

Traffic Calming Measures

CE 453 Lecture 41

Principal sources:

www.trafficcalming.org

<http://www.trans.ci.portland.or.us/trafficcalming/default.htm>

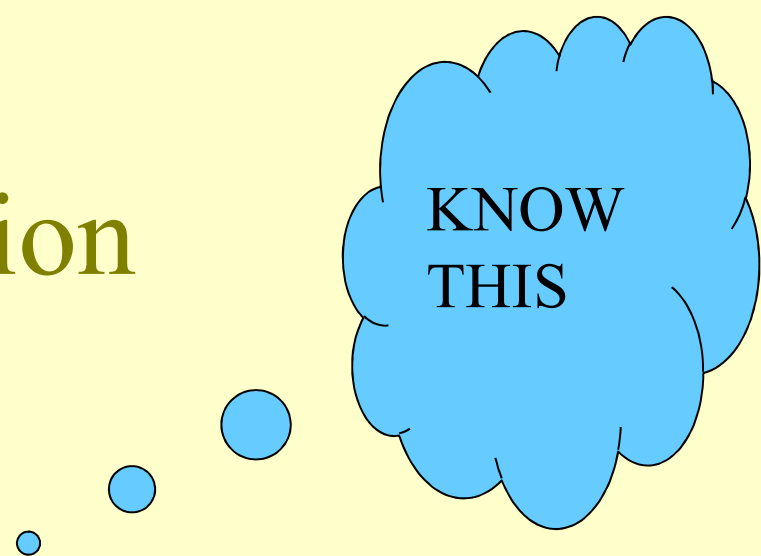
See: <http://www.io.com/~bumper/ada.htm> for anti-traffic calming page

See: <http://www.bayarea.com/mld/mercurynews/news/local/3320291.htm>

Class Objectives

- What are “Traffic Calming” techniques ?
- Are they effective ?
- What do they look like ?
- Are they compatible with other residential interests and issues ?

Definition



KNOW
THIS

Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users.

Citizen Demand YOU

“Do Something”

- Speed and number of cars
- Emergency services
- School zones
- Parks and recreational facilities
- etc

Improves Livability

- Donald Appleyard, “*Livable Streets*”
- Environmental capacity is
 - 500-800 vpd
 - 85% percentile speed 15-20 m.p.h.

The Goal Is

- Finding the balance between
 - The need to slow traffic on residential streets
 - Increase neighborhood safety and livability
 - And, providing prompt emergency **services**



The Concerns Are

- Vehicle speeds
- Travel / response time
- Visibility of devices
- Aesthetics
- Maintenance practices



In a Portland study, residents stated that they considered solving traffic problems more important than maintaining the current level of emergency response!!

- Over 700 traffic circles have been installed in Seattle since 1973.



www.ci.seattle.wa.us/td/ntcp rept.asp

- Many traffic circles involve the surrounding neighborhoods by adding “neighborhood logos” or plaques recognizing donors



www.ci.seattle.wa.us/td/ntcp rept.asp



Figure 7.7. "Worst Thing that Ever Happened." (Charlotte, NC)

Table 7.1. Emergency Service Department Positions on Traffic Calming.

Community	Fire and Emergency Medical Service Departments	Police Department
Austin, TX	Escalated its opposition to traffic calming—agreed to 2 years of new hump installations	In favor of humps—receptive to other measures as yet untested
Bellevue, WA	Negotiating new emergency routes with limitations on measures permitted on each route—oppose use of humps and circles on slopes where emergency vehicles have trouble accelerating	Supportive generally—humps and other self-enforcing measures reduce manpower needs
Berkeley, CA	Forced moratorium on humps until program could be fully evaluated—evaluation ongoing—oppose diverters to lesser extent than humps	No stated position or neutral
Boulder, CO	Forced virtual moratorium on physical measures—opposed to humps, circles, and "anything else that is effective"—experimenting instead with emergency-response-neutral measures	No stated position or neutral
Charlotte, NC	Concerned about humps on collectors—fire chief publicly neutral despite opposition from firefighters	No stated position or neutral
Dayton, OH	Publicly neutral due to a supportive city administration—prefer circles to humps	Supportive generally—instrumental in street closures to fight crime

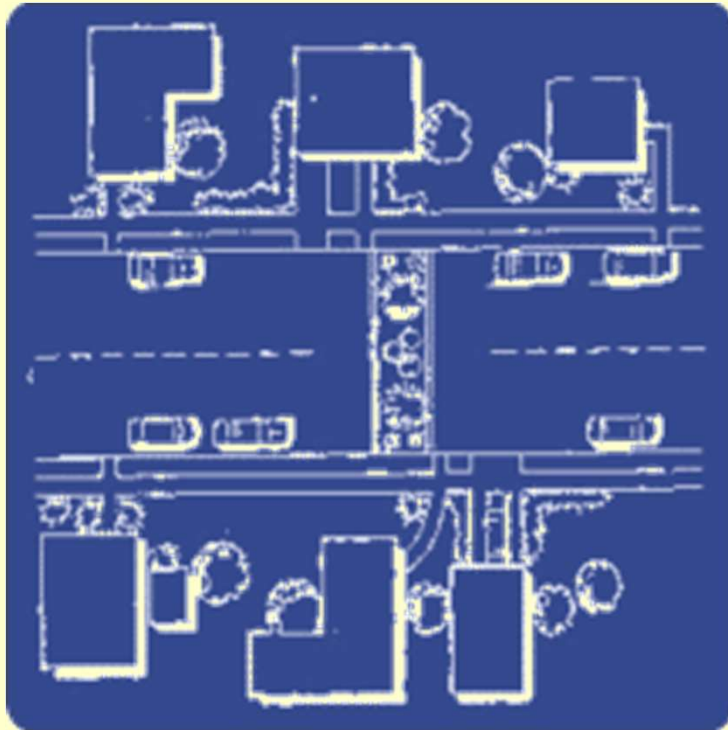


Figure 7.8. Former Speed Table Location on Edgewood Drive.

(Boulder, CO)

... IN AN EFFORT TO ACCOMODATE THE NEEDS OF EMERGENCY SERVICES SPEED HUMPS, ARE NO LONGER INSTALLED IN THE CITY OF AUSTIN.

Volume Control Measures



Full Closures

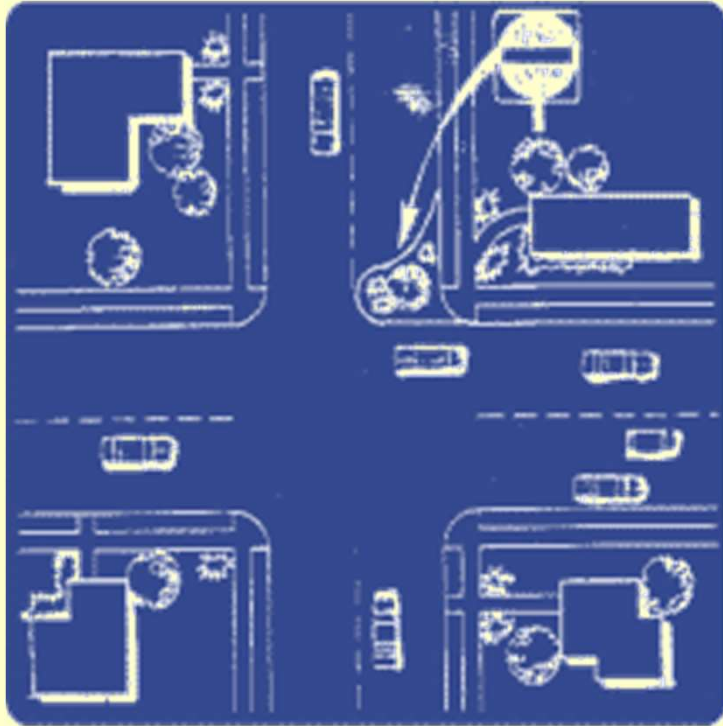
a.k.a. cul-de-sacs, dead ends

Full street closures are barriers placed across a street to completely close the street to through-traffic, usually leaving only sidewalks open.

Cost Estimate: \$120,000 (Seattle, WA)



Gainesville, FL



Half-Closures

a.k.a. partial closures, one-way closures

Half closures are barriers that block travel in one direction for a short distance on otherwise two-way streets.

Cost Estimates: \$40,000 (Portland, OR)
\$35,000 (Seattle, WA)
\$20,500 (Austin, TX)



Phoenix, AZ

Half-Closures

ADVANTAGES:

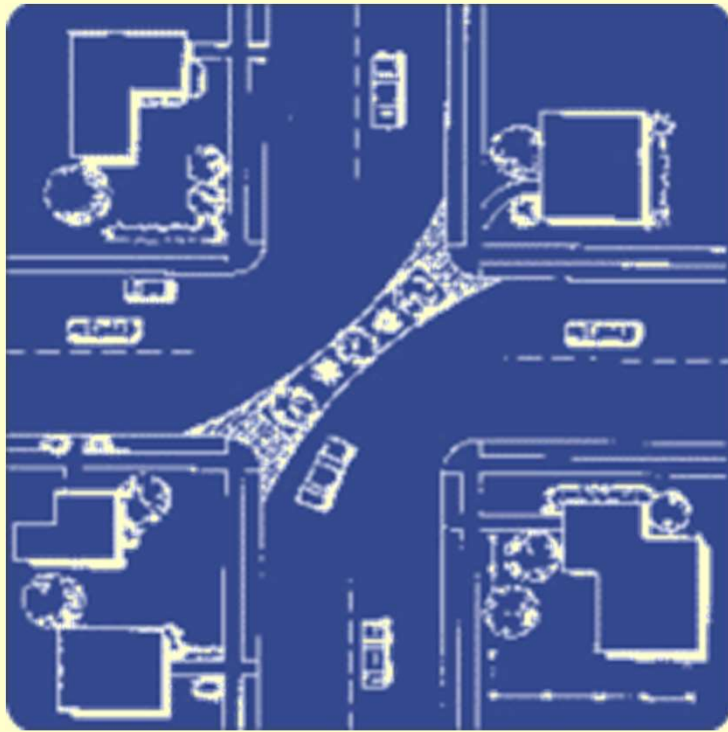
- Restricts movements into a street while maintaining access and movement within the street block for residents.
- Reduces cut-through traffic.
- More self-enforcing and aesthetically pleasing than turn restriction signing.
- Reduces crossing distances for pedestrians.
- Aesthetically pleasing.
- In emergency situations, emergency vehicles can travel in the restricted direction.

DISADVANTAGES:

- May divert traffic to parallel streets without traffic calming measures.
- May increase trip length for some residents.
- Curbside parking must be prohibited adjacent to the device.
- May increase emergency response time as they maneuver around the semi-diverter.
- Maintenance responsibility.

OTHER CONSIDERATIONS:

- Bicycles are typically permitted to travel through a semi-diverter in both directions, including the restricted direction.



Diagonal Diverters

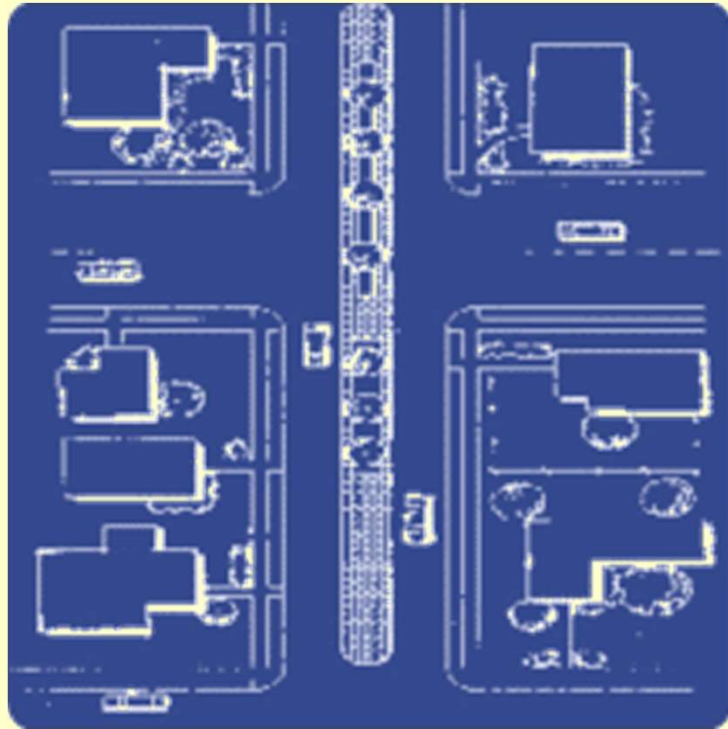
a.k.a. full diverters, diagonal road closures

Diagonal diverters are barriers placed diagonally across an intersection, blocking through movement.

Cost Estimate: \$85,000 (Seattle, WA)



Seattle WA



Median Barriers

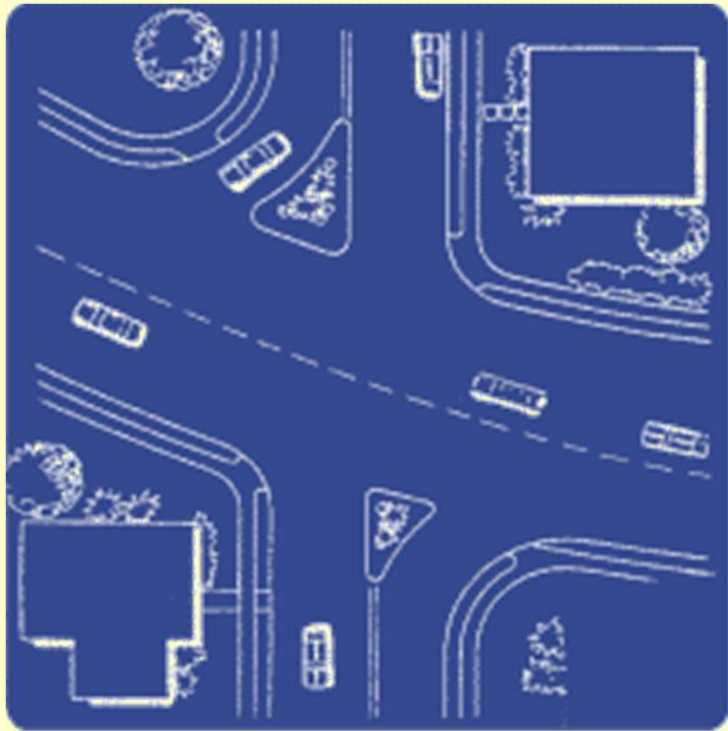
a.k.a. median diverters, island diverters

Median barriers are islands located along the centerline of a street and continuing through an intersection so as to block through movement at a cross street.

Cost Estimate: \$10,000 - \$20,000 (Portland, OR)



Montgomery County, MD



Forced Turn Islands

*a.k.a. forced turn
channelizations, pork chops, right
turn islands*

Forced turn islands are islands on approaches to an intersection that block certain movements.



Orlando, FL

OTHER VOLUME CONTROL MEASURES



Star Diverter
Seattle, WA



One Way - Two Way
Boulder, CO

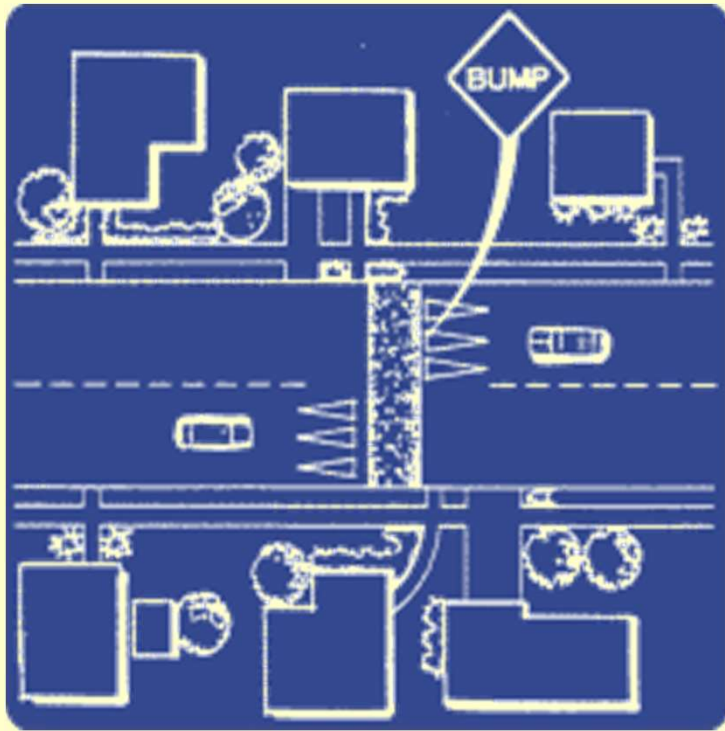


Truncated Diagonal Diverter
Seattle, WA



One Way - Two Way
Montgomery County, MD

Speed Control Measures



Speed Humps

a.k.a. road humps, undulations

Speed humps are rounded raised areas placed across the road.

Cost Estimates:

\$2000-2500 (Portland, OR)
\$2000 (Sarasota, FL)
\$2000 (Seattle, WA)
\$6800 (Austin, TX)



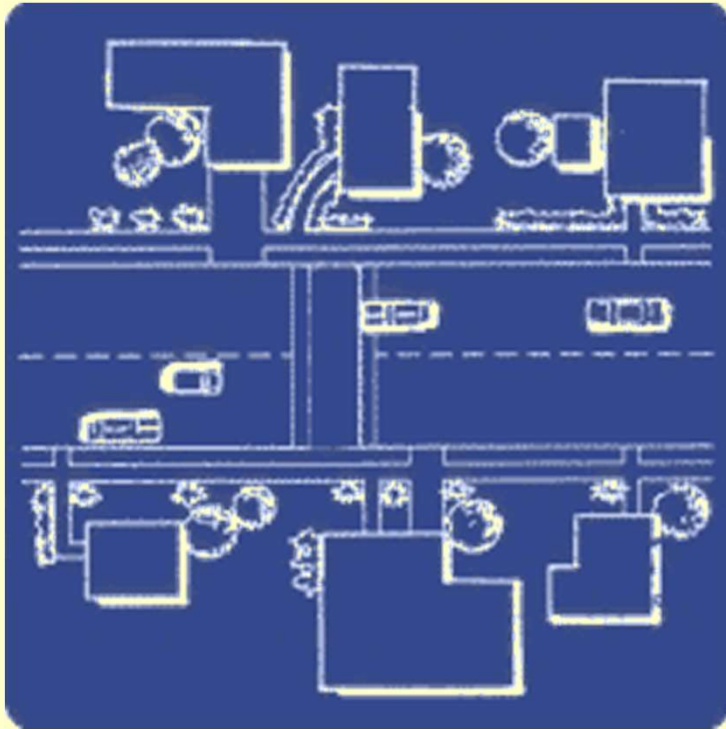
Speed Humps

ADVANTAGES:

- Reduces vehicle speed. More effective if used in a series at 300' to 500' spacing or in conjunction with other traffic calming devices.
- Can reduce vehicular volumes.
- No restrictions to on-street parking.
- Requires minimum maintenance.

DISADVANTAGES:

- May divert traffic to parallel streets that do not have traffic calming measures.
- Increases emergency response times.
- Not esthetically pleasing.



Speed Tables

a.k.a. trapezoidal humps, speed platforms

Speed tables are flat-topped speed humps often constructed with a brick or other textured materials on the flat section.

Cost Estimate: \$2,500 per speed table



40 → 37 mph, 13,000 → 10,300 vpd



**Figure 2. Typical Speed Table
(Traffic Calming for Communities, 2001)**

Table 1. Jurisdiction Speed Hump Placement Guidelines*

Jurisdiction	Guideline
Fairfax, Virginia	200' from an intersection
Thousand Oaks, California	50' to 200' from intersections, STOP signs, and "tight turns"
	5' to 10' from driveways
Fort Worth, Texas	300' from traffic signals, STOP signs, or YIELD signs
	75' from uncontrolled intersections
Pennsylvania DOT	Prohibited on horizontal curves with radius less than 300'
	Prohibited on grades greater than 8%
	150' from unsignalized intersections
	250' from signalized intersections
Gwinnet County, Georgia	Prohibited on grades greater than 8%
	100' to 200' from STOP signs or "small" geometric curvatures

Sources: Urban et al., 1999; Pennsylvania DOT, 2001; Clement, 2001; Vazquez, 2000; City of Fairfax, 2001.

Table 2. Spacing Values Currently Used in Speed Hump Installations*

Jurisdiction	Spacing (ft)
Fairfax, Virginia	No less than 500
Kuna, Idaho	600 minimum
Thousand Oaks, California	150 to 400
Fort Worth, Texas	300 to 1600
Pennsylvania DOT	250 to 600
Atlanta, Georgia	200 to 700
Cobb County, Georgia	300 to 500
Gwinnett County, Georgia	350 to 500
San Antonio, Texas	300 to 890
Seattle, Washington	326 to 553
Austin, Texas	300 to 500
Bellevue, Washington	200 to 300
Berkeley, California	150 to 400
Boulder, Colorado	150 to 800
Howard County, Maryland	400 to 600
Montgomery County, Maryland	400 to 600
Phoenix, Arizona	No more than 500
Portland, Oregon	300 to 600

* Sources: Ewing, 1999; Urban et al., 1999; Pennsylvania DOT, 2001; Clement, 2001; Vazquez, 2000; City of Fairfax, 2001; Marek and Walgren, 1998; Ballard, 1998; Szplett and Fuess, 1999; City of Austin, 2001.

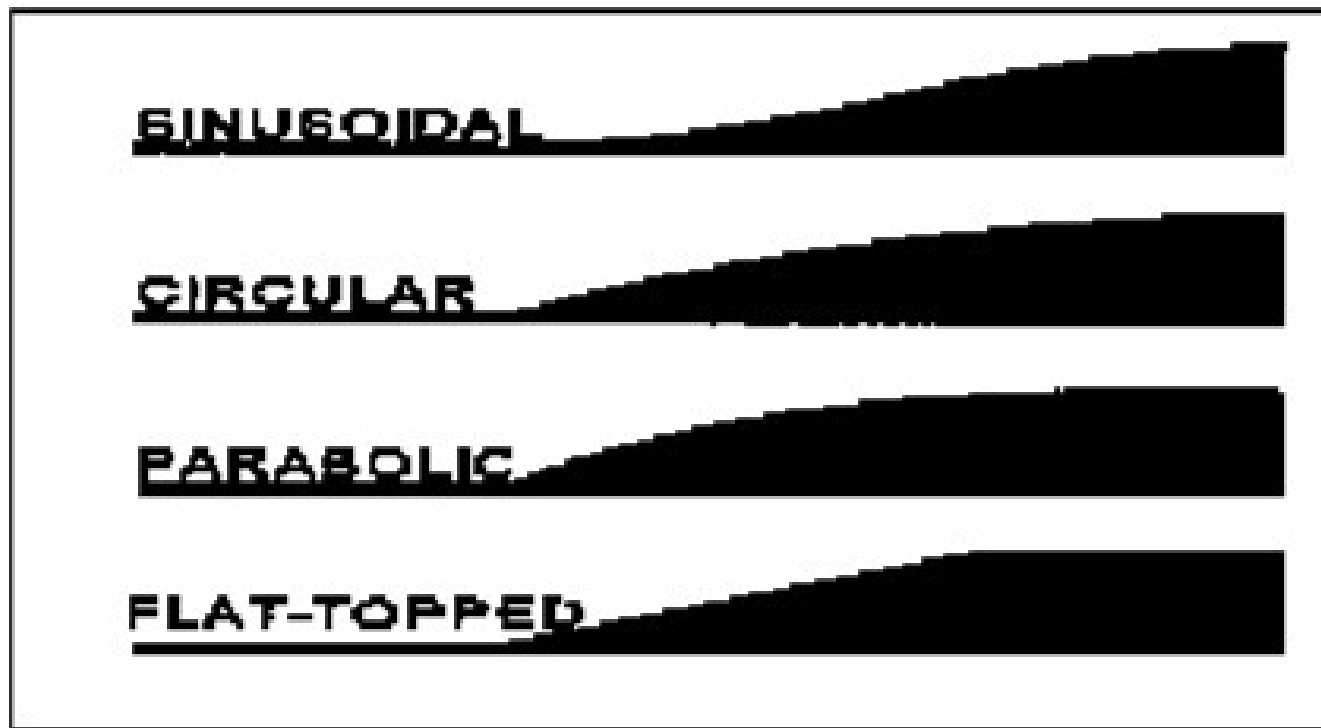


Figure 3. Commonly Used Speed Hump Profiles (Ewing, 1999)



Table 3. Advantages and Disadvantages of Speed Humps/Tables

Advantages	Disadvantages
Speed reduction Volume reduction Accident frequency reduction Accident severity reduction Crime reduction	Emergency response delays Traffic diversion Liability concerns Aesthetics Snow removal/maintenance difficulty Noise

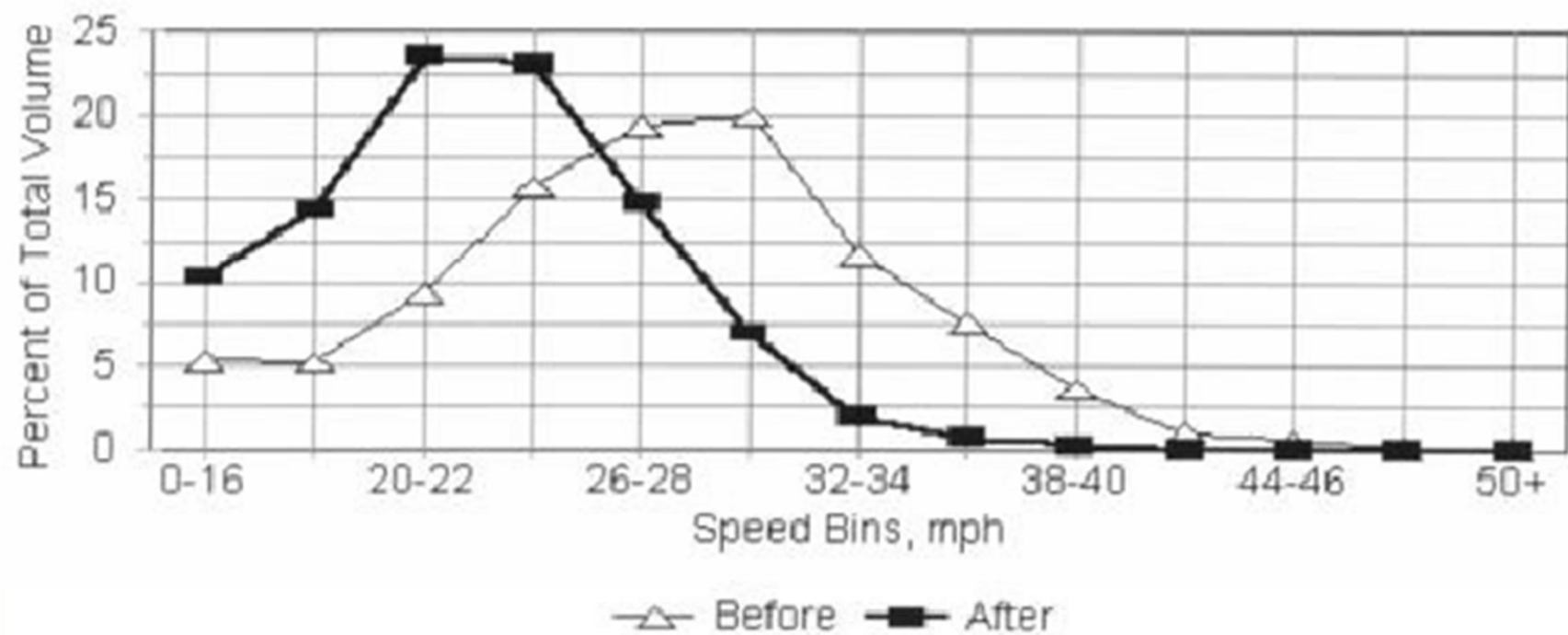
Table 4. Speed Hump/Table Design and Emergency Response Time*

Jurisdiction	Speed Hump/Table Design	Delay per Hump/Table (Seconds)
Portland, Oregon	14' humps	1.0 to 9.4
	22' tables	0.0 to 9.2
Austin, Texas	12' humps	2.3 to 9.7
Montgomery County, Maryland	12' humps	2.8 to 7.3
Sarasota, Florida	12' humps	4.7
Boulder, Colorado	12' humps	2.8 to 6.0

*Sources: Ewing, 1999; Knapp, 2000; Transportation Association of Canada, 1998; Atkins and Coleman, 1997; Montgomery County Fire and Rescue Commission, 1997; Gutschick, 1998.

Table 5. Changes in 85th Percentile Speed*

Jurisdiction	Design	Before (mph)	After (mph)	Difference (mph)	Change (%)
Austin, Texas**	12' humps	36 to 40	26 to 31	-5 to -12	-14 to -32
	22' tables	35 to 40	28 to 31	-6 to -9	-17 to -24
Bellevue, Washington**	12' humps	33 to 39	25 to 27	-6 to -12	-18 to -31
	22' tables	34 to 35	29 to 31	-3 to -6	-9 to -17
Berkeley, California**	12' humps	25 to 36	20 to 28	-3 to -11	-12 to -34
	22' tables	31	25	-6	-19
Boulder, Colorado**	12' humps	28 to 31	25	-3 to -8	-11 to -24
Charlotte, North Carolina**	22' tables	31 to 40	27 to 37	0 to -9	0 to -23
Dayton, Ohio**	12' humps	32 to 34	25 to 32	0 to -9	0 to -26
Eugene, Oregon**	14' humps	32 to 34	27	-5 to -7	-16 to -21
Ft. Lauderdale, Florida**	12' humps	35	25	-10	-29
	22' tables	36 to 38	29 to 33	-4 to -9	-11 to -24
Gwinnett County, Georgia**	22' tables	35 to 47	26 to 34	-6 to -14	-15 to -32
Howard County, Maryland**	12' humps	38 to 40	28	-10 to -12	-26 to -30
	22' tables	35 to 43	28 to 36	0 to -14	0 to -33
Montgomery County, Maryland**	12' humps	32 to 43	25 to 34	-3 to -12	-9 to -30
	22' tables	33 to 40	29 to 34	-1 to -8	-3 to -22
Omaha, Nebraska**	12' humps	34 to 45	27 to 37	0 to -11	0 to -27
San Diego, California* *	12' humps	34 to 38	25 to 30	-6 to -13	-17 to -34
San Jose, California**	12' humps	32 to 36	20 to 26	-10 to -13	-28 to -39
Sarasota, Florida**	12' humps	29 to 35	21 to 28	-5 to -9	-17 to -27
	22' tables	42	25	-17	-41



**Figure 12. Portland 14-Foot Speed Hump Speed Distribution
(Kittelson and Associates, Inc., 2000)**

Table 8. Results of Resident Survey on Speed Humps/Tables*

Jurisdiction	Response Rate	Favor	Disfavor	No Opinion
San Antonio, Texas	40%	75%	21%	4%
Omaha, Nebraska	56%	82%	18%	0%
Iowa City, Iowa	63%	68%	32%	0%

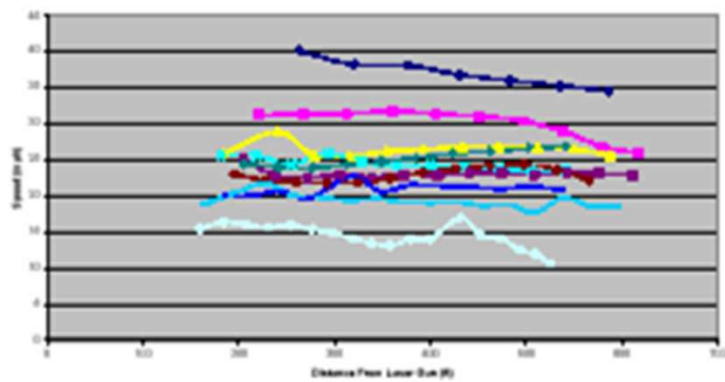
* Sources: Ballard, 1998; Ripley and Klingaman, 1998; Gorman et al., 1989.



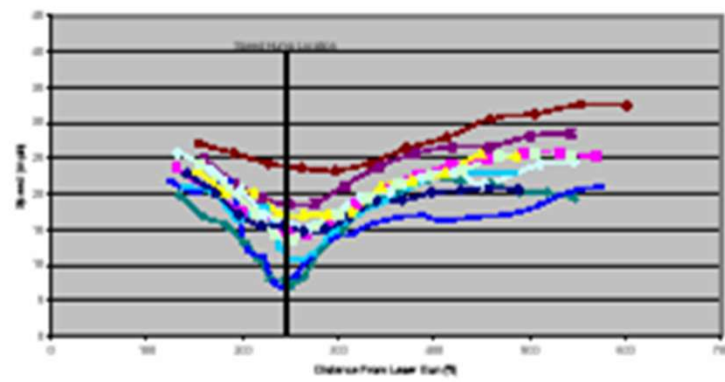
**Figure 17. 14-Foot Temporary 25 mph Speed Hump
(City of Portland, 2001)**



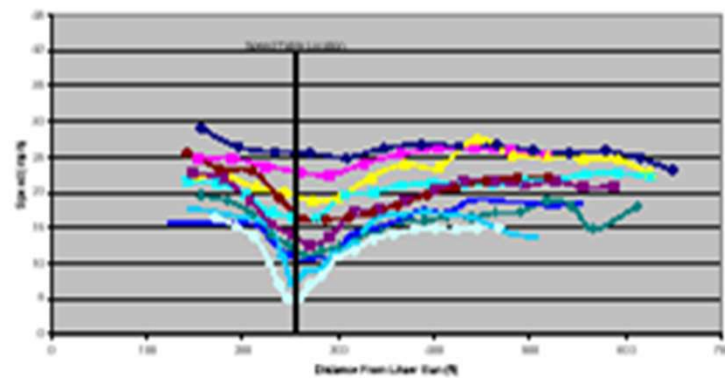
Figure 18. 18-Foot Temporary 30 mph Speed Table



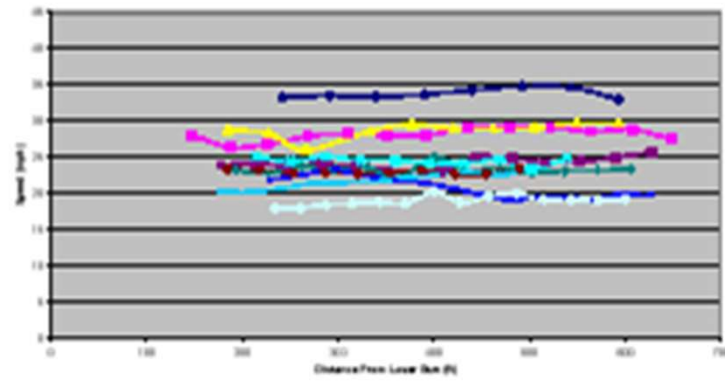
(a) Before



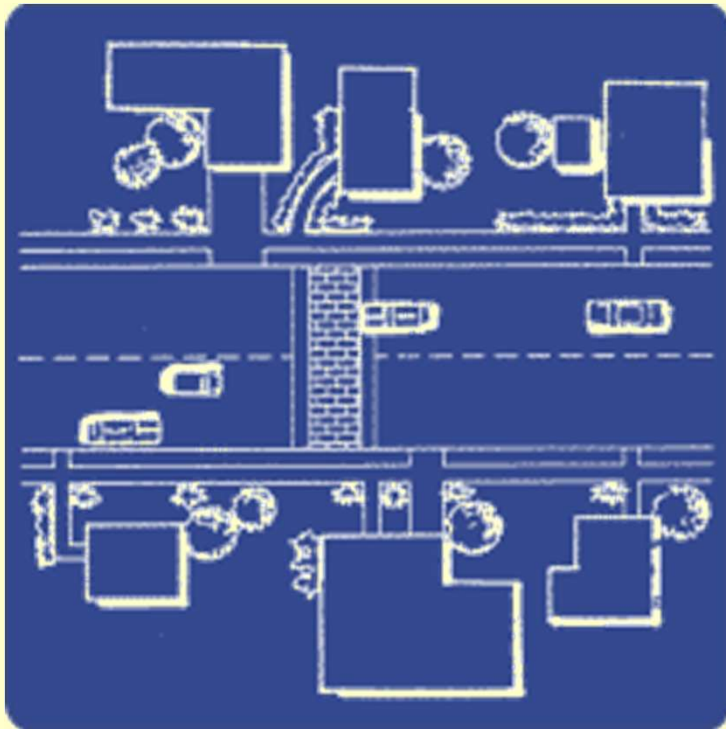
(b) Speed Hump



(c) Speed Table



(d) After



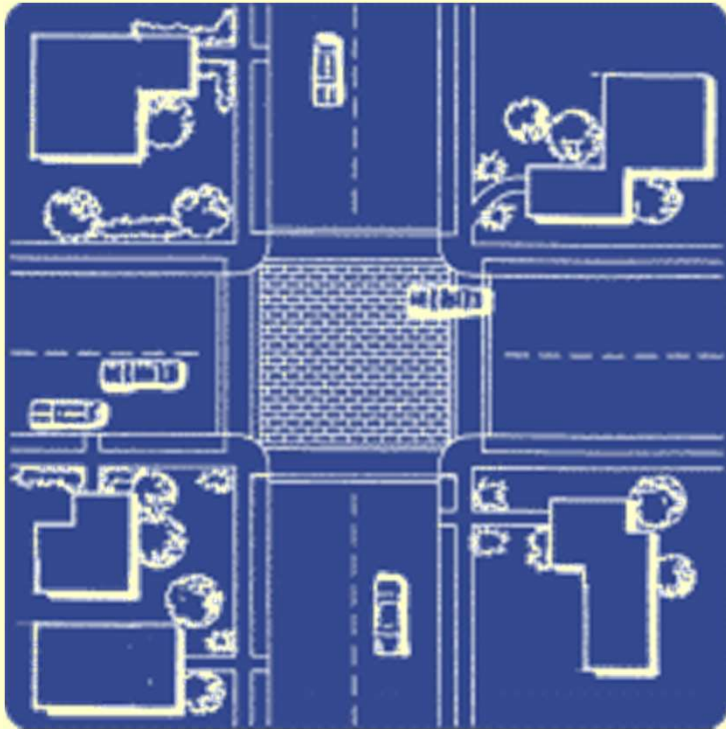
Raised Crosswalks

a.k.a. raised crossings, sidewalk extensions

Raised Crosswalks are speed tables outfitted with crosswalk markings and signage to channelize pedestrian crossings, providing pedestrians with a level street crossing.



Tallahassee, FL



Raised Intersections

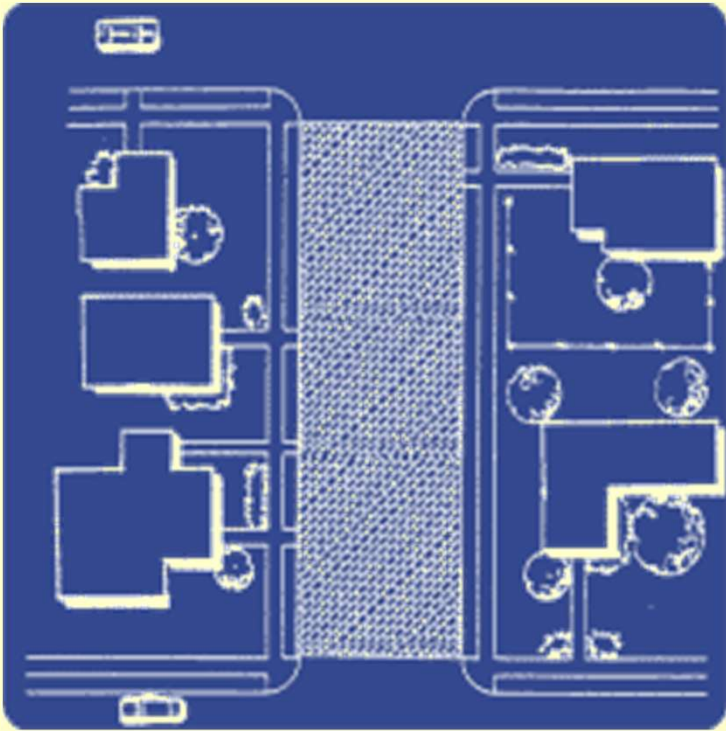
a.k.a. raised junctions, intersection humps, plateaus

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



Cost Estimate: \$12,500 (Sarasota, FL)

37 → 35 mph, volumes not available

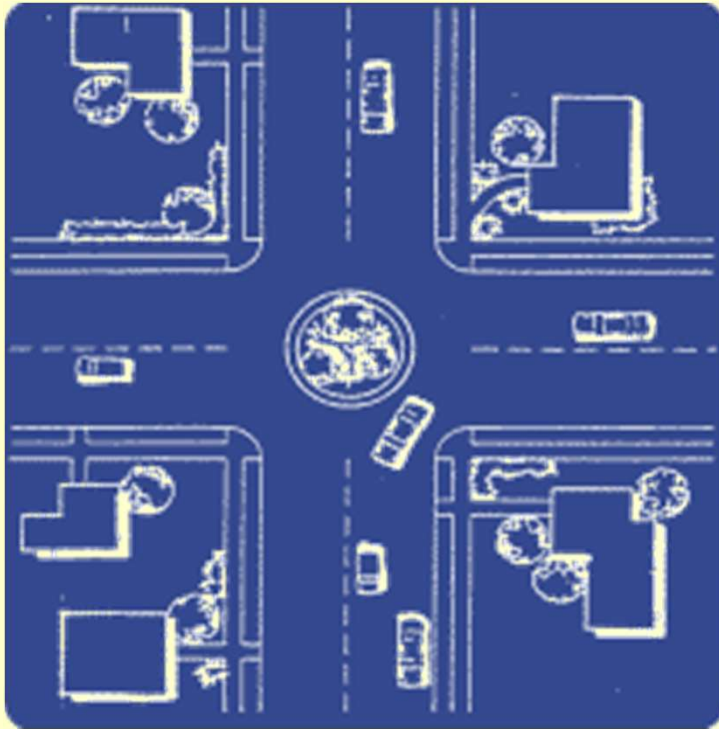


Textured Pavements

Textured Pavements, such as brick or stone surfaces, cause drivers to have a slightly bumpy ride over an extended distance, while improving the aesthetic quality of the street environment.



Seattle, WA



Traffic Circles

a.k.a. rotaries, intersection islands

Traffic circles are islands, placed in intersections, around which traffic circulates.



Cost Estimates:

\$10-15,000 (Portland, OR)
\$3,500 (Sarasota, FL)
\$6,000 (Seattle, WA)
\$ 20,000 (Berkeley)
\$3,000 to \$15,000 (San Francisco);



25 → 23 mph, 561 → 583 vpd

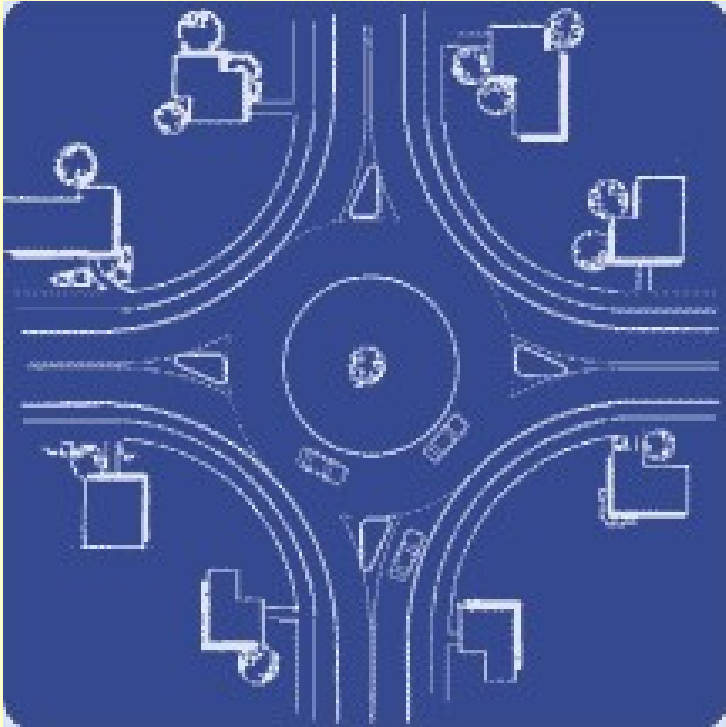
Traffic Circles

ADVANTAGES:

- Reduces vehicle speed.
- Reduces vehicle conflicts at intersection.
- Provides equal access to intersection for all drivers.
- Does not restrict access to residents.
- When landscaped, traffic circles improve the appearance of a street.

DISADVANTAGES:

- A minimum of 40 feet of curbside parking must be prohibited at each corner of the intersection.
- May increase emergency response time. The construction of a mountable curb minimizes the impact to emergency vehicles.
- Can restrict access for large trucks and longer buses, and may require that these vehicles turn left in clockwise direction (in front of the circle, rather than around the circle).
- Maintenance responsibility, if landscaped.
- Requires additional traffic control signs (8-16 signs) and pavement markings.
- May increase conflicts with cyclist and pedestrians.
- May divert traffic to parallel streets.



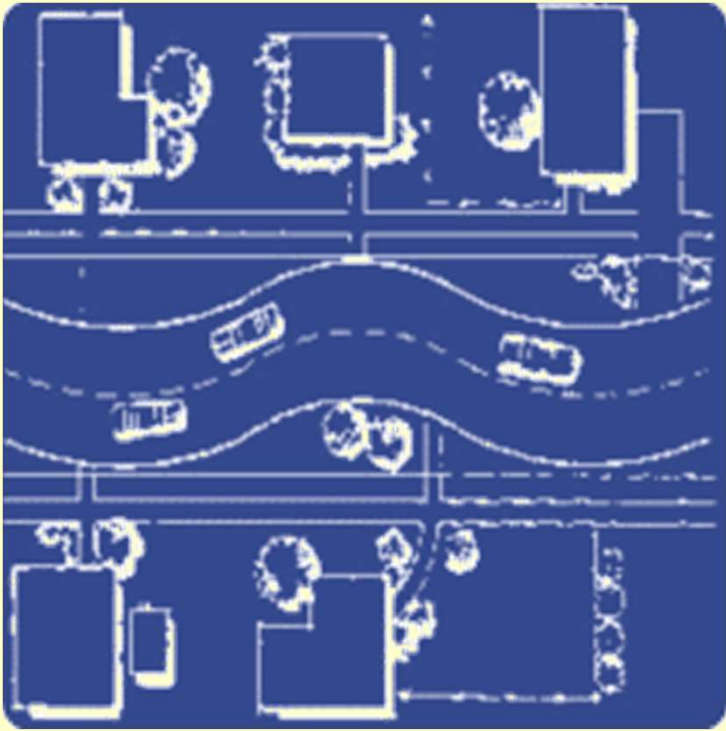
Roundabouts

a.k.a. rotaries

Roundabouts require traffic to circulate counterclockwise around a center island. Unlike traffic circles, roundabouts are used on higher volume streets to allocate rights-of-way among competing movements.



Tallahassee, FL



Chicanes

a.k.a. deviations, serpentines, reversing curves, twists

Chicanes are curb extensions or islands that alternate from one side of the street to the other, forming S-shaped curves.

Cost Estimates: \$14,000 (Sarasota, FL)
\$22,500 - \$37,000 (Austin, TX)



Alachua, FL

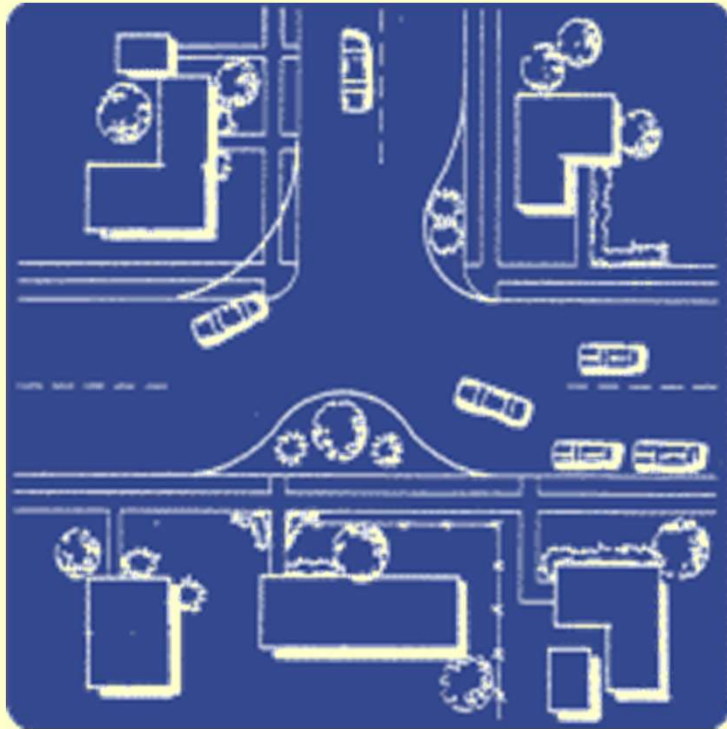
Chicanes

ADVANTAGES:

- Reduces speed.
- Does not restrict access to residents.
- Minimal impact to emergency vehicles.
- Reduces crossing distance for pedestrians.
- Can be aesthetically pleasing, if landscaped.

DISADVANTAGES:

- Curbside parking must be prohibited.
- Maintenance responsibility, if landscaped.
- May divert traffic to parallel streets.
- May increase conflicts with cyclists and pedestrians.



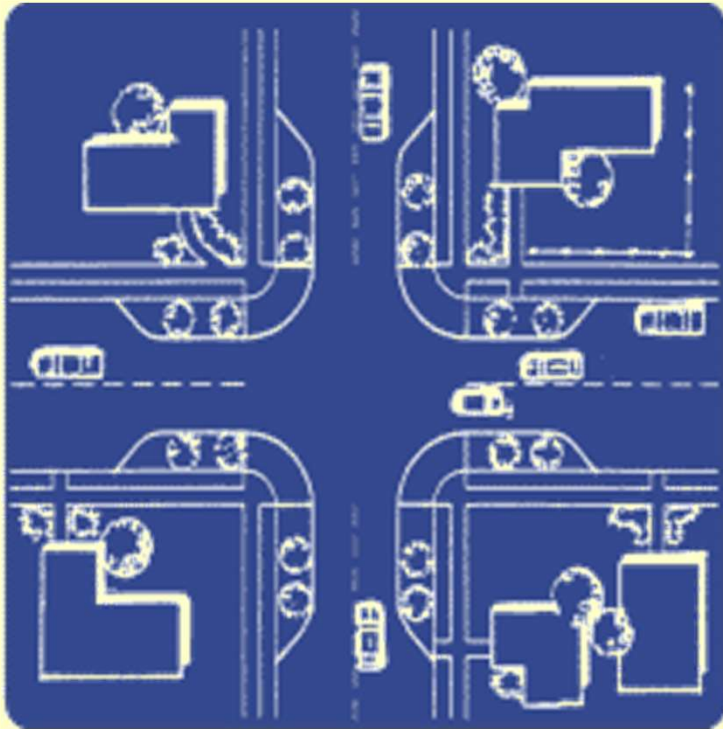
Realigned Intersections

a.k.a. modified intersections

Realigned intersections are changes in alignment that convert T-intersections with straight approaches into curving streets meeting at right angles - a straight shot along the top of the T becomes a turning movement.



Seattle, WA



Neckdowns

a.k.a. nubs, bulbouts, knuckles, intersection narrowings, corner bulges, safe crosses

Neckdowns are curb extensions at intersections that reduce roadway width curb-to-curb.

Cost Estimate: \$16,500 (Austin, TX)



Cambridge, MA

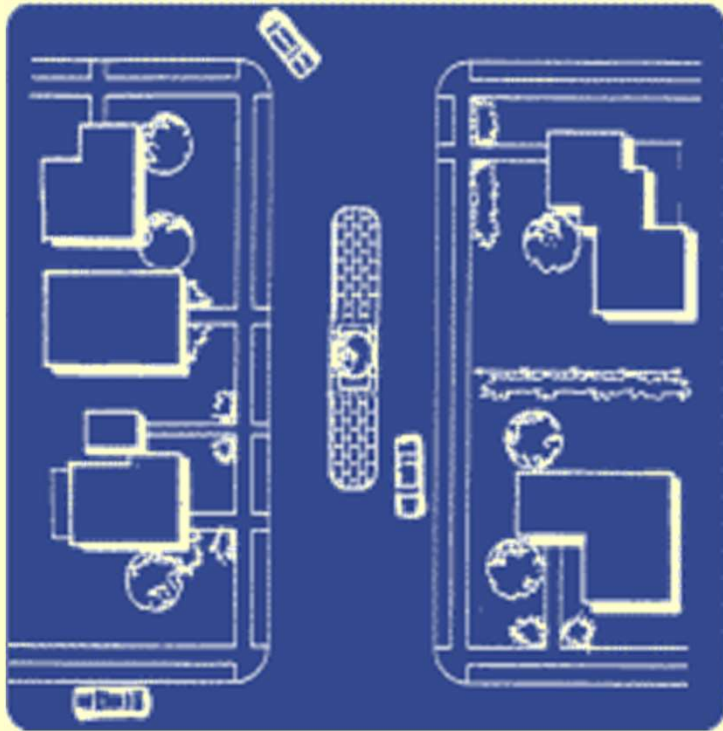
Neckdowns

ADVANTAGES:

- Reduces crossing distance for pedestrians.
- May reduce cut-through traffic.
- Does not restrict access to residents.
- Minimal impact to emergency vehicles.
- Can be aesthetically pleasing, if landscaped.

DISADVANTAGES:

- Curbside parking must be prohibited to adjacent residents.
- Low impact to mid-block speeding.
- Maintenance responsibility, if landscaped.



Center Island Narrowings

a.k.a. midblock medians, median slowpoints, median chokers

Center island narrowings are islands located along the centerline of a street that narrow the street at that location.

Cost Estimates:

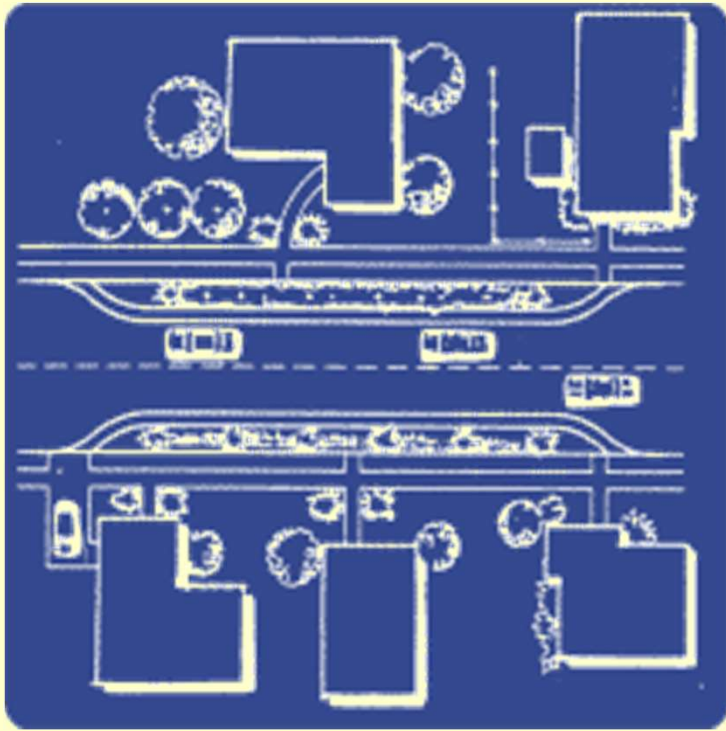
\$8,000-15,000
(Portland, OR)

\$60 per linear foot
(Berkeley);

\$5,000 (Sarasota, FL)



Montgomery County, MD



Chokers

a.k.a. pinch points, midblock narrowings, midblock yield points, constrictions

Chokers are curb extensions or islands on one or both sides of the street that narrow the street at that location.

Cost Estimate: \$7,000-10,000
(Portland, OR)



Montgomery County, MD

OTHER SPEED MEASURES



Intersection Jiggle Bumps. (Dayton, OH)

- Jiggle bumps
- Angle points
- Lateral shifts



Midblock Deflector Island. (Eugene, OR)



Median Choker. (San Jose, CA)



Angle Point. (Bellevue, WA)



Lateral Shift. (West Palm Beach, FL)



Split Median. (Portland, OR)

- Deflector islands
- Median chokers
- Split medians



31 → 28 mph, 770 → 331 vpd

Figure 5.11. One-Lane Angled Slow Point. (128th Ave. NE—Bellevue, WA)



Half Circle
Williamsburg, VA

COMBINED MEASURES

- Speed Hump with Choker
- Diverter-Closure
- Center Island with Neckdown
- Raised Intersection with Neckdown
- Center Island with Chokers
- Center Island with Tables
- Raised Crosswalk with Choker
- Center Island with Humps

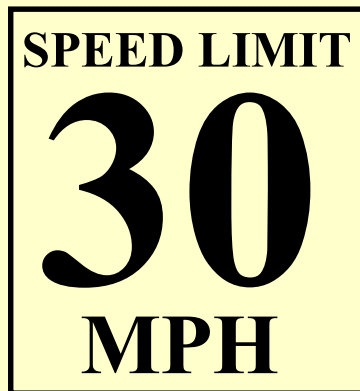


34→ 30 mph, 1,500→ 1,390 vpd

**Figure 5.14. Chicanes/22-foot Speed Tables.
(Huntington Pkwy.—Montgomery County, MD)**

Effectiveness ...





**Speed Impacts of Traffic Calming Measures
(standard deviations in parentheses)**

	Sample Size	85th Percentile Speed Afterward	Average Change in 85th Percentile Speed	Average % Change
12' Humps	179	27.4 mph (4.0 mph)	-7.6 mph (3.5 mph)	-22% (9%)
14' Humps	15	25.6 (2.1)	-7.7 (2.1 mph)	-23 (6)
22' Tables	58	30.1 (2.7)	-6.6 (3.2)	-18 (8)
Longer Tables	10	31.6 (2.8)	-3.2 (2.4)	-9 (7)
Raised Intersections	3	34.3 (6.0)	-0.3 (3.8)	-1 (10)
Circles	45	30.2 (4.3)	-3.9 (3.2)	-11 (10)
Narrowings	7	32.3 (2.8)	-2.6 (5.5)	-4 (22)
One-Lane Slow Points	5	28.6 (3.1)	-4.8 (1.3)	-14 (4)
Half Closures	16	26.3 (5.2)	-6.0 (3.6)	-19 (11)
Diagonal Diverters	7	27.9 (5.2)	-1.4 (4.7)	-0 (17)

AADT AADT AADT

Volume Impacts of Traffic Calming Measures (standard deviations in parentheses)

	Sample Size	Average Change in Volume	Average % Change
<u>One-Lane Slow Points</u>	5	-392 vehicles per day (384 vehicles per day)	-20% (19%)
<u>Full Closures</u>	19	-671 (786)	-44 (36)
<u>Half Closures</u>	53	-1611 (2444)	-42 (41)
<u>Diagonal Diverters</u>	27	-501 (622)	-35 (46)
<u>Other Volume Controls</u>	10	-1167 (1781)	-31 (36)

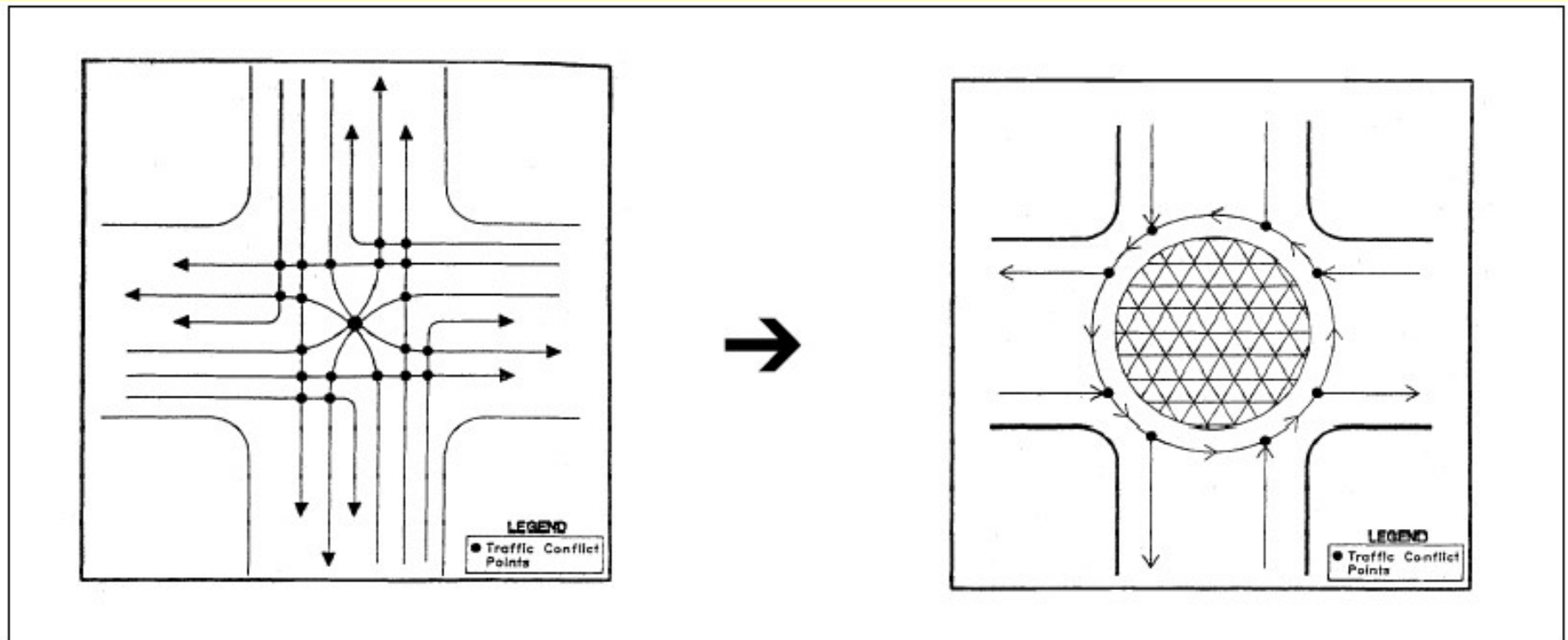


Figure 5.29. Potential Conflicts Reduced by Traffic Circles.

Source: H. Stein et al., "Portland's Successful Experience with Traffic Circles," in *1992 Compendium of Technical Papers*, Institute of Transportation Engineers, Washington, DC, 1992, pp. 39-44.

Safety Impacts of Traffic Calming Measures (U.S. Experience)

	Number of Observations	Average Number of Collisions		% Change in Collisions
		Before Treatment	After Treatment	
12' Humps	49	2.7	2.4	-11%
14' Humps	5	4.4	2.6	-41%
22' Tables	8	6.7	3.7	-45%
Circles (w/o Seattle)	17	5.9	4.2	-29%
Circles (w/ Seattle)	130	2.2	0.6	-73%
All Measures				
w/o adjustments	192	2.6	1.3	-50%*
w/ adjustments	42	3.8	3.0	-21%**

* Significant at 0.001 probability level.

** Significant at 0.04 probability level.



SAFE COMMUNITIES

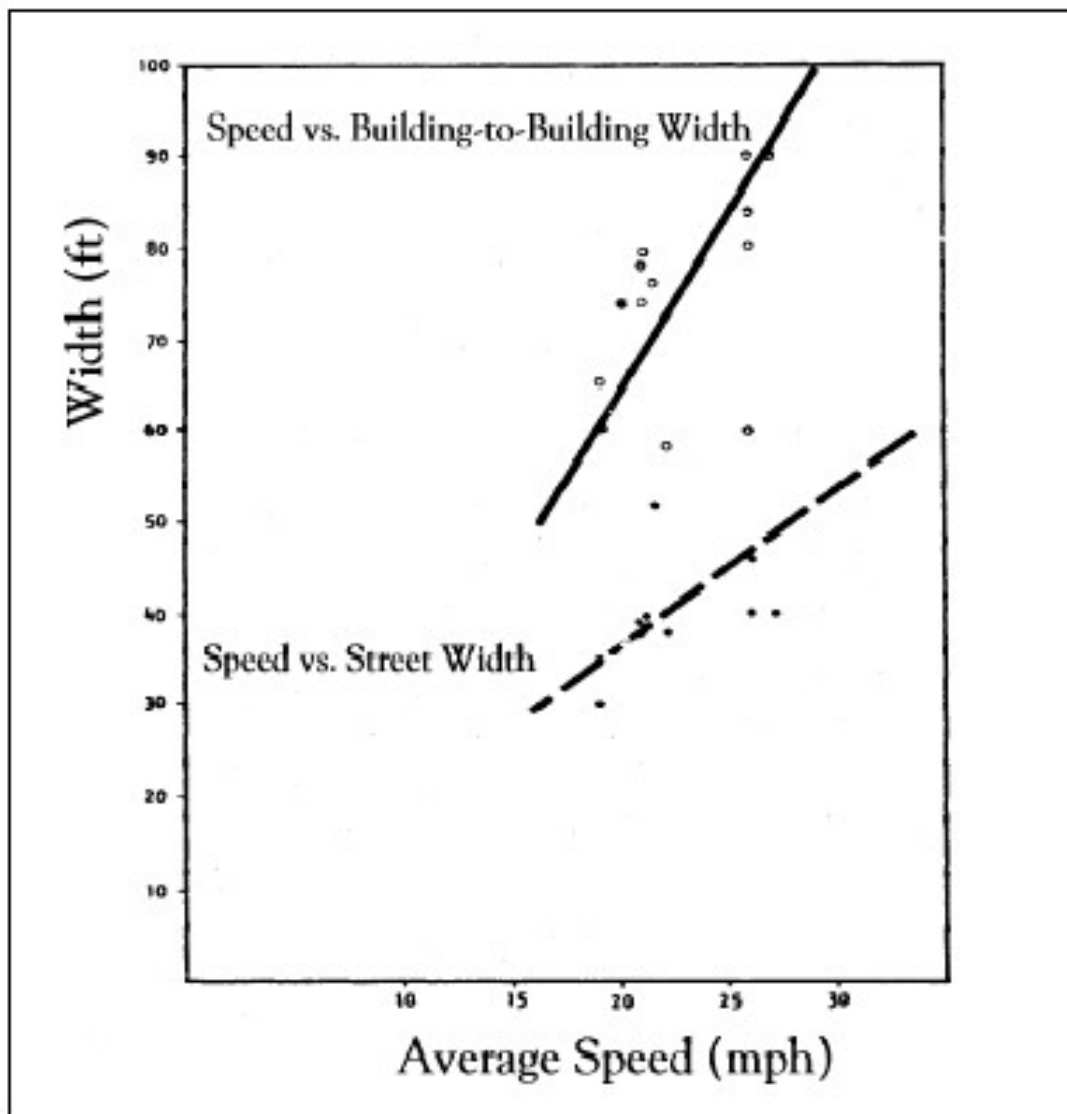


Figure 5.51. Speed versus Pavement Width and Pavement Width Plus Setbacks.

Source: D.T. Smith and D. Appleyard, *Improving the Residential Street Environment—Final Report*, Federal Highway Administration, Washington, DC, 1981, p. 127.

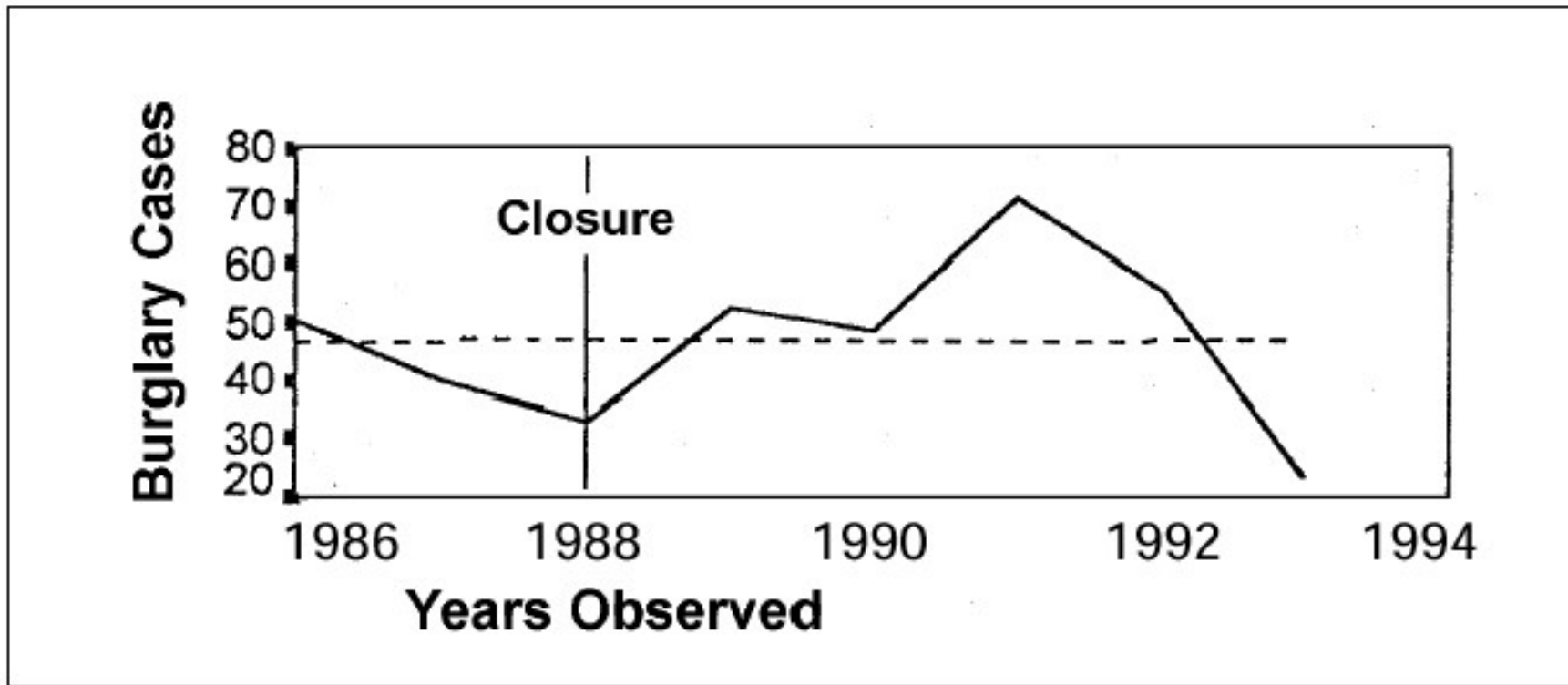


Figure 5.32. Burglaries in the Riverside Park Neighborhood—Before and After Closures. (Ft. Lauderdale, FL)



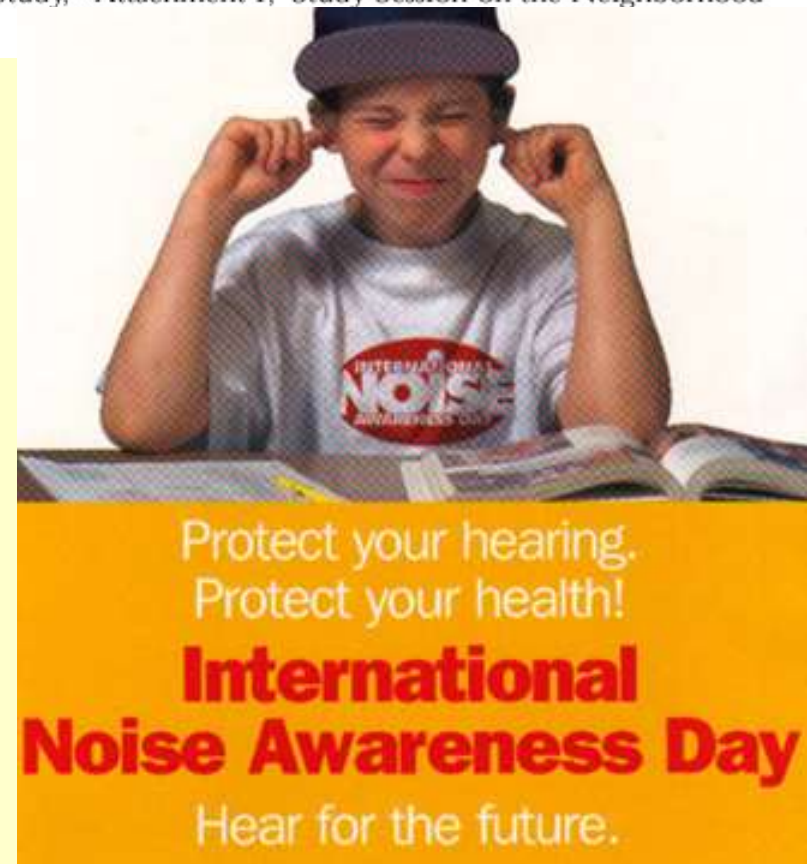
It's Not Just
A Job
It's the NYPD
212-RECRUIT



Table 5.10. Traffic Noise Levels Near an Uncontrolled Intersection, 4-Way Stop, Traffic Circle, and Raised Intersection. (Boulder, CO)

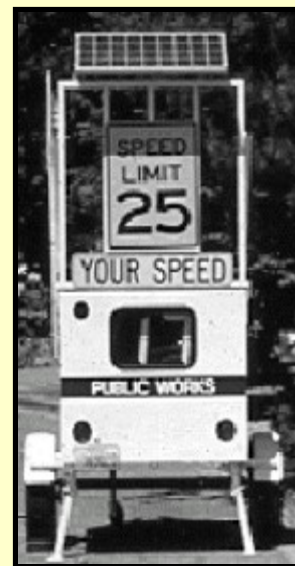
Location	Measure	Usual Level (decibels)	Peak Level (decibels)
17th and Balsam	None	68–69	72
13th and Balsam	4-way stop	66–67	69
14th and Balsam	Traffic circle	60–64	70
Nicholl and Edgewood (extension of Balsam)	Raised crossing	60–62	64

Source: City of Boulder, "Environmental Enforcement Department Sound Study," Attachment F, Study Session on the Neighborhood Traffic Mitigation Program, Boulder City Council, April 8, 1997.



Some Non-Engineered Examples

- Neighborhood traffic safety campaigns
- Neighborhood speed watch
- Speed trailers
- Public safety ad campaigns



A black and white flyer from the City of Kirkland, Washington. The flyer has the city logo and name at the top. The main heading is "NEIGHBORHOOD TRAFFIC SAFETY STARTS WITH YOU!". Below this, it asks "How can you make your neighborhood street safer?" and lists "As a Driver" with several bullet points: "Drive Slower", "Avoid Using Local Streets as Short Cuts", and "Observe All The Rules of The Road (Traffic Laws)". There is also a small illustration of a person walking a dog. The flyer includes text about the legal speed limit on residential streets and the importance of observing traffic laws.

Figure 5.38. Example of a Neighborhood Safety Flyer. (Kirkland, WA)

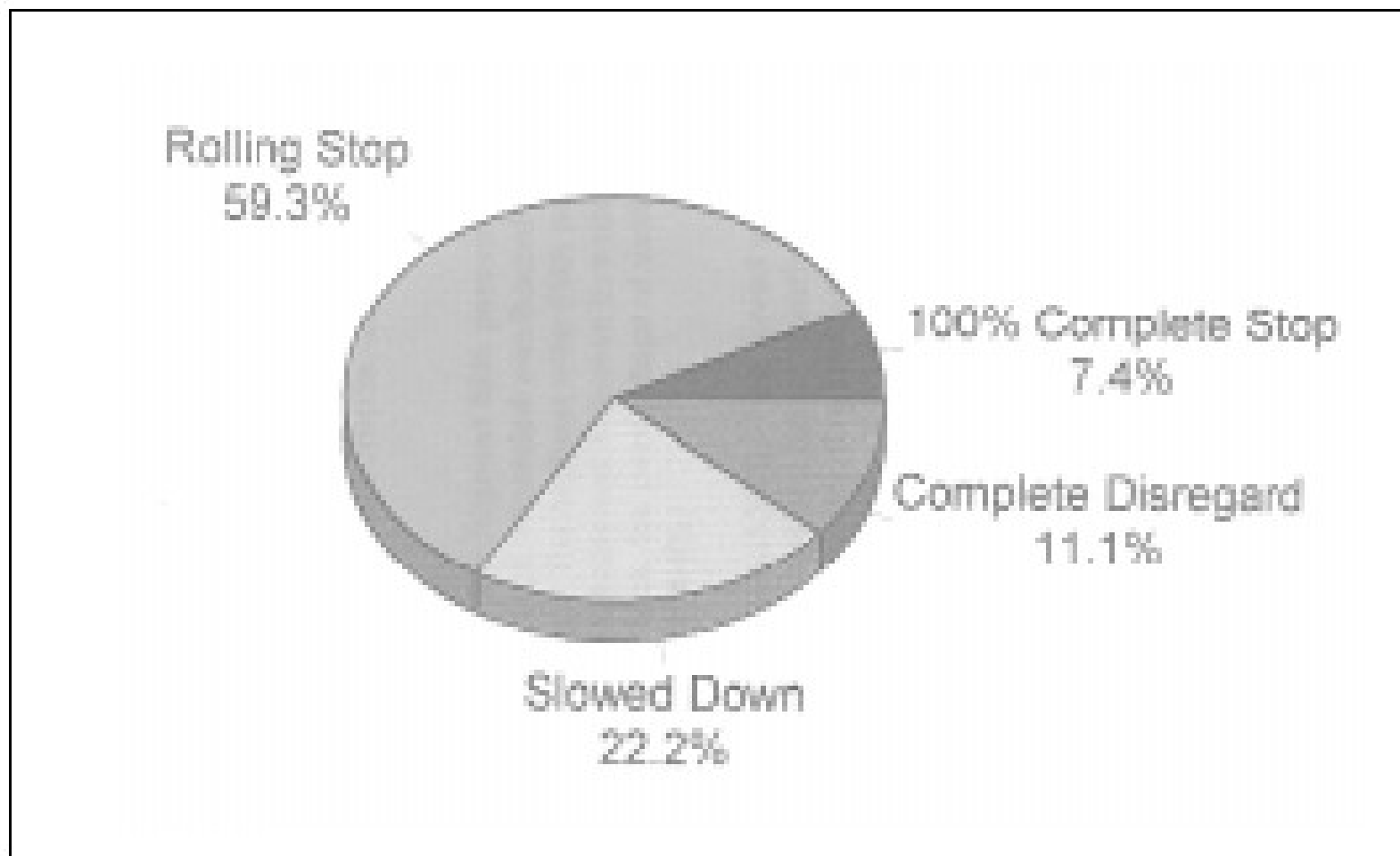


Figure 5.42. Compliance with All-Way Stops. (Gwinnett County, GA)

Source: Department of Transportation, "Brentford Lane—Stop Sign Compliance Study," Gwinnett County, GA, September 1997.

Program Policies (see Iowa City policy)

- Use 3 E's
- Accommodate emergency vehicles
- Direct through traffic to arterials
- Minimize impact on transit
- Enhance alternative transportation modes
- Balance parking needs and parking removal
- Limit re-routing and diversion impact on local streets
- Establish standard project procedures

Public Involvement

- **IS CRITICAL**
- Residents need to feel something is being done “for” them instead of “to” them
- Street is viewed as part of the property
- People become emotional
- Everyone feels strongly that they should have a say in what happens

Liability Issues

- Revolve around
 - Statutory authority
 - Constitutionality
 - Tort liability
- Managing risk
 - Well-designed devices
 - Good signing and markings
 - Well-lighted
 - Process documented

Traffic Calming Tools by Location

Local

1. Curb Extensions
2. Medians
3. Refuge Islands
4. Tree Wells
5. Inset Parking
6. Narrow Lanes
7. Midblock Crossings
8. Curb Radius Reductions
9. Bike Lanes
10. Roundabouts
11. Modified Intersections
12. Median Noses
13. Driveway Modifications
14. Lane Reductions
15. Mini-Circles
16. Speed Tables
17. Raised Intersections
18. Short Medians
19. Medians on Curves
20. Partial Closure
21. Chokers
22. Chicanes
23. Speed Humps

School

1. Curb Extensions
2. Medians
3. Refuge Islands
4. Tree Wells
5. Inset Parking
6. Narrow Lanes
7. Midblock Crossings
8. Curb Radius Reductions
9. Bike Lanes
10. Roundabouts
11. Modified Intersections
12. Median Noses
13. Driveway Modifications
14. Lane Reductions
15. Mini-Circles
16. Speed Tables
17. Raised Intersections
18. Short Medians
19. Medians on Curves
20. Partial Closure
21. Chokers
22. Chicanes
23. Speed Humps

Arterial

1. Curb Extensions
2. Medians
3. Refuge Islands
4. Tree Wells
5. Inset Parking
6. Narrow Lanes
7. Midblock Crossings
8. Curb Radius Reductions
9. Bike Lanes
10. Roundabouts
11. Modified Intersections
12. Median Noses
13. Driveway Modifications
14. Lane Reductions



Traffic Management Device	Traffic Reduction	Speed Reduction	Noise and Pollution	Safety	Traffic Access Restrictions	Emergency Vehicle Access	Maintenance Problems	Level of Violation	Cost
Speed Humps	Possible	Limited	Increase Noise	No Documented Problems	None	Minor Problems	None	Not Applicable	Low
STOP Signs	Unlikely	None	Increase	Unclear	None	No Problems	None	Potentially High	Low
NO LEFT/RIGHT TURN Signs	Yes	None	Decrease	Improved	No Turn(s)	No Problems	Vandalism	Potentially High	Low
One-Way Street	Yes	None	Decrease	Improved	One Direction	One Direction	None	Low	Low
Chokers	Unlikely	Minor	No Change	Improved For Pedestrians	None	No Problems	Trucks Hit Curbs	Not Applicable	Moderate
Traffic Circle	Possible	Likely	No Change	Unclear	None	Some Constraint	Vandalism	Low	Moderate
Median Barrier	Yes	None	Decrease	Improved	Right Turn Only	Minor Constraint	None	Low	Moderate
Forced Turn Channelization	Yes	Possible	Decrease	Improved	Some	Minor Constraint	Vandalism	Potentially High	Moderate
Semi-Divertar	Yes	Likely	Decrease	Improved	One Direction	Minor Constraint	Vandalism	Potentially High	Moderate
Diagonal Divertars	Yes	Likely	Decrease	Improved	Thru Traffic	Some Constraint	Vandalism	Low	Moderate
Cul-de-Sac	Yes	Likely	Decrease	Improved	Total	Some Constraint	Vandalism	Low	High

Source: Street Transportation Division, City of Phoenix, AZ.



Dear State Official:

Thanks for bring this to our attention. I watched and taped the program and found it very interesting. I would like to put in my 2 cents worth on the traffic calming tactics like speed humps. If we put in one or two on a street we will have one every block on that street. When traffic moves to the next block over then we will install them on that street, and so on and so on until the entire city is one big speed hump. If we really look at the percentage of neighborhood speeding compared to the ADT, that percentage is in reality low. I question why those that abide by the traffic laws should be put through the inconvenience of speed humps to TRY to fix a speed problem. It is still my opinion that we are forced to use tactics as these to fix a behavior problem of a few to the detriment of all. As I see it, the State of Iowa needs to take a hard look at the speed problem on every street. I believe they need to look at taking the proper steps to change the behavior of those drivers creating the problem. It is not fair for those drivers who watch their speed closely when driving on any residential street whether in my own neighborhood or one of yours to have to drive over speed humps. We as a society need to suck it up and push for much higher speeding fines in residential neighborhoods or school zones as well have a sliding scale on the speed above the posted limit. We have a law where fines are doubled in work zones, why not in other areas? Speaking as one who worked on the interstate and freeway system in the Des Moines area for 7 years, I understand the need for the law. But as a trained operator I was also educated to keep an eye on traffic traveling through my work zone and to always leave myself an out-I jumped the guard rail more than once. Why do we not use this same concept in residential neighborhoods, where children can dart out into traffic without warning to drivers? It would be a good way to protect our children. I will end by saying it is all about respect for each other, of which there is a huge lack of in our society today, as the comment made in the show demonstrates drivers would be outraged if someone was speeding in their neighborhood but it is ok for them to do it in someone else's neighborhood. As you can tell this is a very sensitive issue for me. Again we are forced to fix speeding issues created by a few to the detriment of all. I thank you for you time.

Director of Public Works, City of xxx

Dear Director of Public Works, City of xxx:

We have one street and one alley in yyy City with speed humps, which were installed under very tight criteria that we have developed. It would be very difficult for the copy-cat phenomenon that you state to occur. I would also add that properly constructed speed humps will have a very mild sensation for a motorist obeying the speed limit, or even going 5 mph over. Once you get 5 mph over the posted speed limit or greater is where the sensation is enough to instinctively cause a motorist to slow down.

I was very hesitant to institute a traffic calming program in yyy City; we were basically forced to do it. Six years later, with the tight criteria we have developed, I am now a believer.

Traffic Engineering Planning. City of yyy

Dear Professor Souleyrette:

For the record I disagree with city xxx and align myself more with yyy City.

State Official

Dear State Official:

Sorry for the late response to you email you sent me awhile back regarding increasing traffic fines and I wanted to respectfully and constructively comment back. I disagree with your comment that our police officers have better things to do than give out speeding tickets. Part of a police officer's job is to enforce the traffic laws. I don't see a difference between a speeding vehicle and a person threatening someone with a loaded gun. Both actions can take lives. And there is by far more problems with speeders than there are people threatening others with guns. As was said at the beginning of the Date Line show, the biggest complaint that comes into the Police Departments is speeding motorists in residential neighborhoods. It is my opinion that higher fines would lessen the workload of our officers, not increase it. I believe it is apparent that our traffic fines as they relate to speeding and other related traffic violations are not stiff enough. How do we teach drivers not to speed? By punishing them when they do speed. And the punishment needs to be severe. I don't understand why society is willing to spend thousands of dollars on the installation of traffic calming devices in neighborhoods at the expense of all taxpayers but are not willing to try a financial traffic-calming device, a high priced speeding ticket, which only affects the violator.

A March 5, 2003 Des Moines Register story, "Budget forces speeders to pay up", discusses the use of speeding tickets to help minimize traffic deaths. The article quoted a representative from the Insurance Institute for Highway Safety who stated "Speeding tickets make the roads safer*". The article also stated that law officers feel that "*nothing else is so effective at getting drivers' attention*".

Our police departments are already out there doing their job. In Clive we set out counters that gather speed/time/traffic count information to help our police department be more efficient in their enforcement efforts and they do a very good job.

We know that a majority of society wants the speeding problem fixed as indicated in the Date Line show, so we look at it with an engineering point of view by designing new physical controls. We spent years making our streets wider to give more visibility and more room to safely and efficiently travel. And now, we want to go back and install controls to narrow our streets and block the visibility of our intersections? We install little traffic circles and bumps or humps that create other hazards that weren't talked about in the Date Line show, again at the expense of the entire community. We haven't even discussed the new ongoing maintenance issues that are created; snow removal, additional signage, paint markings, etc. I would like to point out that in the Date Line show the street where the little boy lost his life was a one-way street with parking on both sides of the street. Did you notice how narrow the street was with cars parked on both sides? How much more traffic calming can you get? And the boy was still hit by a speeding car. I note what one of the witnesses said, "I yelled at him to slow down and he scowled at me and floored it". I believe a speed bump/hump has the same affect. I don't believe it can be considered traffic calming, I believe it heightens road rage. You and I both know that while a speed bump/hump will cause drivers to slow down while they drive over it, they merely drive faster between the bumps/humps. The only change made in the behavior of the speeder is that now he/she speeds down someone else's street. Again, I question the effectiveness of bumps/humps along an entire block. They work no differently than an unwarranted stop sign. The speed hump that was installed on the street in the Date Line show was installed in front of the home where the boy was hit. What about the rest of the street? Residents half a block away aren't getting the benefit of the newly installed control. Are we going to install one in front of their houses? How do you set and justify specific criteria for when and where to use traffic calming devices when the problem is on every street? Also, why can't the law be written so that the communities get a larger percentage of the fines to offset the cost of the physical controls that have to be installed?

Speaking as a taxpayer, which I hate to use the term taxpayer, I do not want those controls in my neighborhood nor do I want to have to pay to have those controls in my neighborhood. I drive accordingly and don't want to be punished for someone else's actions. I want the offender to pay.

We need to look at this problem from an economic standpoint first, not just from an engineering point of view. I believe raising the speeding fines in residential areas and school zones will be an effective control for our police departments.

I would like to thank you for this format to view my thoughts. I'm certainly not directing this at you or anyone else in particular. My main goal is to hopefully begin a different thought process regarding an issue that is very sensitive to all of us and needs to be dealt with.

Again I would like to thank you for your time,

Director of Public Works City of xxx