# CITY OF KINGS MOUNTAIN

# TRAFFIC CALMING POLICY

## (Rev QC-6)

## Rev111516 final

# CITY OF KINGS MOUNTAIN TRAFFIC CALMING POLICY

## PURPOSE:

The City of Kings Mountain's Traffic Calming Policy was developed to guide city staff and to inform residents on the process for implementing traffic calming in residential areas. The policy is intended to address traffic issues not commonly addressed in the Manual on Uniform Traffic Control Devices (MUTCD), although the MUTCD will be used for traffic engineering reference.

Traffic calming means many things to different people. To some, traffic calming is defined by speed limit reductions, to some it is the installation of traffic control devices and to others traffic calming is an attempt to reduce traffic volume and the negative effects that large volumes of traffic can have on residential neighborhoods. Each of these perspectives may correctly define traffic calming. In the most basic terms, traffic calming is a programmatic response to inappropriate speeds or traffic volumes on residential streets.

To aid in prompt responses to traffic related concerns of the citizens of Kings Mountain, the City Manager has directed the Transportation Committee to evaluate, provide sensible and programmatic responses, with respect to citizen concerns.

Streets that are maintained by the City of Kings Mountain and are considered to be a local/residential minor or major collector will be addressed under this policy. They serve as local circulation for automobiles, bicycles and pedestrians and do not carry significant volumes of through traffic. These streets also tend to be adjacent to residential areas. **Streets identified as an expressway, major thoroughfare or minor thoroughfare or city streets carrying more than 4,000 vehicles per day are not eligible for the Traffic Calming Program.**

## EVALUATION PROCESS:

Citizens may contact the City of Kings Mountain Public Works Department staff with a concern for or need of traffic calming or speed limit reduction in their area.

### Determination of Existing Conditions

Before the initiation of a traffic calming study, the Public Works will conduct field observations/site visits, determine the established speed limit utilizing the City Ordinance, collect traffic volumes and speed data. Once the following information is collected, an initial response method to the concern will be recommended by the Transportation Committee using the following criteria in non-hierarchal order:

Traffic volume data and verification of street classification

Speeding violations through the Kings Mountain Police Department

Accident data and/or complaints through Kings Mountain Police Department records and observations

Emergency Services service routes and response times

Housing density and development in the area

Pedestrian and bicycle activity

Vehicle classification data will be collected if deemed necessary

Geometric features of the roadway (lane width, shoulder width, sight distance, alignment and sidewalks)

## Guidelines and Recommendations

The Transportation Committee will make recommendations in cases where the 85th percentile speed is 5 MPH higher than the posted speed limit and/or where there is a geometric deficiency and/or a history of accidents. Research will be conducted into state and national traffic calming examples/trends, as well as the Institute of Transportation Engineers (ITE) traffic calming recommendations and procedures. The ordered responses that will be evaluated and considered before in-street structural traffic calming measures are recommended to City Council are as follows:

Step 1. Police enforcement and citizen education

Step 2. Signage and warning devices

Step 3. Low cost traffic improvements (striping, parking changes, etc.)

Step 4. Traffic calming measures

Step 5. In-street structural devices

## Traffic Calming Studies

Qualifying Criteria for Traffic Calming Studies

If a traffic calming response, outside of speed limit reduction and low cost traffic improvements, is determined to be appropriate by the Transportation Committee, a Traffic Calming Study Request Form will be sent to the applicant. The submitted request should specifically explain and identify the need for a traffic calming measure or device. Upon submittal of the completed form to the City, committee staff will proceed with the evaluation of a formal study using the eight qualifying criteria listed below:

QC-1. The proposed street must be classified as a two-lane (one or two-way traffic) local, residential or collector street

QC-2. The street pavement must be less than 40 feet in width

QC-3. The average daily traffic should be at least 100 vehicles per day and not more than 4,000 vehicles per day

QC-4. The Traffic Calming Study area should include a minimum of 1,000 feet of street

QC-5. 10% of the traffic on the street exceeds the posted speed limit by 5 mph or more

QC-6. Owners of at least 51% of the frontage along the street or at least 75% of the residences of the street, or in the event of a rental the owner of the property on which the rental is located, shall sign a petition supporting the Traffic Calming Request and subsequent device or measure

QC-7. The street's speed limit must be posted at 25 mph if a local/residential street and 35 mph if a collector

QC-8. The street should not be a primary emergency services route as designated by the City Of Kings Mountain Fire Department

Applications that do not meet the above noted qualifying criteria will not be considered for formal study or implementation of in-street structural traffic calming measures as shown in Appendix A of this Policy.

Prioritization Criteria

Upon qualification, Public Works staff will conduct additional reviews to determine the priority of need of the request. The priority review will be conducted by the Transportation Committee and will be based on the following prioritization criteria:

- Traffic Volume

- Speeding
- Geometric deficiencies, Vertical and/or Horizontal sight distance
- Schools, Daycare, etc. if within 1,200 feet of facility
- Sidewalks, no sidewalks on either side of the road
- School crossing, if there is an official school crossing on the street
- Pedestrian generator, if there is an activity within 1,200' that generates high numbers of pedestrians
- Accident History and/or near misses reported to or observed by the Kings Mountain Police Department
- Residential density

The highest ranked requests would be submitted to the City Manager for approval and submittal to City Council. City Council would approve the proposed construction list annually as part of the budget process.

Placement Guidelines

The Public Works Department Traffic staff in conjunction with recommendations from the Transportation Committee shall determine the type and location of all traffic calming measures and devices according to the placement criteria listed below. The Chief of Police also may deem certain traffic safety measures and devices necessary that will be implemented based on protection of the public. Placement of such will be based on engineering judgment and in a manner not to pose a problem to the street as follows:

- Positioned to meet recommended Federal or NCDOT guidelines
- Positioned to provide a stopping sight distance of 200 feet or more at 25 mph.
- Be located a minimum of 200 feet from an intersection.
- Primarily located at or near a property line

- Be located a minimum of 10 feet from a driveway

Notice Regarding Emergency Vehicles and Public Safety Response
Emergency Services, Transit Buses and School Buses will be affected by the installation of in-street structural traffic calming measures. These vehicles must travel at lower speeds due to the type of equipment and service they provide. According to the recent data, fire trucks typically slow to 5-7 mph when encountering a positive measure traffic calming device. This will increase emergency vehicle response time by 5-9 seconds per device. As part of the petition process, neighborhoods should be clearly advised of the reduction in response time that is attributed to in-street traffic calming devices.

Liability Concerns
There is limited documentation that specifically indicates that traffic calming devices and measures create direct traffic hazards. However, the installation of in-street traffic calming devices and measures onto the City's streets may create additional liability to the City. This liability must be balanced against the increased safety that results from lower speeds or limited access on City streets.

## IMPLEMENTATION PROCESS

### 1. Public Hearings

Public Hearing will be held before City Council prior to any in-street structural traffic calming measures being implemented for traffic calming projects. If needed at that time, City Council will be provided with a list of those projects that had previously qualified for future cycles but to date have not been approved. The City Council has the final authority for approving and authorizing any projects.

**2. Construction**

The City of Kings Mountain Public Works Department will be responsible for implementing recommendations made by City Council.

Construction will be performed by City of Kings Mountain forces or by parties contracted for the work by the City.

**Examples of various Neighborhood Traffic Calming devices are contained in the latest revisions of several ITE and FHWA publications. The Transportation Committee should periodically refer to those so as to include the latest technology with regards to traffic calming measures and devices in their recommendations.**

**3. Re-evaluation and Monitoring**

The Public Works Department will review each improvement measure three (3) months after they have been implemented. This will allow staff to measure how effective the improvements were in calming traffic. At any time the City Manager shall have the authority to remove any or all traffic calming measures or devices. Should changes be made, the affected property owners will be notified of the change(s).

# APPENDIX A
# TRAFFIC CALMING REFERENCE GUIDE

## Traffic Calming Measures - Speed Table

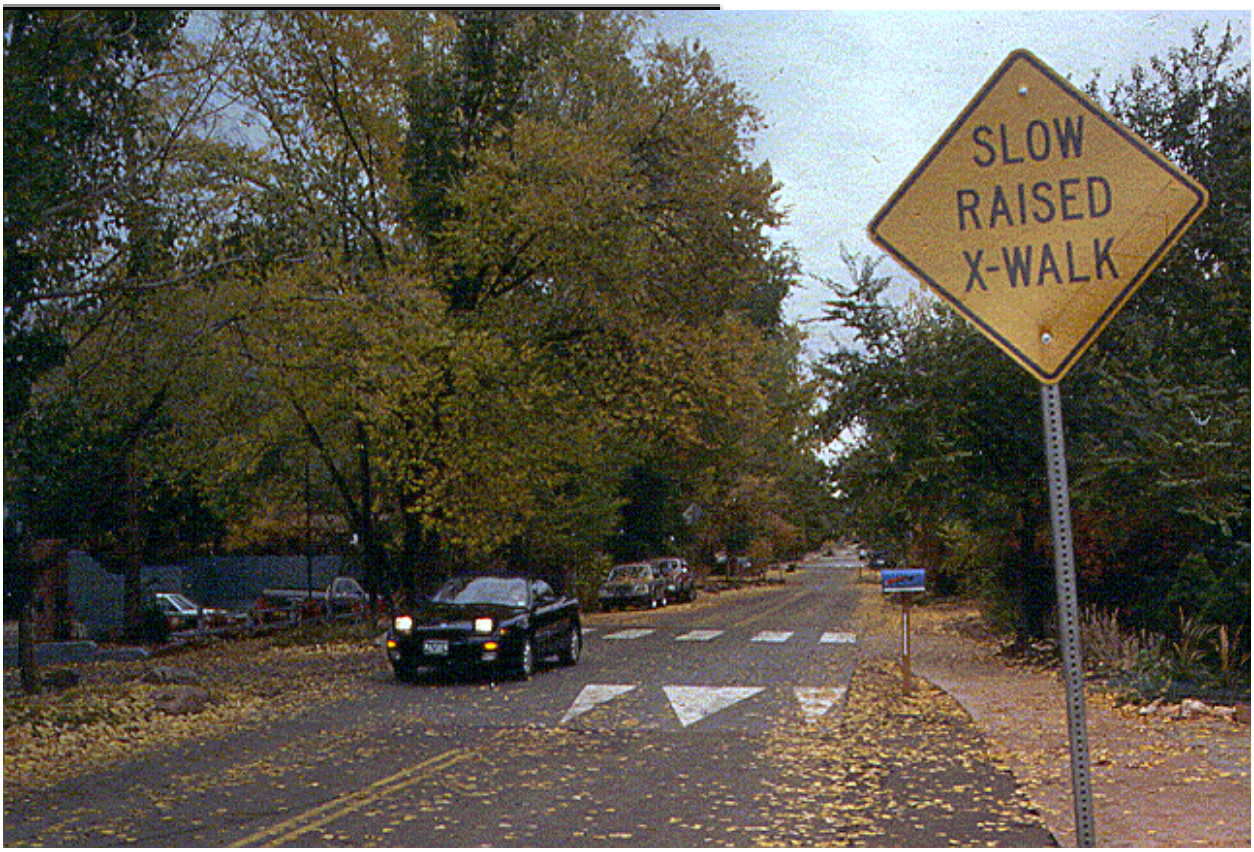
### Description:

- Long raised speed humps with a flat section in the middle and ramps on the ends; sometimes constructed with brick or other textured materials on the flat section

- Often called flat top speed humps, speed platforms, raised crosswalks, or raised crossings

**Applications:**

- Local and collector streets
- Main roads through small communities
- Typically long enough for the entire wheelbase of a passenger car to rest on top
- Work well in combination with textured crosswalks, curb extensions and curb
  radius reductions
- Can include a crosswalk



1

**Design/Installation Issues:**

- Typically 22 feet in the direction of travel with 6 foot ramps on each end and a 10 foot flat section in the middle; other lengths (32 and 48 feet) reported in U.S. practice

- Most common height is between 3 and 4 inches (and reported as high as 6 inches)

- Ramps are typically 6 feet long (reported up to 10 feet long) and are either parabolic or linear

- Careful design is needed for drainage

**Potential Impacts:**

- Little effect on access

- Speeds are reduced, but usually to a higher crossing speed than at speed humps
  (typically between 25 and 27 miles per hour)

- Traffic volumes have been reduced on average by 12 percent depending on alternative routes available

- Collisions have been reduced on average by 45 percent on treated streets (not adjusted for traffic diversion)

- Reported to increase pedestrian visibility and likelihood that driver yields to pedestrian.

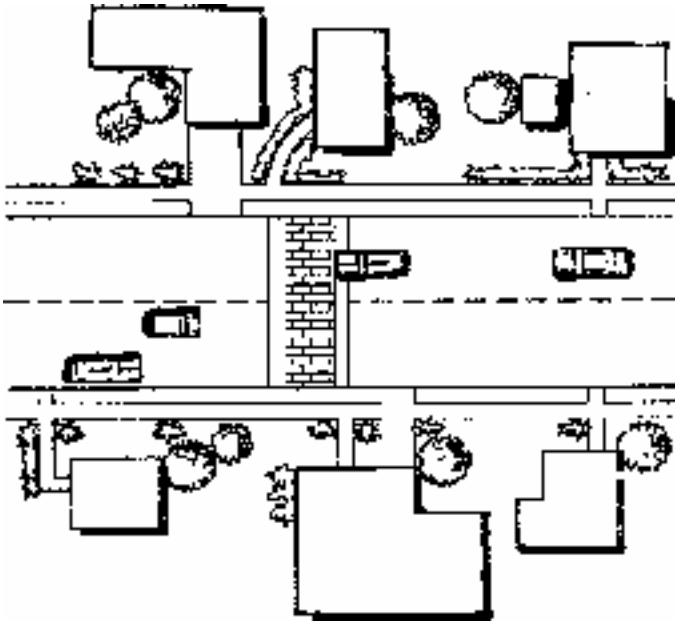
**Emergency Response Issues:**

- Typically preferred by fire departments over 12 to 14-foot speed humps

- Generally less than 3 seconds of delay per hump for fire trucks

**Typical Cost:**

• Approximately $2,800 (in 2000 dollars) for asphalt tables; higher for brickwork, stamped asphalt, concrete ramps and other enhancements sometimes used at pedestrian crossings



## Traffic Calming Measure - Raised Intersection

**Description:**

- Flat raised areas covering entire intersections, with ramps on all approaches and often with brick or other textured materials on the flat section and ramps

- Often called raised junctions, intersection humps, or plateaus

**Applications:**

- Work well with curb extensions and textured crosswalks

- Often part of an area wide traffic calming scheme involving both intersecting streets

- Located in densely developed urban areas where loss of parking would be unacceptable

**Design/Installation Issues:**

- Typically rise to sidewalk level
- May require bollards to define edge of roadway
- Storm drainage modifications are necessary

**Potential Impacts:**

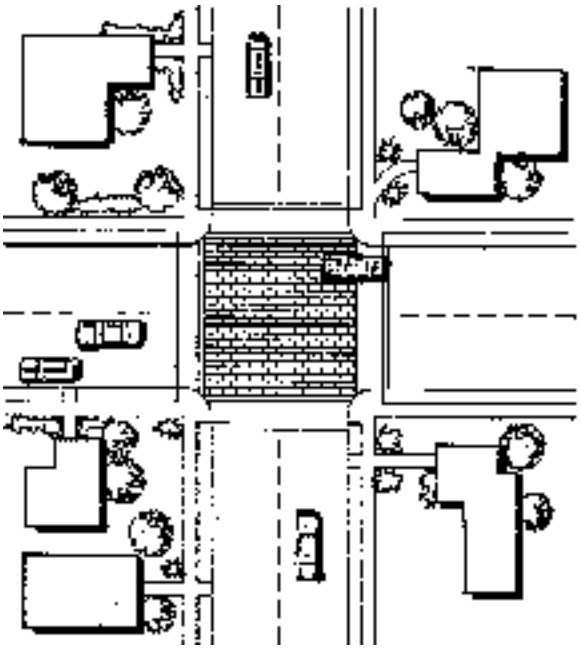
- Reduction in through movement speeds at intersection
- Reduction in midblock speeds typically less than 10 percent
- No effect on access
- Make entire intersections more pedestrian-friendly

**Emergency Response Issues:**

- Slows emergency vehicles to approximately 15 miles per hour

**Typical Cost**

Reported costs range between $20,000 and $60,000 (in 2000 dollars)



# Traffic Calming Measure - Speed Hump

## Description:

- Rounded raised areas of pavement typically 12 to 14 feet in length

- Placed in a series (typically spaced 300 to 600 feet apart)

## Applications:

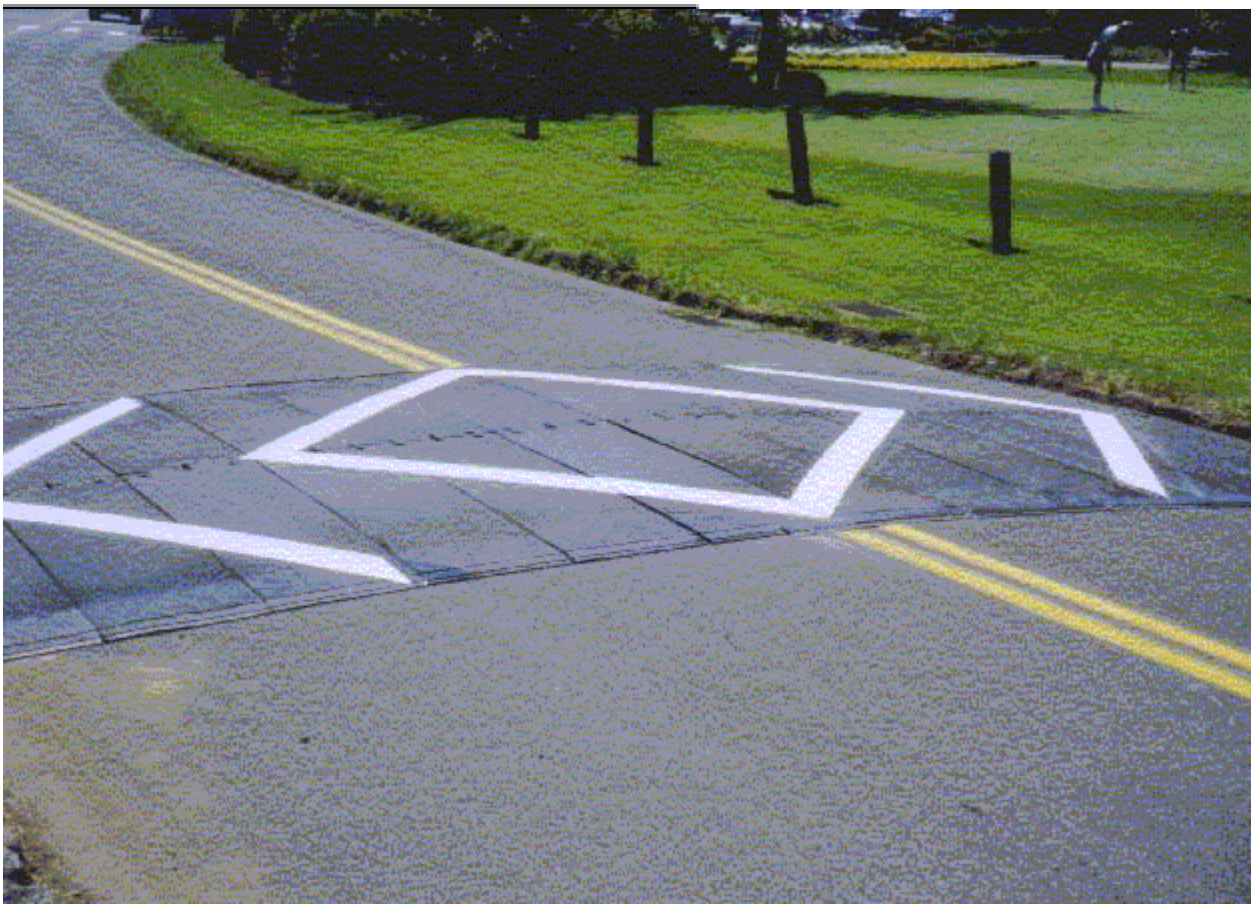
- Residential streets

- Not typically used on major roads, bus routes, or primary emergency response routes

- Midblock placement, not at an intersection

- Not on grades greater than 8 percent

- Work well with curb extensions



**Design/Installation Issues:**

- Typically 12 to 14 feet in length; other lengths (10, 22 and 30 feet) reported in practice in U.S.

- Speed hump shapes include parabolic, circular and sinusoidal

- Hump heights range between 3 and 4 inches with trend toward 3 - 3 1⁄2 inches maximum

- Difficult to construct precisely; may need to specify a construction tolerance (e.g. ± 1/8 inch) on height

- Have signage (advance warning sign before first hump in series and warning sign or object marker at hump)

- Typically have pavement marking (zigzag, shark's tooth, chevron, zebra)

- Taper edge near curb to allow gap for drainage

- Bicyclists prefer that it not cover or cross a bike lane

**Potential Impacts:**

- No effect on non-emergency access

- Speeds determined by height and spacing; speeds between humps have been observed to be reduced

between 20 and 25 percent on average

- Based on a limited sample of sites, typical crossing speeds (85th percentile) of 19 mph have been measured for 3½ inch high, 12 foot humps; and of 21 mph for 3 inch high, 14 foot humps; speeds have been observed to rise to 27 mph within 200 feet downstream

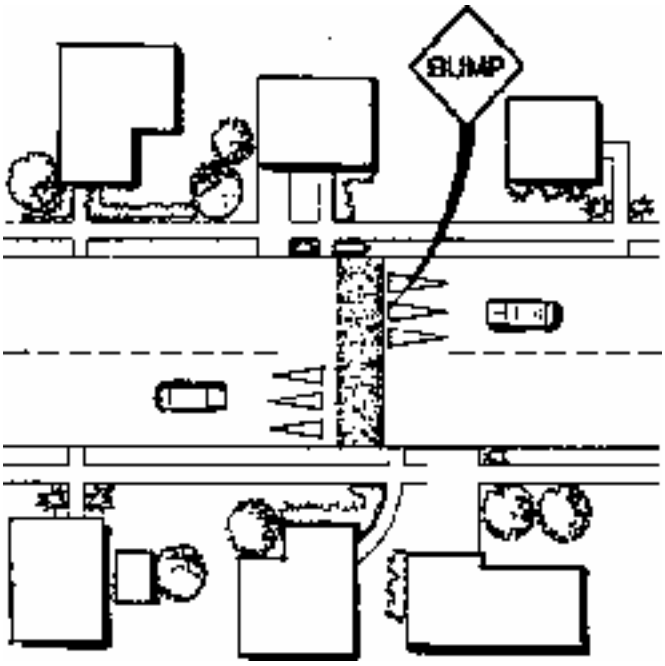
- Speeds typically increase approximately 0.5 mph midway between humps for each 100 feet of separation

- Studies indicate that traffic volumes have been reduced on average by 18 percent depending on alternative routes available

- Studies indicate that collisions have been reduced on average by 13 percent on treated streets (not adjusted for traffic diversion)

- Most communities limit height to 3-3½ inches, partly because of harsh ride over 4-inch high humps

- Increase in traffic noise from braking and acceleration of vehicles, particularly buses and trucks




6

**Emergency Response Issues:**

- Concern over jarring of emergency rescue vehicles

- Approximate delay of between 3 and 5 seconds per hump for fire trucks and up to 10 seconds for ambulance with patient

**Typical Cost:**

Approximately $2,300 (in 2000 dollars)

**Traffic Calming Measures - Closure**

**Applications:**

- Closures are typically applied only after other measures have failed or been determined to be inappropriate

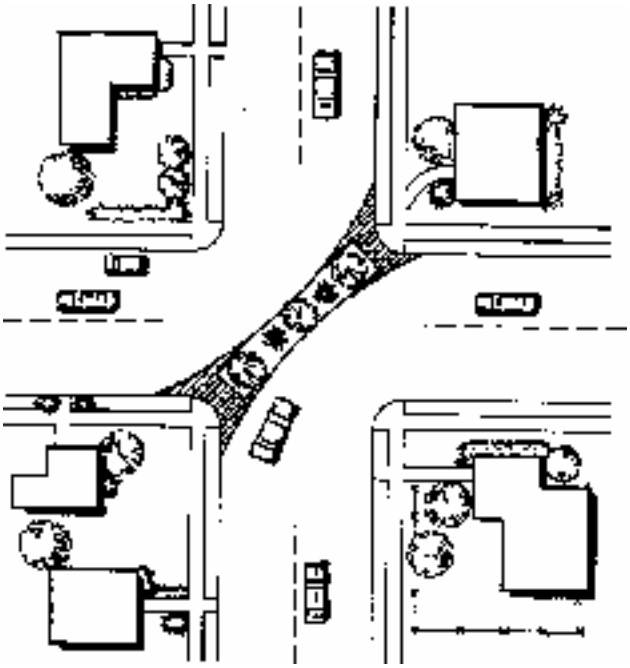
- For all types of closures, provisions are available to make diverters passable for pedestrians and bicyclists

- Often used in sets to make travel through neighborhoods more circuitous - typically staggered internally in a neighborhood, which leaves through movement possible but less attractive than alternative (external) routes

- Closures have been used as a crime prevention tool

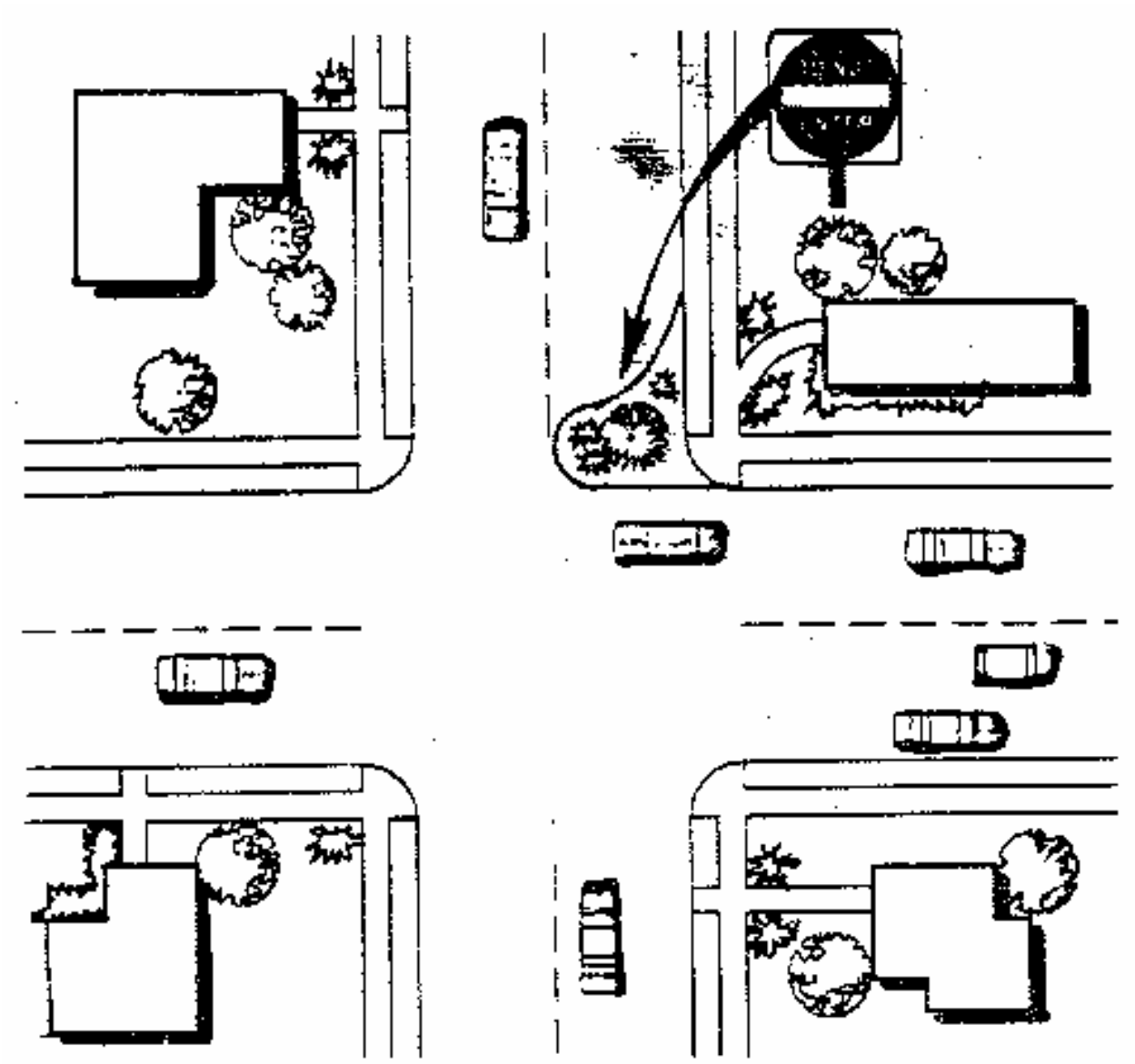
**Descriptions:**

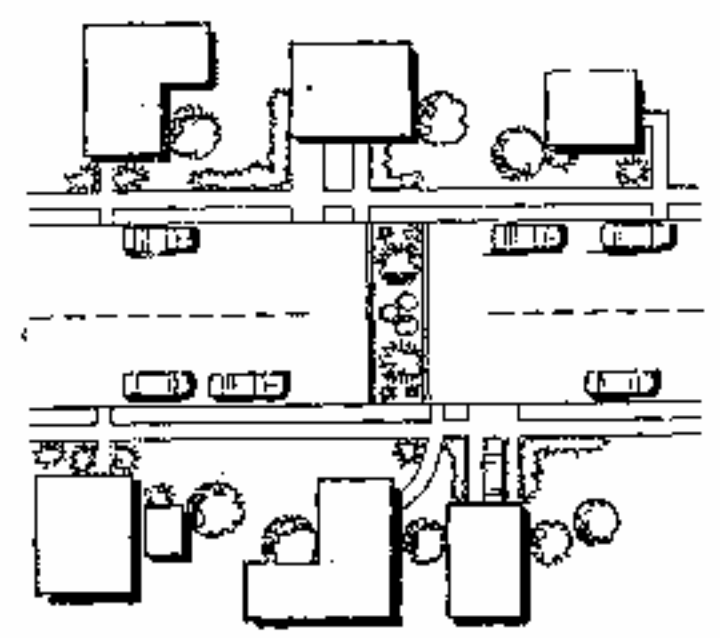
**Diagonal diverters** are barriers placed diagonally across an intersection, blocking through movement; they are sometimes called full diverters or diagonal road closures.



**Half closures** are barriers that block travel in one direction for a short distance on otherwise two-way streets; they are sometimes called partial closures, entrance barriers, or one-way closures (when two half-closures are placed across from one another at an intersection, the result is a semi-diverter).

**Full-street closures** are barriers placed across a street to completely close the street to through-traffic, usually leaving only sidewalks open; they are sometimes called cul- de-sacs or dead-ends.





**Median barriers** are raised islands in the centerline of a street and continuing through an intersection that block the left turn movement from all intersection approaches and the through movement at the cross street.

**Design/Installation Issues:**

- Issues associated with closing a public street

- Can be placed at an intersection or midblock

- Barriers may consist of landscaped islands, walls, gates, side-by-side bollards or any other obstruction that leave an opening smaller than the width of a passenger car

**Potential Impacts:**

- Concern over effects on emergency response, street network connectivity and capacity and parallel local streets that carry diverted traffic

- May divert significant traffic volumes

- No significant effect on vehicle speeds beyond the closed block

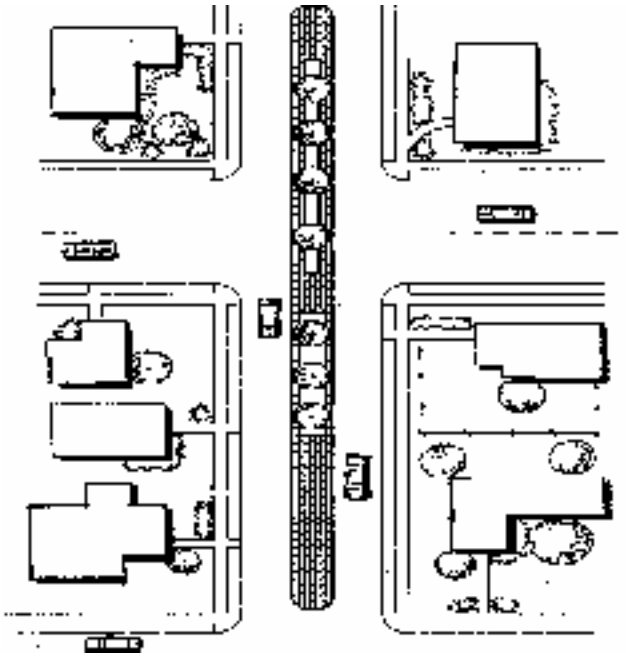
**Emergency Response Issues:**

- Half closures allow a higher degree of emergency vehicle access than full closures or diagonal diverters

- All three types of closures can be designed to allow emergency vehicle access

**Typical Cost:**

• Costs range between $2,400 for a simple half-closure and $45,000 for highly landscaped diagonal diverter. (in 2000 dollars)



# Traffic Calming Measures - Neighborhood Traffic Circle

## Description:

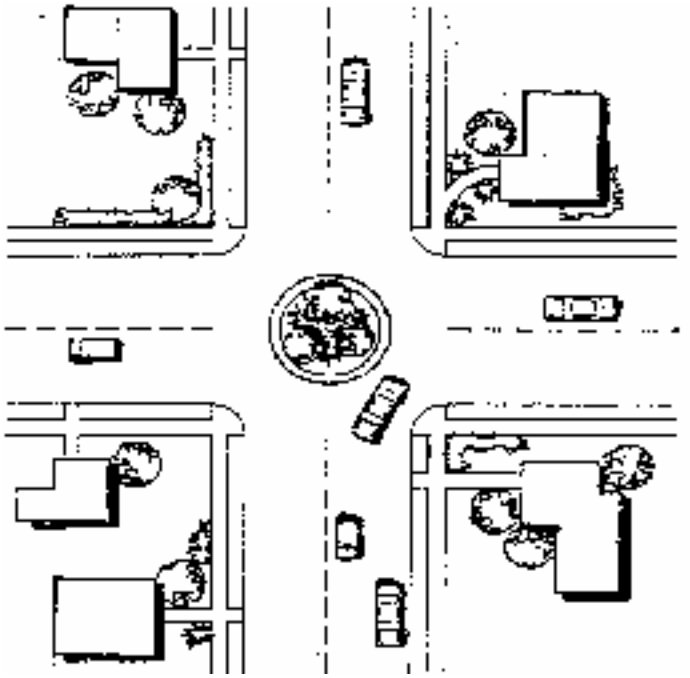
- Raised islands, placed in intersections, around which traffic circulates
- Motorists yield to motorists already in the intersection
- Require drivers to slow to a speed that allows them to comfortably maneuver around them
- Different from roundabouts

**Applications:**

- Intersections of local or collector streets
- One lane each direction entering intersection
- Not typically used at intersections with high volume of large trucks and buses turning left

**Design/Installation Issues:**

- Typically circular in shape, though not always
- Usually landscaped in their center islands, though not always
- Controlled by YIELD signs on all approaches, but many different signage approaches have been used
- Key design features are the offset distance (distance between projection of street curb and center island), lane width for circling the circle, the circle diameter and height of mountable outer ring for large vehicles such as school buses and trash trucks



**Potential Impacts:**

- Minimal effect on access

- Reduction in midblock speed of about 10 percent; area of influence tends to be a couple hundred feet upstream and downstream of intersection

- Minimal diversion of traffic

- Intersection collisions have been reduced on average by 70 percent and overall collisions by 28 percent

- Can result in bicycle/auto conflicts at intersections because of narrowed travel lane

**Emergency Response Issues:**

- Emergency vehicles typically slow to approximately 13 mph; approximate delay of between 5 and 8 seconds per circle for fire trucks

- Fire trucks can maneuver around traffic circles at slow speeds provided vehicles are not parked near the circle

**Other/Special Considerations:**

- Large vehicles may need to turn left in front of the circle (which could be unsafe at higher volumes); legislation may be required to legally permit this movement

- Quality of landscaping and its maintenance are key issues

- Landscaping needs to be designed to allow adequate sight distance

- Care must be taken to avoid routing vehicles through unmarked crosswalks on side-street approach

**Typical Cost:**

- Approximately $4,000 to $25,000

# Traffic Calming Measure - Chicane

## Description:

- A series of narrowing or curb extensions that alternate from one side of the street to the other forming S-shaped curves

- Often called deviations, reverse curves, twists and staggering

## Applications:

- Appropriate for midblock locations only

- Most effective with equivalent volumes on both approaches

- Typically, is a series of at least three curb extensions

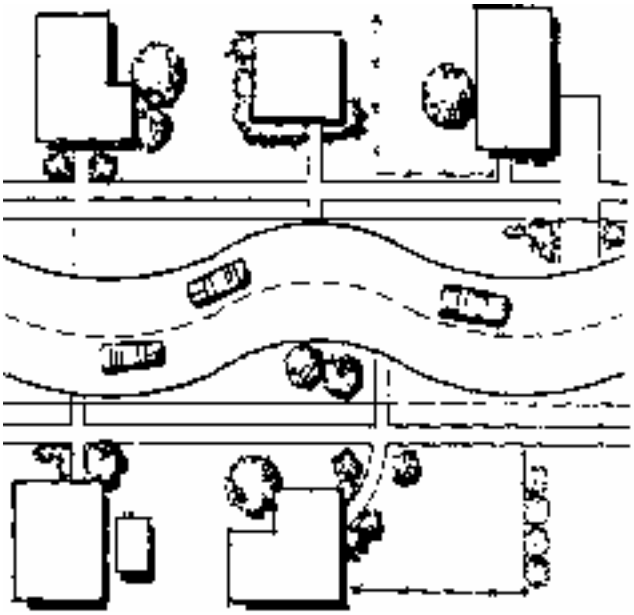
- Can use on-street parking to create chicane

## Design/Installation Issues:

- Unless well-designed, chicanes may still permit speeding by drivers cutting straight paths across the center line

- Recommend traffic shifts in alignment of at least one lane width, deflection angles of at least 45 degrees and center islands to prevent drivers from taking a straight "racing line" through the feature

13



**Potential Impacts:**

- No effect on access
- Street sweeping may need to be done manually
- Can impact parking and driveway access
- Provides opportunity for landscaping

**Emergency Response Issues:**

- Limited data available on their effect on delay of emergency response
- Emergency response typically prefers two-lane chicanes to speed humps

**Typical Cost:**

- Reported costs range between $5,800 and $21,000 (in 2000 dollars)

# Traffic Calming Measures - Choker

## Description:

- Curb extensions at midblock or intersection corners that narrow a street by extending the sidewalk or widening the planting strip

- Can leave the cross section with two narrow lanes or with a single lane

- At midblock, sometimes called parallel chokers, angled chokers, twisted chokers, angle points, pinch points, or midblock narrowing

- At intersections, sometimes called neckdowns, bulbouts, knuckles or corner bulges

- If marked as a crosswalk, they are also called safe crosses

## Applications:

- Local and collector streets

- Pedestrian crossings

- Main roads through small communities

- Work well with speed humps, speed tables, raised intersections, textured crosswalks, curb radius reductions and raised median islands

**Design/Installation Issues:**

- Some applications use an island which allows drainage and bicyclists to continue between the choker and the original curb line

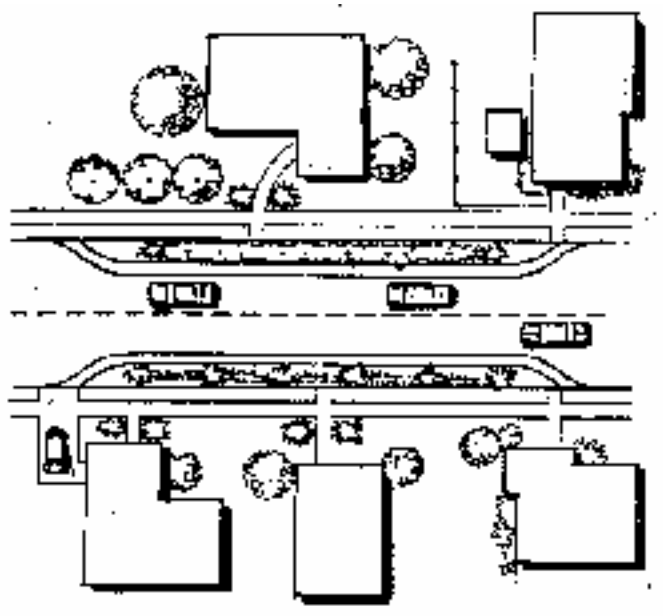
- Typically designed to narrow road to 20 feet for two-way traffic; typically avoid the use of widths between 13 and 17 feet

- Adequate drainage is a key consideration

- Provides opportunity for landscaping

- Vertical delineators, bollards or object markers are often used to make visible to snowplow operators


15



**Potential Impacts:**

- Can impact parking and driveway access
- Reduces pedestrian crossing width and increases visibility of pedestrian
- Speeds have typically been reduced on average by 4 percent for two-lane chokers and 14 percent for one lane chokers
- Minor decrease in traffic for two-lane and 20 percent reduction for one-lane chokers
- Bicyclists prefer not to have the lane narrowed into path of motor vehicles

**Emergency Response Issues:**

- Preferred by many fire department/emergency response agencies to most other traffic calming measures

**Other/Special Considerations:**

- One-lane chokers rely on regulatory signs and driver courtesy to work

**Typical Cost**

- Approximately $7,800 to $12,000

# Traffic Calming Measures - Center Island Narrowing

## Description:

- Raised islands located along the centerline of a street that narrow the travel lanes at that location

- Often called midblock medians, median slow points, or median chokers

## Applications:

- Often nicely landscaped to provide visual amenity and neighborhood identity

- Can help create pedestrian friendly streets by providing a mid-point refuge for pedestrians crossing

- Sometimes used on wide streets to narrow travel lanes

- Work well when combined with crosswalks

## Potential Impacts:

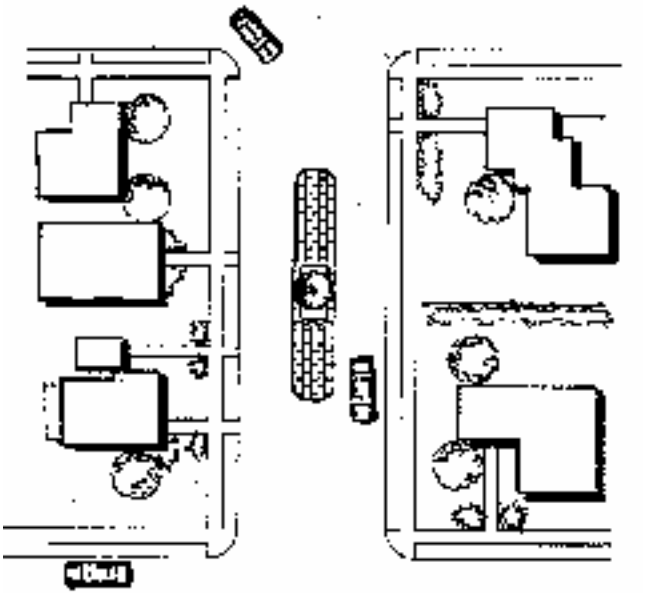
- May reduce parking and driveway access

- Reduces pedestrian crossing width

- May visually enhance the street through landscaping but may also limit visibility of pedestrian crossings

- Bicyclists prefer not to have the travel way narrowed into path of motor vehicles

17



**Emergency Response Issues:**

• Preferred by fire department/emergency response agencies to most other traffic calming measures

**Typical Cost:**

• Reported costs range between $6,000 and $20,000

**The data provided in Appendix A has been obtained from the research and experience of transportation engineering and planning professionals. The information is intended for informational and example purposes only and does not include ITE or FHWA recommendations on the best course of action.**