

Traffic Calming Techniques

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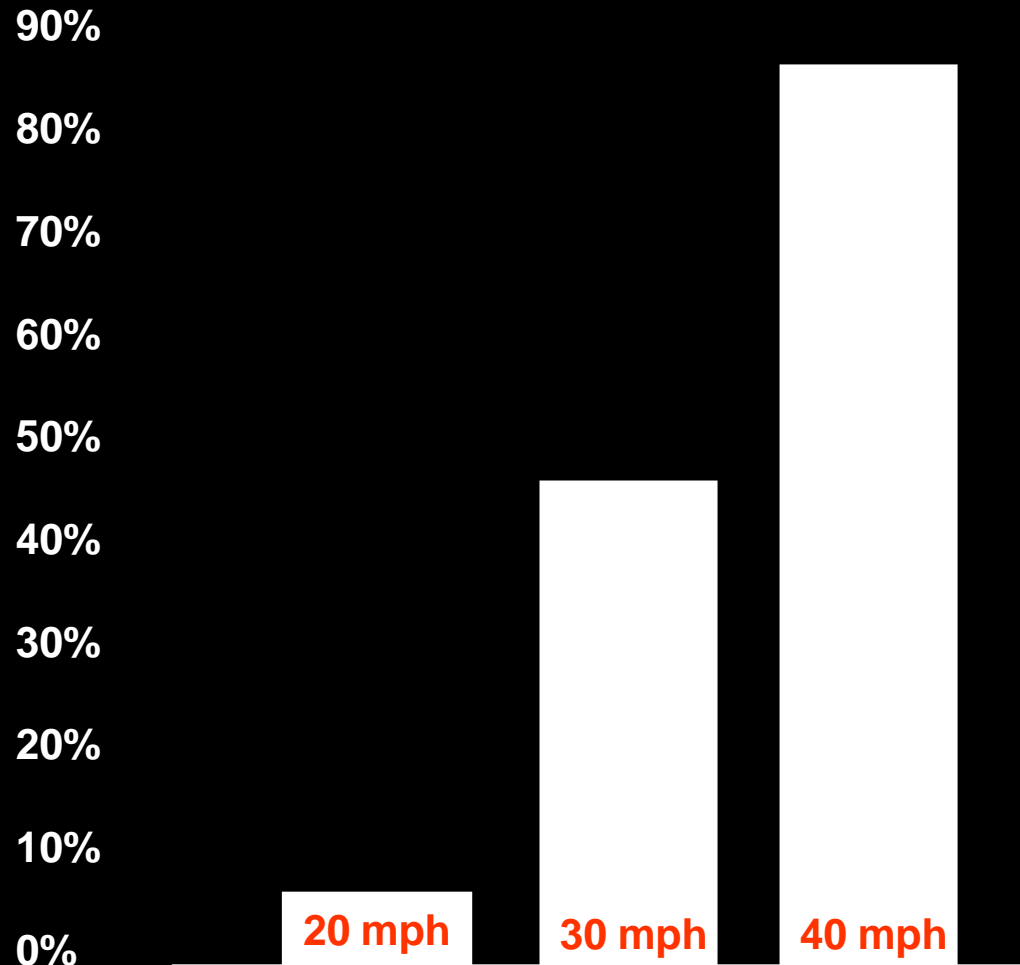
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What is traffic calming?

“Traffic calming involves changes in street alignment, installation of barriers, and other physical measures to **reduce traffic speeds** and/or cut-through volumes, in the interest of street safety, livability, and other public purposes” ITE's (Institute of Transportation Engineers) "Traffic Calming: State of the Practice"

Importance of Reducing Speed

A pedestrian's chance of death if hit by a motor vehicle



Traffic Calming Vs. Traffic Control



Source: Toole Design Group

Stop Signs are Not Traffic Calming!

“STOP signs should not be used for speed control.”

- **Manual for Uniform Traffic Control Devices, Section 2B.05**

- Numerous studies prove that unwarranted stop signs increase vehicular speeds between stop signs. Stop signs only affect speed within 150 feet of the sign.
- Unwarranted stop signs encourage rolling stops.
- Studies have shown that excessive or unwarranted use of Stop Signs breeds disrespect for stop control signs and other traffic control devices.



Table 4. Speed Studies, Robinwood Street

Speed (mph)	Without Stop Signs, 1975	With Stop Signs, 1975	With Stop Signs, 1986
Low	10	13	21
Average	23.4	24.4	30
85th Percentile	30	30	34
High	38	38	42

Multi-way Stops – The Research Shows the MUTCD is correct, Martin Bretherton, PE – Paper and ITE Journal Article – Controlling Speeds on Residential Streets, April 1989

Who Speeds?

- A person's perception of speed is usually wrong
- It is often believed that commuters (cut through traffic) is primarily responsible for neighborhood speeding
- The reality is that it is more likely to be your neighbor

Interesting Statistics:

26% of all trips are less than 1 mile

38% of all trips are less than 2 miles

47% of all trips are less than 3 miles

National Household Transportation Survey

DDOT Traffic Calming Program

TPPA shall conduct a traffic calming study if at least 35% of residents in the problem area support such a request with the concurrence of the area's ANC.

The implementation of any traffic calming measure should have the support of at least 65% of the residents within the study area with the concurrence of the area's ANC.

Table 2: Effectiveness of Typical Traffic Calming Measures

Traffic Calming Measures and Traffic Control Devices	Volume Reduction	Speed Reduction	Conflict Reduction	Emergency Response
Speed Bump	M	S	M	S
Speed Hump	M	S	M	S
Speed Table	N	M	N	M
Circle	M	M	S	S
Chicane	M	M	N	M
Raised Crosswalk	M	S	M	S
Raised Intersection	N	M	M	S
Neckdown	N	M	M	N
Chokers	N	M	M	M
Textured Pavement	N	N	N	N
Rumble Strip	N	M	N	M
Gateway	N	N	N	N
Pedestrian Refuge	N	M	M	N
Median Barrier	S	N	M	S
Street Closure	S	M	S	S
Diagonal Diverter	S	M	M	M
Forced-turn Island	M	N	M	M
Speed Limit Signing	N	M	N	N
Multi-way Stop Control	N	M	M	M
Turn Prohibitions	M	N	M	N
One-way streets	S	N	M	M

N = Minimal or no effect, M = Moderate effect, S = Significant effect.

Source: District Department of Transportation

What Can We Do?

- Education
 - Driver's Education
 - Testing
 - Public Awareness
- Engineering
 - Physical Changes to Roadways:
 - Vertical Deflections
 - Horizontal Deflections
 - Narrowing
 - Road Closures
 - Signs
- Enforcement
 - Automated (Speed Cameras)
 - Police Officer

Pace Car Program



1. **Drive within the speed limit on streets that allow pedestrians.**
2. **Stop for pedestrians and be courteous to bicyclists.**
3. **Display the official Pace Car sticker on your vehicle.**



Speed Bumps

For use only in commercial areas or alleys.

3 inch – 4 inch height

Average Speed = 5-15mph



Source: Toole Design Group

Speed Bumps/Humps

6 ft – 14 ft length

3 inch – 4 inch height, rounded top

Speed Increases with Length

Speed Decreases with Height



Speed Tables



12 ft – 22 ft length

3 inch – 4 inch height, flat top

Average Speed = 25-30mph

Speed Cushions

Allow trucks and emergency vehicles to bypass hump.

If improperly designed allow regular vehicles to avoid.

Not as affective as full width humps for reducing speed



Raised Crosswalks



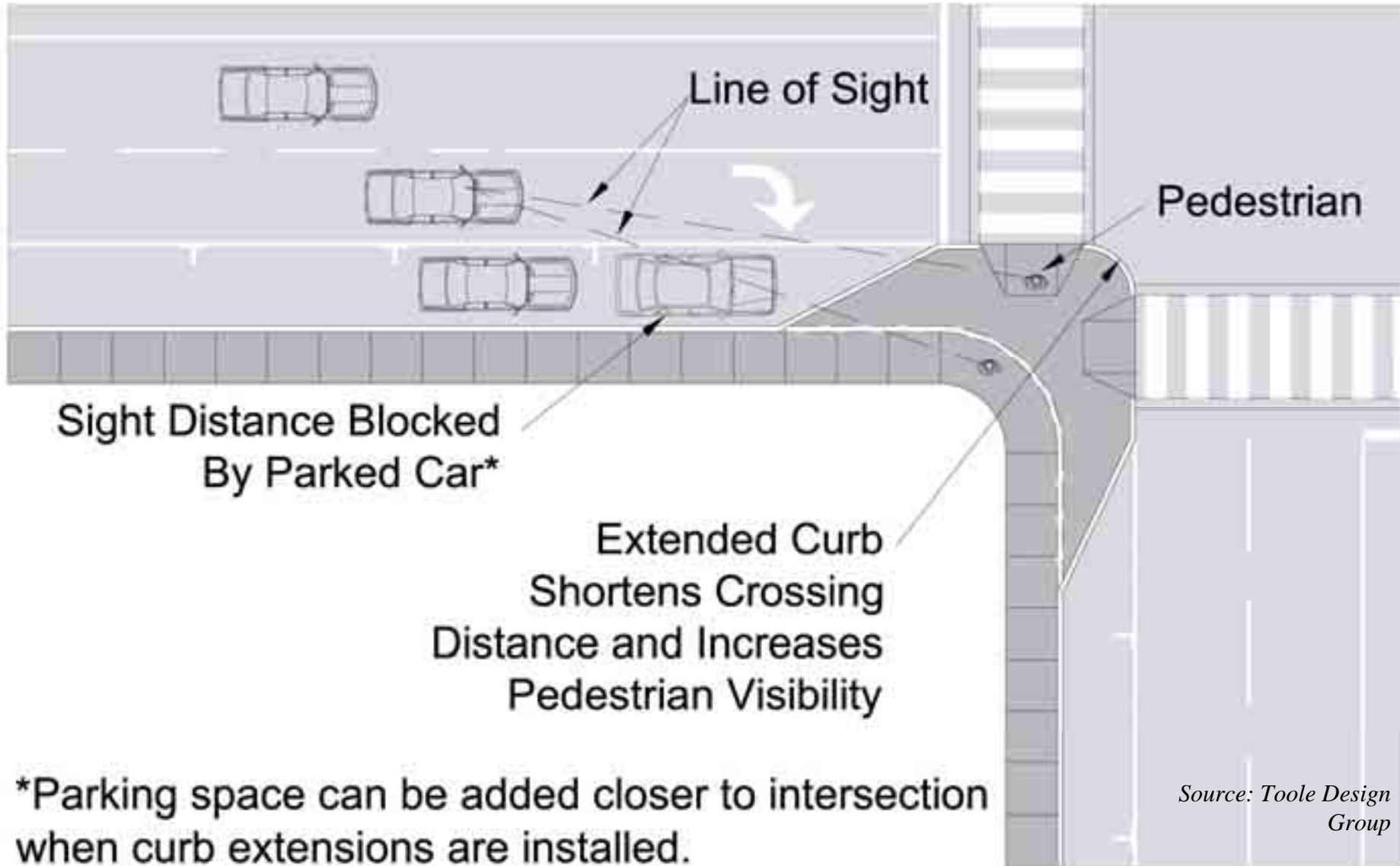
Source: Toole Design Group

Raised Intersections

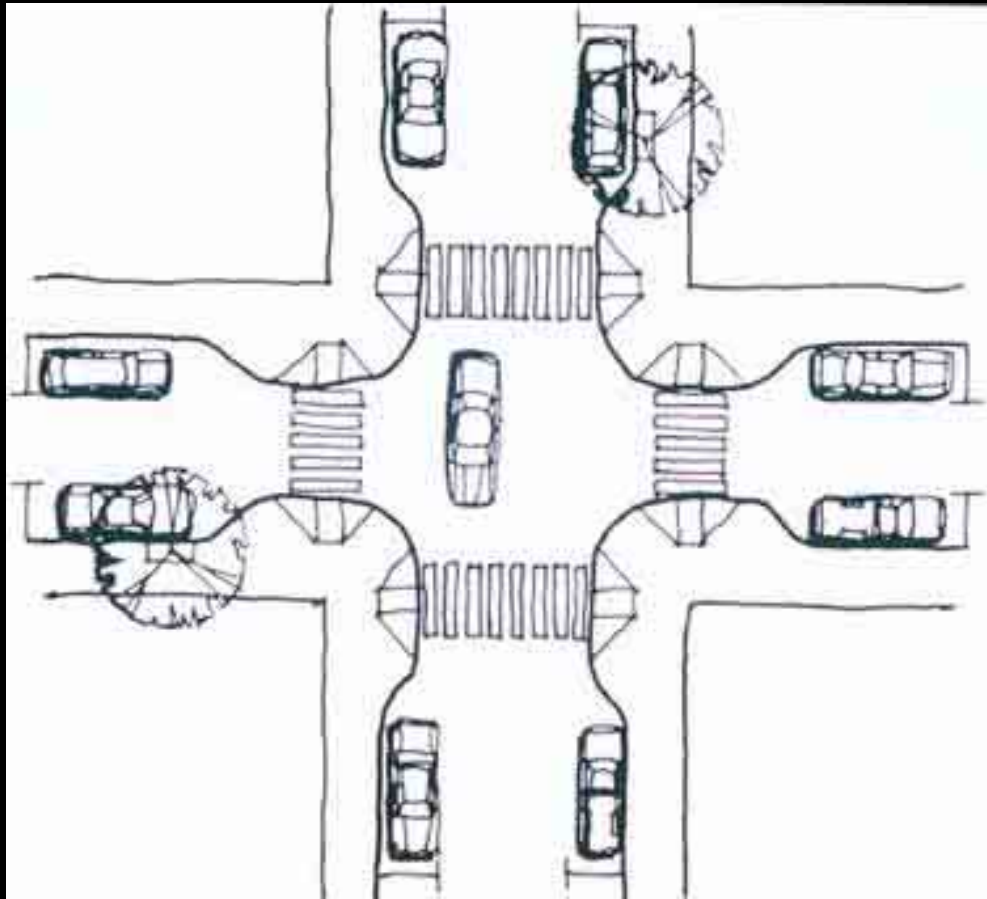


Curb Extensions

EFFECTS OF CURB EXTENSIONS ON SIGHT DISTANCE



Curb Extensions



Source: ITE Traffic Calming State of The Practice Slide Seminar



Source: Toole Design Group

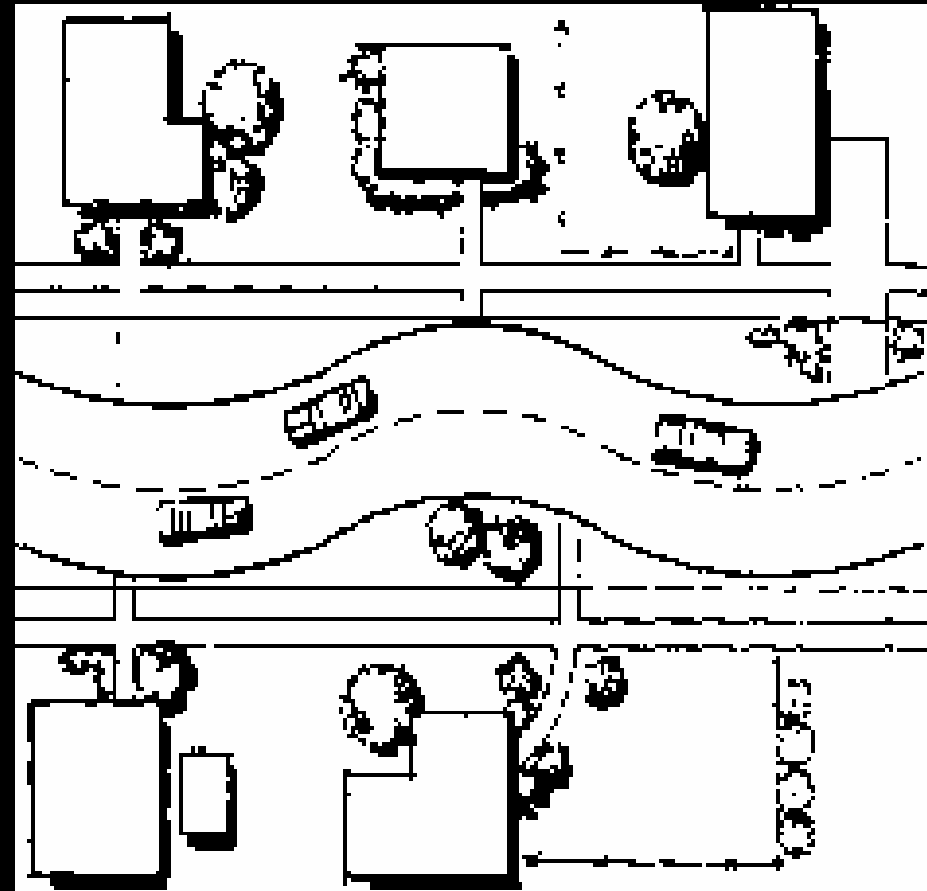


Source: Richard Drdul

Chicanes



Source: Richard Drdul



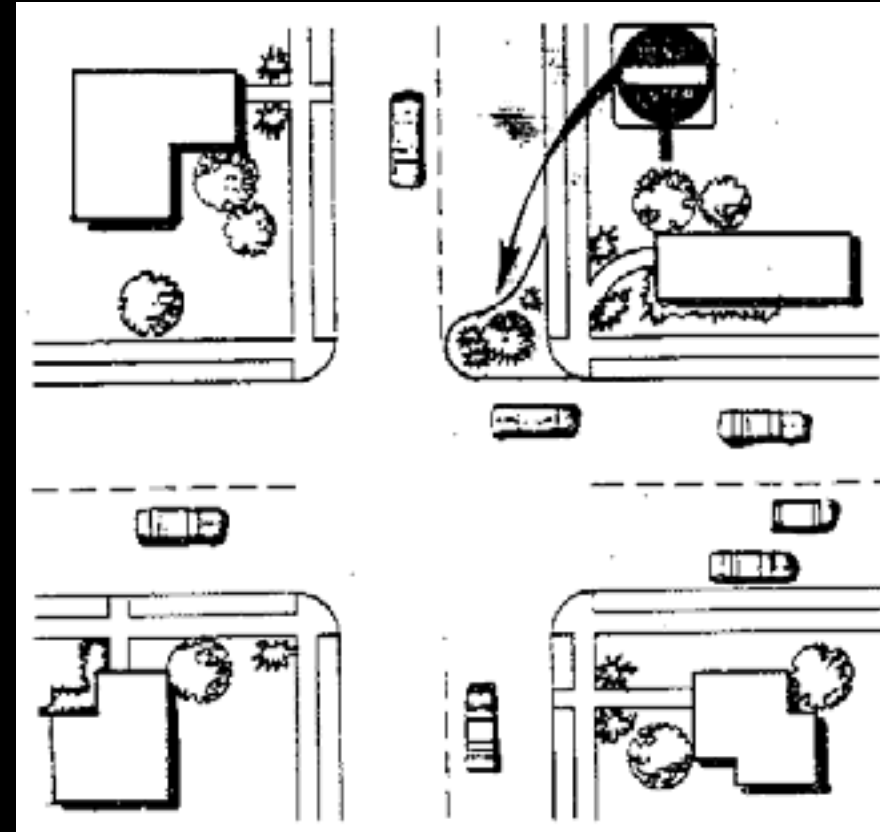
Source: ITE Traffic Calming State of The Practice Slide Seminar

Median Closures

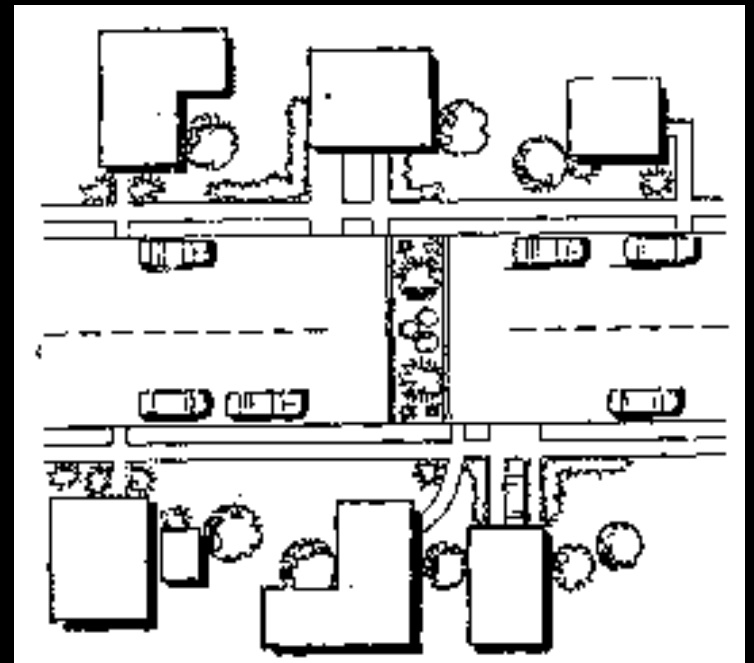


Source: Richard Drdul

Half Closures



Full Closures



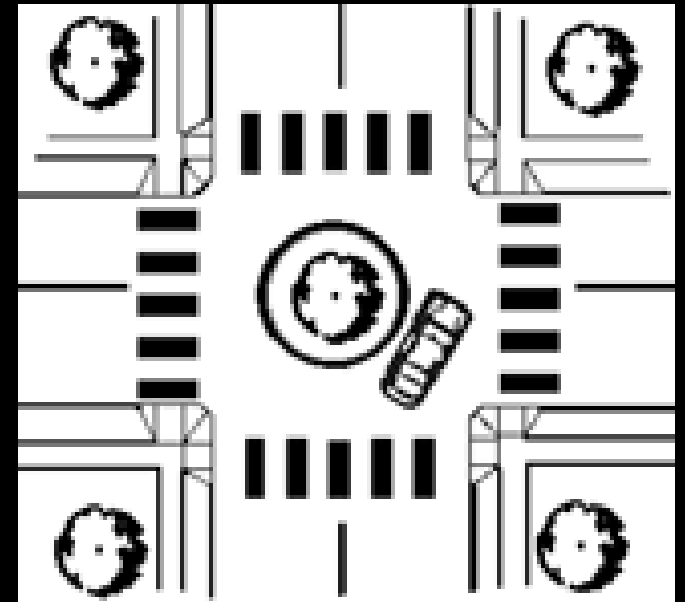
Traffic Circles



Source: Richard Drdul



Source: Toole Design Group



Source: ITE Traffic Calming State of The Practice Slide Seminar

Traffic Circle



Source: Richard Drdul



Source: Richard Drdul

City of Seattle Traffic Circle Experience

Of all the devices used in Seattle, traffic circles have **proven to be the most effective** at solving neighborhood concerns surrounding speeding and traffic accidents with a minimum of controversy.

- 600 traffic circles constructed since 1973
- Receive 700 requests for traffic circles/year
- They build 30 traffic circles/year.

Source: Neighborhood Traffic Calming: Seattle's Traffic Circle Program presentation prepared for the Institute of Transportation Engineers (ITE) District 6 Annual Meeting, July 20-23, 1997, in Salt Lake City, Utah by James E. Mundell, P.E., Senior Traffic Engineer, City of Seattle Department of Transportation

City of Seattle Before/After Data

Injuries

	1991 N=10	1992 N=7	1993 N=9	1994 N=6	4 Year Total
Before Construction	11	11	21	6	49
After Construction	1	0	3	1	5
Percent Reduction	90.9%	100%	85.7%	83.3%	89.8%

Accidents

	1991 N=10	1992 N=7	1993 N=9	1994 N=6	4 Year Total
Before Construction	10	5	17	6	38
After Construction	0	0	1	0	1
Percent Reduction	100%	100%	94.1%	100%	97.4%

Source: Neighborhood Traffic Calming: Seattle's Traffic Circle Program by James E. Mundell, P.E.

Cost Savings Due to Accident Reduction (Seattle)

	Accidents Prevented (1991-1995)	Cost per Accident	Cost Savings (1991-1995)
Non-Injury Accidents	273	\$6,500	\$1,774,500
Injury Accidents	277	\$30,000	\$8,310,000
<i>All Accidents</i>	550		\$10,084,500



Source: Toole Design Group

*Source: Neighborhood Traffic Calming: Seattle's
Traffic Circle Program by James E. Mundell, P.E.*

Impacts of Traffic Calming on Noise Levels

<u>Measure</u>	<u>Usual Level</u>	<u>Peak Level</u>
None (unobstructed traffic)	68-69 dB	72 dB
4-Way Stop	66-67	69
Traffic Circle	60-64	70
Raised Crossing	60-62	64



Combined Measures



Source: ITE Traffic Calming State of The Practice Slide Seminar



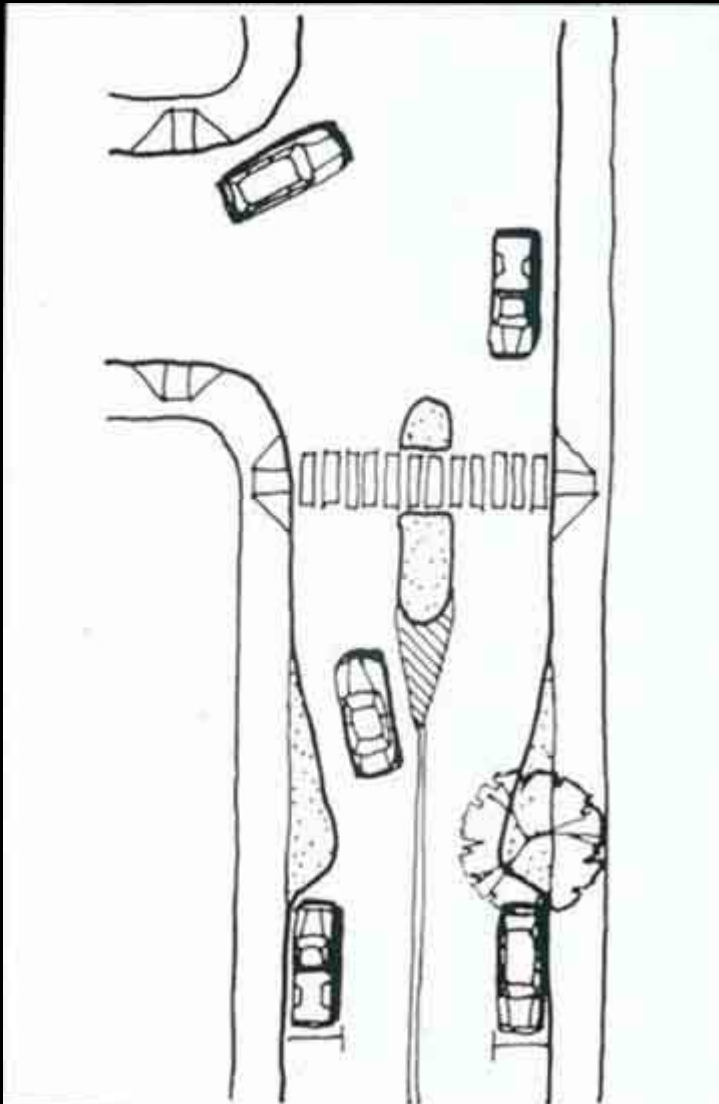
Source: Richard Drdul

Combo – Speed Hump & Chicane



Parking Bumpout to Create Chicane

Speed Table Combined with a Choker



Reduce Confusion with Striping and Signs



Warning Signs



Electronic Messaging Signs



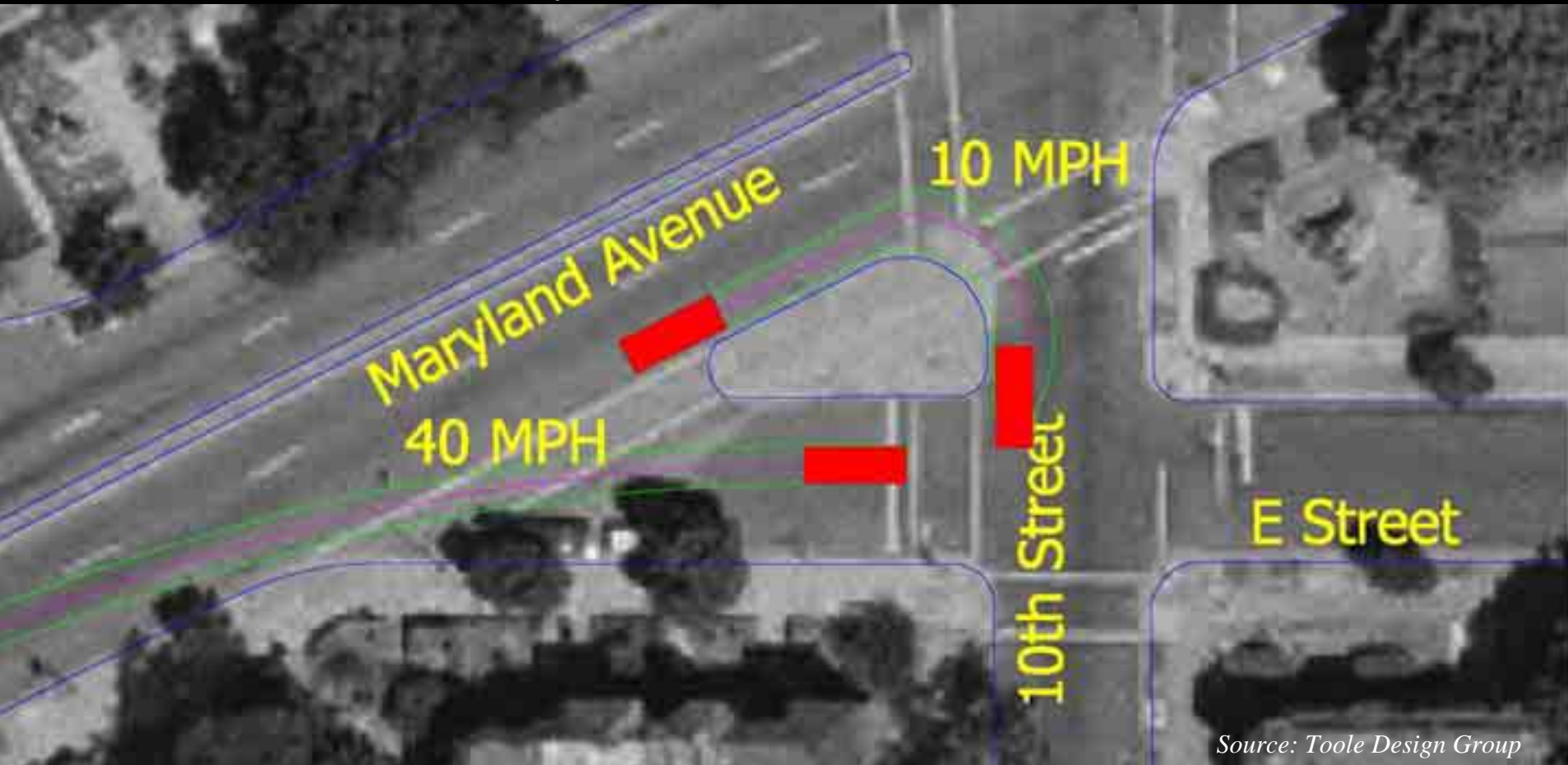
Maintenance and Proper Installation



Visibility of Signs and Pavement Markings is
Critical to Success of Installation

Angled Intersections

- Restrict Visibility
- Create Long Pedestrian Crossings
- Allow for high speed motor vehicle turns
- Create concrete eyesores



Angled Intersections

- Improvement schemes would alter parking
- This example intersection allows for 4 legal parking spaces with existing curb configuration



Angled Intersections

- Close direct E Street access from Maryland Ave
- Reduces speeds of vehicles
- Shortens pedestrian crossings
- Creates green space opportunity
- Increases total available parking by replacing 4 lost spaces with 6

