VILLAGE OF OAK PARK
TRANSPORTATION COMMISSION MEETING
WEDNESDAY, MAY 10, 2017 - 7:00 PM
ROOM 229 – PUBLIC WORKS CENTER
201 SOUTH BOULEVARD

AGENDA

1. Call to Order

2. Non-agenda Public Comment - up to 15 minutes

3. Agenda Approval

4. Approval of Draft Transportation Commission Meeting Minutes

   4.1 not applicable

5. CONTINUED DEVELOPMENT OF THE TRAFFIC CALMING TOOLBOX

   5.1 Staff AIC
   5.2 Background information Traffic Calming Toolbox
   5.3 Pre-Final Proposed Scoring Table
   5.4 This page intentionally left blank
   5.5 Table of Traffic Calming Devices Impacts - All Depts.
   5.6 Traffic Calming Toolbox Booklet

6. Adjourn

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Village Of Oak Park

Transportation Commission Agenda Item

Item Title: Continued Development of the Traffic Calming Toolbox

Review Date: May 10, 2017

Prepared By: Mike Koperniak

Abstract (briefly describe the item being reviewed):

Tonight's meeting is a continuation of the Transportation Commission's work plan item to develop a traffic calming toolbox for use to more effectively address traffic calming petitions that are brought before it.

Staff Recommendation(s):

For tonight's meeting, the Commission will conduct (1) A review of a table of possible traffic calming measures that that was previously reviewed and commented on by the Village's Fire, Police, and Public Works Departments, (2) discuss the contents of the table with representatives of the Fire, Police, and Public Works Departments, (3) decide on which possible traffic calming measures from the table should be included in the draft traffic calming toolbox that will be presented to the Village Board of Trustees, and (4) revisit the weighting of the Community Interest and Bike Routes criteria in relationship to the minimum required score and the maximum possible score.

Supporting Documentation Is Attached

Memorandum

Date: April 24, 2017

To: The Transportation Commission

From: Mike Koperniak, Staff Liaison MK

Re: Continuation in the Development of a Traffic Calming Toolbox

Included in this agenda item are several exhibits for review and consideration.

Exhibit 5.5 is a summary table of possible traffic calming measures that were first presented to the Transportation Commission at its February 27, 2017 meeting. Exhibit pages for each of the traffic calming measures is included as Exhibit 5.6.

This summary table indicates the type of measures that can be used by the Transportation Commission to address resident generated petitions for traffic calming measures and/or controls.

Subsequent to the February 27th meeting and prior to tonight's meeting, the Village's Fire, Police, and Public Works Departments reviewed and commented on each of the possible traffic calming measures. Each Department indicated for every traffic calming measure whether it presented no impact, a minor negative impact, or a major negative impact to its operations. The Departments indicated that they could work around measures having what they considered a minor negative impact on their operations. The Departments indicated that they were opposed to measures that they considered would have a major negative impact on their operations.

Exhibit 5.5 summarizes the comments of the three Departments. This table includes all of the traffic calming measures presented to the Commission at its February 27th meeting and indicates those measures that were opposed by the three Department and are not recommend by Staff for use by the Transportation Commission in carrying out its duties.

Representatives from the three Departments will be present at tonight's meeting to answer any questions that the Commission may have regarding the reasoning behind the Departments scoring of the measures.

At tonight's meeting, the Commission will be reviewing the various traffic calming measures and deciding which of them it would like included in the draft traffic calming toolbox that will eventually be presented to the Village Board of Trustees for approval.

Memorandum

Another item for review has to do with the pre-final Traffic Calming Toolbox Scoring Table that was approved by the Commission at its March 20, 2017 meeting. This table is included as exhibit 5.3.

While preparing the agenda for tonight's meeting, Staff observed that there is an apparent unbalanced condition between the percentage weighting of the six criteria based on the maximum possible score of 100 and the percentage weighting of the six criteria based on the minimum required score of 25.

There are five criteria addressing crash history, vehicle speed, vehicle volume, pedestrian traffic generators, and bike routes / non-bike routes that are scored based upon collected data. The sum of the maximum possible scores for these five criteria equals 85 points and accounts for 85 percent of the maximum possible score of 100.

The sixth criteria has to do with the resident generated petition and accounts for the remaining 15 percent of the maximum possible score of 100. In order for data for the five criteria above to be collected a successful petition must be submitted. A successful petition can have a maximum score of 15 points.

This results in an 85% / 15% split between the five collected data criteria and the one petition criteria based on the maximum 100 possible points score.

The Commission has decided that the minimum score necessary to submit a petition to the Transportation Commission for review and recommendation is equal to 25 points.

Calculating the minimum possible score for each of the five collected data criteria results in a total minimum possible score of 3 points for the five criteria. This is because at least 3 points is given for the Bike Routes / Non-Bike Routes criteria regardless of whether or not the street in question is identified as a bike route.

The minimum possible score for a successful petition, without negative external support, is 10 points.

Combined, this results in a default total minimum possible score of 13 points. This minimum 13 points represents 52 percent of the minimum required score of 25 points. This is just for submitting a successful petition and before any data is collected and scored.

As was stated earlier, the minimum possible score for a successful petition, without negative external support, is 10 points. This 10 points represents 40 percent of the minimum 25 points required score.

This means that the five collected data criteria scores represent only 60 percent of the minimum required score of 25 points.

This results in a 60% / 40% split between the five collected data criteria and the one petition criteria based on the minimum required score of 25 points.

In summary, while there is an 85% / 15% split between the five collected data criteria and the one petition criteria based on the maximum 100 possible points score, there is a 60% / 40% split between the five collected data criteria and the one petition criteria based on the minimum required score of 25 points. In addition, a successful petition by itself represents 52 percent of the minimum required score of 25 points

Does this apparent discrepancy in the percent weighting warrant further consideration by the Commission? Staff is of the opinion that it does. It appears to Staff that the five collected data criteria are not contributing enough weight to the scoring as previously thought.

There are many resources in the Traffic Calming Toolbox directory on the ftp site. The Commission may wish to review documents from which certain exhibits have been made. Those documents are: 1) Placer County NTMP, 2) City of Albuquerque NTMP, 3) Centennial NTMP Manual, 4) ITE Toolbox of Traffic Calming Measures and Establishing a Neighborhood Traffic Management Program. Also located in the Toolbox directory are City of Chicago Safer Street Guides and Pedestrian Plan which provides examples and measures that are being considered locally. The DC DOT Traffic Calming Assessment Application within the Traffic Calming Toolbox directory has good information on the treatments and processing of applications.

Finally, there is the FHWA website has a free online resource, the Traffic Calming ePrimer. Here is the link to that site: https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm . The eight modules have been PDF'd and placed in its own directory on the ftp site.

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<table>
<tr><th>Measure</th><th>Maximum Number of Points</th><th>Percentage weighting based upon maximum possible score of 100</th><th><u>DRAFT</u> Criteria Detail as approved by the Transportation Commission at its 03/20/2017 meeting</th><th>minimum possible score</th><th>Percentage weighting based upon minimum possible score of 25</th></tr>
<tr><td>Crash History</td><td>20</td><td rowspan="5">85%</td><td>1-3 correctible crashes in a 3 year period = 5 points
4-10 correctible crashes in a 3 year period = 10 points
more than 10 correctible crashes in a 3 year period = 15 points
any correctible crash involving injury to a pedestrian/cyclist = 5 points</td><td>0 pts.</td><td rowspan="5">60%

(80% with minimum petition score + maximum external negative support)</td></tr>
<tr><td>Vehicle Speed</td><td>20</td><td>85th percentile speed is not over the speed limit = 0 points
85th percentile speed is 1 mph over the speed limit = 4 points
85th percentile speed is 2 mph over the speed limit = 8 points
85th percentile speed is 3 mph over the speed limit = 12 points
85th percentile speed is 4 mph over the speed limit = 16 points
85th percentile speed is 5 mph or more over the speed limit = 20 points
outlier excessive speeding = 5 points</td><td>0 pts.</td></tr>
<tr><td>Vehicle Volume</td><td>20</td><td>ADT < 750 = 0 points
ADT = 751 - 1,350 = 5 points
ADT = 1,351 - 1,950 = 10 points
ADT = 1,951 - 2,550 = 15 points
ADT > 2,550 = 20 points</td><td>0 pts.</td></tr>
<tr><td>Pedestrian Traffic Generators</td><td>15</td><td>Any school, park, library, church, CTA station 2 to 3 blocks (1,320 to 1,980 ft.) away = 3 points
Any school, park, library, church, CTA station one block (660 ft.) or less away = 5 points</td><td>0 pts.</td></tr>
<tr><td>Bike Routes / Non-Bike Routes</td><td>10</td><td>Not identified as a proposed bike route/boulevard* = 3 points
Identified as an alternative bike route/boulevard* = 6 points
Identified as a bike route/boulevard* = 10 points
* Per the VOP Bike Plan 2008 or 2015 VOP Bike Plan Addendum</td><td>3 pts.</td></tr>
<tr><td>Community Interest</td><td>15</td><td>15%</td><td>Final Score = Base Score (+10 to +15 points) minus External Negative Support Score (-1 to -5 points) Exteral Negative Score is from responses from outside of the affected petition zone.

<table>
<tr><th colspan="4">51% petitions</th><th colspan="4">75% petitions</th></tr>
<tr><td>51%</td><td>-</td><td>59%</td><td>= 10 points</td><td>75%</td><td>-</td><td>78%</td><td>= 10 points</td></tr>
<tr><td>60%</td><td>-</td><td>68%</td><td>= 11</td><td>79%</td><td>-</td><td>82%</td><td>= 11</td></tr>
<tr><td>69%</td><td>-</td><td>77%</td><td>= 12</td><td>83%</td><td>-</td><td>86%</td><td>= 12</td></tr>
<tr><td>78%</td><td>-</td><td>86%</td><td>= 13</td><td>87%</td><td>-</td><td>90%</td><td>= 13</td></tr>
<tr><td>87%</td><td>-</td><td>95%</td><td>= 14</td><td>91%</td><td>-</td><td>94%</td><td>= 14</td></tr>
<tr><td>96%</td><td>-</td><td>100%</td><td>= 15</td><td>95%</td><td>-</td><td>100%</td><td>= 15</td></tr>
</table>
<table>
<tr><th colspan="2">% of negative replies</th><th>Subtract</th></tr>
<tr><td colspan="2">Less than 10 or 16 replies</td><td>= - 0 points</td></tr>
<tr><td rowspan="5">If at least 10 or 16 replies are received, subtract points based upon the percentage of replies that are negative</td><td>1% - 20%</td><td>= - 1 point</td></tr>
<tr><td>21% - 40%</td><td>= - 2</td></tr>
<tr><td>41% - 60%</td><td>= - 3</td></tr>
<tr><td>61% - 80%</td><td>= - 4</td></tr>
<tr><td>81% - 100%</td><td>= - 5 points</td></tr>
</table></td><td>10 pts.

(5 pts. with minimum petition score + maximum external negative support)</td><td>40%

(20% with minimum petition score + maximum external negative support)</td></tr>
<tr><td>Maximum Score</td><td>100</td><td>100%</td><td>Mininum score necessary to submit petition to the Transportation Commission for review and recommendation = 25 points (minimum required)</td><td>13 pts.</td><td>0%</td></tr>
</table>

Created 8/18/2016
Revised 4/20/2017

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Traffic Calming Measures as reviewed and recommended by the Village of Oak Park's Fire, Police, and Public Works Departments

Types of Traffic Calming Measures that can be used by the Transportation Commission to address resident generated petitions for traffic calming / controls	No impacts			Minor negative impacts / can work around			Major negative impacts / opposed to		
	Fire	Police	Public Works	Fire	Police	Public Works	Fire	Police	Public Works
Level 1 - No Traffic Flow Changes									
Targeted Speed Enforcement (Page 1)	✓	✓	✓						
Speed Radar Trailer (Page 1)	✓	✓	✓						
Speed Feedback Sign (Page 2)	✓	✓	✓						
Centerline / Edgeline Lane Striping (Page 2)	✓		✓		✓				
Optical Speed Bars / Speed Reduction Markings (Page 3)	✓	✓	✓						
Signage (Page 3)	✓	✓	✓						
Speed Limit Signage (Page 4)	✓	✓	✓						
STOP / YIELD Signage (Page NA)	✓	✓				✓			
Speed Legend (Page 5)	✓	✓	✓						
Speed Limit Pavement Markings (Page 6)	✓	✓	✓						
High Visibility Crosswalks (Page 7)	✓	✓				✓			
Educational Community Involvement (Page 8)	✓	✓	✓						
Level 2 - Some Traffic Flow Changes									
Sign Turn Restrictions/Turn Movement Restrictions (Page 9)	✓	✓				✓			
Centerline Botts Dots / Raised Pavement Markers (Page 5)	✓				✓	✓			
Angled Parking (Page 7)	✓	✓				✓			
Parking Strategies (Page 10)				✓	✓	✓			
Textured Pavement (Page 11)	✓	✓				✓			
Rumble Strip (Page 11-12)	✓		✓		✓				
Level 3 - Significant Traffic Flow Changes									
Neckdown / Bulbout (Page 13)	✓				✓	✓			
Center Island Narrowing / Pedestrian Refuge (Page 14)	✓					✓		✓	
Two-Lane Choker (Page 15)	✓					✓		✓	
One-Lane Choker (Page 16)	✓					✓		✓	
Roundabout (Single-Lane) (Page 18)			✓	✓				✓	
Chicane (Page 19)	✓				✓	✓			
Lateral Shift (Page 20)				✓	✓	✓			
Realigned Intersection (Page 21)				✓	✓	✓			
Medians & Partial Medians (Page 22)				✓	✓	✓			
Traffic Circle (Page 17) - Not recommended by Staff				✓		✓		✓	
Speed Hump (Page23) - Not recommended by Staff					✓	✓	✓		
Speed Lump (Page 24) - Not recommended by Staff				✓		✓		✓	
Speed Cushion (Page 25) - Not recommended by Staff				✓	✓				✓
Speed Table (Page 26) - Not recommended by Staff					✓	✓	✓		
Speed Kidney (Page 27) - Not recommended by Staff						✓	✓	✓	
Raised Crosswalk (Page 28) - Not recommended by Staff					✓	✓	✓		
Raised Intersection (Page 29) - Not recommended by Staff					✓	✓	✓		
Level 4 - Street Closures									
Diagonal Diverter (Page 33)				✓	✓	✓			
Median Barrier (Page 34)				✓	✓	✓			
Forced Turn Island (Page 35)				✓	✓	✓			
Two-Way Street Conversion (Page 36)			✓	✓	✓				
One-Way Street Conversion (Page NA)				✓	✓	✓			
One-Way Couplet Conversions (Page 37)				✓	✓	✓			
Full Closure (Page 30) - Not recommended by Staff						✓	✓*	✓	
Partial Closure (Page 31) - Not recommended by Staff				✓	✓	✓			
Canadian Design Half Closure / Semi-Diverter (Page 32) - Not recommended by Staff				✓		✓		✓	

reviewed by the three departments in March 2017

Targeted Speed Enforcement

County Staff or NTC members can identify locations for temporary targeted enforcement, based on personal observations and survey comments. A request can be submitted to the California Highway Patrol (CHP) for the desired enforcement. Because of limited CHP resources, the duration of the targeted enforcement may be limited. Targeted enforcement may also be used in conjunction with new neighborhood traffic management devices to help drivers become aware of the new restrictions.

Approximate Cost: No direct cost.

Advantages

- Inexpensive if used temporarily
- Does not physically slow emergency vehicles or buses
- Quick implementation

Disadvantages

- Expensive to maintain an increased level of enforcement
- Effectiveness may be temporary

Radar Trailer

A radar trailer is a device that measures each approaching vehicle's speed and displays it next to the legal speed limit in clear view of the driver. They can be easily placed on a street for a limited amount of time then relocated to another street, allowing a single device to be effective in many locations.

Approximate Cost: No direct cost. (Purchase $6,000 - $12,000)

Advantages

- Portable
- Does not physically slow emergency vehicles or buses
- Quick implementation

Disadvantages

- Effectiveness may be temporary
- Drivers may divert to alternate streets due to uncertainty of device implications
- Subject to vandalism

Speed Feedback Signs

Speed feedback signs perform the same functions as radar trailers but are permanent. Real-time speeds are relayed to drivers and flash when speeds exceed the limit. Speed feedback signs are typically mounted on or near speed limit signs.

Approximate Cost: $3,000 - $10,000

Advantages

- Real-time speed feedback
- Does not physically slow emergency vehicles or buses
- Permanent installation

Disadvantages

- May require power source
- Only effective for one direction of travel
- Long-term effectiveness uncertain
- Subject to vandalism

Centerline/Edgeline Lane Striping

Lane striping can be used to create formal travel lanes, bicycle lanes, parking lanes, or edge lines. As a neighborhood traffic management measure, they are used to narrow the travel lanes for vehicles, thereby inducing drivers to lower their speeds. The past evidence on speed reductions is, however, inconclusive.

Approximate Cost: $2.00 per linear foot

Advantages

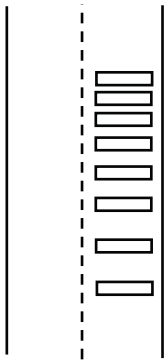
- Inexpensive
- Can be used to create bicycle lanes or delineate on-street parking
- Does not slow emergency vehicles

Disadvantages

- Has not been shown to significantly reduce travel speeds
- Requires regular maintenance

Optical Speed Bars

Optical speed bars are a series of pavement markings spaced at decreasing distances. They have typically been used in construction areas to provide drivers with the impression of increased speed. They do not provide long-term speed reduction benefits.



Advantages

- Inexpensive
- Does not physically slow emergency vehicles or buses

Disadvantages

- Long-term effects in residential area unknown
- Increases regular maintenance

Approximate Cost: $1.00 per linear foot

Signage

Various signs may also also be useful in alerting driver of certain conditions. Examples include:

- "Cross Traffic Does Not Stop" Signs
- Truck Restriction Signs

Approximate Cost: $150 - $500 per sign

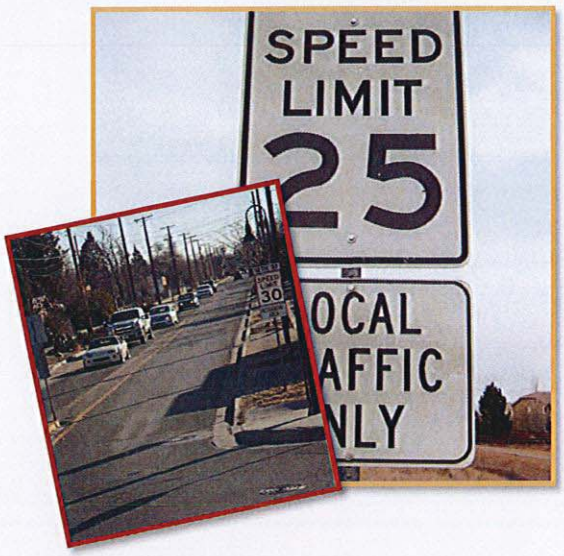
Advantages

- Inexpensive
- Truck restrictions can reduce through truck traffic
- Does not slow emergency vehicles or buses

Disadvantages

- Requires regular maintenance
- Speed limit signs are not applicable because they do not necessarily change driver behavior
- If speed limits are set unreasonably low, drivers are more likely to exceed it

Speed Limit Signage



Advantages

- Speed Limit signs provide a clear indication of the speed limit and undisputable basis for enforcement.
- Speed Limit signs are relatively easy and low-cost to install.
- Speed Limit signs do not slow emergency vehicles.

Disadvantages

- Signs alone do not guarantee responsible driving behavior.
- Overuse of unnecessary signs creates visual clutter that detracts from the conspicuity of other important signs and leads to loss of effectiveness.
- Posted speed limits that are below 25 MPH, below the 85th percentile speed for a roadway, or at an unrealistically low speed will not be respected by most drivers, and will breed disrespect for speed limits in general.
- Signs require regular maintenance. Signs must be replaced approximately every 8 years.

DESCRIPTION:
Regulatory Speed Limit signs (MUTCD R2 1) are installed along streets to notify and remind drivers of the legal speed limit.

APPLICATION:
The standard speed limit on residential streets per the City of Albuquerque Code of Ordinances is 25 MPH:

Because by default, the 25 MPH speed limit applies on all residential streets, the City does not post regulatory Speed Limit signs on every such street. However, where a problem of speeding traffic has been documented, signs may be installed to remind drivers to check their speed.

If used, the City will install Speed Limit signage in conformance with the City of Albuquerque Code of Ordinances and the MUTCD. Speed Limit signs of nonconforming designs or colors, or nonconforming speed values (other than multiples of 5 MPH) will not be installed.

Requests for posting speeds lower than the standard residential speed limit of 25 MPH will be subject to the requirement in the City of Albuquerque Code of Ordinances that an engineering and traffic study be conducted.

Effectiveness Scorecard

Speed	Fair
Volume	Poor
Cut-through	Poor
Crashes	Fair
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$

Very Good · Good · Fair · Poor · Not Applicable

Quick Glance

SPEED LIMIT 25

Speed Legend

Speed legends are numerals painted on the roadway indicating the current speed limit in miles per hour. They are usually placed near speed limit signposts. Speed legends can be useful in reinforcing a reduction in speed limit between one segment of a roadway and another segment. They may also be placed at major entry points into a residential area.

Approximate Cost: $75 per location

Advantages

- Inexpensive
- Helps reinforce a change in speed limit
- Does not slow emergency vehicles

Disadvantages

- Has not been shown to significantly reduce travel speeds
- Requires regular maintenance

Centerline Botts Dots

Botts dots, or "raised pavement markers," are small bumps lining the centerline or edgeline of a roadway. They are often used on curves where vehicles have a tendency to deviate outside of the proper lane, risking collision. Raised reflectors improve the nighttime visibility of the roadway edges.

Approximate Cost: $4.50 per marker

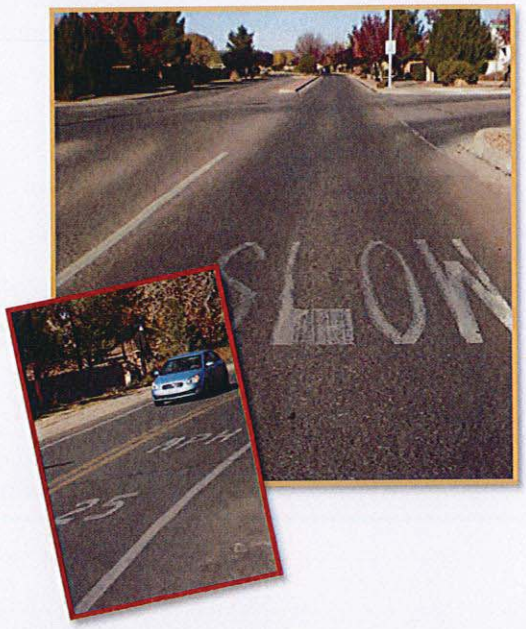
Advantages

- Inexpensive
- Does not physically slow emergency vehicles or buses
- Can help keep drivers in the appropriate travel lane on curves and under low-visibility conditions

Disadvantages

- Noise caused by Botts Dots
- Requires regular maintenance
- Has not been shown to significantly reduce travel speeds

Speed Li
Pavement Markings



DESCRIPTION:

Speed limit pavement markings are numerals applied in the traffic lane to remind drivers of the regulatory speed limit. In addition, a "SLOW" word legend may be applied with the speed legend.

APPLICATION:

Where a problem of speeding traffic has been documented, speed limit pavement markings may be installed to remind drivers to check their speed.

On residential streets, the standard speed limit is 25 MPH (see discussion on the sheet for Speed Limit Signs). On these streets, speed limit pavement markings may be used alone without posting a regulatory speed limit sign. On streets where the speed limit is greater or less than 25 MPH, speed limit pavement markings must be placed in conjunction with regulatory signs, as the pavement markings alone are not enforceable under state traffic laws or City of Albuquerque ordinances.

Advantages

- Provides a clear indication of the speed limit to drivers who are watching the road.
- Do not become obscured by street-side vegetation growth, parked trucks, or other obstructions.
- Relatively easy and low cost to install.
- Do not slow emergency vehicles.

Disadvantages

- Used alone do not guarantee responsible driving behavior.
- Used alone have not been shown to significantly reduce traffic speeds.
- Require regular maintenance. Markings must be reapplied approximately every 6 years.

Effectiveness Scorecard

Speed	Fair
Volume	Poor
Cut-through	Poor
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$

Very Good · Good · Fair · Poor · N/A Not Applicable

CITY OF ALBUQUERQUE · 1706 · NEW MEXICO

Quick Glance

SPEED LIMIT 25

High Visibility Crosswalks

High-visibility crosswalks use special marking patterns and raised reflectors to increase the visibility of a crosswalk. A "triple-four" marking pattern is created by painting two rows of four-foot wide rectangles, separated by four feet of unpainted space across the roadway. Raised reflectors are placed at the approach edges of these rectangles. The unpainted space along the center of the crosswalk provides an untreated path for wheelchair users and foot traffic, as markings may become slippery in rainy/wet conditions.

Advantages

- Increased visibility of crosswalk
- Focus crossing pedestrians at a single location

Disadvantages

- May give pedestrians a false sense of security, causing them to pay less attention to traffic
- Requires more maintenance than normal crosswalks

Approximate Cost: $1,600 per location

Angled Parking

Angled parking reorients on-street parking spaces to a 45-degree angle, increasing the number of parking spaces and reducing the width of the roadway available for travel lanes. Angled parking is also easier for vehicles to maneuver into and out of than parallel parking. Consequently, it works well in areas with high parking demand and turnover rates.

Approximate Cost: Dependent on amount of parking

Advantages

- Reduces speeds by narrowing the travel lanes
- Increases the number of parking spaces
- Provides for easier parking maneuvers that take less time than parallel parking
- Favored by businesses and multi-family residences

Disadvantages

- Precludes the use of bike lanes (unless roadway is wider than 58 feet)
- Ineffective on streets with frequent driveways
- Potential for collisions when backing out

Education
Community Involvement

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DESCRIPTION:

Educational traffic calming measures include working with neighborhoods to make residents aware of speed limits, traffic laws, and safe driving habits, and enlisting their support in practicing and promoting safe and lawful driving habits. Individual program components may include presentations at neighborhood meetings, local workshops, school programs, yard signs, neighborhood flyers or letters, and individual pledge letters to obey speed limits and traffic laws.

APPLICATION:

Public education is an important element in any traffic calming program. While most neighborhood traffic problems are perceived to be caused by "outsiders," the majority of traffic—and problem traffic—in a neighborhood is usually fellow neighbor drivers. Public education programs seek to make all drivers more aware of their own driving behavior and the impact it has on others. As such, it is recommended that neighborhoods applying for traffic calming treatments first attend a traffic calming educational forum with the City.

Staff from the City of Albuquerque, Traffic Engineering Division and the Albuquerque Police Department are available to address neighborhood association meetings or other groups regarding safe driving and the traffic calming program. The Albuquerque Police Department offers "Slow Down Albuquerque" campaign yard signs free to residents who make a personal commitment to not speed on Albuquerque streets. Details are available at http://www.cabq.gov/police/programs/slow-down-albuquerque.

Advantages

- Heightens driver awareness of traffic laws and their own driving behaviors.
- Allows residents to meet, share their views, and move toward consensus on the issues.
- Communicates the identified issues to City staff.

Disadvantages

- May require considerable City staff time.
- Meetings need to be actively led to maintain focus.

Effectiveness Scorecard

Speed	
Volume	
Cut-through	
Crashes	
Emergency Vehicle	
Pedestrian	
Bicycle	
Noise	
Cost	$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Turn-Movement Restrictions

Turn movement restrictions involve the use of signs to prevent undesired turning movements without the use of physical devices. The restrictions may generally apply to turning movements in or out of a residential street to a larger street. The turn movement restrictions may be permanent or only during peak commute hours.

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Reduction	Reduction in Vehicles per Day	I/D
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect.		

Approximate Cost: $150 per sign (enforcement may be necessary to be effective)

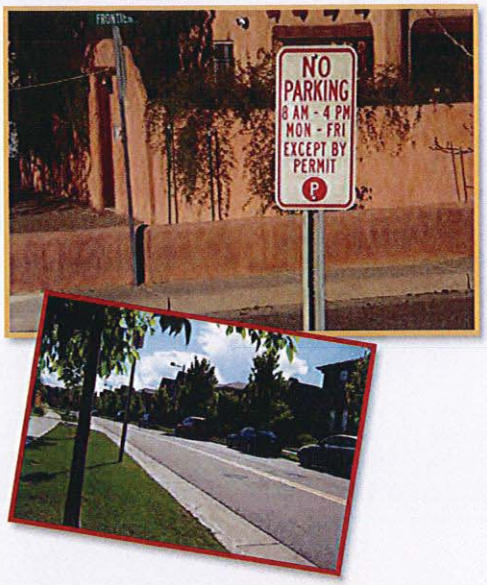
Advantages

- Can reduce cut-through traffic at specific times of day
- Can increase safety at an intersection by prohibiting certain turning movements
- Low cost

Disadvantages

- Restrictions apply to resident and non-residents
- Requires enforcement during time of restriction to be effective
- May divert a traffic problem to another street

Parking Strategies



DESCRIPTION:

In many city neighborhoods, parking issues are just as important to the residents as traffic speeding and volume issues. While some parking treatments can themselves serve traffic calming purposes, consideration of parking issues should be made when applying any of the traffic calming tools outlined in this program. Several of the non-physical, narrowing, and horizontal measures may reduce or eliminate available parking, while others may offer opportunities to create additional parking.

APPLICATION:

As part of any assessment for implementing traffic calming, the parking issues in the neighborhood should be identified at the outset. Is the supply of parking adequate for the demand? Are there parking intrusion issues from nearby land uses? The City of Albuquerque has implemented residential permit parking on some streets around Downtown, the State Fairgrounds, and UNM to address intrusion issues. While parallel parking is the default on most neighborhood streets, streets may be converted to angled or perpendicular parking to increase available spaces.

Advantages

- Reconfiguring the use of available street width can increase parking where needed.
- No Parking zones near intersections and driveways can improve safety for motorists, pedestrians and cyclists.
- The presence of perpendicular or angled parked vehicles reduces traffic speeds.

Disadvantages

- Angled and parallel parking preclude bike lanes.
- Frequent driveways limit parking treatment options.
- Angled and parallel parking increase backing-out collision potential.

Effectiveness Scorecard

Speed	Fair
Volume	Fair
Cut-through	Fair
Crashes	Fair
Emergency Vehicle	Fair
Pedestrian	Good
Bicycle	Fair
Noise	N/A
Cost	$$

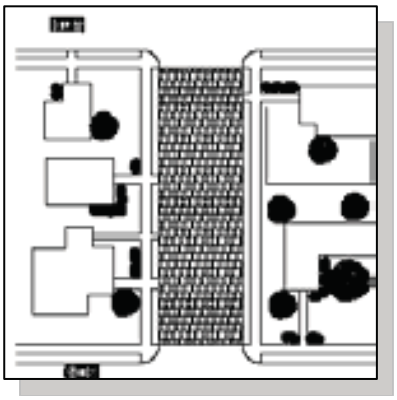
Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Textured Pavement

Textured colored pavement includes the use of stamped pavement (asphalt) or alternate paving materials to create an uneven surface for vehicles to traverse. Textured pavement may have limited effectiveness as a standalone device and should be used to supplement other devices such as raised crosswalks or center median islands. Little data has been collected to predict the reduction in speed, traffic volumes, or collisions, and use of this device may not result in significant decreases. Resources permitting, DPW staff can collect before and after data to determine the effectiveness of textured pavement.



Approximate Cost: $8.00 per square foot

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Reduction	Reduction in Average Daily Traffic	I/D
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect.		

Advantages

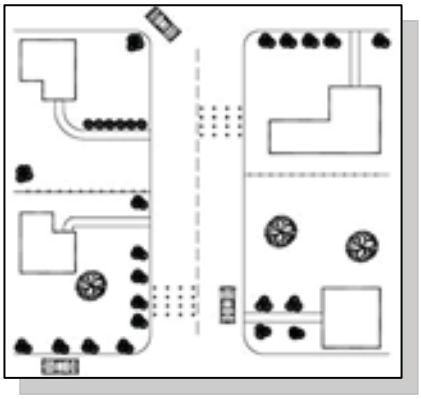
- Can reduce vehicle speeds
- Aesthetic upgrades can have positive value
- Placed at an intersection, it can slow two streets at once

Disadvantages

- Expensive, varying by materials used
- Can be uncomfortable for bicyclists or handicapped.
- Textured pavement can increase noise to adjacent properties

Rumble Strip

Rumble strips are closely spaced raised pavement markers at regular intervals on the roadway that create noise and vibration to the vehicle. Rumble strips can be used to warn drivers of a change in speed limit, leading up to a residential or school area, and upcoming stop sign or intersection. Rumble strips should be used only in areas where the noise impact would be minimal. Little data has been collected to predict the reduction in speed, traffic volumes, or collisions, and use of this device may not result in significant decreases. Resources permitting, DPW staff can collect before and after data to determine the effectiveness of rumble strips.



Approximate Cost: $500 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Reduction	Reduction in Average Daily Traffic	I/D
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect.		

Advantages

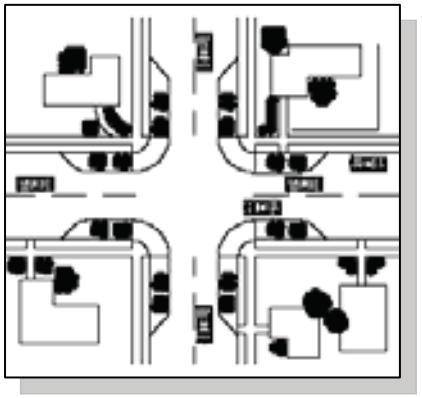
- Relatively inexpensive
- Can be effective in slowing travel speeds in specific locations

Disadvantages

- Raised pavement markers can be slippery when wet
- Increased noise in vicinity of rumble strips
- Maintenance of raised pavement markers
- Aesthetics
- Uncomfortable for motorcyclists and bicyclists

Neckdown/Bulbout

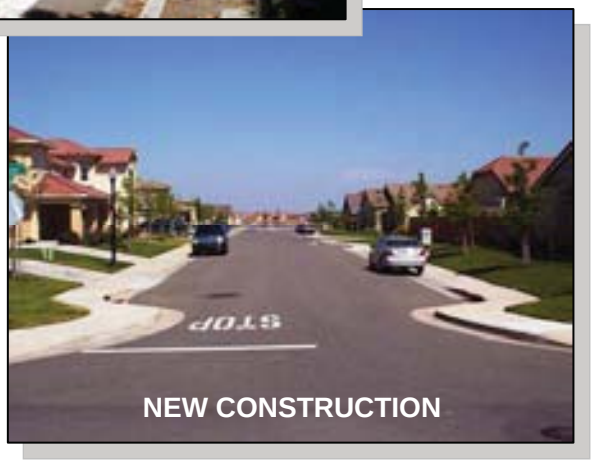
Neckdowns/bulbouts are raised curb extensions that narrow the travel lane at intersections or midblock locations. Neckdowns/bulbouts "pedestrianize" intersections by shortening the crossing distance and decreasing the curb radii, thus reducing turning vehicle speeds. Both of these effects increase pedestrian comfort and safety at the intersection.



The magnitude of speed reduction is dependent on the spacing of neckdowns between points that require drivers to slow (see page 55). On average, neckdowns achieve a 7 percent reduction in speeds.

Approximate Cost: $5,000 – $10,000 per corner

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-7%
Volume Reduction	Reduction in Vehicles per Day	-10%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		



Advantages

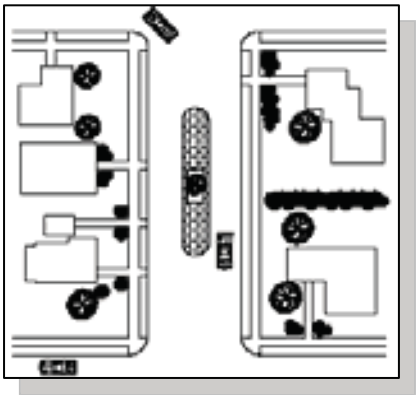
- Reduces pedestrian crossing distance and exposure to vehicles
- Through and left-turn movements are easily negotiable by large vehicles
- Creates protected on-street parking bays
- Reduces speeds (especially right-turning vehicles) and traffic volumes

Disadvantages

- Effectiveness is limited by the absence of vertical or horizontal deflection
- May slow right-turning emergency vehicles
- Potential loss of on-street parking
- May require bicyclists to briefly merge with vehicular traffic

Center Island Narrowing

Center island narrowings are raised islands located along the centerline of a street that narrow the travel lanes at that location. Placed at the entrance to a neighborhood, and often combined with textured pavement, they are often called "gateways." Fitted with a gap to allow pedestrians to walk through at a crosswalk, they are often called "pedestrian refuges." They can also be landscaped to increase visual aesthetics.



The magnitude of speed reduction is dependent on the spacing of center island narrowings between points that require drivers to slow (see page 55). On average, center island narrowings achieve a 7 percent reduction in speeds.

Approximate Cost: $5,000 - $10,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-7%
Volume Reduction	Reduction in Vehicles per Day	-10%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

FITTED WITH PEDESTRIAN REFUGE

UPGRADED AESTHETICS

Advantages

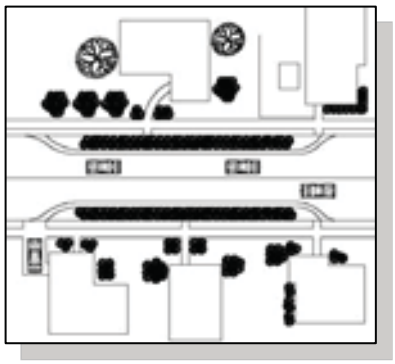
- Can increase pedestrian safety
- Aesthetic upgrades can have positive aesthetic value
- Reduces traffic volumes if alternative routes are available

Disadvantages

- Effect on vehicle speeds is limited by the absence of any vertical or horizontal deflection
- Potential loss of on-street parking

Two-lane choker

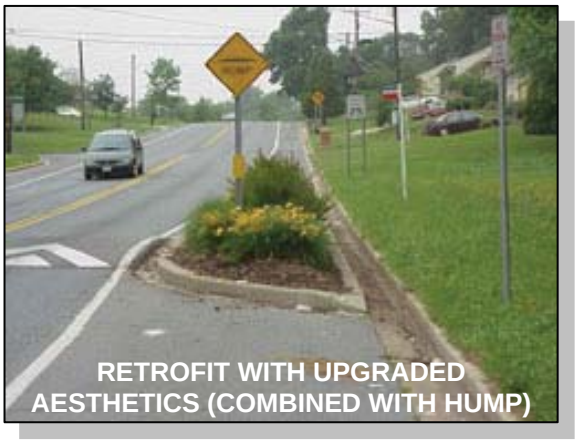
Chokers are curb extensions at midblock that narrow a street. Chokers leave the street cross section with two lanes that are narrower than the normal cross section.



The magnitude of speed reduction is dependent on the spacing of two-lane chokers between points that require drivers to slow (see page 55). On average two-lane chokers achieve a 7 percent reduction in speeds.

Approximate Cost: $7,000 - $8,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-7%
Volume Reduction	Reduction in Vehicles per Day	-10%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		



RETROFIT WITH UPGRADED AESTHETICS (COMBINED WITH HUMP)

NEW CONSTRUCTION

Advantages

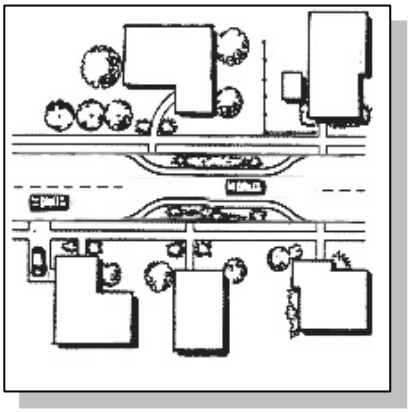
- Easily negotiable by emergency vehicles and buses
- Can have positive aesthetic value
- Reduces both speeds and volumes

Disadvantages

- Effect on vehicle speeds is limited by the absence of any vertical or horizontal deflection
- May require bicyclists to briefly merge with vehicular traffic
- Loss of on-street parking
- Build-up of debris in gutter

One-lane choker

One-lane chokers narrow the roadway width such that there is only enough width to allow travel in one direction at a time. They operate similarly to one-lane bridges, where cars approaching on one side must wait until all traffic in the other direction has cleared before proceeding.



The magnitude of speed reduction is dependent on the spacing of one-lane chokers between points that require drivers to slow (see page 55). On average, one-lane chokers achieve a 14 percent reduction in speeds.

Approximate Cost: $8,000 - $9,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-14%
Volume Reduction	Reduction in Vehicles per Day	-20%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

Advantages

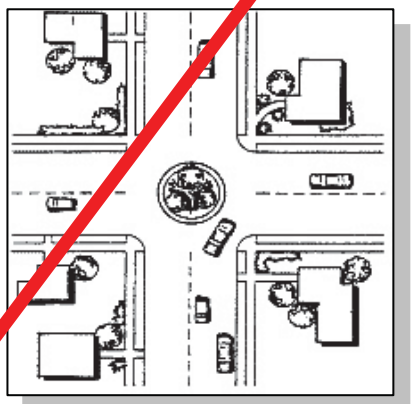
- Maintains two-way vehicle access, except at choker
- Very effective in reducing speeds and traffic volumes

Disadvantages

- Perceived as unsafe because opposing traffic is vying for space in a single lane
- Can be used only on low-volume, low speed roads
- Loss of on-street parking

Traffic Circle

Traffic circles are raised islands, placed in intersections, around which traffic circulates. Stop signs or yield signs can be used as traffic controls at the approaches of the traffic circle. Circles prevent drivers from speeding through intersections by impeding the straight-through movement and forcing drivers to slow down to yield. Depending upon the size of the intersection and circle, trucks may be permitted to turn left in front of the circle.



The magnitude of speed reduction is dependent on the spacing of traffic circles between points that require drivers to slow (see page 55). On average, traffic circles achieve an 11 percent reduction in speeds and a dramatic 71 percent decrease in collisions.

Approximate Cost: $10,000 - $25,000 per location

Measured Effectiveness		
Speed Impacts	Reduction in 85th Percentile Speeds between Slow Points	-11%
Volume Impacts	Reduction in Vehicles per Day	-5%
Safety Impacts	Reduction in Average Annual Number of Collisions	-71%
Source: Traffic Calming: State of the Practice, 2000.		

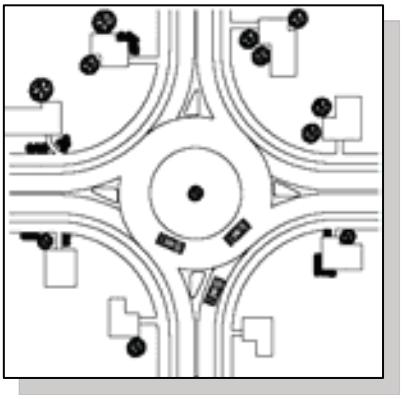
Advantages

- Very effective in moderating speeds and improving safety
- Can have positive aesthetic value

Disadvantages

- If not designed properly, difficult for emergency vehicles or large trucks to travel around
- Must be designed so that the circulating traffic does not encroach on crosswalks
- Potential loss of on-street parking

Roundabout (single-lane)



Like traffic circles, roundabouts require traffic to circulate counterclockwise around a center island. But unlike circles, roundabouts are used on higher volume streets to allocate right-of-way among competing movements. They are found primarily on collector streets, often substituting for traffic signals. They are larger than neighborhood traffic circles, have raised splitter islands to channel approaching traffic to the right, and do not have stop signs. Due to large amount of required right-of-way and construction costs, roundabouts may be most appropriate for new developments.

Roundabouts have an insignificant effect in reducing traffic speeds, but serve to allocate right-of-way at an intersection similar to a traffic signal. On average, roundabouts can reduce the average number of accidents up to 33 percent when compared to a signalized intersection.

Approximate Cost: Varies by intersection and whether new construction or a retrofit.

Measured Effectiveness		
Speed Impacts	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Impacts	Reduction in Vehicles per Day	I/D
Safety Impacts	Reduction in Average Annual Number of Collisions	-15% to -33%
Note: I/D = Insufficient Data to predict reduction effect. Source: Roundabouts: An Informational Guide, 2000.		

Advantages

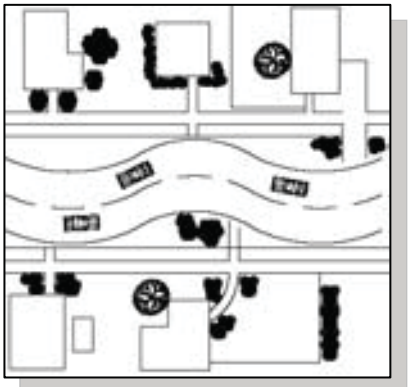
- Enhanced vehicle safety compared to a traffic signal or stop sign
- Minimizes queuing at approaches to the intersection
- Less expensive to operate than traffic signals
- Can have positive aesthetic value
- Shorter pedestrian crossing distance

Disadvantages

- May require major reconstruction of an existing intersection
- Loss of on-street parking
- Continuous flow of traffic limits opportunity for pedestrians to cross (compared to signal)

Chicane

Chicanes are curb extensions that alternate from one side of the street to the other, forming S-shaped curves. Chicanes can also be created by alternating on-street parking between one side of the road and the other. Each parking bay can be created either by restriping the roadway or by installing raised center islands at each end, creating a protected parking area. Chicanes have limited effectiveness in reducing traffic speeds and volumes as compared to other devices. Little data has been collected to predict the reduction in speed, traffic volumes, or collisions, and use of this device may not result in significant decreases. Resources permitting, DPW staff can collect before and after data to determine the effectiveness of chicanes.



Approximate Cost: $8,000 - $14,000 per location

Measured Effectiveness		
Speed Impacts	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Impacts	Reduction in Vehicles per Day	I/D
Safety Impacts	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient data to predict reduction effect.		

RETROFIT WITH
STANDARD TREATMENT

RETROFIT WITH
UPGRADED AESTHETICS

Advantages

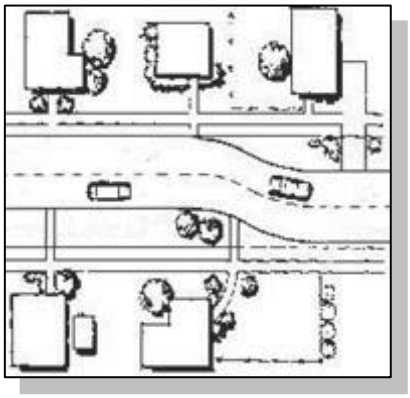
- Discourages high speeds by forcing horizontal deflection
- Easily negotiable by emergency vehicles and buses

Disadvantages

- Must be designed carefully to discourage drivers from deviating out of the appropriate lane
- Curb realignment and landscaping can be costly, especially if there are drainage issues
- Loss of on-street parking

Lateral Shift

Lateral shifts are curb extensions on otherwise straight streets that cause a shift in the travel. Lateral shifts, with just the right degree of deflection, can be effective. However, lateral shifts have had limited use in the United States, and, consequently, insufficient data prevents accurate prediction of speed reduction and traffic volumes.



Approximate Cost: Dependent on size of offset and length of transition

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Reduction	Reduction in Vehicles per Day	I/D
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect.		

Advantages

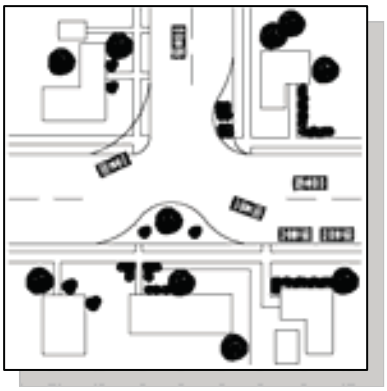
- Can accommodate higher traffic volumes than many other neighborhood traffic management measures
- Easily negotiable by large emergency vehicles and buses

Disadvantages

- Potential for loss of on-street parking
- Must be designed carefully to discourage drivers from deviating out of the appropriate lane

Realigned Intersection

Realigned intersections provide deflection on an otherwise straight approach of a T-intersection. By providing deflection in the form of a curb extension or realignment, drivers are required to slow through the intersection or come to a stop before turning. Little data has been collected to predict the reduction in speed, traffic volumes, or collisions, and use of this device may not result in significant decreases. Resources permitting, DPW staff can collect before and after data to determine the effectiveness of realigned intersections.



Approximate Cost: $15,000 - $30,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Reduction	Reduction in Vehicles per Day	I/D
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect.		

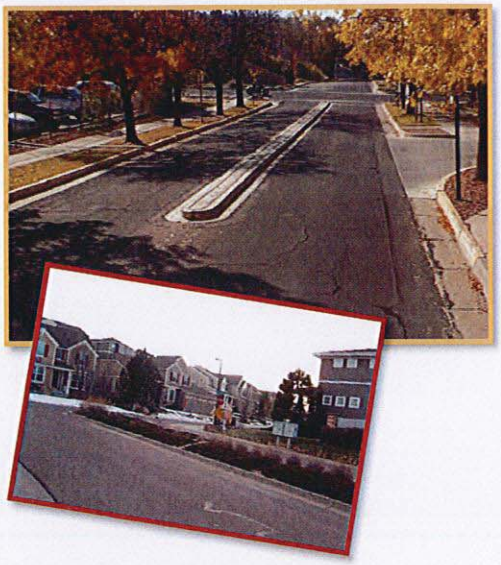
Advantages

- Can be effective at reducing speeds at T-intersections
- Can be effective in increasing safety at T-intersections

Disadvantages

- Modifying curbs or drainage can be costly
- Acquiring additional right-of-way can be costly

Medians
Partial Medians



DESCRIPTION:

A median is a raised curb island placed at the center of a roadway. Medians are typically concrete and may include landscaping to provide additional visual enhancement. They provide physical separation between on-coming traffic lanes, narrow the travel lanes, and can create the perception of a narrower roadway. They can also act as a refuge for pedestrians in certain applications.

APPLICATION:

Medians may be used for speed reduction, turn restrictions, enhanced safety, or a mix of all three. Medians are best suited for wide residential streets with a history of high speeds to narrow the travel lanes, interrupt sight distances, and reduce pedestrian crossing distances.

Advantages

- May help reduce travel speed
- Separates opposing traffic lanes
- Shortens pedestrian crossings
- Can improve safety both for vehicles and pedestrians

Disadvantages

- Potential for increased maintenance if landscaped
- Medians are not as effective as speed humps or traffic circles in slowing speeds
- May interrupt emergency access and operations
- May interrupt driveway/side street access and result in U-turns at the end of medians
- Can create drainage issues

Effectiveness Scorecard

Speed	Fair
Volume	Fair
Cut-through	Poor
Crashes	Fair
Emergency Vehicle	Fair
Pedestrian	Fair
Bicycle	Fair
Noise	N/A
Cost	$$$

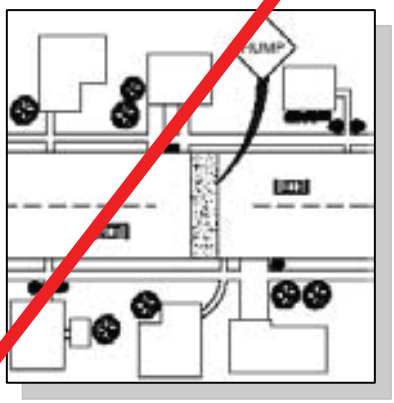
Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Speed Hump

Speed humps are rounded raised areas placed across the road. They are generally 12 feet long (in the direction of travel), 3 to 3 ½ inches high, parabolic in shape, and have a design speed of 15 to 20 mph. They are usually constructed with a taper on each side to allow unimpeded drainage between the hump and curb. When placed on a street with rolled curbs or no curbs, bollards are placed at the ends of the speed hump to discourage vehicles from veering outside of the travel lane to avoid the device.



The magnitude of reduction in speed is dependent on the spacing of speed humps between points that require drivers to slow (see page 55). On average, speed humps achieve a 22 percent reduction in speeds.

Approximate Cost: $2,000 - $3,000 per location

Measured Effectiveness		
Speed Impacts	Reduction in 85th Percentile Speeds between Slow Points	-22%
Volume Impacts	Reduction in Average Daily Traffic	-18%
Safety Impacts	Reduction in Average Annual Number of Collisions	-13%
Source: Traffic Calming: State of the Practice, 2000.		

Advantages

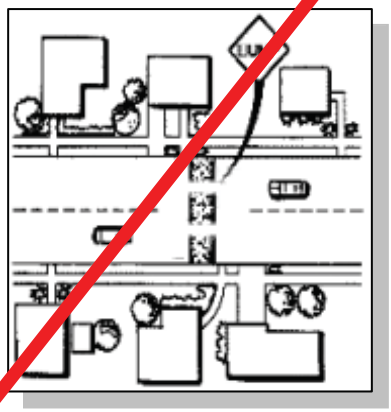
- Relatively inexpensive
- Relatively easy for bicyclists to cross
- Very effective in slowing travel speeds

Disadvantages

- Causes a "rough ride" for drivers, and can discomfort people with certain skeletal disabilities
- Slows emergency vehicles and buses
- Aesthetics
- Signs may be unwelcome by adjacent residents
- Increased noise for nearby residents

Speed Lump

The speed lump is a variation on the speed hump, adding two wheel cut-outs designed to allow large vehicles, such as emergency vehicles and buses, to pass with minimal slowing. The design limits passenger cars and mid-size SUVs from fully passing through the cut-outs, but allows one set of wheels to pass through the cut-out while the other set is required to travel over the lump.



The magnitude of speed reduction is dependent on the spacing of speed lumps between points that require drivers to slow (see page 55). Speed lumps have a similar reduction in speeds when compared to speed humps.

Approximate Cost: $2,000 - $3,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D, but comparable to speed humps
Volume Reduction	Reduction in Average Daily Traffic	
Safety Reduction	Reduction in Average Annual Number of Collisions	
Note: I/D = Insufficient Data to predict reduction effect.		

Advantages

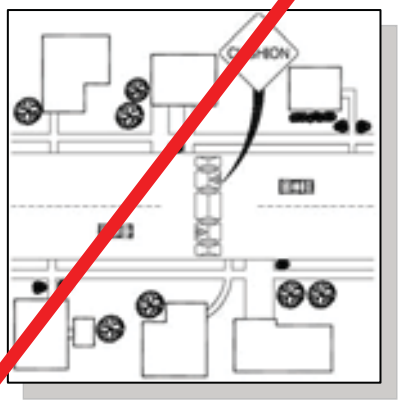
- Effective in reducing speeds
- Maintains rapid emergency response times
- Relatively easy for bicyclists to cross

Disadvantages

- Passenger vehicles with wide wheel base can pass through the lump using the wheel cut-outs
- Aesthetics
- Signs may be unwelcome by adjacent residents
- Increased noise for nearby residents

Speed Cushion

Speed cushions are a variation of the speed lump that is constructed from durable recycled rubber. These prefabricated devices consistently have a more uniform shape than asphalt humps. Speed cushions provide wheel gaps for emergency vehicles and buses, and can be arranged to fit any street width.



The magnitude of speed reduction is dependent on the spacing of speed cushions between points that require drivers to slow (see page 55). On average, speed cushions achieve a 14 percent reduction in speeds.

Approximate Cost: $4,500 - $6,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-14%
Volume Reduction	Reduction in Average Daily Traffic	Comparable to Speed Lumps
Safety Reduction	Reduction in Average Annual Number of Collisions	
Source: City of Portland, Rubber Speed Bump Research, 1995.		

Advantages

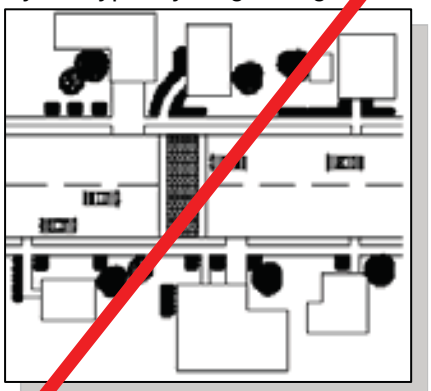
- Provides a more consistent ride than asphalt humps
- Can be used as a temporary device during a testing phase
- Reduces impacts to emergency vehicles due to cut-outs
- Easily accommodates street resurfacing

Disadvantages

- Aesthetics (but may be better than lumps)
- Signs may be unwelcome by adjacent residents
- Increased noise for nearby residents

Speed Table

Speed tables are flat-topped speed humps approximately 22 feet long. They are typically long enough for the entire wheelbase of a passenger car to rest on top. Their long, flat fields, plus ramps that are more gently sloped than speed humps, give speed tables higher design speeds than humps, and, thus, may be more appropriate for streets with higher ambient speeds. Brick or other textured materials improve the appearance of speed tables, draw attention to them, and may enhance safety and speed reduction.



The magnitude of speed reduction is dependent on the spacing of speed tables between points that require drivers to slow (see page 55). On average, speed tables achieve an 18 percent reduction in speeds.

Approximate Cost: $4,000 for basic treatment

Measured Effectiveness		
Speed Impacts	Reduction in 85th Percentile Speeds between Slow Points	-18%
Volume Impacts	Reduction in Vehicles per Day	-12%
Safety Impacts	Reduction in Average Annual Number of Collisions	-45%
Source: Traffic Calming: State of the Practice, 2000.		

Advantages

- Smoother on large vehicles (such as fire trucks) than speed humps
- Effective in reducing speeds, though not to the extent of speed humps

Disadvantages

- Aesthetics
- Textured materials, if used, can be expensive
- Signs may be unwelcome by adjacent residents
- Increased noise for nearby residents

Speed Kidney

Institute of Transportation Engineers Journal December 2012

Advantages

- Decreases vehicle speeds
- Discourages cut through traffic
- Inexpensive and easy to construct

Disadvantages

- May cause speeding beyond the speed kidney
- May divert traffic to an adjacent neighborhood street
- May increase noise levels as vehicles decelerate and accelerate

DESCRIPTION:

Speed Kidneys are an arrangement of three speed lumps elongated with a curvilinear shape in the direction of traffic. The main speed lumps of the speed kidney are placed in the travel lane, while a complimentary speed lump is placed between the lanes. Passenger vehicle drivers choosing to drive over the speed kidneys in a straight path experience vertical discomfort as two or four wheels traverse the different parts of the speed kidney. Passenger vehicle drivers may also choose to take a curvilinear path to avoid the vertical deflection. In either case, field evaluation has documented speed reductions. The effective width of the speed kidney is narrow enough to allow emergency vehicles and trucks to follow a straight path straddling the in-lane lump

APPLICATION:

Speed kidneys may be installed on neighborhood streets to address speed, volume, and cut-through traffic and are designed and constructed to allow vehicles to travel at or near the posted speed limit. Speed Kidneys have the advantage over speed humps, speed lumps, and speed cushions in that passenger car drivers may adapt their travel path to the device and avoid any vertical deflection. Bicyclists may also negotiate the device without crossing any vertical deflection. Design parameters should follow those recommended by researchers at the Universitat Politècnica de València and as documented in the December 2012 issue of the ITE Journal.

Effectiveness Scorecard

Speed	●
Volume	◕
Cut-through	◕
Crashes	◒
Emergency Vehicle	◕
Pedestrian	◕
Bicycle	◕
Noise	◒
Cost	$

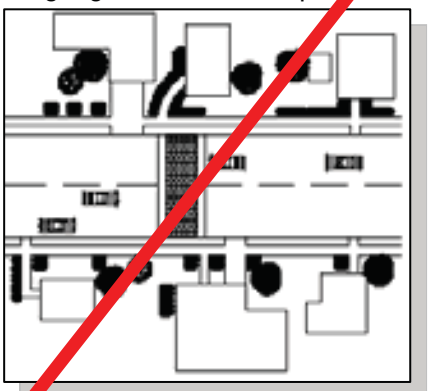
● Very Good ◕ Good ◒ Fair ◔ Poor N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Raised Crosswalk

Raised crosswalks are speed tables striped with crosswalk markings and signage to channelize pedestrian crossings, providing pedestrians with a level street crossing. Also, by raising the level of the crossing, pedestrians are more visible to approaching motorists.



The magnitude of speed reduction is dependent on the spacing of raised crosswalks between points that require drivers to slow (see page 55). On average, raised crosswalks achieve an 18 percent reduction in speeds.

Approximate Cost: $5,000 for basic treatment

Measured Effectiveness		
Speed Impacts	Reduction in 85th Percentile Speeds between Slow Points	-18%
Volume Impacts	Reduction in Vehicles per Day	-12%
Safety Impacts	Reduction in Average Annual Number of Collisions	-45%
Source: Traffic Calming: State of the Practice, 2000.		

STANDARD TREATMENT

UPGRADED AESTHETICS

Advantages

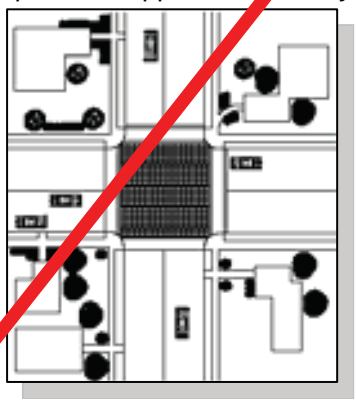
- Improve safety for both vehicles and pedestrians
- Aesthetic upgrades can have positive aesthetic value
- Effective in reducing speeds, though not to the extent of speed humps

Disadvantages

- Textured materials, if used, can be expensive
- Impact to drainage needs to be considered
- Textured pavement can increase noise to adjacent residents
- Signs may be unwelcome by adjacent residents

Raised Intersection

Raised intersections are flat raised areas covering entire intersections, with ramps on all approaches. They usually rise to sidewalk level, or slightly below, to provide a "lip" for the visually impaired. By modifying the level of the intersection, the crosswalks are more readily perceived by motorists to be a pedestrian area. They are particularly useful where loss of on-street parking due to other traffic calming devices is considered unacceptable. Raised intersections are ineffective at reducing traffic speeds or volumes.



Approximate Cost: Varies based on size of intersection

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-1%
Volume Reduction	Reduction in Average Daily Traffic	I/D
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

Advantages

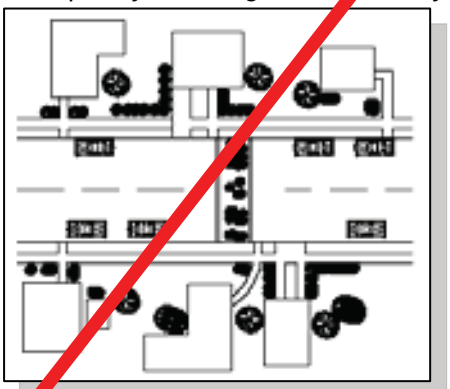
- Can improve safety for pedestrians and motorists
- Aesthetic upgrades can have positive aesthetic value
- Can treat two streets at once

Disadvantages

- Less effective in reducing vehicle speeds than speed humps and speed tables
- Expensive, particularly as a retrofit
- Textured pavement can increase noise to adjacent residents

Full Closure

Full street closures are barriers placed across a street to close the street completely to through traffic, usually leaving only sidewalks or bicycle paths open. The barriers may consist of landscaped islands, walls, gates, side-by-side bollards, or any other obstructions that leave an opening smaller than the width of a passenger car. Emergency vehicles can be accommodated via removable bollards or similar devices.



Approximate Cost: $30,000 - $100,000 per location (dependent on size and treatment)

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D
Volume Reduction	Reduction in Vehicles per Day	-44%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

Advantages

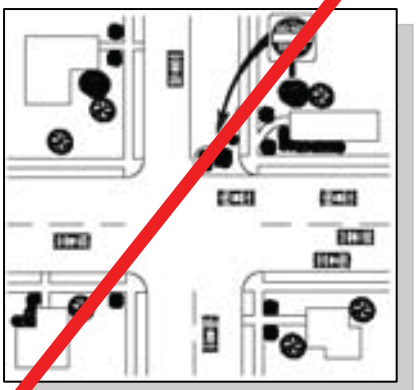
- Very effective in reducing cut-through traffic volumes
- Able to maintain pedestrian and bicycle connectivity

Disadvantages

- Requires statutory actions for public street closures
- Causes circuitous routes for local residents
- Diverts traffic to another street
- Delays for emergency services unless through access is provided
- May limit access to businesses
- Cost

Partial Closure

Half street closures are barriers that block travel in one direction for a short distance on otherwise two-way streets. Half closures are the most common volume control measure after full street closures. Half closures are often used in sets to make travel through neighborhoods with a grid street pattern circuitous rather than direct.



Approximate Cost: $5,000 - $7,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-19%
Volume Reduction	Reduction in Vehicles per Day	-42%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

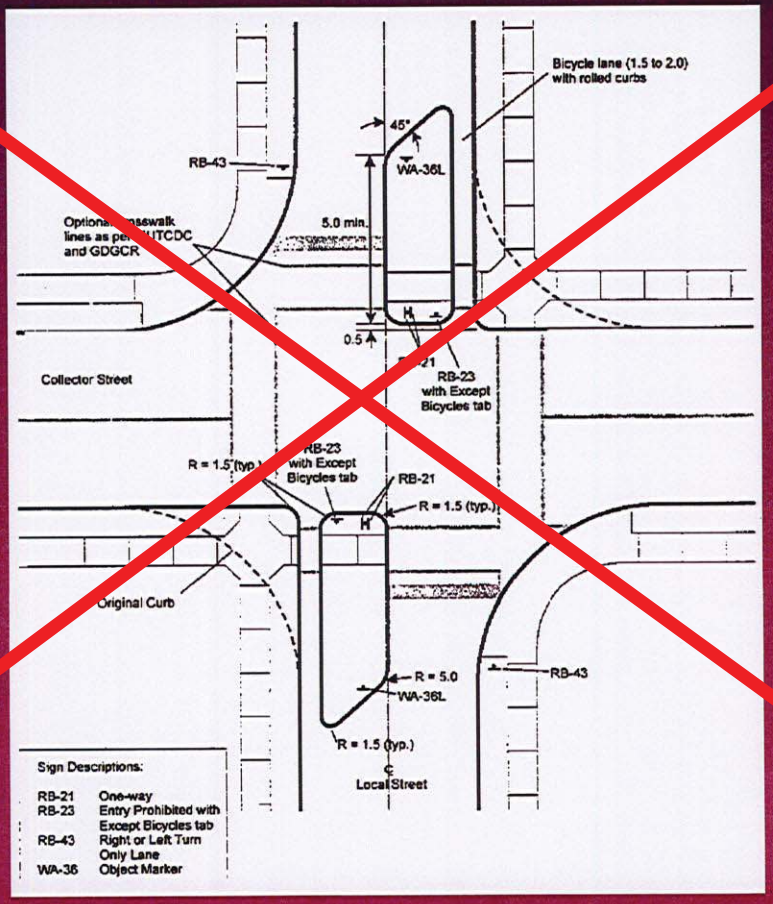
Advantages

- Able to maintain two-way bicycle access
- Effective in reducing traffic volumes

Disadvantages

- Causes circuitous routes for local residents
- May limit access to businesses
- Drivers can bypass the barrier

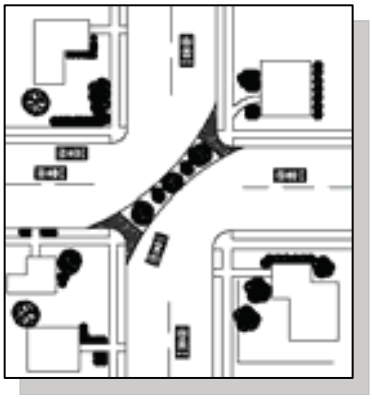
Canadian Design
Half Closure/Semi-Diverter



Source: Draft *Canadian Guide to Neighbourhood Traffic Calming*, 1998, Copyright Transportation Association of Canada. Used with permission

Diagonal Diverter

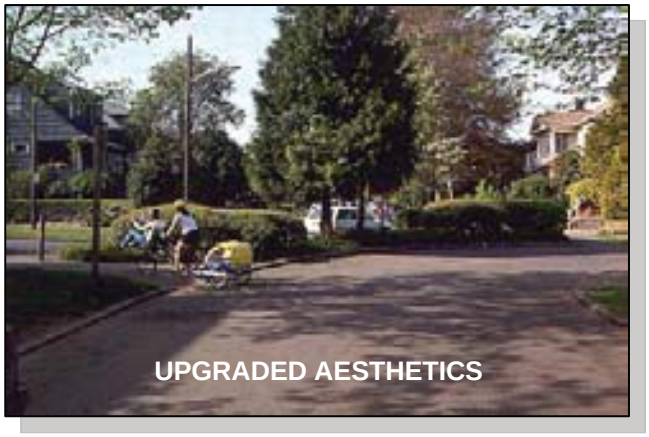
Diagonal diverters are barriers placed diagonally across an intersection, blocking through movement. Like half closures, diagonal diverters are usually staggered to create circuitous routes through neighborhoods.



Approximate Cost: $20,000 - $25,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	-4%
Volume Reduction	Reduction in Vehicles per Day	-35%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

STANDARD TREATMENT
WITH MINOR LANDSCAPING TREATMENT



UPGRADED AESTHETICS

Advantages

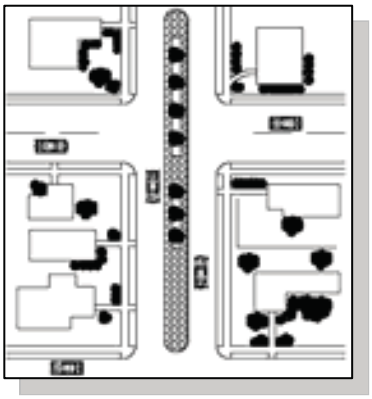
- Able to maintain full pedestrian and bicycle access
- Reduces traffic volumes

Disadvantages

- Causes circuitous routes for local residents
- Delays for emergency services
- May be expensive
- May require reconstruction of corner curbs

Median Barrier

Median barriers are raised islands that are located along the centerline of a street and continue through an intersection so as to block through (and left-turn) movement at a cross street.



Approximate Cost: $15,000 - $20,000 per 100 feet (dependent on length and width)

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D%
Volume Reduction	Reduction in Vehicles per Day	-31%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

Advantages

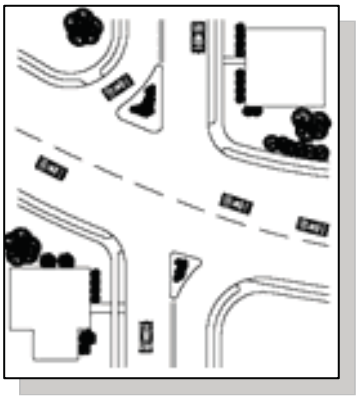
- Can improve safety at an intersection of a local street and a major street by prohibiting critical through or left-turn movements
- Can reduce traffic volumes on a cut-through route that crosses a major street

Disadvantages

- Requires available street width on the major street
- Limits turns to and from the side streets and driveways for local residents and emergency services

Forced-Turn Island

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



Approximate Cost: $3,000 - $5,000 per location

Measured Effectiveness		
Speed Reduction	Reduction in 85th Percentile Speeds between Slow Points	I/D%
Volume Reduction	Reduction in Vehicles per Day	-31%
Safety Reduction	Reduction in Average Annual Number of Collisions	I/D
Note: I/D = Insufficient Data to predict reduction effect. Source: Traffic Calming: State of the Practice, 2000.		

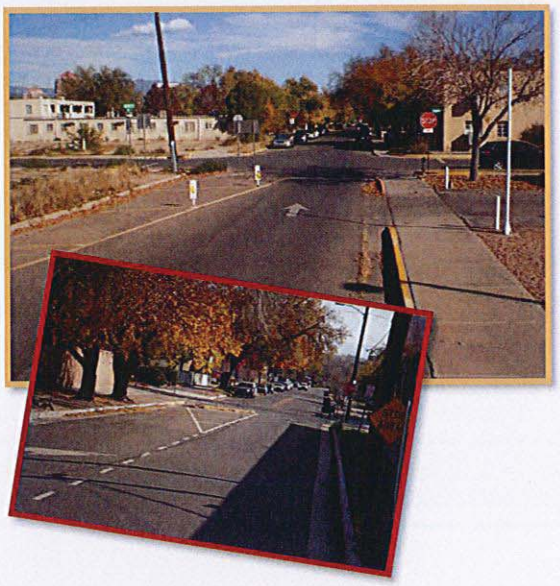
Advantages

- Can improve safety at an intersection by prohibiting critical turning movements
- Reduces traffic volumes

Disadvantages

- If designed improperly, drivers can maneuver around the island to make an illegal movement
- May divert a traffic problem to a different street

Two-
Street Conversions



DESCRIPTION:

Two-way street conversions involve changing the operation of a one way street to two way traffic. One-way couplets were historically established to provide greater capacity for traffic moving into and out of downtown areas. As travel patterns have changed and urban neighborhoods have become more established many cities are converting one-way couplets into two, two-way streets.

APPLICATION:

Two-way street conversions are most appropriate in areas where long established one-way couplets are no longer needed to accommodate the peak hour traffic demand or in areas where changing the character of the street is seen to have a positive neighborhood or economic development benefit. Two-way street conversions involve the reconstruction of traffic signals, signing, and striping.

Advantages

- May reduce vehicle speed
- May improve neighborhood character
- May create economic development opportunities

Disadvantages

- Introduces more vehicle, bicycle, and pedestrian conflicts
- Reduces through traffic capacity
- May impact bicycle lanes and parking

Effectiveness Scorecard

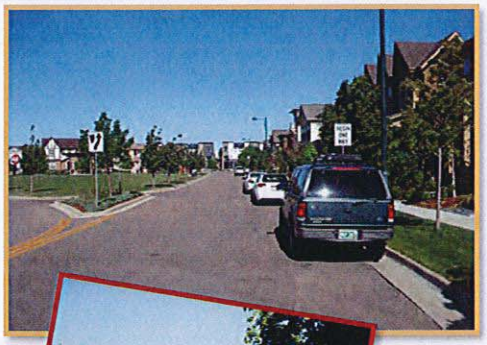
Speed	◕
Volume	◒
Cut-through	◒
Crashes	◒
Emergency Vehicle	◕
Pedestrian	◕
Bicycle	◕
Noise	N/A
Cost	$$$$

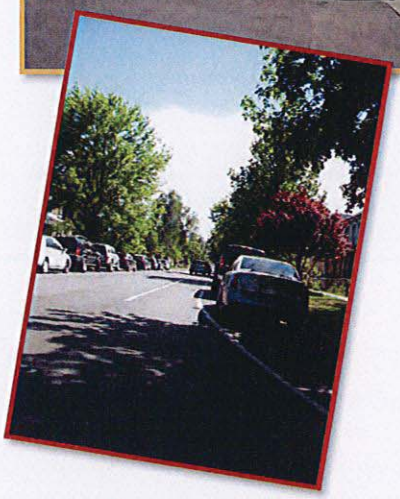
● Very Good ◕ Good ◒ Fair ◔ Poor N/A Not Applicable

Quick Glance

SPEED LIMIT 25

One-Couplet Conversions





DESCRIPTION:

One-way couplets consist of a pair of parallel one-way streets that carry traffic in opposing directions. Couplets are established to provide greater capacity for automobiles particularly in areas with heavy peak directional demand. In a grid system, one-way couplets are often separated by a single city block, have fewer turning movements at intersections, and better synchronization of traffic signals.

APPLICATION:

One-way couplets are most appropriate for core urban areas with an established grid street system where the emphasis on mobility over land access is desired. Recognizing the need to maintain capacity for peak hour travel, this strategy is meant to manage rather than restrict or redirect vehicles. One-way couplets can be designed and configured to reduce the pedestrian crossing distances, establish bicycle lanes, and/or create needed on-street parking.

Advantages

- Higher automobile capacity than equivalent two-way streets
- May reduce pedestrian crossing distances
- Fewer intersection turning movements may increase safety
- Provides opportunities to create bicycle lanes and/or on-street parking

Disadvantages

- Without other traffic management strategies speeds may increase
- Delays emergency vehicles
- Increases travel time and out of direction travel for local residents

Effectiveness Scorecard

Speed	Good
Volume	Fair
Cut-through	Fair
Crashes	Very Good
Emergency Vehicle	Fair
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance