

City of Charlottesville Traffic Calming Handbook

July 2008



CITY OF CHARLOTTESVILLE
NEIGHBORHOOD DEVELOPMENT SERVICES

610 East Market Street, PO Box 911

Charlottesville, VA 22902

Telephone: (434)970-3182

Fax: (434) 970-3359

Traffic Calming Handbook

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610 East Market Street, PO Box 911
Charlottesville, VA 22902



Introduction

The City of Charlottesville's Department of Neighborhood Development Services Traffic Calming Program, in place since 1996, provides administrative procedures that document and catalogue complaints from residents concerning neighborhood traffic-related problems.

Traffic calming is a proactive attempt to improve the livability of residential neighborhoods and promote pedestrian activity in service districts. It involves the application of engineering techniques to physically change the character of streets, improve pedestrian safety and encourage drivers to obey speed limits. Traffic calming utilizes a variety of physical devices to alter the geometry of the street, along with more traditional traffic engineering techniques to slow traffic. A successful traffic calming plan is (generally) not a single device, but rather a series of integrated improvements to slow traffic and, if desired, to direct traffic to more appropriate routes. It is important to note that the term "traffic calming" also applies to non-engineering approaches. The widely used three "E's" of traffic calming is Education, Enforcement and Engineering

When concerns regarding traffic speeds, pedestrian safety, and cut-through traffic arise in residential areas, it is often frustrating for both residents and traffic engineers. Neighborhoods often request a quick fix solution such as enforcement, reduction in posted speed limits, or the addition of stop signs. This increases the pressure to implement haphazard solutions that may not be in the best interests of the neighborhood, the jurisdiction, or the traveling public.

The use of traffic calming devices must be carefully documented so that they are not used inappropriately or too frequently. Jurisdictions should have in place a four-phased procedure by which traffic calming devices are requested, evaluated for appropriateness, and implemented:

- Documentation of the problem and the need for traffic calming devices;
- Field reconnaissance and collection of traffic study data;
- Selection of the proper device to correct the problem; and
- Monitoring of the effectiveness of the device(s) once installed.

It is the intention of the Charlottesville Traffic Calming Program to address traffic problems and concerns on local streets. While not intended to make streets play areas for children or adults, the Charlottesville Traffic Calming Program is intended to generally improve safety for pedestrians, bicyclists, and others who travel along or across these streets.

This handbook provides guidelines for traffic calming devices on local, collector and arterial roads. Some professionals within the field do not consider the use of traffic calming devices on arterials appropriate; however, this topic is currently under debate. Charlottesville presents a unique situation in which arterials, fronted by residences and carrying significant amounts of traffic are present throughout the community.

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Goals

The goals of the City of Charlottesville Traffic Calming Program are to provide residential neighborhoods protection from excessive speeds and volumes of motor vehicles; increase safety, access, comfort and convenience for pedestrians, bicyclists, and motorists; and promote a partnership between City staff and neighborhood residents in the development of traffic calming measures.

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Definitions

85th percentile - The speed at or below which 85% of the vehicles are moving.

Accident Record Investigation - This involves a search of accident records to establish the frequency of occurrence at intersections within and on the fringe of the study area. It will also identify accident occurrence at mid-block locations within the study area. These studies will cover a period of at least one year (typically two years).

ADT Counts - These counts will be conducted in accord with agency-accepted procedures. They should be taken for a period of not less than one weekday (24 hours). ADT (Average Daily Traffic) counts should be taken along all identified problem streets, on neighborhood streets at gateways to the area, and on adjacent or nearby major arterials or collectors (as appropriate).

Arterial Principal - Principal arterials permit traffic flow through the urban area and between major destinations. They are of great importance in the transportation system since they connect major traffic generators, such as the central business district, to other major activity centers.

Arterial Minor - Minor arterials collect and distribute traffic from principal arterials and expressways to streets of lower classification and, in some areas, allow traffic to directly access destinations. They serve secondary traffic generators such as community business centers, neighborhood shopping centers, multifamily residential areas, and traffic between neighborhoods.

Collector - Collectors provide for land access and traffic circulations within and between residential neighborhoods and commercial and industrial areas. Streets serve the purpose of moving traffic over short distances and provide accessibility to various land uses. They distribute traffic movements from these areas to the arterial streets.

Impact Area - properties within one block of an intersection project and all properties fronting the study blocks of the road in the case of projects at the mid-block of streets. In addition, roads that have their sole access through the study blocks will be included in the impact area (examples; dead end road which intersects affected block, neighborhood streets which must use road to exit neighborhood).

Local street - Local streets provide direct access to properties abutting the roadway and within the immediate vicinity. Service to through-traffic is deliberately discouraged on these roadways. A Local Street offers the lowest level of mobility.

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Origin-Destination (O-D) Studies - O-D studies will be conducted when the basic traffic problem relates to excessive cut-through traffic on a particular residential street, or when the problem relates to truck movements through the area. The recommended procedure involves stationing two observers at each gateway to the neighborhood. One observer will record inbound activity and the other will record outbound activity. Information to be recorded includes the time of day (at one minute intervals) and the vehicle license number of all vehicles that enter or exit the neighborhood; license numbers and the time of day must be correlated. These studies will normally be made for a continuous two-hour period in morning and afternoon peak travel hours. For neighborhoods that have certain types of problems, O-D surveys may be needed at other times of the day. It is necessary to use a sufficient number of surveyors to observe all gateways to the neighborhood simultaneously if a full understanding and documentation of the through traffic problem is to be gained.

Speed study - A study using equipment to measure, collect and statistically analyze the speeds of vehicles.

Spot Speed Survey - This survey is intended to measure the prevailing speed of traffic, and to determine the percentage of total motorists who exceed the speed limit. It will be conducted in accord with standard Traffic and Transportation procedures.

Traffic calming - methods used to reduce vehicular speed and volume and increase the sharing of streets by pedestrians and other users. Generally refers to physical measures and roadway design changes but enforcement and education can be components.

Traffic control - signs, signals and markings designed to regulate and warn. Examples include: stop signs, speed limit signs and traffic signals. Traffic control is not a part of traffic calming.

Turning Movement Counts - These manual counts are required when the principal neighborhood traffic problems result from through traffic. They will be conducted at intersections that serve as gateways to the neighborhood. In most circumstances, they can be restricted to the peak travel hours (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m.). Should the field reconnaissance or neighborhood meeting reveal through traffic problems during other time periods, consideration will be given to extending the count period.

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General Information

- Requests for a transportation study may be initiated by the residents of the area in coordination with the local neighborhood group.
- All requests shall be in the form of a formal petition submitted on the “Request for Transportation Study” form, obtainable from the Department of Neighborhood Development Services (NDS) by calling (434)970-3319 or by visiting the NDS website at www.charlottesville.org/nds
- NDS may establish working groups to review the study information and comment on recommended solutions.
- Transportation study requests will be accepted on a rolling basis. Studies will be conducted by Charlottesville Traffic Engineering department or consultants hired by the department in the order in which they are received and the potential severity of the transportation concern. Traffic Engineering reserves the right to expand the study area due to potential adverse impacts to areas adjacent to the original request.
- Completed applications should be sent to: City of Charlottesville; Traffic Engineering; PO Box 911; Charlottesville, VA 22902
- NDS maintains the right to conduct a transportation study without a request from the community based upon safety and mobility consideration.
- Each request for a transportation study shall contain a list of signatures and addresses of residents in the block or blocks where a study is desired. These signatures ensure that there is an awareness of the request among neighbors.

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Policies

The following policies are established as part of the City of Charlottesville Traffic Calming Guidelines:

- A transportation study shall be the basis for deciding the appropriate solution(s) for a traffic safety or mobility situation or need.
- NDS shall be responsible for conducting Transportation Studies and making recommendations for implementation.
- Traffic calming measures shall conform to engineering and procedural standards established by the Manual of Uniform Traffic Control Devices, Institute of Transportation Engineers and Neighborhood Development Services Traffic Engineer or designee.
- Through traffic should be encouraged to use higher classification streets (i.e. arterial and collector streets)
- In areas where speeding is determined to be a problem, traffic calming measures shall be implemented to reduce speeds.
- Ingress and egress of police and emergency vehicles must be maintained or not substantially hindered.
- The final location of traffic calming installations shall be determined by City Traffic Engineer or designee.
- Installation of traffic calming measures shall conform to engineering and procedural standards and shall be determined by the City Traffic Engineer or designee.
- Transportation study recommendations should not result in a significant reduction of the capacity of intersections and roadways where they are placed.
- Transportation study recommendations should not inadvertently divert significant volumes of vehicular traffic onto adjacent residential streets.
- Recommendations for identified problems should be cost-effective.
- NDS may consider the installation of traffic calming measures on a trial basis. All such installations should be evaluated for effectiveness within six months. Although in some cases a twelve month duration may be required.

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- Physical traffic calming measures such as speed humps will not be considered on roadways with a grade of 8% or more, arterial and collector streets, and through truck routes.
- Traffic calming measures shall have no significant adverse impact on fire, police and emergency services.
- As a general guideline, when the 85th percentile speed on a street segment exceeds the appropriate speed limit by at least 10mph, traffic calming measures shall be considered.
- Traffic calming measures may be justified if the Origin-Destination study proves at least 30% of the total daily traffic volume is a result of cut-through traffic.
- Traffic calming measures shall be considered if the average daily traffic (ADT) exceeds 800 vehicles per day (vpd) or if the peak hour volume is greater than 150 vehicles on residential streets.
- Crash data for the most recent three years shall be analyzed for by type, severity, location, roadway condition, and time of crash. Accident rates shall be considered problematic when there are three or more reported cases involving pedestrian, bicycle and automobiles along a local residential street within one year.
- Transportation studies shall not be conducted during holidays or at times of the day that does not reflect “typical” traffic conditions within the neighborhood. To the greatest extent possible, transportation studies should examine traffic during times when potential conflicts or problems are most likely to occur.

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Process

Step 1: Traffic Calming Request

Requests for traffic calming studies can be sent to Neighborhood Development Services (NDS) on a rolling basis. The requests must come from a neighborhood association or group. Individuals requesting a traffic calming review must work through their neighborhood association or group. All requests should outline the neighborhood traffic problem to be investigated. Requests shall be submitted on the Request for Traffic Calming Study form. This petition shall contain signatures from at least 50 percent of residents in the affected area. This assures that all residents in the affected area are in agreement that there is a problem and would like the City to investigate.

All projects plans that are advanced to the City for evaluation must be contained within the Comprehensive Plan as an “Action” item. The “Action” item list will be updated annually.

To be eligible for consideration, a street must serve areas that are primarily residential.

Step 2: Engineering Review and Data Collection

On finding that the identified street meets the aforementioned standard and is eligible for traffic calming, NDS will identify the limits of the street to be subject to the study process. If NDS determines that the study limits go beyond the limits on the original request, notification will be sent to the neighborhood association or group for additional residential support before proceeding with the engineering review.

Engineering review and data collection shall be performed by the City Traffic Engineer or designee. The process will involve study area determination, data collection and analyses. Data collection consists of one or more areas:

- Vehicular volume
- Speeds
- Cut through traffic (Origin-Destination study)
- Crash rates
- Road alignment and grade
- Street or segment classification
- Parking
- Pedestrian activities
- Bicyclist activities
- Existing traffic calming measures/traffic control devices
- Other physical conditions on roadway or street segment.

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Step 3: Analysis

The various data collected in the field reconnaissance and during the data collection effort will be summarized and analyzed to determine if a problem does or does not exist, by comparing actual activity measures to established threshold values. Threshold values are presented in the following sections for each of the basic types of traffic problems. It is emphasized that many of these suggested limiting values must be carefully weighed in the context of their application to problems within the study area. Moreover, experience gained in the future may suggest changes in these values to better relate to problem definition.

Step 4: Formulate Improvement Concepts

Once the nature and degree of the traffic problem(s) is fully assessed, the City's Traffic Engineer (in conjunction with fire, police, and public works officials), will formulate a series of alternative improvement concepts. Any traffic control measure that has been found to be effective and is accepted by recognized governmental and professional agencies will be evaluated for potential application.

Formulation of improvement strategies will consider the following guiding principles:

- Changes that compromise public safety or significantly impact emergency vehicle access will not be employed.
- The capital and maintenance costs of improvements will receive appropriate consideration.
- Use of official traffic control devices shall conform in design and application to standards contained in the Manual of Uniform Traffic Control Devices (MUTCD).
- Preference shall be given to those management techniques that will achieve the desired improvement and cause the least negative impact on the neighborhood.

Step 5: Presenting Alternatives to Neighborhood

There are 3 stages of intervention that can be used in traffic calming:

Stage 1: Education, enforcement, signage, striping

Stage 2: Speed humps, raised crosswalks, raised intersections, mini traffic circles, chicanes, chokers, intersection narrowing, center island narrowing

Stage 3: Roadway closures, signals

When a traffic problem can be addressed using Stage 1 tools, the City will notify the Neighborhood Association and petition originator via letter. No further action is required for the City to go ahead with project. If the problem is to be addressed using Stage 2 or 3 tools, the City requires a petition

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from affected residents before proceeding. Certain Stage 2 and 3 tools require extensive design. In addition, a public meeting is held where the proposed traffic calming measure is presented to the neighborhood and questions are taken. Prior to this meeting, residents will receive a ballot with which to vote on the proposed measure.

Step 6: Final Neighborhood Vote

Area residents will cast their final votes on the traffic calming measure(s) during a one month period that begins the day of the final neighborhood meeting. At least 50% of the impact area's residents must vote in the final poll.

Of that 50%, at least 2/3 of the votes must be in favor of the project for the project to advance to final construction.

Step 7: Follow Up Study

A follow-up general study of the plan and its effectiveness will be completed within 6 months to a year following construction of the traffic calming measure(s). The city reserves the right to remove any traffic calming measure that is potentially unsafe and impairs the public safety and welfare.

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Appendix

References

City of Charlottesville Roadway Classification Map

Traffic Calming Measures Approved for Use in the City of Charlottesville

Illustrations of Traffic Calming Measures

Request for Transportation Study

Traffic Calming Handbook

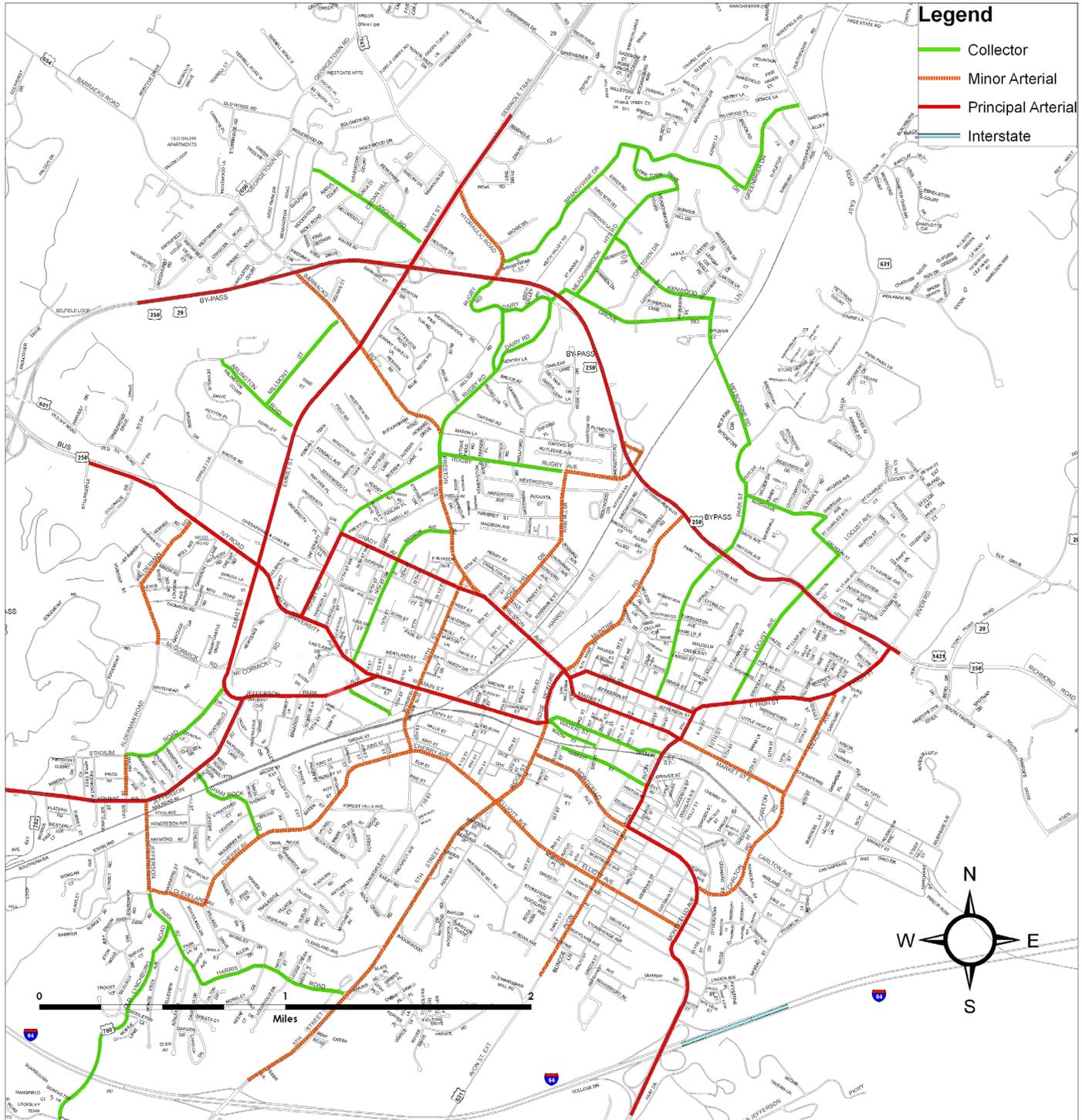
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References:

Alameda County Neighborhood Traffic Calming Program
City of Atlanta Neighborhood Traffic Management Program Manual
City of Albuquerque (NM) Neighborhood Traffic Management Program
City of Boulder (CO) Neighborhood Traffic Mitigation Program
City of Cambridge (MA) Traffic Calming Program
City of Columbia (SC) Traffic Management Program
District of Columbia Department of Transportation
Institute of Transportation Engineers
City of Portland (ME) Traffic Calming Policy Guidelines
City of Portland (OR) Neighborhood Speed Watch Program Evaluation
Traffic Calming Program of City of Richmond
City of Seattle (WA) Neighborhood Traffic Control Program
Nashville Neighborhood Traffic Management Pilot Program
Neighborhood Traffic Calming Program for the City of Sunnyvale (CA)
City of San Buenaventura (CA) Neighborhood Traffic Management and Calming Program

CITY OF CHARLOTTESVILLE FUNCTIONAL CLASSIFICATION OF STREETS



Traffic Calming Handbook

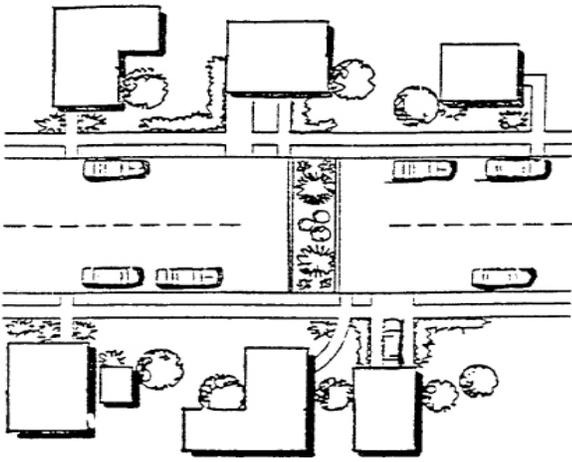
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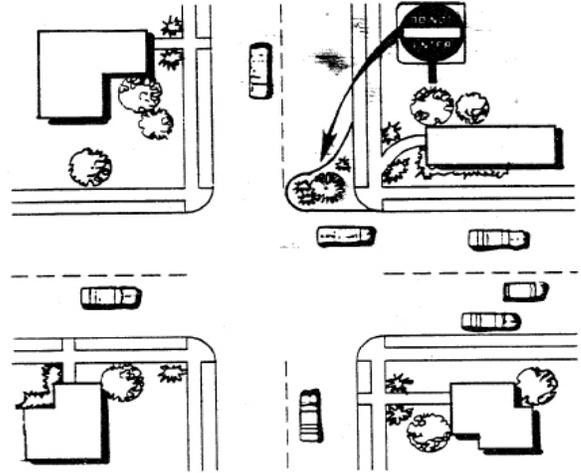
Traffic Calming Measures Approved for Use in the City

- **Bulbouts** – An extension of a curb in the form of a bulb, usually at an intersection or mid-block, that narrows the vehicular pathway and inhibits fast turns.
- **Chicanes** – A series of fixed objects, usually extensions of the curb, which alter a straight roadway into a zig-zag or serpentine path to slow vehicles.
- **Chokers** – A narrowing of the fixed street, often in mid-block and sometimes near an intersection. May be done with curb extensions, landscaping or islands in the street.
- **Circles** – A small circular island, usually less than 26 feet in diameter, used in the middle of intersections and intended to force vehicular traffic to slow and negotiate around it.
- **Diagonal diverters** – A partition that connects two diagonally opposite curbs, bisecting the intersection, to force motor vehicles to slow down and turn.
- **Forced turns** – Islands used on approaches to an intersection that force drivers to turn in only one direction (usually right).
- **Full street closures** – Barriers placed across an entire width of street to completely close the street to through-traffic, usually leaving only sidewalks open.
- **Gateways** – Also known as entry treatments; may involve alterations in the pavement surface, with bricks, stamped concrete, or other colored materials intended to signal to drivers that they are entering a neighborhood or community that requires lower speeds.
- **Half closures** – Barriers that block travel in one direction for a short distance on an otherwise two-way street.
- **Medians** – Narrow islands constructed between travel lanes through an intersection. They are intended to prevent left turns from the major street and through movements along the minor street.
- **Raised crosswalks** – A traditional pedestrian crossing area purposely raised above the normal pavement surface level in order to give motorists and pedestrians a better view of the crossing area.
- **Speed humps** - Mountable obstructions installed on the pavement surface, across the traveled lanes, and intended to cause vehicles to slow. Speed humps utilize larger vertical radii than speed bumps that result in wider widths and a more gentle crossing by vehicles.

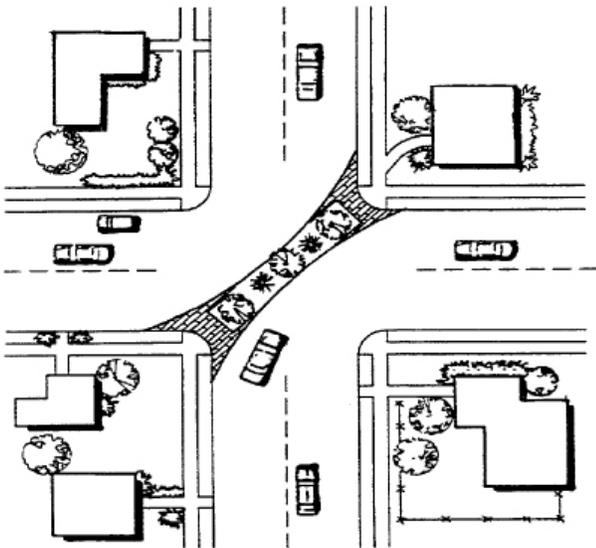
Illustrations of Traffic Calming Measures



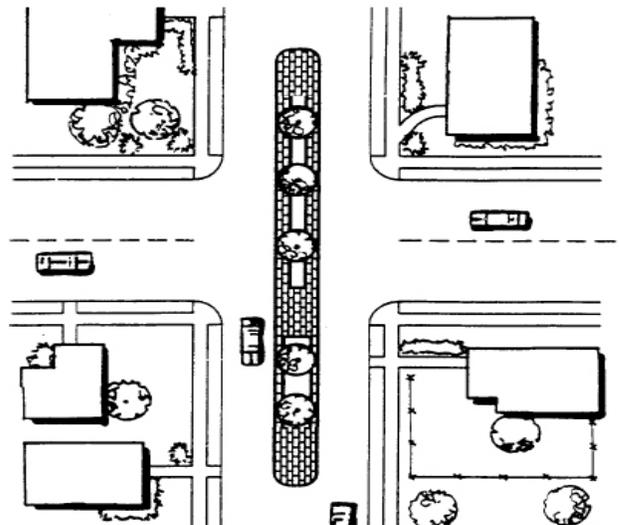
Full Closure



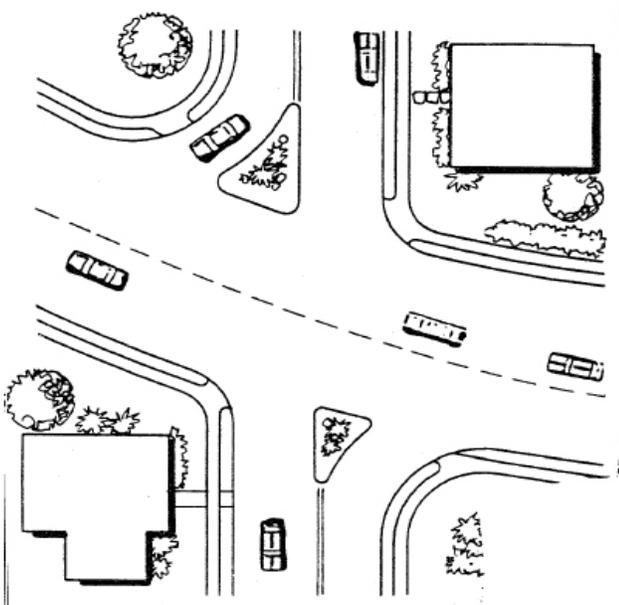
Half Closure



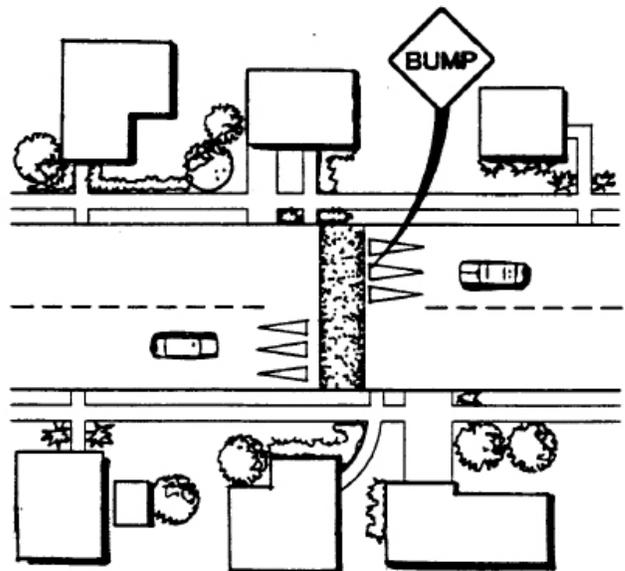
Diagonal Diverter



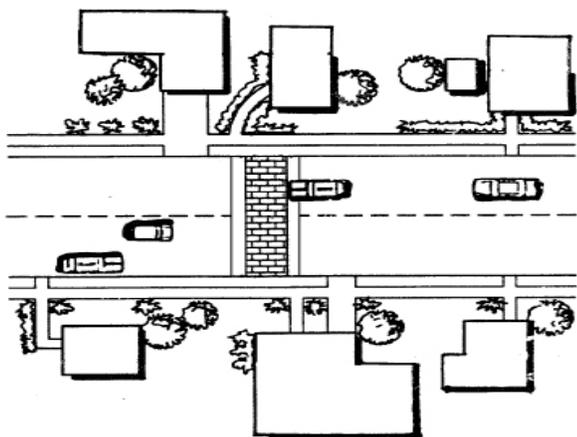
Median Barrier



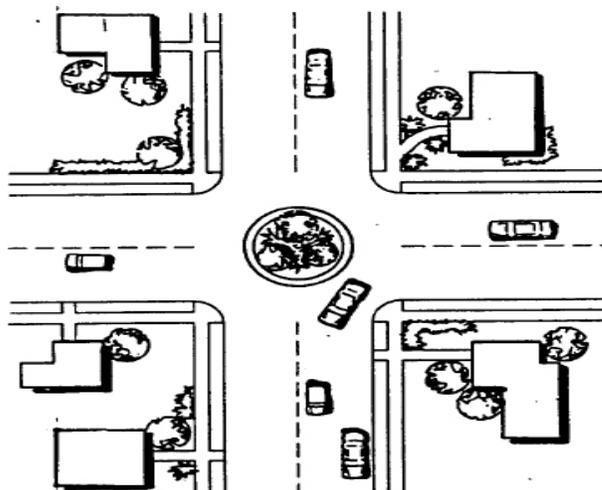
Forced Turn Island



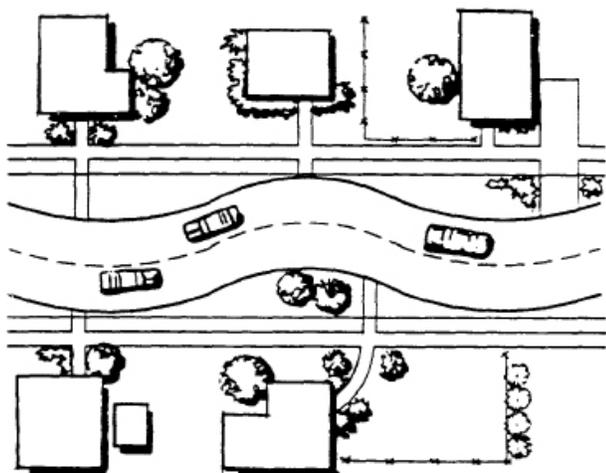
Speed Bump



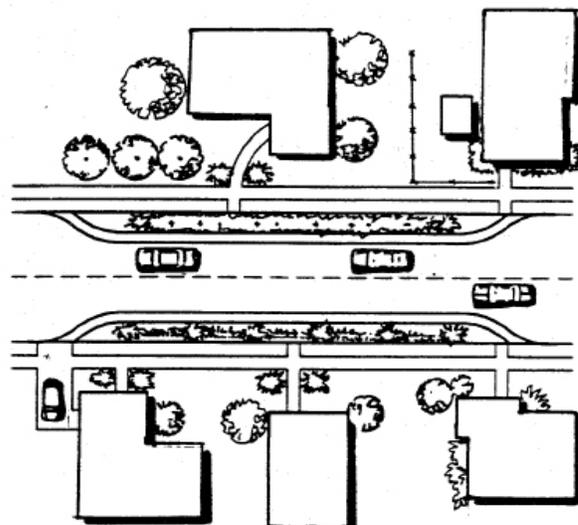
Speed Table



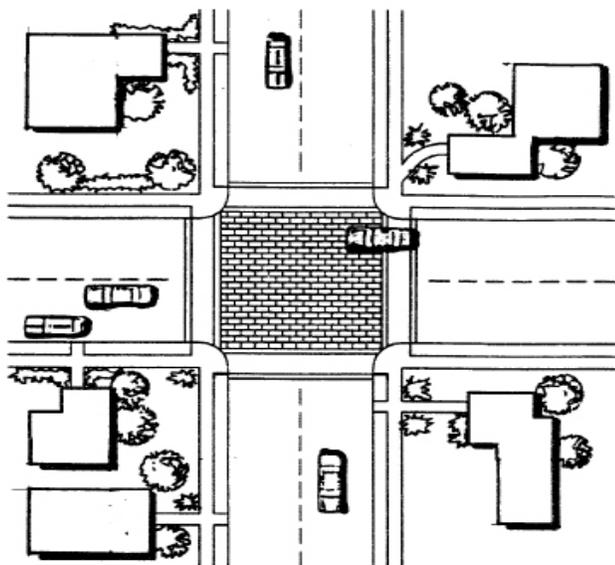
Traffic Circle



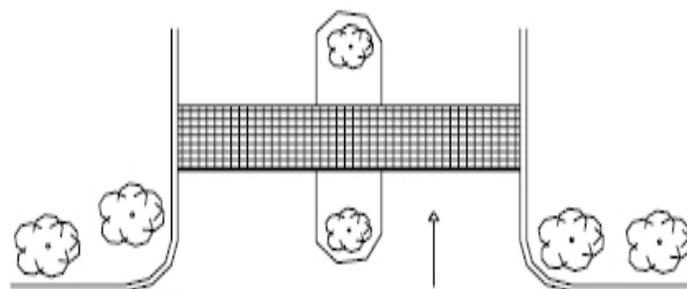
Chicanes



Chokers



Pedestrian Refuges



Entrance to Traffic Calming Neighbourhood

Gateway

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Request for Transportation Study

The following is a request for a traffic calming study. The request shall be processed according to procedures in the City of Charlottesville Traffic Calming Guidebook.

Street Information

Please provide the name(s) of the street(s) on which a study is requested as well as the boundaries of the street segment. (Note: Boundaries may change at NDS' discretion).

Street: _____ Traffic Problem(s): _____
From: _____
To: _____

Contact Information:

Each request must provide a contact person who lives on the requested street segment.

Name of Representative: _____

Address: _____ Zip Code: _____

Phone Number: _____ Email address: _____

I agree to be the contact person for the above request.

Signature: _____ Date: _____

Evidence of Support Attached: Yes No

(Note: Must have 50% of residents sign the request in order for the City to perform a transportation study)

CITY OF CHARLOTTESVILLE TRAFFIC CALMING PETITION



To the residents of _____ [local street name] _____ in the City of Charlottesville.

This request was made by you or your neighbors and will be investigated by the Neighborhood Development Services Department. Fifty (50) percent of affected households must be in favor of this review before any data collection begins. (A formal ballot will be required prior to any implementation.)

On _____ [local street to be 'calmed'] _____ from _____ [street name] _____ to _____ [street name] _____.

Street Address of Affected Household	Representative of Affected Household (please print)	Signature
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Contact Name _____ E-mail Address _____ Phone _____

CITY OF CHARLOTTEVILLE TRAFFIC CALMING PETITION



To the residents of _____ [local street name] _____ in the City of Charlottesville.

This request was made by you or your neighbors and will be investigated by the Neighborhood Development Services Department. Fifty (50) percent of affected households must be in favor of this review before any data collection begins. (A formal ballot will be required prior to any implementation.)

On _____ [local street to be 'calmed'] _____ from _____ [street name] _____ to _____ [street name] _____.

Street Address of Affected Household	Representative of Affected Household (please print)	Signature
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		
21.		
22.		

Contact Name _____ E-mail Address _____ Phone _____