



TRAFFIC CALMING 101



What Is Traffic Calming?

Traffic Calming means different things to different people.
There is no single solution or definition.

CAN BE DEFINED AS:

A form of traffic planning that seeks to equalize the use of streets between automobiles, pedestrians, bicyclists, and playing children. This is accomplished through the use of devices and techniques that reduce traffic volume and speed in neighborhoods while maintaining maximum mobility and access.

Traffic Calming, Cynthia L. Hoyle, APA, July, 1995, p.1

These “forms of traffic planning” can be considered TOOLS



THE BASICS

What Does Traffic Calming Accomplish?

TOOL BOX		Volume Reduction	Speed Reduction	Safety Improvement	Pollution Reduction	Access Restriction	Emergency Access	Maintenance Problems	Cost of Installation	Emergency Access
Counter	Measure									
1	Truck Restrictions									
2	Increased Enforcement									
3	Speed Watch									
4	Variable Speed Display									
5	Watch for Children									
6	Pavement Markings									
7	Street Narrowing									
8	Truck Restrictions									
9	Private Streets									
10	Basket Weave Stop Signs									
11	Yield Signs									
12	Do Not Enter									
13	Speed Limit Changes									
14	Parking Restrictions									
15	All Way Stop									
16	One Way Streets									
17	Stop Sign Removal									
18	Chokers									
19	Partial Dividers									
20	Street Closure									
21	Full Dividers									
22	Traffic Circles									
23	Median Barriers									
24	Speed Bump									
25	Complete Reconstruction									

LOW, UNLIKELY
MAY BE POSSIBLE
HIGHLY LIKELY, YES
SHIFT

SLOWS TRAFFIC
REDUCES CUT-THROUGH TRAFFIC
INCREASES SAFETY FOR PEDESTRIANS, BICYCLES, VEHICLES
REDUCES TRAFFIC RELATED NOISE
CAN IMPROVE AESTHETICS



THE BASICS

The Traffic Calming “TOOL BOX”

Speed Limit Changes

- Do Not Work
FORGET ABOUT IT!

All Way Stops

- Moderate Success

Diverters/Street Closures

- Consider These

Chapter	TOOL BOX	Volume Reduction	Speed Reduction	Safety Improvement	Pollution Reduction	Access Restriction	Emergency Access	Maintenance Problems	Level of Violation	Community Acceptance	Cost
1	Truck Restrictions	○	○	○	○	○	○	○	○	○	○
2	Increased Enforcement	○	●	○	○	○	○	n/a	●	○	○
3	Speed Watch	○	●	○	○	○	○	n/a	●	○	○
4	Variable Speed Display	○	●	○	○	○	○	n/a	●	○	○
5	Watch for Children	○	○	○	○	○	○	n/a	●	○	○
6	Pavement Markings	○	○	○	○	○	○	n/a	●	○	○
7	Street Narrowing	○	○	○	○	○	○	n/a	○	○	○
8	Turn Restrictions	●	○	○	○	○	○	○	○	○	○
9	Private Streets	○	○	○	○	○	○	n/a	○	○	○
10	Basket Weave Stop Signs	○	○	○	○	○	○	○	○	○	○
11	Yield Signs	○	○	○	○	○	○	○	○	○	○
12	Do Not Enter	○	○	○	○	○	○	○	○	○	○
13	Speed Limit Changes	○	○	○	○	○	○	○	○	○	○
14	Parking Restrictions	○	○	○	○	○	○	○	○	○	○
15	All Way Stop	○	○	○	○	○	○	○	○	○	○
16	One Way Streets	○	○	○	○	○	○	○	○	○	○
17	Stop Sign Removal	○	○	○	○	○	○	n/a	○	○	○
18	Chokers	○	○	○	○	○	○	n/a	○	○	○
19	Partial Diverters	○	○	○	○	○	○	○	○	○	○
20	Street Closure	○	○	○	○	○	○	n/a	○	○	○
21	Full Diverters	○	○	○	○	○	○	n/a	○	○	○
22	Traffic Circles	○	○	○	○	○	○	n/a	○	○	○
23	Median Barriers	○	○	○	○	○	○	n/a	○	○	○
24	Speed Bumps/Humps	○	○	○	○	○	○	n/a	○	○	○
25	Curvilinear Reconstruction	○	○	○	○	○	○	n/a	○	○	○

KEY
 ○ LOW, UNLIKELY, NO
 ● MID, MODERATE, POSSIBLE
 ● HIGH, LIKELY, YES
 ◊ SHIFT



APPLICATION OF TOOLS

What Tools Fit Which Purpose?

Each tool addresses a different objective of traffic calming. The key is to find the most effective way of “calming” traffic for a given set of conditions.

Reduce Speed/Slow Traffic

- Traffic Circles
- Neckdowns
- Medians
- Chokers
- Enforcement
- Photo Radar
- Speed Trailer
- Landscaping
- Speed Humps
- Realigned Intersection
- Diverters
- Raised Crosswalks
- Raised Intersections
- Deviations

Mitigate Cut-Through Traffic

- Diverters
- Closures
- Signed Turn Restrictions
- Physical Turn Restrictions
- One-Way Sections
- Partial Closures
- Gateways/Entry Ways
- Identification Islands
- Truck Restrictions
- Speed Humps
- Barrier Medians
- Raised Crosswalks
- Raised Intersections
- Traffic Circles

Increase Safety

- Neckdowns
- Bikelanes
- Raised Crosswalks
- Medians
- Enforcement

Improve Aesthetics

- Neckdowns
- Medians
- Identification Islands
- Traffic Circles
- Pavement Treatments
- Deviations
- Landscaping
- Street Furniture

What Should You Consider When Selecting a Tool?

First, identify existing problems to determine which tool is the best solution.

SOME THINGS TO CONSIDER

- **Costs**
- **Positive** and **negative impacts**
- **Feasibility** from the following standpoints:
 - Traffic Engineering
 - Funding
 - Political Limitations
 - Public Acceptance

Reduce Speed/Slow Traffic

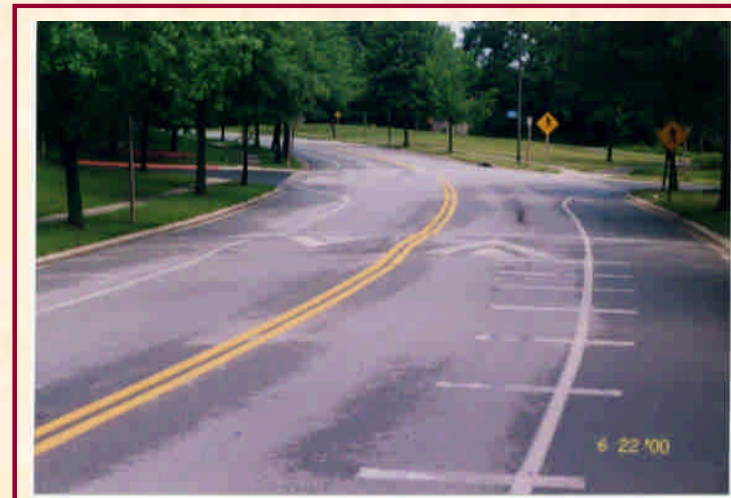
SPEED HUMP

Advantages:

- Slows traffic; Minimum maintenance; Minimal impact on snow removal

Disadvantages:

- Increases emergency response times; Need to be carefully designed





ITE Speed Hump Guidelines

- Streets classified as “local”
- No more than 2 travel lanes or 40 foot pavement width
- Horizontal curve of 300 foot radius or more
- Vertical curve with adequate stopping sight distance
- Grade of 8 percent or less
- Posted speed limit of 30 mph or less
- No more than 5 percent long wheel-base vehicles
- Not on primary emergency response route or bus route
- Majority of residents support

Four Different Rises

TRAFFIC CALMING SAMPLES

SINUSOIDAL

CIRCULAR

PARABOLIC

FLAT-TOPPED



Prefabricated Speed Hump

Features:

- conform to traffic calming safety standards and specifications outlined by the Institute of Transportation Engineers (ITE)
- Available in 7', 14' and 21' lengths and customizable to any road width
- easy installation and removal
- comparable in price to permanent speed humps (7'L x 24" W = approx. \$2500 + shipping)



Other Prefabricated Solutions:

speed tables
speed bumps
speed cushions
traffic circles



TRAFFIC CALMING SAMPLES

Serving As Raised Crosswalks





Serving as Raised Crosswalks in Conjunction with Medians

King Farm – Montgomery County, MD

TRAFFIC CALMING SAMPLES



Reduce Speed/Slow Traffic



CHOKERS

Advantages:

- Pedestrian crossing distance reduced; Narrowed road may contribute to speed reduction; Breaks up drivers' line-of-sight

Disadvantages:

- May create hazard for bicyclists



SPEED MONITORING TRAILER

Advantages:

- Educational tool; Good public relations; Effective for temporary speed reduction needs

Disadvantages:

- Some motorists may try to register a high speed; Duration of effectiveness may be limited; Not self enforcing

Mitigate/Reduce Cut-Through Traffic

TRAFFIC CIRCLE

Advantages:

- Slows traffic as it drives around circle; Breaks up sight-lines on straight streets; Opportunity for landscaping

Disadvantages:

- Definition of right-of-way is contrary to “yield to the vehicle on the right” rule; May impede emergency response; May impede left turns by large vehicles; Bikes must merge with traffic around circle

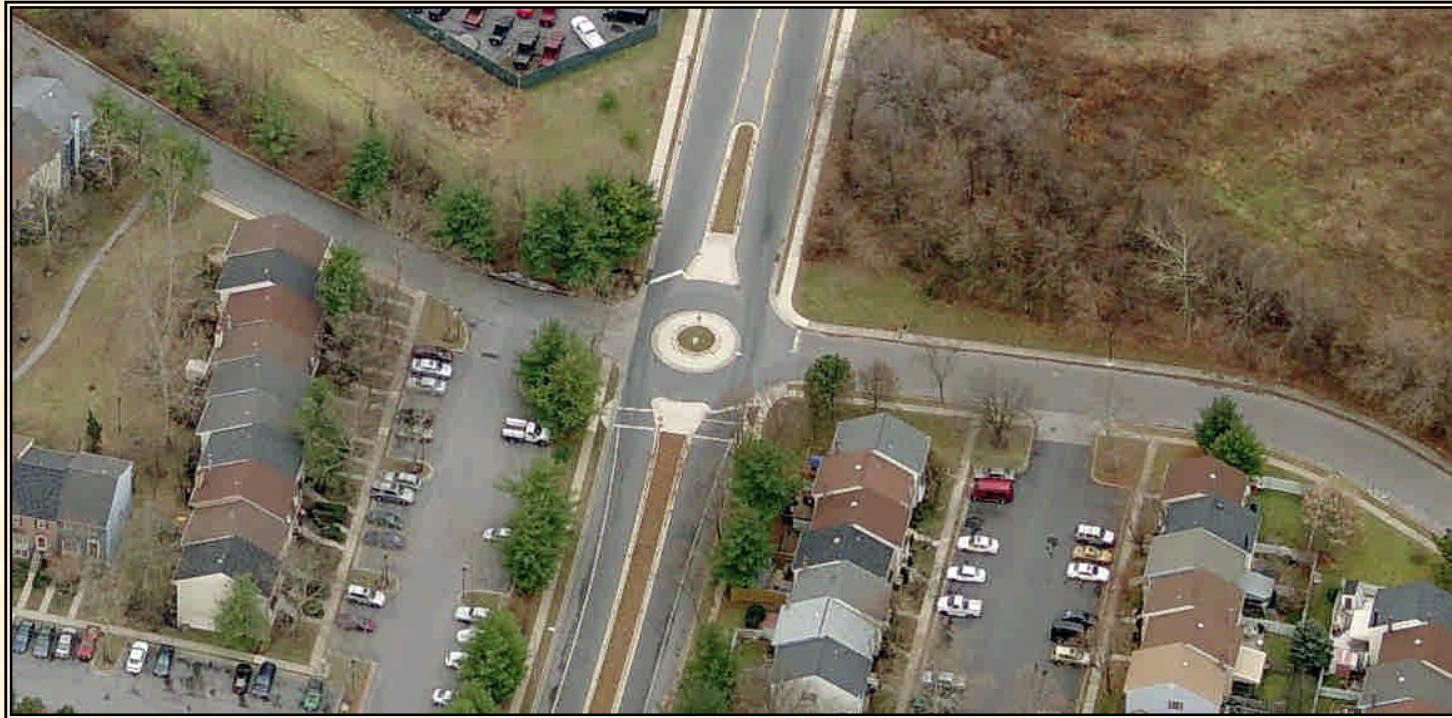




Traffic Circles

Lord Baltimore Drive

TRAFFIC CALMING SAMPLES





Traffic Circles

King's Contrivance – Shaker Drive



One-Lane Chokers

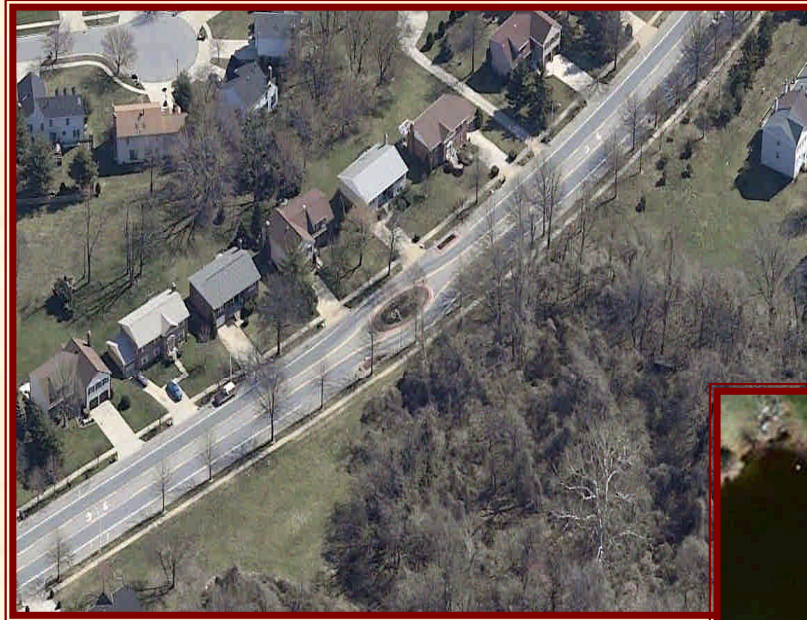




TRAFFIC CALMING SAMPLES

Two-Lane Chokers

Lake Arbor Way



Gateway Treatments



A Break for Pedestrians

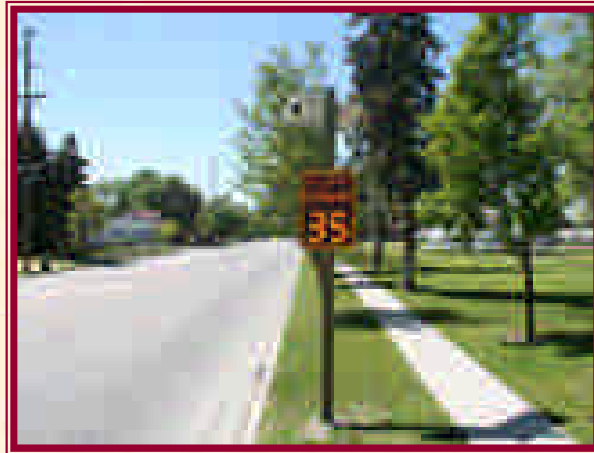
TRAFFIC CALMING SAMPLES





Radar Speed Signs

Radar Speed Signs display the speed of oncoming vehicles using highly visible LEDs to make motorists aware when they are driving at unsafe speeds.



Proven to slow traffic down and ideal for use on local roads or in school zones!



COST:

Direct Power Signs: start at \$4500 each (include everything needed to install and run on direct power)

Solar Power Signs: will add not less than \$1800 per sign and will be more depending on how much daily sunlight is available in the area.



What is the Process?

- **IDENTIFY** *the Stakeholders*
- **DESIGN** *the decision-making process*
- **DEFINE AND PRIORITIZE** *the problems*
- **IDENTIFY** *desired outcomes*
- **REVIEW** *alternatives*
- **DESIGN** *the plan*
- **IMPLEMENT** *the plan*
- **EVALUATE** *the results*



Implementing a Pilot Project

. Try Putting it to the Test!

COMMUNITY INVOLVEMENT

1. Identify pilot neighborhood

2. Meet with stakeholders to define problem(s)

3. Collect Data

6. Stakeholders and elected officials approve plan

5. Develop a neighborhood plan

4. Meet with stakeholders to review options

7. Implement Plan

8. Evaluate Results

9. Review the overall process





Prevalence of Selected Measures in 153 Cities and Counties
(ITE Survey)

<i>MEASURE</i>	<i>NUMBER OF JURISDICTIONS</i>
SPEED HUMPS	79
DIVERTERS/CLOSURES	67
TRAFFIC CIRCLES	46
CHOKERS	35
ENGINEERING MEASURES (any kind)	110

Source: *Traffic Calming State of the Practice*, R. Ewing, ITE, 1999, p.7.



Traffic Before and After Speed Humps and After Closure

Royal Highlands,
(San Diego, CA)

SURVEYS, STUDIES & DATA

Source: Traffic Engineering Division, City of San Diego, CA

	<u>VEHICLES PER DAY</u>		
	Before Speed Humps	After Speed Humps	After Street Closure
Armour Street	525	350	280
Caledonia Street	215	240	210
Dellwood Street	1,065	1,260	370
Kirkcaldy Street	1,350	820	260
Lochlomond Street	140	180	90
<i>Total Traffic Within Neighborhood</i>	3,295	2,850	1,210
% Change in Total Traffic	base	-14%	-63%
Change in Speeds	36 - 38 mph	25 - 27 mph	-----
Spacing (General)	-----	200 ft. - 600 ft.	-----

Source: *Traffic Calming State of the Practice*, R. Ewing, ITE, 1999, p. 19.



Recommended Residential Street Widths **(Paved Surface)**

	ASCE NAHB ULI	Bucks County, PA	Orange County, FL	Recommended for Florida
Locals	22-24' (access streets)	16-26' (access streets, depending on lot widths)	18' (0-300 average daily traffic volume)	18' (access streets with parking on only one side or in parking bays)
	26-28' (subcollectors)	20-36' (subcollectors, depending on lot widths and on-street parking policies)	20' (301-800 average daily traffic volume)	26' (subcollectors with a striped parking lane on one side)
Collectors	24-36' (minimum applies to streets with no fronting residences)	20-24' (depending on average daily traffic -- no provision for on-street parking)	24' (1,201-1,500 average daily traffic volume)	28' (with extra- wide curb lanes)
			36' (1,501-3,500 average daily traffic volume)	30' (with striped bike lanes on both sides)
				34-36' (with striped parking lanes on both sides)

Source: R. Ewing, Best Development Practices -- Doing the Right Thing and Making Money at the Same Time, American Planning Association (in cooperation with the Urban Land Institute, Chicago, IL, 1996, p. 70).

Source: Land Development, The National Association of Home Builders, Fall, 1996, p. 8.



Design Speeds of Traffic Calming Devices

DEVICE	DESIGN SPEED
SPEED HUMP (standard Watts design)	15 - 20 mph
SPEED TABLE (long flat-topped hump)	25 - 30 mph
ROUNABOUT/CIRCLE (25-foot diameter island)	20 - 25 mph
CHICANE (90-foot radii)	20 - 25 mph
CHICANE with SPEED TABLE	15 - 20 mph
NARROWING (two-lane)	30 - 35 mph
NARROWING with SPEED TABLE	20 - 25 mph
NARROWING (single-lane angled)	12 - 15 mph
RAISED JUNCTION	12 - 15 mph

Source: R. Ewing, Best Development Practices -- Doing the Right Thing and Making Money at the Same Time, *American Planning Association* (in cooperation with the Urban Land Institute, Chicago, IL, 1996, p. 70)

Source: *Land Development*, The National Association of Home Builders, Fall, 1996, p. 9.



Average Annual Crash Frequencies at 11 U.S. Intersections Converted to Roundabouts

<u>Type of Roundabout</u>	<u>PERCENT CHANGE</u>			
	SITES	TOTAL	INJURY	PDO
Single-Lane	8	-51%	-73%	-32%
Multi-Lane	3	-29%	-31%	-10%
TOTAL	11	-37%	-51%	-29%

Source: Jacquemart, G. *Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States*. National Cooperative Highway Research Program. Washington, D.C.: National Academy Press, 1998.

Source: *Roundabouts: An Informational Guide*, U.S. Department of Transportation, Federal Highway Administration.



Sample Cost Estimates for Individual Calming Measures

MEASURE	PORTLAND, OR - \$ (1997)
Speed Humps	\$2,000 - \$2,500
Speed Tables	\$2,500
Raised Intersections	\$12,500
Traffic Circles	\$10,000 - \$15,000
Chicanes	\$14,000
Chokers	\$7,000 - \$10,000
Center Islands	\$8,000 - \$15,000
Median Barriers	\$10,000 - \$20,000
Half Closures	\$40,000
Diagonal Diverters	\$85,000
Full Closures	\$120,000

Sources: Staffs of the respective traffic calming programs-1997 - 1998

Source: *Traffic Calming State of Practice*, R. Ewing, ITE, 1999, p. 58.