



Cathedral City



Traffic Calming Policy and Guidelines

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1 Introduction

1.1 Objective

The City of Cathedral City Traffic Calming Guidelines are a comprehensive set of measures intended to improve neighborhood safety and quality of life through the use of various roadway improvement strategies. The contents of this guideline document are not presented as firm requirements; rather, they provide a tool for city staff, residents, and other collaborative teams to use when developing effective traffic calming plans.

1.2 Traffic Calming

Traffic calming is the process of minimizing the negative impacts associated with neighborhood traffic on residents, pedestrians, bicyclists and school children. When implemented, traffic calming measures can reduce neighborhood speeding, cut-through traffic, and reckless driver behavior on city streets.

The purpose of traffic calming measures falls into two fundamental categories:

- Devices that reduce “Speed”
- Devices that reduce “Volume”

While roadways ensure both vehicle and pedestrian connectivity, excessive traffic or speeding can cause adverse neighborhood impacts resulting from their original design and placement. To avoid these negative impacts, city streets can be retrofitted to encourage safer driver behavior.

The guidelines and traffic calming measures presented in this document are intended to be implemented on residential streets, many of these measures can be successfully applied to major and collector roadways as well.

1.3 Existing and Future Concerns

These guidelines are part of the City's Traffic Calming strategy and is intended to help address existing and future neighborhood concerns and to facilitate the coordination between City staff and residents so that they may work together to develop traffic calming solutions.

Existing concerns may involve both speeding and cut-through traffic through existing neighborhoods. These concerns are addressed in this document by providing resources of available traffic calming measures along with information on selecting the appropriate traffic calming device to ensure its successful physical placement in the residential environment.

The Traffic Calming Guidelines have also been developed as a planning tool for City staff and developers concerned with avoiding traffic challenges in future neighborhoods.

1.4 Existing Procedure – Temporary Traffic Calming

Currently, traffic calming in the City of Cathedral City is handled by city staff who receive individual requests from residents for traffic solutions in their neighborhoods. These requests are directed to the Engineering Division to evaluate and coordinate. Once a request is received, temporary traffic calming measures are scheduled for that road segment with the assistance of the Public Works Maintenance Division. The temporary traffic calming measures are considered the preliminary evaluation to determine if permanent traffic measures are recommended (PART A) to move forward into the implementation phase (PART B). In addition, funding must be identified for a project to proceed.

2 Goals, Policy, Objectives, and Guidelines

The primary purpose of traffic calming is to support the livability and vitality of residential and commercial areas through improvements in non-motorist safety, mobility, and comfort. These objectives are typically achieved by reducing vehicle speeds or volumes on a single street or a street network.

2.1 Goals

Many of the goals and policies relating to traffic calming are identified in the Circulation and Mobility Element of the City's General Plan (2021). The two main goals in the City's General Plan are:

- Goal 1: An intra- and inter-city transportation system that provides for the safe, efficient, diverse and cost-effective movement of people and goods, and enhances commerce and the overall economic well-being of the entire community.
- Goal 2: A City-wide and neighborhood-specific transportation system that is responsive to, and which implements the new urbanism principles of community design, through land use and transportation planning.

2.2 Policy

The City of Cathedral City has several goals, policies and objectives regarding traffic calming which are referenced but not explicitly outlined in the Circulation and Mobility Element of the City's General Plan, the City's Active Transportation Plan, and the 5-Year Strategic Plan.

Beyond the recognition of safe neighborhoods and walkable streets contained in the General Plan goals, other specific policies identify and guide the effort to design communities with pedestrians, safety and comfort in mind. This document introduces the traffic calming policy supporting the General Plan goals.

2.2.1 Traffic Calming Policy

Install traffic calming measures to increase safety and enhance the livability of communities.

- Use traffic calming techniques in appropriate locations to reduce vehicle speeds or discourage shortcutting traffic.
- Choose traffic calming devices to best fit the situation for which it is intended.

- Place traffic calming devices so that the full benefit of calming will be realized with little or no negative effect upon the overall safety or quality of the roadway.
- Design traffic calming devices appropriately, including consideration for accessibility, drainage, underground utilities, adequate visibility, the needs of emergency, sanitation, and transit vehicles, and landscaping.
- Weigh the undesired effects of traffic calming devices (increased travel times, emergency response times, noise, and traffic diversion) against their prescribed benefits.

2.3 Objectives

The objectives of traffic calming are:

- Reduce traffic speeds on residential streets with a demonstrated problem to levels consistent with other non-impacted local streets in the City.
- Reduce, eliminate or discourage demonstrated non-local “cut-through” traffic on local residential streets and focus such traffic on the arterial roadway system.
- Limit the shifting of traffic intrusion and speeding problems from one residential street or neighborhood to another.
- Ensure citizen participation throughout the process, obtaining the input of affected residents, business owners and non-resident property owners.
- Minimize impacts on emergency vehicle response times due to the use of neighborhood traffic control measures.

2.4 Guidelines

The City of Cathedral City adopted several guidelines for street design including the County of Riverside County Road Standards (Ordinance No 461, 2023), the California Department of Transportation Standard Plans and Specifications (2023), Caltrans Traffic Calming Guide, and the California Manual of Uniform Traffic Control Devices (2014).

These guidelines help facilitate the physical implementation of various traffic calming devices, and include general design criteria regarding pedestrian safety such as:

- Signing, striping and pavement markings for streets experiencing excessive vehicle speeds.
- Marked crosswalks that can be enhanced at some locations with traffic signals, pedestrian signals when warranted, traffic-calming treatments, or other substantial crossing

improvements presented in these guidelines, and should not be used under the following conditions:

- a) Where the 85% percentile speed exceeds 40 mph.
 - b) On a roadway with four or more lanes without additional traffic calming treatments such as islands, lighted crosswalks, etc.
 - c) On a roadway with poor illumination, poor sight distance, or very low pedestrian volumes.
- Residential street crossings combined with traffic calming measures designed to maintain low vehicle speeds such as raised crosswalks, and gateway narrowing.
 - Curb extensions at the crosswalk enhancing pedestrian crossing visibility and reduce crossing distance.
 - On streets that experience excessive vehicle speeds, pedestrian crossings should be enhanced with traffic calming measures, such as raised crosswalks or curb extensions.

3 Project Process and Implementation

This section describes a process that can be used to successfully provide traffic calming improvements. This section can be used by City staff and residents seeking to find solutions to neighborhood traffic calming issues.

The process is separated into two (2) parts, each consisting of specific components and steps that should be considered during the development of a street/neighborhood traffic management plan.

The two parts in this process are:

1. PART A: Investigation - Temporary Traffic Control Measures
2. PART B: Actions - Permanent Traffic Control Measures.

3.1 PART A: Investigation - Temporary Traffic Control Measures

This is the first part of the process and implementation of traffic calming measures. This part describes how the traffic calming process is initiated and how requests are handled and considered for treatment.

One of the priorities in the 5-Year Strategic Plan was developing a traffic calming plan with strategies to address location-specific speeding issues. As a response to the priority, the city created the Traffic Calming Committee, composed of city Staff from various Departments/Divisions, including Public Works Maintenance, Fire, Police, Fleet Maintenance, and Engineering. The Traffic Calming Committee was responsible for procuring temporary traffic calming devices and developing a temporary traffic calming procedure.

3.1.1 Temporary Traffic Calming Procedure

The temporary traffic calming procedure include the following steps.

Step 1: Identify Candidate Streets/Neighborhoods

- The process is started when a residents' request is submitted to the Engineering Division to investigate speeding, cut-through traffic or other traffic related safety issues within their neighborhood.

The request should be detailed for staff to understand the traffic-related issues within the neighborhood. The request should identify the location (roadway segment) of the problem, whether the problem is excessive speed and/or excessive traffic volume, and include the initiating party's home address, e-mail address, and telephone number.

Additionally, citizens' requests may filter through the Police Department, Council Office, or local Community Groups.

- Staff will review the request and may need to conduct minor data collection.

This initial investigation allows staff to determine the type and magnitude of the problem and best course of action. The initial investigation will determine if temporary traffic calming measures are necessary to address the resident's concern related to traffic related safety issues within their neighborhood or it could also lead to other solutions, for example, concerns may be addressed through maintenance (trees blocking a stop sign), or targeted police enforcement.

- The parameters for the implementation of traffic calming devices in residential areas are as follows:
 - **Parameter 1:** The measured 85th percentile traffic speed shall be equal to or greater than 35 mph, and or,
 - **Parameter 2:** 70% of the measured speeds shall be in excess of 25 mph.

Step 2 – Speed Radar Survey

- Once the location is identified, Public Works staff will install a speed radar device to measure traffic speeds 24/7 for a minimum of a week. The speed radar is then returned to the Engineering Division to determine whether the parameters for implementing traffic calming devices are met.
- If traffic speeds do not meet the parameter thresholds, the study is completed, and the city takes no further action.
- If traffic speeds meet the parameter thresholds, the city will proceed to step 3 of the temporary traffic calming policy.

Step 3: Speed Feedback Signs

- Staff from Public Works Maintenance Division will then install speed feedback signs (one sign installed in each direction of travel) to measure/collect data and display traffic speeds 24/7 for a minimum of a week.
- The data from the speed feedback signs is then analyzed by the Engineering Division to determine whether the parameters for implementing traffic calming devices are met.
- If traffic speeds do not meet the parameters, the study is completed, and the traffic calming committee will then recommend permanent traffic calming measures to the City Engineer.
- If traffic speeds meet the parameter, the city will proceed to step 4 of the temporary traffic calming policy.

Step 4: Speed Feedback Signs and Police Traffic Enforcement

- Speed feedback signs (one sign installed in each direction of travel) will remain installed to measure and display traffic speeds 24/7. The police department is also notified to patrol and enforce the area for a minimum of two weeks.
- The data from the speed feedback signs is then analyzed to determine whether the parameters for implementing traffic calming devices are met. Additionally, the number of speeding tickets, if any, issued by the Police Department will be considered in the analysis.
- If traffic speeds do not meet the parameters, the study is completed, and the traffic calming committee will then recommend permanent traffic calming measures to the City Engineer.
- If traffic speeds do meet the parameters, the speed feedback signs should be returned to the public works yard, and the city will proceed to step 5 of the temporary traffic calming policy.

Step 5: Speed Cushions/Humps

- Prior to installing the temporary speed cushions, Engineering staff must analyze the street geometry to determine the optimum location for the traffic calming device. Once a location is identified, Public Works Maintenance Division staff will install speed cushions and the respective signage to inform oncoming traffic. The speed radar will also be installed to measure traffic speeds 24/7 for a minimum of two weeks.
- The data from the speed radar is then analyzed to determine if the parameters for implementing traffic calming devices are met. The traffic calming committee will then recommend permanent traffic calming measures to the City Engineer.

Step 6: Memorandum

- After reviewing the recommendations from the Traffic Calming Committee, the City Engineer will prepare a technical memorandum outlining the proposed traffic calming measures.
- The memorandum will be submitted to the Public Works Director for approval of the traffic calming measures recommended by the City Engineer and for funding allocation, if necessary.
- If the memorandum concludes that no traffic control measures are required, the study is complete, and no further actions will be required.
- If the memorandum concludes that the issue warrants action but that permanently constructed traffic calming devices are not the most cost-effective solution, city actions may be recommended. These actions may include police enforcement, education, maintenance, monitoring, traffic operations, and other measures. The Public Works Director will then discuss these actions with the relevant departments and proceed with Part B of the process, which includes allocating available funds and approving the necessary actions to implement the permanent traffic control measures.

- If the memorandum concludes that the issue warrants action and that the installation of permanent traffic calming devices is the appropriate solution, the Public Works Director will proceed with Part B of the process, which may include using available budgeted funds and/or proceeding to secure approval of the funds necessary to implement the permanent traffic control measures.

3.2 PART B: Actions - Permanent Traffic Control Measures

This is the second part of the process for implementing traffic calming measures, which includes three distinct components: one for city actions, another for localized traffic calming measures, and a third for the neighborhood traffic control plan.

The Director of Public Works will approve the technical memorandum that outlines the process for the implementation of permanent traffic calming measures.

3.2.1 City Actions

City actions generally fall into either enforcement or traffic operations and maintenance, with no neighborhood actions required.

3.2.1.1 Enforcement

Staff may decide the best solution is to increase enforcement in the affected area by employing one of the following:

- Temporary radar speed trailers
- Increased police presence (targeted speed enforcement)

Radar trailers can be an alternative to traffic calming. Increased police enforcement is dependent on police availability. These methods can be effective in reducing speed in the short-term, but unless increased police enforcement is continued, driver behavior will often revert to pre-enforcement levels.

3.2.1.2 Traffic Operation and Maintenance Traffic Calming Measures

Traffic operations and maintenance can be altered by the City to reduce neighborhood impacts. The following are examples of traffic operations and maintenance changes that City staff may choose to implement. Examples of these improvements are:

- Centerline lane striping
- Centerline Dots
- Trimming of vegetation to improve sight distance
- Signal timing changes on arterials or collectors
- Vehicle prohibitions implemented via signage
- Signage changes
- Turning movement restrictions

3.2.1.3 Funding

These measures are lower-cost and easier to implement. However, resources from the City's operations and maintenance departments will be required, and staff should ensure that these resources are available.

Staff will need to assess the effects of the action to ensure it benefits the neighborhood. Additions or removals will be at the discretion of staff and should be made without neighborhood input.

The Director of Public Works will identify the available funding sources for the traffic operations and maintenance traffic calming measures.

The following funding sources, if available, may be used to implement these city actions:

- Public Works operations and maintenance budget.
- Capital improvements funds if a project is planned or identified in the Capital Improvement Plan (CIP) for the street segment under analysis, and/or if funding for traffic calming measures is programmed in the CIP.
- Assessment Districts funds
- Special contributions from district funds

3.2.2 Localized Traffic Calming Control Measures

3.2.2.1 Localized Traffic Calming Issue

A localized issue pertains to a relatively small area (a street or set of streets) where implementation of traffic calming treatment would not cause spillover effects to adjacent streets.

An example of this could be a residential street connecting two arterials with no other streets in the neighborhood providing through access between the two arterials. If a traffic calming treatment intended to reduce travel time through the neighborhood were introduced on the cut-through route, then the cut-through traffic would be redirected to the arterials.

Another example of a localized issue could be a speed related issue on a collector leading from a subdivision to an arterial. Introducing a traffic calming treatment intended to reduce speed on the collector would not cause spillover onto adjacent residential streets.

If an issue is determined by staff to be localized, then it follows the localized traffic calming process as described below.

3.2.2.2 Localized Traffic Calming Control Measures Process

Issues that are determined to be localized can follow a more streamlined process for treatment. The following describes the localized traffic calming process.

- a) City staff begins the localized process by reviewing information about the issue and identifying a treatment. The proposed treatment should be consistent with the traffic calming guidelines and any additional City guidelines. If possible, proposed treatments found to be effective for similar issues should be used as guides.

- b) Staff consults with affected agencies (i.e., fire department, police department, transit agencies, school districts, environmental services, and street division) to gather their input on the proposed treatment. Fire department approval must be received before continuing the process. If the fire department does not approve of the treatment as proposed by staff or any alternatives, then the requestors are informed that the plan to implement a traffic calming treatment on their street(s) was unsuccessful.
- c) The City next circulates a petition to residents of the affected street or set of streets where treatment is desired.
- d) Residents need to complete and return the petition with 75% or more of the responses in support of the proposed treatment. If the plan fails to receive approval of at least 75%, then it is not continued. The requestor will be informed that the plan to implement the proposed traffic calming treatment on their street(s) was unsuccessful.
- e) After successful support from residents, the proposed plan will be presented to the Traffic Calming Committee. Input from Traffic Calming Committee will be considered advisory with the City Council having the ultimate decision.
- f) Staff will identify the funding. Special contributions might be available through resident's organizations for treatment in certain areas. The following funding sources, if available, may be used to implement these localized traffic calming measures:
 - Public Works operations and maintenance budget.
 - Capital improvements funds if a project is planned or identified in the Capital Improvement Plan (CIP) for the street segment under analysis, and/or if funding for traffic calming measures is programmed in the CIP.
 - Assessment Districts funds
 - Special contributions from district funds
- g) Once the plan has been completed and funding is available, the City Council may be required to approve a contract or task order for construction of the treatment companies providing services to install the traffic calming measures selected.
- h) Before construction, staff will notify the public and affected agencies regarding the implementation of a traffic calming device. Notification helps ensure that motorists and other road users, including fire and emergency response vehicles, are familiar with the device and that they can continue to use the roadway in a safe manner.
- i) The traffic calming device or devices will be installed.

3.2.3 Neighborhood Traffic Calming Control Plan

3.2.3.1 Neighborhood Traffic Calming Issue

A traffic calming issue, not previously determined to be localized, is treated as a neighborhood traffic calming issue.

An example of a neighborhood traffic calming issue is when a traffic calming treatment on one street, if implemented, would simply result in moving the challenge to an adjacent street or to several adjacent streets or neighborhoods. Once the issue is determined to be of a neighborhood scale, the City Manager is notified. Funding and staff resources are assessed to establish viability of project.

After the City Manager notification, staff begins to collect input from the community through community outreach. A Community Planning Group including the Traffic Calming Committee, the City Engineer, and, if necessary, an on-call traffic engineering consultant will be formed. The community planning group will help determine if the challenge is recent, on-going, broad, or narrow.

Once the issue is determined to be a neighborhood traffic calming issue and community planning group input has been collected, the study area will be defined. The study area should include streets that are materially affected by the proposed actions and should generally be bounded by major features (arterials, streets, rivers, canyons, etc.). Traffic calming treatments may be applied to multiple streets within the study area. Once the study area is defined, the treatment may be added to the Capital Improvement Plan list of projects.

3.2.3.2 Neighborhood Traffic Calming Control Plan Process

The neighborhood traffic calming control plan process include the following steps.

3.2.3.2.1 Plan Development

Plan development starts once adequate staff resources and project funding are identified.

The plan development component begins after staff has defined the study area. This section describes how the neighborhood task force, staff, and other affected agencies work together to develop a plan to treat traffic related issues.

A - Selection of the Neighborhood Area

Staff notifies the residents on the affected area about the selection of their neighborhood area to participate in the traffic calming plan.

B – Community Outreach

Following the notice, a community outreach meeting with residents in the affected area will be held. The meeting is intended for staff to provide an overview of the process to develop, approve, and implement a neighborhood traffic management plan.

At this meeting, residents will have the opportunity to volunteer for the task force. Members of the task force should largely be residents or business owners from the study area. The task force should include a representative from the Community Planning Group. The task force will meet with City staff to review and develop a plan for their neighborhood. Although all residents have the opportunity to provide input and receive updates as the plan develops, the task force is more actively involved, committing the time and effort necessary to develop a comprehensive plan.

Residents not selected for the task force are welcome to attend all meetings, and time will be allocated on the agenda for public comments/questions.

C – Task Force to Clarify Goals/Purpose

Once the task force is formed, they will meet with staff to clarify their goals and purpose. The meeting will accomplish the following:

- Neighborhood Traffic Management Tutorial – Staff presents an overview of the program and devices. This is intended to be for informational purposes only and not a prescription of what should be implemented.
- Review traffic-related issues – Discuss the type of issue(s), location(s), and time of occurrences.
- Refine study area (if necessary) – Staff will refine the study area based on street(s) affected by the traffic-related issues or that may potentially be affected by development of a neighborhood traffic management plan.
- Review traffic data – Review the initial data collected and determine if additional data collection is necessary.
- Define desired outcomes – Clearly defined outcomes need to be formed as a benchmark for results.

D – Staff to Collect Additional Data

If additional data collection is necessary, then staff will collect traffic data based on the study area as previously defined.

E –Data Review

City staff and the task force will schedule a meeting(s) to review traffic data within the study area and formulate ideas to address problems. Data regarding the traffic related concerns and traffic data would be compared to the design guidelines (see Section 4) to determine which devices may be most appropriate. At this point in the process, staff can also begin to contact affected agencies (Fire Department, Police Department, EMS, Transit Agencies, School Districts, Environmental Services, Public Works Maintenance Division) to better understand their needs and concerns.

F – Plan Development

The main purpose for the task force is to identify issues and serve as liaison to the Community Planning Group and the residents, and to provide feedback to staff proposals.

The initial plan development may consider the following speed reduction devices to treat the traffic related concerns (see Section 4):

- Vertical Devices – Speed cushions, speed humps, speed tables, etc.
- Horizontal Devices – Traffic circles, roundabouts, etc.
- Signing and Marking Devices – Lane striping, bottle dots, speed legends, etc.
- Narrowing Devices – Bulbouts, chokers, center island narrowings, etc.

Because volume reduction measures (i.e. partial closures or forced turn islands) intentionally divert traffic to another street, new issues can occur as a result. For this reason, volume reduction devices are not proposed until all other options have been shown to be ineffective at reducing the traffic-related impacts.

G – Affected Agency Review

Once staff and the task force have developed a plan that they believe appropriately addresses the traffic-related issues, City staff will seek additional feedback from other agencies that may be potentially affected by the plan. The intent of this process is to identify concerns and potential modifications to the plan. The following agencies will likely be involved in reviewing most plans:

- City of Cathedral City Fire Department and EMS
- City of Cathedral City Police Department
- Transit Agencies (Sunline)
- Palm Springs Unified School District
- Environmental Services (Burrtec)
- Public Works Maintenance Division

Staff will share the input from these agencies with the task force, and the task force will revise the plan accordingly.

H – Notify Residents

A neighborhood meeting will be arranged by the Community Planning Group to present the proposed plan to the neighborhood at-large to gather input prior to the approval process.

I – Planning Group Meeting

At this meeting the task force will present a map of the proposed plan and describe the types and locations of devices proposed.

At this time, residents can also recommend what, if any, aesthetic improvements are desired. Changes to the proposed plan can be made as necessary. This Planning Group meeting is intended for informational purposes.

Residents are informed of the approval process and ballots/petitions they will receive once the proposed plan is refined.

3.2.3.2.2 Plan Support

The plan support component assesses the amount of neighborhood support for the proposed plan.

A – Neighborhood Education

Prior to surveys being distributed, residents, business owners, and property owners are informed regarding the pending plan details and of the approval process.

This could be carried out through public notices, mailers, newspaper and also through neighborhood association newsletters.

B – Survey Distribution to Immediate Adjacent Residents (Approval Rate)

Staff and the Task Force distribute surveys to neighborhood residents who are immediately adjacent to the proposed device(s). The immediately adjacent addresses are determined by location. For devices placed at an intersection, responses should come from addresses within 150 feet in each direction of the device. For devices placed within a residential block, responses should come from address only within that block. A minimum approval rate of 75 percent must be met from the immediate adjacent resident survey. If the minimum approval rate is not met, the task force has one opportunity to revise the plan if desired.

C – Survey Distribution to Entire Area (Support Rate)

Once the 75% approval rate has been met by the adjacent residents, the survey will be distributed to the entire study area. A minimum response rate and support rate must be met from individuals in the study area before the plan moves forward. For implementation of speed reduction devices, a minimum of 33 percent of all surveys must be returned with a simple majority of those responses in favor of the plan ($50\% + 1$). For example, if 100 surveys are mailed out, at least 33 must be returned with 17 or more of those in favor of the proposed plan. If the plan includes volume reduction measures, a minimum of 50 percent of ballots must be returned with 67 percent or more of those responses in favor.

Apartments present a unique situation because residents may be less likely to respond. For this reason, surveys from apartment units are not counted toward the minimum response rate but will be counted in favor or against the proposed plan.

D – General Public Responses

Responses from the general public (phone, website, e-mails) will be recorded separately. Those responses will be considered for information purposes only, with no thresholds of approval required.

E – Survey Results Discussion

City staff will count all received ballots and determine whether the minimum response rate and support rate are satisfied. If the minimum number of ballots is not received, neighborhood residents could be reminded to submit their mail back postcards in order to meet the minimum response rate. Staff will then share this information with the Planning Group.

F - Possible Survey Result Scenarios

- a) If the minimum response rate is met but the support rate is not, then the task force has one opportunity to revise the plan if desired. This would require modifying the plan to address the aspects of the plan that were not favored by residents. Modifying the plan would also require consulting the affected agencies, holding a public meeting to present the revised plan, and redistributing ballots to the study area.
- b) If the minimum response rate and support rate are met, then staff determines whether the proposed plan needs City Council approval. Conditions that may require Council approval are if a proposed plan needs certification of environmental documents, General Plan amendments, Community Plan amendments, or high project cost.

- c) If the plan needs City Council approval, and the plan is not supported by a majority of the Council, then the plan may be modified to address the aspects of the plan that were not favored. Similar to the plan revision described above, staff and the task force would have one opportunity for revision.
- d) If the Council approves the plan, or if Council approval is not needed, then the plan continues to the implementation component.

3.2.3.2.3 Plan Implementation

The final component of the traffic calming process is project implementation.

A - Funding

Staff may develop a funding means for each plan as part of the annual CIP process, which will typically involve gas tax, sales tax, assessment districts, community block grants (if applicable to the area) and other transportation funding sources.

Staff and the task force may also want to seek grants or contributions from district funds or organizations.

This is also the opportunity for residents to fund upgrades. Collecting from residents for upgrades is not mandatory and may present challenges, especially when collecting from residents who don't support traffic calming in their neighborhood. If funding for upgrades are needed, a funding collection mechanism, such as assessment districts, may be appropriate.

B - Phasing

If full funding is not available, the project may be phased to accommodate the funds available.

C – Design and Consultation

Staff will present the detailed project plans (project design) to affected agencies. If necessary, staff and the affected agencies may conduct field tests of the pending devices. For example, the fire department could test the effects of navigating fire engines through pending devices.

Traffic cones could be used to outline the dimensions of the devices and trial runs conducted to determine the impact on fire engine maneuverability.

D - Notification

Before construction, staff will notify the public and affected agencies (Fire, EMS, etc.) regarding the planned implementation of a traffic calming device. Notification helps ensure that motorists and other road users are familiar with the device before it is built.

E - Construction

The traffic calming devices can be constructed either as temporary or permanent devices. Temporary devices can be constructed at staff's discretion based on previous experience with the device. These temporary devices can be converted to permanent devices after six months of acceptable performance.

If plans, specification and estimates were prepared for the neighborhood traffic calming control plan, and staff identified the funding for the project, then City Council approval for the construction contract will be required.

F - Education

Education is planned to run concurrently with Notification, Construction, and Monitoring in order to aid roadway users in the proper maneuvering within and around the pending devices. Education helps ensure that all users can continue to use the roadway in a safe manner. Some examples include posting informational signs, hosting seminars, and distributing flyers.

G - Monitoring

After construction of the approved plan, staff will monitor the devices and collect data 3-6 months after implementation as well as rely on the task force and community members for feedback on the constructed devices.

H – Degree of Success

Based on the task force and/or community members' feedback and collected data, staff will determine the next steps.

I – Next Steps

I-1 Leave Neighborhood Traffic Calming Control Plan As-Is

For example, the approved plan may have produced reasonable and satisfactory results and therefore there is nothing further for City staff to do.

I-1 Return to Project Development

If the approved plan has not produced reasonable and satisfactory results, staff can recommend one or more of the following:

- Collect additional traffic data as deemed appropriate.
- Modify constructed devices as deemed appropriate.
- Construct additional speed reduction devices as deemed appropriate.
- Return to Project Development and modify the plan.

The plan can be revised once. This includes the removal of devices found to be ineffective. If staff determines that speed reduction devices will not adequately address the traffic-related concern, then staff can recommend the use of volume reduction measures.

4 Design Guidance

Based on engineering judgment, traffic calming strategies should be considered whenever there is a need to reduce vehicle speeds and/or traffic volumes on a roadway or roadway network.

Increased consideration should be given to the following areas:

- Along streets or roadway segments with a high percentage of speed-related collisions.
- In locations or facilities that generate high concentrations of bicyclists and pedestrians.
- To support transitions from high speed to low-speed contexts.

Traffic calming measures vary in their range of control, impact and cost. The fundamental differences in these measures are based on their basic purpose and design. Understanding these factors can increase the possibility that the best measure will be selected.

4.1 Purpose

As mentioned before, the purpose of the available traffic calming measures falls into two fundamental categories:

- Devices that reduce “Speed”
- Devices that reduce “Volume”.

Traffic calming measures are not intended to address safety issues at intersections, to mitigate noise or other externalities from roadway arterials. Traffic calming is also not meant to create any modal shift or alteration of the roadway network and should not be installed merely to create uses for the roadway that were not otherwise intended.

4.2 Design

4.2.1 Available Options

The design of traffic calming measures can be organized into four categories to assist in understanding the available options.

Awareness Measures:

Traffic calming awareness measures are designed to induce the driver to change their behavior voluntarily rather than through the requirements of a permanent physical device.

These measures typically involve using signage, pavement markings or visual cues and effectively reduce speeds or volumes by alerting drivers about pedestrian crossings, upcoming traffic calming devices or creating the threat of traffic tickets.

Awareness and safety are basic steps of traffic calming and should be examined as a primary measure before physical solutions are considered.

Examples include centerline and lane striping, lane and pavement markings with visual cues, warning signs, turn restrictions and speed signs.

Vertical Deflection Measures

Traffic calming "vertical deflection measures" refers to physical design elements on a road that create a change in elevation, forcing drivers to slow down due to the bump or rise, essentially acting as a speed control mechanism.

Examples include speed humps, speed tables, raised intersections, and raised crosswalks.

Horizontal Deflection Measures

Traffic calming "horizontal deflection measures" refer to design elements that physically alter the path of vehicles by creating slight curves or offsets in the road, forcing drivers to slow down and navigate more carefully. Essentially, these measures are any feature that makes the road path less straight and more "zigzag-like."

Examples include curb extensions (bulb-outs), chicanes, raised median islands, and on-street parking.

Diversion Measures:

The traffic calming "diversion measures" refer to design elements that divert traffic in a particular direction or prevent traffic from traveling through a certain point.

Examples of diversion measures include full or partial road closure, Cul de sac, median barriers, right in / right out island, diagonal diverters and turning restrictions.

4.2.2 Available Options by Purpose

Calming devices that reduce Speed

Calming devices that reduce speed are designed to reduce excessive neighborhood speeds to acceptable levels. These tools either induce drivers to reduce their own speeds through awareness measures or can directly force drivers to decrease their speeds via physical changes to the roadway, which can prohibit reckless driving behavior.

Speed reduction methods are generally preferable to volume reduction methods in that they do not increase travel distances for residents. Also, some devices, such as raised medians or bulbouts have a dual purpose of providing safer pedestrian crossings and making pedestrians more visible.

The various traffic calming measures which can reduce speed, include:

Awareness Measures

- Roadway Striping

- In street pedestrian crossing signs
- Crosswalk enhancement
- Signage
- Flashing beacons
- Permanent Driver Feedback Sign
- Temporary Radar Speed Trailer
- Temporary Enforcement
- Pedestrian Hybrid Beacon / HAWK
- Gateway / Entrance Feature

Vertical Deflection Measures

- Speed Cushions, Speed Humps
- Speed Tables
- Raised Crosswalk

Horizontal Deflection Measures

- Angled Parking
- Bulbouts/Pop-Outs/Curb Extension
- Raised Crosswalks
- Raised Median / Pedestrian Refuge
- Roundabouts
- Traffic Circles
- Curb Radius Reduction
- Short Intersection Median
- Chokers
- Treatment on Curve

Calming devices that reduce Volume

Traffic calming devices that reduce volume are designed to reduce excessive cut-through traffic on residential streets that should otherwise be traveling on collectors or arterials.

The traffic calming measures that reduce volume include:

Awareness Measures

- Signage
- Turn Restrictions

Diversionsary Measures

- Right-In / Right-Out Island
- Full Street Closure / Cul-de-sac
- Median Barriers/ Channelization
- Diagonal Diverters
- Partial Street Closures/ Semi-diverter

4.2.3 Placement Considerations

The most important consideration in choosing what traffic calming device presents the best solution, is whether or not the tool can be physically implemented.

The selected calming device may be constrained by the limitations of the roadway, since residential streets vary in terms of the parking supply and need, roadway width, and the presence or width of sidewalks.

The location of the traffic calming device shall be placed where the full benefit of calming will be realized so long as there is little or no negative effect upon overall safety or quality of the roadway.

4.2.4 Design Considerations

Traffic calming devices shall be clearly marked and visible during the day and night. Where appropriate, they should include warning signs on all approaches of traffic affected by the device. All physical devices shall be designed with aesthetics in mind to provide for visual contrast and landscaping in the roadway.

Traffic calming measures vary in effectiveness depending on their design. Effects of awareness and respect from drivers can differ depending on where the calming device is placed. Designing a traffic calming device should take into consideration if:

- There is adequate provision of warning signs.
- The device will maintain adequate sight distances along the roadway and at driveways and intersections for both drivers and pedestrians.
- The device will settle into the character of its surroundings.
- The device will be viewed as a nuisance.
- The device will be fully obeyed once it is placed.
- The device will unsafely prevent emergency response vehicles from traveling to their destination.
- The device will be placed near a school so that pedestrian crossings are not affected.
- The device will block access to driveways.
- The device will block drainage.
- The device will be marked, signed and visible during both daytime and nighttime hours.

The likelihood of driver compliance with new installations should also be evaluated based on the location and situation. A well-designed device will increase the possibility that drivers will obey the visual cues of the device.

4.3 Traffic Calming Trade-Offs

Traffic calming involves trade-offs, finding a balance between the need to provide an efficient transportation network and maintaining a livable and safe environment for bicyclists, pedestrians, and other street or street-adjacent users. The challenge of traffic calming is selecting the appropriate measures and locations to reach that balance.

Traffic calming issues have shifted over the decades as communities across the country have embraced the concept of installing traffic calming on their roadways. Rapid response needs of emergency service providers remain a concern and policy to resolve such concerns has been developed. Funding of traffic calming however, continues to be an issue for many traffic calming programs and plans.

The design and installation of traffic calming devices should consider:

4.3.1 Travel Time Impacts:

Traffic calming in general is contrary to the purpose of driving – to get from one place to another in the shortest, most efficient manner. Traffic calming attempts to hinder driver natural behavior by introducing such things as speed reducing devices and restricting certain movements. These traffic calming measures increase travel time. When implementing a traffic calming treatment, it is understood that the motorists' inconvenience is necessary to improve the quality of life for others.

For example, neighborhood residents may want to reduce traffic and speeding through their neighborhood by placing traffic calming measures on a cut-through route. This may negatively affect both the cut-through motorists and neighborhood residents alike.

4.3.2 Emergency Response Times:

Traffic calming creates a conflict between two public safety goals. Minimizing emergency response times is an important public safety objective. Reducing speeds on residential streets also increases public safety. Implementation of traffic calming furthers the goal of residential street safety, but it can hamper emergency response times. This trade-off needs to be recognized as a part of the traffic calming process.

4.3.3 Noise:

Another drawback that must be considered when choosing among various tools of traffic calming is the creation of additional noise, such as that which stems from many vertical measures. In selecting a traffic calming device, tools that are the least likely to bring with them the creation of additional noise should be given priority so as to maintain the environmental quality of the residential area.

4.3.4 Street Diversion:

Driver behavior is difficult to predict; therefore, the outcome of implementing a traffic calming treatment may not be as originally desired.

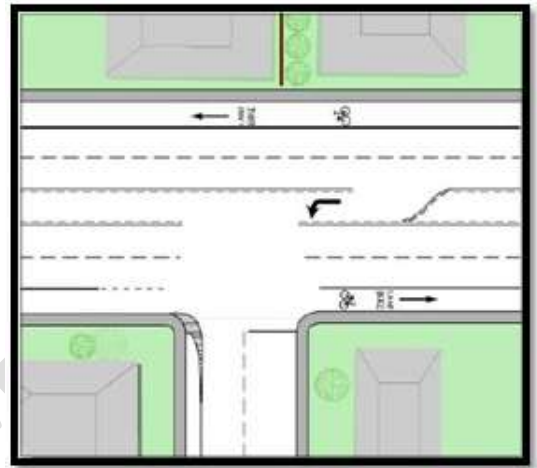
For example, introducing a speed reducing device may cause traffic to take another residential street. It should be considered unacceptable to merely reroute traffic to other residential streets unless the diversion results in a more equitable distribution of traffic.

5. Speed Reduction Measures

5.1 Awareness Measures

DRAFT

ROADWAY STRIPING



Primary Purpose:

SPEED REDUCTION

On: Residential, Collector and Major Arterial

ROADWAY STRIPING can change the appearance of the roadway, encouraging drivers to remain in designated lanes or drawing their attention to bike lanes.

Adding lane striping to a residential road without lane marking or bike lane may change the behavior of some drivers. By adding striping, the vehicle travel lanes are narrowed which will encourage slower speeds.

In general, vehicles will not travel in a designated bike lane. This can have a positive impact on both driver and bicycle safety.

ADVANTAGES

- Speed Reduction
- Increase visibility of bikes to drivers

DISADVANTAGES

- Possible loss of parking

IN STREET PEDESTRIAN CROSSING SIGNS



Primary Purpose:

PEDESTRIAN SAFETY

Other Potential Results:

SPEED REDUCTION

On: Residential, Collector and Minor Arterial

IN STREET PEDESTRIAN CROSSING SIGNS are placed within a roadway, either between travel lanes or in a median. The sign may be used to remind road users of laws regarding right of way at an unsignalized pedestrian crossing.

This sign is used with other crosswalk visibility enhancements to indicate preferred locations for people to cross and help reinforce the driver requirement to yield the right of way to pedestrians at designated pedestrian crossing locations.

ADVANTAGES

- Increase visibility of pedestrian to drivers.
- Driver compliance.

DISADVANTAGES

- Need appropriate width to avoid conflicts with commercial vehicles
- Only in uncontrolled pedestrian crossing locations.

CROSSWALK ENHANCEMENT



Primary Purpose:

PEDESTRIAN SAFETY

Other Potential Results:

SPEED REDUCTION

On: Residential, Collector and Minor Arterial

CROSSWALK ENHANCEMENT

Poor lighting and other factors that reduce driver visibility can cause safety issues at pedestrian crosswalks. In high speed or high vehicle traffic conditions, a substantially visible roadway crossing area could prevent or reduce the number of pedestrian-related collisions. Any number of enhancements may be combined to increase vehicle operators' visibility of the crosswalk and pedestrian users.

Enhancement options include:

- High-visibility crosswalk markings and marking patterns
- Improved lighting
- Advance Stop/Yield/Pedestrian Crossing markings and signs
- Parking restrictions
- Rectangular Rapid-Flashing Beacons (RRFB)

ADVANTAGES

- Increase visibility of pedestrian to drivers.
- Driver compliance.

DISADVANTAGES

- Installation costs
- Only in uncontrolled pedestrian crossing locations.

SIGNAGE



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

PEDESTRIAN SAFETY

On: Residential, Collector and Minor Arterial

SIGNAGE comes in various forms. Depending on the given circumstances, these signs may make drivers aware of their surroundings. Upon leaving a major arterial, many people do not recognize when they enter a residential neighborhood. Installing speed limit signs can notify drivers that have entered a residential neighborhood. “School Zone” signs are installed at appropriate locations to remind drivers that there is a school and there are children in the vicinity.

ADVANTAGES

- Speed reduction
- May discourage cut-through traffic
- Raise driver awareness

DISADVANTAGES

- Effect is often temporary
- Drivers may not obey the device without enforcement

FLASHING BEACONS



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

PEDESTRIAN SAFETY

On: Residential, Collector, Minor and Major Arterial

FLASHING BEACONS use repeating flashing lights to warn motorists. They are used to draw motorists' attention to a sign informing them of an upcoming change in the road conditions that could include unseen intersections, schools, curves, or other typical applications as shown below.

Typical Applications listed in CA MUTCD:

- Signal ahead
- Stop signs
- Speed limit signs
- Other warning and regulatory signs
- Schools
- Fire stations
- Intersection control
- At Intersections, where a more visible warning is desired.

ADVANTAGES

- Speed reduction
- Raise driver awareness
- Customizable colors for different situations

DISADVANTAGES

- Potential distraction
- Reduced visibility in bright light
- Misinterpretation

PERMANENT DRIVER FEEDBACK SIGN



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

On: Residential, Collector, Minor and Major Arterial

PERMANENT SPEED FEEDBACK SIGNS are used to educate drivers of their speed, specially as they travel on residential streets. Speed Feedback Signs can be setup permanently for a more lasting effect when compared with radar speed trailer. This device can be a first attempt at getting drivers to reduce their speeds. The driver's behavior may change when the feedback sign is first introduced; it will not necessarily modify driver behavior permanently.

ADVANTAGES

- Speed reduction
- Inexpensive attempt at traffic calming
- No increase in EMS/ Fire response time

DISADVANTAGES

- Changes in driver behavior are only temporary

TEMPORARY RADAR SPEED TRAILER



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

On: Residential, Collector, Minor and Major Arterial

PERMANENT SPEED FEEDBACK SIGNS are used to educate drivers of their speed, specially as they travel on residential streets. Radar speed trailers are mobile and can be used for a temporary warning device. This type of equipment can a first attempt at getting drivers to reduce their speed. The driver's behavior may change when radar speed trailer is first introduced; it will not necessarily modify driver behavior permanently.

ADVANTAGES

- Speed reduction
- Inexpensive and temporary attempt at traffic calming
- No increase in EMS/ Fire response time
- Raises driver awareness

DISADVANTAGES

- Changes in driver behavior are only temporary

TEMPORARY ENFORCEMENT



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

On: Residential, Collector, Minor and Major Arterial

TEMPORARY ENFORCEMENT requires the presence of officers to monitor and enforce speeds and restrictions. Enforcement is usually used as a first attempt at reducing speeds and changing driver behavior. However, the influence of the police usually lasts as long as the officers are present. Based on the cost versus benefit, physical measures may have greater effect and could be more effective in the long run.

ADVANTAGES

- Speed reduction
- No permanent roadway changes

DISADVANTAGES

- Changes in driver behavior are only temporary

PEDESTRIAN HYBRID BEACONS/HAWK SIGNALS



Primary Purpose:

PEDESTRIAN SAFETY

Other Potential Results:

SPEED REDUCTION

On: Residential, Collector, Minor and Major Arterial

PEDESTRIAN HYBRID BEACONS/HAWK Signals are a pedestrian-activated overhead signal consisting of two red lenses above a single yellow lens. The lenses remain “dark” until a pedestrian pushes the call button to activate the beacon, which then initiates a yellow to red lighting sequence that directs motorists to slow and come to a stop. The pedestrian hybrid beacon accompanied with appropriate signs and pavement markings provides greater visibility for locations, where a crosswalk is not accompanied by a signal-controlled intersection.

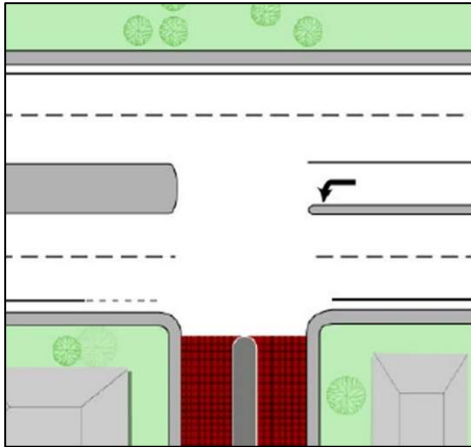
ADVANTAGES

- Enhance driver awareness of pedestrian at uncontrolled crossings

DISADVANTAGES

- Maintaining minimum sidewalk clear width in compliance with ADA
- Right of way considerations
- Signal pole foundations can impact existing utilities

GATEWAY / ENTRANCE FEATURES



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

PEDESTRIAN SAFETY

On: Residential, Collector

GATEWAY / ENTRANCE FEATURES are used on local streets at the intersection with collectors or major arterials. The purpose of a gateway/entrance feature is to alert the driver that they have left the arterial roadway and have entered a residential neighborhood. Examples may include a median with a tree or neighborhood sign, and or texture roadway treatment.

ADVANTAGES

- May cause a reduction in speeds
- May discourage cut-through traffic
- May provide pedestrian crossing refuge
- Strengthens neighborhood identity
- Changes driving environment

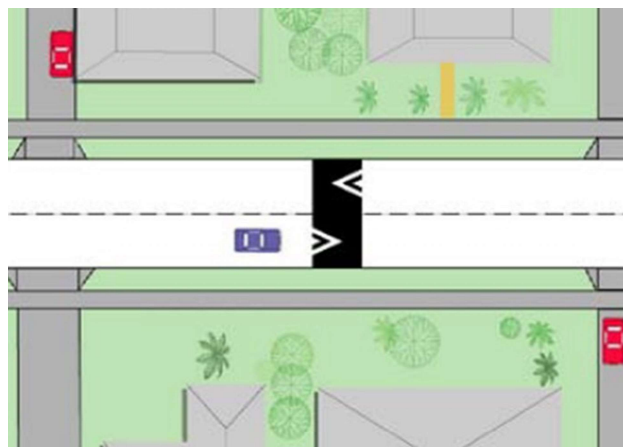
DISADVANTAGES

- May cause difficulty for large vehicles to make right turns

5.2 Vertical Deflection Measures

DRAFT

SPEED HUMPS



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

COLLISION REDUCTION

On: Residential, Collector*

*May only be used on low ADT two lane collectors that do not have two-way left-turn lanes or dedicated left turn pockets

SPEED HUMPS are devices to encourage drivers to travel at lower speeds over the device. They are approximately 3 ½ inches high, have a parabolic-shape surface, and span the width of the road. The height causes the driver to be jolted if traveling at too high of a speed. However, due to the advance in vehicle suspension systems, this device may not affect all drivers. It must be cautioned that these devices do have a severe impact on emergency response services and can create uncomfortable situations for all passengers including those in ambulances.

ADVANTAGES

- Speed reduction
- May discourage cut-through traffic
- Changes driving environment

DISADVANTAGES

- Uncomfortable for bicyclist and vehicle passengers
- Create noise
- EMS/Fire vehicles forced to almost stop at ramp

SPEED CUSHIONS



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

COLLISION REDUCTION

On: Residential, Collector*

*May only be used on low ADT two lane collectors that do not have two-way left-turn lanes or dedicated left turn pockets

SPEED CUSHIONS are similar to speed humps except that there are two tire cut-outs set far enough apart to allow for an emergency vehicle's tire pathway to pass between each cushion. devices to encourage drivers to travel at lower speeds over the device. They are approximately 3 ½ inches high, have a parabolic-shape surface, and span the width of the road. The pathway is set based on the axle width of a fire apparatus allowing emergency vehicles to pass through virtually unimpeded. Vehicles with narrower wheelbase would be forced to travel over the cushions.

ADVANTAGES

- Speed reduction
- May discourage cut-through traffic
- Will not impede EMS/Fire response as much as traditional speed humps

DISADVANTAGES

- Uncomfortable for bicyclist and vehicle passengers
- Create noise

SPEED TABLE



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

COLLISION REDUCTION

On: Residential, Collector*

*May only be used on low ADT two lane collectors that do not have two-way left-turn lanes or dedicated left turn pockets

SPEED TABLES provide vertical deflection. Instead of having a rounded surface, speed tables have ramps on either side leading to a flat table. The effectiveness of the speed table can be varied by changing the shape of the ramps and/or the texture of the table. Steeper ramps will cause a greater reduction in speeds. Texture pavement may affect bicyclist but can be designed to take bike safety into account.

Speed tables can be used in conjunction with a midblock pedestrian crossing. The speed table may increase the visibility of pedestrians at mid-block locations (similar to a raised crosswalk).

ADVANTAGES

- Speed reduction

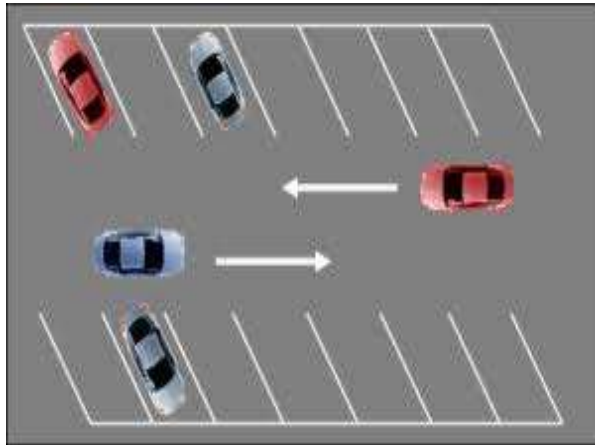
DISADVANTAGES

- EMS/Fire vehicles forced to almost stop at ramp
- Create more noise from decelerating and accelerating
- May cause bicycle safety issues if non-standard pavement treatments are used

5.3 Horizontal Deflection Measures

DRAFT

ANGLED PARKING



Primary Purpose:

SPEED REDUCTION

On: Residential, Collector

Other Potential Results:

ANGLED PARKING is generally used to increase the number of available parking spaces. However, a positive by-product can be reduction of vehicle speed. Drivers may slow down in anticipation of vehicles backing out from parking spaces.

Another option for angled parking is to provide back-in parkin which may decrease the accident potential associated with traditional back-out parking.

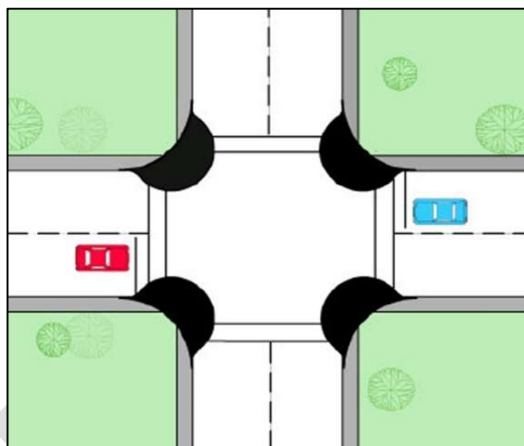
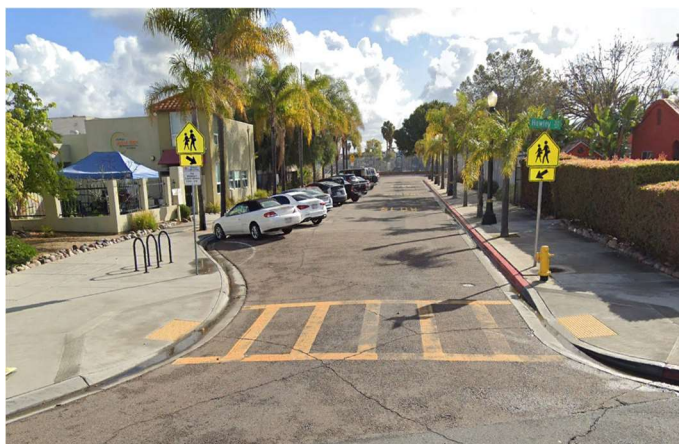
ADVANTAGES

- Speed reduction
- Maintains emergency response access
- Increase parking

DISADVANTAGES

- May encourage cars from other streets to use available parking
- Potential Bike impacts

BULBOUTS / POP-OUTS / CURB EXTENSION



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

PEDESTRIAN SAFETY

COLLISION REDUCTION

On: Residential, Collector, Major

BULBOUTS, also known as Pop-Outs and Curb Extensions, narrows the width of a street at intersection locations by extending the curb into the parking lanes. This creates shorter crossing distance a pedestrian's exposure time to oncoming vehicles. Bulbouts also may slow vehicles making right turns, as the potential turning radius is greatly reduced. By placing the pedestrian at the edge of the travel lane, both the pedestrian and the driver have a better view of each other. Bulbouts are best used in locations with high pedestrian volumes, such as downtown areas and near schools.

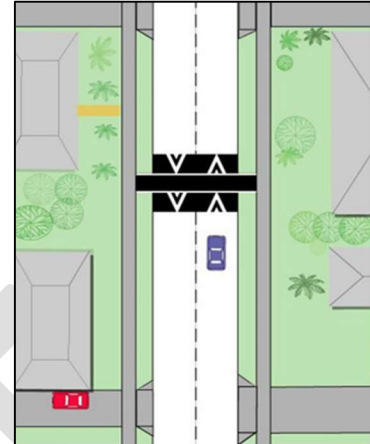
ADVANTAGES

- Increase the visibility of pedestrians to drivers
- Speed reduction of through traffic
- Speed reduction for right vehicles

DISADVANTAGES

- Difficult for emergency vehicles and larger vehicles to turn
- May force bicyclists into travel lanes

RAISED CROSSWALK



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

PEDESTRIAN SAFETY

On: Residential, Collector

RAISED CROSSWALKS are similar to speed tables; however, they provide a marked pedestrian crossing. This device can be used at intersections or mid-block locations. Raised crosswalks are highly effective in areas with large volumes of pedestrian traffic, such as schools or downtown business districts.

Raised crosswalks can be combined with bulbouts or chokers to decrease the distance a pedestrian is in the vehicle travel way.

ADVANTAGES

- Speed reduction
- Improves visibility of pedestrians and crossings
- Can provide pedestrian mid-block crossings

DISADVANTAGES

- Loss of parking
- EMS/Fire vehicles forced to almost stop at ramp.
- Creates more noise from vehicles decelerating and accelerating

RAISED MEDIAN / PEDESTRIAN REFUGE



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

PEDESTRIAN SAFETY

VOLUME REDUCTION

On: Residential, Collector, Major

RAISED MEDIAN/PEDESTRIAN REFUGE are used on wide streets to shorten a pedestrian's crossing distance and provide pedestrians with a refuge. To provide refuge, the median should have a minimum width of 6'. This also allows the pedestrian to cross one direction of traffic at a time. After a pedestrian crosses one lane of traffic, they may wait in the median area before crossing the other lane of traffic. These medians can be landscaped to break up the sight line of the driver and enhance the aesthetics of the neighborhood. Landscaping also increases the visibility of the tool.

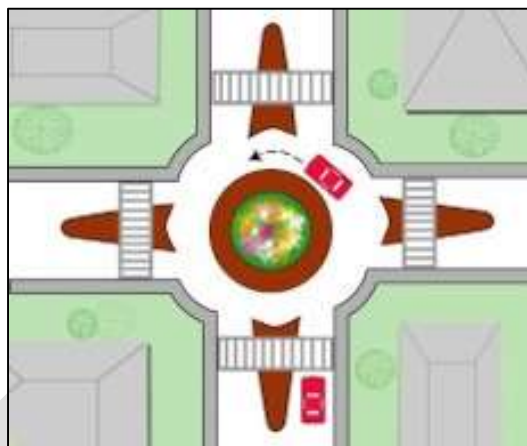
ADVANTAGES

- Provides ability for a safer pedestrian crossing
- Possible opportunity for landscaping

DISADVANTAGES

- Potential loss of parking
- May restrict access to driveways in vicinity of devices

ROUNDBABOUT



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

COLLISION REDUCTION

On: Residential, Collector

ROUNDBABOUTS are large circular medians placed in the center of an intersection. Traffic flows around the median counterclockwise through the intersection. Drivers yield to vehicles already circulating within the intersection. Due to the horizontal deflection, vehicles must slow to maneuver around the intersection. Speeds can be reduced from multiple directions. The circular median and splitter islands can both be landscaped to help beautify the neighborhood.

In general, roundabouts are more expensive than traffic circles due to larger right-of-way requirements. However, roundabouts are typically more cost effective for an intersection compared with traditional traffic signals

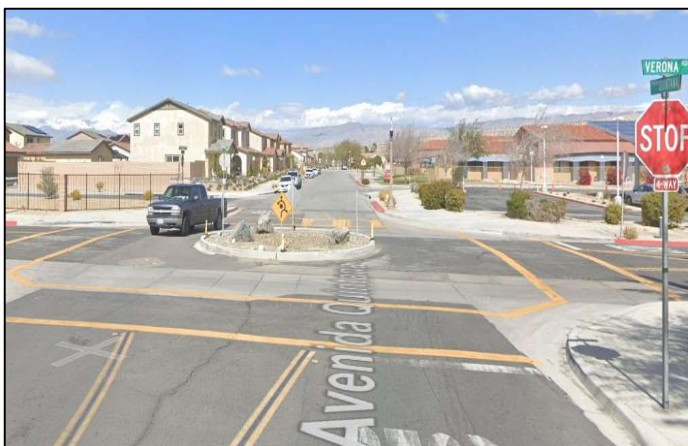
ADVANTAGES

- Speed reduction
- Possible opportunity for landscaping
- Easier for larger vehicles to navigate relative to traffic circles
- Typically, more cost effective than traditional signals

DISADVANTAGES

- Potential loss of parking
- Greater expense relative to traffic circles
- Potentially difficult for disabled pedestrians to navigate
- Increased EMS/Fire response

TRAFFIC CIRCLES



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

PEDESTRIAN SAFETY

COLLISION REDUCTION

On: Residential

TRAFFIC CIRCLES are circular medians placed in the center of an intersection. Traffic flows around the median counterclockwise through the intersection. Drivers yield to vehicles already circulating within the intersection. These devices may reduce speeds through neighborhoods. Due to the horizontal deflection, vehicles must slow to maneuver around the device. The circular median can be landscaped to help beautify the neighborhood.

Depending on right-of-way and budget constraints, either a traffic circle or roundabout can be installed. Unlike roundabouts, traffic circles do not have splitter islands on each approach to help guide traffic around the roundabout due to their smaller size. Large emergency vehicles like fire trucks are permitted to turn left in front of circle.

ADVANTAGES

- Speed reduction
- Possible opportunity for landscaping
- Possible decrease in intersection accidents with stop-controlled intersections

DISADVANTAGES

- Potential loss of parking
- Restricts turning movements by larger vehicles
- Increased EMS/Fire response

CURB RADIUS REDUCTION



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

PEDESTRIAN SAFETY

COLLISION REDUCTION

On: Residential, Collector, Major

CURB RADIUS REDUCTIONS provide tighter corner radii at intersections. This treatment may reduce the right-turn speed of vehicles. By reducing right-turn speeds, some drivers may be discouraged from cutting through the neighborhood. It also will increase the visibility of pedestrians to drivers and shorten the crossing distance for pedestrians.

This treatment may cause difficulty for larger vehicles. Some larger vehicles may not be able to make the turn without crossing into the opposing travel lane. This treatment may not be appropriate in areas that experience high volumes of large vehicles.

ADVANTAGES

- Slow right turn speeds
- May discourage cut through traffic
- Increase the visibility of pedestrian to drivers
- Shorten pedestrian crossing distance

DISADVANTAGES

- Difficult for larger vehicles to make right turn

SHORT INTERSECTION MEDIAN



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

PEDESTRIAN SAFETY

COLLISION REDUCTION

On: Residential, Collector

SHORT INTERSECTION MEDIAN can be installed on any leg of an intersection to slow fast-turning vehicles. The median forces vehicles to make a turn along a smaller radius, rather than making a higher speed turn on a larger radius, thereby slowing traffic. This device may also be installed at mid-block locations to achieve the same effect by forcing traffic to shift its path to travel safely around the median. However, this tool may block access to some driveways. Also, it may require removing some parking. The medians may restrict some larger vehicles, such as fire trucks, buses or moving vans, from making left turns at the intersection.

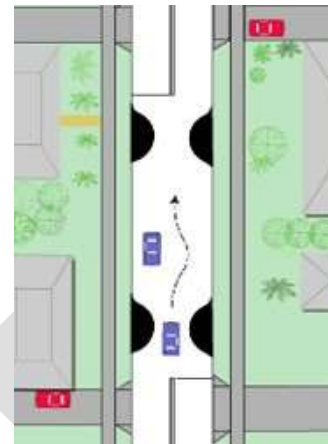
ADVANTAGES

- Potential for reduction of left-turn speeds
- Possible opportunity for landscaping
- Refuge for pedestrians

DISADVANTAGES

- Potential loss of parking
- May restrict access to driveway in vicinity of device
- May restrict turning movements by larger vehicles

CHOKERS



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

VOLUME REDUCTION

COLLISION REDUCTION

On: Residential, Collector

CHOKERS are created by installing curb extensions at locations on opposite sides of a roadway. This narrows the road, but still maintains two-way traffic. This form of traffic management works best at mid-block locations that have sufficient enough volumes so that opposing traffic would be passing the choker at or near the same point in time. This discourages drivers from traveling down the center of the roadway to avoid any impacts of the chokers. There should be enough roadway width maintained between the chokers to accommodate bicycle and vehicle traffic.

ADVANTAGES

- Speed reduction
- Possible opportunity for landscaping
- Potential midblock crossing location if combined with pedestrian crossing features

DISADVANTAGES

- Loss of some on-street parking in vicinity of treatment
- Potential increased maintenance

TREATMENT ON CURVE



Primary Purpose:

SPEED REDUCTION

Other Potential Results:

COLLISION REDUCTION

On: Residential, Collector

TREATMENT ON CURVES intends to prevent vehicles from drifting into the opposing lane while traveling around a sharp curve. By eliminating the ability to travel into the opposing lane, speeds are generally reduced around the curve. Raised pavement markers (Botts dots) can be installed. Also, medians can be installed if there is sufficient roadway width. However, median installation has the potential to block driveway access. Openings may be cut in the median or the median may be mountable, to accommodate this situation.

ADVANTAGES

- Speed reduction

DISADVANTAGES

- Potential loss of parking
- May restrict access to driveways in vicinity of device
- May create noise

6. Volume Reduction Measures

6.1 Awareness Measures

DRAFT

TURN RESTRICTION



Primary Purpose:

VOLUME REDUCTION

Other Potential Results:

SPEED REDUCTION

On: Residential, Collector, Major

TURN RESTRICTIONS can help reduce cut-through traffic or eliminate turn movements. Turn restrictions such as “No Right Turn 6AM-9AM” may help reduce traffic from cutting through a residential neighborhood to avoid a congested arterial. This type of treatment, however, relies on enforcement to make sure drivers are abiding by the restriction.

ADVANTAGES

- May discourage cut-through traffic
- Maintains emergency response access

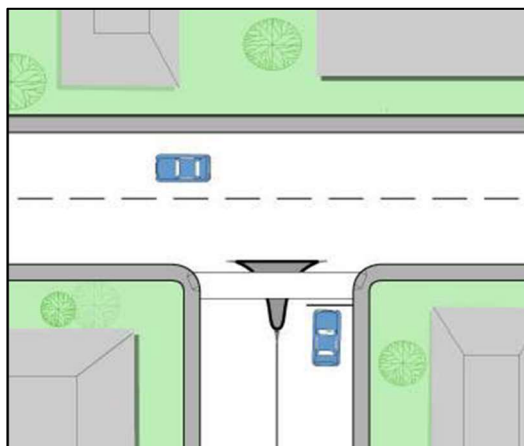
DISADVANTAGES

- May Increase trip length for many residents
- May increase traffic on adjacent roadways
- Drivers can bypass device

6.2 Diversionary Measures

DRAFT

RIGHT-IN/RIGHT-OUT ISLAND



Primary Purpose:

VOLUME REDUCTION

Other Potential Results:

SPEED REDUCTION

PEDESTRIAN SAFETY

COLLISION REDUCTION

On: Residential, Collector

RIGHT-IN/RIGHT-OUT ISLANDS restrict left-turns into and out of a particular street. Rather than relying on a sign to discourage drivers from turning left, right-in/right-out islands force drivers to make the desired movement using a raised median.

The right-in/ right-out island can be constructed to restrict a single left-turn. For example, the left-turn out may be restricted, but the left-turn in may be maintained.

This device may be particularly effective at locations where local streets intersect with uncontrolled collector streets. If a left-turn in or out of a particular street is difficult due to speed or sight distance, the installation of a right-in/ right-out island may be very beneficial. However, on low volume roadways, the device may be ineffective as drivers may still be able to make left turns, thereby bypassing the device.

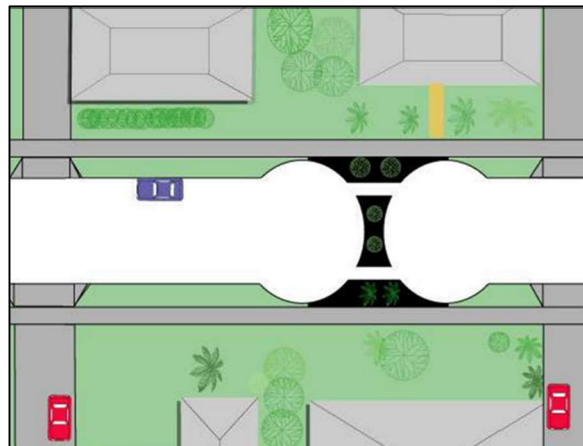
ADVANTAGES

- Slows right turn speeds
- May discourage cut-through traffic
- May provide pedestrian refuge

DISADVANTAGES

- Difficult for large vehicles to make right-turn
- May shift traffic to adjacent streets

FULL STREET CLOSURE/CUL-DE-SAC



Primary Purpose:

VOLUME REDUCTION

Other Potential Results:

SPEED REDUCTION

COLLISION REDUCTION

On: Residential

FULL STREET CLOSURES/CUL-DE-SACS are created by constructing a barrier across the entire street to all through traffic. This measure will have a drastic effect on local traffic circulation. They are used to force changes in travel patterns – such as preventing cut-through traffic in residential neighborhoods or to eliminate dangerous or problematic intersections. Adjacent roadways will experience an increase in traffic due to the closure and local residents will have longer travel routes.

Full street closures should be constructed in a manner that maintains pedestrian, bicycle, and emergency vehicle access.

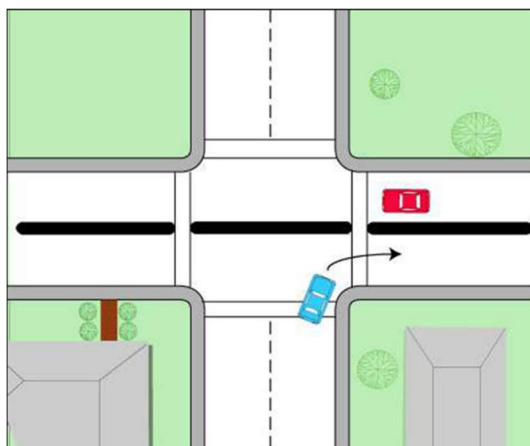
ADVANTAGES

- Eliminate cut-through traffic
- Potential landscaping opportunity

DISADVANTAGES

- Will change neighborhood Traffic patterns
- Will increase trip length for many residents
- Will increase traffic in adjacent roadways
- Emergency response routes may lengthen

MEDIAN BARRIER / CHANNELIZATION



Primary Purpose:

VOLUME REDUCTION

Other Potential Results:

SPEED REDUCTION

PEDESTRIAN SAFETY

COLLISION REDUCTION

On: Residential, Collector

MEDIAN BARRIERS/CHANNELIZATION help prevent cut-through traffic in residential neighborhoods. The raised median is used on the major street, restricting traffic from continuing from one residential neighborhood to the next. The median barrier also restricts left-turns from the major street into the residential neighborhoods. Typically, right-in and right-out are the only turn movements allowed to and from the minor street. However, a variation on the median barrier is an "S" Median which allows for left turn movements from the major street onto the minor street but still prevents through traffic from crossing.

Median barriers can also help improve traffic flow along the major street. Stacking caused by vehicles waiting for a gap to make a left turn will be eliminated. Median barriers can also help improve intersection safety due to a decrease in conflicting intersection turn movements. Pedestrians may also use the median barrier as a refuge while crossing the major street, given a minimum median width of 6'. Pedestrians would only have to be concerned with one direction of traffic at a time.

Median barriers can help reduce cut-through on residential streets. However, they inevitably result in changes to travel patterns which can shift problems elsewhere. They also may cause inconvenience to residents and delays to emergency response vehicles.

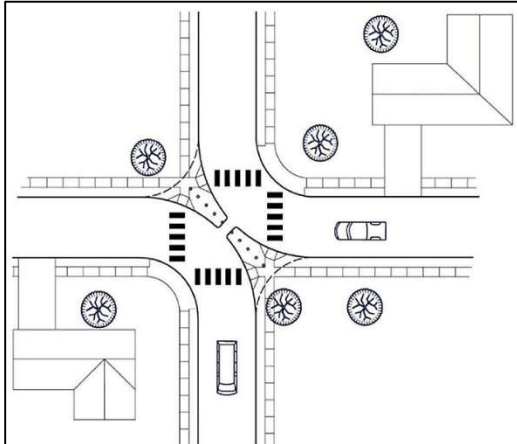
ADVANTAGES

- Effective in reducing cut through traffic
- Possible opportunity for landscaping
- Can reduce traffic volumes on residential streets

DISADVANTAGES

- May shift problem to neighboring roads
- Restricts access to neighborhood
- Restricts EMS/ Fire access
- May cause difficulty in mapping routes to a location due to roadway change

DIAGONAL DIVERTER



Primary Purpose:

VOLUME REDUCTION

Other Potential Results:

SPEED REDUCTION

COLLISION REDUCTION

On: Residential

DIAGONAL DIVERTERS are barriers constructed diagonally across a four-legged intersection blocking the through movements. Diagonal diverters can create circuitous routes for those accessing adjacent properties, including emergency services. Some neighborhood roads may experience an increase in traffic, while others experience a decrease due to the change in traffic circulation. Design features of the diverter could allow for pedestrian, bicycle, and EMS/ Fire access.

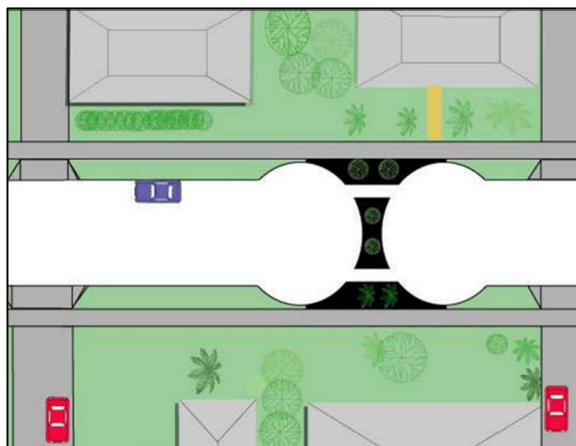
ADVANTAGES

- Eliminate cut-through traffic
- Potential landscaping opportunity

DISADVANTAGES

- Will change neighborhood Traffic patterns
- Will increase trip length for some residents
- Will increase traffic in adjacent roadways
- Emergency response routes may lengthen

PARTIAL STREET CLOSURE/SEMI DIVERTER



Primary Purpose:

VOLUME REDUCTION

Other Potential Results:

SPEED REDUCTION

PEDESTRIAN SAFETY

COLLISION REDUCTION

On: Residential

PARTIAL STREET CLOSURES/SEMI-DIVERTERS are barriers that block one direction of travel. This device can be used to block entering or exiting traffic, depending on the specific neighborhood problem. They are used to prevent drivers from making certain turn movements at an intersection. Partial street closures can effectively reduce traffic volumes on a street although the diverted traffic may impact adjacent streets.

Careful consideration must be given when installing a partial street closure. Pedestrian and bicycle access should be maintained when using this device. Any road closure can create circuitous travel routes for residents in the affected neighborhood. Closures will also increase traffic volumes on adjacent roadways due to the changes in residents' travel patterns.

ADVANTAGES

- Eliminate cut-through traffic in one direction
- Potential landscaping opportunity
- Maintains emergency response access

DISADVANTAGES

- Will change neighborhood Traffic patterns
- Will increase trip length for many residents
- Will increase traffic in adjacent roadways
- Drivers can bypass device