

County of Greenville  
South Carolina



**Greenville  
County**

**Traffic Calming Program**

Neighborhood Traffic Education Program and Speed Hump Program

(rev) **August 2008**

## I. PURPOSE

The potential negative impacts from vehicular traffic on residential roads have been a longstanding public concern. Traffic conditions such as speeds and/or volumes on residential roads can greatly affect neighborhood livability by discouraging non-motorized road users and eroding the residential character of the neighborhood roads. When roads are designed to serve vehicles, bicycles, and pedestrians safely while maintaining the character of the neighborhood, the quality of life is enhanced. When traffic problems become a daily occurrence, the sense of community and personal well-being are threatened.

The Traffic Calming Program serves as a County commitment to the safety and livability of residential neighborhoods. Under the program, the Department of Public Works and the Planning Commission work with residents to identify traffic problems in their neighborhoods and find solutions.

Local residential roads make up the great majority of the 1,500-mile publicly maintained road system of Greenville County. These roads generally serve local circulation needs – vehicle and pedestrian - and provide access to local residences.

The most common problems on local residential roads are high vehicle speeds and excessive volumes of through-traffic. These, in turn, can lead to safety concerns for all users of the roads. Our mission is to improve neighborhood safety by working with residents to design and implement solutions that minimize the negative effects of speeding and/or excessive vehicular traffic on “eligible roads”.

## II. TRIAGE SOLUTION - THE THREE ‘E’S

Traffic calming projects can involve three kinds of possible efforts: education, enforcement, and/or engineering. **Education** alerts people to ways they can help ease traffic problems, for example, by reducing speed or traveling by bus or bicycle instead of automobile. **Enforcement** enlists the help of the Sheriff’s Office to focus enforcement efforts on the affected road(s) and increase community awareness of speeding problems. **Engineering** tools include a variety of traffic calming devices that can reduce speed, decrease volumes, and/or improve safety. For example, speed humps and traffic circles can be used to slow traffic, and neckdowns can improve pedestrian safety.

The County’s Traffic Calming Program has two components: The Neighborhood Traffic Education Program (NTEP) and The Speed Hump Program. The intent of the NTEP is to encourage use of education and enforcement. The Speed Hump Program uses engineering to reduce the impacts of speed and volume.

### III. CLASSIFICATIONS

*The following are general classifications; however, due to the unique nature of development in Greenville County, some roads can be broken down into distinct segments. Some roads can serve as one type of roadway but still take on different characteristics as the road moves through other segments on its path. County staff reserves the right to classify segments of a roadway using different classifications. A written “Statement of Classification” will document the classification of any road to be studied. Beyond the general description below, additional factors that are considered in the County’s “Statement of Classification” may include but are not limited to design speed, number of lanes, and residential density.*

- A. **Arterial Roads** – Serve major centers of activity in urbanized areas and carry a high proportion of the traffic entering and leaving the urban area. Arterial roads generally carry more than 18,000 vehicles per day and must be built to South Carolina Department of Transportation standards. (Ex: Wade Hampton Blvd.)
  
- B. **Minor Arterial Roads** – Interconnect and augment the arterial system by distributing travel to geographically smaller areas than arterial roads. Minor arterial roads provide more emphasis on land access and a lower level of travel mobility. These roads handle volumes between 10,000 to 18,000 vehicles per day and must be built to South Carolina Department of Transportation standards. (Ex: Edwards Road)
  
- C. **Major Collector Roads** – Collectors usually connect on both ends with other collectors and/or arterial roads carrying more than 4,000 but less than 10,000 vehicles per day. Collector road systems provide both land access service and traffic circulation with residential neighborhoods. Collector roads penetrate residential neighborhoods, distributing trips to and from arterial roads and their residential destinations. Major collector roads must be built to South Carolina Department of Transportation standards. (Ex: Taylors Road)
  
- D. **Minor Collector Roads** – Minor collector roads generally serve multiple neighborhoods and usually connect on both ends to roads of a higher classification. Minor collectors usually carry between 1,250-4,000 vehicles per day and will be designed to 35 miles per hour (mph) minimum design speed. (Ex: Imperial Drive)
  
- E. **Local Residential Roads** – Local residential roads are usually roads contained within the neighborhood they serve and typically connect only on one end to a road of a higher classification. Some roads can serve as local residential roads in a neighborhood setting and still take on different characteristics as the road moves through other segments on its path. These roads usually carry 750-1,250 vehicles per day and are designed for a 30 mph minimum design speed.

- F. **Residential Access Roads** – Residential access roads are residential roads that augment the local residential roads. Residential access roads usually carry 250 to 750 vehicles per day and post a minimum design speed of 25 mph.
- G. **Residential Sub-Access Roads** – Residential sub-access roads are cul-de-sacs or low volume roads with less than 250 vehicles per day. A 20 mph minimum design speed is appropriate.
- H. **Nonresidential Roads** – 35 mph minimum design speed - A roadway will be in this category if, as determined by the Greenville County Planning Commission, it is wholly or partially within a zoned Commercial, Services, Office, or Industrial district as established by the County’s Zoning Ordinance; or if, in an unzoned area, the character or intent of the surrounding property is for commercial, service, office, or industrial use. (Example Industrial Boulevard)
- I. **Affected Road** – A road that the County has received a request for traffic calming assistance and that is determined by County staff to be eligible for assistance.

#### **IV. PROGRAMS**

- A. **Neighborhood Traffic Education Program (NTEP)** – The Neighborhood Traffic Education Program (NTEP) focuses on two of the E’s of traffic calming: **E**ducation and **E**nforcement. Within this program, the neighborhood representative will be encouraged to contact the Sheriff’s Office and request speeding enforcement. At the same time, educational information such as banners, signs, stickers and brochures will be made available by County staff for distribution in the neighborhood. Staff will also be available for neighborhood association meetings. The placement of a speed trailer to increase driver awareness will be subject to availability and appropriateness based on road conditions as determined by County staff. Once a neighborhood is placed on the waiting list to be studied, the neighborhood representative will be encouraged to use the NTEP in their neighborhood. Additionally, if a neighborhood does not qualify for the Speed Hump Program or fails to return a valid petition, it will be eligible for the NTEP.
- B. **The Speed Hump** – The Speed Hump Program focuses on the third “E”: the **E**ngineering aspect of traffic calming. The Greenville County Department of Public Works will only fund through the Road Improvement Program those roads that qualify for one of three methods and meet all the criteria outlined below. Additionally, the following roads or segments are not eligible for the Speed Hump Program:

- Arterial Roads

- Minor Arterial Roads
- Major Collector Roads
- Nonresidential Roads

Residential roads or segments of roads that qualify under the Speed Hump Program primarily provide residential access. The low volumes on these roads tend to make constant enforcement difficult, and any traffic calming efforts will generally affect only those from the neighborhood which the roads service.

If traffic calming devices were recommended by County staff during the construction of a subdivision, but were not installed or implemented by the developer, speed humps will not be funded by the County on the roads within that subdivision. In this case, the residents will be responsible for the entire cost and must follow the process as outlined below.

There are four methods in which a road may be eligible for speed humps or other traffic calming measures under the Speed Hump Program:

- Volume and Speed
- Speed Only
- Special Study
- Impact Threshold Curve

**1. Volume and Speed Method**

a. The Road must meet Average Daily Traffic (ADT) and 85<sup>th</sup> Percentile Speed requirements. *(The 85<sup>th</sup> Speed is the speed at above which 15% of the traffic is traveling.)*

- i. If the 85<sup>th</sup> Speed is at least 15 mph over the Posted Speed Limit (PSL), the Volume must be at least 600 vehicles per day (vpd).
- ii. If the 85<sup>th</sup> Speed is at least 10 mph over the PSL, the Volume must be at least 675 vpd.
- iii. If the 85<sup>th</sup> Speed is at least 9 mph over the PSL, the Volume must be at least 800 vpd.

<b>85th Speed</b> (mph over posted speed limit)	<b>ADT</b> (vehicles per day)
15.0 ≤	600 ≤
10.0 ≤	675 ≤
9.0 ≤	800 ≤

- b. The grade of the affected road or segments thereof shall not be greater than 8%
- c. The minimum length of road or segment shall not be less than 1000 feet.
- d. The Road must be classified as residential (not collector).
- e. The Road must be completely maintained by the County of Greenville.

- f. If the road is in a subdivision, the subdivision must be at least 80% complete.
- g. A County certified petition approved by 75% of the residents on the affected road and 25% of the residents living in the defined service area in the neighborhood that must use the affected road must be submitted to the County within the designated time period. The terms “residents” and “service area” are defined in Section V, “Procedures.”

*Speed humps installed under the Volume and Speed Method will be funded through the Road Improvement Program.*

## **2. Speed Only Method**

- a. The 85<sup>th</sup> Percentile Speed must exceed 10 mph over the posted speed limit.
- b. The grade of the affected road or segments thereof shall not be greater than 8%
- c. The minimum length of road or segment shall not be less than 1000 feet.
- d. The Road must be classified as residential (not collector).
- e. The Road must be completely maintained by the County of Greenville.
- f. If the road is in a subdivision, the subdivision must be at least 80% complete.
- g. A County certified petition approved by 75% of the residents on the affected road and 25% of the residents living in the defined service area in the neighborhood that must use the affected road must be submitted to the County within the designated time period. The terms “residents” and “service area” are defined in Section V, “Procedures.”

*Roads that qualify under the Speed Only Method will be eligible for installation of speed humps only if the community agrees to fund the installation costs or a Greenville County Council Member agrees to use funding from his/her In-District Expense Account to assist with the installation costs.*

## **3. Special Study Method**

In some cases, County staff may determine that an entire neighborhood road system should be reviewed as a special study. In rare cases, speed humps may be considered on minor collector roads as a part of a special study. In these special study cases, a public meeting will be held with the neighborhood and the staff recommendation will be taken to County Council for approval.

*Within the Special Study Method, a road must meet the criteria and funding under either the Volume and Speed Method or the Speed Only Method.*

#### 4. Impact Threshold Curve Method

The impact threshold curve is a measurement used by the County as a guideline only. It is used to determine whether a road has been significantly impacted by the installation of traffic calming devices on adjacent roads. It may be modified by County staff to respond to particular road or neighborhood characteristics. In general, an increase of up to 150 vehicles per day is acceptable on any local service road. The maximum amount of traffic increase on any local service road is 400 vehicles per day.

There are four criteria that a road must meet to qualify under the Impact Threshold Curve Method:

- a. The total traffic volume on any local service road (the existing volume plus the increased volume resulting from the project) should not exceed 3,000 vehicles per day;
- b. The grade of the affected road or segments thereof shall not be greater than 8%;
- c. The minimum length of road or segment shall not be less than 1000 feet
- d. A County certified petition approved by 75% of the residents on the affected road and 25% of the residents living in the defined service area in the neighborhood that must use the affected road must be submitted to the County within the designated time period. The terms “residents” and “service area” are defined in Section V, “Procedures.”

Greenville County staff will take the following measures to ensure that a project will keep within the allowable limits:

- Projects are planned and designed in an effort to avoid unacceptable impacts.
- A traffic volume on adjacent local service roads are monitored before and after the project is constructed.

*Speed humps installed under the Impact Threshold Curve Method are funded through the Road Improvement Program.*

## V. PROCEDURES

- A. **Project Initiation** – A traffic calming project begins with a request from a citizen or a neighborhood association. Typically a neighborhood representative is designated as the

contact person. The neighborhood representative will fill out an official request form and submit it to County staff. Once the request is received, County staff will check the location to determine whether the request concerns an eligible residential road. If the road meets eligibility requirements, it will be placed on a waiting list and the neighborhood representative will be notified by letter of the neighborhood's status on the list. Traffic counts will be taken to determine if the volume(s) and speed(s) meet the required criteria of the Speed Hump Program. If the problem is speeding only or the road in question has not been designated as an eligible road by County staff, the neighborhood representative will be notified.

- B. **Plan Development** – If the required criteria are met, staff will determine the location and number of speed humps for the subject road or segment. Some factors that may be considered in determining speed hump locations include but are not limited to: the spacing of intersection(s) and the location of hills and curves, drainage, and other improvements within the right-of-way. County staff will provide maps attached to petitions showing the approximate location of the proposed speed humps. County staff will also be available as a technical resource to explain the proposed number and location of speed humps.

***“Residents” and “service area” defined*** – For purposes of determining who is eligible to sign a traffic calming petition under the Speed Hump Program, a “resident” means a person inhabiting an existing home (residence) within the service area as determined by County staff. “Service area” means all identifiable homes that are located on a road subject to traffic calming device installation and those residents whose homes are located on a road that must travel over the proposed speed humps in order to reach their homes. All eligible requests will require a case-by-case review by County staff or County-employed consultants to determine the service area.

- C. **Timeframes** – In each case where the road is determined to be eligible for speed humps, the neighborhood representative or designee will be issued the necessary petitions and attachments and will be given 120 days to obtain the required signatures. Should the petition effort fail to meet the required signature level, no petition for traffic calming will be reissued to that particular service area for a period of two (2) years from the conclusion of the 120 days.

If a road does not qualify for speed humps after the speed and/or volume studies are conducted, the residents will be required to wait two (2) years from the date the studies are conducted to re-apply for traffic calming. If the County adjusts speed limits on the affected

road or segment, the service area will be required to wait at least 90 days after the new speed limit signs are installed before a new study will be initiated.

- D. **Alternative Traffic Calming Measures** – If a road within a designated service area qualifies for traffic calming, alternative traffic calming measures may be installed if the residents pay the difference in cost between speed humps and the alternative measure(s). The use of decorative speed humps will require the residents to pay the additional costs associated with the special pavement stamping. Brick pavers are not allowed. Should alternative measures be installed, the County will only maintain curbs and regular asphalt, and any additional maintenance such as textured pavement or landscaping will be the responsibility of the neighborhood. The uses of alternative traffic calming measures are subject to approval by County staff.

Alternative traffic calming measures include but are not limited to the following:

- Raised Intersections
- Raised Crosswalks
- Chokers
- Neck Downs
- Traffic Circles
- Chicanes
- Center islands
- Any combination of the above measures.

Specifications for these devices can be found in the Appendix to this document. Should additional right-of-way be needed for an alternative traffic calming measure to be installed, it will be the responsibility of the homeowners to obtain such right-of-way. Greenville County will not assume any responsibility or incur any cost related to the acquisition of additional right-of-way.

- E. **Design and Construction/ Implementation** – The County designs and constructs traffic calming devices. Speed humps can usually be constructed within six (6) months of approval with the exception of the winter months. If the traffic calming project involves the use of traffic calming devices other than speed humps, then the design and construction process generally will take about one (1) year, but may take longer depending upon the specific device to be installed.

At the time the speed humps are approved, pavement conditions using the Overall Condition Index (OCI) and visual inspection) will be checked for the eligible road(s). If a road is already in the current County Road Improvement Program, the speed humps will be installed

after the paving is completed. No special provisions will be made to accelerate the paving schedule. If minor repairs (e.g. patching) are necessary, County staff reserves the right to delay the installation of speed humps until the necessary repairs to the road surface have been completed. The time period for this delay will be determined by the prior schedule of the patching and/or paving crew. If a road is on a future paving list that has not been approved by County Council but projected to be paved in the next 4 years, that road may qualify for rubber speed humps. Rubber speed humps could be installed on a “first-come, first-served” basis due to limited availability. The rubber speed humps will serve as a temporary measure only and will be removed when the road has been repaved and permanent speed humps installed.

- F. **Signage** - Speed Hump warning signs will be placed at locations to be determined by County staff. Typically, signs are placed at the beginning and end of an affected road. In the event that there are crossroads intersecting the impacted road, County staff may add additional signs. The speed hump sign will be supplemented with an advisory speed plate and/or a plate describing distance and/or number of speed humps.
  
- G. **Project Evaluation** – Within one year after the construction of traffic calming devices is complete, the Department of Public Works will evaluate the effects of the project (e.g. traffic speeds and traffic diversion onto other local service roads).
  
- H. **Removal Policy** – If after two (2) years from the date of installation, residents of the neighborhood decide that they no longer want speed humps; they can request that the speed humps be removed. A County certified petition will be issued and must be approved by 75% of the residents on the affected road and 25% of the residents on roads that must travel over the humps in order to reach their homes. The entire cost of removal must be paid by the residents. If speed humps are removed from a road, pursuant to this section, that road will not be eligible for new speed humps for a period of five (5) years from the date of removal.

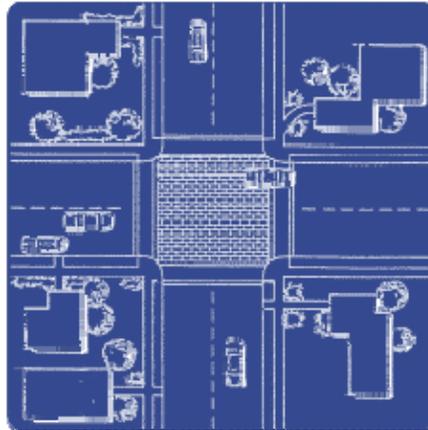
# APPENDIX A

## Specifications for Alternative Traffic Calming Measures

All graphics were taken from [www.trafficcalming.org](http://www.trafficcalming.org) and [Traffic Calming: State of the Practice](#) (Institute of Transportation Engineers)

## RAISED INTERSECTIONS

RAISED INTERSECTIONS ARE FLAT RAISED AREAS COVERING ENTIRE INTERSECTIONS, WITH RAMPS ON ALL APPROACHES AND TEXTURED MATERIALS ON THE FLAT SECTION.



**DESIGN CHARACTERISTICS:** THE ENTIRE INTERSECTION IS RAISED 8'-10' WITH A TEXTURED AND/OR PAINTED PAVEMENT SURFACE. BRICK PAVERS MAY **NOT** BE USED.

**CRITERIA:** INTERSECTION OF TWO LOW SPEED STREETS

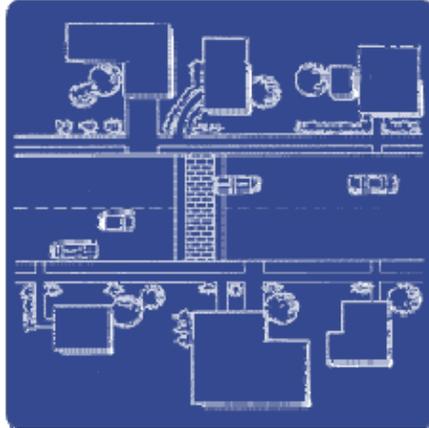
**DESIRED TRAFFIC EFFECTS:** INCREASE PEDESTRIAN SAFETY AND REDUCE SPEEDS.

**TYPICAL CONSTRUCTION COST:** \$5,000-\$10,000 PER INTERSECTION



## **RAISED CROSSWALKS**

RAISED CROSSWALKS ARE SPEED TABLES THAT ARE MARKED AS CROSSWALKS AND SIGNAGE TO CHANNELIZE PEDESTRIAN CROSSINGS, PROVIDING PEDESTRIANS WITH A LEVEL STREET CROSSING.



**DESIGN CHARACTERISTICS:** SIMILAR TO SPEED HUMPS

**CRITERIA:** SIMILAR TO SPEED HUMPS

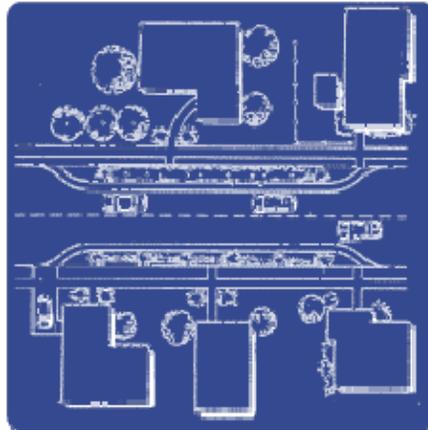
**DESIRED TRAFFIC EFFECTS:** INCREASE PEDESTRIAN SAFETY AND REDUCE SPEED

**TYPICAL CONSTRUCTION COST:** \$1,200-\$2,500 PER CROSSWALK



## CHOKERS

CHOKERS ARE CURB EXTENSIONS OR ISLANDS ON ONE OR BOTH SIDES OF THE STREET THAT NARROW THE STREET AT THAT LOCATION.



**DESIGN CHARACTERISTICS:** REDUCES ROADWAY WIDTH AT NARROWED PORTION

**CRITERIA:** BEST USED ON LOWER VOLUME STREETS

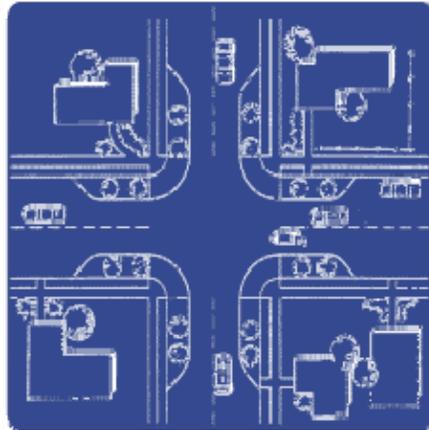
**DESIRED TRAFFIC EFFECTS:** REDUCE SPEEDS

**TYPICAL CONSTRUCTION COST:** \$2,000-\$5,000



## NECKDOWNS (BULBOUTS)

NECKDOWNS ARE CURB EXTENSIONS AT INTERSECTIONS THAT REDUCE ROADWAY WIDTH CURB-TO-CURB.



**DESIGN CHARACTERISTICS:** REDUCES PEDESTRIAN CROSSING DISTANCE BY NARROWING APPROACHES TO MINIMUM ACCEPTABLE LANE WIDTHS

**CRITERIA:** BEST USED WITH CROSSWALKS

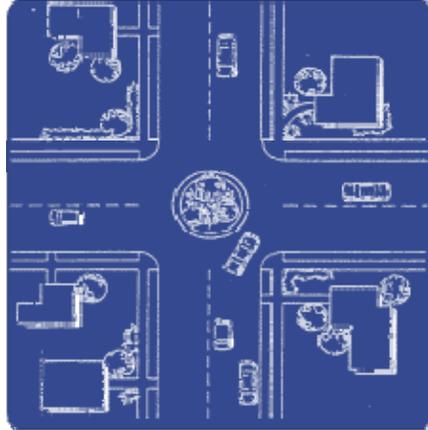
**DESIRED TRAFFIC EFFECTS:** INCREASE PEDESTRIAN SAFETY AND REDUCE SPEEDS

**TYPICAL CONSTRUCTION COST:** \$1,500-\$5,000



## TRAFFIC CIRCLES

TRAFFIC CIRCLES ARE ISLANDS PLACED IN INTERSECTIONS, AROUND WHICH TRAFFIC CIRCULATES.



**DESIGN CHARACTERISTICS:** TWO-LANE ROADS, NO OTHER TRAFFIC CONTROL NEEDED, TRUCKS MAY TURN IN FRONT OF CIRCLE, CIRCLE DIAMETER 15'-20'

**CRITERIA:** INTERSECTION VOLUME < 4000 VPD

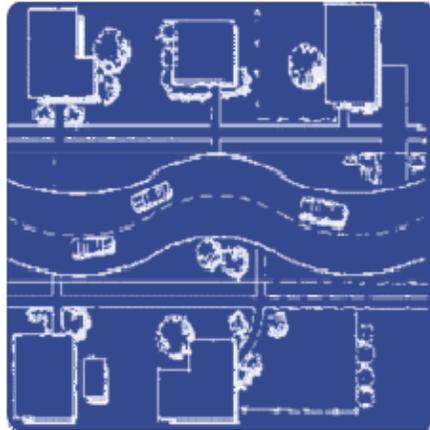
**DESIRED TRAFFIC EFFECTS:** REDUCE SPEEDS AND COLLISIONS

**TYPICAL CONSTRUCTION COST:** \$7,500-\$15,000 PER INTERSECTION



## CHICANES

CHICANES ARE CURB EXTENSIONS OR ISLANDS THAT ALTERNATE FROM ONE SIDE OF THE STREET TO ANOTHER, FORMING S-SHAPED CURVES.



**DESIGN CHARACTERISTICS:** MOST EFFECTIVE WHEN APPLIED AT INTERVALS ALONG A STREET

**CRITERIA:** LOW VOLUME STREETS WITH ADEQUATE SIGHT DISTANCE

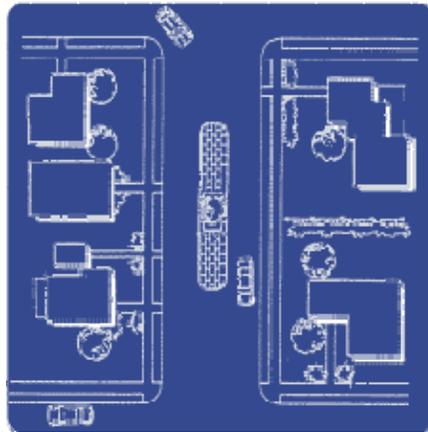
**DESIRED TRAFFIC EFFECTS:** REDUCE SPEEDS

**TYPICAL CONSTRUCTION COST:** \$2,000-\$7,500



## CENTER ISLAND NARROWINGS

CENTER ISLAND NARROWINGS ARE ISLANDS LOCATED ALONG THE STREET CENTERLINE THAT NARROWS THE STREET AT THAT LOCATION.



**DESIGN CHARACTERISTICS:** CHANGES VEHICLE PATH OR REDUCES PAVEMENT WIDTH

**CRITERIA:** SHORT MEDIANS CAN BE USED ON RESIDENTIAL STREETS; CAN BE PEDESTRIAN REFUGE

**DESIRED TRAFFIC EFFECTS:** REDUCE SPEEDS

**TYPICAL CONSTRUCTION COST:** \$2,000-\$7,500



**COMBINED MEASURES**



Speed Hump with Center Island



Neckdown with Center Island



Raised Intersection with Neckdown



Center Island with Chokers

## OTHER MEASURES



Split Median



Hammerhead