roadway, and provides a more pleasant street environment for all. Landscaping can include trees, bushes and/or planters which can be planted in the buffer area between the sidewalk and the street. Landscaping is often used in conjunction with other traffic-calming measures such as roadway narrowing, traffic islands, and sidewalk improvements.
Benefits: Landscaping increases motorists' awareness and can help define a neighborhood identity. Its installation is long term and increases the quality of life of a community.
Drawbacks: Depending on the design, the installation and maintenance costs can be high. Maintenance costs can be minimized by choosing appropriate plants and providing adequate space for them to grow.
Costs: Moderate to high - varies depending on scale and materials/plantings



Landscaped buffer in Montclair, NJ. Image: Arterial

Rumble Strips

Description: Rumble strips are raised buttons, or engraved depressions in the pavement, or grooves closely spaced on the roadway surface to create noise and vibration. They are typically installed to alert drivers of an upcoming curve or speed change. They are also commonly placed in the shoulders of freeways to alert drivers who might veer or drift off the road. They are also placed in the centerline area to alert drivers who may be drifting into oncoming traffic.
Benefits: Rumble strips are a permanent method to alert motorists they are entering an area with high pedestrian activity or other safety concerns. They do not require any additional right of way and their installation does not disrupt existing traffic patterns. They are inexpensive.
Drawbacks: Rumble strips are effective only through the noise and vibration they create. This same noise and vibration are their biggest detraction, particularly in residential areas. Drivers can more easily ignore rumble strips than other calming methods that vertically or horizontally deflect vehicles. Without adequate signage, rumble strips could startle motorists, potentially creating a hazardous condition. They also require increased maintenance; particularly during roadway re-paving.
Costs: $10 - $15/linear foot



Raised transverse rumble strips in Newark, NJ

Road Diets

Description: A Road Diet, or roadway reconfiguration, can improve safety, calm traffic, provide better mobility and access for all road users, and enhance overall quality of life. A Road Diet typically involves converting an existing four-lane undivided roadway to a three-lane roadway consisting of two through lanes and a center two-way left-turn lane (TWLTL). Often, two bicycle lanes can be created using the width of the eliminated vehicular travel lane.

Benefits: Reduction of crashes, traffic calming, improved visibility for left-turning motorists and reduced speeds, fewer lanes for pedestrians to cross, opportunities to install pedestrian refuge islands, bicycle lanes, on-street parking, or transit stops.

Drawbacks: In some cases, can increase traffic congestion and block travel lanes.

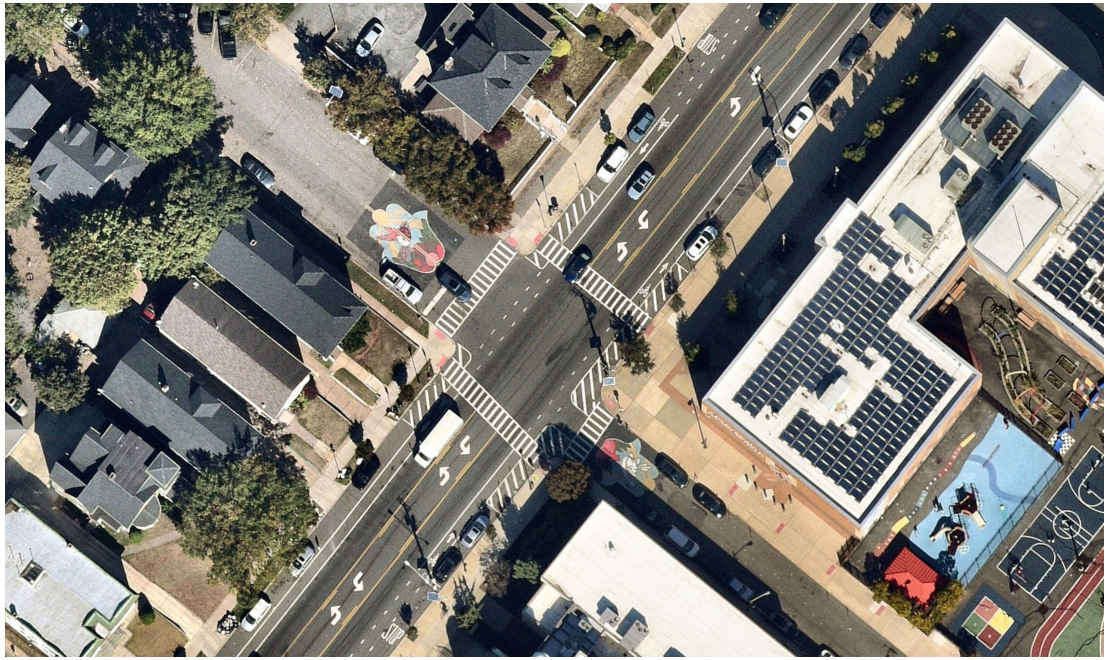
Costs: Can be a low-cost safety solution when planned in conjunction with a simple pavement overlay, and the reconfiguration can be accomplished at no additional cost. Technically the road diet configuration may involve a slightly higher cost for pavement markings.

Livingston Avenue Road Diet

Following the the preparation of a study by Voorhees Transportation Center in 2014, the City of New Brunswick implemented a road diet along Livingston Avenue (County Route 691) in 2020. The aerials to the right show the portion of Livingston Avenue near AC Redshaw Elementary School at the intersection with Delevan Street.



2019 aerial image of Livingston Avenue near AC Redshaw Elementary School in New Brunswick, NJ. Image: Nearmap, dated September 27, 2019, accessed February 23, 2026.



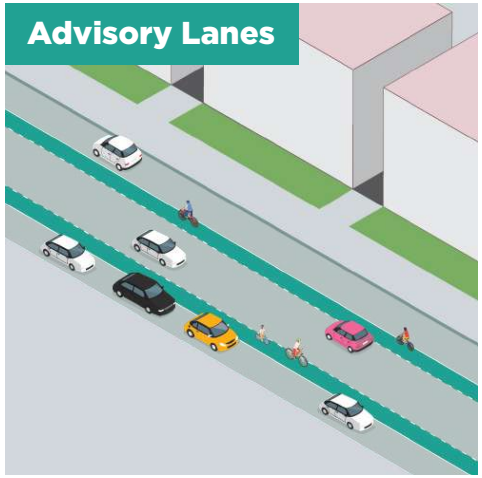
2025 aerial image of Livingston Avenue near AC Redshaw Elementary School in New Brunswick, NJ. Image: Nearmap, dated October 5, 2025, accessed February 23, 2026.

JERSEY CITY TRAFFIC CALMING TOOLKIT

In 2024, the City of Jersey City developed a Traffic Calming Toolkit to help planners, engineers, and community members understand and apply traffic-calming measures to improve safety across the city. The toolkit is organized into two main sections. The first categorizes treatments by location type, including local streets, collector streets, arterial streets, signalized intersections, directional stop-controlled intersections, and multi-way stop-controlled intersections. The second section categorizes treatments by type of traffic-calming measure, such as corridor treatments, intersection treatments, pedestrian treatments, bicycle treatments, and placemaking treatments.

Users begin by identifying applicable treatments based on the Location Type, and then narrow down the options to select the most appropriate treatment type. Each treatment includes a detailed description of its characteristics, such as its purpose, design description, relative cost, installation time, applicable locations, impacts, safety benefits, and relevant design guidance.

Advisory Lanes



Purpose
Allow motorists to temporarily enter bike lane to provide sufficient space for oncoming traffic to safely pass on streets with limited width to install dedicated bike facilities.

Description
A bike lane with a dashed outside stripe indicating that vehicles may traverse the bike lane, if necessary, but should watch for and yield to cyclists, as with any bike facility.

Cost
$ $ $

Installation Time

Applicable Locations

- Street Type: Local Streets
- Cartway Width: One- and two-lane streets
- Traffic Volume: Less than 3,000 daily vehicles
- Speed Limit: 25 MPH
- Roadway Grade: Less than 8 percent
- Heavy Vehicles: Less than 5 percent

Impacts

- Volume Impacts: Bike volumes may increase.
- Crash Reduction Impacts: Advisory bike lanes have been shown to reduce crashes by 36 – 44%.[1]

Safety Benefits

- Provides designated space for cyclists.
- Allows vehicles to safely pass when necessary.
- May have a speed reduction effect on motor vehicles.[2]

Design Guidance

- The minimum width of an advisory bike lane is 6 feet adjacent to parking, or 4 feet curb-adjacent exclusive of gutter. A desirable width is 7 feet.
- The minimum width of the un-laned 2-way motorist space should be 12 feet between the bike lanes. The maximum width is 18 feet.

Advisory Lane treatment page example.
Find more information at Jersey City Traffic Calming Toolkit

Speed Humps

Description: Speed humps are rounded, raised areas across the roadway that cause vehicles to reduce speeds. They are usually found on neighborhood streets (low-volume), not on major roadways or primary emergency vehicle routes. Speed humps should terminate before the gutter pan or curb, so as to not interfere with proper stormwater drainage. They are sometimes broken up to allow a clear path for bicyclists or emergency vehicles, and include signage and paint markings so that they are visible.
Benefits: Speed reduction. Relatively low-cost. Easy to test.
Drawbacks: Increased noise.
Increased maintenance costs. Requires additional costs for signage. Extra care is required when snowplowing.
Costs: $2,500



Speed hump in front of an elementary school in West Orange, NJ.

Speed Tables

Description: Speed tables are midblock traffic-calming devices that raise the entire wheelbase of a vehicle to reduce its traffic speed. Speed tables are longer than speed humps and flat-topped, with a height of 3–3.5 inches and a length of 22 feet.
Benefits: Speed reduction.
Drawbacks: It can be challenging to get buy-in from local and regional emergency services and first responders as speed tables can be perceived as reducing emergency response times.
Costs: $20,000



Speed Table in Northampton, Massachusetts. Image: Northampton Massachusetts

Raised Crosswalks

Description: Raised crosswalks are ramped speed tables spanning the entire width of the roadway, often placed at midblock crossing locations. The crosswalk is demarcated with paint and/or special paving materials. These crosswalks act as traffic-calming measures that allow the pedestrian to cross at grade with the sidewalk.
Benefits: Speed reduction. Increase visibility of and for pedestrians.
Drawbacks: Noise. Maintenance. Need for signage. May require revisions to stormwater systems
Costs: $40,000



Raised crosswalk at Somerville School in Ridgewood, NJ.

Raised Intersections

Description: Raised intersections are raised areas of roadway, including crosswalks that are higher than the surrounding roadway approaches. Like speed humps, they deflect both the wheels and frame of traversing vehicles. The entire intersection is at sidewalk grade, putting pedestrians and vehicles on the same plane.
Benefits: Speed reduction. Improved safety. Reduction in cut-through traffic. The gentle ramps that lead to the intersection are designed to avoid damage to large vehicles and emergency response vehicles.
Drawbacks: Increased roadway noise. Higher maintenance costs. Required signage costs and aesthetics. May require revisions to stormwater systems
Costs: High ($80,000 - $120,000 each)



Raised intersection, Princeton, NJ.

Mini-Roundabouts / Mini-Traffic Circles / Modern Roundabouts

Description: Another variation used in residential traffic calming is the mini traffic circle, which is a raised circular island constructed in the center of residential or minor street or intersections. These are generally not intended for use where one or both streets are arterial streets. Motorists must reduce speed to maneuver around the circle, which helps reduce the frequency and severity of crashes. Mini-circles are commonly landscaped, most often at locations where the neighborhood has agreed to maintain the plants. In locations where landscaping is not feasible, traffic circles can be enhanced through specific pavement materials. Mini-circles are an intersection improvement as well as a traffic-calming device and can take the place of stop or yield signs. A modern roundabout is a form of circular intersection in which traffic travels at low speeds counterclockwise around a central island. Vehicles entering a roundabout must yield, or stop if needed, to circulating traffic. The lower design speed of roundabouts is likely to improve yielding, safety, and comfort for pedestrians and bicyclists. In settings with large numbers of children, lowering vehicle speed has great potential for injury prevention.
Benefits: Slows traffic. Reduces cut-through traffic. Can provide a gateway or identity to a neighborhood. Does not alter the path of pedestrians or bicyclists.
Drawbacks: In some cases, design techniques may be employed to mitigate impacts on emergency access, for example, by providing mountable curbs or aprons at the edges of traffic circles or medians. A single roundabout used in isolation will not significantly calm traffic. A coordinated system of multiple traffic circles or other calming measures is preferred.
Costs: $45,000 - $110,000 each

- Roundabouts and Traffic circles are an incredible opportunity for green infrastructure. Mini-roundabouts can be home to small plants and trees while the largest roundabouts can even host small landscaping features or even micro-parks! Additionally, roundabouts can be an effective tool to mitigate stormwater runoff. Consult your local botanist/arborist before planting anything.

- Roundabouts can reduce fatalities and injuries from crashes compared to traditional two-way stop-controlled intersections by up to 82%.

Chicanes

Description: A chicane is a set of two or more curb extensions/islands on alternating sides of a roadway or approach that narrow and realign the roadway for short segments. Since the street is no longer straight, drivers must slow down to negotiate the roadway. Two-way traffic and full access for larger vehicles and emergency services can be maintained. A chicane effect can be created using various methods, including concrete curbs, landscaped areas or alternating diagonal and parallel parking.
Benefits: By creating a "slalom" effect, chicanes reduce vehicle speeds and discourage cut-through traffic. These methods can improve the appearance and function of the street.
Drawbacks: Concrete chicanes complicate street maintenance and stormwater drainage. Must be able to maintain required clearances for emergency vehicle and bus access.
Costs: $10,000 - $30,000 (paint versus physical diverter)



Roadway with a chicane. Image: Google map

Curb Extensions / Bulb Outs

Description: Curb extensions, sometimes referred to as "bulb-outs" or "bump-outs" narrow the roadway by extending the curb at key intersections and mid-block locations.
Benefits: Slows traffic. Reduces turning speeds. Increases pedestrian safety by reducing crossing distance and increasing pedestrian visibility. Can be lengthened to create landscaped areas or transit stops.
Drawbacks: Relatively high initial costs. Potential loss of on-street parking. Increased maintenance costs. Complicates plowing and street sweeping operations. Can hinder drainage. Can impact turning movements for large trucks and may not be feasible in some areas for this reason.
Costs: $25,000 per corner of intersection



Curb Extension in Montclair, NJ. Image: VTC

Pedestrian Refuge Islands

Description: Concrete or landscaped islands typically located down the center of a roadway or at a roadway entrance.
Benefits: Landscaped or concrete traffic islands and medians can reduce speeds by narrowing drivable travel lane widths. They can improve pedestrian accommodation by providing a mid-block pedestrian refuge at crossings. They complement improved crosswalks, and can allow a pedestrian to cross each direction of travel separately. A minimum 6-foot width is desirable. They can also reduce pedestrian crossing width. They can be used to provide a visual enhancement or gateway to promote neighborhood identity.
Drawbacks: Traffic islands and medians may reduce parking and driveway access, and the narrower road may also increase motor vehicle/bicycle conflicts.
Costs: $4,000



Pedestrian Refuge Island in Cherry Hill, NJ. Image: VTC

Roadway Closures

Description: The most extreme form of traffic diversion, a permanent roadway closure interrupts the traffic grid pattern by creating dead-end or cul-de-sac street segments. A street closure is accomplished by installing a physical barrier that blocks a street to motor vehicle traffic and provides some means for vehicles to turn around. Full street closures should be used only in the rarest of circumstances. Neighborhoods with cul-de-sac streets require extensive out-of-the-way travel, which is not a mere convenience issue, but has serious implications for impacts on other streets, which should be studied before implementation. If a roadway is closed, it should always allow for the free through movement of all pedestrians, including wheelchair users, and bicyclists. Local emergency services should be consulted when planning a roadway closure.
Benefits: This treatment works very well where all other calming attempts have failed.
Drawbacks: Street closures divert all through traffic onto other nearby roadways in the network.
Costs: Low, varies depending on materials, and landscaping



This permanent roadway closure in Ocean City, NJ preserves bicycle and pedestrian access.

Diverters

Description: Several types of diverters, such as semi-diverters and diagonal diverters, may be used to restrict traffic flow and discourage cut-through traffic. Diagonal diverters, also called turning movement diverters, can be installed at the intersection of a neighborhood street with a major street or collector to prevent cut–through traffic. They prevent straight–through movements and allow right turns only into and out of the neighborhood.
Benefits: Diverters reduce through traffic without preventing pedestrian access. They can also be designed to allow bicycle and emergency vehicle traffic.
Drawbacks: Do not work well on arterials, highways, other main roadways and transit routes.
Costs: $25,000 - $150,000



This landscaped median along Haven Avenue in Ocean City, NJ allows right turns only for motor vehicles.

Turn Restrictions

Description: This treatment uses signage to restrict certain turns at intersections to influence travel patterns. For example, a "No Left Turn" sign at an intersection is intended to prevent left turns. This measure is applicable on streets where cut-through traffic exists. This method can be tailored to be applicable during the most problematic times by defining a time period for the restriction.
Benefits: Low cost.
Drawbacks: This treatment does not work well for high-volume intersections with many turning movements, because it is difficult to enforce.
Costs: Low



Turning right on red is restricted during school hours at this intersection.

Temporary Circulation Changes (Street Closures and One-Way Streets)

Description: Temporary street closures during student arrival and departure times can improve the efficiency and safety of the drop off and pick up of students at school. Temporary closures eliminate motor vehicles in areas congested with pedestrians, bicyclists, and perhaps buses. Another similar technique is to designate a street as one-way during arrival and departure time. Signs are essential for this method.
Benefits: Work well at densely developed neighborhood schools.
Drawbacks: This treatment may create traffic problems on other streets. Requires staff to set up and take down temporary traffic devices for each implementation.
Costs: Low



Temporary roadway closure in front of the Bullock School in Montclair, NJ.

School Streets

Description: The concept of School Streets originates from NACTO's Streets for Pandemic Response and Recovery guide. School Streets are roads surrounding schools that are temporarily closed to through motor vehicle traffic during arrival and dismissal times. They create shared spaces using temporary barriers at school entrances to provide safe waiting areas while still allowing necessary vehicular access.
Benefits: Increase safety, air quality and health and well-being
Drawbacks: Might displace traffic congestion to nearby roads, operational challenges for some schools. Requires staff to set up and take down temporary traffic devices for each implementation.
Costs: Low



School Streets on Clinton Avenue, Ridgewood, NJ. Image: School Zone Safety Strategies

Hardened Center Lines

Description: Vertical or mountable elements placed along the centerline of two-way streets or lane lines on multi-lane streets to guide vehicles into a single receiving lane and discourage wide or high-speed turns.
Benefits: Slowing high-speed turning traffic in pedestrian areas
Drawbacks: High-speed turns in conflict with pedestrians
Costs: Low



Hardened Center Lines in Jersey City, NJ. Image: Hudson County Complete Street Demonstration Project

Slow Turn Wedges

Description: Left turns can increase the risk of pedestrian crashes. Slow-turn wedges are a traffic-calming treatment that uses posts placed within the intersection to force drivers to slow down and follow the proper path when making left turns. This type of traffic-calming device can only be installed at locations where a one-way road intersects with a two-way road or another one-way road.
Benefits: Increase safety, and speed reduction.
Drawbacks: High-speed turns in conflict with pedestrians
Costs: Low (if implemented using striping and modular equipment)



Slow Turn Wedges in Brooklyn, NY. Image: The City of New York

INTERSECTION MURALS AND AESTHETIC SURFACE TREATMENTS

Per the MUTCD FAQ, aesthetic surface treatments and intersection murals are not considered traffic control devices and therefore are not governed by the MUTCD, except where they interact with or adversely affect official traffic control devices. While such treatments may increase intersection visibility, the use of colors is limited to those that do not conflict with MUTCD color provisions. As a result, school-specific colors may not always be permitted. The final design and installation must ensure that the crosswalk striping is visible to all users. In addition, before installation of any street artwork, verify current FHWA policy and regulations especially if federal funding is involved.



Intersection mural at the intersection of Holmes Street and High Street in Belleville, NJ. Image: VTC

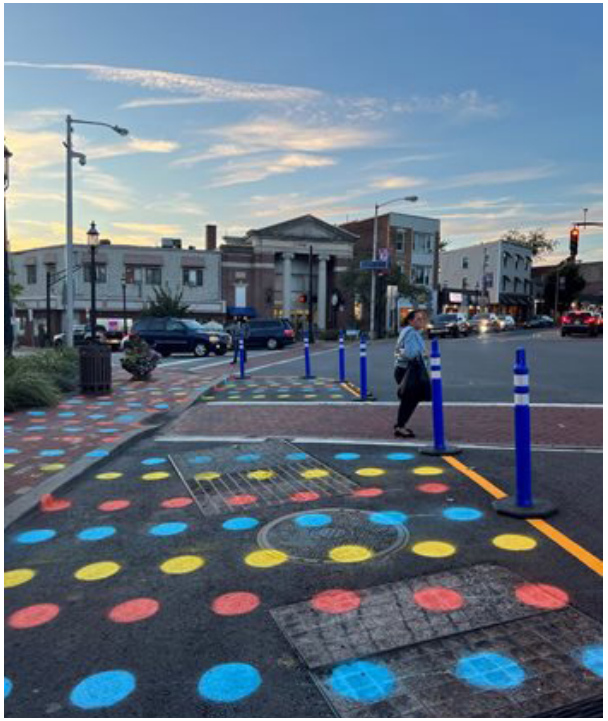
Temporary Demonstrations for Traffic Calming and Complete Streets

Temporary demonstration projects help communities test the feasibility and effectiveness of potential roadway improvements before permanent installation. Communities across the country have increasingly implemented these projects as a way to evaluate design concepts in real-world conditions. This approach can highlight potential project shortcomings, broaden public engagement, test interventions, and inspire community support and action. The North Jersey Transportation Planning Authority (NJTPA), in partnership with the Hudson Transportation Management Association (Hudson TMA), created the Complete Streets Demonstration Library to support low-cost, quick-build projects. The purpose of the program is to encourage and expand the use of temporary demonstration projects as a planning and engagement tool. The goals of these projects include:

- Testing street design interventions, such as bicycle lanes, corner curb extensions or "bump-outs," pedestrian plazas, "parklets" in place of on-street parking spaces, and other safety, placemaking, and traffic-calming features.
- Engaging communities through education on safer street design, placemaking, active transportation, and the collection of real-time public feedback.
- Evaluating impacts on street performance, user behavior, and overall safety.



Pilot Bicycle Lanes in Asbury Park, NJ. Image: VTC



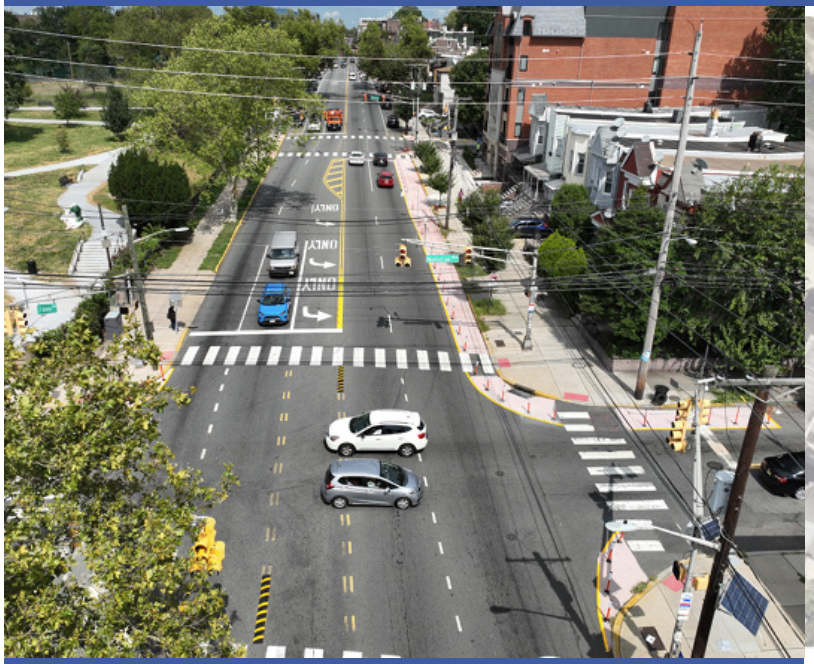
Temporary Curb Extension in West Orange, NJ. Image: NJTPA

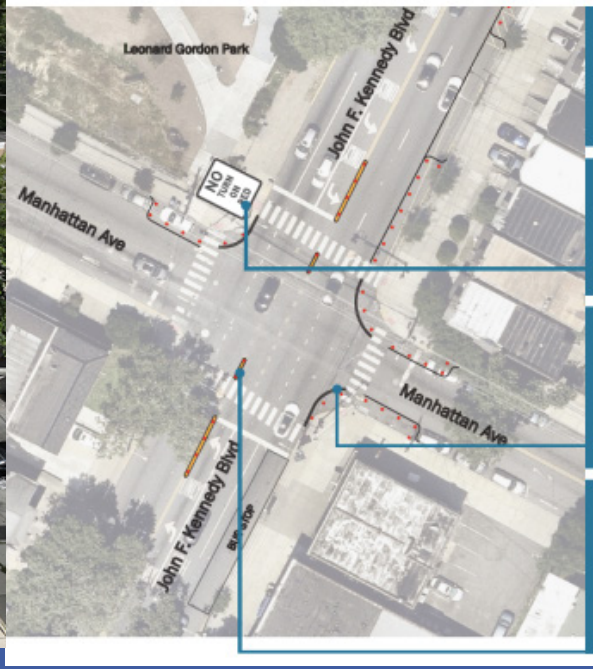
HUDSON COUNTY COMPLETE STREETS DEMONSTRATION PROJECTS

In 2024, Hudson County developed its Vision Zero Safety Action Plan to eliminate fatal and serious-injury crashes. The project follows the following policy and design strategy considerations:

- Making streets safer for people walking and bicycling through Complete Streets improvements.
- Fixing common risks on roads by adding clear markings, lights, and signs.
- Adding simple safety measures like turning lanes, rumble strips, and brighter road markings along high-crash corridors.
- Providing Safe Routes to School and improved public transit services for underserved communities.
- Conducting community outreach and education when making changes that are new to communities.

On September 7, 2024, the project team installed a temporary demonstration project featuring curb extensions, a hardened centerline, and signal timing adjustments to create an all-pedestrian phase. These treatments are designed to improve safety and accessibility for people who use active transportation. Although temporary, the demonstration provided valuable insight into how these treatments could improve traffic safety and inform future improvements in Hudson County.





ALL-PEDESTRIAN PHASE
A signal timing strategy that allows pedestrians to cross all intersections simultaneously, with no vehicle movement.

TURN RESTRICTIONS
During this duration of the demonstration project, signs were installed prohibiting Right-On-Red.

BUMP-OUTS/CURB EXTENSIONS
An extension of the sidewalk at the intersection that narrows roadways, shortens crossings, and improves safety and walkability.

CENTERLINE HARDENING
A barrier installed on the double yellow line to prevent lane crossing, reducing head-on collisions and calming turns. The demo also included a short section in front of the crosswalk.

Source and find more information: https://www.hcnj.us/visionzero/safety-plan/

Summary Matrix: Traffic Calming Measures for School Zones

This summary matrix lists the traffic-calming measures described in this chapter and provides a brief description of each measure, the issue it is intended to address, what it is best used for and not intended to be used for, an idea of cost (where available), and other considerations regarding the measure. This cost information has been updated using the NJDOT Transportation Alternatives Program 2026 Cost Estimate Guidelines and Recommendations for Pedestrian, Bicycle and Traffic Calming Projects.

Measure	Description	Issue	Best For	Not Used For	Costs	Considerations
Gateway	A signing and/or landscaping treatment to alert motorists they are entering a special area with increased conflicts. Gateways are typically supplemented with other traffic-calming measures.	Speed Reduction	Entrances to school zones, neighborhoods, commercial areas, town centers, or busy places of activity.	Isolated higher-volume arterials and highways	Varies	Generally expensive and can require routine maintenance.
Pavement Marking/ Stencil	Markings lines and symbols need to be selected and placed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Some examples include: A "SCHOOL" legend can be installed on a travel lane in advance of a school area with high pedestrian activity. Crosswalks can be used to alert motorists of pedestrian activity.	Speed Reduction	Roadways with wide rights of-way that would benefit from slower speeds and improved pedestrian safety	Isolated higher-volume arterials and highways	Low Average quality markings cost $7.00/ sf. Longer lasting markings $15.00/sf.	Pavement markings are typically used in conjunction with signs and other measures. Require regular maintenance and may not be visually aesthetic. Not visible when roads are snow-covered.
Stationary Radar Sign / Speed Display Board / Speed Feedback Sign	Radar signs are interactive signs that draw motorists' attention to their speed and the road's legal speed limit. They work by informing motorists when they're exceeding the speed limit. They can be used in residential areas, school zones, construction zones, or other safety zones. Radar signs can be permanently mounted on signposts or temporary installations can be mounted on self-contained trailers.	Speed Reduction	High volume and high speed arterials and highways; residential areas, school zones, construction zones, or other safety zones	Streets where speeding is not a concern	$6,000 - $16,000 each	Radar signs do not slow traffic as much as physical measures. Motorists' compliance is voluntary. Enforcement is still necessary.

Measure	Description	Issue	Best For	Not Used For	Costs	Considerations
Textured and Colored Pavement	Paving materials such as brick, cobbles, or concrete pavers can be used to identify a traffic calmed area. The variety of color and texture signal to drivers that they are traveling in a pedestrian-centric zone. Bricks or blocks are sometimes also used to provide the same traffic-calming benefits as rumble strips, delineating crosswalks and pedestrian zones.	Speed Reduction	Residential and neighborhood shopping areas	Isolated higher-volume arterials and highways	Moderate to High. Costs vary depending on materials used and size of paving area.	Some materials, particularly cobblestones, present a hazardous riding surface to bicyclists. Loose or uneven installations of paving stones pose a tripping hazard to pedestrians and should be regularly inspected, increasing maintenance costs over ordinary asphalt or concrete pavement.
Landscaping	Landscaping defines pedestrian and vehicle areas, reduces the visual width of the roadway, and provides a more pleasant street environment for all. Landscaping can include trees, bushes and/or planters which can be planted in the buffer area between the sidewalk and the street. Landscaping is often used in conjunction with other traffic-calming measures.	Pedestrian Safety, Speed Reduction	Residential and neighborhood shopping areas	Isolated higher-volume arterials and highways	Moderate to high - varies depending on scale and materials/ plantings	Depending on the design, the installation and maintenance costs can be high. Right-of-way impacts may be significant as well.
Rumble Strip	Rumble strips are raised buttons or grooves closely spaced on roadway surface to create noise and vibration. They are typically installed to alert drivers of an upcoming curve or speed change. They are freeways, or along center lines of roadways, to alert drivers who risk leaving the roadway or cross into oncoming traffic.	Speed Reduction	Isolated higher-volume arterials and highways; areas with high pedestrian activity and safety concerns	Residential areas; Bicycle paths / lanes	$10 to $15 per linear foot	Rumble strips are effective only through the noise and vibration they create. This same noise and vibration are their biggest detraction, particularly in residential areas. Drivers can more easily ignore rumble strips than other calming methods that vertically or horizontally deflect vehicles. Without adequate signage, rumble strips could startle motorists, potentially creating a hazardous condition. They also require increased maintenance, particularly during roadway re-paving.

Measure	Description	Issue	Best For	Not Used For	Costs	Considerations
Signage (regulatory and warning)	Traffic signs can be used to alert or inform motorists of a condition or a potential situation. Signs need to be selected and placed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Speed limit signs, pedestrian/bicycle/school crossing signs, and in street-pedestrian crossing signs are often used by municipalities to warn motorists of high pedestrian activity, and can help to reduce speeds.	Speed Reduction	All types of roadways (in moderation)	-	Low $180-$540 for an average sign	Signs are also used in conjunction with other measures such as pavement markings. Can be considered to clutter the roadside especially on a residential street. In-street signs are susceptible to being struck or may need to be removed at night and placed back during the day. Overall effectiveness can vary.
Narrowed Lane	Studies have shown that wider travel lanes allow for faster vehicular travel speeds. Conversely, drivers naturally travel more slowly when navigating narrow travel lanes, providing a more subtle calming effect than other physical calming methods.	Speed Reduction	All types of roadways	-	Varies depending on method of narrowing the roadway. Low if striping only.	Excess right-of-way can be shifted to providing wider sidewalks, bicycle lanes, or on-street parking. Simple roadway restriping to achieve roadway narrowing is inexpensive.
Road Diet	A "road diet", or roadway reconfiguration, can improve safety, calm traffic, provide opportunities to install pedestrian refuge islands, bicycle lanes, on-street parking, or transit stops, and enhance overall quality of life. A road diet typically involves converting an existing four-lane undivided roadway to a three-lane roadway consisting of two through lanes and a center two-way left-turn lane (TWLTL).	Speed Reduction, Pedestrian Safety	Four-lane undivided roadways with histories of left turn or sideswipe crashes, and/or high pedestrian and bicycle usage.	Arterial corridors with very heavy through traffic volumes, or with no pedestrian/ bicycle demand	Varies. Can be a low-cost safety solution when planned in conjunction with a simple pavement overlay, and the reconfiguration can be accomplished at minimal additional cost	On corridors with significant left turn volumes, "road diet" typically does not significantly impact capacity, though traffic engineering study may be requested to demonstrate to the public and/or municipal officials

Measure	Description	Issue	Best For	Not Used For	Costs	Considerations
Speed Hump/Speed Table	Speed humps are rounded raised areas across the roadway that require vehicles to reduce speeds.	Speed Reduction	Neighborhood streets	Arterials, highways, other main roadways	$2,500 (hump) to $20,000 (table)	Can interfere with transit, snow plow, and emergency vehicle operations. Speed humps increase roadway noise and wear on vehicle suspensions. Highly visible warning signage and pavement markings required.
Raised Crosswalk	Raised crosswalks are elongated speed humps that feature a marked crosswalk at the same elevation as the adjacent sidewalks. Crosswalk markings or contrasting crosswalk materials (pictured) show this element is also a crosswalk.	Pedestrian Safety; Speed Reduction	Areas where pedestrian traffic takes priority over vehicular traffic	Arterials, highways, other main roadways	$40,000	As both a marked crosswalk and a traffic calming-element, raised crosswalks provide a superior safety advantage to pedestrians. Raised crosswalk can also impact stormwater flow.
Raised Intersection	Similar to raised crosswalks, except the entire intersection is at sidewalk grade	Pedestrian Safety; Speed Reduction	Areas with heavy pedestrian traffic, such as shopping areas and college campuses.	Arterials, highways, other main roadways	$80,000 - $120,000	Raised intersections provide a barrier-free crossing for pedestrians and slow all vehicles, including emergency vehicles and transit buses. Raised intersections can also impact stormwater flow.
Mini Roundabout Modern Roundabout	Motorists must reduce speed to maneuver around the circle, which helps reduce speeds and the frequency of crashes.	Speed Reduction	Neighborhood streets that have a history of high speeds and high crash rates at intersections	Intersections with dispro-portionate volume on approaches	$45,000 (Mini Roundabout) $110,000 (Neighborhood traffic circle)	Can provide a gateway or neighborhood identity.

Measure	Description	Issue	Best For	Not Used For	Costs	Considerations
Chicane	Sets of two or more alternating curb bulb outs or extensions that narrow and realign the roadway.	Speed Reduction and Cut-Through Traffic	Neighborhood streets that experience high speeds or heavy cut-through traffic volume	Arterials, highways, other main roadways	$30,000	Concrete chicanes complicate street maintenance and drainage and may require additional right-of-way to construct. Chicanes created through pavement striping are cost-effective and easy to implement, but also less effective. On-street parking can be alternated from side-to-side along the street.
Curb Extension ("Bulb-Out" or "Bump-Out")	Briefly narrow the roadway by extending the curb at intersections or mid-block locations Reduces vehicle travel speeds due to narrowed travel lanes. Reduces crosswalk lengths.	Pedestrian Safety; Speed Reduction	Areas with pedestrian traffic and wider roadway cross sections; Village environments	Arterials; Narrow streets or areas with high volumes of large truck turns	$25,000 per corner of intersection	May require eliminating some on-street parking and may hinder street plowing and sweeping operations.
Pedestrian Refuge Island	Concrete or landscaped islands and medians slow travel speeds by narrowing lanes and also improve pedestrian accommodation by providing a pedestrian refuge at crossings, allowing pedestrians to cross each direction of travel separately.	Pedestrian Safety; Speed Reduction	Roadways with wide rights-of-way that would benefit from slower speeds and improved pedestrian safety	Already narrow roads, or roadways with frequent driveways	$4,000	Islands and medians can provide a visual enhancement or gateway to promote neighborhood identity. They may reduce parking and driveway access and may increase motor vehicle conflicts with bicycles.
Roadway Closure	The most extreme form of traffic diversion, roadway closures interrupt the traffic grid pattern by creating dead-end or cul-de-sac street segments.	Cut-Through Traffic	Neighborhood streets where all other calming attempts have failed	Arterials, highways, other main roadways, transit routes, and anywhere street continuity is desired	Low, varies depending on materials, and landscaping	Street closures divert all through traffic onto other nearby roadways in the network. Traffic impacts of a roadway closure should be studied when considering implementation.

Measure	Description	Issue	Best For	Not Used For	Costs	Considerations
Diverter	Several types of diverters, such as semi-diverters and diagonal diverters, may be used to restrict traffic flow and discourage cut-through traffic.	Cut-Through Traffic	Neighborhood streets that experience high cut-through traffic volume	Arterials, highways, other main roadways and transit routes	$25,000 - $150,000	Diverters reduce through traffic without preventing pedestrian access. They can also be designed to allow bicycle traffic.
Turn Restriction	Restricting certain turns at intersections to influence travel patterns.	Cut-Through Traffic	Low-volume turning movement	High-volume intersections and turning movements	Low	Can be difficult to enforce without physical improvements to intersection geometry.
Temporary Circulation Changes	Temporary street closures during student arrival and departure times can improve the efficiency and safety of the drop off and pick up of students at school. Temporary street closures eliminate motor vehicles in areas congested with pedestrians, bicyclists, and perhaps buses.	Cut-Through Traffic; Congestion during school arrival/ dismissal	Low volume neighborhoods with comprehensive grid network; High cut-through neighborhoods	Isolated higher-volume arterials; Transit routes; Major emergency response routes	Low	Circulation changes will have secondary impacts on adjacent roadways that must be considered.
School Streets	Roads surrounding schools that are temporarily closed to through motor vehicle traffic during arrival / dismissal times. They create shared spaces using temporary barriers at school entrances to provide safe waiting areas while still allowing necessary vehicular access.	Traffic congestion and queuing adjacent to schools, causing pedestrian conflicts	Neighborhood streets with low through traffic volumes	High- volume arterial streets	Low	Need staff to deploy and retrieve traffic control devices, for each implementation

Measure	Description	Issue	Best For	Not Used For	Costs	Considerations
Hardened Center Lines	Vertical or mountable elements placed along the centerline of two-way streets or lane lines on multi-lane streets to guide vehicles into a single receiving lane and discourage wide or high-speed turns.	High-speed turns in conflict with pedestrians	Slowing high-speed turning traffic in pedestrian areas	Areas with low pedestrian demand	Low	Modular equipment subject to damage from vehicles including snow plows
Slow Turn Wedges	Posts placed within the intersection to force drivers to slow down and follow the proper path when making left turns. This type of traffic-calming device can only be installed where a one-way road intersects with a two-way road or another one-way road.	High-speed turns in conflict with pedestrians	Slowing high-speed turning traffic in pedestrian areas	Areas with low pedestrian demand, or approaches with no left turns	Low (if implemented using striping and modular equipment)	Only for installation on one-way street approaches. Modular equipment subject to damage from vehicles including snow plows