

# Neighborhood Traffic Management Program

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# Introduction

Arapahoe County Public Works and Development Staff (County) created the Neighborhood Traffic Management Program (NTMP) in response to concerns about vehicle speeds, safety, and cut-through traffic on residential roadways. This manual provides procedures for the County to address requests for traffic calming and neighborhood traffic management and outlines the process to follow when an NTMP application for traffic calming is received.

The objectives of the NTMP are to:

- Create a consistent approach to the initiation and approval of a traffic calming study or neighborhood traffic management strategy.
- Improve safety for all road users as a result of slowing traffic speeds.
- Define the existing traffic conditions on the local roadway that warrant the initiation of a traffic calming study.
- Encourage citizen involvement in developing solutions to neighborhood traffic concerns.
- Effectively balance the goal of reducing traffic impacts with the needs of emergency response and maintenance.
- Efficiently allocate the use of County funding and resources.
- Implement traffic management strategies that effectively address the study findings.

This program is intended for application on existing roadways, opposed to new roadway construction. The main intent of this program is to address speeding and/or safety concerns. While the treatments identified in **Appendix A** can be considered with new construction, new construction has more flexibility and opportunities to utilize additional treatments and strategies with typically more area and additional funding opportunities outside the limited County budget.

## NTMP Process

The NTMP pre-application process is initiated when a traffic calming request is submitted to Arapahoe County. A County staff member will then refer the individual or group to the NTMP document. The entire NTMP process is outlined in **Figure I**.

### *Program Eligibility*

In order to determine whether a location is eligible for this program, the location must meet the following eligibility criteria.

The identified location must be located on:

- A local roadway OR minor collector – as shown on ArapaMap, Streets layer (<https://gis.arapahoegov.com/arapamap/>)

AND

- A roadway that is County maintained pavement – as shown on ArapaMap (<https://gis.arapahoegov.com/arapamap/>).

This information can be used by the applicant to determine if the location is eligible for this program and will also be used by County staff to confirm eligibility when reviewing applications. If a location is eligible for this program, County residents can submit a request for the NTMP program using the Service Request Form.

All other roadway types and private roadways do not qualify for the County-funded NTMP. For traffic concerns on private roadways, please contact local maintenance or the appropriate Homeowners Association (HOA) for resources.

### *Threshold Criteria*

These criteria help determine if traffic calming treatments will be effective in addressing the concerns identified in the NTMP application. If the location does not meet minimum thresholds, then the location does not qualify for the NTMP. A new application may not be submitted for two years. During this time, no mitigation efforts will be completed by the County.

After the location is confirmed to be on an eligible roadway with the requirements above, data will be collected by Arapahoe County to determine the existing traffic conditions on the roadway. The traffic volumes and speed observation data should be collected over a minimum of three 24-hour periods.

The following minimum threshold criteria must be met for a roadway to qualify for the NTMP:

- Average Daily Traffic (ADT) Volumes: The measured volume is over 500 vehicles per day

AND

- Speed Observations: The measured 85<sup>th</sup>-percentile speed exceeds the posted speed limit by six miles per hour or more

OR

- Safety Analysis: The roadway segment has documented traffic safety issues that are considered correctable by traffic calming treatments

### Traffic Volumes and Speed Observation Methodology

The County will utilize or collect traffic counts at one or more locations along the neighborhood roadway during typical weekday conditions. The following process is a suggested methodology to consider, but all situations are different, and engineering judgement may be applied:

- 1) The County staff will divide the roadway in question into segments with homogenous conditions. This should include consideration of traffic generators (i.e. schools, community gathering locations, parks and recreation facilities), roadway characteristics, intersecting facilities, and other factors deemed appropriate by engineering judgement. Typically, this will result in an intersection to intersection segment but may look different based on whether the roadway connects to other roads.
- 2) The County staff will determine if existing traffic volumes and speed observation data are available. Data may be available from other projects, agencies, and/or traffic impact studies. If this data is available within the previous year, it may be utilized for this analysis.
- 3) The County will collect data if necessary. Traffic volumes and speeds should be collected for at least three 24-hour periods. Weeks including holidays and other special events (including block parties) should be avoided when selecting days to complete data collection.

## Safety Analysis

To complete the safety analysis, a minimum of three years of crash history will be compiled from crashes reported to the Arapahoe County Sheriffs' Office. County staff will conduct an analysis to determine if the safety issues and crash patterns could be corrected by traffic calming treatments.

## *Community Input and Traffic Calming Plan*

If the location meets the roadway eligibility and threshold criteria, the County will move forward to determine the general level of support for potential traffic calming treatments.

## Study Limits/Location Definition

The study limits will typically be defined at the most immediate intersecting streets of the requested location, with the potential to expand based on the potential diversion of traffic to other roadways with installation of traffic calming treatments. Defining the project limits depends on the nature of the neighborhood, whether there are other access points, and how many households may be impacted. Arapahoe County will identify the study limits based on this criteria and engineering judgement.

## Support Poll

The County will administer an online poll (with an option to answer the questions over the phone) to determine whether there is enough resident support within the study limits to move the project forward. A postcard will be mailed from the County to all physical addresses identified within the study limits. The postcard will provide a link to complete the form as well as a phone number for households to respond to the poll. The poll will follow a simple format to determine if people are open to traffic calming treatments installed along the roadway. There may be questions related to the different types of traffic calming treatments, but it won't include information about potential recommendations. The poll will be active for at least two weeks and a deadline provided on the postcard and online.

There is not a specific level of support necessary for an application to move forward, but the County will look at the poll results to determine if there is enough interest in the potential traffic calming treatments.

## Traffic Calming Plan

If the County determines the application should move forward, the County will prepare a traffic calming plan evaluating the appropriate treatments for the neighborhood roadway(s), considering those that are listed within the toolbox (**Appendix A: NTMP Traffic Calming Treatments**).

## Neighborhood Approval

After completing the traffic calming plan, the County will provide the plan to the applicant for them to share with the households within the study limits to get final approval for the traffic calming treatment(s). A postcard with mail-in and online ballot options will be mailed from the County to all physical addresses identified within the project limits to record approval. For the project to be considered for implementation, a meaningful portion of the community must approve the traffic calming plan. The County will make the ultimate decision about the implementation of the traffic calming plan, but the greater the degree of neighborhood approval, the more favorable the plan will be viewed for implementation.

## *Implementation*

If a meaningful level of neighborhood approval is gathered, the County will place the treatment(s) identified in the traffic calming plan as a project on the County's NTMP project list. The project may be prioritized by impact, neighborhood support, and length of time since application submittal. Then the project will be implemented based on available funding and resources. These projects will be listed on the County's website.

### Funding

The County staff will seek funding in the yearly budget process to implement traffic calming projects approved through the NTMP program. Projects that have been designed, but for which funding is not identified will have the highest priority for future NTMP funding.

A neighborhood HOA, special district, or other organized entity may elect to provide funding for an approved traffic calming project, or even to contract for the construction themselves. The following conditions must be met in order for a privately-funded project to be implemented:

- County staff will work with the private entity on design, review, permitting and construction.
- The County and the funding private entity will enter into a contract that will specify all of the conditions and responsibilities of each party for completion of the project. The contract will also specify the responsibilities and funding for any necessary maintenance activities.
- All agreements must be approved by County Attorney and executed by the Public Works and Development Director.
- It will be the responsibility of the private entity to raise the funds needed to complete the project.
- Funding must be received prior to County staff approving construction.

### Other Agency Review

All traffic calming plans developed by the County as part of the NTMP are subject to review by other agencies. This includes external emergency service providers, neighboring jurisdictions, South Metro Fire District, or any other agency deemed appropriate by County staff.

### Construction

When priority, funding and resources are available, the County will move forward with construction on the approved traffic calming project. Construction will be managed by, or through, County Public Works and Development Staff.

### Following Construction

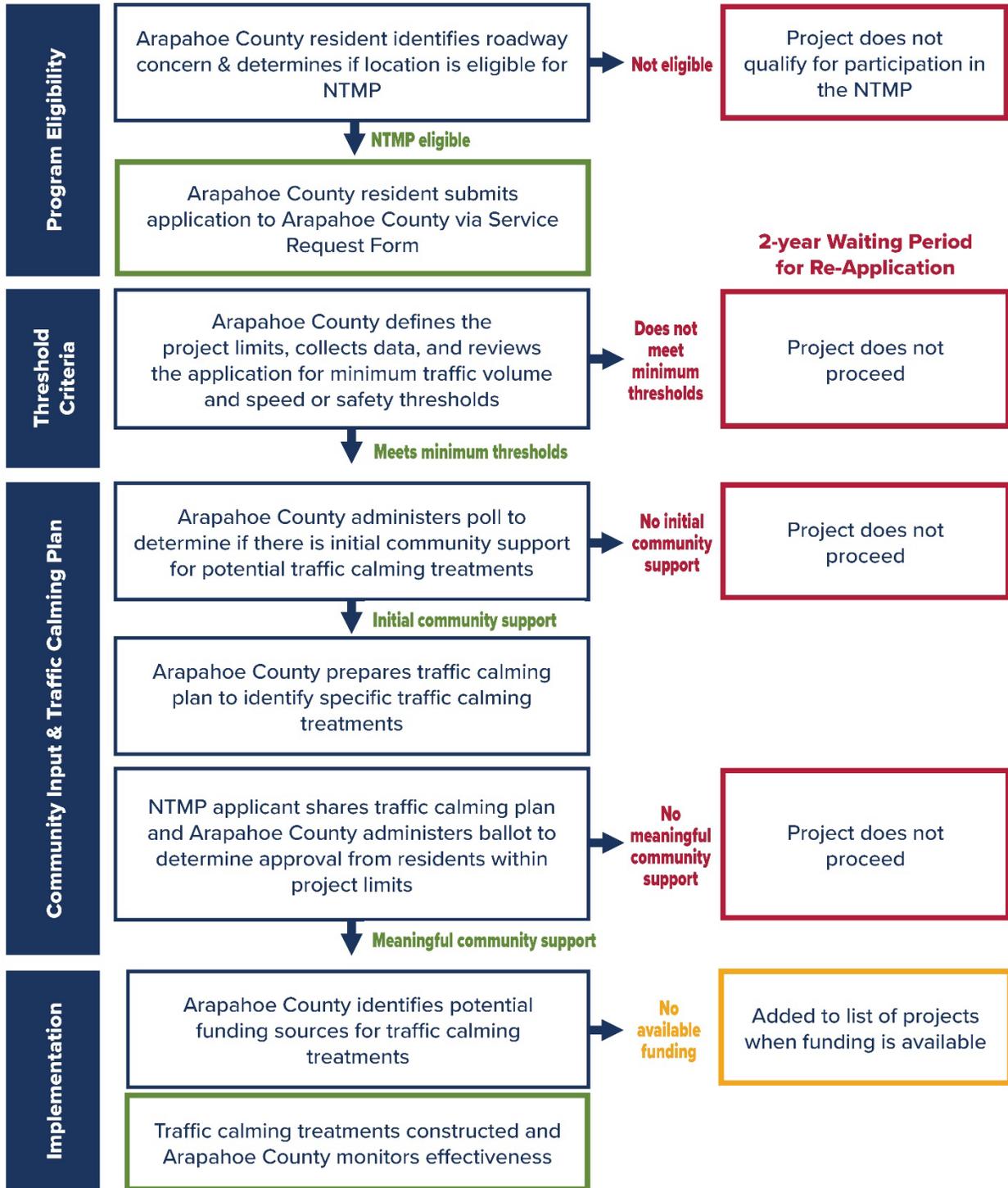
The County will monitor and maintain the traffic calming treatments to evaluate the effectiveness. The County may determine at any time to remove any treatment that is ineffective or causing detrimental effects.

Figure 1. NTMP Process

# Neighborhood Traffic Management Program

## LEGEND

■ Project Application Moves Forward    
 ■ Project Put on Hold    
 ■ Project Not Recommended to Proceed



## Neighborhood Traffic Calming Treatments

Different street types, neighborhood characteristics, and traffic and safety issues will warrant varying traffic calming treatments. Descriptions and applicability information about the traffic calming treatments that would be considered by Arapahoe County are in **Appendix A: NTMP Traffic Calming Treatments**. The primary resources for these treatments are based on documentation from the Federal Highway Administration (FHWA), Institution of Transportation Engineers (ITE) and National Association of City Transportation Officials (NACTO).

Most of the traffic calming treatments consist of vertical or horizontal deflection to slow driver speeds. Installation of these treatments can occur with different materials depending on the location, issues, and available funding. For example, the most effective and permanent options typically utilize curb and gutter, but this can be costly for construction and has potential drainage, utility, and accessibility impacts. Striping and flexible delineator posts can sometimes provide similar reductions in traffic speeds with lower initial construction cost, although they may have higher maintenance costs due to frequent damage and replacement.

Traffic calming treatments can also be achieved through operational treatments. These types of treatments should be analyzed to identify consequential congestion or safety issues. Additional speed limit signs or other signage are low-cost elements to add to a roadway, but they are relatively ineffective at changing driver speeds or behavior unless paired with other traffic calming treatments.

### *Bicycle and Pedestrian Improvement Projects*

The traffic calming treatments included as part of the NTMP have the primary intent of slowing traffic and improving traveler safety, although treatments may also provide improved conditions for bicyclists and pedestrians. While projects with bicycle and pedestrian improvements may also provide traffic calming, the primary intent of these types of improvements is to improve access, comfort, and safety for bicyclists and pedestrians.

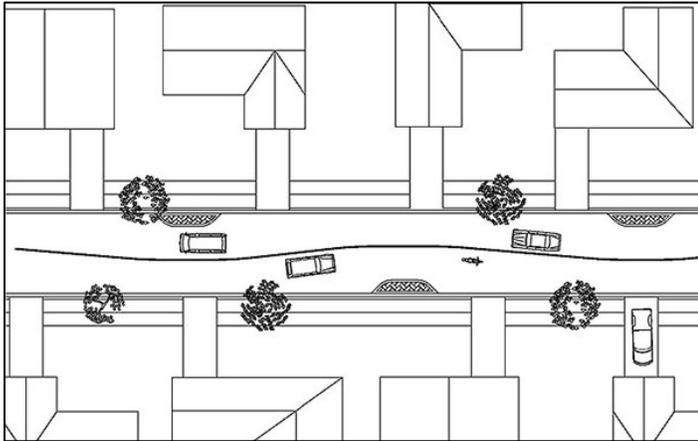
For roadway and roadside elements specifically designed to address pedestrian crossings, please reference the Arapahoe County Pedestrian Crossing Guidelines.

### *Enforcement*

While the most commonly requested strategy to address traffic speed is police enforcement, this is difficult to implement consistently based on limited resources and budget constraints, and often has only temporary results. Given that the Arapahoe County Sheriff's office is a separate department from Public Works, the County Public Works and Development staff are unable to assign and/or manage police enforcement or the Sheriff's automated speed-enforcement cameras. Therefore, it is not a viable traffic calming treatment with the NTMP.

# Appendix A: NTMP Traffic Calming Treatments

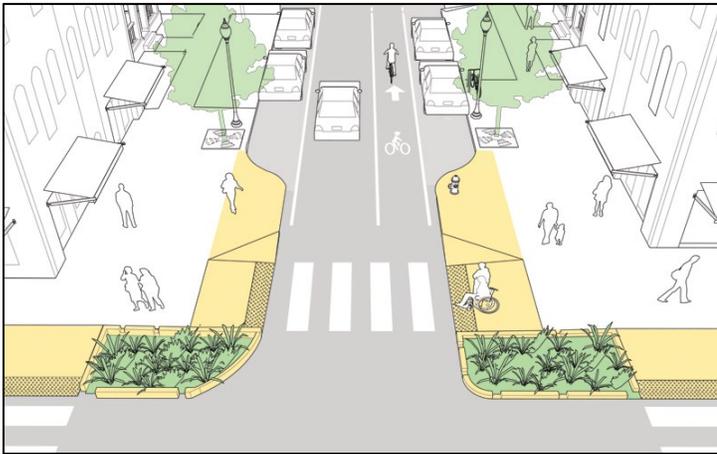
## Chicane



Concept Illustration (Delaware Department of Transportation) Photo Example (NACTO)

<b>Description</b>	A series of alternating curves or lane shifts that force a driver to steer back and forth instead of traveling a straight path. These are typically a series of three curb extensions.
<b>Design Considerations</b>	<p>The installation of chicanes can be difficult with the spacing of driveways and curb ramps.</p> <p>Daily traffic volume range for implementation should be relatively low. The FHWA reports that Pennsylvania sets a maximum of 3,500 vehicles per day.</p> <p>Speed limit is typically 35 miles per hour or less (FHWA).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>● Emergency service routes</li> <li>● Transit routes</li> <li>● Bike and pedestrian facilities – compatible with roadways with bike facilities; consider how bike facility is accommodated through curves or lane shifts</li> <li>● Large vehicle movements, such as delivery trucks and school buses</li> <li>● On-street parking – may require removal of sections of on-street parking</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>● Slows traffic by encouraging a driver to reduce vehicle speed through a series of horizontal deflections.</li> <li>● Potential to be relatively low-cost, depending on materials: <ul style="list-style-type: none"> <li>○ Bollards or flex posts (less cost)</li> <li>○ Curb and gutter</li> </ul> </li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>● Design with minimal lane shifts may still allow speeding by drivers cutting straight paths across the center line.</li> <li>● Less effective in reducing vehicle speed when the volume of traffic is significantly higher in one direction than the other or when volumes are so low that the likelihood of a driver encountering an opposing vehicle within the chicane zone is low.</li> <li>● Curb and gutter are relatively costly with potential for drainage, utility, and accessibility impacts.</li> </ul>

## Curb Extensions/Bulbouts



Concept Illustration (NACTO)



Photo Example (NACTO)

<p><b>Description</b></p>	<p>Horizontal extension of the curblines into the street, resulting in a narrower roadway section and tighter turns at intersection corners.</p>
<p><b>Design Considerations</b></p>	<p>The turning space needed for large vehicles, such as delivery trucks and school buses, should be closely considered in curb extension design at intersection corners.</p> <p>All levels of daily traffic volumes and speed limits are appropriate for this treatment, assuming the appropriate distance is provided between the travel lane and the extension curb (FHWA).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>● Emergency service routes</li> <li>● Transit routes</li> <li>● Bike and pedestrian facilities - consider how bike facility is accommodated; curb extensions may enhance pedestrian crossing location</li> <li>● Large vehicle movements – turning movements of larger vehicles (delivery trucks and school buses) may need to be accommodated</li> <li>● On-street parking – results in the removal of some on-street parking</li> </ul>
<p><b>Advantages</b></p>	<ul style="list-style-type: none"> <li>● Reduces speed of vehicles on approach to turns and during turning movements.</li> <li>● Additional benefit of narrowing pedestrian crossing distances and increasing pedestrian visibility.</li> <li>● Curb extensions can provide area to place landscaping and street furniture.</li> <li>● Potential to be relatively low-cost, depending on materials:             <ul style="list-style-type: none"> <li>○ Bollards or flex posts (less cost)</li> <li>○ Curb and gutter</li> </ul> </li> </ul>
<p><b>Disadvantages</b></p>	<ul style="list-style-type: none"> <li>● Curb and gutter are relatively costly with potential for drainage, utility, and accessibility impacts.</li> </ul>

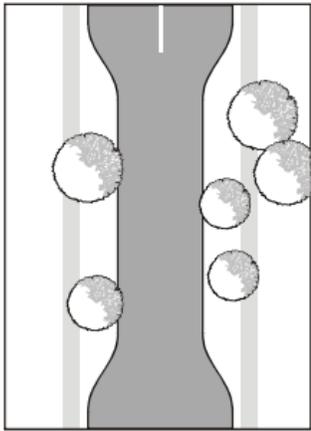
## Speed Feedback Sign



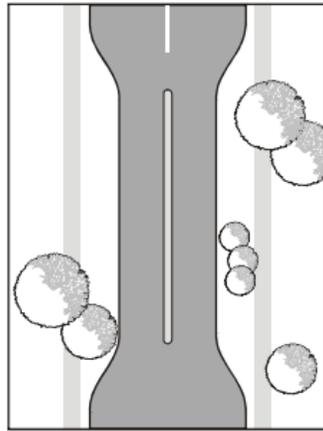
Photo Example (FHWA)

<p><b>Description</b></p>	<p>A speed-measuring radar and message sign that displays feedback to drivers with flashing message and lights when exceeding the speed limit.</p>
<p><b>Design Considerations</b></p>	<p>Appropriate for areas where speeding is a concern with adequate distance for sign visibility, particularly with a high percentage of drivers unfamiliar with area/roadway. The placement of these signs is best for roadways with one lane in each direction, otherwise it can become confusing which vehicle the speed is measuring.</p> <p>It is important to place this in a location between controlled intersections so drivers are traveling at a normal operating speed opposed to accelerating or decelerating.</p> <p>All levels of daily traffic volume and speed limits are appropriate for this treatment.</p>
<p><b>Advantages</b></p>	<ul style="list-style-type: none"> <li>• Effective in reducing speeds for vehicles traveling over the posted or advisory speeds and number of vehicle crashes.</li> </ul>
<p><b>Disadvantages</b></p>	<ul style="list-style-type: none"> <li>• Effectiveness in lowering speeds reduced with drivers more familiar with area/roadway.</li> </ul>

## Pinch Point



One-Lane Slow Point



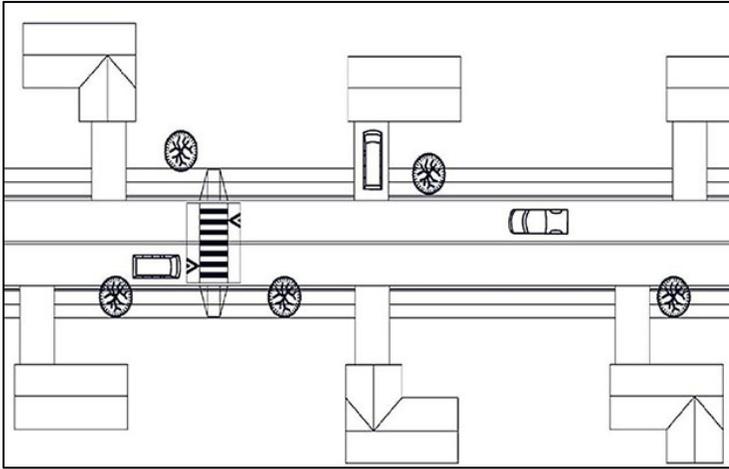
Two-Lane Slow Point



Photo Example, with crosswalk (NACTO)

<p><b>Description</b></p>	<p>Narrowing of a roadway with lateral extension of the curblines into the street on both sides of the street, forcing drivers to slow and, in some cases, to merge into a single lane.</p>
<p><b>Design Considerations</b></p>	<p>A horizontal deflection narrows the roadway to slow vehicles down and forces two-way traffic to take turns going through the pinch point.</p> <p>All levels of daily traffic volume and speed limits are appropriate for this treatment, assuming the appropriate distance is provided between the travel lane and the extension curb (FHWA).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>● Emergency service routes</li> <li>● Transit routes</li> <li>● Bike and pedestrian facilities – consider how bike facility is accommodated; curb extensions may enhance pedestrian crossing location or combined with raised crosswalk in areas where there is more pedestrian activity</li> <li>● Large vehicle movements, such as delivery trucks and school buses</li> <li>● On-street parking – results in the removal of some on-street parking</li> </ul>
<p><b>Advantages</b></p>	<ul style="list-style-type: none"> <li>● Reduces speeds by narrowing roadway, most effectively when traffic flow is restricted to one lane through the pinch point.</li> <li>● Additional benefit of narrowing pedestrian crossing distances if a mid-block crossing is provided with more sidewalk space.</li> <li>● Potential to be relatively low-cost, depending on materials:             <ul style="list-style-type: none"> <li>○ Bollards or flex posts (less cost)</li> <li>○ Curb and gutter</li> </ul> </li> </ul>
<p><b>Disadvantages</b></p>	<ul style="list-style-type: none"> <li>● May force bicyclists and vehicles to share the travel lane through the pinch point.</li> <li>● Curb and gutter are relatively costly with potential for drainage, utility, and accessibility impacts.</li> </ul>

## Raised Crosswalk

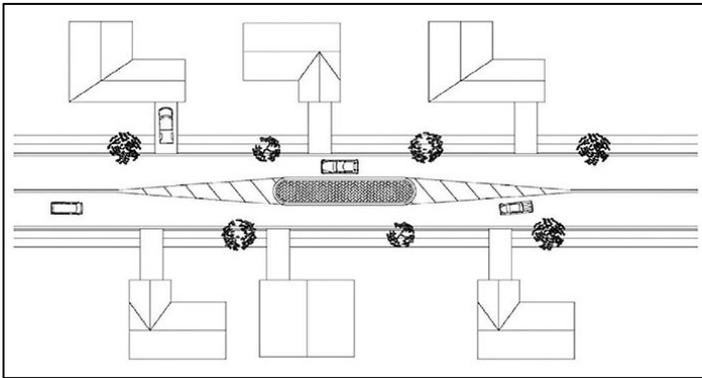


Concept Illustration (FHWA)

Photo Example (FHWA)

<p><b>Description</b></p>	<p>Raised area of pavement with plateau at top with striped pedestrian crossing. For additional pedestrian crossing information, please reference the Pedestrian Crossing Guidelines.</p>
<p><b>Design Considerations</b></p>	<p>Placed at a pedestrian crossing location, either midblock or at an intersection. ITE recommends installing this treatment with a maximum grade of 8 percent or less. Raised area normally has a height of 3 to 4 inches and a travel length of approximately 12 feet, although these dimensions may vary.</p> <p>Speed limit is typically 30 miles per hour or less (ITE). In general, this treatment is not appropriate where the 85<sup>th</sup>-percentile speed prior to implementation is 45 miles per hour or more (FHWA).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>• Emergency service routes – consider whether the location is on a route utilized by emergency service providers</li> <li>• Transit routes and bus stop locations – raised area should be located so transit vehicles can transverse the hump perpendicularly</li> <li>• Bike and pedestrian facilities – appropriate in areas with bike facilities; may be cut back at sides to allow bicyclists to pass through</li> <li>• On-street parking – if this is a new crosswalk, will remove some on-street parking to create a crosswalk across the roadway</li> </ul>
<p><b>Advantages</b></p>	<ul style="list-style-type: none"> <li>• Reduces speeds similar to speed hump.</li> <li>• Enhances crosswalk and pedestrian visibility.</li> <li>• Additional benefits for pedestrians with a continuous-level surface at crossing.</li> </ul>
<p><b>Disadvantages</b></p>	<ul style="list-style-type: none"> <li>• Concern about restricted access and increased response time for emergency vehicles.</li> </ul>

## Raised Median Islands



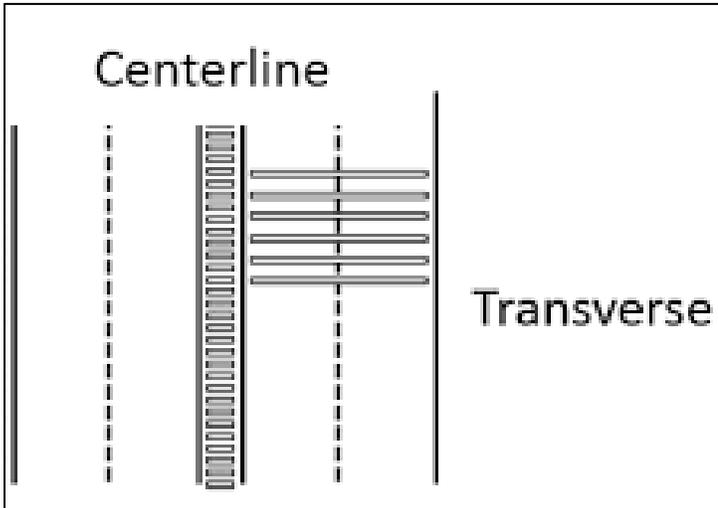
Concept Illustration (FHWA)



Photo Example (FHWA)

<b>Description</b>	Raised island located in the middle of the roadway that narrows the travel lanes at that location.
<b>Design Considerations</b>	<p>Can be constructed at the entrance to a neighborhood and include landscaping and signage to inform drivers of entering a neighborhood area.</p> <p>All levels of daily traffic volumes and speed limits are appropriate for this treatment assuming the appropriate distance is provided between the travel lane and the extension curb (FHWA).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>● Emergency service routes</li> <li>● Transit routes</li> <li>● Bike and pedestrian facilities – curb cuts or ramps for crossing; if an on-street bike lane is on the roadway, it should be striped through this area</li> <li>● On-street parking – no on-street parking in area of median</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>● Reduces speeds by narrowing travel area.</li> <li>● Additional benefit of narrowing pedestrian crossing distances if also used for a pedestrian/bicycle refuge island.</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>● May impact access to properties at median.</li> <li>● No significant reduction in vehicle speeds beyond the island area.</li> <li>● May force bicyclists and vehicles to share the travel lane through the island area.</li> <li>● Curb and gutter are relatively costly with potential for drainage, utility, and accessibility impacts.</li> </ul>

## Rumble Strips



Concept Illustration (Oregon Department of Transportation)

Photo Example (Caltrans)

<b>Description</b>	Sections of pavement textures or transverse cuts in pavement across travel lanes, which abruptly alert drivers to pay attention to roadway condition.
<b>Design Considerations</b>	<p>Driving over rumble strips creates noise within adjacent area. For this reason, it is important to consider proximity and density of residential land uses. Rumble strips can be installed at edge, centerline, or both as determined appropriate for application. The roadway cross section / cross slope and drainage characteristics also need to be considered.</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>• Bike and pedestrian facilities and impact to bicyclists traveling on roadway; provide space for bicyclists to pass through along edge of lane</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>• Can reduce speeds of traffic, typically on approach to an unexpected curve, intersection, or other roadway feature.</li> <li>• Can reduce roadway departures and lane departures.</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>• Generally ineffective in reducing overall roadway segment speeds.</li> <li>• May not be ideal for bicyclist comfort.</li> <li>• Results in noise with each vehicle going over the rumble strips.</li> <li>• Can cause pooling or icing areas on certain roadway cross slopes.</li> <li>• Increased cost to effectively maintain.</li> </ul>

## Speed Hump



Concept Illustration (NACTO)



Photo Example (NACTO)

<p><b>Description</b></p>	<p>Raised areas of pavement, most effectively placed in a series.</p>
<p><b>Design Considerations</b></p>	<p>Placed at a midblock location and not near an intersection. Raised area normally have a height of 3 to 4 inches, although these dimensions may vary. Due to the raised area as part of this treatment, drainage impacts is an important design consideration.</p> <p>Speed humps should be placed at regular intervals and no more than 500 feet apart to achieve a 85<sup>th</sup>-percentile speed of 25-35 miles per hour but they can be placed closer together (250 feet apart) to achieve slower speeds (NACTO). The placement of the speed humps will likely be impacted by driveways and intersections and should be considered when identifying the locations.</p> <p>Speed limit is typically 30 miles per hour or less (ITE). In general, this treatment is not appropriate where the 85<sup>th</sup>-percentile speed prior to implementation is 45 miles per hour or more (FHWA).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>● Emergency service routes – consider whether the location is on a route utilized by emergency service providers</li> <li>● Transit routes and bus stop locations – raised area should be located so transit vehicles can transverse the hump perpendicularly</li> <li>● Bike and pedestrian facilities – appropriate in areas with bike facilities; may be cut back at sides to allow bicyclists to pass through</li> <li>● On-street parking</li> </ul>
<p><b>Advantages</b></p>	<ul style="list-style-type: none"> <li>● Effective in reducing speeds between humps by 20 to 25 percent.</li> </ul>
<p><b>Disadvantages</b></p>	<ul style="list-style-type: none"> <li>● Concern about restricted access and increased response time for emergency vehicles.</li> </ul>

## Traffic Circles



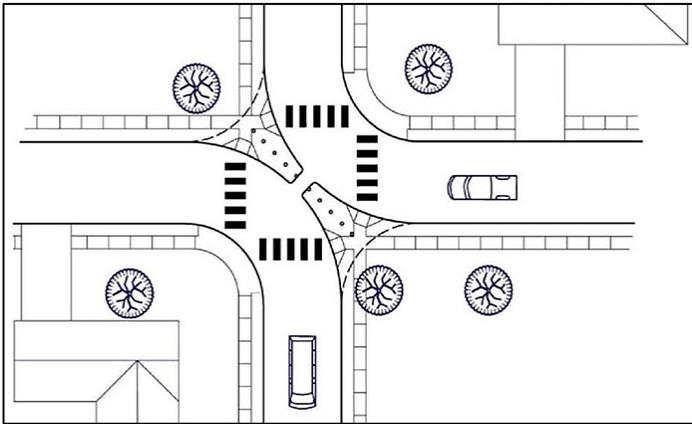
Concept Illustration (NACTO)



Photo Example (NACTO)

<p><b>Description</b></p>	<p>Raised circular islands placed in the middle of unsignalized intersections around which traffic circulates.</p>
<p><b>Design Considerations</b></p>	<p>Appropriate for low-volume roadways, with approaches not designed to full modern roundabout standards.</p> <p>Daily traffic volume range for implementation can be up to 3,500 vehicles per day for each intersection leg (FHWA references Pennsylvania). Speed limit is typically 30 miles per hour or less (FHWA references Delaware and South Carolina).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>• Emergency service routes – consider if fire trucks can navigate a left turn through traffic circle</li> <li>• Transit routes – may be difficult for buses to make left turns at traffic circles</li> <li>• Bike and pedestrian facilities – compatible with on-street bike lanes, although a bike lane should not be striped within a traffic circle</li> <li>• Large vehicle movements – difficult to make left turns for delivery trucks and school buses</li> <li>• On-street parking – should be restricted on approaches to traffic circle</li> </ul>
<p><b>Advantages</b></p>	<ul style="list-style-type: none"> <li>• Slows traffic by requiring drivers to maneuver around circle center island.</li> <li>• Can be installed with a variety of different materials with different associated costs (paint and flex post, curbed with no landscaping, or curbed with landscaping).</li> </ul>
<p><b>Disadvantages</b></p>	<ul style="list-style-type: none"> <li>• Requires bicyclists and vehicles to share the travel lane through traffic circle if there are no shared use paths present.</li> <li>• May not provide adequate path for large vehicles to turn left through traffic circle, limiting movements.</li> <li>• May not be appropriate for roadways that serve as main routes for emergency vehicles, transit, and delivery vehicles due to the challenges associated with turning left.</li> </ul>

## Traffic Diverter



Concept Illustration (FHWA)



Photo Example (NACTO)

<p><b>Description</b></p>	<p>Raised islands placed diagonally across an unsignalized intersection so traffic approaching the intersection is restricted to one movement.</p>
<p><b>Design Considerations</b></p>	<p>The turning space needed for large vehicles such as delivery trucks and school buses should be closely considered in diverter design.</p> <p>Daily traffic volume range for implementation should be low, the FHWA reports that Pennsylvania sets a maximum of 3,500 vehicles per day. Speed limit is 25 miles per hour or less since vehicles need to navigate the sharp curve (FHWA).</p> <p>Specific location design should consider:</p> <ul style="list-style-type: none"> <li>● Emergency service routes – emergency routes should not be located on these roadways due to limited movements</li> <li>● Transit routes – transit routes should not be located on these roadways due to limited movements</li> <li>● Bike and pedestrian facilities – can be constructed with cuts to allow full bicyclist movements through intersection, while limiting vehicular movements</li> <li>● Large vehicle movements – delivery trucks and school buses should consider limited movements</li> <li>● On-street parking – should be restricted on approaches to traffic diverter</li> </ul>
<p><b>Advantages</b></p>	<ul style="list-style-type: none"> <li>● Reduces speeds by requiring turns through the intersection.</li> <li>● Additional benefit of improved pedestrian and bicycle safety at intersection crossings.</li> </ul>
<p><b>Disadvantages</b></p>	<ul style="list-style-type: none"> <li>● Concern regarding impacts to street network connectivity, limited movements, and traffic diversion.</li> <li>● No significant reduction in vehicle speeds beyond the approach to the diverter.</li> </ul>