

Prepared For:
City of Paso Robles



RESIDENTIAL AND ARTERIAL/COLLECTOR STREET TRAFFIC CALMING PROGRAM

Final Draft



Prepared By:



Residential and Arterial/Collector Street

Traffic Calming Program

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TRAFFIC CALMING PROGRAM**

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City of Paso Robles

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Section 1 - Introduction

Maintaining safe and efficient streets is the policy of the City of Paso Robles. The purpose of this program is to protect the neighborhoods and districts these streets serve. “Traffic calming” measures area means to respond to unacceptable motoring behavior. This program is designed to address the specific traffic calming needs of both local and arterial/collector streets.

General Plan Authority

Traffic calming is recognized as policy of the City of Paso Robles within the City’s General Plan documents, specifically:

- **General Plan - Land Use Element**
 - *Action Item 2(Quality of Life).* “Preserve health and safety, and strengthen the integrity of district and identifiable neighborhoods and districts, by protecting local streets from cut through traffic, speeding, parking intrusion, and traffic congestion by implementing traffic calming measures.”
 - *Action Item 3 (Traffic Calming).* Develop safety and traffic calming measures to be incorporated into the design of streets to ensure that they are compatible with the character of the residential neighborhood and other districts with pedestrian activity. These measures are to include, but not be limited to: narrow lanes, landscaped parkways, traffic circles, textured crosswalks, angled parking, and/or other measures.
- **General Plan - Circulation Element**
 - *Goal CE-1.* Establish a safe, balanced, and efficient circulation and pedestrian system serving all segments of the community, preserving the City’s small town character and quality of life, and planning for anticipated growth.”
 - *Table CE-1.* Identifies “Potential Circulation Improvements” to include “Traffic Calming Measures where appropriate.”
 - *Action Item 6.* Develop a traffic calming program, and implement traffic calming measures, where appropriate and feasible, to minimize the impacts on the use of local streets by vehicular traffic and to maintain / enhance health, safety and livability of the neighborhoods. Consider traffic calming measures along collector and minor arterial streets, where appropriate and feasible, to slow speeds where needed. Use traffic calming strategies to respond to requests by neighborhoods for traffic calming measures, including appropriate limitations on commercial vehicles in residential areas and truck routes that balance neighborhood preservation with community access needs.”
 - *Action Item 12 (Circulation Master Plan).* Consider establishing limitations on unnecessary truck traffic in residential areas, including signed truck routes.”
 - *Action Item 1 (Pedestrian Access and General Coordination).* Implement an ongoing program to identify and eliminate hazardous conditions to pedestrians.”

- *Circulation Standards and Development Policies.* “Developing standards for traffic calming” and “Establishing truck routes / limitation on non-delivery truck traffic in residential areas.”
- *Development Policies, Item 1.* Incorporate circulation design elements that keep traffic “calm”, encourage walking and bicycling and enhance the overall livability of a community. Circulation elements may include differing pavement types, night lighting, and traffic calming measures, including but not limited to landscaped traffic circles and medians, and street narrowing.”

These strong statements of public policy clearly illustrate the City’s intent to prove a safe, congestion free environment for all neighborhoods and /or districts within the City. This program is designed to recognize the various needs within the City and to respond accordingly.

Traffic Calming Defined

In 1997, the Institute of Traffic Engineers (ITE) defined traffic calming:

“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 ITE document goes on to further define traffic calming as follows:

*... "**mainly physical measures**" ... means "physical measures and a supportive environment, which includes such things as policy and legislative support for traffic calming and flexibility of standards, guidelines, and practices.*

*... "**reduce the negative effects of motor vehicle use**" ... means altering ...the design and role of the street to minimize the adverse effects (such as speeding and pollution)...*

*... "**alter driver behavior**" ... means drivers regulate their own behavior, such as reducing both their speed and aggressive driving and increasing their respect for pedestrians, bicyclists, etc.”*

*... "**Improving conditions for ... non-motorized street users**" means promoting activities such as walking and cycling, increasing overall safety, and enhancing aesthetics.*

*... "**measures**" referred to ... vertical and lateral changes to the street, constrictions, narrow pavement widths, entrance features, traffic circles, small corner radii, and related "streetscaping," such as lighting, trees, landscaping, art, etc., placed along streets and at intersections. (Traffic calming is most successful when it is accompanied by streetscaping.)*

The same document, which defines traffic calming, also articulates the need for the establishment of goals and objectives; and, the development of a process to evaluate the many requests that are sure to come. This program has been developed to address safety and quality of life issues within the neighborhoods of Paso Robles, be they residential, commercial, or school zone in nature.

Section 2 - Overall Program Goals, Objectives and Policies

The intent of this program is to meet the needs of each neighborhood in the City. In **general**, the City of Paso Robles aims to:

- *Promote safe, congestion free, motor vehicle operation.*
- *Promote conditions which enhance the community environment*
- *Promote conditions which encourage bicycle and pedestrian activity*
- *Support the creation of new construction standards which promote each of these activities*

To meet these goals the following **general objectives** have been identified:

- *Establish a comprehensive, integrated, policy based “Traffic Calming Program” founded on sound traffic engineering principles*
- *Provide clear guidelines of the process to evaluate traffic calming measures*
- *Encourage citizen involvement in neighborhood traffic calming activities*
- *Prioritize traffic calming requests*
- *Establish “Development Standards” which reduce the need for subsequent traffic calming measures*

The traffic calming program herewith presented shall comply with these **general policy statements**:

- *“Traffic Calming Measures” shall be consistent with sound traffic engineering principles*
- *The process will encourage and facilitate public involvement*
- *Minimize diverted traffic to other local or residential collector streets*
- *Maintain or improve the aesthetics of the streetscape*
- *Emergency vehicle access, safety and response times shall be considered*
- *Traffic calming devices shall be designed to minimize adverse impacts to maintenance activities*
- *Only State/Federal approved regulatory and/or warning signs shall 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. Under this policy, staff will work with residents, and businesses, to identify traffic issues in their neighborhoods. Each neighborhood will have its own unique set of problems that will require a comprehensive traffic engineering evaluation to identify appropriate traffic calming options.

The basic goal of this Traffic Calming Program is to evaluate measures that will affect driver behavior in such a way that public safety and the quality of life for residents and/or businesses, pedestrians, bicyclists and motorists are improved.

Section 3 - Purpose

It is the concern with overall public safety and mobility that has led the City to develop a program which addresses the needs of:

- Residential Neighborhoods
- Business and/or Commercial Districts
- School Zones

This program recognizes “functional classification” differences of streets within the community, and addresses them specifically and individually. With respect to school zone traffic calming - schools are often located on arterial and/or collector streets, which are “functionally classified” to provide for the safe and efficient movement of large volumes of vehicular traffic. The appropriate measures for school zone traffic calming must recognize a broader spectrum of solutions, applying specific measures appropriate for use on residential streets¹ and/or arterial²/collector³ streets. This program also identifies measures designed specifically for the school environment.

Residential Streets

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, or “cut-through”; the geometrics of the neighborhood street system can lead to increased speeds as well. These problems, individually or collectively result in a reduction in neighborhood safety for homeowners, pedestrians, and bicyclists.

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.

Therefore, the objectives of the local residential streets program are:

- *Reduce vehicular speed where appropriate*
- *Reduce cut-through traffic*
- *Promote conditions that encourage bicycle and pedestrian travel*
- *Enhance the neighborhood environment*

Business and/or Commercial District Streets

Business and commercial districts are normally located on or adjacent to arterial and collector streets. These streets are planned and designed to carry significant traffic flows, at a high rate of speed on both a daily and peak hour basis.

¹ Residential streets primarily serve as access to residences.

² Arterial streets provide long distance travel routes across and between cities.

³ Collector streets provide connections between arterial streets and residential streets

These neighborhoods often experience undesirable travel speeds, and/or congestion, incompatible with the business and/or commercial characteristics of the adjoining business activities. It is the intent of this program to identify measures, which can alter travel behavior to the betterment of the community at large. The objectives of the Business/Commercial District traffic calming program is to:

- *Enhance safety*
- *Control traffic speeds*
- *Reduce congestion*
- *Promote conditions that encourage bicycle and pedestrian travel*
- *Enhance the street environment*

School Zone Streets

School zone traffic calming may involve all classifications of streets. The measures appropriate for installation around schools are broader in spectrum, and can involve alterations to the operations of the school itself. Traffic calming measures considered for school zone installation need to 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 class. 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 engineering studies must take these issues into consideration.

Therefore, the objectives of the school zone portion of this program are:

- *With respect to existing schools*
 - *Improve the safety environment for children*
 - *Increase awareness of school sites by motorists*
 - *Promote conditions that encourage bicycle and pedestrian travel*
- *Work cooperatively with the School District during the planning phases of new schools*

Section 4 – 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 five levels of traffic calming measures:

- Basic Measures
- Speed Reduction Measures
- Volume Reduction Measures
- Congestion Relief Measures
- School Zone 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 “Basic Measures” category, if they fail more restrictive measures may be warranted.

The “more restrictive” traffic calming measures, those found in the “speed reduction” and “volume reduction” categories, mandate driver behavior change and as a result may be effective where “basic measures” have failed. These measures generally require either/both:

- Obstacles to be mounted - Vertical Deflection
- Roadway narrowing/closures/obstacles to be circumvented - Horizontal Shift

Basic Measures

Basic traffic calming measures are traffic control devices and programs implemented on a day-to-day basis to regulate, warn, guide, inform, and educate pedestrians, bicyclists and motorists. They include standard striping and signing measures as found in the State of California Traffic Manual, minor roadway design measures to improve visibility and safety, enforcement by police and photo-radar, and safety education programs. Basic Measures are used primarily in those areas where traffic impacts have been found not to be excessive or serious, but where traffic control and/or education has been determined to be appropriate. Some common Basic Measures include:

- Safety Education Programs
- Police Enforcement
- Photo Radar Enforcement
- High-Visibility Crosswalks
- Radar Application
- Permanent Radar Installation
- Permanent Striping
- Curb Markings
- Gateway Treatments
- Truck Restrictions
- High-Visibility Signs
- Signed Turn Restrictions
- Minor Bulbouts

Speed Reduction Measures

Speed reduction measures are traffic control devices and roadway design features primarily designed to slow traffic. They are employed when the use of basic measures cannot, or has not, effectively addressed speeding issues and it has been found that speeds and/or accidents exceed the thresholds identified later in this document. Speed reduction measures are often used in conjunction with basic measures, and may have a limited effect on traffic volume as well.

Some common speed reduction measures include:

- Speed Humps
- Raised Crosswalks
- Raised Intersections
- Speed Cushions
- Traffic Circles
- Roundabout
- Mid-Block Chokers
- Medians
- Major 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. They are used when it has been found that traffic volumes exceed established thresholds (indicated later in this document). Volume reduction devices can be used by themselves or in conjunction with basic and/or speed reduction measures. Some common volume reduction measures include:

- Diverters
- Extended Median
- Partial Closure
- Full Street Closure

Congestion Relief Measures

Congestion Relief measures are traffic control devices or alterations to the City street system, designed to accommodate and enhance the traffic flow and safety within the City. Many of these measures have been previously identified for use as speed or volume control measures; however, their application under differing criteria, and in a different fashion, can result in the primary benefit of congestion relief rather than speed or volume control. The most obvious of these potential measures is the application of the “modern roundabout”, which has as its principal benefits:

- Delay reduction
- Accident reduction
- Reduced queuing

Other potential measures include the use of extended median islands, and street closures.

School Zone Measures

Concerns regarding children’s safety, emergency access, congestion and neighborhood impacts have led to the development of a series of specific school zone traffic calming measures.

The goal of this Traffic Calming Program is to provide the tools and an interactive process whereby all concerned can come to a consensus on a traffic management plan for each individual school.

- Safe Routes to School Program
- Carpool to School Program
- Bike Pools
- Walk Pools
- Staggered Bell Times
- Pick-Up and Drop-Off Procedures
- Redesign Parking Lots and Loading Areas
- Crossing Guard
- Safety Patrol and Escort Service

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 Vehicles 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 physical traffic calming techniques can significantly worsen emergency response time

The City's Fire and Police Departments are concerned about the effect these devices have on response time. These concerns will be considered for each location where speed and/or volume reduction traffic calming techniques are recommended.

Traffic Diversion

Another concern is the potential for traffic calming techniques to move, rather than solve, a problem. Proposals for traffic volume reductions will include an adequate traffic engineering study to evaluate traffic diversion impacts.

Impacts on Transit and Utility Vehicles

Some speed reduction and volume reduction traffic calming options could potentially impact bus routes and utility vehicles. Service providers will be consulted whenever speed reduction and volume reduction options are considered.

Considerations for Other Roadway Users

In addition to safety concerns, speed reduction and volume reduction traffic calming measures can often have unintended negative impacts on bicyclists, roller skaters, skate boarders, joggers, pedestrians and parked vehicles. These impacts will also be considered.

Noise Impacts

The noise impact to adjacent residents resulting from vehicles braking, going over and around traffic calming devices can have an impact on the acceptability of these devices by residents affected by them. The support of residents living immediately adjacent to locations where physical changes are proposed will be important to the success of any project.

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. Delay of emergency response could result in a civil action by an injured party from allegations that the emergency vehicle response was delayed by traffic calming devices. It is also possible that traffic calming devices themselves might allegedly result in damage or injury.

Visual Impacts and Aesthetic Concerns

While some traffic calming devices can have favorable aesthetic impacts, others can be unsightly. Virtually all speed reduction and volume reduction traffic calming techniques require reflective devices, signs and striping which may negatively affect the aesthetics of a neighborhood.

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.

Characteristics of Traffic Calming Measures

Basic Measures

Safety Education Programs

Safety education programs are an important component of a comprehensive traffic calming program. Safety education programs include efforts to make the public more aware of their own driving behavior and the impact it has on others. Pedestrian and bicycle safety programs alert and educate pedestrians and bicyclists on road safety. Driver safety information and education on existing laws can help improve driver behavior.

The various safety education programs currently being implemented in the City of Paso Robles, by the Police Department in association with the School District Safety Manager are:

- School Safety Education Program -Assemblies and Bike Rodeos
- Pedestrian and Bicycle Safety Workshops-In-Classroom Training
- Safety Training - Classroom and field training

Further information about these programs can be obtained by contacting the Community Services Office of the Police Department.



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

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



Photo Radar Enforcement

Photo radar speed enforcement is designed to augment police enforcement that may be implemented by the City. This program is most applicable for residential streets with speeding problems.



Positive Aspects

- Speed enforcement with minimal paid staffing
- May have widespread effectiveness due to mobile nature, difficulty to anticipate, and widespread application
- Does not involve pursuit of speeding vehicle in neighborhoods

Negative Aspects

- Public perceptions related to invasion of privacy
- Vehicle owners may receive tickets when they were not driving
- Requires staffing and results in a long term commitment of police personnel



High-Visibility Crosswalks

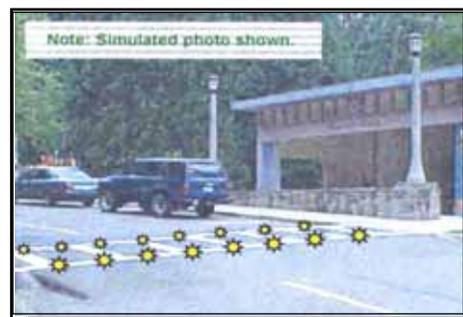
A high-visibility crosswalk is a crosswalk that incorporates striped patterns, pavement lights, improved signing or advance flashing beacons to improve the visibility of the crosswalk. This measure is most applicable on local streets where speed control and pedestrian crossing designation is desired. 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



Radar Application

Radar 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



Permanent Radar Installation

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

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. Striping can be at curb end or in the middle of the street to create a median. 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

Negative Aspects

- May not be self-enforcing

Curb Markings

Curb markings are special colored curb paintings that restrict or limit parking along the curb to enhance safety and/or increase visibility of pedestrians and bicyclists. Some applications include:

- Red curb between driveways to increase visibility
- Red curb at crosswalk to increase visibility
- Red curb at pedestrian ramps
- Blue curbs for accessible parking
- White, green and yellow curbs for passenger and freight loading

Positive Aspects

- Provides for safer conditions for pedestrians, bicyclists and motorists
- Easy to install and maintain

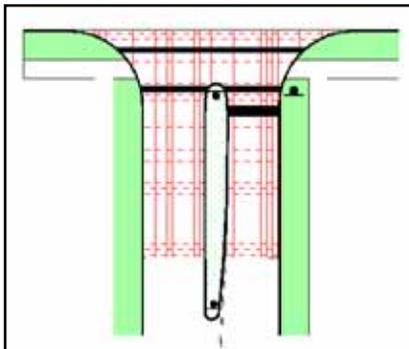
Negative Aspects

- Could result in loss of parking
- Not self enforcing



Gateway Treatments

A gateway is a special entrance that reduces the width of a travel way, often through the use of islands. It is usually placed in a roadway to define the entry to a residential area and/or to narrow each direction of travel and interrupt the view path along the center of the roadway.



Positive Aspects

- High visibility to motorists to notify change in roadway nature
- May discourage cut-through traffic
- Helps slow traffic

Negative Aspects

- Will increase need for maintenance
- May necessitate removal of parking

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



High-Visibility Signs

High-visibility signs may include larger speed limit signs on the streets to ensure visibility to motorists. This measure is a basic method aimed at slowing traffic through visual reminders of the speed limits or other regulations. It can be applied to most streets that have speeding or other problems.

Positive Aspects

- Provides a clear definition of legal speed limit or other warnings
- Provides context for enforcement efforts

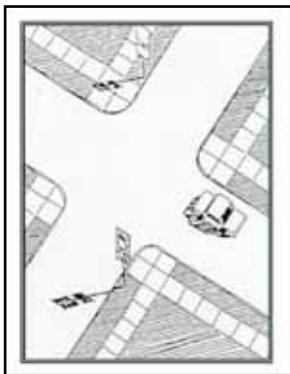
Negative Aspects

- Not self-enforcing
- Larger signs provide a negative impact on the aesthetics of the street



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



Minor Bulbouts

Minor bulbouts narrow the street width at intersections creating smaller corner radii, shorter and safer pedestrian crossing, and encouraging drivers to slow down. Bulbouts may be striped or may be curbed islands containing special paving or landscaping. Corner bulbouts are typically used adjacent to 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 view path

Negative Aspects

- May create a hazard for bicyclists who are less visible to turning vehicles and cross traffic
- May require partial or total removal of parking
- Could result in increased maintenance costs
- Care must be exercised to keep motorists from hitting bulbouts



Speed Reduction Measures

Speed reduction 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 3-4 inches in height over a minimum of 12 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.

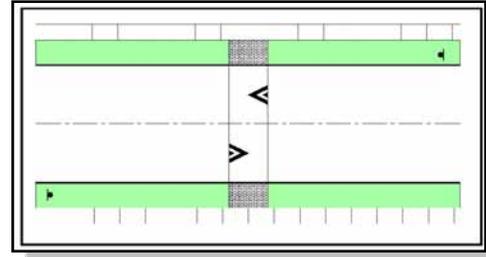
Positive Aspects

- Slows traffic
- Self-enforcing
- Requires minimum maintenance

Speed Humps continued

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



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.

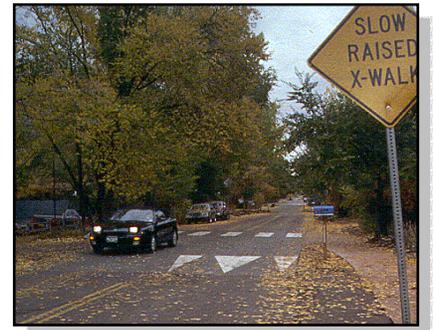


Positive Aspects

- 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



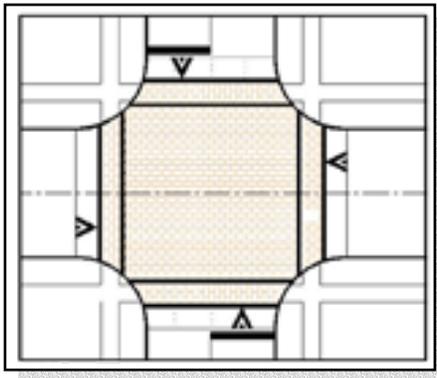
Raised Intersection

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.



Raised Intersection continued

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

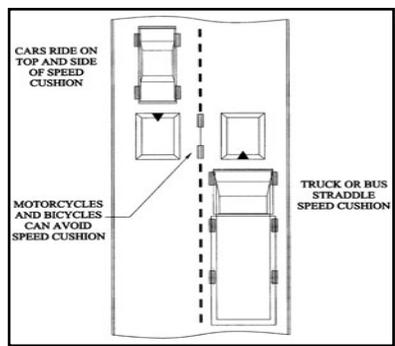
Negative Aspects

- 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

Negative Aspects

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

Traffic Circles

Traffic Circles are raised circular medians that direct counterclockwise traffic flow through an intersection. Vehicles must change their travel path to maneuver around the circle, which may be controlled by “Yield on Entry” on all approaches. In some cases, stop signs can also be used in conjunction with circles.

Traffic Circles are applicable to control speed and side street access. These devices are relatively small and are applicable on residential streets. Traffic circles may contain low growth landscaping and/or a tree.



Positive Aspects

- Provides increased access to street from side street
- Slows traffic as it drives around the circle
- Breaks up sight-lines on straight streets
- Opportunity for landscaping and visual enhancements to the neighborhood

Negative Aspects

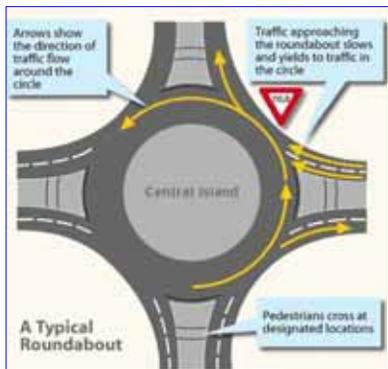
- Definition of right-of-way is contrary to the “Yield to the vehicle on the right” rule
- May impede left turns by large vehicles
- Bicyclists must merge with traffic around circle



Roundabouts

Roundabouts are high capacity, minimum delay safety features, designed for all levels of arterial and collector traffic conditions. The raised circular median (inner circle) directs traffic flow in a counterclockwise direction through an intersection. Vehicles must change their travel path to maneuver through the roundabout, which will be controlled by “Yield on Entry” on all approaches.

Roundabouts are applicable to control speed, increase capacity, reduce delay and improve side street access. Roundabouts include curbed approach “splitter” islands to direct traffic and create pedestrian refuge areas at the point of pedestrian crossing. Roundabouts must be designed to accommodate large vehicle turning radii. The intersection may contain special paving and the inner circle may contain landscaping or sculpture, or some other feature.



Positive Aspects

- Provides increased access to major street from side street
- Slows traffic as drivers maneuver around the circle
- Reduces delays and the resulting congestion
- Breaks up sight-lines on straight streets
- Opportunity for landscaping and visual enhancements to the neighborhood
- Can be a cost effective alternative to traffic signals
- Congestion Relief

Roundabouts continued

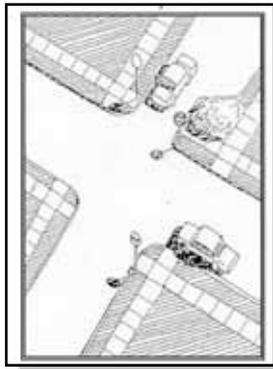
Negative Aspects

- Definition of right-of-way is contrary to the “Yield to the vehicle on the right” rule
- May impede emergency response
- May impede left turns by large vehicles
- May impact flow of pedestrians and bicyclists



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.



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



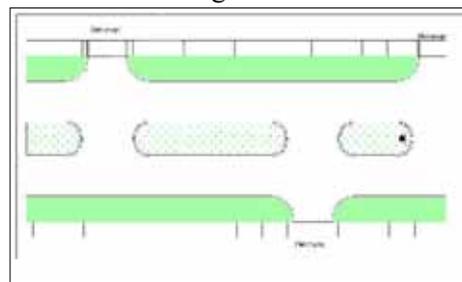
Medians

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

Major Bulbouts

Major 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 major bulbouts requires altering the curb, gutter and sidewalk. Major bulbouts may contain special paving or landscaping and are generally used at intersections where parking is restricted.

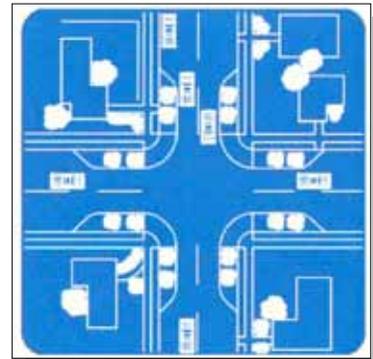


Positive Aspects

- 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



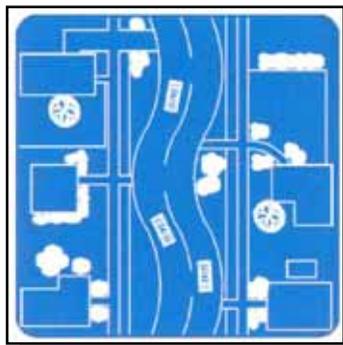
Chicanes

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

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 force a turn in all directions. Diverters are most applicable to local streets where cut-through traffic is a major problem.

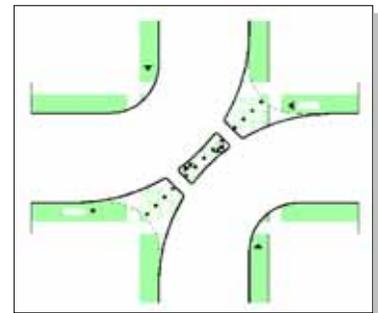


Positive Aspects

- 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



Extended Median

Extended Medians are raised islands in the center of the roadway that separate traffic directions. Extended medians reach beyond cross street(s), thus eliminating left turns and through traffic. Extended medians are used on wide streets to narrow the travel lanes, interrupt sight distances down the center of the roadway, and ease pedestrian crossings. Extended medians can be used to discourage cut through traffic through the neighborhood.



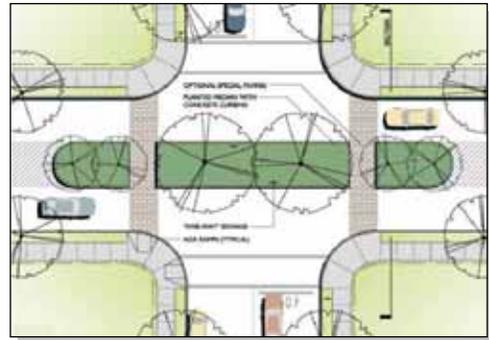
Positive Aspects

- Narrowed travel lanes can slow vehicle speeds
- Opportunity for landscaping and visual enhancements to the neighborhood
- Reduces cut-through traffic

Extended Median continued

Negative Aspects

- Has a significant impact on emergency access and operations
- May interrupt driveway access and result in U-turns
- May require removal of parking
- High cost to construct and maintain



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

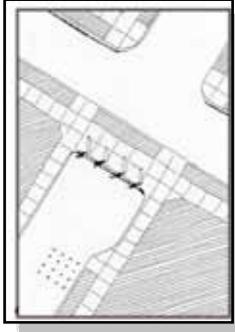


Negative Aspects

- 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



Congestion Relief Measures

Modern Roundabout

The modern roundabout is a safety, capacity and congestion/delay reducing measure. It is described in detail on page 18.

Extended Median Islands

Extended median islands can control/limit access thus reducing accident potential and congestion. They are described in detail on page 21.

Street Closures

Street closures vary from full to partial closures. These closures limit access to arterial streets, thus reducing vehicular conflicts. These reductions can eliminate some accidents, and reduce the constant access interference to optimum traffic flow. These measures are illustrated on pages 20 and 21.

School Zone Measures

Safe Routes to School Program

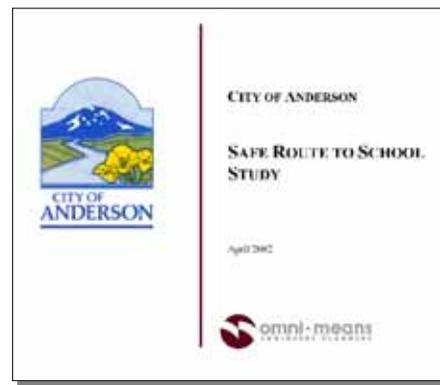
The "Safe Routes to School" program is a formal State of California program. Funds are provided to enhance pedestrian and bicycle safety for school age children. The scope of these programs includes; researching the most viable routes, based upon the potential number of students that could utilize these two alternative transportation modes; and, inventorying existing pedestrian and bicycling facilities to identify deficiencies and safety problems. The result is the identification of public improvements to enhance safe and effective walking and bicycling activity to and from each school. The result will be the production of maps, for each school studied that shows the "Preferred" routes to school cycling and walking routes. This document is the first step to qualifying for SR2S (Safe Routes to School) program grant funds administered through Caltrans.

Positive Aspects

- Provides needed improvements in physical roadway and school facilities prior to promoting these two mode choices, which improves safety and reduces the incidents of crashes

Negative Aspects

- May provide "false sense of security" and potential liability if promoted as "safe" and something negative happened to the commuter. In Paso Robles any document developed will identify "preferred" routes rather than "safe" routes.



Bike Pools

Consists of a group of students that bicycle together to and from school. Bike pools for children in elementary schools should be parent supervised. This provides a safe alternative for students who live relatively close to school and have access to a route safe for bicycling.

Positive Aspects

- Reduces congestion and pollution around school
- Increases safety around the school
- Saves time and money for parents
- Riding in groups is safer than riding alone

Negative Aspects

- May take longer than driving



Carpool to School Program

The school district may provide a Carpool Request Form/Flyer and send them out to all parents of children attending the school, inviting the parent to register to participate in a school carpool.



In order to increase the number of potential carpoolers, the school district can facilitate the identification of parents living in specific zones, or areas that can support carpools. The school district can send a message to the parents that live close to participating carpool parents, informing them that other parents in their same neighborhood are looking to share rides and asking them to register.

This program can be effective for parents that don't know that another parent lives close by and is also wanting to carpool. This program is also applicable to college students.

Positive Aspects

- Allows parents and college students to coordinate with other parents/college students willing to carpool
- Reduces trips and traffic congestion and pollution around school
- Improves traffic, bicycle and pedestrian safety
- Ability to gauge effectiveness of the program through service surveys
- Improves community and residential relationships around schools as the school neighbors (that don't have children attending the school) start seeing a difference in their neighborhood

Negative Aspects

- Initial reluctance at first with sharing rides with non-family members. This is reduced when parents meet the prospective carpool partner in an informal arrangement prior to the first carpool ride and works out any potential problems



Walk Pools

Consists of a group of students who walk together to and from school. Walk pools for children in elementary schools should be parent supervised. This is most useful for students who live relatively close to school and have access to a route safe for walking.

Positive Aspects

- Reduces congestion and pollution around school
- Increases safety around the school
- Saves time and money for parents
- Walking in groups is safer than walking alone

Negative Aspects

- May take longer than driving



Staggered Bell Times

School bell times changed to approximately 15-minute intervals between grade levels to extend the drop-off and pick-up times to reduce the number of vehicles at the school at the same time. The program would be implemented by the school district to extend the arrival and departure times of students.

Positive Aspects

- Extends the time frame for student drop-off and will reduce the number of vehicles arriving at same time

Negative Aspects

- Subject to collective bargaining with the Teachers Classified Unions with input from the parents and community
- Parent concerns due to work schedule or multiple children. A staggered bell schedule could actually increase the number of vehicle trips, when there are multiple children in a family attending school(s) at different times



Pick-Up and Drop-Off Procedures

Specific procedures developed for each school. Given the wide variation in each school's drop-off area, each school will have unique procedures developed by their school site traffic committee, and the City traffic engineering staff. The program is used when on-street and residential traffic is impacted by parents picking up and dropping off students.

Positive Aspects

- Allows site specific procedures to facilitate greater movement

Negative Aspects

- Initial training may be needed to have the procedure work effectively
- Need parent understanding and cooperation to have procedure work effectively



Redesign Parking Lots and Loading Areas

Review of efficiency and design of existing lots with recommendations as to how to increase available parking and loading areas. The program is used to increase the amount of on and off-street parking as well as increase the loading zone capacity.

Positive Aspects

- Increases the amount of loading zone area of the parking lots
- Increases the efficiency of the drop-off procedure

Negative Aspects

- May have significant cost associated with recommended changes



Crossing Guard

The presence of a crossing guard serves as an easily recognized indicator to drivers that pedestrians are about to use the crosswalk and that all traffic must stop. These personnel should be placed at any location as deemed necessary by the school district and the City.



Positive Aspects

- Increases visibility and recognition of pedestrian crosswalk

Negative Aspects

- Difficult to keep crossing guards employed
- Are not allowed to control traffic
- Labor intensive and expensive



Safety Patrol and Escort Service

The Safety Patrol gives older elementary students (4th and 5th graders) the opportunity to assist in the loading and unloading of students during the pick-up and drop-off. The Escort Service is a program that takes the younger students from the vehicle and walks them to their classroom. This program is used to supplement the volunteers during the pick-up and drop-off to further aid the students.



Positive Aspects

- Provides added measure of security for the younger students, without requiring the parents escort their child to class
- The members of the safety patrol will be able to educate the younger students on the proper safe loading and unloading procedures

Negative Aspects

- Elementary students in Safety Patrol will still need some level of supervision, especially when assisting in the unloading and loading of children

Effectiveness/Application of Traffic Calming Measures

The following table provides a general assessment of the effectiveness of some traffic calming measures under certain street conditions.

Table 1A
Effectiveness of Basic Measures

Basic Measures:	Reduces speed	Reduces Traffic	Noise	Loss of Parking	Restricts Access	Emergency Impacts	Maint.	Cost
Safety Education Program	Maybe	Maybe	No Change	No	No	No	No	Low
Police Enforcement	Yes	Maybe	No Change	No	No	No	No	Low
NASCOP Enforcement	Yes	Maybe	No Change	No	No	No	No	Low
High-Visibility Crosswalks	Maybe	No	No Change	No	No	No	Yes	Medium/High
Radar Application	Maybe	No	No Change	No	No	No	No	Low
Permanent Striping	Maybe	No	No Change	Maybe	No	No	Yes	Low
Curb Markings	No	No	No Change	Maybe	No	No	Yes	Low
Gateway Treatments	Maybe	Minimal	No Change	No	No	No	Yes	Medium/High
Truck Restrictions	No	Yes	Decrease	No	No	No	Occasional	Low
High-Visibility Signs	Maybe	Maybe	Increase	No	No	Yes	Occasional	Low
Signed Turn Restrictions	No	Yes	No Change	No	Yes	Maybe	Occasional	Low
Minor Bulbout	Yes	Maybe	No Change	Maybe	No	No	Yes	Medium

**Speed humps and raised crosswalks must be reinstalled each time a street is resurfaced.
Cost = "Low" is less than \$1,000, "Medium" is \$1,000 to \$10,000, "High" is greater than \$10,000*

Table 1B
Effectiveness of Speed Reduction Measures

Speed Reduction Measures	Reduces speed	Reduces Traffic	Noise	Loss of Parking	Restricts Access	Emergency Impacts	Maint.	Cost
Speed Humps	Yes	Maybe	Increase	No	No	Yes	Yes	Medium
Raised Crosswalk	Yes	Maybe	Increase	Yes	No	Yes	Yes	Medium/High
Raised Intersection	Yes	Maybe	Increase	Maybe	No	Yes	Yes	High
Speed Cushions	Yes	Maybe	Increase	No	No	Yes	Yes	Medium
Traffic Circles	Yes	Maybe	No Change	Yes	Yes	Yes	Yes	Medium/High
Roundabouts	Yes	Maybe	No Change	Yes	Yes	Yes	Yes	High
Mid-Block Chokers	Yes	Maybe	No Change	Yes	No	Some	Yes	Medium
Median	Yes	Maybe	Decrease	Yes	Yes	Yes	Yes	Medium/High
Major Bulbout	Yes	No	No Change	Yes	No	Some	Yes	High
Chicane	Yes	Maybe	No Change	Yes	Maybe	Some	Yes	Medium/High

**Speed humps and raised crosswalks must be reinstalled each time a street is resurfaced.
Cost = "Low" is less than \$1,000, "Medium" is \$1,000 to \$10,000, "High" is greater than \$10,000*

Table 1C
Effectiveness of Volume Reduction Measures

Volume Reduction Measures	Reduces Speed	Reduces Traffic	Noise	Loss of Parking	Restricts Access	Emergency Impacts	Maint.	Cost
Diverter	Maybe	Yes	No Change	Maybe	Yes	Yes	Yes	High
Extended Median	Maybe	Yes	Decrease	No	Yes	Yes	Yes	Medium/High
Partial Closure	Maybe	Yes	No Change	Maybe	Yes	Maybe	Yes	High
Full Street Closure	Maybe	Yes	No Change	Maybe	Yes	Yes	Yes	High

**Speed humps and raised crosswalks must be reinstalled each time a street is resurfaced.
Cost = "Low" is less than \$1,000, "Medium" is \$1,000 to \$10,000, "High" is greater than \$10,000*

Table 1D
Effectiveness of Congestion Relief Measures

Volume Reduction Measures	Reduces Speed	Reduces Congestion	Noise	Loss of Parking	Restricts Access	Emergency Impacts	Maint.	Cost
Roundabout	Yes	Yes	No Change	Yes	Yes	Yes	Yes	High
Extended Median	Maybe	Maybe	Decrease	No	Yes	Yes	Yes	Medium/High
Partial Closure	Maybe	Maybe	No Change	Maybe	Yes	Maybe	Yes	High
Full Street Closure	Maybe	Maybe	No Change	Maybe	Yes	Yes	Yes	High

**Speed humps and raised crosswalks must be reinstalled each time a street is resurfaced.
Cost = "Low" is less than \$1,000, "Medium" is \$1,000 to \$10,000, "High" is greater than \$10,000*

Table 1E
Effectiveness of School Zone Measures

School Zone Measures:	Reduces speed	Reduces Traffic	Noise	Loss of Parking	Restricts Access	Emergency Impacts	Maint.	Cost
Safe Routes to School Program	No	No	No Change	No	No	No	No	Medium
Carpool to School Program	Maybe	Yes	No Change	No	No	No	Yes	Low
Bike Pools	No	Yes	Decrease	No	No	No	Yes	No
Walk Pools	No	Yes	Decrease	No	No	No	No	No
Staggered Bell Times	No	Maybe	No Change	No	No	No	No	Low
Pick-Up and Drop-Off Procedures	Maybe	No	No Change	No	No	No	No	Low
Redesign Parking Lots and Loading Areas	Maybe	No	No Change	Maybe	Maybe	No	No	Medium/High
Crossing Guard	No	No	No Change	No	No	No	No	Medium
Safety Patrol and Escort Service	No	No	No Change	No	No	No	No	Low

**Speed humps and raised crosswalks must be reinstalled each time a street is resurfaced.
Cost = "Low" is less than \$1,000, "Medium" is \$1,000 to \$10,000, "High" is greater than \$10,000*

Selection of Traffic Calming Measures

Some traffic calming measures are suitable for nearly all applications, while others are more suitable for specific application.

Table 2A
Basic Measures

	Local / Residential Street (two lanes)	Arterial / Collector Streets (Circulation Element)	School Zones
Safety Education Programs	X	X	X
Police Enforcement	X	X	X
NASCOP Enforcement	X	X	X
High-Visibility Crosswalks	X	X	X
Radar Application	X	X	X
Striping Changes	X	X	X
Permanent Striping	X	X	X
Curb Markings	X	X	X
Gateway Treatments	X	X	X
Truck Restrictions	X	X	X
High-Visibility Signs	X	X	X
Signed Turn Restrictions	X	X	X
Minor Bulbouts	X	X	X

Table 2B
Speed Reduction Measures

	Local / Residential Street (two lanes)	Arterial / Collector Streets (Circulation Element)	School Zones
Speed Humps	X		X
Raised Crosswalks	X	X	X
Raised Intersection		X	X
Speed Cushions	X		X
Traffic Circles	X		X
Roundabouts	X	X	X
Mid-Block Chokers	X	X	X
Medians	X	X	X
Major Bulbouts	X	X	X
Chicanes	X	X	X

**Table 2C
Volume Reduction Measures**

	Local / Residential Street	Arterial / Collector Streets (Circulation Element)	School Zones
Diverter	X		X
Extended Median	X	X	X
Partial Street Closure	X		X
Full Street Closure	X		X

**Table 2D
Congestion Relief Measures**

	Local / Residential Street (two lanes)	Arterial / Collector Streets (Circulation Element)	School Zones
Roundabout		X	X
Extended Median	X	X	X
Partial Street Closure	X	X	X
Full Street Closure	X	X	X

**Table 2E
School Measures**

	Local / Residential Street (two lanes)	Arterial / Collector Streets (Circulation Element)	School Zones
Safe Routes to School Program	X	X	X
Carpool to School Program	X	X	X
Bike Pools	X	X	X
Walk Pools	X	X	X
Staggered Bell Times	X	X	X
Pick-Up and Drop-Off Procedures	X	X	X
Redesign Parking Lots and Loading Areas	X	X	X
Crossing Guard	X	X	X
Safety Patrol and Escort Service	X	X	X

Guidelines for Installation of Traffic Calming Measures

Generally, “Basic Measures” are lower cost and may be used where a traffic engineering analysis indicates that:

- A problem exists, and
- There is an expectation of a successful result

If this expectation is without merit, or a “basic measure” installation has failed, more restrictive measures may be appropriate (discussed below). However, deviations from these criteria may occur only when a traffic engineering study identifies needed adjustments.

Vertical Deflection Guidelines (Speed Control)

The following guidelines (warrants) shall govern the installation of vertical deflection installations, following a comprehensive traffic engineering study. Some or all of these guidelines may apply, depending upon the individual street characteristics.

1. The streets or street segment shall be a two lane residential local or collector street not identified within the Circulation Element of the General Plan.
2. The street or street segments shall be fully improved, (i.e. includes curb and gutter), or curb and gutter shall be constructed as part of the traffic calming project cushions. Streets without full improvements may be considered if physical conditions exist that will allow the measure to operate effectively.
3. The street segment shall be at least 600’ long.
4. The installation impacts to response time for emergency service vehicles shall be evaluated.
5. Guidelines apply only to streets with a speed limit of 30 miles per hour or less.
6. The critical speed (i.e., the 85th% speed) shall be at least seven miles per hour above the posted speed limit.
7. The median speed should exceed the speed limit.
8. The average daily traffic volume, excluding cut-through traffic, should be more than 1000 vehicles per day.
9. Vertical deflection devices should not be placed on curves.
10. Vertical deflection devices should be located at or near residential property lines and away from driveways, when possible.
11. Vertical deflection devices should be located near street lights to illuminate them for safe bike and pedestrian activity at night.
12. Vertical deflection devices should be accompanied by the appropriate advanced signage.
13. 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.
14. 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%.

Horizontal Shift Guidelines (Volume Control)

The following guidelines (warrants) shall be followed when considering the installation of horizontal shift traffic calming devices, following a comprehensive traffic engineering study. Some or all of these guidelines may apply, depending upon the individual street characteristics.

1. The installation impacts to response time for emergency service vehicles shall be evaluated.
2. The average daily traffic volume should exceed 1000 vehicles per day.
3. Cut through traffic exceeds 25% of total daily and/or peak hour traffic.
4. Traffic circles are restricted to two lane neighborhood streets.
5. Roundabouts shall be considered on collector and arterial streets.

Traffic Circle Guidelines

In addition to the *Horizontal Shift* and *Vertical Deflection* criteria, the following guidelines (warrants) shall be considered for the installation of traffic circles. These guidelines should be applied following a comprehensive traffic engineering study. Some or all of these guidelines may apply, depending upon the individual street characteristics:

1. Traffic circles are a traffic calming measure suitable for installation on local residential neighborhood streets ONLY.
2. Intersections should be a minimum of 55 feet diagonally across (both directions, measured from curb face).
3. Crosswalk should be located a minimum of 12 feet from the inscribed circle (measured from curb face of circle to white stripe of crosswalk).
4. Device should allow for a minimum 22 foot wide travel lane for circulating traffic (measured curb face of interior circle to the curb return).
5. Interior diameter of circle should be a minimum of 10 feet (measured curb face to curb face).
6. Traffic circles should not be used in conjunction with stop signs at a given location.

Roundabout Guidelines

In addition to the *Horizontal Shift* and *Vertical Deflection* criteria, the following guidelines (warrants) shall be considered for the installation of roundabouts. These guidelines should be applied following a comprehensive traffic engineering study. Some or all of these guidelines may apply, depending upon the individual street characteristics:

1. Roundabouts are a traffic control measure, suitable for installation on collector and arterial streets.
2. Roundabouts shall be installed for the express purpose to reduce delay and congestion and to increase safety.
3. Roundabouts shall be installed only where a comprehensive traffic engineering evaluation indicates.
4. Roundabouts shall be designed and installed per the FHWA guide on Modern Roundabout Installations.
5. Consistent with Caltrans Design Bulletin – DIB 80-01 dated October 3, 2003.

Crosswalk Guidelines

Crosswalks shall not be installed unless the location demonstrates a high concentration of pedestrians and shall be installed in conjunction with traffic control devices such as traffic signs. New “marked” crosswalks at uncontrolled intersection or mid-block locations shall be strictly limited and shall be allowed only in the most urgent circumstances and if pedestrian safety can be provided. Several studies have documented the poor safety experience resulting from the installation of uncontrolled and mid-block crosswalks. This safety problem results from the pedestrians perception of safety within the marked crosswalk; and, the motorists lack of the ability to see the crosswalk markings. This problem has resulted in more attention being paid to high visibility crosswalks. Crosswalks will only be installed following a comprehensive traffic engineering study.

Section 5 – The Process

The City of Paso Robles will consider traffic calming solutions where motor vehicular use of City streets adversely impact the neighborhood quality of life and the safety of the residents and/or businesses within that neighborhood.

The City will work closely with the community to identify concerns, conduct appropriate studies to quantify problems, and develop options to address with the quantified problems.

Traffic Calming Program Procedures

Traffic calming is the application of techniques at a specific location which will likely result in a reduction in vehicular traffic speed, volume, noise and/or accidents. The techniques may include one or several of the traffic calming measures identified previously.

It is the goal of the City to achieve solutions to traffic related problems in a manner least intrusive to the neighborhood. To accomplish this goal, the City has developed this procedure to assure a systematic and comprehensive approach to each neighborhood request.

A traffic engineering study will likely be necessary in order to determine if, and to what magnitude, there is a traffic concern, which can be effectively addressed by installing traffic calming measures. The three (3) most common concerns the program addresses are:

- Speeding and cut-through traffic in residential areas
- Speed, congestion and pedestrian safety along arterial and collector streets in commercial areas
- School Zone safety caused by excessive speed and congestion

The City of Paso Robles' Residential and Arterial/Collector Street Traffic Calming Program is based on substantial community participation. Because residents and/or adjacent businesses are primarily the initiators of traffic calming requests and must live day-to-day with the resulting actions, the City, strongly encourages, community participation throughout the process. Development of successful traffic calming programs depends on a strong interaction between the community and City staff. One of the intents of the program is to provide a clear structure for addressing traffic concerns in the City's neighborhoods.

Traffic concerns may exist throughout an entire neighborhood, or may be specific to a:

- Particular street or segment(s) of roadway - such as a single street, or series of neighboring streets
- Spot location - such as a schools
- Several City blocks - such as downtown or commercial districts

The City's implementation process consists of a series of traffic calming measures, as shown in Section 4. Each measure requires, as a first step, community or City staff identification of an existing problem. The process allows implementation of traffic calming tools in a timely manner in conditions where problems could be addressed with fairly routine solutions (Basic Measures).

The process is illustrated on the following page, and the steps described below. The steps begin with the citizen recognition of a problem, a thorough evaluation of the problem, citizen input and finally City Council review.

Traffic Calming Decision Making Process

Step 1 - Community Identification of the Problem.



Citizen Complete Traffic Calming Request for Residential Street, Arterial/Collector Street, or School Area

Step 2 - Initial City Evaluation and Findings.



Perform Preliminary Evaluation
IS REQUEST VALID?

No



Notify Citizen

Will "BASIC MEASURE" Provide Relief to Problem?

Yes



SPEED LIMIT 15

Basic Traffic Calming Implemented



Citizens Perception of Effectiveness



Concerns addressed

No

No

Step 3 - Determination of Potential Traffic Calming Measures.



Evaluate Area for Comprehensive Traffic Calming Solution

Step 4 - Neighborhood Meeting/Committee Formation.

Step 5 - Develop Traffic Calming Project Plan.



Develop Traffic Calming Plan

Step 6 - Neighborhood Evaluation & Acceptance



Citizens Review Proposal

and



Petition for Comprehensive Traffic Calming

Step 7 - Traffic Calming Project Prioritization.



City Council Authorization



Prioritization of Traffic Calming Projects

Step 8 - Implementation.



Design and Implementation

Step 9 - Funding Considerations.



Step 10 - Traffic Calming Project Design/Construction.

Step 1 - Community Identification of the Problem

The traffic calming process begins once the Department of Public Works receives a request from a neighborhood to initiate a study, or the Department identifies a traffic problem through its regular review of traffic statistics. In the case of a neighborhood-initiated request, a single citizen, or a group of citizens must submit a Traffic Calming Request form. The form must include a discussion of the current traffic problems. This form, which includes a petition, must be circulated by the requesting party(ies), and be returned containing the names and signatures of at least 50% plus one of the affected residents (in a residential neighborhood), or business owners/managers (in a commercial district) supporting the request to initiate a study. The petition shall be limited to one signature per household or business.

Step 2 - Initial City Evaluation and Findings

Upon receipt of the Traffic Calming Request form, the City's Public Works Department will document the neighborhood concern, conduct a field investigation, and collect data, as appropriate (e.g., traffic volumes, collision data, travel speeds, etc.). After collecting the study information, the City will make a determination as to the validity of the stated request. If the problem stated cannot be confirmed, and the normal criteria for the implementation of traffic calming measures is not supported by the data collected, a report will be issued to the requesting party('s), describing the reasons for the denial of the request.

Step 3 - Determination of Potential Traffic Calming Measures

If the traffic studies confirm that the stated problem is valid, and finds that the problem may be reduced or alleviated through the implementation of "basic measure(s)", the City may implement the most appropriate Basic Measure(s). If the evaluation determines the need for "speed reduction, or volume reduction or school zone" traffic calming, the Public Works Department will contact the requesting party('s) and provide a petition for circulation within the neighborhood area. The neighborhood area will be determined by the City (to represent the potential area, which may be effected by the implementation of traffic calming devices).

Step 4 - Neighborhood Meeting/Committee Formation

The City will then request that a neighborhood meeting be held to discuss study findings and to form a Neighborhood Traffic Calming Committee (NTCC) to work with the City. The NTCC will be a volunteer group of residents/business representatives chosen by the neighborhood. The NTCC will be responsible for arranging subsequent group meetings and shall keep their neighborhood constituents informed as to progress. The goal is to have members that represent the various geographical areas and other interests within the potential project neighborhood. City staff will arrange and provide the location for the initial meeting.

This procedure will also serve as the first step in the case of a City initiated traffic calming project. The City will work with the NTCC in an attempt to identify as many stakeholders that will be directly affected as possible. Their perspective is essential for developing a plan that effectively addresses existing concerns while minimizing or avoiding new problems.

Step 5 - Develop Traffic Calming Project Plan

The NTCC will work with the City in an advisory role and will meet to review existing problems, review the neighborhood study boundary, discuss and evaluate various measures, and gain neighborhood acceptance on

which measures to implement as means of addressing the problems. The NTCC will work with the City to identify the most effective solutions to the traffic related problem. Solution consensus within the NTCC will advance the project to the level of neighborhood acceptance.

Step 6 - Neighborhood Acceptance Evaluation

Once the NTCC has agreed with the City on the potential traffic calming implementation project, a second petition will be circulated within the project area, or as modified through the course of these evaluations. This petition must be circulated by the requesting party(’s), and returned containing the names and signatures of at least 66 % of the affected property owners (in a residential neighborhood), or business owners/managers (in a commercial neighborhood) supporting the proposed project. This petition shall also be limited to one signature per household or business.

Step 7 - Traffic Calming Project Prioritization

The need to prioritize projects arises when the demand for traffic calming exceeds City resources. This includes staff time to work on the project as well as construction funding. A common approach used by most other cities to efficiently utilize City resources is to prioritize projects so that the neighborhoods with the greater problems are addressed first.

This program recognizes the need for traffic calming in residential and our commercial districts. Since most neighborhood traffic problems involve speeding vehicles or a high volume of vehicles relative to the street type, these criteria are weighted heavier in the ranking. Another factor that is considered in defining the extent of the problem is the average annual reported accidents.

Additionally, the impact traffic will have on a neighborhood depends upon the character of the street and the amount of pedestrian activity in the neighborhood. Streets that have a greater percentage of fronting homes or commercial/businesses are impacted more than streets that are lined with backing lots or controlled access designs.

Neighborhoods that have a higher number of pedestrian generators, such as parks, schools and other public facilities, will be impacted greater than those neighborhoods without pedestrian generators. Due to the high concentration of school-aged pedestrians and localized traffic congestion associated with elementary, middle and high schools, these pedestrian generators are weighted double that of other non-school pedestrian generators.

For the purposes of the prioritization criteria, the data collected will be rounded up to the nearest whole number. This prioritization scoring criteria allows 30 maximum points (35 in school areas) and is as follows:

Table 3
Prioritization Ranking Process

Speed – (85th percentile speed)

MPH above Legal speed Limit	Points
7 mph	2
9 mph	4
11 mph	6
13 mph	8
15 mph	10 maximum

Volume – (average daily/peak hour)

Non-Circulation Element		Circulation Element		Points
Local Street (2 Lane)	Collector (2 Lane)	Collector (2 Lane)	Arterial (4 Lane)	
1000 -1100	2500 - 2600	6,001-6,750	12,001-15,000	1
1101 -1200	2601 - 2700	6,751-7,500	15,001-18,000	2
1201 -1300	2701 - 2800	7,501-8,250	18,001-21,000	3
1301 -1400	2801 - 2900	8,251-9,000	21,001-24,000	4
1401 -1500	2901 - 3000	9,001-9,750	24,001-25,500	5
1501 -1600	3001 - 3100	9,751-10,500	25,501-27,000	6
1601 -1700	3101 - 3200	10,501-11,250	27,001-28,500	7
1701 -1800	3201 - 3300	11,251-12,000	28,501-30,000	8
1801 -1900	3301 - 3400	12,001-12,750	30,001-31,500	9
1901 -2000	3401 - 3500	12,751-	31,501-	10 max

Fronting Uses/Access (includes homes, businesses, etc.)

Percent of street with fronting uses/access	Points
10% or less	1
11 - 25%	2
26 - 50%	3
51 - 75%	4
76 - 100%	5 max

Pedestrian Generators (parks, schools ¹, public facilities)

Number of generators within study boundaries	Points
1	1
2	2
3	3
4	4
5	5 max

1. Elementary, middle and high schools will gain double point

When a particular location reaches the top of the City’s prioritization list, it will enter into the next phase of the traffic calming process.

Step 8 - Project Implementation

If approved, the proposed speed reduction, volume reduction, or school zone traffic calming plan may be implemented on a test basis using temporary control devices, where possible, for a period determined by the City’s Public Works Department. Test program duration will be established by the City in consultation with the NTCC.

Following the test period, City staff will collect new data (e.g., traffic volume counts, speed surveys, etc.) in order to determine the effectiveness of the measures put into place. These results will be provided to all of the neighborhood residents and property owners. Then the devices may be installed in a permanent manner, removed, or a further vote may be taken using the same process as described previously. Again, City staff will notify residents and property owners about the ballot results. If approved and funded, the permanent devices will be installed. City staff will give notification to the neighborhood prior to construction. After construction of the permanent volume reduction measures, the City’s Public Works Department will continue monitoring the effectiveness of the plan for up to one year. City staff will prepare a report of the findings for presentation

to the neighborhood. Depending on the nature of the measures, this report could include a maintenance plan for residents and property owners.

Step 9 - Funding Considerations

Traffic calming devices will normally be installed at the City's expense subject to availability of funds. Consideration of the funding limitations of the City should be considered throughout the plan development process. If funding limitations will impact the range of options available, this needs to be identified early in the process and the variety of appropriate devices should reflect these limitations. It must be reiterated that speed reduction and/or volume reduction devices are expensive.

Furthermore, the City's Residential and Arterial/Collector Street Traffic Calming Program operates on a limited budget. Given these limitations, if a neighborhood desires to implement a more extensive plan than developed through this process the City Council will have two options; approve the plan with additional funding; and/or, require the neighborhood to participate in funding all or a part of the project.

Projects for which a 100% funding commitment by the neighborhood, or private development interests, is received will be moved forward to implementation by the City upon completion of the design process.

Step 10 - Traffic Calming Project Design/Construction

When a traffic calming project is authorized for design by the City Council, the City staff will either design the project "in-house" or have the design prepared by consultant.



CITY OF EL PASO DE ROBLES
"The Pass of the Oaks"

TRAFFIC CALMING REQUEST FORM

The following information should be filled out as completely as possible and returned to the City of Paso Robles, along with the attached Petition. Additional information on the Traffic Calming Program can be found at www.prcity.com.

PLEASE PRINT:

APPLICANT: _____ Hm. PHONE: (____) _____

ADDRESS: _____ Bs. PHONE: (____) _____

CITY: _____ ZIPCODE: _____

LOCATION OF TRAFFIC PROBLEM: _____

DESCRIPTION OF TRAFFIC PROBLEM: _____



CITY OF EL PASO DE ROBLES
"The Pass of the Oaks"

CITY OF PASO ROBLES PETITION

1.	print name	residence address
	signature	email/phone date
2.	print name	residence address
	signature	email/phone date
3.	print name	residence address
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4.	print name	residence address
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10.	print name	residence address
	signature	email/phone date



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"The Pass of the Oaks"

CITY OF PASO ROBLES PETITION

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20.	print name	residence address
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CITY OF PASO ROBLES PETITION

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CITY OF PASO ROBLES PETITION

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	signature	email/phone date



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CITY OF PASO ROBLES PETITION

41.	print name	residence address
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