

MEMORANDUM

TO: CITY COUNCIL

FROM: TERESA MCCLISH, DIRECTOR OF COMMUNITY DEVELOPMENT

BY: MATT HORN, CITY ENGINEER

SUBJECT: CONSIDERATION OF NEIGHBORHOOD TRAFFIC CALMING GUIDELINES

DATE: APRIL 12, 2016

RECOMMENDATION:

As recommended by the Traffic Commission, it is recommended the City Council adopt a Resolution approving the Neighborhood Traffic Calming Guidelines.

IMPACT ON FINANCIAL AND PERSONNEL RESOURCES:

No direct costs are incurred by the approval of Neighborhood Traffic Calming Guidelines. Staff time will be processing Neighborhood Traffic Calming needs. Some future cost might be incurred if City Council chooses to fund future Neighborhood Traffic Calming Projects.

BACKGROUND:

On October 12, 2014, and January 26, 2015 the Traffic Commission reviewed Neighborhood Traffic concerns in the Le Point Street at McKinley Street area. After review, the Traffic Commission directed staff to prepare Neighborhood Traffic Calming Guidelines.

On April 28, 2015, the City Council reviewed the Neighborhood Traffic concerns in the Le Point Street at McKinley Street area, and concurred with the Traffic Commission's advisement.

On January 25, 2016 the Traffic Commission reviewed these Draft Neighborhood Traffic Calming Guidelines and provided direction on necessary revisions to the document. On March 28, 2016 the Traffic Commission reviewed the Neighborhood Traffic Calming Guidelines and recommends approval.

ANALYSIS OF ISSUES:

The Neighborhood Traffic Guidelines is divided in six (6) sections. Those sections are as follows:

**CITY COUNCIL
CONSIDERATION OF NEIGHBORHOOD TRAFFIC CALMING GUIDELINES
APRIL 12, 2016
PAGE 2**

1. Introduction
2. Passive Traffic Calming Measures
3. Active Traffic Calming Measures
4. Volume Reduction Measures
5. Guidelines and Warrants
6. Approval Process

The first four (4) sections of the Neighborhood Traffic Calming Guidelines are intended to be educational. Section five (5) Warrants and Guidelines is intended to provide a benchmark to help determine traffic calming needs and applicability. Section six (6) is intended to describe the process to analyze neighborhood traffic patterns, select appropriate traffic calming measures, and gain neighborhood concurrence.

ALTERNATIVES:

The following alternatives are provided for the Council's consideration:

- Approve Neighborhood Traffic Calming Guidelines;
- Do not approve Neighborhood Traffic Calming Guidelines; or
- Provide direction to staff on necessary Traffic Calming Guideline modifications.

ADVANTAGES:

Approving the Neighborhood Traffic Calming Guidelines provides an educational and procedural document that will help guide the Neighborhood Traffic Calming process. The Neighborhood Traffic Calming Guidelines is intended to provide City Leadership, Staff and Residents a better understanding of the benefits and compromises of traffic calming installations. The Neighborhood Traffic Calming Guidelines will also provide the City a process to develop neighborhood consensus.

DISADVANTAGES:

No disadvantages have been identified.

ENVIRONMENTAL REVIEW:

In compliance with California Environmental Quality Act (CEQA) the project is categorically exempt per section 15061(b)(3) of the CEQA Guidelines.

PUBLIC NOTIFICATION AND COMMENTS:

The Agenda was posted in front of City Hall on Thursday, April 7, 2016. The Agenda and staff report were posted on the City's website on Friday, April 8, 2016.

Attachment

1. Neighborhood Traffic Calming Guidelines

RESOLUTION NO.

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY
OF ARROYO GRANDE APPROVING NEIGHBORHOOD
TRAFFIC CALMING GUIDELINES**

WHEREAS, neighborhoods in the City of Arroyo Grande have increasingly indicated interest in traffic control measures and safety; and

WHEREAS, the City of Arroyo Grande encourages neighborhood input in such matters; and

WHEREAS, the City of Arroyo Grande wishes to establish a consistent procedure regarding Neighborhood Traffic Calming that ensures public involvement, safety and efficient roadway use.

NOW, THEREFORE BE IT RESOLVED that the City Council of the City of Arroyo Grande does as follows:

1. The Neighborhood Traffic Calming Guidelines date April 12, 2016, copies of which are on file in the Office of the City Clerk, are hereby approved.

On motion of Council Member _____, seconded by Council Member _____, and on the following roll call vote, to wit:

AYES:

NOES:

ABSENT:

the foregoing Resolution was passed and adopted this 12th day of April, 2016.

**RESOLUTION NO.
PAGE 2**

JIM HILL, MAYOR

ATTEST:

KELLY WETMORE, CITY CLERK

APPROVED AS TO CONTENT:

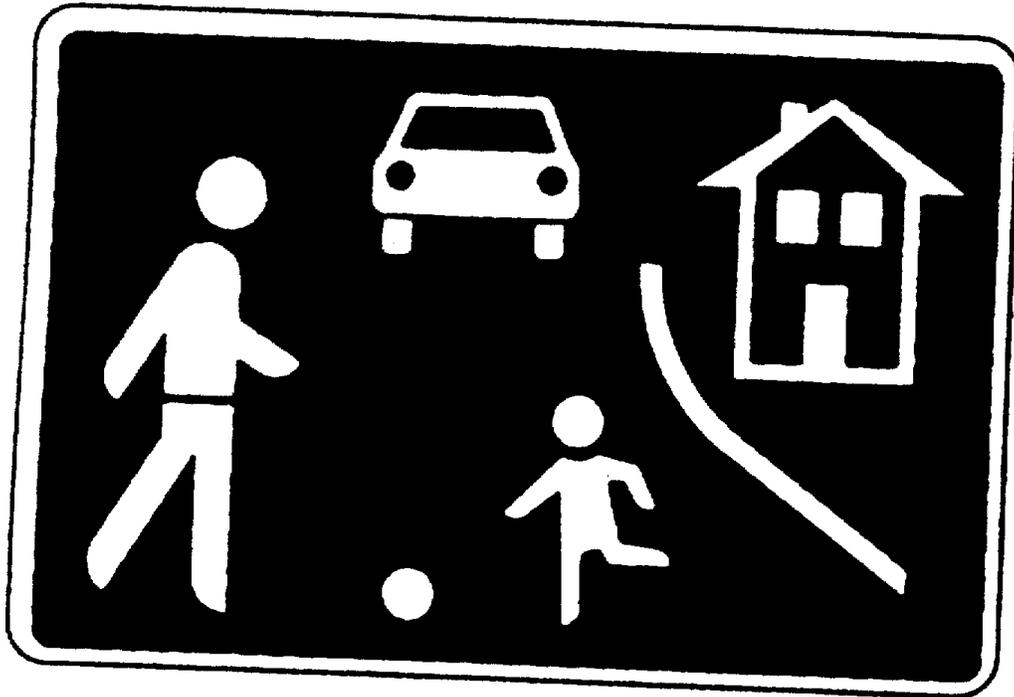
DIANNE THOMPSON, CITY MANAGER

APPROVED AS TO FORM:

HEATHER WHITHAM, CITY ATTORNEY

Neighborhood Traffic Calming Guidelines

ADOPTED BY THE CITY COUNCIL OF ARROYO GRANDE
BY RESOLUTION NO. XXX ON
April 12, 2016



COMMUNITY DEVELOPMENT DEPARTMENT ENGINEERING DIVISION

300 East Branch Street
Arroyo Grande, CA 93420
(805) 473-5420

Table of Contents

Introduction.....	3
Stop Sign Installation	4
Speed Limits	5
Traffic Calming Measures	5
Passive Traffic Calming Measures.....	6
Active Traffic Calming Measures	6
Volume Reduction Measures	6
Impacts of Traffic Calming Measures.....	7
Passive Traffic Calming Measures	8
Police Enforcement	8
High-Visibility Crosswalks	8
Radar Trailer, Speed Feedback Trailer.....	9
Speed Feedback Signs	10
Pavement Striping.....	10
Signed Turn Restrictions.....	11
Truck Restrictions	11
Active Traffic Calming Measures.....	12
Speed Humps	12
Speed Tables or Raised Crosswalk	13
Raised Intersection	14
Speed Cushion.....	15
Neighborhood Traffic Circles.....	16
Mid-Block Chokers	17
Medians.....	18
Bulbouts	19
Chicanes	20
Volume Reduction Measures	21
Diverters.....	21
Partial Closure.....	22
Full Street Closure	23
Guidelines for Installation or Warrants	24
Passive Traffic Calming Measures.....	24
Active Traffic Calming Measures	24
Volume Reduction Measures	25
Approval and Implementation Process.....	25

Neighborhood Traffic Calming Guidelines

Introduction

“Traffic calming” measures are a means to respond to unacceptable motoring behavior. The Institute of Traffic Engineers (ITE) define traffic calming as:

“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.”

The guiding principals of the “Traffic Calming Measures” include:

- The design and installation of “Traffic Calming Measures” should use sound traffic engineering principles.
- The development and selection of “Traffic Calming Measures” should encourage and facilitate public involvement.
- Installation of traffic calming measures should minimize diverted traffic to other local or residential collector streets.
- Emergency vehicle access, including safety and response times must be considered.
- Traffic calming devices must be designed to minimize adverse impacts to maintenance activities.
- Only State/Federal approved regulatory and/or warning signs may be installed.
- Bicycle and pedestrian travel should be enhanced through traffic calming and congestion relief.

Traffic calming measures are not solutions for all:

- Speeding;
- Cut-through;
- Congestion; or
- Traffic safety concerns.

Each neighborhood will have its own unique set of problems that will require an evaluation to identify appropriate traffic calming options. Residential streets are planned and designed to provide access to and from our residential neighborhoods. These facilities are neither designed nor intended for the use of non-local traffic. However, when congested conditions occur on collector and arterial roadways, these local streets will often provide an attractive alternative route.

It is the intent of this program to identify traffic calming measures, which can alter travel behavior to the betterment of the neighborhoods being affected. The intent here is to improve safety, encourage

bicycle and pedestrian travel, and to positively affect a resident's quality of life. The objectives of the local residential streets program are:

- Reduce vehicular speed where appropriate
- Reduce cut-through traffic
- Improve safety for bicycle and pedestrian travel
- Enhance the neighborhood environment

Residential areas adjacent to school zones traffic patterns, volumes and needs are different than other typical residential areas. These residential areas should meet the same basic criteria for implementation, including evaluation of the potential negative impacts that can result. School zone traffic tends to be extremely peaked, occurring at the time when children are arriving or departing school. While the condition requiring attention is short term in nature, the impacts of the traffic calming device extend throughout the day, and continue during school holidays and vacation. Traffic calming devices must take these issues into consideration and consider the following additional objectives:

- Improve the safety environment for children coming to and from school
- Increase awareness of motorist to school sites
- Improve safety for bicycle and pedestrian travel

This document outlines some basic traffic calming measures as well as the process for implementation. It is important to note that after the community agrees upon what is the appropriate solution, those costs to implement the traffic calming work may be borne by the City, the Neighborhood, or some combination of the two. This determination will be made by City Council upon plan approval.

Stop Sign Installation

Stop signs are valuable and effective control devices when used at the right place and under the right conditions. The intent of stop signs is to help drivers and pedestrians at an intersection decide who has the right-of-way.

Federal and State guidelines are required to be met prior to an installation of a Stop Sign. These guidelines take into consideration, among other things, the probability of vehicles arriving at an intersection at the same time, the length of time traffic must wait to enter, traffic delays, and the availability of safe crossing opportunities. This analysis is called a warrant analysis.

An unwarranted Stop Sign installation reduces speed in the vicinity of the Stop Sign, but drivers may accelerate to a speed faster than they drove before the Stop Sign was installed to make up for time lost.



Stop signs are not effective for speed control. Drivers tend to ignore unwarranted Stop Signs that, in their view, are unnecessary. If drivers are required to stop for Stop Signs and rarely see any traffic on the opposing streets, drivers become impatient and tend to disregard Stop Signs that have no obvious need.

Traffic generally finds the path of least resistance. If there are alternative routes to get from Point A to Point B and if these alternate routes have fewer traffic controls, drivers will take them. This may increase traffic volume on local streets.

Unwarranted Stop Signs increase vehicle fuel consumption. The Stop Sign requires additional stop/start maneuvers increasing wear and tear on vehicles.

Noise pollution increases due to stops and acceleration due to engine noise and brakes.

Speed Limits

The “Basic Speed Law” means that you may never drive faster than is safe for current conditions. Other than local residential roadways where the speed limit is 25 MPH, maximum Speed Limits are posted with Speed Limit signs. Posted Speed Limits are determined by measuring the speed of vehicles that use the roadway based on ideal driving conditions.

These Speed Limits are set near the 85th percentile speed of vehicles driving on the roadway. That means that 85 percent of vehicles driving on the roadway drive at or below this speed and 15 percent drive above this speed limit. Periodically, typically every five years, these Speed Limits are reevaluated and the Speed Limit adjusted to match the 85th percentile speed.

Adjusting the Speed Limit does not mean that vehicles will drive faster or slower, the adjusted Speed Limit more appropriately reflects vehicle speeds. As with most laws, Speed Limits depend on the voluntary compliance of the majority of motorists. Speed Limits cannot be set arbitrarily low, as this would create violators of the majority of drivers and would not command the respect or compliance of drivers. Speed Limits that are not set at the 85th percentile speeds are typically not enforceable and the court system will not enforce the ticket.



Traffic Calming Measures

The tools available for use in resolving neighborhood traffic problems are many and diverse in both their cost and effectiveness. This program has identified levels of traffic calming measures:

- Passive Traffic Calming Measures
- Active Traffic Calming Measures

- Volume Reduction Measures

Traffic calming measures may include devices that do not directly affect driver behavior and are not self-enforcing. These measures are generally included within the Passive Traffic Calming Measures. If Passive Traffic Calming Measures do not provide desired results, more restrictive measures may be warranted. More restrictive traffic calming measures, those found in the Active Measures and Volume Reduction categories, mandate driver behavior change and may be effective where Passive Traffic Control Measures have failed.

While this document identifies many Traffic Calming Measures, there are other traffic calming measures that are not included. This is not intended to restrict the use of other Traffic Calming Measures. Traffic Calming is an ever evolving area. Site specific analysis should be completed at the time of Traffic Calming implementation based on the best available current practices and design guidance.

Passive Traffic Calming Measures

Passive Traffic Calming Measures are intended to regulate, warn, guide, inform, and educate pedestrians, bicyclists and motorists. They include standard striping and signing measures, minor roadway design measures to improve visibility and safety, and enforcement by police. Passive Traffic Calming Measures are used primarily in those areas where traffic impacts have been found and traffic control and/or education has been determined to be appropriate. Some common Passive Traffic Calming Measures include:

- Education
- Police Enforcement
- High-Visibility Crosswalks
- Permanent Speed Feedback Signs
- Permanent Striping
- Signed Turn Restrictions
- Truck Restrictions

Active Traffic Calming Measures

Active Traffic Calming Measures are traffic control devices and roadway design features primarily designed to slow traffic. They are employed when the use of Passive Traffic Calming Measures cannot, or has not, effectively addressed speeding issues. Active Traffic Calming Measures may be used in conjunction with Passive Measures. Active Measures may have a limited effect on traffic volume as well. Some common Active Measures include:

- Speed Humps
- Speed Tables
- Raised Crosswalks
- Raised Intersections
- Speed Cushions
- Mid-Block Chokers
- Medians
- Bulbouts
- Chicanes

Volume Reduction Measures

Volume Reduction Measures are traffic control devices and roadway design features primarily designed to discourage residential street cut-through traffic. Volume reduction devices may be used by themselves or in conjunction with Passive and Active Measures. Some common Volume Reduction Measures include:

- Diverters
- Partial Closure
- Full Street Closure

Impacts of Traffic Calming Measures

Prior to installing traffic calming measures, it is important to carefully consider potential impacts. While many of the measures offer positive results, there are potential problems, which may be more significant than the original concern. This section attempts to describe some of the possible impacts of the use of speed reduction or volume reduction traffic calming tools.

- Effect on Emergency Vehicle Response Times: Speed, and to a lesser extent, volume traffic calming measures have potential for negatively impacting emergency vehicle response because they physically affect speed and maneuvering. Many Active Measures may increase emergency response time. These concerns should be considered for each location where Active Measures and Volume Reduction Measures are recommended.
- Traffic Diversion: Another concern is the potential for traffic calming techniques to move, rather than solve, a problem. Proposed Volume Reduction Measures should include an adequate study to evaluate traffic diversion impacts.
- Impacts on Transit and Utility Vehicles: Some Active Measures and Volume Reduction Measures could potentially impact bus routes. South County Transit and Lucia Mar Unified School District should be consulted whenever Active Measures and Volume Reduction Measures options are considered.
- Noise Impacts: The noise impact to adjacent residents resulting from vehicles braking and going over and around traffic calming devices can have an impact on the acceptability of these devices by residents.
- Loss of Parking: It may be necessary to restrict or prohibit on-street parking in the immediate vicinity of certain traffic calming features. There can also be significant on-street parking impacts from many speed reduction and volume reduction options.
- Liability Exposure Implications: Speed reduction and volume reduction traffic calming devices may result in varying degrees of liability exposure to the City. This exposure stems from the potential negative impact to emergency vehicle response times. It is also possible that traffic calming devices themselves could result in damage or injury if improperly used.
- Increased Maintenance Costs: Street maintenance costs will increase in two areas. First, landscaping associated with such devices as neighborhood traffic circles, roundabouts, chokers and chicanes, etc., will require regular maintenance. Second, devices such as speed humps will have to be reinstalled each time a residential street is overlaid which will increase these costs.

Passive Traffic Calming Measures

Police Enforcement

Police enforcement entails the presence of police to monitor speeds and issue citations. This method is used as an initial attempt to reduce speeds on streets. It is most applicable on streets with documented speeding problems and the need for quick mitigation. It can also be used during the learning period when new devices or restrictions are first implemented. For police enforcement, contact the Police Department.

Positive Aspects

- Effective while officer is actually present at the location
- Can be targeted to specific time periods that are deemed to be most problematic
- Can be implemented on short notice
- Targets violators without affecting normal traffic

Approximate cost: No direct additional cost to the City.

Negative Aspects

- It is a temporary measure
- Enforcement may be limited by police availability and other policing duties
- Long term financial commitment of police personnel
- It is labor intensive and expensive



High-Visibility Crosswalks

A high-visibility crosswalk is a crosswalk that incorporates striped patterns, pavement lights or flashing beacons, and signing to improve the visibility of the crosswalk. This measure is most applicable on local streets where speed control and pedestrian crossing designation is desired. It can also be used to discourage cut-through traffic. This type of crosswalk is most appropriate near schools and recreation facilities, but typically not at signalized intersections.

Positive Aspects

- Slows traffic
- Increases driver awareness of crosswalk
- Requires minimal maintenance for striped crosswalks

Negative Aspects

- May require removal of parking in the vicinity of the crosswalk
- May result in significant maintenance for embedded pavement lights or advance flashing lights

Approximate cost: \$20,000 to \$50,000 - (2016 dollars)



Radar Trailer, Speed Feedback Trailer

This is a mobile trailer-mounted radar display that informs drivers of their speed. This measure is applicable on any street where speeding is a problem.

Positive Aspects

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

Negative Aspects

- Not self-enforcing
- Duration of effectiveness is limited
- May require temporary lane closures

Approximate cost: No direct additional cost to the City.



Speed Feedback Signs

This is a permanent-mounted radar display that informs approaching drivers of their speed. This measure is applicable on any street where speeding is a problem.

Positive Aspects

- Educational tool
- Good public relations for neighborhoods
- Permanent reminder of travel speed

Approximate cost: \$4,000 to \$6,000 – (2016 dollars)

Negative Aspects

- Not self-enforcing
- Duration of effectiveness is limited
- Maintenance/theft



Pavement Striping

Striping is used to create narrow lanes, which give the impression of a narrow street. This makes the motorist feel restricted, which helps reduce speeds. It is most applicable to long, wide residential streets where speeding traffic exists.

Positive Aspects

- Easy to install and modify as necessary
- Low cost of implementation

Approximate cost: \$2,500 to \$15,000 – (2016 dollars)

Negative Aspects

- May not be self-enforcing
- May increase the likelihood of sideswipe accidents



Signed Turn Restrictions

Signs may be installed which prohibit certain movements at an intersection, e.g., “No Left Turn”. This measure is applicable on streets where cut-through traffic exists. This method can be tailored to be applicable during the most problematic times by defining a time period for the restriction.

Positive Aspects

- Redirects traffic to main streets
- Reduces cut-through traffic
- May address time-of-day problems

Negative Aspects

- Not self-enforcing
- May increase trip length for some commuters
- May redirect traffic to other neighborhood streets
- May confuse motorists unfamiliar with time-of-day restrictions

Approximate cost: \$1,500 to \$5,000 – (2016 dollars)



Truck Restrictions

Restricting the entry of trucks into residential neighborhoods can be achieved through the posting of truck restriction signs. This method is most applicable on residential streets to reduce cut-through traffic of commercial vehicles.

Positive Aspects

- Redirects commercial traffic through main streets
- Reduces noise and air pollution due to trucks in residential streets

Negative Aspects

- Not self-enforcing

Approximate cost: \$500 to \$2,500 – (2016 dollars)



Active Traffic Calming Measures

Active Traffic Calming Measures are primarily designed to lower travel speeds on the streets where they are installed.

Speed Humps

Speed humps are areas of pavement raised 3 inches in height over a minimum of 14 feet in length. The combination of different heights, lengths and approach ramps will affect the speed a vehicle can comfortably go over the hump. Speed humps are marked with signs and pavement markings. Speed humps are applicable on local streets where speed control is desired or where cut-through traffic is to be discouraged. Speed humps are not recommended for use on streets designated as primary response routes for emergency vehicles.

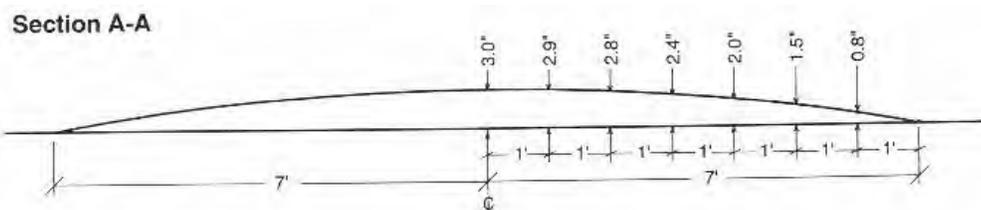
Positive Aspects

- Slows traffic
- Self-enforcing
- Requires minimum maintenance

Negative Aspects

- May increase emergency response times
- May damage emergency response vehicles if not carefully designed
- May increase traffic noise in the vicinity of the bump
- Modern cars with active suspension may be able to traverse the bumps at increased speeds.

Approximate cost: \$3,500 to \$5,000 – (2016 dollars)



Speed Tables or Raised Crosswalk

Raised crosswalks are flat-topped speed humps, 22 feet in length, built as a pedestrian crosswalk, with vehicle ramps on the approaches. This type of crosswalk is applicable to local streets where speed control and pedestrian crossing designation are desired. It can be an effective safety tool near schools and recreation facilities and can also be used to discourage cut-through traffic. Raised crosswalks are well-marked and may contain special paving or textures.

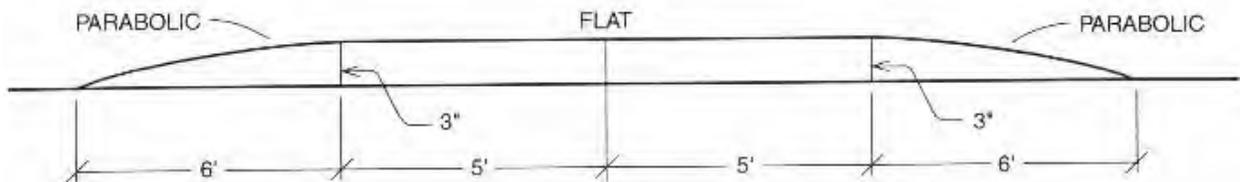
Positive Aspects

- Slows traffic
- Increases pedestrian visibility in the crosswalks
- Requires minimal maintenance

Negative Aspects

- May increase emergency response times
- May damage emergency response vehicles if not carefully designed
- May increase traffic noise in vicinity of crosswalk
- May create drainage issues where raised crossing extends from curb to curb
- May require extensive warning signs to be effective

Approximate cost: \$4,000 to \$6,000 – (2016 dollars)



Raised Intersection

Like raised crosswalks, the raised intersection is a flat-topped speed hump built over the entire area of intersecting streets at curb height, creating a flat surface over the entire intersection area. Raised intersections are constructed with ramps (gentle approaches 1:40) on all vehicle approaches, using bollards to define the pedestrian zone. They are often constructed with textured materials on the flat sections and the approach ramps. These are commonly used in area-wide traffic calming installations. This type of installation is applicable to arterial and collector streets where speed control and pedestrian crossing designation are desired. It can be an effective safety tool near schools and recreation facilities and can also be used to discourage cut-through traffic. Raised intersections are used in locations where loss of on-street parking would be acceptable.

Positive Aspects

- Slows traffic
- Increases pedestrian visibility in the crosswalks
- Requires minimal maintenance
- No impact on access

Approximate cost: \$25,000 to \$75,000 – (2016 dollars)

Negative Aspects

- May increase emergency response times
- May increase traffic noise in vicinity of the intersection
- May create drainage issues where raised crossing extends from curb to curb



Speed Cushion

Speed cushions consist of either recycled rubber or asphalt, raised about 3 inches in height. The length of the cushion is about 10 feet. The spaces between the cushions allow emergency vehicles to partially straddle the device. These devices are most effective if used in a series at 300' to 500' spacing or in conjunction with other traffic calming devices.

Positive Aspects

- Reduces vehicle speed
- Can reduce vehicular volumes
- No restrictions to on-street parking
- Does not restrict access
- Requires minimum maintenance
- Minimal impacts to emergency response times

Approximate cost: \$3,500 to \$5,000 for set – (2016 dollars)

Negative Aspects

- May increase emergency response times
- Not aesthetically pleasing
- May increase road maintenance costs



Neighborhood Traffic Circles

Neighborhood Traffic Circles are raised island placed in the intersection around which traffic circulates. Motorist yield to other motorists already in the intersection. Neighborhood Traffic Circles required motorist to slow to a speed that allows them to comfortably maneuver. The outer ring of the circle is mountable for large vehicles. The interior of the circle may be landscaped for enhanced aesthetics.

Positive Aspects

- Reduces intersection speed
- Reduces mid-block speeds by 10%
- Intersection collision reduction
- May include planting for increased neighborhood aesthetics

Negative Aspects

- May increase emergency response times
- Increased difficulty of large vehicle turning movement
- May result in bicycle/auto conflicts at intersections because of narrowed travel lane

Approximate cost: \$10,000 to \$30,000 for set – (2016 dollars)



Mid-Block Chokers

Chokers are raised islands in the parking zone that can be detached from the curb line to allow for drainage. Mid-Block Chokers narrow the roadway and are most applicable on wide streets with speeding and cut-through problems. Special attention is required during the design of Mid-Block Chokers to provide for bicycle access.

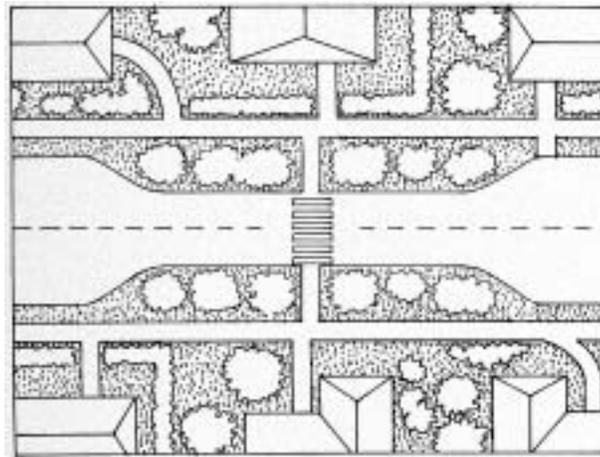
Positive Aspects

- Speed reduction
- Breaks up driver's sight-line
- Reduces pedestrian crossing
- Increases pedestrian and motorist visibility

Negative Aspects

- May require partial or total removal of on-street parking
- Increases maintenance for areas where street sweeping equipment cannot reach between the choker and the curb line

Approximate cost: \$15,000 to \$35,000 – (2016 dollars)



Medians

Medians are raised islands in the center of the roadway that separate traffic directions. Medians are used on wide streets to narrow the travel lanes, interrupt sight distances down the center of the roadway, and ease pedestrian crossings.

Positive Aspects

- Narrowed travel lanes can slow vehicle speeds
- Shortens pedestrian crossing
- Opportunity for landscaping and visual enhancements to the neighborhood
- Properly placed medians can result in congestion relief and capacity increases
- Congestion Relief

Negative Aspects

- Long medians may interrupt emergency access and operations
- May interrupt driveway access and result in U-turns at the end of medians
- May require removal of parking
- High cost to construct and maintain

Approximate cost: \$35,000 to \$100,000 – (2016 dollars)



Bulbouts

Bulbouts narrow the street width, and create smaller corner radii, creating a shorter and safer pedestrian crossing and encouraging drivers to slow down. Construction of bulbouts requires altering the curb, gutter and sidewalk. Bulbouts may contain special paving or landscaping and are generally used at intersections where parking is restricted.

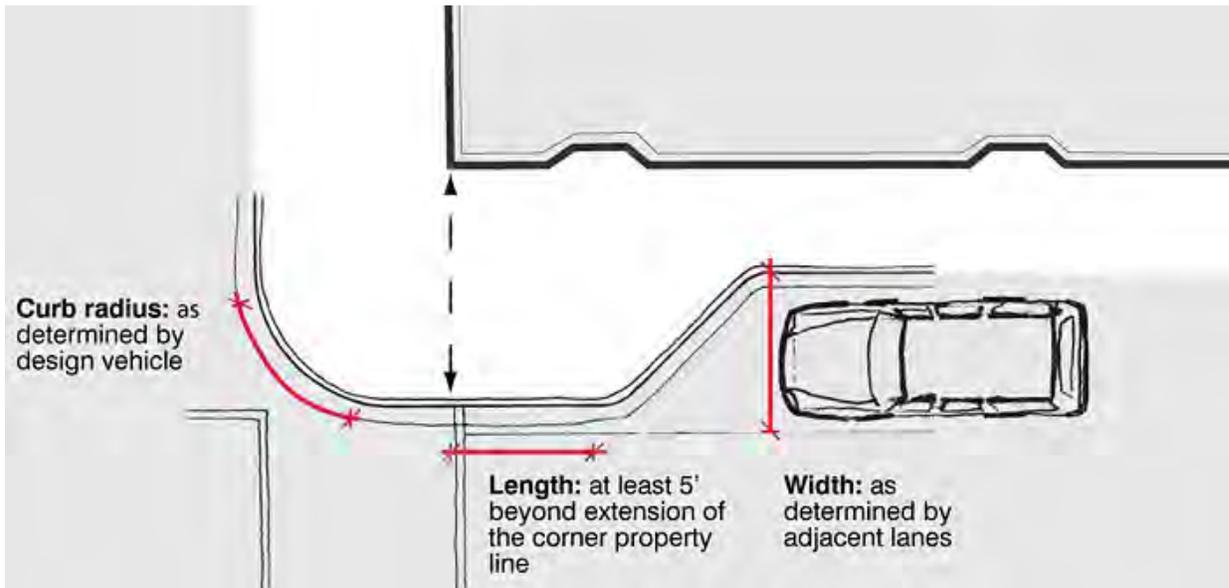
Positive Aspects

- Pedestrian crossing distance is reduced
- Narrowed roadway section may contribute to reduction of speeds
- Breaks up driver's sight-line
- Opportunity for landscaping and visual enhancements to the neighborhood

Negative Aspects

- May reduce visibility for cyclists who are less visible to turning and cross traffic
- May require partial or total loss of parking
- Could result in a minor increase on maintenance
- Care should be taken to keep motorists from hitting bulbouts

Approximate cost: \$15,000 to \$35,000 – (2016 dollars)



Chicanes

A curved street alignment that can be designed into new developments or retrofitted in existing right-of-ways is called a chicane. The curvilinear alignment requires additional maneuvering and shortens drivers' sight-lines, resulting in lower average speeds. This device can be applied to any street where speed control is desired, provided the street is wide enough to accommodate the curvilinear design.

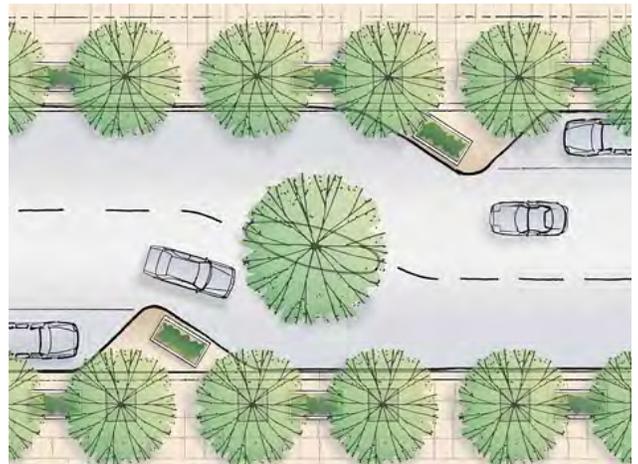
Positive Aspects

- May slow traffic
- Changes the look of the street, making it more aesthetically pleasing
- Has minimal impact on emergency response

Negative Aspects

- Involves extensive design and expensive implementation
- May require partial or total removal of on-street parking
- Additional maintenance for service vehicles to maneuver a curvilinear street
- May have little or no impact on cut-through traffic
- May require modification of drainage features and other utilities

Approximate cost: \$35,000 to \$100,000 – (2016 dollars)



Volume Reduction Measures

Volume reduction traffic calming measures are primarily designed to reduce the traffic level on the streets where they are installed.

Diverters

Diverters are raised areas placed diagonally across a four-way intersection that restrict through movements and vehicles to turn. Diverters are most applicable to local streets where cut-through traffic is a major problem.

Positive Aspects

- Reduces cut-through traffic
- Channels traffic flow, thus eliminating conflicts at an intersection
- Can be designed to accommodate emergency vehicles
- Opportunity for landscaping and visual enhancements to the neighborhood
- Can accommodate bicycle traffic through intersection

Negative Aspects

- Will re-direct traffic to other local streets
- Causes increased travel time for local residents
- Is a permanent measure, even though problem may be limited to certain times of day
- High installation costs
- May require partial or total removal of parking near intersection
- Needs significant warning and guiding signs

Approximate cost: \$15,000 to \$35,000 – (2016 dollars)



Partial Closure

A Partial closure is a physical barrier that restricts vehicles from turning into a street, while still allowing for bicycle access. The opposite lane is left open to allow vehicle exits. Two-way traffic is maintained for the rest of the block. Partial closures are applicable to local streets where cut-through traffic is a concern. It can also be a favorable traffic volume control measure.

Positive Aspects

- Restricts movements into a street while maintaining full access and movement within the street block for residents
- Reduces cut-through traffic
- Pedestrian crossing distance is reduced through a closure island
- Creates a space for street landscaping

Approximate cost: \$10,000 to \$30,000 – (2016 dollars)

Negative Aspects

- May require partial or total removal of on-street parking
- May redirect traffic to other local streets
- May increase trip length for local drivers
- Is in effect at all times, even if cut-through problem exists only at certain times of day



Full Street Closure

A complete closure of the street blocks both lanes of travel, so that the street becomes a cul-de-sac. This device eliminates all through traffic and limits street access to local residents. This device is applicable to local streets with major cut-through concerns where an emergency vehicle response route does not exist. The closure location may be designed as a pocket park with through bicycle and pedestrian access.

Positive Aspects

- Restricts all through traffic
- Effective volume and speed control measure
- Improves the aesthetic quality of the street

Negative Aspects

- May re-direct traffic to other local streets
- May increase trip length for local drivers
- May require partial removal of on-street parking
- Not applicable for designated emergency vehicle response routes
- May result in difficult turnaround conditions

Approximate cost: \$15,000 to \$35,000 – (2016 dollars)



Guidelines for Installation or Warrants

Regardless of the traffic calming measure under consideration, a complete evaluation of the existing corridor's signage, pedestrian facilities, on-street parking, lighting, speed and traffic volume information should be completed.

Passive Traffic Calming Measures

Generally, Passive Traffic Calming Measures are lower cost and may be used where analysis indicates a problem exists and an appropriate Passive Traffic Calming Measures can be installed with successful results. If it is not likely that the Passive Traffic Calming Measures will be successful or that the installed Passive Traffic Calming Measure has failed, more restrictive measures may be appropriate.

Active Traffic Calming Measures

The following guidelines (warrants) are recommended to govern the installation of Active Traffic Calming Measures, following analysis and study. Some or all of these guidelines may apply, depending upon the individual street characteristics.

1. The street or street segment should be a two lane residential local or collector street with continuous curb and gutter, asphalt concrete berm, or curb and gutter or may be constructed as part of the traffic calming project.
2. The street segment should be at least 500 feet long.
3. The impacts to response time for emergency service vehicles must be evaluated and determined negligible.
4. Guidelines apply only to streets with a speed limit of 30 miles per hour or less.
5. The 85th percentile speed must be at least seven miles per hour above the posted speed limit.
6. The average daily traffic volume, excluding cut-through traffic, should be more than 500 vehicles per day.
7. The subject location has good visibility;
8. Vertical deflection devices should not be placed on curves.
9. Vertical deflection devices should be located at or near residential property lines and away from driveways, when possible.
10. Vertical deflection devices should be located near street lights to illuminate them for safe bike and pedestrian activity at night.
11. Spacing between vertical deflection devices should be as even as possible to produce uniform speed along an entire street. When placed in a series they should be placed between 200 and 600 feet apart. Spacing should allow at least one installation on each block.
12. Vertical deflections shall not be installed at locations with street grades in excess of 6%, except under conditions where there are very short sections with grades up to 8%-10%.
13. The installation will not result in diversion of traffic to other residential streets.

Volume Reduction Measures

The following guidelines (warrants) are recommended to govern the installation of Volume Reduction Measures following analysis and study. Some or all of these guidelines may apply, depending upon the individual street characteristics.

1. The impacts to response time for emergency service vehicles must be evaluated and determined negligible.
2. The average daily traffic volume should exceed 500 vehicles per day.
3. Cut through traffic exceeds 10% of total daily and/or peak hour traffic.

Approval and Implementation Process

Neighborhood traffic calming is a term used to describe a process of education, enforcement, and finally engineering. The education component typically is completed using a neighborhood meeting in which residents can share concerns and help identify the problem. Additionally, education can also include physical improvements such as speed limit signs, revised roadway striping, and speed feedback indicators such as permanently mounted signs or temporarily placed trailers to better identify what drivers should be doing.

After the education phase is complete, enforcement activities are typically implemented. In this phase, the drivers should now be well informed and compliance is now achieved through monetary penalties in the form of traffic tickets. Enforcement work is highly effective to calm traffic speeds when officers are present to enforce. Since it is not feasible to devote officers to one area for a prolonged duration, lasting results will vary.

The last course of action is engineering. This phase would incorporate physical changes to roadway geometry, which might include speed humps, speed tables, chokers, and medians.

The Neighborhood Traffic Calming process is designed and intended to be a “grass roots” effort. With this in mind, notification of Neighborhood Traffic Calming needs comes from the neighborhoods.

1. Neighborhood representative writes letter requesting consideration, obtaining as many neighbors’ signatures / support as available.
2. Staff receives and evaluates the request. Staff agendas the request for a future Traffic Commission Meeting date.
3. Staff writes a letter to residents to notify them of the Traffic Commission meeting date.
4. Traffic Commission meets to evaluate the request and determine if continued processing of the requested traffic calming should be considered. If Traffic Commission determines continued processing of the request is warranted, staff will begin data collection and the review process.



5. If the concern relates to speed, data will be collected using the Speed Feedback Trailer. This allows for data collection as well as informing motorists of current travel speeds.
6. After the Speed Feedback Trailer has obtained the data and been removed, if the data indicates the need, increased speed enforcement will be implemented.
7. If increased enforcement is implemented, additional speed data may be obtained.
8. Staff will evaluate speed and enforcement data and prepare a report to present to the Traffic Commission.
9. Staff writes a letter to residents to notify them of the Traffic Commission meeting date.
10. The Traffic Commission meets to review the data results and to determine if continued processing of traffic calming should be considered or if the actions taken have achieved desired results.
11. If the Traffic Commission determines continued processing is needed, staff will return and bring forward traffic calming alternatives. This process is iterative until a amenable plan is developed.



- 12.A Preferred alternative is selected by the Traffic Commission with input from the neighborhood. The requesting parties circulate a petition within the project area. This petition must be circulated by the requesting parties, and returned containing the names and

signatures of at least 66 % of the affected property owners in the project area. This petition is limited to one signature per household.

13. Once Staff receives the petition, Staff will prepare a staff report for the City Council with the Traffic Commission's recommendation and notify the neighborhood of the City Council meeting date.
14. City Council reviews preliminary plan.
15. If City Council approves the preliminary plan, staff will request direction of City Council as to funding of the improvements. The funding source may be City funds, funds from the requesting parties or neighborhood, or some combination of the two. Funds from the requesting parties or neighborhood, must be strictly on a volunteer basis.
16. If the City Council approves the preliminary plan with City funding, a budget request will be prepared for consideration for the next Capital Improvement Plan budget.
17. If the budget is approved, design and construction of the improvements will be completed based upon the funding delivery timeframe.

THIS PAGE INTENTIONALLY LEFT BLANK