



HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: November 14, 2024
To: Joshua Llamas, City of Sunnyvale
From: Ollie Zhou, Shikha Jain
Subject: Potential Changes to the Sunnyvale Neighborhood Traffic Calming Program

As part of the Sunnyvale Neighborhood Traffic Calming Program (NTCP) update, Hexagon conducted a literature review of traffic calming programs of comparable cities in the region, traffic calming criteria and thresholds, and traffic calming measures and best practices. This review was used to inform the City about the neighborhood traffic calming best practices in the region. In addition to the literature review, Hexagon also conducted community outreach through two community meetings, a stakeholder meeting with Department of Public Safety (DPS), and a study session with City Council to understand their concerns about the current program. The review of traffic calming programs, criteria, and thresholds of comparable cities, traffic calming measures, and community feedback is attached as Appendix A, B, and C respectively.

Based on the feedback by all and the literature review, the following potential changes to the NTCP have been identified.

Expand the Definition of Traffic Calming

The current NTCP Handbook definition of traffic calming focuses on what traffic calming is and the issues it treats. The current definition is:

“Traffic Calming employs a combination of non-physical and physical measures to reduce cut-through traffic and speeding, alter driver behavior and improve conditions for all users on the road.”

Based on discussions with City Staff and public input, the issue of cut-through traffic and speeding in residential areas needs to be treated to:

- Improve quality of life for all residents
- Improve comfort level for non-vehicular users

Therefore, the traffic calming definition can be expanded to include these reasons. A potential updated definition of traffic calming for the NTCP is:

“Traffic Calming employs a combination of non-physical and physical measures to reduce cut-through traffic and speeding issues in residential neighborhoods, improve quality of life for residents as well as the comfort level for non-vehicle road users.”

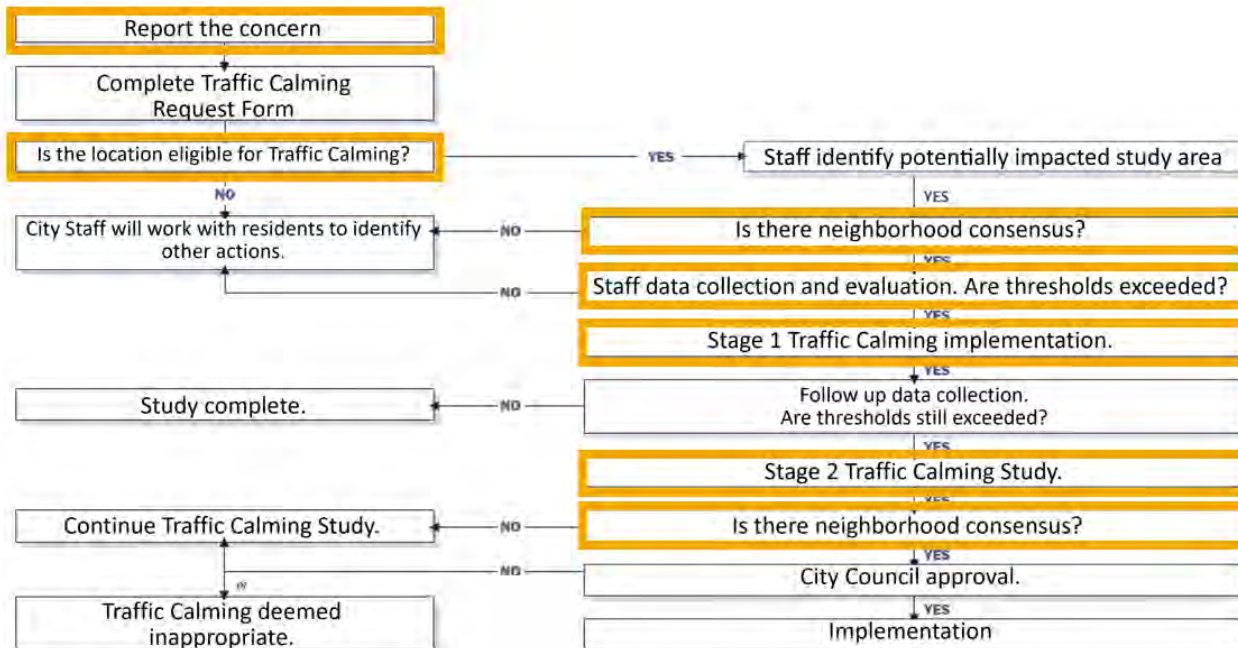
Furthermore, in support of the traffic calming definition and to provide a clear focus of this program, the following objectives for the traffic calming program shall be included:

- Encourage responsible driving;
- Discourage non-residential cut-through traffic on local residential streets;
- Maintain emergency vehicle response times; and
- Reduce the need for police enforcement post traffic calming

Changes to the Program Process

Based on community and City Council input and a review of other City’s programs, the following highlighted steps in the current NTCP process (illustrated below) could be modified to better align it with City’s current policies and community needs:

- Report the Concern
- Is the location eligible for Traffic Calming?
- Is there neighborhood consensus? (Initial Petition Stage)
- Staff data collection and evaluation. Are thresholds exceeded?
- Stage 1 Traffic Calming implementation
- Stage 2 Traffic Calming Study
- Is there neighborhood consensus? (Stage 2 measure implementation)



Source: Sunnyvale Neighborhood Traffic Calming Program Handbook, 2002

Potential modifications to each of the steps including the pros and cons associated with the modifications is provided below.

Report the Concern

Currently, the City of Sunnyvale website has a link to the existing Neighborhood Traffic Calming Handbook that a resident can download. If a resident wants to request a concern, they need to

contact the City's public works department, who direct them to complete the traffic calming request form if the request is eligible. Following the completion of the request, the resident needs to reach out to the public works department for any updates on the request. Furthermore, if the resident request is not eligible, staff directs them to other city programs. Based on input from the community, this process is not user friendly and transparent. Therefore, one of the potential updates to the program involves improving the communication and transparency of the program.

In order to improve the communication of the program, a program webpage could be created that may include the information listed below to provide an easy and accessible guide for the residents/public to follow:

- Link to Traffic Calming Program Handbook
- Direct and simple information about the program and process related to:
 - Definitions and Objectives of the program
 - Traffic Calming process flow chart
 - Link to the Traffic Calming Petition
 - Roadway Classification Map
 - Speed and Volume Thresholds
- Improved transparency for completed and ongoing requests like:
 - Status of requests (i.e. completed, under review, not yet started)
 - If completed, findings and measures implemented, whether Stage 1 is successful, and if not, status for Stage 2 implementations
- Clarify available resources for common resident concerns:
 - Provide links or information on other City programs that cover transportation concerns not covered under NTCP. Examples of common resident requests and other City programs include:
 - Common resident requests like intersection controls, new crosswalk or crossing improvements, signing and striping, and enforcement can be reported through Access Sunnyvale.
 - Improvements near schools can be reported through the school or school district.
 - Other City programs include the adopted Active Transportation Plan and Vision Zero plan. If there are recommendations in those plans to improve the segment of concern, the City looks for funding opportunities to implement them.

The pros/cons of improving program communication are provided in Table 1.

Table 1: Pros/cons of Improving Program Communication

| Pros | Cons |
|---|---|
| <ul style="list-style-type: none"> • Improved program transparency and clarity • Direct resident requests to the most appropriate City program • Residents can view status updates on traffic calming requests | <ul style="list-style-type: none"> • Require additional staff resources to update ongoing projects |

Is the Location Eligible for Traffic Calming?

The current Sunnyvale NTCP does not include residential collector streets. A review of 8 other cities' similar programs in the region showed that five cities include residential collector streets under their program and three cities do not include residential collector streets under their program. The City could potentially include residential collector streets in their program making 48 residential collectors throughout the city eligible for traffic calming. However, since collector streets move traffic from local streets to arterial streets, traffic calming criteria for residential collectors should only include speed thresholds, and traffic calming measures considered on residential collector streets should only include speed reduction measures. Volume thresholds or volume diversion measures should not be considered for residential collectors since they may divert traffic to local residential streets.

Traffic calming criteria and traffic calming measures to be considered for residential collectors include:

- Traffic calming criteria for residential collectors:
 - Speed threshold can be similar to that of local streets
- Traffic calming measures for residential collectors:
 - Traffic calming measures that could be considered for residential collectors include all Stage 1 measures and Stage 2 speed reduction measures like Curb Extension, Choker, Chicane, Median Island, and Speed Cushion.
 - Traffic calming measures such as Median Barrier, Forced Turn Island, Barrier, Channelization, Diagonal Diverter, One-Way Street, One-Way Choker, Half-Closure or Semi-Diverter, Street Closure, and Cul-de-sac are used for volume diversion and reduction of cut-through traffic. Therefore, they should not be considered for residential collectors.

The pros/cons of including residential collectors in the program are provided in Table 2.

Table 2: Pros/cons of Expanding the Program to Include Residential Collectors

| Pros | Cons |
|---|--|
| <ul style="list-style-type: none"> • Address potential speeding and volume issues on residential collectors • Respond to requests that could improve residents' quality of life | <ul style="list-style-type: none"> • Require additional staff resources • May impact emergency response times • May result in traffic diversion to local residential streets • Limited traffic calming measures are applicable |

Is there Neighborhood Consensus (Initial Petition)?

Currently, the NTCP requires an initial petition with greater than 50 percent support from a neighborhood boundary (determined by the City) to start the traffic calming process. Once the project receives support, the City conducts the initial Stage 1 process. If Stage 1 measures cannot adequately address the traffic calming concerns, the City conducts the Stage 2 process without the need for another petition to begin the process.

Most other cities whose programs were reviewed require only an initial petition from a resident to implement Stage 1 measures. However, they do require 10 percent to 60 percent support to initiate the process of considering Stage 2 measures. Stage 1 measures are non-physical measures that

are typically easy to implement, relatively inexpensive, less intrusive, and have few negative effects. On the other hand, stage 2 measures are physical measures, which unlike non-physical measures, inconvenience all vehicles. These measures are difficult to implement, relatively expensive, can be very intrusive, and have varying negative effects. Therefore, cities want to ensure that there is neighborhood support when considering implementation of Stage 2 measures.

A potential change to the program could include lowering the support required during the initial petition stage to implement Stage 1 measures. The pros/cons of reducing the initial petition support percentage are provided in Table 3.

Table 3: Pros/cons of Reducing the Initial Petition Support Percentage

| Pros | Cons |
|--|--|
| <ul style="list-style-type: none"> • Easier to initiate a traffic calming request for residents | <ul style="list-style-type: none"> • Result in additional traffic calming studies and city resources as the initial petition requirement is reduced • Less than 50% support means we do not have a majority who share the same concerns • Require a second petition to initiate Stage 2 measures to ensure majority support prior to consideration of physical traffic calming measures |

Staff Data Collection and Evaluation. Are thresholds Exceeded?

The NTC current speed and volume thresholds are:

- Speed threshold:
 - 85th percentile speed > 32 miles per hour, or
 - 95th percentile speed > 35 miles per hour
- Volume threshold:
 - ADT > 1,000 vehicles per day

The 85th percentile speed threshold and the volume threshold are in line with other reviewed cities' traffic calming programs. However, no other cities' program included a 95th percentile speed threshold. The 95th percentile threshold implies that out of 100 vehicles, as long as five vehicles exceeded the 95th percentile speed threshold, then traffic calming can be considered. This threshold addresses resident concerns for the few drivers who considerably exceed the speed limit. In all the traffic calming studies that the City of Sunnyvale has conducted, no location has only met the 95th percentile speed threshold. Furthermore, all studied locations that met the 85th percentile speed threshold also met the 95th percentile speed threshold.

Since this threshold is not used by other cities and has never solely qualified a street for traffic calming in Sunnyvale, it could potentially be removed from the program.

The pros/cons of removing the 95th percentile speed criteria are provided in Table 4.

Table 4: Pros/cons of Removing the 95th Percentile Speed Criteria

| Pros | Cons |
|--|--|
| <ul style="list-style-type: none"> Focuses on speeding issues that are prevalent versus those caused by a handful of outlier speeders | <ul style="list-style-type: none"> Relies on police enforcement to address outlier speeders |

Stage 1 Traffic Calming implementation (Stage 1)

A review of traffic calming measures as part of the *Traffic Calming Measures for the Sunnyvale Neighborhood Traffic Calming Program Memorandum* by Hexagon dated August 9, 2024 showed that most of the documented traffic calming measures are identified in the Sunnyvale NTCP. However, a stage 1 measure not included in the Sunnyvale NTCP that could be added is community outreach and education. Community outreach involves neighborhood awareness and education campaigns on traffic and traffic safety issues. These campaigns can consist of neighborhood meetings, written correspondence, school safety workshops, or other programs that help inform and educate the public.

The pros/cons of adding community outreach and education to the traffic calming measures are provided in Table 5.

Table 5: Pros/cons of Adding Community Outreach/Education to Traffic Calming measures

| Pros | Cons |
|---|--|
| <ul style="list-style-type: none"> Providing a forum for residents to discuss their concerns Educating residents who occasionally speed within the residential neighborhoods Low-cost relative to other measures | <ul style="list-style-type: none"> Cultural and language barriers may dissuade resident participation Require additional staff resources Unproven and potentially limited effectiveness |

Stage 2 Traffic Calming Study (Stage 2)

A stage 2 measure not included in the Sunnyvale NTCP that could be added is raised intersections. A raised intersection is a flat, raised area covering an entire intersection with ramps on all approaches. It brings the entire intersection to the level of the sidewalk and serves as a speed table that covers an entire intersection, including the crosswalks.

The pros/cons of adding raised intersection to traffic calming measures are provided in Table 6.

Table 6: Pros/cons of Raised Intersection to Traffic Calming measures

| Pros | Cons |
|--|--|
| <ul style="list-style-type: none"> Calm two streets at once Can reduce cut-through traffic and speeding Improve pedestrian safety by slowing down vehicles at common crossing locations | <ul style="list-style-type: none"> May impede emergency response vehicles and trucks travel times Higher construction cost and increased maintenance |

Is there Neighborhood Consensus (Stage 2 measure implementation)?

The current Sunnyvale NTCP consensus requirements for implementation of Stage 2 measures include 60 percent or more support from neighborhood residents and 100 percent support from residents within 100 feet of the device. The review of other cities’ programs showed that most cities required 50 percent to 70 percent support for the implementation of Stage 2 measures through a neighborhood vote. One city also requires 100 percent support from homeowners fronting the device and one city requires greater than 50 percent support from homeowners within 100 feet of the device.

Sunnyvale’s requirement of 100 percent support from residents within 100 feet of the device is stricter than other cities’ requirements and could potentially make it harder to gain consensus among neighbors, compared to other reviewed cities. This requirement could potentially be removed to align with other cities’ programs.

The pros/cons of modifying the neighborhood consensus requirements to only require support from 60 percent or more neighborhood residents are provided in Table 7.

Table 7: Pros/cons of Modifying the Neighborhood Consensus Requirements

| Pros | Cons |
|---|--|
| <ul style="list-style-type: none"> • Easier to select a location for the device • Easier to achieve neighborhood consensus and move the process forward | <ul style="list-style-type: none"> • Residents with frontage at the proposed device location might object |

Conclusions

The Sunnyvale NTCP is generally in line with other reviewed cities traffic calming programs. However, based on community and City Council input and a review of other city programs, the following modifications could be made to the program:

- Expand the definition of traffic calming and adding program objectives
- Improve the communication of the program and making it more user friendly and transparent by creating a webpage for the program
- Include residential collector streets in the program
- Reduce the initial petition support percentage
- Remove the 95th percentile speed criteria from the program
- Add community/outreach and education as a Stage 1 traffic calming measure
- Add raised intersection as a Stage 2 traffic calming measure
- Remove the “100% resident support living within 100 feet of a proposed Stage 2 Traffic Calming Measure” requirement

APPENDIX A

Criteria and Threshold Evaluation



Traffic Calming Criteria and Threshold Evaluation Memorandum

Introduction

As traffic congestion increases in the Bay Area, cities frequently receive complaints from their residents about speeding and cut-through traffic in their neighborhoods. In response to public concerns, many cities have adopted a traffic calming program, frequently referred to as the “Neighborhood Traffic Management Plan”, to systematically address public concerns.

The City of Sunnyvale currently has an adopted traffic calming council policy and traffic calming program. The purpose of this memorandum is to review the current criteria and thresholds in the City’s Neighborhood Traffic Calming Program and compare criteria and thresholds to other cities’ traffic calming programs that were approved or updated relatively recently within the San Francisco Bay Area.

What is “Traffic Calming”

The Institute of Transportation Engineers, an international educational and scientific association of transportation professionals, defines traffic calming as follows:

“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 (bicyclists, pedestrians, etc...).”

In an effort to improve safety for non-motorized street users and improve neighborhood livability, many cities in the Bay Area have expanded this definition to also include non-physical measures, such as education programs and enhanced enforcement.

Sunnyvale Traffic Calming Policy and Handbook Overview

City of Sunnyvale Council Policy 1.2.4 Traffic Calming and City of Sunnyvale Traffic Calming Handbook is designed to assist in the consideration and implementation of traffic calming measures in residential neighborhoods.

Per the City’s policy and handbook, the traffic calming process to address neighborhood traffic concerns on local residential streets includes a Stage 1 program and a Stage 2 program. The process begins when a resident reports speeding problems or cut-through traffic problems.

The Stage 1 program includes measures that do not involve the use of physical controls. These include speed feedback trailers, police enforcement, and signing and striping. If the Stage 1 traffic calming measures are not successful in reducing speeds and/or cut-through traffic along the residential street, the Stage 2 program is triggered, which could involve physical modifications to the street like speed humps, traffic circles, curb extensions etc. A formal traffic study to suggest possible solutions to the problem will be conducted and neighborhood involvement is a critical component of this process.

Sunnyvale’s traffic calming criteria and process are described in detail and are compared to other Bay Area cities’ adopted traffic calming programs in the sections below.





Traffic Calming Programs in Comparable Cities

This memorandum reviewed the current traffic calming programs in comparable cities within the Bay Area where traffic calming programs were adopted or modified within the last eight years. These cities are listed below. City of Fremont's Residential Traffic Calming Program was adopted by the City Council in 2002 and was included in the review per the City of Sunnyvale staff's request.

- City of Mountain View, *Neighborhood Traffic Management Program, June 22, 2021*
- City of Livermore, *Neighborhood Traffic Calming Program and Priority List, September 2020*
- City of Cupertino, *Neighborhood Traffic Calming Program, July 2020*
- City of Gilroy, *Neighborhood Traffic Management Program, November 2019*
- City of Campbell, *Neighborhood Traffic Calming Program, July 2017*
- City of San Carlos, *Neighborhood Traffic Management Program, April 2017*
- City of Redwood City, *Policy and Guidelines for Residential Traffic Calming, September 2016*
- City of Fremont*, *Residential Traffic Calming Program, May 2002*

*Note that the program has been suspended due to lack of funding. The City of Fremont's General Plan Traffic Calming Policy (Policy 3-4.5) states that it should be reinstated as budget conditions allow.

Most adopted traffic calming programs typically contain five sections: 1) traffic calming issues, 2) street qualifications, 3) appropriate traffic calming devices and implementation stages, 4) implementation procedures, and 5) funding and prioritization mechanisms. This memorandum first defines the various terminologies in this paper, then discusses each section of a typical traffic calming program in detail and highlights the commonalities and differences between each city's adopted program.

Definitions

This section presents a brief definition and discussion about the terminologies used in this paper.

85th / 95th Percentile Speed

The 85th percentile speed is the speed that 85 percent of the motorists drive at or below. Similarly, 95th percentile speed is the speed that 95 percent of the motorists drive at or below. The 85th percentile speed is traditionally used by traffic engineers to determine speed limits, which must be set at reasonable levels to achieve compliance.

Average Daily Traffic (ADT)

Average daily traffic (ADT) represents the total number of vehicles using the street on a typical day.

Cut-Through Traffic

Cut-through traffic refers to traffic that has neither an origin nor destination within the neighborhood. Neighborhood is generally defined as a contiguous area bounded by arterials or natural boundaries.

Roadway Classification

Roadways within a City are typically classified in the City's General Plan. There are differences among cities in street classifications, but there is an overall theme that each City has arterials, collectors, and local streets. Arterials are major thoroughfares within the City that connect City streets to regional network (freeways and expressways). Local streets are roadways that provide access to individual properties and are mostly residential in nature. Collector streets serve as the connection between local streets and arterials. A map showing the City of Sunnyvale's roadway classification is provided in Figure 1 below.



Traffic Calming Issues

Many cities have clearly identified the issues that could be addressed using the traffic calming program. In most cities, speeding and high traffic volume (due to cut-through traffic) are the two primary concerns requiring the implementation of traffic calming measures. Some cities, such as the City of Gilroy and the City of San Carlos, have also included collisions as issues to be addressed by implementing traffic calming measures. Many cities recognize that not all traffic related issues can be addressed with the traffic calming program and have other programs to address issues not covered by the traffic calming program. Sunnyvale's traffic calming program is currently designed to address only speeding and high traffic volume issues on local residential streets. Sunnyvale has other programs to address issues such as safety concerns, bike facility improvements, stop sign requests, etc.

Street Qualifications

Traffic calming measures are mostly designed to maintain a reasonable travel speed and/or regulate the volume on the affected streets. Therefore, traffic calming measures may not be applicable to all street types. All cities apply traffic calming measures on local residential streets as these are the streets that should have lower speeds and volumes. Reducing arterial speeds and capacities may cause more vehicles to seek alternative cut-through routes on collector and residential streets and would undermine the purpose of traffic calming. Some cities studied in this memo also apply traffic calming measures on residential collector streets and apply different qualification criteria for traffic calming on local residential and residential collector streets. Collector streets are more challenging to include in a neighborhood traffic calming program because these streets should be allowed to maintain an intermediate level of traffic volume (lower than arterials but higher than local residential streets), so traffic calming measures should be used more carefully on these streets to avoid unintended consequences such as pushing cut through traffic onto local streets.

As shown in Table 1, the City of Sunnyvale's traffic calming program is only applicable to local residential streets. The traffic calming programs of most other Bay Area cities studied in this memo are applicable to local residential streets as well as collector streets that are residential in nature. The City of San Carlos is unique because it also allows certain non-aggressive traffic calming measures on arterial streets.

In all cities, the qualified streets also have to pass a threshold test to be eligible for certain/all types of traffic calming measures (see more discussion in section below). The 85th percentile speed and bi-directional average daily traffic (ADT) volume are common criteria used to qualify streets for traffic calming measures while number of collisions is a less common one.. These criteria are discussed below:

- **Speeding:** Most cities studied in this memo define a "speeding issue" within a residential neighborhood (25 mph speed limit) as having the 85th percentile speed exceed 30 mph to 33 mph. Along a residential collector street, the threshold is generally having the 85th percentile speed exceed the speed limit by 7 mph. Other speeding criteria used include 60 to 70 percent of vehicles exceeding the posted speed limit or 150 vehicles per day (vpd) exceeding the speed limit by 6 to 7 mph. Sunnyvale defines a "speeding issue" within a residential neighborhood (25 mph speed limit) as having the 85th percentile speed exceed 32 mph. Sunnyvale also allows for some situations where the residents are concerned about few drivers considerably exceeding the speed limit. In these cases, a 95th percentile speed of 35 miles per hour is used as a threshold.





- **Volume:** Typical ADT thresholds range between 1,000 vpd to 2,000 vpd for residential/local streets, and between 3,000 vpd to 4,000 vpd for collector streets, if qualified. Fremont has an ADT threshold of 800 vpd to 3,500 vpd for the City's Speed Lump Policy. Beyond 3,500 vpd, Fremont would consider implementing alternate traffic calming measures. Some cities, like Cupertino and Mountain View, also require streets to meet a "cut-through" percentage threshold. The cut-through traffic threshold ranges between 25% to 40% of the ADT. Sunnyvale uses an ADT threshold of 1,000 vpd for local residential streets.
- **Collisions:** Gilroy and San Carlos have broader definitions of "traffic calming issues" and have included collision rates as a threshold. Gilroy has a collision threshold of five collisions in the last three years and San Carlos has a collision threshold of the three-year accident rate on the street to be greater than the City average for comparable streets. Both cities require that the primary collision factors are correctable by traffic calming improvements.

It should be noted that many physical traffic calming measures that are designed to slow vehicles or restrict vehicle access would have negative effects for emergency vehicles, buses, and/or trucks. All cities, including Sunnyvale, recognize these effects and require these be considered when qualifying streets for traffic calming and/or analyzing traffic calming alternatives.

Each City's qualification criteria for traffic calming is summarized on Table 1.



Table 1
Qualification Criteria Summary

| Qualification Criteria | | | | |
|------------------------|--|--|--|-------------------------|
| City | Roadway Classification ¹ | Percentile Speed ² | Volume | Collisions ³ |
| Sunnyvale | local residential street | 85th percentile > 32 mph 95th Percentile > 35 mph | ADT > 1,000 vpd | |
| Mountain View | local residential street | 85th percentile > 31 mph or 30 mph in a school zone 85th percentile > speed limit (25 mph) + 6 mph or, over 150 vehicles per day traveling above 31 mph | cut-through > 25% ADT | |
| | residential collector street | 85th percentile > speed limit (30 mph) + 7 mph, or over 150 vehicles per day traveling above 37 mph 85th percentile > speed limit (35 mph) + 7 mph, or over 150 vehicles per day traveling above 42 mph | cut-through > 25% ADT | |
| Cupertino | local residential street | 85th percentile > 32 mph or 30 mph in a school zone | cut-through > 25% ADT and, ADT > 1,000 vpd | |
| Campbell ⁴ | local residential street | 85th percentile > speed limit + 7 mph | ADT > 1,000 vpd | |
| | residential collector street | | ADT > 2,000 vpd | |
| Redwood City | local residential street or "Pedestrian Street", or "Bicycle Boulevard" (2-lane) | 85th percentile > 30 mph (35 mph on streets posted 30mph) or, 60% of the traffic exceeds the posted speed limit or, average speed of vehicles in the top 15th percentile is 40 mph or greater | cut-through > 40% ADT | |



| Qualification Criteria | | | | |
|------------------------|---|--|--|--|
| City | Roadway Classification ¹ | Percentile Speed ² | Volume | Collisions ³ |
| Fremont | local residential street | 85th percentile \geq speed limit + 8 mph | ADT > 800 vpd | |
| San Carlos | local residential street or pedestrian route | 85th percentile > speed limit + 7 mph | ADT > 1,200 vpd | 3-yr accident rate > City average for comparable streets |
| | other collector street | | ADT > 4,000 vpd | |
| | arterial street | | ADT > 13,000 vpd | |
| Livermore | local residential street and residential collector street | 85th percentile \geq speed limit + 8 mph | cut-through > 250 vpd | |
| Gilroy ⁵ | local residential street | 85th percentile > speed limit + 7 mph or, 70% traffic exceeds posted speed limit | cut-through > 25% ADT and, ADT > 1,000 vpd | 5 in last 3 years |
| | residential collector street | | -- | |

Notes:

¹General Plan Roadway Classification is provided in " " else the street qualification criteria in the traffic calming program is provided.

²Speed limit of a local residential street is typically 25 mph.

³Collisions will be used to justify the installation of traffic calming devices when either speed or volume thresholds are not met. Must be collisions preventable via traffic calming.

⁴Both speeding and volume criteria must be satisfied in Campbell for the street to be eligible for traffic calming.

⁵The criteria provided is for implementing Stage 2 measures only which are described in detail in later sections of the memorandum.



Traffic Calming Measures & Implementation Stages

Traffic calming measures can typically be divided into two categories: non-physical and physical measures. Common non-physical and physical measures are briefly discussed below and listed in Table 2:

- Non-physical measures include educational programs, police enforcement, speed feedback signs, additional signage (stop signs and turn-prohibition signs excluded), and additional pavement striping. These measures do not disturb normal traffic operations or emergency operations and target only those that are speeding and/or cutting-through. These measures are easy to implement, relatively inexpensive, less intrusive, and have few negative effects. At the same time, these measures may also have limited effectiveness in mitigating the traffic calming issues compared to physical measures. Sunnyvale's program categorizes these as Stage 1 measures. Other City programs use different nomenclature like Tier 1 measures, Level 1 measures etc.
- Physical measures typically include speed humps/tables, traffic circles/roundabouts, physical lane narrowing/shifting measures (i.e. bulbouts, chokers, chicanes), and physical movement-restriction measures (i.e. turn-prohibition, forced-turn channelization, half street closure and full street closure). Unlike non-physical measures, physical measures inconvenience all vehicles. Physical measures are difficult to implement, relatively expensive, can be very intrusive (i.e. full street closure), and have varying negative effects (i.e. visual and noise impacts, primary response times, diverted traffic). Sunnyvale's program categorizes these as Stage 2 measures. Other City programs use different nomenclature like Tier 2 measures, Level 2 measures etc.

All cities typically require non-physical measures to be considered/implemented before implementing physical measures.





Table 2
Common Traffic Calming Measures/Devices

| Traffic Calming Measure/Device | Brief Discussion |
|---|---|
| Non-Physical Measures (Stage 1) | |
| Community Outreach/Education | Meetings and workshops to educate residents about traffic safety issues |
| Police Enforcement | Deploy police officers to target neighborhood streets with reported speeding problems |
| Signage | Speed limit signs, radar speed feedbacks, etc. |
| Pavement Striping | Lane striping to narrow travel lane widths usually to 10 feet wide |
| Physical Measures (Stage 2) | |
| Speed Humps/Tables | Raised areas placed across the road designed to slow vehicles as they approach the humps/tables |
| Traffic Circles/Roundabouts | Raised circular islands placed in the center of an intersection designed to slow vehicles and reduce intersection conflict points |
| Curb Extensions/Bulbouts | Curb extensions placed at an intersection to narrow the travel lanes |
| Chokers | Curb extensions placed along a roadway to narrow the travel lanes |
| Chicanes | Alternating curb extensions placed along a roadway to narrow the travel lanes and create an "S-shaped" street |
| Turn-Prohibition | Signage restricting specified turn movements at an intersection |
| Forced-Turn Channelization | Raised islands at an intersection that block certain movements |
| Half-Street Closure | Physical barriers placed at one end of an approach so the street can only be entered from one direction but vehicles can exit in both directions |
| Full-Street Closure | Physical barriers placed at one end of the street effectively creating a dead-end |
| Median Entry/Exit/Midblock Islands | Raised island located along the street centerline that narrows the travel lanes at that location. |
| Median Barriers | These can be a barrier or raised island along the center of a roadway to prohibit left turns or crossing traffic. |
| Diagonal Divertors | Physical barrier placed diagonally across a four-legged intersection. The barrier creates two unconnected intersections. |
| One-Way Streets | Traffic on a street is regulated to only allow traffic to flow in one direction. Usually this is accomplished through sign placement. |
| Woonerf | Typically narrow streets without curbs and sidewalks, and vehicles are slowed by placing trees, planters, parking areas, and other obstacles in the street. |
| Notes: Stage 1 and Stage 2 is nomenclature used by Sunnyvale. | |

Table 3 lists traffic calming measures from the Federal Highway Administration (FHWA) *Traffic Calming ePrimer* and Caltrans *Traffic Calming Guide* considered in the reviewed cities' traffic calming programs. As shown in the table, all the measures considered in Sunnyvale's traffic calming program are also considered in at least one other City's traffic calming program. Measures that are part of the traffic calming program for most cities are radar speed trailer deployment, police enforcement, community outreach/education, traffic signing and pavement markers, speed humps/cushions/lumps, traffic circles, curb extensions, and median islands. Measures that are part of only one other City's traffic calming program compared to Sunnyvale include woonerfs and street closures.



Table 3
Traffic Calming Measures/Devices Included in Reviewed City's Traffic Calming Programs

| Measure ¹ | Sunnyvale | Mountain View | Cupertino | Campbell | Redwood City | Fremont | San Carlos | Livermore | Gilroy |
|--|-----------|---------------|-----------|----------|--------------|---------|------------|-----------|--------|
| Non-Physical Measures (Stage 1) | | | | | | | | | |
| Radar Speed Trailer Deployment ² | X | X | X | X | X | X | X | X | X |
| Traffic Enforcement Action ³ | X | | | X | X | X | X | X | X |
| Community Outreach/Education ³ | | | | X | | X | X | X | X |
| Traffic Signing and Pavement Marker ⁴ | X | X | X | X | X | X | X | X | X |
| Physical Measures (Stage 2) | | | | | | | | | |
| Vertical Deflection | | | | | | | | | |
| Speed Hump | X | X | X | X | X | | X | | |
| Speed Cushion/Lump | X | | | | | X | X | X | X |
| Speed Table/Raised Crosswalk | X | X | X | | X | X | X | X | |
| Raised Intersection | | X | | | | | | | |
| Horizontal Deflection | | | | | | | | | |
| Traffic Circle | X | X | X | X | X | X | X | X | X |
| Roundabout | X | X | X | | | | X | X | X |
| Street Width Reduction | | | | | | | | | |
| Curb Extension/Choker/Chicane | X | X | X | X | X | X | X | X | X |
| Median Island | X | X | X | X | X | X | X | X | X |
| Routing Restriction | | | | | | | | | |
| Median Barrier, Forced Turn Island, Barrier, Channelization | X | X | | | X | | X | | |
| Diagonal Diverter | X | X | | | X | | X | | |
| One-Way Street | X | X | | | | | X | | |
| One-Way Choker, Half-Closure or Semi-Diverter | X | X | | | | | X | | |
| Street Closure and Cul-de-sac | X | X | | | | | | | |
| Woonerf | X | X | | | | | | | |
| Notes: | | | | | | | | | |
| ¹ Stage 1 and Stage 2 measures are nomenclature used by Sunnyvale. Some cities follow different nomenclature like Tier 1 and Tier 2 measures or Level 1 and Level 2 measures. Mountain View, Cupertino, Campbell, and Redwood City only include physical measures as part of their traffic calming program. | | | | | | | | | |
| ² Mountain View, Cupertino, Campbell, and Redwood City consider speed feedback signs as a physical measure. | | | | | | | | | |
| ³ Campbell's program recommends education and enforcement if the street doesn't meet qualifications for traffic calming. | | | | | | | | | |
| ⁴ Mountain View, Cupertino, Campbell, and Redwood City, staff can approve a resident's request for signing & striping without requiring a petition. | | | | | | | | | |



Typical Implementation Procedures

While each city follows a unique implementation procedure, research found that all cities' procedures require non-physical measures to be considered before considering physical measures. For consideration of non-physical measures, the procedure generally involves a combination of the following elements: resident request, resident petition, and/or request qualification. For physical measures to be considered, the request must have satisfied certain request qualifications, and the process generally involves the following elements: neighborhood meetings and traffic calming studies, neighborhood consensus, traffic calming measure approval, and implementation. The discussion below is separated by the process for implementing non-physical and physical measures.

Non-Physical Measure (Stage 1) Implementation Process

Request Initiation and Eligibility

All researched cities require the traffic calming process to be initiated by a resident request.

If the request is signage and striping improvement, staff for the cities of Mountain View, Cupertino, Redwood City, and Campbell, approve the installation without requiring further action. All other measures considered by these cities follow the physical measures implementation process as outlined in the next section.

For Sunnyvale, staff will first review the request to determine the concerned street is a suitable street for traffic calming based on street classification. They will then require the resident to submit a petition form indicating that the expressed concern is widespread and shared. Upon receiving the resident request and petition for traffic calming, the staff will begin collecting data to determine if the street qualifies for traffic calming.

Livermore, San Carlos, Gilroy and Fremont require only a request from the resident and a determination by staff that the street classification is appropriate for this program prior to initiating an assessment of the street including collection of speed/volume data.

Implementation

If the street meets the criteria, Sunnyvale, Gilroy, Livermore, San Carlos, and Fremont staff will address the concern first using non-physical measures like additional signage (i.e. speed warning signs) and striping, education, and enforcement. The use of physical measures are reserved until non-physical measures are found to be not effective.

San Carlos staff may determine that non-physical measures may not be appropriate and may directly move on to physical measures.

Follow up Data Collection

For Gilroy and Fremont, data are collected 1-6 months after non-physical measures have been implemented, while Sunnyvale collects data 3-6 months after Stage 1 measures have been implemented as part of a follow-up study to evaluate the success of these measures.

For Cupertino, Redwood City, San Carlos, Mountain View, Campbell and Livermore, no follow-up data collection is specified in their respective documents. However, if the resident still has a concern, the resident can request to move the request forward to Stage 2 measures.

Physical Measure (Stage2) Implementation Process

All cities share a common philosophy that traffic calming projects are for the residents, and neighborhood involvement is critical in each step of the traffic calming procedure. Some cities require a petition showing neighborhood support prior to commencing the development of the traffic calming plan in addition to neighborhood support for the proposed plan itself. The process





of developing neighborhood consensus and ultimately funding and implementing the measures is described below and summarized in Table 4.

Initiation

For some cities, initiation of the traffic calming study for physical measures occurs only after non-physical measures have been implemented but have not resolved the speeding or volume issues.

Sunnyvale and Livermore staff initiate the development of a traffic calming plan that considers physical measures if non-physical measures have been unsuccessful.

Mountain View, Cupertino, Redwood City, and Campbell require a petition, then data collection (these cities do not collect data until this step) to qualify the streets before staff initiate the development of traffic calming plans. Mountain View and Cupertino require the resident or property owner to obtain signatures on a petition from a minimum of 10% of the residents or property owners on the street in question. Redwood City requires that the requestor obtain a signature of support from at least one additional property owner on the requested street to initiate data collection. Campbell requires a neighborhood petition signed by 50% of the affected households.

Redwood City, Livermore, and Gilroy prioritize working on traffic calming projects based on a scale system after collecting sufficient data to qualify the projects. This data typically includes considerations related to vehicles exceeding the 85th percentile speed threshold, ADT or cut-through volumes exceeding the respective city's threshold, number of collisions, proximity to pedestrian generators, and neighborhood support. Priority is given to projects that have a higher total score using this criterion.

San Carlos, Fremont, Redwood City, and Gilroy require support from 50% to 70% of the households prior to commencing the development of a traffic calming plan that considers implementing physical measures.

Neighborhood Meetings and Traffic Calming Studies

The neighborhood process for all cities entails at least one meeting and potentially two meetings: one initial meeting to explain the traffic calming process and a second meeting to discuss the potential traffic calming measures. In addition, some cities also conduct a postcard survey to vote on traffic calming devices they would like to see in their neighborhood. Many cities also ask the residents to form a steering committee after the initial neighborhood meeting to represent the neighborhood and interact with staff.

While all cities involve residents in the study process by hosting neighborhood meetings, there are various levels of resident involvement in determining the traffic calming plans: 1) staff lead the process, and 2) resident/staff share the lead. These distinctions are discussed below:

- In Sunnyvale, San Carlos, and Redwood City, City staff would lead the process in developing the traffic calming plans. This is not saying that residents are not involved in the process, it just means that the process of developing a traffic calming plan is led by City staff. After qualifying the resident requests, City staff would develop the initial traffic calming plans with alternatives. Neighborhood meetings then occur so staff could explain the various alternatives and hear feedback from residents. Staff would then revise the plans based on resident feedback and hold additional meetings so residents could reach a consensus on the identified traffic calming plan. During the initial development of traffic calming plans, City staff would have considered the potential negative impacts of the plan, and consulted other relevant departments to ensure city policies are upheld with the plan.





- The remaining cities require staff and residents to work together to develop a desired traffic calming plan during the neighborhood meetings. Livermore and Fremont specify that the residents should select a working group to work with city staff to develop the plans. The other cities do not specify the need for a working group.

Neighborhood Consensus

Once the traffic calming plan is identified and supported by both the staff and neighbors during the neighborhood meetings, most cities then require a neighborhood vote to put the plan before city decision bodies (i.e. traffic commission, city council) for approval. The voting area and level of required support to advance the plan differ among cities. The required support level within the voting area ranges between 50% and 70%. For some cities, the neighborhood voting area is the same as the study area. Other cities restrict the voting area to only the affected blocks, which may be smaller than the initial petition area to start the traffic calming process. Sunnyvale requires support from greater than 60% of the neighborhood voting area with 100% support from owners with properties within 100 feet of the device installation.

Traffic Calming Plan Approval

The traffic calming plan that has been developed by the neighborhood and city staff and reviewed by other City departments is then submitted to the city decision bodies for approval. Half of the cities, including Sunnyvale, require only the City Council to hear the plan, while others require the Planning/Transportation Commission to review the plan prior to City Council.

Implementation

For half of the researched cities including Sunnyvale, once the appropriate decision bodies (discussed above) approve the plan, city staff would permanently implement the Stage 2 traffic calming measures. A trial implementation is not needed. In Mountain View, Campbell, San Carlos, and Fremont once a traffic calming plan is finalized during the neighborhood meetings, staff will install temporary devices to serve as a trial installation of the traffic calming measures. At the end of the trial implementation period (typically 9 months to 1 year), staff will prepare a follow-up study, and present findings to the neighborhood. If there are revisions required to the plan, the neighborhood is asked to vote on the revised plan to advance the plan for city council approval. If there are no revisions required, the staff can make the measures permanent.

Funding

Most researched cities provide funding for the traffic calming program. Sunnyvale specifies that its funding will come from the General Fund, grants, and private funding. Livermore, Cupertino, Redwood City, and Fremont specify that funding will come from the General Fund. Mountain View specifies that funding for smaller projects would come from the General Fund and larger projects would come from the Capital Improvement Program (CIP). Gilroy and Campbell specify that the funding will come from the CIP. San Carlos specifies that the funding will come from grants or private funding.

Implementation Prioritization

All researched cities recognize that they have only limited staff resources and budgets that can be devoted to traffic calming projects. Therefore, all researched cities have specified a prioritization method for the traffic calming requests. There are generally two methods of prioritization: 1) first-come first-served, and 2) scale system. Both are discussed below:

- Sunnyvale, Mountain View, Campbell, and San Carlos are the four cities that work on traffic calming projects on a first-come first-served basis.

As described above, Redwood City, Livermore, and Gilroy prioritize working on traffic calming projects. Once the traffic calming plans for the priority projects is developed and approved, they implement them. Cupertino and Fremont prioritize implementation of the traffic calming plan



after the plan is developed and approved. Generally, the prioritization process is based on a scale system. This data typically includes considerations related to speed, volumes, safety, proximity to pedestrian generators, and neighborhood support. Priority is given to projects that have a higher total score using this criterion.

Table 4
Summary of Each City's Traffic Calming Procedure for Implementing Physical Measures

| City | Petition to Initiate Plan Development | Required Support for Installation | Test Period | Funding | Prioritization ¹ |
|---------------|--|--|----------------|--------------------------------------|-----------------------------|
| Sunnyvale | No | 60% + 100% of the residents within 100 feet of the proposed device must support the measure. | None | General Fund Grants, Private Funding | First come first serve |
| Mountain View | Petition with 10% of property owners on the street | Minimum 35% response to survey; 67% project support | 1 year | General Fund/CIP | First come first serve |
| Cupertino | Petition with 10% of property owners on the street | 67% | None | General Fund | Priority List |
| Campbell | Petition with 50% of affected households | 67% | 1 year | CIP | First come first serve |
| Redwood City | Petition with >50% of affected households | >50% | None | General Fund | Priority List |
| Fremont | Petition with 70% of affected households | >70% | 9 month review | General Fund | Priority List |
| San Carlos | Petition with >50% of affected households | >50% | 1 year | Private funding/grants | First come first serve |
| Livermore | No | 60% + 100% of the residents fronting the proposed device must support the measure. | None | General Fund | Priority List |
| Gilroy | Petition with >60% of affected households | Minimum 50% response to survey ; 60% project support | None | CIP | Priority List |

Notes:
¹ Livermore, Redwood City, and Gilroy prioritize working on traffic calming projects. Cupertino and Fremont prioritize the implementation of traffic calming projects.





Device Removal

The entire traffic calming process is designed to ensure community buy-in for the permanent installation of the traffic calming devices. However, it is possible that residents may later request the removal of the traffic calming devices. Sunnyvale, Cupertino, Campbell, and Redwood City have not specified a process for device removals. Gilroy, Mountain View, and Fremont have specified that only residents within the study area could later petition to remove the devices. The process to remove the device would be similar to the installation process with neighborhood meetings, neighborhood approval and city approvals. San Carlos specifies that if the follow-up study finds the devices to be ineffective, staff could recommend the removal of the devices and/or implementation of additional devices. While most cities have not specified the funding responsibility for device removals, Livermore requires the neighborhood to fully fund the removal cost.



Sunnyvale Traffic Calming Requests

City of Sunnyvale staff provided Hexagon with traffic calming requests and speeding complaints/issues/comments that they have been tracking since 2004. Complaints are generally made by residents over the phone, email, in-person, or through their webpage and are documented by staff. Speeding complaints that relate to adding a speed feedback sign, speed limit sign, or requiring additional police enforcement are accordingly resolved by the staff. Complaints that relate to wanting traffic calming along a street or neighborhood require the staff to follow the process outlined in their Neighborhood Traffic Calming program.



Since the initiation of the program, the City's best available data shows that there were 229 requests by residents to address speeding concerns in their neighborhood using traffic calming. As summarized in Table 5, 79% of the requests received by the City did not qualify for traffic calming. 88 requests were either for roadways classified as "Collector" or "Arterial" streets, non-residential streets, or private properties, which the traffic calming program labels as ineligible for traffic calming, 92 requests were classified as local residential streets, which are eligible for traffic calming. However, there were no neighborhood consensus forms filed with these requests. The traffic calming program uses this form to ensure the reported concern is shared by other residents along the reported roadway.



49 requests were eligible for traffic calming and City staff initiated traffic calming studies. Of these, 4 requests have initial studies still in progress. 28 requests have data collected but the data did not meet the threshold for traffic calming. The remaining 17 requests have resulted in either stage 1 measure under construction, stage 1 measure implementation, or stage 2 measure implementation.



Since 2004, Stage 1 traffic calming measures have been implemented along three residential streets (Heron Drive, Blazingwood Drive, and Pome Avenue) and Stage 1 traffic calming measures are under construction along four residential streets (Aster Avenue, Eleanor Way, Kingfisher Way, and Dartshire Way). The City has implemented Stage 2 traffic calming measures along 12 residential streets (Frances Street, Taafe Street, Norman Drive, Grape Avenue, Blair Avenue, Canary Drive, Plaza Drive, Bradford Drive, Iowa Avenue, Carroll Street, Bayview Avenue, and Garner Drive).





Table 5
Traffic Calming Request Summary

| | Sunnyvale Traffic Calming Requests | | | |
|--|------------------------------------|------------|---------------------|-------------|
| | Number of Requests | | % of Total Requests | |
| Total requests | 231 | 147 | 100% | 100% |
| Request did <u>not</u> qualify for traffic calming study | 180 | 135 | 78% | 92% |
| Roadway classified as "Collector" | 75 | 57 | 33% | 39% |
| Roadway classified as "Arterial" | 5 | 4 | 2% | 3% |
| Local residential streets without neighborhood consensus | 92 | 68 | 40% | 46% |
| Non-residential street | 1 | 1 | 0% | 1% |
| Private Property | 7 | 5 | 3% | 3% |
| Request qualified for traffic calming study | 51 | 12 | 22% | 8% |
| Study in-progress | 4 | 4 | 2% | 3% |
| Stage 1 measure under construction | 4 | 3 | 2% | 2% |
| Stage 1 measure implemented | 3 | 0 | 1% | 0% |
| Stage 2 measure implemented | 12 | 0 | 5% | 0% |
| Collected data did not meet thresholds | 28 | 5 | 12% | 3% |



Traffic Calming Paper
Appendix
Traffic Calming Programs

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

City of Mountain View
Public Works Department

Adopted December 11, 1996
Revised June 30, 1998, September 24, 2002,
June 22, 2021



NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

ACKNOWLEDGEMENTS

From the 1996 Original

CITY COUNCIL:

Sally J. Lieber, Mayor
R. Michael Kasperzak, Jr., Vice Mayor
Ralph Faravelli, Councilmember
Matt Pear, Councilmember
Rosemary Stasek, Councilmember
Mary Lou Zoglin, Councilmember

CITY STAFF:

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Joan Jenkins, Transportation and Policy
Manager
Peter Skinner, Senior Administrative Analyst
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From the 2021 Revision

CITY COUNCIL:

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Lucas Ramirez, Vice Mayor
Margaret Abe-Koga, Councilmember
Alison Hicks, Councilmember
Sally J. Lieber, Councilmember
Lisa Matichak, Councilmember
Pat Showalter, Councilmember

CITY STAFF:

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OVERVIEW

In 1996, the City Council adopted the Neighborhood Traffic Management Program (NTMP) to establish a consistent set of guidelines to provide residents and property owners with a means to obtain relief from traffic-related concerns, namely speeding vehicles and cut-through traffic on their residential street. This is accomplished through a multi-step process involving an initial petition, a traffic survey, neighborhood meetings, a postcard survey, and the possible installation of traffic-calming measures.

When the NTMP was approved, the concept of traffic management was, for the most part, theoretical. Today, most cities in California have adopted similar programs, and staff has been able to refine the NTMP process. In September 2002, the City Council approved a revision, which reduced the number of steps necessary to complete the process, modified the installation criteria, and updated the types of traffic-calming devices available to mitigate speeding or cut-through traffic. In June 2021, the City Council approved this revision to make some additional adjustments to the program.

GUIDING PRINCIPLES

- The primary purpose of the NTMP is to address neighborhood concerns and to reduce the speed and volume of traffic on **local residential and residential collector streets**. The NTMP does not apply to roadways designated as arterial roads.
- Some diversion of traffic from a traffic-managed street to an adjacent street will be unavoidable. **An increase of up to 25% of existing vehicles or 500 vehicles per day, whichever is less, would trigger an automatic analysis of that street.** The analysis could be performed at a lower level of impact, if deemed appropriate by the Council Transportation Committee (CTC) or City Council. This standard comes from the City's Environmental Guidelines. Some diversion of traffic from a local street to a collector street is appropriate based on the functional definitions of the two types of streets.
- Traffic not generated by and related to a specific residential neighborhood (nonneighborhood or through traffic) should be encouraged to use arterial streets designed for such purposes. The General Plan designates street types and will be used as a guide. However, the General Plan also designates some streets as residential arterials. The NTMP guidelines do not apply to residential arterials as they are wider than local residential streets and are intended to carry higher traffic volumes than local streets. Changes to residential arterials shall be taken to the CTC for recommendations.

- A low level of nonneighborhood traffic on local streets usually exists and is virtually unavoidable. Ambient through traffic is estimated at between 10% and 20% of total daily traffic volume.
- Emergency vehicle access will be maintained in all traffic management plans. Emergency vehicle travel times will also be considered when evaluating traffic management measures.
- Reasonable automobile, pedestrian, and bicycle access should be maintained to streets with traffic management plans.
- Removal of some on-street parking spaces may be necessary to install some traffic management measures. Parking loss at specific locations will be balanced with the neighborhood's desire for the traffic management device.
- Only approved traffic-calming devices included in this manual will be considered for installation under the NTMP. Public Works staff will examine the feasibility of the installation of a particular device before a recommendation is made.
- Traffic management devices will be planned, designed, and used in keeping with sound engineering and planning practices. The installation of traffic control devices, such as signs, markings, and speed humps, will be in compliance with the State of California Vehicle Code and the California Manual on Uniform Traffic Control Devices (CA MUTCD).
- Requests for traffic management devices shall be taken on a first-come, first-served basis and implemented up to the limit of funds available.
- The initial installation of traffic-calming devices will be for a one-year evaluation period. Depending on the success and neighborhood acceptance of the devices, they will either be permanently installed or removed.
- Only approved signs from the CA MUTCD shall be installed.
- Traffic management measures require approval by affected residents and property owners prior to implementation.

FUNDING

The City allocates General Fund dollars each year for the NTMP. Projects are funded on a first-come, first-served basis, and, if the budget is exhausted (or near exhausted), staff will request additional budget from Council if funding is available. Larger projects, which might deplete the budget, may be considered as a midyear Capital Improvement

Program (CIP) project. Permanent installation of some devices could require CIP programming. Those projects would compete with other City projects for funding and may be scheduled in future fiscal years.

THE NEIGHBORHOOD TRAFFIC MANAGEMENT PROCESS

To be successful, the Neighborhood Traffic Management Program includes a structured, seven-step planning process. A diligent effort has been made to streamline this procedure as much as possible. Each step in this process is outlined below.

Step 1: Initial Inquiry and/or Petition by Residents

The first step in the NTMP process begins with an inquiry to the City Traffic Engineer from one or more residents or property owners. **If, during the initial inquiry, the property owner/resident requests signing and striping, the Public Works Director can approve the installation of the sign. No further action would be necessary.**

If a speed or warning sign is not sufficient, staff will direct the resident or property owner to obtain signatures, on a petition, from a minimum of five residents or property owners or a minimum of **10% of the residents or property owners** on the street in question, whichever is higher. This petition should also have a statement explaining the traffic concern. Through this petition, there is an assurance the individual's concerns also reflect the concerns of the neighborhood.

Step 2: Traffic Study, Identification of Appropriate Measures, and Establishment of Notification/Voting Area

After a petition has been received, staff will conduct a **traffic or speed survey** to determine if the speed of traffic or the amount of cut-through traffic on the street exceeds the NTMP criteria. The criteria established for local residential and collector streets are detailed in Table 1 and Table 2 below. If the survey verifies the traffic concern, staff will move to the next step in the process.

During this phase of the NTMP, staff will also establish a notification/voting area. This area will only include those residences that are directly affected by the traffic issue and the possible traffic-calming measures to mitigate the concerns. Only residences on the segment of street in question, or on cul-de-sacs or courts directly connected to the street, will be included in the notification/voting area. Individuals on separate or distant areas of the same street or on streets with alternate ingress and egress will not be included in the notification area. These areas are not included as they will not be directly affected by traffic-calming measures.

Table 1: Local Residential Streets (25 mph Speed Limit)

| Speed Criteria | Cut-Through Volume Criteria |
|---|--|
| 15% (85th percentile speed) of the vehicles on the street exceed 31 mph or 30 mph in a school zone. | 25% or more of the traffic on the street is cut-through traffic. |

Table 2: Collector Streets

| Speed Criteria | | Cut-Through Volume Criteria |
|----------------|---|--|
| 25 mph Limit | <ul style="list-style-type: none"> 31 mph 85th percentile speed; or Over 150 vehicles per day traveling above 31 mph. | 25% or more of the traffic on the street is cut-through traffic. |
| 30 mph Limit | <ul style="list-style-type: none"> 37 mph 85th percentile speed; or Over 150 vehicles per day traveling above 37 mph. | |
| 35 mph Limit | <ul style="list-style-type: none"> 42 mph 85th percentile speed; or Over 150 vehicles per day traveling above 42 mph. | |

Step 3: Neighborhood Meeting with Affected Residents/Property Owners to Identify Preferred Traffic-Calming Measures

Staff will arrange a neighborhood meeting with the residents and property owners within the notification area and send out an informational letter about the meeting. Whenever possible, staff will arrange to hold the meeting at a public venue near the affected area.

At this meeting, City staff will present the traffic-calming measures described in the Appendix. Staff will also address concerns and answer questions about these devices and the NTMP process in general.

Staff will then explain the initial installation of traffic-calming devices, if approved, will be on a demonstration basis for one year. Depending on the results of subsequent traffic studies and neighborhood satisfaction, staff will either recommend permanent installation or removal.

At the conclusion of the meeting, staff will poll the individuals in attendance to see if there is an agreement on the type of traffic-calming device they would like to see on their street. If a consensus can be reached, staff will move to Step 4 of the process, a postcard survey. If there is not clear direction from the residents, staff will arrange a second and final neighborhood meeting. If, at the conclusion of the second meeting, a consensus cannot be reached, the process may be concluded depending on the desires of the residents and property owners.

Step 4: Postcard Survey

At the successful conclusion of Step 3, City staff will send out a postcard survey to all the residents and property owners within the notification area, asking them for a yes-or-no vote on whether or not they would like to see the selected traffic-calming device(s) installed on their street for a one-year demonstration period. A minimum of 35% of the postcard ballots must be returned, and a supermajority (minimum 67%) approval of the returned postcards is required to approve installation of traffic-calming devices. If there are multiple recommended traffic-calming devices to be voted on by the neighborhood, each device will be itemized on the postcard survey, and each device's approval shall be independent of any other device rather than an all-or-nothing approval.

During the postcard survey period, staff will send out at least one additional notice either via mail or email reminding residents and property owners to vote to promote the highest response rate possible.

If a supermajority is not received on any of the devices, the NTMP process does not proceed. Residents and property owners receive a notification of vote results and are informed they may reapply for the process in one year.

Step 5: Approval by Staff and/or the City Council Transportation Committee/City Council

Depending on the type of device(s) selected from the traffic-calming device inventory in the Appendix, Public Works staff will approve the installation of the device, or it will be at staff's discretion and judgment about whether it is necessary to take a recommendation to the CTC or City Council. Staff will take items to the CTC for more vetting and policy discussion when deemed necessary. To determine what type of approval is necessary for a particular device, refer to Table 3 below. Staff may authorize additional traffic-calming measures as new techniques or devices are developed.

Table 3: Traffic-Calming Device Approval

| Device | Approval Process |
|---|---|
| <ul style="list-style-type: none"> • Speed/warning signs and striping | Public Works Director approval. |
| <ul style="list-style-type: none"> • Turn restriction signs • Curbside trees | Public Works Director and resident/property owner approval (67% majority). |
| <ul style="list-style-type: none"> • Speed humps • Narrow median islands • Traffic circles • Chokers/bow-outs/bulb-outs • Raised intersections/crosswalks • Electronic speed feedback signs | Public Works Director recommendation and resident/property owner approval (67% majority). Approval by the CTC will be at staff's discretion and judgment. |
| <ul style="list-style-type: none"> • Street closures/cul-de-sacs • One-way entrance/exits to two-way streets • Forced turn channelization • One-way chicanes • Woonerf | Public Works Director recommendation, resident/property owner approval (67% majority) and approval by the CTC and City Council. |

Step 6: Installation of Traffic-Calming Device(s)

After the project has been approved, staff will arrange to install demonstration traffic-calming devices. To reduce cost, some demonstration devices (e.g., speed humps or narrow median islands) will become permanent installations upon final approval.

Step 7: Evaluation, Permanent Installation or Removal After One Year

After the one-year evaluation period, staff will conduct another speed or traffic survey to determine if traffic speed or the volume of cut-through vehicles has been reduced. This step does not apply to speed/warning signs, striping or curbside trees. At this point, three possible actions can be taken. Table 4 below details the removal requirements for each device.

- If the traffic concern has been successfully resolved and the residents and property owners are satisfied with the results, staff will make the installation permanent or recommend a permanent installation to the CTC or City Council.
- If the residents and property owners are unhappy with the installation, even though the traffic study shows the devices have been successful, they may request removal of the device. For a device to be removed by the residents and property owners, a petition needs to be submitted with signatures from a minimum of five residents or

property owners or a minimum of 10% of the residents or property owners on the street in question, whichever is higher. After the petition is received, staff will send out a postcard survey to determine support for removal. A minimum of 35% of the postcard ballots must be returned, and if 67% or more of the individuals who respond request removal, the device will be removed, and the NTMP process will automatically restart.

- If the traffic study shows the speed of traffic or the volume of cut-through traffic has not been reduced, staff may remove the device or ask the CTC and/or the City Council for approval to remove. Staff will automatically arrange for another neighborhood meeting to determine if the residents want to consider a different device.

Table 4: Traffic-Calming Device Removal

| Device | Removal Process |
|--|---|
| <ul style="list-style-type: none"> • Speed/warning signs and striping • Curbside trees | Devices typically not removed. Trees only removed if deemed a safety hazard. |
| <ul style="list-style-type: none"> • Turn restriction signs | Public Works Director approval or resident/property owner approval (67% majority). |
| <ul style="list-style-type: none"> • Speed humps • Narrow median islands • Traffic circles • Chokers/bulb-outs • Raised intersections/crosswalks • Electronic speed feedback signs | Public Works Director recommendation and approval by the CTC or resident/property owner approval (67% majority). |
| <ul style="list-style-type: none"> • Street closures/cul-de-sacs • One-way entrance/exits to two-way streets • Forced turn channelization • One-way chicanes • Woonerf | Public Works Director recommendation and approval by the CTC and City Council or resident property owner approval (67% majority). |

APPENDIX

TRAFFIC MANAGEMENT DEVICE INVENTORY

SPEED AND WARNING SIGNS

Speed limit signs, including street legends, are intended to inform the motorist of the speed limit and gain compliance with the speed limit. Warning signs and striping provide information to the motorist, such as the presence of a crosswalk ahead. However, the effectiveness is short-lived on the driver who routinely travels the same route. The proliferation of signs and striping could cause visual blight or visual pollution in some neighborhoods. All signs will be installed following applicable State and municipal codes. After a sign has been installed, it is typically not removed.

Estimated Cost:

Approximately \$200 per item.



TURN RESTRICTION SIGNS

The purpose of turn restriction signs is to prohibit certain turning movements to block cut-through traffic on residential streets. However, these signs are often as effective as speed and warning signs. Traffic volume reduction is potentially significant, but a high violation rate reduces their effectiveness. Speed and noise may or may not be reduced with these prohibitions. Diversion to collector streets is encouraged.

Cost:

Approximately \$200 per sign.



Sylvan Avenue, Mountain View

CURBSIDE TREES

The purpose of planting trees in the parking strip area between the sidewalk and street is to give the impression of a narrower street and thus slow traffic. The trees act as a buffer zone between motorists and pedestrians and also provide a visual barrier between the two. Trees have no impact on the volume of traffic but can have a minor impact on speed once mature. To be effective, trees must be planted consistently along street frontages at a rate of one every 30' to 50'. Trees can also improve the aesthetics of roadways as well as providing value in traffic calming. The Dana Street narrowing project has demonstrated the value large trees can add to a street. After a tree has been planted, it is typically not removed unless deemed a safety hazard.

Cost:

\$300 to \$500 per tree.



Velarde Street, Mountain View

SPEED HUMPS

Speed humps have proven to be the most effective device to slow traffic. The current standard for speed hump design is 3" high and 14' wide. Typically, speed humps extend across the entire street. Speed humps should only be installed on streets longer than 750' and placed no more than 200' to 300' apart. On unimproved streets or streets with rolled curbs, bollards may be installed at each end of the speed hump to deter motorists from traveling around the speed hump.

Minor increases in emergency vehicle response times will be experienced, with the average delay being three to five seconds. Less experienced cyclists may also be uncomfortable traveling around the speed humps. City experience has shown speed humps divert little or no traffic onto adjacent streets.

Cost:

Cost estimates range from \$5,000 to \$8,000 for each speed hump, including signing and striping.



Gretel Lane, Mountain View

NARROW MEDIAN ISLAND

Narrow median islands are small raised islands placed in the center of a street at an intersection. They are typically 2' to 3' wide, 10' to 20' long, and about 6" high. Typically, the islands are not landscaped but will have a decorative hardscape in the center. Narrow median islands are designed to prevent turning vehicles from crossing into opposing travel lanes when making turns onto or from the street. The narrow median island also has a narrowing effect, which will slow traffic. It also provides refuge for pedestrians crossing wider streets. However, depending on the width of the street, on-street parking may be eliminated in the vicinity of the island.

Cost:

On average, narrow median islands cost approximately \$5,000 to \$15,000. However, the cost will vary with the width and length of the narrow median island.



Todd Street, Mountain View

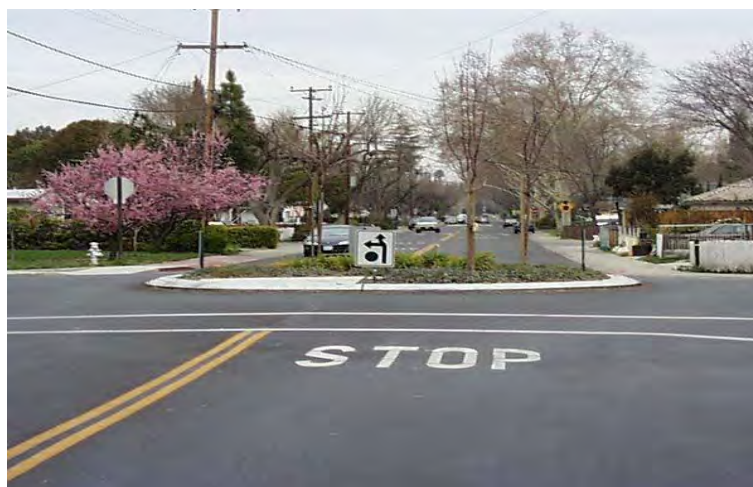
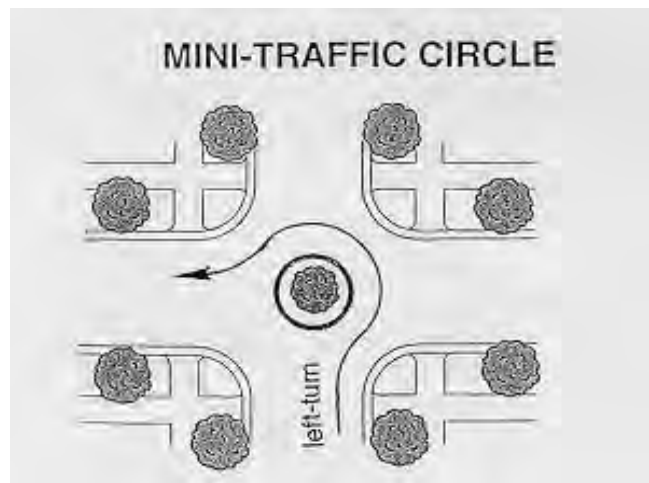
TRAFFIC CIRCLES/ROUNDBABOUTS/ISLANDS

Traffic circles are circular islands placed at the center of intersections. The purpose of traffic circles is to reduce speeds along a length of street, if used in a series, and to reduce accidents at problem intersections. Traffic circles in series have reduced traffic by up to 20%; however, a single traffic circle may have little effect on traffic volume.

Increased maintenance is required for landscaping, but there is no impact on drainage or street sweeping. Emergency vehicle response times may also increase.

Cost:

The cost ranges from \$10,000 for a small, temporary circle to \$50,000 to \$75,000 for a small, permanent landscaped circle.



Farley Street, Mountain View

NECKED INTERSECTIONS OR CHOKERS AND BULB-OUTS

The purpose of the necked intersections, also referred to as chokers or bulb-outs, is to narrow the lanes of travel so they “feel” very tight to the motorist, thus slowing vehicle speed and often reducing cut-through traffic. The narrowing of the street is usually accomplished by extending the curb line into the street.

Chokers used at intersections will slow turning vehicles as well as decrease the crossing length for pedestrians. However, chokers bring vehicles close to the curb, which could increase pedestrian hazards. Narrowing of the lanes also forces motor vehicles and bicycles closer together, which may make cycling uncomfortable for less experienced riders. Parking may also be impacted as some or all on-street parking may be eliminated, depending upon the extent of the chokers/bulb-outs installed.

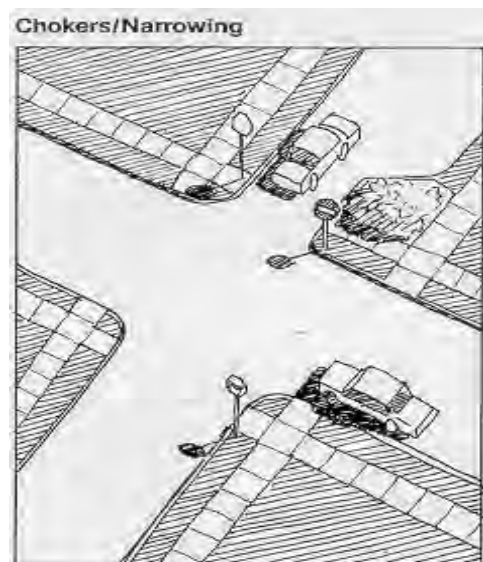
In most instances, the final installation of a chokers or bulb-outs will be landscaped, while the temporary installation will not. Painting only of chokers and bulb-outs has not proved effective. If installed, increased maintenance will be required for street sweeping, gutter clearing and landscaping.

Cost:

The cost ranges from \$5,000 for a simple raised berm to \$50,000 to \$75,000 for low-maintenance/high-aesthetic landscaped islands, per set (one on each side of the street).



Sylvan Avenue, Mountain View



RAISED INTERSECTION AND RAISED CROSSWALK

A raised intersection and a raised crosswalk include pavement raised to the level of the sidewalk, usually around 4" to 6". In some locations, the raised area has been given a special pavement treatment to differentiate the area from the normal paving surfaces.

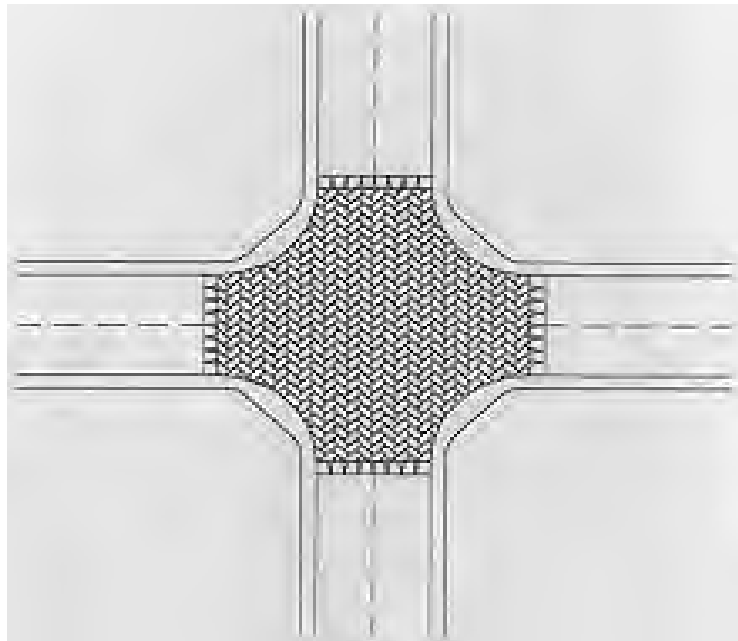
The concept of the raised intersection has been used widely in Europe. In the United States, they have been used more for enhancements for pedestrian safety and aesthetics rather than for neighborhood traffic management.

Due to the long, raised plateau of the intersection, drivers will take care to slow their speed. This device also benefits pedestrians as the street is raised to the same level of the sidewalk. However, because the intersection has been raised, emergency vehicles will need to slow their speed, increasing response times.

Installation of a raised intersection and a raised crosswalk would also require modifications to the drainage system. Raised intersections and raised crosswalks are more easily installed in new developments or redevelopments. They are also a possibility for private streets, whether they are retrofitted or installed during construction.

Cost:

The cost of a raised crosswalk ranges between \$10,000 and \$30,000. The cost of a raised intersection could be upwards of \$50,000.



ELECTRONIC SPEED FEEDBACK SIGNS

Electronic speed feedback signs are traffic-calming devices designed to slow speeders down by alerting them of their speed. Many drivers may not realize they are traveling over the speed limit and the electronic speed feedback signs provide drivers with feedback about their speed in relationship to the posted speed limit.

Cost:

The cost of an electronic speed feedback sign ranges between \$8,000 and \$10,000.



Levin Avenue, Mountain View

STREET CLOSURES/CUL-DE-SACS (Permanent or During Specified Hours)

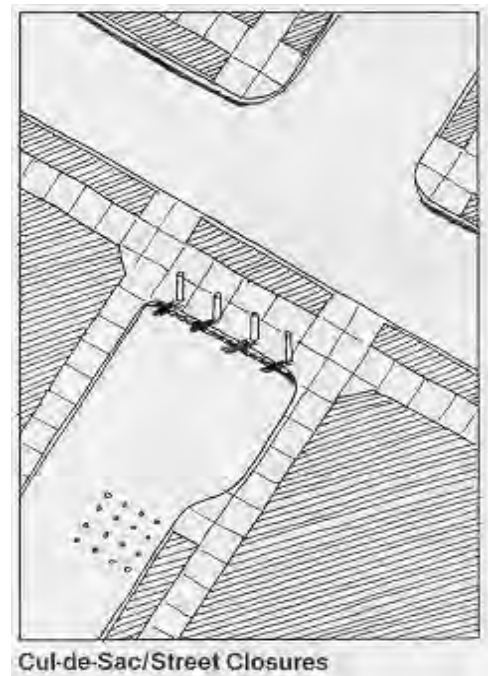
This device can be the most effective at reducing the volume of traffic. A street closure involves the complete closure of a street at an intersection or midblock and may be permanent or during designated hours. If the closure is permanent, it will result in the creation of a cul-de-sac. Access for emergency vehicles can be maintained, but response times may be impacted. In most cases, bicycle and pedestrian access will be maintained, and some on-street parking may be lost at the closure. The street closure will reduce traffic speed, noise, and traffic accidents in the immediate vicinity. Signage is required and aesthetics will depend upon the type of closure installed.

Cost:

Approximate cost ranges from \$2,000 to \$5,000 for simple, removable bollards (which will cost more if they must be fitted into a hole versus something placed on the street) to \$50,000 for a landscaped island. Temporary installation of freeway or construction-type barriers is considerably less expensive and is recommended for a trial demonstration.



16th and San Salvador Streets, San Jose



ONE-WAY ENTRANCES/EXITS TO TWO-WAY STREETS

One-way entrances and/or exits to two-way streets are accomplished through various devices that prevent motorists from turning in a specified direction. These devices are designed to limit traffic volume and have proved to be quite effective. However, one-way entrances and exits do not slow traffic. It may be necessary to install different devices at different locations depending upon the intersection. An example of a variation of this situation can be seen at Houghton Street and Dana Street. Both Houghton Street and Dana Street can only turn right in and right out as shown below.

Cost:

Costs range from \$5,000 for a simple raised island to \$50,000 for a large landscaped device.



Houghton Street, Mountain View

FORCED-TURN CHANNELIZATION

Forced-turn channelization consists of one or more traffic islands designed to prevent traffic from making certain movements at an intersection. A diagonal diverter usually forces all traffic onto the intersecting street, thus breaking up through routes and making travel through a neighborhood more difficult. This results in a reduction in cut-through traffic, and speed may also be reduced, especially near the intersection. Noise is also lessened due to fewer vehicles on the street. Emergency vehicles may not be able to continue through the intersection, which could result in increased response times. Trip diversion of about 10% on each of the adjacent neighborhood streets should be expected. Diversion to collector streets is encouraged.

Cost:

Costs range from \$5,000 for a simple berm to \$50,000 for a low-maintenance landscaped island.



San Jose near San Jose State University

ONE-WAY CHICANES

A one-way chicane is an artificially created series of small tight turns with only enough width for one-way travel through a short section. They are similar in construction to chokers or bulb-outs but protrude more substantially into the street. While chokers merely reduce the width of streets, chicanes eliminate one lane. The purpose of a one-way chicane is to reduce both the speed and volume of traffic. One-way chicanes are quite effective; in Seattle, volumes were reduced up to 35% and speeds were reduced up to 25%. Some noise may be generated by braking and accelerating in the chicane area. However, overall noise should be reduced due to lower speeds and fewer vehicles. All parking is lost at the location of each chicane. There would be a substantial delay to emergency vehicles if a chicane is very long, but access to the entire street is maintained.

The bulb-outs created by a one-way chicane may be landscaped and warning signs and reflectors required. Maintenance would be increased for landscaping, street sweeping, and gutter clearing. Chicanes should only be installed on local residential streets at least 750' long.

Cost:

The cost ranges from \$5,000 for a simple bulb-out to \$50,000 to \$100,000 for low-maintenance/high-aesthetic islands.



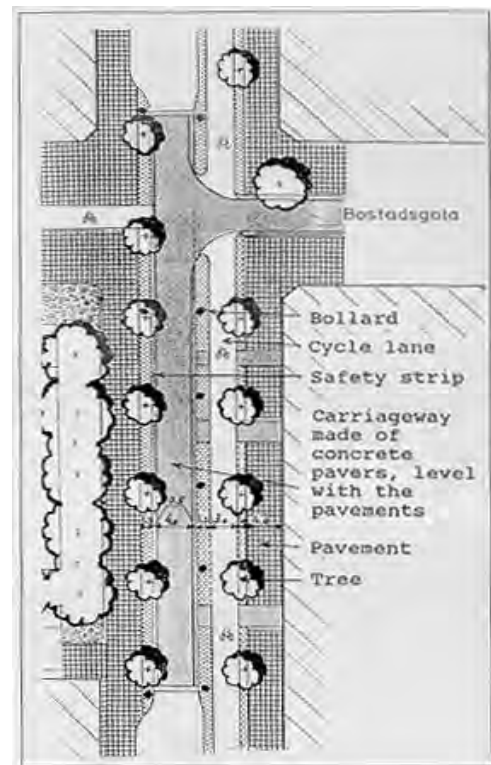
WOONERF

A Woonerf, common in Europe and Japan, is an area in which all vehicular and pedestrian activities are merged, with no grade changes or separations. In the Netherlands, about 2,700 residential streets were converted to Woonerven between 1976 and 1983. Through traffic is permitted, but landscaping and street furniture make it impossible to drive fast. The street clearly indicates entry into a residential precinct. The street may only be wide enough for traffic in one direction at a time, although two-way traffic is allowed. The street is used as play space for children as well as transportation uses.

This concept is generally not seen in the United States, and specific cost data are not available. However, the cost of renovating an existing street may be prohibitively high, but it may be cost-effective if installed in a new development as they can be constructed as part of the entire development. They are also a possibility for private streets, whether they are retrofitted or installed during construction.

Cost:

The cost would be dependent on the length of the street, whether pavement will be replaced, grade changes or grade separations, and the extent of other features added. Project costs to retrofit an existing street could range from \$250,000 to over \$1 million.



GLOSSARY

| | |
|------------------------------|--|
| Access | The ability to enter and/or exit a property, street or neighborhood; includes both ingress and egress. |
| ADT | Average daily traffic, or the number of vehicles that travel a roadway in one 24-hour weekday period. |
| CIP | The City's Capital Improvement Program, used to schedule and budget major capital projects. |
| General Plan | The City General Plan is the planning document for Mountain View. It contains several chapters that describe and discuss various important aspects of the City and sets goals, policies, and actions. The Circulation Chapter applies to traffic and transportation. |
| Ingress and Egress | The ability to enter (ingress) and exit (egress) a property, street, or neighborhood, such as a driveway into a parking lot. |
| ITE Trip Generation Handbook | The Institute of Transportation Engineers (ITE) professional manual that compiles surveys of the amount of vehicle trips generated by land use type. |
| Prima Facie Speed Limit | The apparently obvious speed limit on a street with no posted speed limit, such as 25 mph on a local residential street. |
| Safe Stopping Distance | Also safe sight distance. A distance of sufficient length such that a driver can avoid striking an unexpected obstacle on the roadway. |
| Sight Distance | The maximum distance at which a driver can clearly see an oncoming vehicle, a stopped vehicle or an obstacle in the roadway; this distance is often reduced by the vertical and horizontal alignment of a roadway. |

Speed Survey

A survey of vehicles performed with radar to determine the speed at which they are traveling. The 85th percentile speed is commonly used as the indicator of the appropriate roadway speed (see 85th Percentile). Radar may be used to enforce a speed limit set with a radar survey.

85th Percentile

The speed at or below which 85% of vehicles surveyed travel. This measurement is one criterion used to set the speed limit on roadways.



Neighborhood Traffic Calming Program

Transportation Division | Department of Public Works

Adopted July 2020

City of Cupertino | 10300 Torre Avenue

Cupertino, CA 95014

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Introduction

Due to rising public interest and concerns about speeding and cut-through traffic in Cupertino's residential neighborhoods, the City of Cupertino Transportation Division has developed a Neighborhood Traffic Calming Program (NTCP).

The Neighborhood Traffic Calming Program aims to establish a consistent set of guidelines to provide residents and property owners with a means to obtain relief from traffic-related concerns, namely speeding vehicles and cut-through traffic on their residential street. This is accomplished through a multi-step process involving an initial petition, a traffic survey, neighborhood meetings, a postcard survey and the possible installation of traffic calming measures.

Guiding Principles

- The primary purpose of the NTCP is to address neighborhood concerns and to reduce the speed and volume of traffic on local residential and residential collector streets with an established speed limit of 25 miles per hour. The NTCP does not apply to roadways designated as arterial roads or collector roads.
- Emergency vehicle access will be maintained in all traffic calming plans. Emergency vehicle travel times will also be considered when evaluating traffic calming measures.
- Reasonable automobile, pedestrian and bicycle access should be maintained to streets with traffic calming measures.
- Removal of some on-street parking spaces may be necessary to install some traffic calming measures. Parking loss at specific locations will be balanced with the neighborhood's desire for the traffic calming device.
- Only approved traffic calming devices included in this manual will be considered for installation under the NTCP. Transportation Division staff will examine the feasibility of the installation of a particular device before a recommendation is made.
- Traffic calming devices will be planned, designed and used in keeping with sound engineering and planning practices. The installation of traffic control devices such as signs, markings and speed humps will be compliant with the State of California Vehicle Code and the Manual of Uniform Traffic Control Devices.

- Requests for traffic calming devices shall be evaluated on a first-come, first-served basis and implemented up to the limit of funds available. Eligible traffic calming projects will be prioritized for implementation based upon the severity of traffic conditions.
- Traffic calming measures require approval by affected residents and property owners prior to implementation.

Funding

The City allocates General Fund dollars each year for the NTCP program. Projects are funded in priority order based upon the severity of the problem, and if the budget is exhausted, remaining projects will be carried over to the next year. Larger projects, which might deplete the budget, may be considered as a separate capital improvement project. Those projects would compete with other City projects for funding and may be scheduled in future fiscal years.

The Neighborhood Traffic Calming Process

The Neighborhood Traffic Calming Program includes a structured, six (6) step planning process. In most cases, the total process from initial inquiry to installation takes four to six months. Each step in this process is outlined below.

Step 1: Initial Inquiry and/or Petition by Residents

The first step in the NTCP process begins with an inquiry to the Transportation Division from one or more residents or property owners. If, during the initial inquiry, the property owner or resident requests signing and/or striping, the Transportation Manager can approve the installation. No further action would be necessary.

If signing and/or striping is not sufficient and additional traffic calming is desired, staff will direct the resident or property owner to obtain signatures, on a petition provided by City staff, from a minimum of 10 percent of the residents or property owners on the street in question. This petition will have a statement explaining the traffic concern. Through this petition, there is an assurance the individual's concerns also reflect the concerns of the neighborhood.

Step 2: Traffic Study, Identification of Appropriate Measures and Establishment of Notification/Voting Area

After a petition has been received, staff will conduct a traffic or speed survey to determine if the speed of traffic or the amount of cut-through traffic on the street exceeds the NTCP thresholds. The criteria established for local residential and residential collector streets are detailed in Table 1 and Table 2 below. If the survey verifies the traffic concern, staff will move to the next step in the process.

During this phase of the NTCP, staff will also establish a notification/voting area. This area will include those properties that are directly affected by the traffic issue and the potential traffic calming measures. Only properties on the segment of street in question, or on cul-de-sacs or courts directly connected to the street, will be included in the notification/voting area. Properties on separate or distant areas of the same street or on streets with alternate ingress and egress will generally not be included in the notification area. Specific notification areas will be determined by staff on a case-by-case basis.

Table 1: Local Residential Streets (25 mph Speed Limit)

| Speed Criteria | Cut-Through Volume Criteria |
|--|--|
| <input type="checkbox"/> 15% (85th percentile speed) of the vehicles on the street exceed 32 mph or 30 mph in a school zone. | <input type="checkbox"/> 25% or more of the traffic on the street is cut-through traffic; and <input type="checkbox"/> Street carries more than 1000 vehicles per day Cut-through traffic is defined as traffic entering the neighborhood with a destination outside of the neighborhood |

Step 3: Neighborhood Meeting with Affected Residents/Property Owners to Identify Preferred Traffic Calming Measures

Staff will arrange a neighborhood meeting with the residents and property owners within the notification area and send out an informational letter about the meeting. Whenever possible, staff will arrange to hold the meeting at a public venue near the affected area.

At this meeting, City staff will present the traffic calming measures described in the Appendix. Staff will also address concerns and answer questions about these devices and the NTCP process in general.

At the conclusion of the meeting, staff will poll the individuals in attendance to see if there is agreement on the type of traffic calming device they would like to see on their street. If staff determines a consensus can be reached, staff will move to Step 4 of the process, a postcard survey. If there is not clear direction from the residents, staff will arrange a second and final neighborhood meeting. If, at the conclusion of the second meeting, staff determines a consensus cannot be reached, the process may be concluded depending on the desires of the residents and property owners.

Step 4: Postcard Survey

At the successful conclusion of Step 3, City staff will mail a postcard survey to all the residents and property owners within the notification area, asking them for a yes-or-no vote on whether or not they would like to see the selected traffic calming device(s) installed on their street. Noticed residents will have a two (2) week period to return their vote and are encouraged to communicate with and remind their neighbors to submit their vote. For a device to be installed, a supermajority (67 percent) of residents need to respond with support for the proposed measures.

If a supermajority is not received, the NTCP process does not proceed. Residents and property owners receive a notification of vote results and are informed they may reapply for the process in one year.

Step 5: Approval by Staff and/or the City Council

Depending on the type of device(s) selected from the traffic calming device inventory in the Appendix, Public Works staff will approve the installation of the device or, in some instances, will bring a recommendation to the City Council. To determine what type of approval is necessary for a particular device, refer to Table 3 below.

Table 3: Traffic Calming Device Approval

| Device | Approval Process |
|--|--|
| <ul style="list-style-type: none"> • Speed / warning signs and striping | <ul style="list-style-type: none"> • Transportation Manager Approval |
| <ul style="list-style-type: none"> • Speed humps • Speed tables • Median islands • Traffic Circles / Roundabouts • Bulb-outs / Curb extensions • Turn restriction signs • Radar speed feedback sign | <ul style="list-style-type: none"> • Resident / property owner approval (67% majority) • Transportation Manager Approval • Public Works Director Approval |

Step 6: Installation of Traffic Calming Device(s)

After approval, the project will be placed on a prioritized list for implementation. Approved projects will be ranked for installation according to the following criteria and point system:

| | |
|---|--|
| Percent of vehicles exceeding speed limit | <ul style="list-style-type: none"> • 1 point / percentage point |
| Number of vehicles exceeding 1,000 average daily traffic volume | <ul style="list-style-type: none"> • 1 point / 100 vehicles |
| Number of reported speed related accidents (in last 2 years) | <ul style="list-style-type: none"> • 10 points / accident |
| Vicinity to schools or parks (within 600 ft) | <ul style="list-style-type: none"> • 5 points each |
| Percent of property owners approving installation(s) | <ul style="list-style-type: none"> • 1 point / percentage point |

Projects will be implemented, beginning with the highest-ranking project, until available funding is depleted. Projects not funded for a specific funding cycle shall be re-evaluated and shall compete on an annual basis with any new eligible installation on a priority basis.

Traffic Calming Measures

SPEED AND WARNING SIGNS

Speed and warning signs may be installed to increase roadway users' awareness of upcoming roadway conditions such as a change in the speed limit or the presence of a crosswalk ahead.

The frequent use of signs and striping may decrease their effectiveness and cause visual pollution in some neighborhoods. Signing and striping will be installed to applicable State and municipal codes. After a sign is installed it is typically not removed.

Estimated Cost:

Approximately \$250 per sign



Torre Avenue & Rodrigues Avenue, Cupertino

TURN RESTRICTION SIGNS

Turn restriction signs prohibit certain turning movements to discourage cut-through traffic on residential streets. Cut-through traffic volume reduction is potentially significant; however, turn restrictions may redirect traffic to other neighborhood streets and impede access by legitimate residents. Speed and noise are not typically reduced with this measure.

Estimated Cost:

Approximately \$250 per sign



S Stelling Road & Lilac Way, Cupertino

SPEED HUMPS / SPEED TABLES / SPEED CUSHIONS

Speed humps are rounded, raised areas placed across the roadway to slow speed. Speed humps have a parabolic profile and are generally 3 – 4 inches high and 12 feet wide in the direction of travel. Often referred to as “bumps” on signage and by the general public, speed humps may reduce speeds to 15 – 20 mph.

Speed tables are modified speed humps with a ten-foot-wide flat top that results in a 22-foot-wide hump in the direction of travel. Speed tables provide a gentler driving experience than speed humps, and as a result less reduction in speed can be expected. Speed tables may be designed as raised midblock crossings often in conjunction with curb extensions.

Speed cushions are speed humps that include wheel cutouts to allow large vehicles to pass unaffected while reducing passenger car speeds. Emergency vehicles with wider axles are able to straddle speed cushions without affecting their speed, thus maintaining their emergency response time. Speed cushions may be considered on key emergency response routes.

Estimated Cost:

Approximately \$20,000 - \$25,000

Cost is per speed hump or table (includes signing and striping).



Meteor Drive, Cupertino

MEDIAN ISLAND

Median islands are raised islands along the centerline of a street near an intersection that provide separation between the travel lanes at that location. Median islands are designed to prevent turning vehicles from crossing into opposing travel lanes when making turns onto or off of the street, and also may slow traffic due to the narrowing of the travel lanes. Median islands may act as a refuge island for pedestrians crossing wider streets. Depending on the width of the street, on-street parking may be eliminated in the vicinity of the island.

Median islands are typically 2' to 3' wide (or wider if acting as a pedestrian refuge), 10' to 20' long and about 6" high. The islands are not landscaped but will have decorative hardscape in the center.

Estimated Cost:

Approximately \$1,500 - \$3,000

Cost will vary with the width and length of the median island.



S Tantau Avenue & Barnhart Avenue, Cupertino

TRAFFIC CIRCLES/ROUNDBABOUTS

Traffic circles are raised circular medians that direct traffic counterclockwise within an intersection. Traffic circles can help manage speeds, reduce volume and improve side street access. Vehicles must change their direction of travel to maneuver around the circle. Per the State guidelines, traffic circles are controlled by “Yield” signage on all approaches. The traffic circles are not landscaped and will have decorative hardscape in the center. There is no impact on drainage or street sweeping. Emergency vehicle response times may also increase.

Estimated Cost:

Approximately \$2,000 - \$30,000

Cost will vary based on size and type of material used.



Portal Avenue & Wheaton Drive, Cupertino

BULB-OUTS / CURB EXTENSIONS

Bulb-outs, also known as curb extensions, are a method of narrowing the roadway by extending raised curbs into the street. This has the effect of slowing vehicle speeds and often reducing cut-through traffic. Bulb-outs can be used at street entrances, exits, and midblock locations. Bulb-outs used at intersections will slow turning vehicles as well as decrease the crossing length for pedestrians, which acts to enhance safety for pedestrians. Narrowing travel lanes may force motor vehicles and bicycles closer together making cycling uncomfortable for less experienced riders. Parking may also be impacted depending upon the extent of the bulb-outs installed.

Though less aesthetically pleasing, bulb-outs can also be constructed using flexible posts rather than extending the curb using concrete. The use of flexible posts allows existing drainage patterns to remain and may allow for the passage of bicycles, eliminating the need to share a narrower lane with motor vehicles.

Estimated Cost:

Approximate cost ranges from \$1,000 for flexible posts and \$2,000 for a simple raised berm, to \$40,000 for low maintenance/high-aesthetic landscaped islands.

Cost is per set (one on each side of the street).



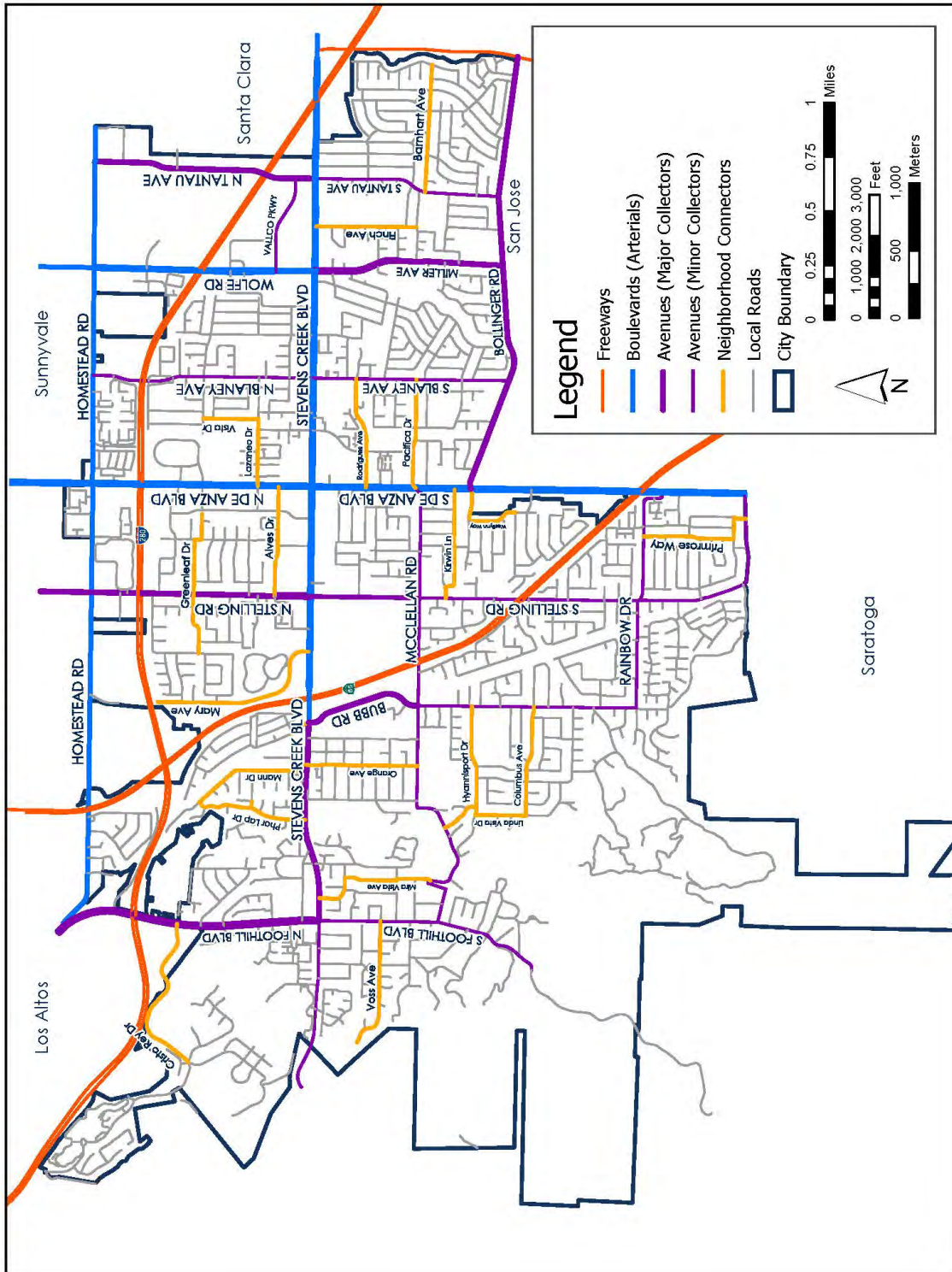
Merritt Drive & Vista Drive, Cupertino



Alves Drive & Bandle Drive, Cupertino

Appendix – A: Circulation Network Map

City of Cupertino Circulation Network
As Indicated in General Plan (Community Vision 2015 - 2040)



Neighborhood Traffic Calming Program Petition Form

Name: _____
Address: _____
Phone Number: _____
Email: _____



Please indicate traffic issues that concern residents in your neighborhood:

- Speeding
- Traffic Volumes
- Collisions
- Pedestrian/Bicycle Safety
- Other

Please list the boundaries of your neighborhood. Attach a map if necessary:

Please list possible solutions that you would like the city of Cupertino to consider:

To request that your neighborhood be included in the Neighborhood Traffic Calming Program (NTCP), complete both sides of this form and return to the address below:

City of Cupertino
Attn: NTCP – Transportation Division
10300 Torre Ave
Cupertino, CA 95014

You will be notified when your request form has been received and processed. If you have any questions, please call the Transportation Division at 408.777.3354

We the undersigned are petitioning the City, requesting Traffic Calming for Residents of

All persons signing this petition do hereby:

- 1. Certify that they are at least 18 years of age and reside within the impacted area;
- 2. Validate the presence of traffic issues in the neighborhood and the need for traffic calming; and
- 3. Agree that the following contact person(s) represent the neighborhood as facilitator(s) between the neighborhood residents and the City of Cupertino staff in matters pertaining to 1 and 2 above

| | | | |
|----|------|---------|-------|
| 1. | Name | Address | Phone |
| 2. | Name | Address | Phone |
| 3. | Name | Address | Phone |

Use Back Side for Signatures

Only One Signature Per Address

| | | | | |
|-----|------|---------|-------|-----------|
| 1. | Name | Address | Phone | Signature |
| 2. | Name | Address | Phone | Signature |
| 3. | Name | Address | Phone | Signature |
| 4. | Name | Address | Phone | Signature |
| 5. | Name | Address | Phone | Signature |
| 6. | Name | Address | Phone | Signature |
| 7. | Name | Address | Phone | Signature |
| 8. | Name | Address | Phone | Signature |
| 9. | Name | Address | Phone | Signature |
| 10. | Name | Address | Phone | Signature |
| 11. | Name | Address | Phone | Signature |

Neighborhood Traffic Calming Program

PURPOSE

In July 2017, the City Council adopted this Neighborhood Traffic Calming Program (NTCP) to include a neighborhood engagement process by which residents can request traffic calming studies to verify and address various types of traffic conditions. This process can result in the development and installation of physical traffic calming measures in a neighborhood.

SCOPE

- The NTCP will apply to local and collector streets, as classified in the General Plan.
- The NTCP does not apply to roadways designated as arterial roads.
- Requests for traffic calming measures shall be taken on a first-come, first-served basis and implemented up to the limit of funds available.
- Emergency vehicle access will be maintained in all traffic calming plans. Emergency vehicle travel times will also be considered when evaluating traffic calming measures.
- Traffic calming devices will be planned, designed and used in keeping with sound engineering and planning practices and in compliance with the California Manual on Uniform Traffic Control Devices.
- Potential traffic calming measures may include the following basic and physical roadway design features:
 - Traffic Signage
 - Street Markings / Striping
 - Traffic Circles
 - Bulb-outs
 - Speed Humps
 - Spot Islands
 - Radar Speed Feedback Signs
 - Crosswalk Flashing Beacons

NEIGHBORHOOD TRAFFIC CALMING PROCESS

The Neighborhood Traffic Calming Process includes an eight-step planning process. It is anticipated that the total process, from initial inquiry to installation, may take six to twelve months. Each step in this process is outlined below.

Step 1: Initial Inquiry.

The NTCP process begins with an inquiry (see [Neighborhood Request for Traffic Calming Study](#)) to the City's Public Works Department from a resident with a traffic safety concern. Staff evaluates the concern(s) and determines if:

- The concern can be addressed through traditional traffic engineering measures such as signage and striping.

- The concern can be addressed through other programs (e.g. Safe Routes to School Program or street resurfacing work); or
- If a neighborhood petition is required to begin a traffic calming process.
- If the concern could be mitigated through regular staff work, then the resident submitting the inquiry will be notified of this outcome and given a projected timetable for the work.

Step 2: Neighborhood Petition

If engineering staff determines that a traffic study is necessary to evaluate the concern, staff will ask for a neighborhood petition signed by 50% of the affected households. The petition must describe the perceived problem and inform residents that the traffic calming process may take 6-12 months. Neighborhood engagement will be requested as staff considers traffic calming measures. This petition is required in order to determine neighborhood support. Upon receipt of the petition, staff will conduct a traffic or speed study to collect appropriate data to determine if the speed meets the Neighborhood Traffic Calming Policy criteria.

Step 3: Minimum Criteria and Traffic Calming Study.

- a. The criteria to determine eligibility for further study of neighborhood physical traffic calming measures is determined when traffic studies conclude that:
 - 85th percentile speed traveled by vehicles exceeds the posted speed limit by 7 miles per hour (mph) on local streets and average daily traffic volume of 1,000 vehicles per day.
 - 85th percentile speed traveled by vehicles exceeds the posted speed limit by 7 mph on collector streets and average daily traffic volume of 2,000 vehicles per day.
- b. If the traffic calming study concludes the minimum criteria are not met (hence the traffic safety concern is not verified by the data); the request for physical traffic calming will be nullified. Staff can then discuss with the residents other options such as police enforcement or education. Potentially, staff could revisit with the neighborhood the possibility of striping or advisory signage that was assessed at the beginning of the traffic calming process.
- c. If the traffic calming study indicates that the traffic conditions in the neighborhood meet the criteria staff will define the neighborhood and impacted streets to consider any other potential unintended traffic impacts that these solutions may create, identify possible traffic calming surveys, and convene a neighborhood meeting.

Step 4: Neighborhood Engagement

At the neighborhood meeting, the goal is to present:

- Traffic data and proven strategies for specific traffic issues;
- Fiscal Impact (cost, funding options);
- Neighborhood preference for specific types of solutions; and
- Timeline

If the consensus at the neighborhood meeting is to proceed with the development of a traffic calming plan, staff will prepare options for physical traffic calming devices to address the neighborhood issue (e.g. speed humps, roundabout, etc.). In addition, the Police Department will be engaged to deploy speed trailers, or other available tools, as interim measures to use during the community planning process.

If necessary, staff will then convene an additional neighborhood meeting to present the proposed traffic calming devices and determine neighborhood preference. If the neighborhood and staff agree at the first meeting on a desired approach, a second meeting may not be necessary.

Step 5: Postcard Vote

To affirm neighborhood support, a postcard vote will be conducted and will require the support of 67% of residences in the project area (one vote per residence). Only residences that are directly affected and are located on the segment of the street in question, or on cul-de-sacs or courts directly connected to the street will be included in the notification/voting area. If a project does not receive 67% support, staff will report results to the neighborhood and determine next steps.

Step 6: Approval

For projects with 67% support for a physical traffic calming measure, staff recommends that the City Council review the project and allocate funding. Projects with non-physical measures such as striping or signage are recommended for approval by the Public Works Director.

Step 7: Installation

Once a project receives approval and funding by the designated body, staff will prepare final plans and specifications for implementation.

Step 8: Evaluation

The final step in the traffic calming process takes place within one year of installation. At that time, a new traffic study will be conducted to determine the effectiveness of the installed traffic measure. Both the neighborhood and City Council will receive a copy of this report. Staff estimates that the traffic calming process, following the receipt of a neighborhood petition, will take approximately six to twelve months.

FUNDING

The NTCP will be funded from the Capital Improvement Program Reserve funds. The amount will be determined each year during the review and approval of the five-year Capital Improvement Program budget. It is anticipated that funds will be used for:

- Traffic Calming Studies (data surveys)
- Traffic Calming Projects (low cost traffic calming measures)
- Program management (staff time), including community meetings

**CITY OF REDWOOD CITY
POLICY AND GUIDELINES
FOR RESIDENTIAL TRAFFIC CALMING**

INTRODUCTION

The City of Redwood City wishes to preserve the nature of its residential neighborhoods and to ensure that local streets, particularly those in residential neighborhoods, are as quiet and safe as possible. One method of doing this is through “traffic calming.” This policy and guideline document describes methods for analyzing and implementing traffic calming measures on Redwood City’s residential streets.

USE OF THIS POLICY AND GUIDELINES

The measures outlined in this document are intended to slow traffic to the posted speed limit and to discourage unnecessary through traffic on residential streets, while maintaining access for police, fire, emergency services, and local residents. Traffic calming on streets not specifically covered by this policy will be evaluated and addressed separately. Non-residential streets are typically evaluated on a case-by-case basis through engineering studies and analysis.

This document is to be used in combination with professional engineering judgement and best practices. Additionally, because every street in Redwood City has its own unique characteristics, these guidelines do not constitute either final or complete design or evaluation criteria for a traffic calming plan. Local site conditions must be evaluated for all traffic calming installations, and terrain, roadway, traffic or land use characteristics, or other unusual conditions may require case-specific modifications or exceptions.

A major factor in achieving successful traffic calming is public input, including comprehensive public education and participation. With the exception of cut-through traffic, the majority of residential speeding violations typically result from drivers who live in the neighborhood. Public education and participation encourage neighborhood residents to help identify the cause of the problem and to be accountable for the solution. Therefore, Redwood City requires that a majority of residents on a residential street be supportive of a traffic calming plan for it to be implemented.

The City of Redwood City reserves the right at its own discretion to analyze and implement traffic calming at a location should it feel it is necessary to increase roadway safety.

WHAT IS TRAFFIC CALMING?

The Institute of Transportation Engineers (ITE) defines traffic calming as “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.” In less technical terms, traffic calming uses physical changes, either on or adjacent to the street, to encourage safer, more responsible driving and improve safety for motorists, pedestrians, and cyclists.

Typical physical measures that can have a traffic calming effect and that reduce vehicle speeds and volumes include:

- Warning and specialty signs
- Radar speed feedback signs

- Gateways
- Textured crosswalks, special striping, narrow lanes
- On-street parking
- Bulb-outs, chokers, curb extensions
- Median islands
- Traffic circles
- Serpentine streets, chicanes
- Speed tables and raised crosswalks
- Speed humps
- Turn prohibition signs
- Diagonal diverters, forced turn channelization, median barriers

GOALS AND OBJECTIVES

The goal of the City of Redwood City's Residential Traffic Calming Program is to establish procedures to facilitate installation of traffic calming and measures that will enhance the quality of life in the City's neighborhoods by mitigating the negative impacts of vehicular traffic on residential streets.

Objectives

- To promote safe and pleasant conditions for people who live, walk, bike, and drive on neighborhood streets
- To reduce the average speed of traffic on local neighborhood streets
- To reduce the amount of cut-through traffic on local neighborhood streets
- To preserve and enhance walking and biking access to neighborhood destinations
- To facilitate resident involvement in neighborhood traffic management activities
- To provide a process to prioritize neighborhood traffic calming requests

Policies

- Through-traffic should be routed to the major roadways, whenever possible
- The amount of rerouted traffic that is acceptable as a result of a traffic calming project should be defined on a project-by-project basis
- Emergency vehicle access must be preserved
- Each traffic calming measure will be planned and designed in conformance with sound engineering and planning practices
- Uniform procedures will be followed in the processing and prioritization of neighborhood traffic calming requests

TRAFFIC CALMING GUIDELINES

Engineering Study

Traffic calming measures should only be installed where an engineering study concludes that:

- Traffic calming installations can address speeding or cut-through traffic;
- Judicious use of other guide, warning or regulatory control devices has been considered but does not address the issues;
- A reasonable level of enforcement has not solved or appears unlikely to solve the problem, or a necessary level of enforcement is unlikely to be made available; and
- Key design guidelines, as outlined herein for location, placement, configuration details, and related street and traffic conditions, can be reasonably conformed to at the site under consideration.
- The study location meets a combination of the following eligibility measures. With

emphasis on the speed, volume and collision data.

ELIGIBILITY

Street Classification and Use

Traffic calming can only be installed on those roadway facilities functionally classified as "Local Streets", "Pedestrian Streets", or "Bicycle Boulevards" in the Redwood City General Plan. Table 1 lists the street segments streets classified as "Connector" streets or higher classes of streets. Street segments on Table 1 are **not eligible** for residential traffic calming under this policy and guidelines.

TABLE 1: STREETS INELIGIBLE FOR TRAFFIC CALMING

Boulevards

| Roadway: | From: | To: |
|------------------------|-----------------------|---------------------|
| El Camino Real (SR 82) | N. City Limit | S. City Limit |
| Marine Pkwy | U.S. 101 | Bridge |
| Redwood Shores Pkwy | U.S. 101 | Shoreline |
| Veterans Boulevard | U.S. 101 | Woodside Road |
| Twin Dolphin Drive | Marine Pkwy | Redwood Shores Pkwy |
| Woodside Road | Alameda de las Pulgas | U.S. 101 |

Transit Streets

| Roadway: | From: | To: |
|-------------------|------------------|-----------------|
| Broadway | El Camino Real | Fifth Avenue |
| Middlefield Road | Winslow Street | S. City Limit |
| Seaport Boulevard | U.S. 101 | End of the Road |
| Winslow Street | Middlefield Road | Broadway |

Connector Streets

| Roadway: | From: | To: |
|-----------------------|-----------------------|-----------------------|
| Edgewood Road | I-280 | Alameda de las Pulgas |
| Alameda de las Pulgas | N. City Limit | Woodside Road |
| Farm Hill Boulevard | I-280 | Jefferson Avenue |
| Jefferson Avenue | Farm Hill Boulevard | Veterans Boulevard |
| Whipple Avenue | Alameda de las Pulgas | U.S. 101 |
| East Bayshore Road | Seaport Boulevard | Haven Avenue |
| Bridge Pkwy | Marine Pkwy | Redwood Shores Pkwy |
| Redwood Shores Pkwy | Shoreline Road | Shearwater Pkwy |
| Marine Pkwy | Bridge Pkwy | Shearwater Pkwy |
| Shell Pkwy | Marine Pkwy | Redwood Shores Pkwy |
| Shearwater Pkwy | Marine Pkwy | Redwood Shores Pkwy |
| Main Street | El Camino Real | Middlefield Road |
| Winslow Street | Brewster Avenue | Whipple Avenue |

Industrial Streets

| Roadway: | From: | To: |
|-------------------|------------------|--------------------|
| Bay Road | Chestnut Street | Fifth Avenue |
| Spring Street | Chestnut Street | Second Avenue |
| Chestnut Street | Spring Street | Veterans Boulevard |
| Willow Street | Spring Street | Bay Road |
| Charter Street | Spring Street | Bay Road |
| Kaynyne Street | Spring Street | Bay Road |
| Sweeny Avenue | Spring Street | Bay Road |
| Douglas Avenue | Fair Oaks Avenue | Bay Road |
| Hurlingame Avenue | Fair Oaks Avenue | Bay Road |
| Warrington Avenue | Fair Oaks Avenue | Bay Road |
| Barron Avenue | Fair Oaks Avenue | Bay Road |
| Second Avenue | Fair Oaks Avenue | Bay Road |

Number of Lanes

Traffic calming should only be used on streets with no more than two travel lanes. Streets with a center turn lane may still qualify for traffic calming.

Drainage Characteristics

Streets considered for traffic calming should have good drainage qualities. Potential drainage impacts must be considered when evaluating whether a traffic calming installation is appropriate.

Street Grades

Certain traffic calming measures should not be employed on streets with grades exceeding five percent. When traffic calming measures are installed on streets with sustained downgrades, special care should be taken to ensure that vehicles can navigate the installation safely at appropriate speeds.

Sight Distance

Traffic calming devices should generally be installed only where the minimum safe stopping sight distance (as defined in AASHTO's *A Policy on Geometric Design of Streets*) can be provided. For mid-block locations on typical residential streets, a minimum safe stopping sight distance allowance would normally be at least 200 feet, the nominal stopping sight distance for vehicles traveling at 30 mph. Depending on the character of the intersection and the traffic control, sight distance requirements might be less for installations located within the influence area of an intersection.

Traffic Speeds

When traffic calming is installed to address speeding concerns, studies will be performed to confirm the magnitude of the speeding problem. The number of vehicles exceeding speed limits, percentage of all vehicles exceeding speed limits, 85th percentile speed, and the speed of fastest vehicles may all be considered when evaluating whether a speeding problem exists.

Traffic calming devices should generally be installed only on streets where the posted or prima facia

speed limit is 30 mph or less. Where speed problems occur on streets with higher speed limits (such as streets posted for 35 mph experiencing 45-50 mph traffic), focused enforcement and combinations of other types of control measures should be considered instead of speed humps.

Speed humps should only be used on streets where traffic speeds are intended to be low. Speed humps should not be installed on streets where the posted speed limit is considerably greater than speeds at which most motorists feel comfortable traversing the speed humps.

In Redwood City, specific criteria to qualify for traffic calming are as follows:

- Eighty-fifth percentile speed exceeds 30 mph (35 mph on streets posted 30mph),
- 60 percent of the traffic exceeds the posted speed limit (normally 25 mph),
- The average speed of vehicles in the top 15th percentile is 40 mph or greater.

Traffic Volumes

Traffic calming should be installed only on streets classified as “Local Streets”, “Pedestrian Streets,” or “Bicycle Boulevards.” Such streets typically have an average daily traffic volume of 5,000 vehicles or fewer. Requests are occasionally received to install traffic calming on streets classified as “Local Streets,” Pedestrian Streets,” or “Bicycle Boulevards” that carry higher traffic volumes, indicative of a higher functional classification of street (nominally, above 5,000ADT, average daily trips). When considering such situations, the City must make a conscious policy decision. Is the street *really* a “local” street that is simply impacted by too much traffic which is traveling too fast? If so, traffic calming may be an appropriate response. Or is the street really fulfilling a necessary and appropriate “major collector” function in the City's circulation network - in essence, is its designation a misclassification? In the latter case, traffic calming is probably too restrictive and should not be used.

For cut-through traffic, the specific criteria to qualify for traffic calming is as follows:

- 40% or more ADT on a local street is cut-through traffic between arterials or major roadways

Traffic Safety

When traffic calming measures are installed to address documented or anticipated vehicle or pedestrian collisions, the causes of those collisions should be correctable by speed control.

Proposed traffic calming must be evaluated in the field to verify that such installations will not introduce or increase the potential for collisions.

Vehicle Mix

Typically, traffic calming should not be installed on streets that carry significant volumes of truck traffic unless there is a reasonable alternative route for those vehicles. Generally, heavy or long-wheelbase trucks constituting up to five percent of all traffic is considered normal. Special consideration may be given to a location where there is a significant generator of truck traffic.

Bicyclists, motorcyclists, low-riders, and operators of other types of special vehicles often consider traffic calming annoying. While potentially annoying to these types of roadway users, traffic calming does not constitute an unusual hazard or obstruction for these vehicles. For this reason, the possible presence of these vehicle types is **not** a reason to deny approval of traffic calming in circumstances where it would otherwise appear desirable or needed.

Emergency Vehicle Access

Traffic calming is typically not installed on streets that are defined or used as primary emergency vehicle access routes. If traffic calming is deemed necessary on any roadway identified as a primary response route, the design must be coordinated with the emergency responders. Primary emergency vehicle routes are comprised of two types of streets:

1. Routes used by emergency vehicles to cross large parts of the community or on paths logically used to service large numbers of potential destinations. Routes of this type are generally ineligible for traffic calming through this document based on their functional classification.
2. Streets of generally local character which also serve as the immediate egress route from an emergency vehicle dispatch point or as the immediate access route to a regular destination for emergency vehicles (such as where a fire station or a hospital emergency room access is located on a street classified "local"). Such circumstances will limit the eligibility of streets which would otherwise be eligible for traffic calming.

The City has a duty to maintain a street system which reasonably allows for timely emergency service response. However, on local streets the City also has other compelling duties which may to some degree conflict with maintaining the streets in a manner to optimize emergency service response. Those duties include maintaining local residential streets in a manner which will induce traffic behavior consistent with areas where children and pedestrians can be expected to be in or near the street, or maintaining the streets in a manner which induces traffic behavior that allows residents quiet enjoyment of their homes and that limits impacts from traffic. For residential streets which are **not** on primary emergency response routes, reasonable accommodation for timely emergency service response may be quite different from individual residential streets on the primary response routes. In those circumstances, traffic calming which causes minor increases to emergency service response time may be acceptable. Fire vehicles rarely if ever achieve speeds of over 20 mph on the local residential streets where traffic calming is normally employed. Traffic calming plans will be designed with this in mind to minimize the impact on response times.

The City will normally seek to identify and implement measures which offset the effects of neighborhood traffic management on emergency response and to avoid situations where the cumulative effect of neighborhood traffic controls dramatically alters emergency response.

Transit Routes

Traffic calming generally should be limited along streets with established, conventional bus transit with normal service frequency. School transit, shuttle vans, paratransit vehicles, and similar services of conventional transit are not included in this consideration because they can reasonably be expected to operate in the neighborhood environment at speeds where traffic calming would not pose problems. In addition, many of these vehicles are not exceptionally long wheelbase vehicles.

Resident Support

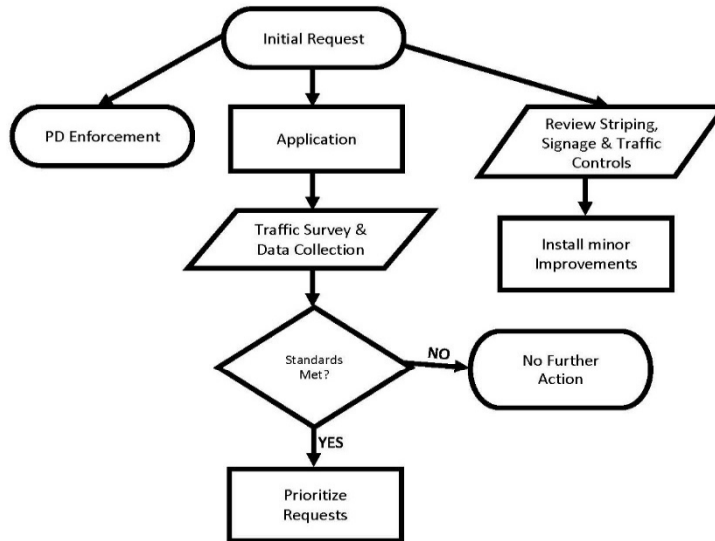
Where traffic calming is initiated by resident request, a petition requesting traffic calming signed by representatives of 50 percent of the properties in the primary impact zone of the traffic calming shall be considered sufficient indication of community support for the City to act on the request (impact zone to be defined by the City staff).

TRAFFIC CALMING REQUEST PROCESS

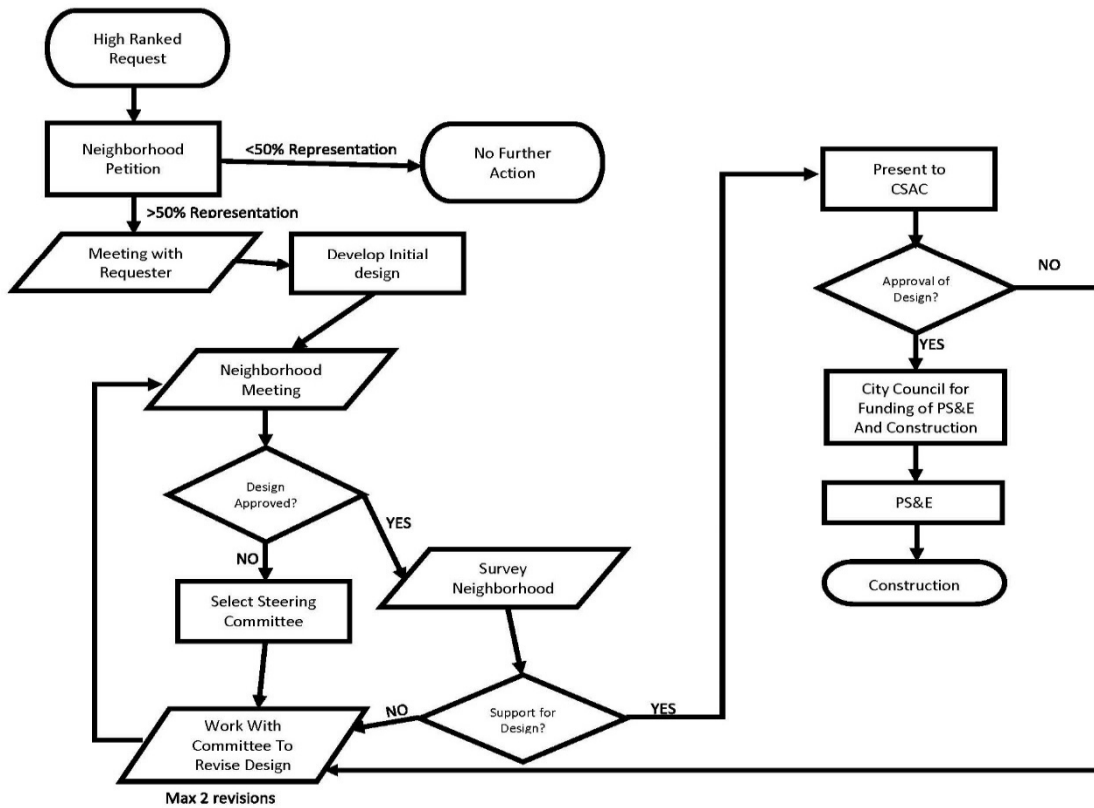
A traffic calming plan goes through two processes from initiation to implementation. The request process must be completed before the application may move into the development process. A flow chart showing the path of an application through each of these processes is seen in Chart 1 and the processes are described further below:

Chart 1:

**TRAFFIC CALMING
REQUEST PROCESS**



**TRAFFIC CALMING
DEVELOPMENT PROCESS**



THE REQUEST PROCESS

In most circumstances a resident or a group of residents requests that the City lower the speed or volume of traffic on a street. Following this request the requestor will receive a copy of this policy and the attached application, Exhibit B. Requestors wishing to continue the process must fill out the traffic calming application and obtain a signature of support from one additional property owner on the requested street, then submit it to the City.

At the time of the initial request the Police Department will be notified of the requestor's traffic concerns. Engineering will review the existing signage and striping along the requested street to see if minor modifications can mitigate the concerns.

Following receipt of the application City staff will schedule data collection and complete a traffic evaluation of the requested street(s). Once collected the data will be analyzed to see if the City's minimum traffic calming standards are met. If they are, the request will be prioritized and the results reported to the applicant. If the minimum standards are not met and there are no special circumstances that warrant additional consideration, the request will be closed with no further action and the applicant notified. A location that has been evaluated cannot be re-evaluated for at least one year.

Upon successfully passing the request process, the application will be placed on the City's active traffic calming application list. Placement within the list will be determined by the score the project receives based on the data collected for the location.

Due to staff and financial resources required for these type of projects, Redwood City must prioritize requests to address the areas of highest need first. The application with the highest score will be placed at the top of the list and will be first to receive funding for development and implementation. The scoring criteria are listed in Table 2.

THE DEVELOPMENT PROCESS

Once a request reaches the top of the priority list it will move into the Development Phase of the process and the applicant will be notified.

First step is for the requestor to confirm neighborhood support by providing the City a petition signed by residents in the traffic calming area. Greater than 50 percent representation of the properties in the area is required to move forward with the design of a traffic calming plan. If greater than 50 percent support cannot be obtained, the request will be closed with no further action by the City and the applicant notified.

Following the successful submittal of the petition, the requestor and the City will meet to discuss initial design ideas and concerns. The City will use feedback from this meeting along with the previously-completed analysis to develop an initial design for the traffic calming plan. Depending on the size and scope of the requested traffic calming area the City may request the assistance of a consultant to develop the plan. If this is necessary, additional time will be needed to secure the services of the consultant.

At the completion of the initial design the City will schedule a neighborhood meeting to review the design and allow the neighborhood to provide comments and feedback. This meeting may be held at a resident's house or at an offsite location depending on what is most convenient and accessible for the neighborhood. At the meeting residents will be asked to approve the design of the plan. If a general consensus is obtained the process will move forward. If there is no consensus on the plan design at the meeting, the residents will be asked to select a steering committee to work with City staff on the redesign of the traffic calming plan. Upon completion of a revised plan with the help of the steering committee, the City will hold a second neighborhood meeting to share the plan and solicit resident

feedback. Residents will be asked to approve the revised design of the plan. If a general consensus is obtained the process will move forward. If there is no consensus on the plan design at the second meeting the design process will closed with no further action by the City. The design will be passed back to the steering committee to work with the neighborhood to find a solution that is supported by consensus, for resubmittal to the City.

Once a plan is approved at a neighborhood meeting, the City will mail a survey to all the residences in the plan area. If there is majority support for the plan the process will move forward. If there is not majority support the City will work with the steering committee to revise the plan based on feedback received. The revised plan will be resurveyed to the neighborhood to obtain support for the traffic calming plan. If support cannot be found on a second survey then the process will be closed for no further action from the City. If there is disagreement between the neighborhood and City staff the proposed plan will be brought before the Complete Streets Advisory Committee for discussion and recommendations.

When the traffic calming plan is approved by the neighborhood with majority support, it will be scheduled for review by Redwood City's Complete Streets Advisory Committee at its next available meeting. City staff will collect any feedback and ask the Committee to approve the traffic calming plan and authorize it to go to the City Council for approval and funding.

The traffic calming plan will be presented to City Council for approval of the project plan and funding for the construction documents and construction.

Once funding is in place, construction plans and specifications will be developed and the project will be constructed.

This policy and guideline was prepared by and for the City of Redwood City Community Development Department-Engineering and Transportation.

TABLE 2: Redwood City Traffic Calming Priority Scale

| Criteria | Point Value |
|---|---|
| Speed | 2 points for each mph difference between the 85th percentile speed and the posted or prima facie speed limit |
| Volume | 1 point for each 500 vehicles over 1,000 vehicles per day; 5 points if 40 – 65% or more ADT on local street is cut through traffic between arterials or major roadways; 10 points if higher than 65% |
| Crash History | 5 points for each speed-related crash in the past 3 years 8 points for each injury crash in the past 3 years 8 points for each crash involving a pedestrian or a cyclist in past 3 years |
| Pedestrian Generators (15 points max.) | 5 points for each school, park, library or community center along roadway; 3 points if within 1 block; 2 points if within 2 blocks |
| Support | 8 points for 80% representation of neighborhood 5 points for 70% representation of neighborhood |
| Unique Conditions (15 points max.) | 5 points for designation as a Bike Route or as a General Plan pedestrian corridor, or for proximity to neighborhood business district or existing/planned transit hub; 5 points for evidence of crashes or speeding, such as long skid marks or broken glass; 5 points for missing sidewalk section; 5 points for unique roadway geometry that substantially restricts visibility; 5 points for high crash rate |

Exhibit A

**REDWOOD CITY
TRAFFIC CALMING
POLICY SUMMARY**

Definitions

Traffic Calming: the combination of physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users.

Eligibility Conditions

| Eligible for Traffic calming | Ineligible/Questionable for Traffic calming |
|--|---|
| Persistent speed problem: 85th percentile speed 30 mph or greater or 60% of all vehicles exceed speed limit or average of top 15th percentile speeds observed is 40 mph or | Speeds unremarkable: Criteria opposite not met. |
| Local or minor collector street. | Arterial or collector street. |
| Two-lane street. (may have center turn lane) | Street with more than two lanes. |
| Street less than 40 feet wide. | Street wider than 40 feet. |
| Drainage satisfactory. | Poor drainage/ ponding. |
| Grades less than 5 percent in area of installation. | Grades greater than 5 percent or sustained downgrade present. |
| Straight and level or mild horizontal and/or vertical curves. | Horizontal curves of less than 300 foot centerline radius or vertical curves with less than safe stopping sight distance. |
| Streets posted 30 mph or less. | Streets posted 35 mph or more. |
| Low volume streets (generally below 5000 ADT). | Moderate to high volume streets (generally more than 5,000 ADT). Less than 40% cut through traffic. |
| Streets used by <5% of long wheel based vehicles (trucks). | Streets used by >5% of long wheel based vehicles. |
| Streets used occasionally by emergency vehicles operating at low to moderate speeds. | Streets used as primary emergency vehicle circulation routes. |
| Streets not used for frequent, regularly-scheduled public transit. Use by school transit, paratransit and infrequent conventional transit tripper service is | Regular, frequently served conventional transit routes. |



Exhibit B Traffic Calming Request Form



The purpose of this form is to enable residents to request the possible initiation of a traffic calming warrant analysis in accordance with the City of Redwood City's adopted Policy and Guidelines for Residential Traffic Calming. This form must be filled out in its entirety and submitted with any traffic calming request to:

The City of Redwood City
Community Development – Engineering **or** rwcengineering@redwoodcity.org
1017 Middlefield Road
Redwood City, California 94064

Feel free to attach additional sheets containing pictures, maps, diagrams, or additional text if the space provided is insufficient.

1. Requesting Individual's Contact Information

Name: _____
Address: _____
Phone Number: _____
Email: _____

2. Signature of Support

Signature: _____
Name: _____
Address: _____
Phone Number/email: _____

3. Please describe the location of the traffic concern (feel free to include pictures or a map):

4. Please describe the nature of the traffic problem you are concerned with:

5. Please describe how traffic calming will be able to eliminate or reduce your traffic concerns:

6. Is there neighborhood support, including support from the Home Owners Association, for the installation of traffic calming at this location? Can you demonstrate these supports if required?

7. Are there any facilities (churches, schools, shopping malls, etc.) near this location that generate a high concentration of vehicle or pedestrian traffic?



RESIDENTIAL TRAFFIC CALMING PROGRAM



**Adopted By City Council
May 28, 2002**

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CITY OF FREMONT RESIDENTIAL TRAFFIC CALMING PROGRAM

Executive Summary

The primary goal of the residential traffic calming program is to have guidelines and set procedures to address neighborhood speeding and bypass traffic on residential streets. The City of Fremont Residential Traffic Calming Program is based on the experience and lessons learned from the Eggers Drive Pilot Traffic Calming Project, the City's Speed Lump Policy and successful elements of other cities traffic calming programs.

The residential traffic calming program requires strong community support and participation by affected residents and property owners. It involves a review of the streets accident history, speed data, and traffic volumes. Installation of the traffic calming devices requires specific design criteria and warrants be satisfied. The residential traffic calming program provides a structured planning process and is flexible enough to adjust to the challenges of each unique project.

Residential Traffic Calming Program Objectives

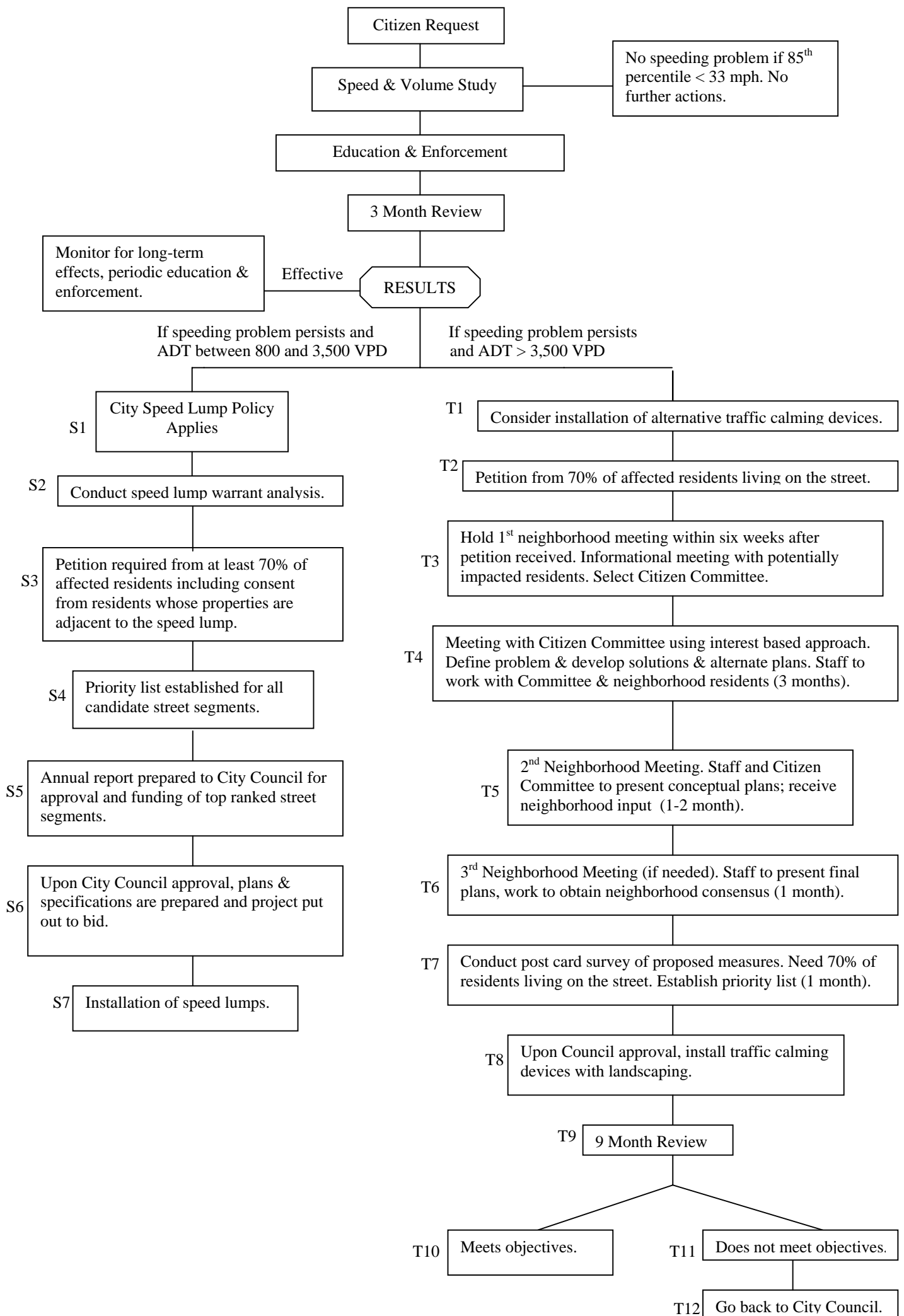
- Reduce vehicle traffic speeds on two-lane residential streets.
- Encourage non-neighborhood bypass traffic on two-lane residential collector and local streets to use major arterial streets when traveling to and from their neighborhood.
- Enhance safety for residents, pedestrians, bicyclists, and motorists.
- Maintain and enhance neighborhood livability.

Residential Traffic Calming Policy Guidelines

- A combination of education, enforcement and engineering methods will be used in the City's residential traffic calming program. Traffic calming devices will be planned, designed and used in keeping with sound engineering and planning practices. The City Engineer will recommend the installation of traffic calming devices such as speed lumps, center islands, traffic circles and other approved traffic calming devices in this policy to accomplish the residential traffic calming program objectives. Installation of traffic calming devices will require the approval of the City Council.
- The installation of traffic calming devices will require strong community support by residents living on the affected street segment. A warrant analysis for the installation of traffic calming devices will be conducted based on accident data, speed data, traffic volumes and standard design criteria.
- Traffic calming measures on residential streets will be installed to reduce traffic speeds. Non-neighborhood or bypass traffic will be encouraged to use major arterial streets. Some diversion from a traffic managed street to an adjacent street will be unavoidable. An increase of up to 25% of existing average daily traffic (ADT) or 500 vehicles per day, whichever is less will trigger an analysis of the adjacent street.
- Installation of traffic calming devices will only be considered on two-lane residential streets with a posted speed limit of 25 miles per hour.
- Emergency vehicle access will be accommodated in all residential traffic calming plans. Traffic calming devices will be installed only with the consent of the Fire and Police Departments.
- Reasonable automobile, pedestrian and bicycle access should be maintained on residential streets with traffic calming devices.
- Traffic calming devices will not inhibit or significantly impact transit, waste disposal trucks and other service vehicles.
- Removal of some on-street parking spaces may be necessary to install certain types of traffic calming devices. The parking needs of residents will be balanced with the neighborhood's desire for the installation of traffic calming devices.
- The speed lump will be the traffic calming device considered for residential streets with an average daily traffic between 800 vehicles per day to 3,500 vehicles per day.

- Installation of alternative traffic calming devices such as traffic circles, center islands, chicanes (triangular islands), neck downs, modified T-intersections and speed tables/raised crosswalks will only be considered for residential streets that have average daily traffic greater than 3,500 vehicles per day.
- The City of Fremont Residential Traffic Calming Program flow chart is shown on page 5.
- A complete description of the seven traffic calming devices and the criteria for installation of these devices is described on pages 9 to 15.

Residential Traffic Calming Program Flow Chart



Note: Total planning process is 11 months. Planning schedule may be shortened dependent on scope of project and if neighborhood consensus is achieved early in the planning process.

Types of Traffic Calming Devices

The following pages consist of the description of the seven traffic calming devices to be used in the residential traffic calming program. The devices listed (see Table 1 on page 8) are designed to slow traffic by the following methods: (1) narrowing of street such as center islands; (2) horizontal or lateral deflection such as the use of chicanes and traffic circles; (3) vertical deflection – use of vertical force to cause vehicles to slow down, such as speed lumps. Traffic calming devices that would divert traffic to other streets by channeling traffic, e.g. traffic islands (that force right or left-turn movements) or barriers that limit or close street access will not be permitted, and are not included in the traffic calming program.

The City will proceed with the installation of traffic calming devices only if all the criteria outlined in this policy for each device (see pages 9 to 15) is satisfied. Installation of traffic calming devices will be based on safety considerations, speed analysis, volume data, review of accident history, and other special studies pertinent to the project. The City Engineer will recommend the installation of traffic calming measures and will require the approval of the City Council. The City will consider resident support for traffic calming in determining whether or not there is a need to reduce speed in a project area. If petitions in support of traffic calming are signed by less than 70% of residents within the project area, the City will proceed with a traffic calming plan only if all other criteria outlined in this Policy support a need for installation based on safety considerations.

Construction of the traffic calming devices such as the traffic circles, chicanes, center islands, modified T-intersections, neckdown or curb extensions will be constructed in accordance to existing City design standards for curbs, gutter, sidewalk, street pavement, drainage, and landscaping.

The traffic calming devices used in this policy will be governed by standard engineering design principles for roadway geometry, signing and markings. Design and dimensions of traffic calming devices will be derived using geometric design principles in the California Highway Design Manual and/or American Association of State Highway and Transportation Officials' (AASHTO) "A Policy on Geometric Design of Highways and Streets. No standard specifications were developed for the alternative traffic calming devices due to the varying roadway geometry, which would affect dimensions and placement of traffic calming devices. Non-standardization of the devices will allow the City flexibility in its design for each unique project. After the City has gained experienced in the design and construction of alternative traffic calming devices, the City may consider standardization of these devices. The City has adopted a standardize design for the speed lump.

The signing and marking of traffic calming devices will use signing, striping and marking consistent with the practices in the California Highway Transportation Manual and/or the Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). The 2000 MUTCD currently gives guidance in the

striping and signing of speed bumps, speed tables, traffic circles and center islands. These manuals give guidance and recommendation in standard signing, striping and marking of objects within the roadway.

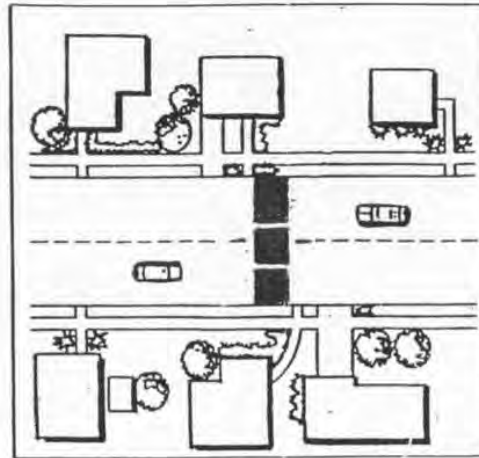
A complete description of the traffic calming devices, and the criteria for the installation of these devices are included in pages 9 to 15. The traffic calming devices are as follows:

- Speed Lumps
- Modified T-Intersections
- Traffic Circles
- Chicanes
- Neckdowns
- Center Islands
- Speed Tables/Raised Crosswalks

TABLE 1

RESIDENTIAL TRAFFIC CALMING DEVICES

| # | Type of Device | Purpose | Advantages | Disadvantages | Emergency Services Impact |
|---|--------------------------|---|--|--|---|
| 1 | Speed Lumps | Slows traffic speed by vertical deflection. | Slows vehicle speeds and discourages bypass traffic. Self enforcing. No on-street parking removal required. Speed lumps have minimal impact on fire vehicle response time. | Fire vehicles must travel at the center of the street to traverse over the cut through sections. Slight increase in noise. | Speed lumps have minimal impact on emergency vehicle response times as well as physical impacts to fire vehicles. |
| 2 | Modified T-Intersections | Slows traffic speeds of the through approach of a T- intersection by forcing motorists around a bulb shaped island. | Slows vehicle speeds. Self enforcing. | Requires removal of some on-street parking. | No significant impedance to emergency vehicles. |
| 3 | Traffic Circles | Slows traffic speeds through the intersection by horizontal deflection. | Effectively reduces vehicle speeds, visually attractive, may contribute to reduction of vehicle and pedestrian accidents at intersections. | Requires removal of some on-street parking. May require bicyclists to merge with vehicle traffic. May limit passage of emergency or large vehicles if vehicles are parked illegally near the traffic circle. | Fire trucks can maneuver around traffic circles at slow speeds provided vehicles are not illegally parked near the circles. |
| 4 | Chicanes | Slows traffic speeds on a street segment by forcing drivers to travel an S-curve path. | Self enforcing. Limits the downstream view of the roadway thus encouraging motorists to reduce their speeds. | Requires removal of on-street parking. Not effective on street segments with substantial horizontal curvature or where crest-vertical curves limit sight distance. | No significant impedance to emergency vehicles. |
| 5 | Neckdowns | Slows traffic speeds through the intersection by narrowing lanes and reduction of curb radius. | Reduces pedestrian crossing distance; slows speed of traffic traveling through the intersection. | Potentially greater cost than other traffic calming devices. May require removal of on-street parking. | No significant impedance to emergency vehicles. |
| 6 | Center Islands | Slows traffic speeds by narrowing of roadway and horizontal deflection. | Provides pedestrians a refuge island at intersections, slows vehicle speeds. | Requires removal of on-street parking. | No significant impedance to emergency vehicles. |



SPEED LUMPS

Speed lumps are modified speed bumps intended to slow traffic. These devices are installed on residential streets with a speeding problem and where the average daily traffic is between 800 to 3,500 vehicles per day. Speed lumps can better accommodate fire vehicles than the standard speed bumps because the speed lumps have a cut through which matches the wheelbase of the fire vehicle axle. The cut through of the speed lump is typically located equidistant to the centerline of the street. The cut through eliminates the jolt fire personnel would normally experience when driving over a speed bump.

Positive Impacts:

Speed lumps are self-enforcing; the Police Department expends less effort to gain voluntary compliance to the speed limit. Speed lumps reduce neighborhood traffic speeds while allowing fire vehicles to maintain their speed when traversing over the lumps. The lumps also minimize the physical impacts or jolts experienced by the fire crews.

Negative Impacts:

Emergency vehicles must travel along the center of the roadway, partially encroaching onto the opposing travel lane in order to use the cut through of the speed lumps.

The Criteria:

Criteria for installation of this device include the following:

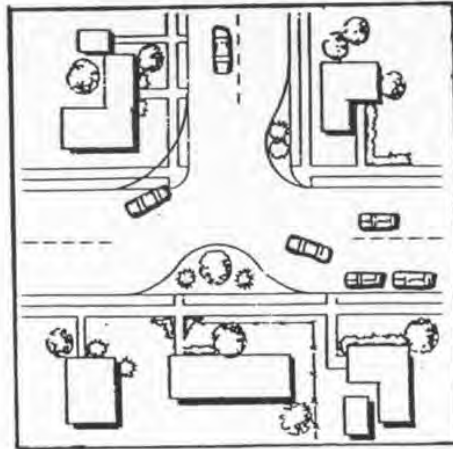
- Two lane residential streets.
- Street width of 40' or less.
- Posted speed limit of 25 miles per hour.
- 15% of traffic traveling 33 miles per hour or greater.
- ADT between 800 and 3,500 vehicles per day.
- Fire and Police Department Consent.
- Improved streets with curb and gutter.
- 6% or less street longitudinal grade.
- Centerline curve radius of 300' or more.
- Street segment at least 750' long.
- Single family homes or multi-dwelling residential units on one side of the street.
- Driveway access maintained.
- Greater than 150' from the beginning or end of the curved street section.
- Greater than 100' from an intersection.

Approval:

At the recommendation of the City Engineer, approval of City Council, support by 70% of residents living on the affected street segment and support by 3 out of 4 residents adjacent to the proposed speed lump location.

Removal:

At the recommendation of the City Engineer, approval of City Council and support by 90% of residents, speed lumps may be removed. Residents shall bear the full cost of the removal of the devices if not justified.



MODIFIED T-INTERSECTIONS

Modified T-intersections are raised bulb shaped islands installed at T-intersections. The device is used to slow through traffic approaches of T intersections by channeling motorists to travel around the bulb shaped island. While not commonly used, these islands are one of the few devices used for T-intersections in order to create a lateral deflection for through traffic.

This device should be placed a minimum of 200' apart from other devices but more typically 300' to 400' spacing from other devices.

Positive Impacts:

Modified T- intersections are self-enforcing; the Police Department expends less effort to gain voluntary compliance to the speed limit. Reduced overall speeds at or near T-intersections.

Negative Impacts:

May slow response time of emergency vehicles and requires removal of on-street parking.

The Criteria:

Criteria for installation of this device include the following:

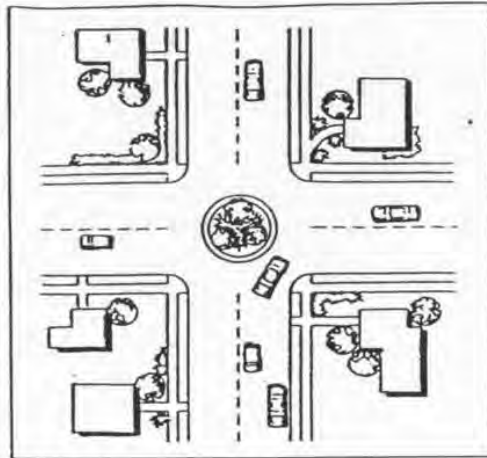
- Two lane residential streets.
- Street width of 40' or less.
- Posted speed limit of 25 miles per hour.
- 15% of traffic traveling 33 miles per hour or greater.
- ADT greater than 3,500 vehicles per day.
- Fire and Police Department Consent.
- Improved streets with curb and gutter.
- 6% or less street longitudinal grade.
- Centerline curve radius of 300' or more.
- Street segment at least 750' long.
- Single family homes or multi-dwelling residential units on one side of the street.
- Driveway access maintained.

Approval:

At the recommendation of the City Engineer, approval of City Council, support by 70% of residents living along the affected street segment and 100% approval by residents adjacent to the device to remove on-street parking.

Removal:

At the recommendation of the City Engineer, approval of City Council and support by 90% of residents, the traffic calming device may be removed. Residents shall bear the full cost of the removal of the devices if not justified.



TRAFFIC CIRCLES

Traffic circles are raised circular islands, placed at the center of an intersection. The main purpose of a traffic circle is to reduce vehicle speeds at or near intersection locations and to control right of way. Traffic circles reduce traffic speeds by horizontal deflection of the straight-through movement at an intersection. Traffic circles may be installed at uncontrolled or controlled intersections with yield signs or stop signs if warrants are met. This device should be placed a minimum of 200' from other devices but more typically 300' to 400' from other devices.

Positive Impacts:

Traffic circles are self-enforcing; the Police Department expends less effort to gain voluntary compliance to the speed limit. Traffic circles reduce traffic speeds at or near the intersections. Studies have shown that collisions may be reduced by up to 80% were these devices have been installed.

Negative Impacts:

May prevent large vehicles to turn around small-radius curves. Traffic circles may cause confusion to motorists traveling through the intersection. Requires removal of on-street parking. Bicyclists must merge with traffic around the circle.

The Criteria:

Criteria for installation of this device include the following:

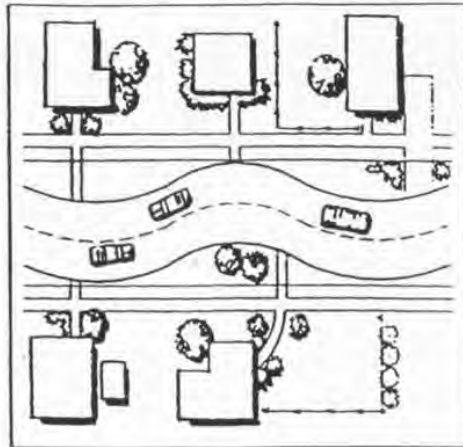
- Two lane residential streets.
- Street width of 40' or less.
- Posted speed limit of 25 miles per hour.
- 15% of traffic traveling 33 miles per hour or greater.
- ADT greater than 3,500 vehicles per day.
- Fire and Police Department Consent.
- Improved streets with curb and gutter.
- 6% or less street longitudinal grade.
- Centerline curve radius of 300' or more.
- Street segment at least 750' long.
- Single family homes or multi-dwelling residential units on one side of the street.
- Driveway access maintained.

Approval:

At the recommendation of the City Engineer, approval of City Council, support by 70% of residents living on the affected street segment and 100% approval of residents adjacent to the traffic circle to remove on-street parking.

Removal:

At the recommendation of the City Engineer, approval of City Council and support by 90% of residents, the traffic circle may be removed. Residents shall bear the full cost of the removal of the devices if not justified.



CHICANES

Chicanes are raised triangular islands placed adjacent to the curb on alternate sides of the street forming S-shape curved path. These devices are used to slow traffic by requiring motorists to negotiate the narrowed street along the curved path. Center islands may be installed parallel to the chicanes to discourage speeding motorists from driving a straight path across the center island or speeding through the curves.

The devices should be placed in pairs on alternate sides of the street. Each pair combination should be spaced 300' to 400' from other devices.

Positive Impacts:

Chicanes are self-enforcing; the Police Department expends less effort to gain voluntary compliance to the speed limit. Chicanes help to reduce traffic speeds on straight neighborhood street segments.

Negative Impacts:

May slow response time of emergency vehicles, requires removal of on-street parking spaces.

The Criteria:

Criteria for installation of this device include the following:

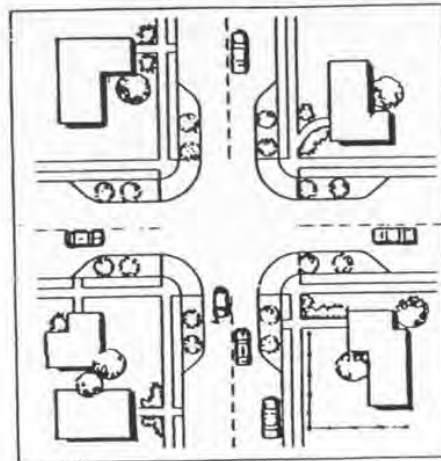
- Two lane residential streets.
- Street width of 40' or less.
- Posted speed limit of 25 miles per hour.
- 15% of traffic traveling 33 miles per hour or greater.
- ADT greater than 3,500 vehicles per day.
- Fire and Police Department Consent.
- Improved streets with curb and gutter.
- 6% or less street longitudinal grade.
- Centerline curve radius of 300' or more.
- Street segment at least 750' long.
- Single family homes or multi-dwelling residential units on one side of the street.
- Driveway access maintained.

Approval:

At the recommendation of the City Engineer, approval of City Council, support of 70% of residents living on the affected street segment and 100% approval by residents adjacent to the proposed device location to remove on-street parking.

Removal:

At the recommendation of the City Engineer, approval of City Council and support by 90% of residents, the Chicanes may be removed. Residents shall bear the full cost of the removal of the devices if not justified.



NECKDOWNS

Neckdowns are curb extensions placed at intersections. Neckdowns are also called bulbouts, nubs, knuckles or intersection narrowings. These devices slow vehicles by narrowing the roadway at the intersections. These devices may also be used to slow right-turning vehicles by reducing the curb radius at the corner. Neckdowns shorten the pedestrian crossing distance at the intersection.

Positive Impacts:

Slows speed of through and right turning traffic and may increase pedestrian safety by reducing the pedestrian crossing distance.

Negative Impacts:

May prevent large vehicles to turn on small-radius curves. May require removal of on-street parking.

The Criteria:

Criteria for installation of this device include the following:

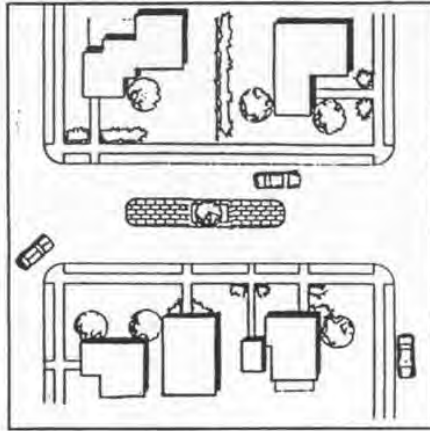
- Two lane residential streets.
- Street width of 40' or less.
- Posted speed limit of 25 miles per hour.
- 15% of traffic traveling 33 miles per hour or greater.
- ADT greater than 3,500 vehicles per day.
- Fire and Police Department Consent.
- Improved streets with curb and gutter.
- 6% or less street longitudinal grade.
- Centerline curve radius of 300' or more.
- Street segment at least 750' long.
- Single family homes or multi-dwelling residential units on one side of the street.
- Driveway access maintained.

Approval:

At the recommendation of the City Engineer, approval of City Council, support by 70% of residents living on the affected street segment and 100% approval of residents adjacent to the device to remove on-street parking.

Removal:

At the recommendation of the City Engineer, approval of City Council and support by 90% of residents, the neckdowns may be removed. Residents shall bear the full cost of the removal of the devices if not justified.



CENTER ISLANDS

Center islands are raised islands placed along the center of a street. These devices are used to slow traffic by narrowing the travel lanes. They are effectively used when installed downstream of an intersection or at main entrances to neighborhood streets. Center islands may be placed on a curved street where there is a history of speeding,

Positive Impacts:

Center islands are self-enforcing; the Police Department expends less effort to gain voluntary compliance to the speed limit. Center islands reduce traffic speeds and provide a pedestrian refuge at intersection locations.

Negative Impacts:

May slow response time of emergency vehicles and may require bicyclists to merge with traffic. May require removal of on-street parking spaces.

The Criteria:

Criteria for installation of this device include the following:

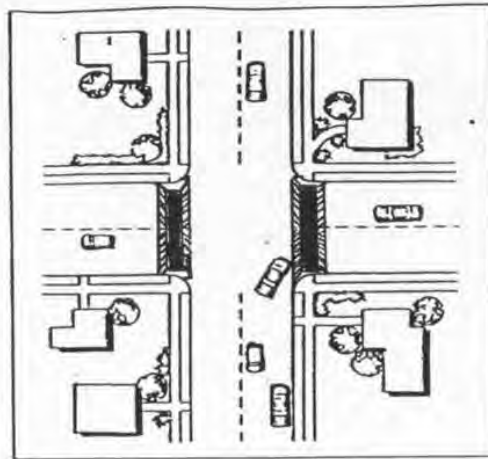
- Two lane residential streets.
- Street width of 40' or less.
- Posted speed limit of 25 miles per hour.
- 15% of traffic traveling 33 miles per hour or greater.
- ADT greater than 3,500 vehicles per day.
- Fire and Police Department Consent.
- Improved streets with curb and gutter.
- 6% or less street longitudinal grade.
- Centerline curve radius of 300' or more.
- Street segment at least 750' long.
- Single family homes or multi-dwelling residential units on one side of the street.
- Driveway access maintained.

Approval:

At the recommendation of the City Engineer, approval of City Council, support by 70% of residents living on the affected street segment and 100% approval of residents adjacent to the device to remove on-street parking.

Removal:

At the recommendation of the City Engineer, approval of City Council and support by 90% of residents, the center islands may be removed. Residents shall bear the full cost of the removal of the devices if not justified.



SPEED TABLES/RAISED CROSSWALKS

Speed tables are flat-topped speed bumps consisting of ramp approaches at each end. These devices are typically installed on a straight segment of the street or an intersection. Speed tables are typically 22' in length with a height ranging from three inches to six inches. The ramp approach is six feet in length and the flat section is 10 feet in length. Vehicle speeds can be adjusted by varying the length and vertical displacement of the speed table. Speed tables can better accommodate fire vehicles and large vehicles because of the more gradual slope. Speed tables also can be marked as a raised crosswalk thus giving it a dual purpose if desired.

Positive Impacts:

Speed tables are self-enforcing; the Police Department expends less effort to gain voluntary compliance to the speed limit. Speed tables help to reduce traffic speeds and may have less mechanical impacts on large vehicles such as trucks and buses.

Negative Impacts:

May slow response time of emergency vehicles and cause increase in noise.

The Criteria:

Criteria for installation of this device include the following:

- Two lane residential streets.
- Street width of 40' or less.
- Posted speed limit of 25 miles per hour.
- 15% of traffic traveling 33 miles per hour or greater.
- ADT greater than 3,500 vehicles per day.
- Fire and Police Department Consent.
- Improved streets with curb and gutter.
- 6% or less street longitudinal grade.
- Centerline curve radius of 300' or more.
- Street segment at least 750' long.
- Single family homes or multi-dwelling residential units on one side of the street.
- Driveway access maintained.

Approval:

At the recommendation of the City Engineer, approval of City Council, support by 70% of residents living on the affected street segment and 100% approval of residents adjacent to the device.

Removal:

At the recommendation of the City Engineer, approval of City Council and support by 90% of residents, the speed tables/raised crosswalks may be removed. Residents shall bear the full cost of the removal of the devices if not justified.

PROGRAM PROCESS/PUBLIC PARTICIPATION ELEMENT

Procedure

The total planning process for the Residential Traffic Calming Program will take approximately 11 months. The City of Fremont believes it is important to process requests in a timely manner. The City's program has been streamlined to effectively and efficiently utilize the City's resources while not compromising on the education and citizen participation element. The City's Residential Traffic Calming Program is a structured process that is responsive to the needs of the neighborhood.

The residential traffic calming program will be initiated by a citizen's request for speed control along a certain street segment or if City Staff determines it is appropriate to analyze speeding problems in a given area. Staff will conduct a preliminary analysis to determine if a speeding problem exists. If a speeding problem is identified, an education and enforcement effort will be conducted. If the speeding problem persists following three months of education and enforcement, the City will then consider the installation of speed lumps or alternative traffic calming devices. This process may involve some or all of the following steps: hold neighborhood meetings, establish Citizen Committee, formulate solutions and alternate plans, post card survey of residents, priority ranking of requests, implementation/construction of traffic calming devices and nine-month review of the project to measure the devices effectiveness. In some cases it may not be necessary to follow every step.

The following is a description of the program process and public participation element:

Step 1 – Initiation

Step 1 is the initiation of the process by a citizens request for speed control along a certain street segment or if City Staff determines it is appropriate to analyze speeding problems in a given area. Staff's current practice is to deal with the request on a direct basis and to respond to the resident within a short time period. This means that instances where the City receives an inquiry about neighborhood traffic issues, Staff will respond with traditional studies and actions. Ensuring that simple or incidental request can be addressed by the Traffic Engineering Staff without the necessity of a petition.

Step 2 – Identification of Traffic Issue(s)

Staff will identify clearly the issue or problem by collecting the appropriate traffic information, such as accident history, speed and volume data, etc. and perform an analysis to determine if a speeding problem exists. Staff will review the roadway signing, striping and traffic controls in the area and in some cases conduct field observations. If appropriate, signing/striping changes or additions will than be undertaken by the City. If the analysis indicates a speeding problem exists, an appropriate education and enforcement plan will be initiated. Federal and State speed limit guidelines define the 85th percentile speed as a "reasonable speed" or the speed in which 85% of motorists

travel at or below. Speed surveys indicate that many residential streets in Fremont with a posted speed limit of 25 miles per hour have an 85th percentile speed ranging from 30-32 miles per hour. Staff considers street segments with 85th percentile speeds equal to or greater than 33 miles per hour as having a speed problem.

Step 3 – Education and Enforcement

If a street is determined to have a speeding problem, education and enforcement measures will be implemented. Educating a neighborhood of a speeding problem or a traffic concern may comprise of conducting meetings, mailing letters, distributing flyers, etc. The police department to inform motorists of their driving speeds or the use of stealth box to determine if a speeding problem exists on the street segment may deploy a radar speed trailer. Also, additional signing or striping may be installed to provide awareness of the posted 25 mile per hour speed limit. In conjunction with educating the neighborhood residents, Traffic Engineering will notify the City's Police Department of the speeding problem and request traffic enforcement. The intent of the education and enforcement process is to modify motorists behavior hopefully resulting in lower traffic speeds and a safer environment for all users and residents.

However, in instances where it is obvious or becomes obvious that the request is likely to lead to the consideration of installation of traffic calming devices, the petition process can be initiated and conducted in conjunction with the education and enforcement process. These street segments typically have a history of traffic complaints, they may have higher than normal number of accidents and regularly have been the focus of traffic enforcement efforts.

Step 4 – Review of Education and Enforcement

Following three months of education and enforcement the traffic conditions will be reevaluated. Following the performance of a new analysis and the results indicate that the speeds are at or below 32 miles per hour, periodic enforcement and education will continue to maintain long-term effects of compliance, and no further action will be necessary. If the analysis indicates a speeding problem exists (85th percentile speed is equal or greater than 33 miles per hour), education and enforcement will continue. Staff will determine if the criteria to install traffic calming devices are satisfied. Staff will also determine through a petition process if the neighborhood residents support installation of traffic calming devices.

Step 5 – Implementation of Speed Lump Policy

The City's Speed Lump Policy will only apply to residential streets where the ADT is between 800 and 3,500 vehicles per day. The process from inception to the final installation of the speed lumps is repeated once every fiscal year. The speed lump policy process is as follows:

- A. A warrant analysis will be conducted to determine if the residential street segment is eligible for speed lump installation.
- B. If a street segment satisfies the criteria for the installation of a speed lump, the requester(s) is asked to complete a City furnished petition form. The City will consider resident support for traffic calming in determining whether or not there is a need to reduce traffic speeds in a project area. If petitions in support of traffic calming are signed by less than 70% of residents within the project area, the City will proceed with a traffic calming plan only if all other criteria outlined in this Policy support a need for installation based on safety conditions. Only one vote per residential unit will be applied towards the petition.
- C. Following receipt of a completed petition, a priority list for all candidate street segments is established. Points are allocated to each street segment based on traffic volumes, vehicle speeds, vicinity to school(s) and traffic accidents.
- D. Staff prepares a report to Council for approval and funding of the top ranked street segments.
- E. Following Council approval and funding of top ranked street segments, Staff prepares a California Environmental Quality Act (CEQA) analysis, prepares plans and specifications and puts project out to bid. Installation of speed lumps is repeated once a year.
- F. Should the residents desire to remove the speed lumps, Staff will collect data and perform a new analysis based on a review of accident data, speed data, volume data and other special studies pertinent to the project. Staff will consider resident support for removal of speed lumps if supported by 90% of the residents living on the affected street segment. Based on these factors and safety considerations, the City will make a determination to retain or remove the devices. A recommendation by the City Engineer to remove the traffic calming devices will require the approval of the City Council. Any associated cost for the removal of the traffic calming devices not justified by the project goals and objectives will be fully borne by the residents.

Step 6 – Implementation of Alternative Traffic Calming Devices

If a speeding problem exists and the street ADT exceeds 3,500 vehicles per day, the street segment will be considered for installation of alternative traffic calming devices.

- A. Preliminary Petition - Staff will request that resident(s) submit a petition to the City to determine if the concern is widespread and there is consensus among the neighborhood to pursue installation of alternative traffic calming devices such as traffic circles, center islands, chicanes (triangular islands), neckdowns, modified T-intersections and speed tables/raised crosswalks. Requester will be asked to circulate and complete a City furnished petition form for residents living on the affected street.

If petitions in support of traffic calming are signed by less than 70% of residents within the project area, the City will proceed with a traffic calming plan only if all other criteria outlined in this Policy support a need for installation based on safety conditions. Only one vote per residential unit will be counted towards the petition.

- B. First Neighborhood Meeting - A neighborhood meeting will be conducted within six weeks after Staff receipt of the completed petition. Staff will notify all the residents living on the street and residents within 300 feet of the affected street segment. Staff may also notify residents outside the 300' boundary if there is reason to believe adjacent parallel streets may be impacted by the project. The notice sent to residents will explain the purpose of the meeting, provide background information about the traffic issues, actions completed to date and any proposed actions. The initial neighborhood meeting will be conducted to inform and educate residents of the City's Residential Traffic Calming Program, the existing neighborhood traffic conditions, define roles and responsibilities of residents, and update residents of the events that have occurred up to that point.

Staff will ask for volunteers to serve on a Citizen Committee. The size of the committee will be a minimum of three members. An odd number of committee members will be required in case there is a need for any tie-breaking vote. Committee members who serve on the committee must be a resident living on the affected street segment(s). In addition, only residents living on the affected street segment(s) will be eligible to vote for any measures proposed. Only one vote per residential unit will be permitted.

- C. Development of Solutions and Alternate Plans – Once the Citizen Committee is established, Staff will conduct the first meeting with the Citizen Committee using interest based approach. The first objective of the Committee meeting will be to establish Committee ground rules, membership (add or remove membership) and scheduling. The second goal is to determine the project goals and objectives. The City's Residential Traffic Calming Policy has defined four standard objectives. These objectives will be included in all residential traffic calming projects in addition to any other traffic goals the neighborhood residents may want Staff to consider. These objectives will provide the committee and Staff direction and a standard to measure the success of the project. A Staff member will take meeting minutes to document all discussions and actions during the meeting.

Dependent on the progress and accomplishments of the initial meeting, additional meetings with the Citizen Committee may be scheduled to provide Staff and Committee members an opportunity to educate each other about the neighborhood's concern and to engage in discussions regarding possible solutions. Additional data or studies may be needed during this process in order to better understand the problems. Following an analysis of the information collected, education and investigation by the Citizen Committee and Staff, the issues should become more defined. Discussion will include the advantages and disadvantages of each device as well as the economic feasibility of each device considered.

The Citizen Committee involvement process is vital, the Committee's role will include educating the neighborhood residents about the residential traffic calming program, informing residents of the project status and participate in the selection of the traffic calming devices.

Once the Committee and Staff has defined and gained a thorough understanding of the problems, the group will formulate solutions and alternatives. Staff will include the residents and Citizen Committee suggestions in the conceptual plans wherever feasible. If alternative solutions are presented, discussion of the positives and negatives of each alternative will be presented. The solutions considered by the Citizen Committee would include alternatives with the most benefits.

- D. Second Neighborhood Meeting – Once a solution and/or alternative plan(s) have been selected, a second neighborhood meeting will be scheduled within two months of the first neighborhood meeting to communicate the proposed solution or alternatives to the neighborhood. At the meeting, Staff and the Citizen Committee will explain the decision making process that led to the selection of the recommended solution and/or alternate plans. This meeting will allow the residents an opportunity to provide input to Staff about the proposed solutions and discuss any issues with residents that were not addressed in previous meetings. It is important that Staff, the Citizen Committee and neighborhood residents obtain agreement or support of the proposed solution. If residents are in agreement with the proposed plan and/or alternative(s) at the second neighborhood meeting, a post card survey will be mailed to the residents living on the affected street.
- E. Third Neighborhood Meeting - If necessary, a third neighborhood meeting will be conducted to present the revised conceptual plans and alternatives to the neighborhood if there were significant changes to the conceptual plans presented in the second neighborhood meeting. Staff and residents will work to obtain agreement or support of the proposed solution and/or alternative(s).
- F. Polling and Notification – Following the neighborhood meetings, residents will be sent notices describing the proposed residential traffic calming plan. It will include background information about the process and how the proposed solution and alternative(s) were formulated. Only residents living on the affected street segment(s) will be polled using a post card survey to select the most favored solution or alternative(s). Only one vote per residential unit will be applied towards the survey. Following completion of the post card survey, a letter will be sent to the residents within the notification area describing the poll results.
- G. Priority Ranking – If approved by 70% or more of the affected residents living on the street, Staff will establish a priority list for all candidate street segments. Points are allocated to each street segment based on traffic volumes, speed data, vicinity to school(s) and traffic accidents. Streets with the most points will be ranked at the top of the priority list and will have the best chance of being selected for implementation.

- H. Council Approval and Funding of Project - Upon the recommendation of the City Engineer and approval by the City Council of the top ranked streets, the traffic calming device(s) will be installed. The number of street segments selected for funding will be based on the cost of the traffic calming devices, the number of traffic calming devices needed and the funding allocated by the City Council for each fiscal year.
- I. Installation of Alternative Traffic Calming Devices – Following Council approval and funding of top ranked street segments, Staff prepares a California Environmental Quality Act (CEQA) analysis, prepares plans and specifications and puts project out to bid. Installation of alternative traffic calming devices is repeated once every two years. The traffic calming device(s) will be installed with landscaping.
- J. Nine Month Review –Following the installation of the traffic calming devices, an evaluation will be conducted for up to nine months to measure the effectiveness of the traffic calming devices and to determine if the program objectives were met. The evaluation will be based on the following criteria:
1. A review of the 85th percentile speed will be conducted to determine if overall traffic speeds were reduced.
 2. Vehicle counts will be collected to determine if there was diversion of traffic to parallel residential streets. Traffic diversion is permitted if traffic is moved to major arterial streets or is within the allowable increase of 500 vehicles per day or 25% increase of the existing ADT. An increase of up to 25% of the existing ADT or 500 vehicles per day, whichever is less would trigger an analysis of the adjacent residential street(s).
 3. A review of the accident history will be conducted to identify any adverse impacts the traffic calming devices may have caused. By slowing traffic, eliminating conflicting movements, and sharpening driver attention, installation of traffic calming devices may reduce the number of accidents.
 4. Fire and Police Departments will be consulted to provide input about any impacts they may have experienced. Field observations and or discussions may also be conducted with AC transit, Waste Management and other service providers to ensure that services provided to the residents are not significantly impacted.

If the program objectives are satisfied as evidenced in the evaluation no further actions will be taken. If program objectives are not met, Staff will prepare alternatives and seek direction from the City Council.

- K. Should the residents desire to remove the alternative traffic calming devices after evaluation results indicate the program objectives were satisfied, Staff will collect

data and perform a new analysis based on a review of accident data, speed data, volume data and other special studies pertinent to the project. Staff will consider resident support for the removal of the devices if supported by 90% of the residents living on the affected street segment. Based on these factors and safety considerations, the City will make a determination to retain or remove the devices. A recommendation by the City Engineer to remove the traffic calming devices will require the approval of the City Council. Any associated cost for the removal of the traffic calming devices not justified by the project goals and objectives will be fully borne by the residents.

SOURCE REFERENCES

1. "Traffic Calming State of the Practice", Reid Ewing, Institute of Traffic Engineers & FHWA, 1999.
2. "Transportation Planning Handbook, Second Edition", John D. Edwards, Institute of Transportation Engineers, 1999.
3. "Neighborhood Traffic Management Program," City of Mountain View, December 11, 1996.
4. "Possible Neighborhood Traffic Calming Methods, Report to Council 97-040," City of Sunnyvale, February 4, 1997.
5. "City of Fremont General Plan," Chapter 8 - Transportation Chapter, May 7, 1991.
6. "Evaluation of the Traffic Calming Pilot Program on Eggers Drive, and Accept Completion of Permanent Roadway Features," City of Fremont Report to Council, Item 7.1, April 3, 2001.
7. "Establishment of a Policy on the Application of Speed Bumps On Two-Lane Residential Streets in Fremont," City of Fremont Report to Council, Item 7.2, June 13, 1995.

City of San Carlos Neighborhood Traffic Management Program (NTMP)

Prepared for:
The City of San Carlos

Prepared by:
Stantec Consulting Services Inc.



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1.0 INTRODUCTION

The City receives numerous transportation complaints and requests for many neighborhoods in the city. These can include complaints about speeding, requests for stop signs, reports of parking violations, and annoyance at traffic intrusion into local neighborhoods, etc.

The Public Works Department has traditionally responded to traffic requests in the order they were received. Particularly requests for speed humps have been popular. To date, speed humps have been installed on several street blocks in various parts of the City. More recently, to address pedestrian and bicycle safety, the Public Works Department has installed high-visibility signs and pavement markings, in-street pedestrian crossing signs, warning symbol markings, and Rectangular Rapid Flash Beacons (RRFB).

The City has no formalized process to verify the need for these types of measures. City staff addressed resident requests on a first-come/first serve basis – with each request becoming a unique process and each involving extensive City resources. The major problem with this method was that requests were not put into the proper context – which ones have priority and which ones represent “normal” traffic conditions on residential streets. Another problem with this method was its inability to systematically evaluate impacts on surrounding local streets when a traffic modification is considered.

1.1 PURPOSE OF NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM (NTMP)

Many jurisdictions face problems similar to those described above, and they often develop a program to systematically address traffic issues involving the livability and safety of residential neighborhoods. The City of San Carlos Neighborhood Traffic Management Program (NTMP) is being prepared to best meet the needs of San Carlos based on past efforts in the City, guidance provided by the City's General Plan, policies and lessons learned from other jurisdictions, practices published by the transportation industry, and community input regarding traffic concerns and ideas for improvements.

The objective of NTMP is an attempt to achieve a balance to provide an efficient multi-modal transportation system while at the same time maintaining safety of the streets for use by residents and visitors to the City of San Carlos. The City of San Carlos's NTMP is created to help address this overall objective.

Once the NTMP program is adopted, the approved traffic calming tools and measures would become the typical tools to manage high vehicular speeds or cut-through volumes. The three E's (Educational, Enforcement and/ or Engineering measures) employed by NTMP program would be used so that their negative impacts on residents, pedestrians, bicyclists, and schools are minimized. The immediate and overall purpose of NTMP is to reduce the speed and/ or volume of traffic to acceptable levels. Ultimately the goal is to achieve traffic safety and enhanced quality of life. To summarize, the intent of traffic calming in the NTMP is to achieve desired outcomes in several areas, including:

- ✓ Speed reduction,
- ✓ Improved pedestrian safety,
- ✓ Reduction in cut-through traffic,
- ✓ Collision reduction and
- ✓ Reducing noise and air pollution.

1.2 GOALS AND POLICIES

By carrying out the provisions of the NTMP, the City of San Carlos hopes to fulfill the following goals:

- ✓ Promote safe and convenient travel by pedestrians, bicyclists and vehicles.
- ✓ Encourage compliance with designated speed limits.
- ✓ Encourage through traffic to take more appropriate travel routes based on roadway classification, but limit impacts to other local streets.
- ✓ Provide a well-defined process that is responsive to all neighborhoods in San Carlos.
- ✓ Provide objective criteria to help City staff prioritize requests.
- ✓ Provide a process that maximizes neighborhood participation and decision-making, and obtains measurable consensus from the neighborhood throughout.

- ✓ Use the least restrictive measure that will address neighborhood concerns, and test any physical measures before permanent installation when appropriate and possible.

As discussed later, many different NTMP tools are available to achieve the above goals.

In pursuing these goals, the City supports the following policies:

- ✓ Maintain capacity and facilitate traffic flow on the City's arterial and collector streets to reduce incidence of cut-through traffic (General Plan Policy CSH 1-2¹);
- ✓ Closely collaborate with Police and Fire to balance neighborhood traffic management needs with public safety needs, specifically emergency response;
- ✓ Work with residents to employ a variety of measures that help reduce traffic speeds and/ or volumes on local and collector streets;
- ✓ Permanent traffic calming measures should be designed to standards and should complement the residential character of the neighborhood;
- ✓ Traffic calming measures employed should not shift the issue elsewhere (General Plan Policy CSH 3.13²)

Balancing the E's: Education, Enforcement, and Engineering

The "3Es" (Education, Enforcement and Engineering) are commonly accepted prerequisites for the successful implementation of a traffic-calming program. The cumulative experience of other similar programs has shown that when applying only one of these Es without the other two would result in less than satisfactory results.

After the identification of a neighborhood problem, an integrated approach is used to develop measures that consider the "3 E's": Education, Enforcement and Engineering.

Education

Typically, educational programs seek to remind speeding drivers of the negative effects of their actions, often by stressing that the community's children are the most at risk. Educational campaigns may use brochures or neighborhood newsletters to spread this message. Newsletters may also contain information on speeding fines (particularly in school zones), pedestrian and bicycle safety tips, and information on average speeds in the neighborhood. Educational aspects of the program also promote community building which by itself promotes respect for one's neighborhood.

In a small city such as San Carlos, education plays a critical role in traffic calming. Due to budgetary and staffing limitations, educational efforts are often the most readily implementable means of modifying driver behavior.

¹ *San Carlos General Plan, Circulation & Scenic Highway Elements, adopted April 14, 2008*

² *San Carlos General Plan, Circulation & Scenic Highway Elements, adopted April 14, 2008*

Enforcement

Enforcement involves a more intensive police presence and a greater allocation of time to enforcing the speed limit in a particular neighborhood. Unfortunately, it is often not practicable to maintain a police presence at the level needed to permanently lower speeds. However, consistent visible enforcement does lead to respect of the speed limit by motorists.

The police department is committed to utilize its available resources to respond to areas experiencing traffic problems as identified by collision analysis, residents' complaints, and conditions observed by enforcement officers.

Engineering

Engineering includes, but is not limited to, traffic calming measures. It can also include the use of signs and pavement markings to obtain the desired effect. Prior to installing traffic calming measures on local or collector streets, traffic conditions on adjacent arterial streets would be investigated to determine if operational deficiencies are contributing to the identified traffic concerns.

Through collaboration of residents, Transportation & Circulation Committee (T&C) and City staff, NTMP strategies involving physical features can be developed using a combination of sound engineering principles, community input, and financial constraints.

Elements of one or more of the "3 E's" are incorporated into all of the NTMP measures considered by the City. These fall into two different program tiers, each with increasing levels of neighborhood participation and community review.



2.0 NEIGHBORHOOD TRAFFIC MANAGEMENT FRAMEWORK

The framework of the Neighborhood Traffic Management Program (NTMP) is designed to provide well-defined, citywide guidelines for addressing neighborhood traffic concerns in an equitable and effective manner. Guidelines regarding primary concerns to be addressed by the NTMP, balancing user needs, the effect of roadway classifications, qualifying criteria, and types of measure to be considered are discussed below.

2.1 PRIMARY NEIGHBORHOOD CONCERNS

High speeds and volumes are usually the two most worrisome traffic safety factors to residents, so the NTMP must deal with these at a minimum. Typically residents are concerned about traffic speeds more so than traffic volumes. Almost all of San Carlos streets have a posted or prima facie speed limit of 25 miles per hour (mph). Many factors influence a driver's selection of travel speed. For example, the width and length of a street affects the driver's sense of what is an appropriate speed for the environment. The number of people visible, amount of landscaping, weather conditions, number of parked cars, and other factors are quickly processed by the driver's mind to select a speed. The driver's temperament, trip purpose and schedule are other considerations. The result is that many drivers do not adhere to the legal speed limit. And, unfortunately many times speed limit signs/pavement markings and periodic enforcement do not guarantee full compliance.

The majority of traffic collisions occur away from local streets in most cities. However, speed plays an important role in traffic collisions on all types of roadways. Speed affects the probability of being in a collision, although collisions are complex events that can rarely be attributed to a single factor.

Speed is most directly linked to severity of a collision. More specifically, the probability of severe injury increases sharply with the impact speed of a vehicle in a collision. The risk is even greater when a vehicle strikes a pedestrian, the most vulnerable of road users. As shown in Exhibit 1,³ the risk of fatality is more than double when hit by a vehicle at 35 mph vs 25 mph.

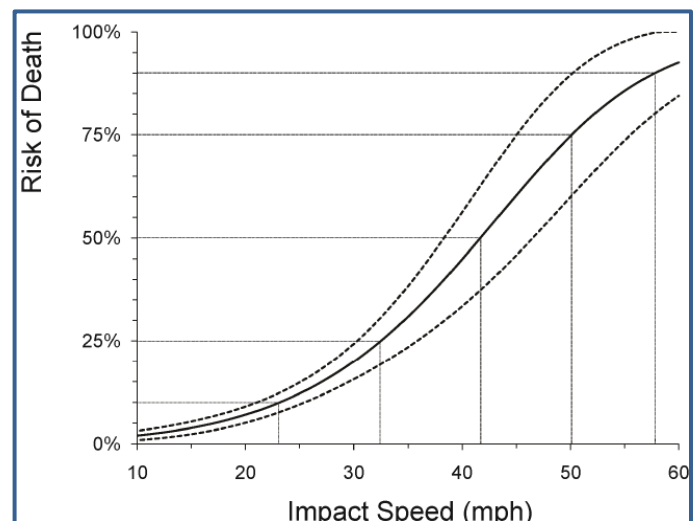


Exhibit 1: Impacts of Speed

³ *Impact Speed and a Pedestrian's Risk of Severe Injury or Death*, AAA, September 2011

Many San Carlos residents are upset by drivers who exceed the speed limit of 25 mph on residential streets because they reason that the faster a vehicle goes on a residential street, the harder it is to stop in time for a child darting into the street to chase a ball or crossing the street to reach out to a friend. As a result, these residents request that traffic be calmed on their streets. As traffic volumes increase on a residential street, the number of imprudent drivers likewise increases as does the noise from passing traffic. At some threshold volume, the number of residents who dislike traffic on their street is larger than those who ignore it. Studies show that this volume lies between 1,000 and 4,000 vehicles daily depending on the function of the street. This is the “environmental capacity” of a residential street – not the traffic carrying capacity which can be four or five times higher. High speeds and volumes also contribute to the sense that it is unsafe to walk or bike in a neighborhood. Other key concerns involve obstacles to convenient and safe walking and bicycling.

These concerns involve either the lack of protected crossings and pathways or discontinuous facilities. Finally, residents are concerned that the street patterns in or around certain neighborhoods create short-cuts that attract drivers who are trying to avoid delays at traffic signals or stops signs. The traffic using these short-cuts is typically referred to as cut-through traffic.

Some San Carlos residents feel their neighborhoods are experiencing cut-through traffic that has created excessively high traffic volumes on their streets. Related concerns include difficulty getting out of driveways and parked cars getting hit by passing vehicles.

Balancing User Needs

The Neighborhood Traffic Management Program (NTMP) must carefully balance the needs of all who share San Carlos streets. Users of the street include pedestrians of various ages and abilities, bicyclists and the motoring public. The NTMP seeks to reconcile the desire for quiet, low-speed streets versus efficient and convenient mobility by designing a street environment that functions well for pedestrians, bicyclists and the motoring public. A key element in balancing user needs is to design pedestrian-friendly neighborhood streets. In a pedestrian-friendly environment, people feel safe walking, the environment is comfortable, and access to destinations is logical and convenient.

The intent is that, in pedestrian-friendly areas, children and others who do not drive automobiles will be less reliant on others for their transportation and those who do drive will drive less.

Bicyclists also share streets and must also be considered during the process of developing neighborhood traffic management strategies.

The NTMP must also address the needs of those traveling via motor vehicles. Because community members place a high value on maintaining reliable vehicular access to streets that carry them to work, freeways and other regional destinations, the NTMP strives to maintain efficient and convenient routes for vehicles along collector and arterial streets. The NTMP also strives to maintain the traditional use of residential streets for traffic circulation within a neighborhood and between adjacent neighborhoods. However, neighborhood traffic management measures may be used to discourage extraordinary amounts of cut-through traffic utilizing local streets and instead guide this traffic to collector and arterial streets. This is consistent with the roadway classifications identified in the City's General Plan as described below.

Schools, transit nodes, and other activity centers such as churches, parks, senior centers, libraries, and shopping areas provide important services to the community and require special consideration. City staff and residents must collaborate with the operators of these facilities so that streets will continue to provide the functionality needed by these facilities for access, circulation and loading/unloading. Finally, the NTMP must meet the needs of those who provide various other neighborhood services, including the occasional moving van, garbage and recycling services, and, most importantly, emergency service providers.

Roadway Classification

The Transportation and Circulation Element of the City's General Plan⁴ provides general guidance on the uses and functions for each street within the City. In terms of motor vehicles, the street hierarchy ranges from an arterial that provides the greatest mobility for through traffic to a local access street that provides the lowest mobility function. As such, the NTMP evaluation process will consider the functional classification of streets.

Typically, NTMP for most cities are intended to be limited to local and collector streets. The reason is that traffic calming measures such as speed humps, traffic circles, and angled parking are typically not used on major arterial streets because they affect emergency vehicle response time, limits the mobility of large vehicle, and affect an arterials' capacity.

The proposed San Carlos NTMP also apply to arterial streets in the city. This is based on current best practices which includes some measures that could be applied on major arterials including narrow lanes, signal optimization, focused police enforcement, radar feedback signs, pavement markings, roundabouts, and others (additional explanation in later section). In addition, educational and enforcement measures in the NTMP can be applied to these streets as well.

⁴ *San Carlos General Plan, Circulation & Scenic Highway Elements, adopted April 14, 2008*

Typically, each street classification is defined as follows:

Local streets are low-speed, low-volume roadways that provide direct and full access to abutting land uses. They typically have two travel lanes with parking on both sides and daily traffic volumes of less than 1,200 vehicles per day (vpd).

Collector streets are relatively low-speed, low-volume roadways that collect and distribute local traffic moving between local and minor arterial streets. They typically have two travel lanes with parking on both sides. Collector streets often carry some amount of through traffic and may carry transit. They are designated as emergency response routes.

Arterial streets carry traffic to regional routes and freeways. Principal/major arterials typically have multiple lanes of traffic in each direction. They are also emergency response and transit routes. Principal/major arterials typically carry traffic volumes in excess of 10,000 vpd. Minor arterial streets carry through traffic providing intra-city mobility. Minor arterials are emergency response routes and typically transit routes as well.

The City's Bicycle Transportation Plan⁵ designates bicycle policies and recommended bikeway network. Evaluation methods in the NTMP will also consider these pedestrian and bicycles routes.

⁵ Amended by Transportation and Circulation Commission on September 18, 2012

3.0 NTMP IMPLEMENTATION PROCESS

The City of San Carlos's NTMP begins with an "initiation" step, which all requests undertake, then follows one of two levels of implementation, depending on the level of traffic calming requested by the community. A chart illustrating the implementation process is shown on Exhibit 2.

As mentioned earlier, the NTMP is meant to be a process to streamline and process resident-initiated traffic calming process and not intended to prevent or limit Public Works or the City Council from initiating and implementing other traffic calming measures.

3.1 INITIAL REQUEST

The first step in initiating a potential NTMP process is for a resident to contact the Public Works Department and describe the concern. As some of the requests may come through emails, Inform San Carlos App or the City webs, City staff would be in charge of filling out the Request form.

Staff will identify the specific problem and first evaluate if it can be solved through the regular traffic request process, which generally produces solutions that are less likely to adversely affect neighboring streets. For example, if a request concerns unsafe speeds or limited visibility at an isolated curve or intersection, it could possibly be addressed through the installation of standard solutions such as centerline striping, red curb markings or warning signs. These types of requests will be evaluated in the order they are received.

Some traffic requests that require spot treatment could include for example, striping of crosswalk, red curb, green curb, drop off zone, installation of new signs, adding access ramps, ADA parking stalls, sidewalk safety, and others. Many of these concerns would be addressed by collaboration between the Engineering Division and the maintenance staff.

Another task during this initial phase is preliminary data collection which could include traffic volumes, speed and collision data which are required during the initial screening process in the next section.

3.2 INITIAL SCREENING QUALIFYING CRITERIA

Requests regarding neighborhood traffic concerns such as speeding, high traffic volumes, and pedestrian and bicycle issues can be numerous from residents across the City. The problem is how to place these requests in context – which ones have priority and which ones represent “normal” traffic conditions on residential streets. The criteria for when a street qualifies for the evaluation of neighborhood traffic management measures are based on thresholds which research shows most residents would likely agree that there is a problem as discussed in

Section 2.1. For conditions that do not exceed one of the thresholds, the NTMP process will not be started. However, the resident may choose to resubmit the request at a later date.

Requests for neighborhood traffic management must satisfy at least one of the criteria listed below.

1. The 85th-percentile speed* must be in excess of the posted speed limit by more than 7 miles per hour (mph) as follows:
 - ✓ Local Streets or Pedestrian Routes - 7 mph above legal posted speed limit
 - ✓ Other Collector - 7 mph above legal posted speed limit
 - ✓ Arterial Streets - 7 mph above legal posted speed limit

**Note: When the speeds of all motorists at one location are ranked from slowest to fastest, the 85th-percentile speed separates the slower 85 percent from the fastest 15 percent, who typically pose the greatest safety hazard.*

2. Average daily vehicular traffic volume must exceed the amount of traffic that would typically be generated by land uses with direct access on that block:
 - a. Local Streets - 1,200 vehicles per day (vpd)
 - b. Collector Streets - 4,000 vpd
 - c. Arterial Streets – 13,000 vpd
3. Collision data during the last available 36 months demonstrates that the numbers of collisions are above the City-wide average for a similar type of street/intersection⁶ and have primary collision factors that are correctable by traffic improvements.
4. Special circumstances – there might be unique circumstances or issues that warrant NTMP considerations. For example, locations that lack pedestrian paths or sidewalks, or a bicycle or pedestrian route near schools, parks and other destination points that experience unique safety issues.

3.3 SELECTION OF NTMP PROCESS

From the issues identified in the Request Form, City staff will make a preliminary assessment if it merits either Level 1 or Level 2 NTMP process.

Based on the extent of the perceived traffic issue, City staff will identify the preliminary study area boundaries. Staff may determine that the study area should consist of just one street segment or extend beyond those locations of initial concern. If a NTMP process is initiated, study area boundaries may be changed due to potential benefits and impacts. Through a collaborative effort between City staff and those residents who petitioned the study, all households in the identified preliminary study area will be invited to the initial neighborhood meeting.

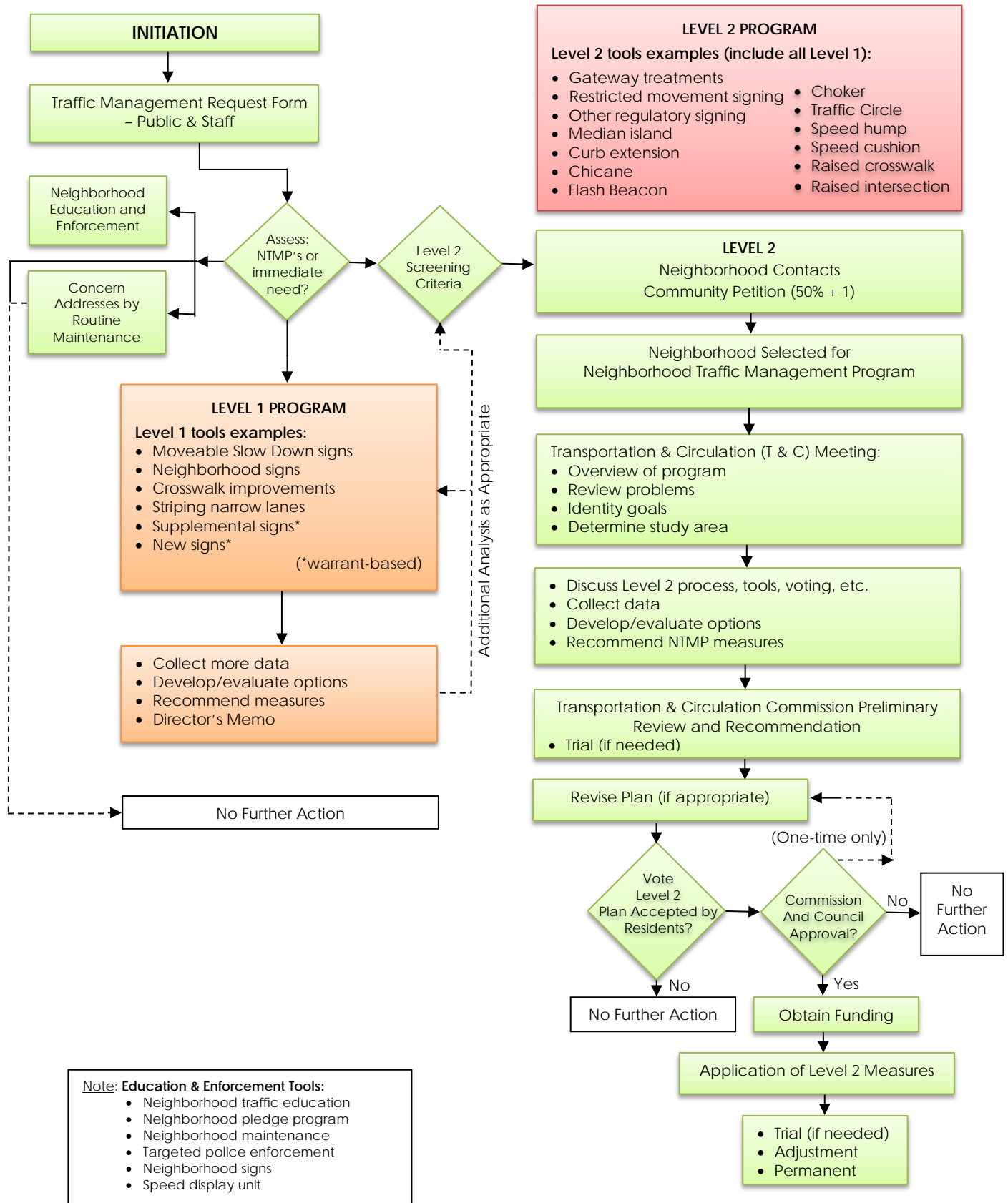
⁶ The average collision rate based on Caltrans Statewide rates for urban streets would be acceptable

3.4 LEVEL 1 PROCESS

After the Initial Request and staff evaluation described above, a qualifying NTMP request may follow the Level 1 or Level 2 process. Level 1 measures focus on easily implementable and still relatively low cost features such as enhancing the visibility of crosswalks, striping narrow lanes, providing speed limit signing, installing new high visibility crosswalks, providing additional informational signage, and installing new regulatory signs. New installations and speed limit changes require fulfillment of established or commonly accepted traffic engineering standards and warrants. Because implementation of Level 1 measures is often less controversial and affects fewer people than Level 2 types of measures, the Level 1 process is more streamlined.

The Level 1 improvement will be shared with Transportation and Circulation (T&C); however, no approval is needed from T & C. The NTMP program anticipates that residents will be given Neighborhood Education and Enforcement materials during the Level 1 process.

Exhibit 2: SAN CARLOS NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM (NTMP) PROCESS



Data Collection & Assessment

City staff will collect necessary data and work with neighborhood contacts. This will include developing and evaluating alternative plans, and recommend a Level 1 plan for consideration by the potentially affected neighborhood. Staff will review collected data and discuss the pro's and con's of available Level 1 tools with residents.

Neighborhood Review of Level 1 Plan

City staff will present the proposed Level 1 NTMP plan to residents and property owners through a meeting and/ or through a newsletter, flyer or other type of informational material. As discussed previously, residents will play a significant role in developing and implementing the plan. It is expected that resident will serve as a resource and contribute substantially to the overall effort of the team. This could occur at a T & C meeting if needed.

Revision & Neighborhood Approval of Level 1 Plan

The intent of presenting the recommended plan to the neighborhood is to confirm goals and issues to the affected residents and to solicit input regarding the Level 1 NTMP tools. We will use any feedback obtained to revise the Level 1 plan, as appropriate. As indicated before, this could occur at a T & C meeting if needed.

Application of Level 1 Measures

After neighborhood acceptance and subject to budgetary restraints, the recommend Level 1 NTMP measures will be installed. The City will arrange for the installation of Level 1 measures. However, residents could appeal for additional analysis before installation of Level 1 measures.

3.5 LEVEL 2 PROCESS

Neighborhood Education and Enforcement Program

After a Request form has been completed, or when otherwise requested, the City will forward Neighborhood Education and Enforcement NTMP materials to a designated person or community group. These materials enable a neighborhood to take the initiative in responding to local traffic issues. As discussed below, all Neighborhood Education and Enforcement techniques and tools provided in the package can be deployed almost immediately and most may be implemented by the neighborhood itself without City action.

It should be noted that although Neighborhood Education and Enforcement program materials enable residents to voluntarily conduct NTMP education, the Neighborhood Education and Enforcement program could be implemented by a neighborhood as a part of any Level 1 or Level 2 NTMP plan.

The following describes the typical procedure to implement Level 2 NTMP tools. Since Level 2 measures impact many people in a neighborhood and the measures tend to be more costly, it is necessary to determine if there is a high-level of support from the project street for the process

before continuing. Due to the potential impacts, the Level 2 process is designed to have more opportunities for review in the neighborhood, as well as by City boards. Neighborhood acceptance, as well as Transportation & Circulation Commission review and City Council approval, is required prior to the implementation of any Level 2 NTMP measure.

The NTMP program anticipates that residents will incorporate Neighborhood Education and Enforcement program and Level 1 measures into Level 2 plans. Neighborhood participation is a key component to the success of any NTMP program. Therefore, this program's success is based on residents' participation and contribution to the overall effort of the team.

Data Collection & Development in Level 2

City staff will work with residents to identify the affected neighborhood and review the NTMP Petition Request Form to ensure that at least 50 percent plus 1 of the households/businesses would like to pursue NTMP measures. If the petition does not achieve the required approval from the addresses on the project street, the neighborhood may resubmit an NTMP Request Form after a minimum of two-year lapse from the submittal of this petition. If the petition does achieve 50 percent plus 1 approval, City staff will proceed with developing a draft NTMP based on public input from the first meeting.

The development of the plan will first require detailed data collection that may include speeds, volumes, collision history, and other information needed to define the problem and later measure the success of the plan. Enough data will be collected and evaluated to provide an accurate picture of the current conditions throughout the neighborhood.

A detailed analysis will help determine which Level 2 measures are warranted based on the NTMP Framework in Section 3.2 of this report. This analysis will be based on roadway classification, existing and project traffic conditions, multi-modal travel counts and facilities, land uses within the impacted area, emergency service routes, public transit routes, potential for traffic diversion to other residential streets, and compliance with existing local and state regulations.

Neighborhood Review of Level 2 Plan

City staff will lead discussions and review of Level 2 implementation process, discussing the potential benefits and impacts of available Level 2 tools, collecting appropriate data, developing and evaluating alternative plans and recommending a Level 2 plan for consideration by the potentially affected neighborhood. Participants could include neighborhood residents, staff, traffic engineer, emergency service providers, and representatives of other entities that may be directly impacted by the implementation of Level 2 measures. Thorough neighborhood notification and input is necessary for the successful implementation of a Level 2 plan.

One of the key items is to develop a process for gaining consensus on key decisions throughout the development of the Level 2 plan. This will include decision on what tools will be incorporated into a plan for neighborhood vote and Transportation & Circulation Commission and Council approval. The neighborhood voting process is described below.

Transportation & Circulation Commission Review of Preliminary Level 2 Plan

The next step is to present a preliminary plan to the Transportation & Circulation Commission for an informal review. The Transportation & Circulation Commission will provide guidance and constructive feedback.

Neighborhood Approval of Level 2 Plan

Level 2 NTMP plans may have benefits and impacts that extend beyond the location of the proposed features themselves. Thus, Level 2 plans require a higher level of approval than Level 1 plans. The approval process for a Level 2 plan is based on fairness to all regular users in proportion to their proximity from the proposed NTMP measures, as well as the potential for some tools to divert traffic.

City staff will determine the voting area based on the project study area. There will be only one vote per household. For Level 2 NTMP measures, 50% + 1 approval from all households within the project study area.

City staff will distribute one ballot to each property. Staff will also distribute one ballot to each unit when there is more than one unit on the property. These latter properties will be identified through Assessor's records, Registrar of Voters records, Post Office information and/ or field surveys. A letter will accompany each ballot. Again there will be only one vote per household. Either renter or owner, not both.

From the returned ballots, City staff will count the votes and determine if the needed minimum voting percentages of returned ballots were reached. If the proposed Level 2 NTMP plan is not approved by the property owners and residents, no NTMP features will be implemented.

Under this scenario, a neighborhood request for a new or future NTMP study will not be considered by the City for at least two years.

City Council Approval

If approved by the Transportation & Circulation Commission, all Level 2 NTMP plans next require City Council approval. Proposed plans will be agendaized as meeting schedules allow. At this stage, residents would still have the option to appeal the project for further discussions before it goes to the Council.

If City Council rejects the proposed Level 2 plan, then no action will be taken unless Council's direction is to revise and bring back for approval. Any revised plan must be approved through a vote as outlined above by the neighborhood within six months after the original plan's disapproval by the City. The Transportation & Circulation Commission must review and the City Council must accept the revised plan before it can be implemented. If the Transportation & Circulation Commission does not recommend a Level 2 plan to City Council, the neighborhood may request that the City Council consider its plan. If the City Council does not accept the revised plan, no NTMP features will be implemented. Under this scenario, a neighborhood request for a new or further NTMP study will not be considered for at least two years.

Obtaining Funding for Level 2 Plans

Funding for the implementation of a Level 2 NTMP plan should be considered throughout the plan development process. If funding limitations impact the range of options available, this should be identified early in the process and a variety of appropriate tools should reflect these limitations. Level 2 measures are generally expensive.

Currently the City does not have a yearly funding allocation for NTMP. Based on the Council's preliminary budget, the neighborhood may want to revise the plan to be consistent with budget issues. Private funding is optional for Level 2 NTMP plans.

Certain Level 2 measures may qualify for outside grants. Grant sources are scarce, often small in value compared to the project cost, and difficult to obtain. City staff should be able to give a neighborhood guidance on what type of grant funding may be available and how well a neighborhood's project may compete for those funds.

Application of Level 2 Measures

Upon having neighborhood acceptance, City approval, and funding availability, the recommend Level 2 NTMP measures will be scheduled for installation.

Trial or Temporary Measures

Since Level 2 NTMP measures could be costly, as appropriate it might be useful to install these NTMP measures for trial or interim basis. This would allow for review of the results of the trial of temporary measures before proceeding to permanent installation.

Monitoring and/or Removal of Level 2 Measures

City staff will evaluate conditions in the study area to determine the impact of the NTMP features and their effectiveness no sooner than 180 days (excluding summer months) but within one year of the installation of Level 2 NTMP features. The City will make low cost adjustments, where appropriate and practical. City staff may extend the monitoring period when the initial results are inconclusive, adjustments need to be evaluated, or when unanticipated changes in traffic conditions have occurred.

In the unlikely event that a feature creates a potentially hazardous condition, the Public Work Director may order modifications to or removal of a NTMP tool at City expense.

At any time after the monitoring period, any city resident may request that NTMP features be modified or removed by completing NTMP Petition Request Form as contained in Appendix A.

4.0 NTMP Toolbox

As traffic management has evolved in the past few decades, it is generally considered to consist of a combination of educational, enforcement and engineering measures that reduce the negative effects of motor vehicle use, alter driver behavior, improve safety for non-motorized street users, and improve neighborhood livability.

Public education aims at changing behaviors of drivers, pedestrians and bicyclists through enhancement of their knowledge, awareness, courtesy, and sense of responsibility. Enforcement enlists the assistance of the Police Department to focus enforcement efforts on problem areas and increase public awareness of speeding problems. Engineering includes design and implementation of roadway features and physical elements such as speed humps and street narrowing features. Of the three traffic management areas, public education and enforcement should be implemented before engineering improvements.

The following pages describe and illustrate NTMP measures that may be used on residential local, collector and arterial streets in San Carlos. Not all measures that may be acceptable are desirable in all situations. For example, some measures are not acceptable for use on collector streets or on some local streets determined by the Fire Department to be important emergency response routes. The determination of which measure best suits which application will be worked out between neighborhood residents, the city, and Fire Department, following the guidelines and qualifying criteria described in the NTMP document. Many of the measures described herein may be used in combination with each other, and there are also many design variations of each measure.

Arterial Streets

In the City’s General Circulation Element, the primary role of the arterial streets is to move traffic efficiently through a corridor. A list of the City’s arterial streets is shown in Exhibit 3. Therefore, traffic calming measures that work well on a slower, less-traveled residential street, are not appropriate, on high volume, higher speed corridors. Most of these streets are generally emergency response and truck routes in the city. Traffic calming measures that attempts to induce lower speeds through vertical displacement methods (i.e., speed humps) for lower speed local and collector streets are not appropriate for arterials.

| Arterials | Number of Lanes |
|---|-----------------|
| Alameda de las Pulgas | 2-4 |
| Brittan Avenue | 2-4 |
| Crestview Drive | 2-4 |
| Holly Street | 2-4 |
| Crestview Drive | 2-4 |
| Howard Avenue (Laurel Street to Industrial Road) | 2-4 |
| Industrial Road | 4 |
| Laurel Street | 2 |
| Old County Road | 2 |
| San Carlos Avenue | 2-4 |
| Shoreway Road | 2 |

Exhibit 3: Arterial Streets in San Carlos

Traffic calming strategies that could be considered for arterials including narrow lanes, signal optimization, focused police enforcement, radar feedback signs, pavement markings, roundabouts, speed management techniques and others are discuss below.

Each NTMP tool has limitations on its use, advantages, disadvantages and associated costs. Before considering any NTMP tool or a combination of tools, it is important to clearly understand the resident's concerns and the factors or conditions that generated those concerns. In other words, to ensure a successful NTMP plan it is critical to use the right tool under the right set of circumstances.

4.1 NEIGHBORHOOD EDUCATION AND ENFORCEMENT PROGRAM

Before considering any Level 1 or 2 NTMP project, the neighborhood should consider use of Education and Enforcement Program measures which are neighborhood-driven, and allow a neighborhood to take immediate action to address its concerns. For example, residents take the initiative to conduct neighborhood education workshops, maintaining landscaping to improve the street environment and others. The following are examples of Education and Enforcement Program NTMP measures.

4.1.1 Neighborhood Traffic Education

Education is a key component of a NTMP. Common driver behavioral issues that could be addressed through neighborhood traffic education include speeding within school zones, violations of stop control and violation of pedestrian right-of-way at crosswalks. Neighborhood traffic safety outreach could include: flyers, newsletters and personalized letters; and meetings, workshops, specific school programs, and neighborhood speed awareness signs or banners. The outreach could focus on issues such as pedestrian safety, enforcement and speeding impacts in order to heighten community awareness.

Advantages -

- Open forums for residents to discuss safety issues
- Information focus on specific audience
- Programs could be applied quickly without a formal review process

Disadvantages -

- Limited effectiveness
- Potentially time consuming
- Enforcement would still likely be required

4.1.2 Radar Speed Display Trailer

The Radar Trailer is an effective visual reminder to drivers to stay within the speed limit. A computer inside the radar trailer tracks the speed and the time all the vehicles that pass the trailer during the time it is deployed. This traffic flow and speed data is then reviewed by a police officer. The most common form of radar speed display unit is a portable trailer equipped with a radar unit that detects the speed of passing vehicles and displays it on a reader board, often with a speed limit sign next to the display. The primary benefit of speed display units is to discourage speeding along neighborhood streets. As a follow-up to the request for the trailer, an officer could conduct traffic enforcement at the same location as appropriate.



Advantages -

- Flash immediate feedback to drivers on their driving speed
- Aid residents to see how fast vehicles are traveling
- Shown to aid speed compliance and can reduce speeds temporarily
- Speeds may be reduced by 3 to 5 mph during short intervals where the radar trailer is located

Disadvantages -

- Not an enforcement tool
- Potential for vandalism
- Requires City staff set-up and removal

4.1.3 Neighborhood Sign Campaign

The key idea is for residents to move the signs around the neighborhood every few days to different yards so drivers and pedestrians will notice the newly placed signs. The City will loan yard signs to a neighborhood on a temporary basis. It is hoped that this will encourage drivers to respect the neighborhood and to drive more responsibly.

Advantages -

- Rotation of new signs draws attention to the message
- With support of multiple neighborhood residents will ensure broader reach of the message
- Short duration of sign placement helps keep the message fresh

Disadvantages -

- Signs could be vandalized
- Effectiveness will diminish with repeat usage

4.1.4 Neighborhood Landscape Maintenance

The primary purpose of this tool is for residents to maintain certain landscape so that it does not become a safety hazard. For example, residents could organize a neighborhood maintenance day to prune overgrown vegetation that may block signs, driveways, sidewalks or obstruct vision of pedestrians, bicyclists and motorists. If requested, the City would provide guidelines for proper pruning.

Advantages -

- Neighbors could work together to make changes at locations they determine are problematic
- Provides opportunity to correct or prevent problems early on
- Effective way to solve a localized issue

Disadvantages -

- Some residents with problem landscape vegetation issue may decide not to participate
- Volunteer may not know how to prune vegetation appropriately

4.1.5 Police Enforcement

Police enforcement entails the presence of police to monitor speeds and other inappropriate driving behavior and issue citations when necessary. This method is used as an initial attempt to increase driver compliance on streets. It is most applicable on streets with documented speeding problems or notable stop sign/red light violations that need quick mitigation. It can also be used during the learning period when new devices or restrictions are first implemented.

Advantages -

- Effective while officer is actually present at the location
- Can target specific times deemed to be most problematic
- Can be implemented on short notice
- Targets violators without affecting normal traffic

Disadvantages -

- It is a temporary measure
- Enforcement may be delayed and/or limited, due to police availability and other policing duties



4.2 LEVEL 1 TOOLS

Level 1 measures focus on easily implementable and still relatively low-cost features such as enhancing the visibility of crosswalks, striping narrow lanes, providing speed limit signing, installing new high visibility crosswalks, additional signage, and new stop signs, where they meet commonly-accepted traffic engineering warrants. The following are examples of Level 1 traffic calming measures.

4.2.1 Striping Narrow Lanes and/or Centerlines

The key purpose of this measure is to use lane striping to create narrow lanes -- often about 10 feet wide. This may be accomplished by striping edgelines and/ or yellow centerline striping. A centerline stripe helps drivers stay on the "right" side of the road and not use the entire roadway width as a travel lane. On wide roadways, restriping can sometimes be used to stripe a bicycle lane, a parking lane, or a pedestrian shoulder. The primary benefit of narrowing lanes through striping is to slow vehicle speeds.



Advantages -

- Can be quickly implemented
- Shown to slow vehicle speeds
- Improves safety by clearly designating travel paths for vehicles

Disadvantages -

- Not always perceived as effective tool
- Adds striping to neighborhood streets

Typical Cost: Construction and maintenance costs range from \$2.00 to \$5.00 per linear foot of striping.

4.2.2 Moveable/Temporary Slow Down Signs

Permanent signs often lose their effectiveness, but new sign may draw a motorist's attention. As appropriate, the City could install new signs on existing sign posts, on a short-term basis, to heighten driver awareness to a particular concern. These new signs may call driver's attention to the need to observe speed limit, observe speeds for school zones, or some other desired behavior.

Advantages -

- New signs attracts the attention of motorists
- Avoids long-term sign clutter

Disadvantages -

- More sign clutter in residential area
- Requires City staff to install and remove
- Long-term benefit may be negligible

4.2.3 Signing and Markings

Streets can be restriped and marked in various ways to alter driver behavior. This can include yellow centerlines, edge/shoulder striping or bike lane striping, cross-hatching, high-visibility crosswalks (ladder markings), advance warning symbol markings, delineators/Botts' dots, and generally restriping lanes to have narrower widths or reducing the total number of lanes. Advance warning signs or supplementary signs could be installed for special circumstances.



Advantages -

- May highlight lesser-known roadway features
- Increases awareness
- Inexpensive to install

Disadvantages -

- Adds additional signage or markings
- Potential sign clutter
- Pavement markings could be slippery when wet for bicyclists

Typical Cost: Construction and maintenance costs range from \$300 to \$400 per sign.



4.2.4 Crosswalk Improvements

The primary benefit of higher visibility crosswalks is to increase crosswalk visibility which could in turn increase pedestrian safety. These can consist of providing higher visibility crosswalks or new crosswalks. Higher visibility crosswalks can be created by painting "zebra" stripes in lieu of or between the crosswalk's outer boundary stripes. New crosswalks, when warranted, designate pedestrian crossing areas.

Advantages -

- Highlight preferred pedestrian crossing location
- May slow travel speeds when pedestrians are present,
- High visibility crosswalks are more visible than traditional crosswalks
- Help channel pedestrian crossing

Disadvantages -

- Might give pedestrians a false sense of security
- Must be carefully applied at mid-block locations
- High visibility crosswalks require more maintenance than traditional crosswalks

Typical Cost: Construction and maintenance costs range from \$2.00 to \$5.00 per linear foot of striping.

4.3 LEVEL 2 TOOLS

Level 2 measures typically alter the configuration, and potentially the visual character, of neighborhood streets, so they often require engineering, are higher cost, and require substantial community input. To be more effective in achieving the desired traffic calming results, Level 2 tools in the NTMP program have been categorized to address four general traffic issues and to achieve the desired outcomes.

The four general traffic issues to address are:

- 1) Speed reduction,
- 2) Improved pedestrian safety,
- 3) Reduction in cut-through traffic and
- 4) Collision reduction

The following are examples of Level 2 NTMP tools which have been organized to provide solutions to achieve the four goals as indicated above.

Some of these Level 2 tools would be applicable for arterials. However, additional speed management techniques would be required to manage the whole corridor. Some typical tools are shown in Exhibit 4 - NTMP Traffic Calming Tools Applicability by Roadway Type and discussed below.

| | Local Roads | Collectors | Arterials |
|-------------------------------|-------------|------------|-----------|
| Street Narrowing | | | |
| Narrow Lanes | X | X | X |
| Street Trees | X | X | X |
| Spot Narrowing | X | X | |
| Medians & Crossing Islands | X | X | X |
| Curb Extensions | X | X | X |
| Road Diets | X | X | X |
| One-Way Street | X | X | |
| Horizontal Deflection | | | |
| Chicanes | X | X | X |
| Crossing Islands/Short Median | X | X | X |
| Traffic Circles | X | | |
| Roundabouts | | X | X |
| Lane Offsets | X | | |
| Gateway Treatment | X | X | X |
| Diagonal Diverter | X | X | |
| Partial Closure | X | X | |
| Urban roundabouts | X | X | X |
| Vertical Alterations | | | |
| Speed Humps | X | X | |
| Raised Crosswalks | X | X | |
| Traffic Management | | | |
| RRFB | X | X | |
| Signal coordination | | X | X |
| Speed Enforcement Corridors | | X | X |
| Textured Pavement | X | X | X |

Exhibit 4: Typical Applicability by Roadway Types

4.3.1 Speed Reduction Level 2 NTMP Measures

4.3.1.1 Chicanes, Chokers and Slow Points

A serpentine street or chicane is an artificially created, curving, two-way street on a naturally straight road section. Horizontal deflection influences motorists to reduce speed through the serpentine roadway.

The primary benefit of chicanes is speed control without a significant impact to emergency vehicle mobility.

Chokers and slow points are intersection or mid-block curb extensions that narrow a street by extending the sidewalk or widening the planting strip. The remaining cross-section can consist of one lane or two narrow lanes. Chokers and slow points are intended to reduce traffic volumes and speeds by making the roadway narrow so vehicles slow down. Chokers reduce the roadway width so that only one car at a time can pass through it, while slow points allow two cars to pass very slowly in opposite directions.

Chicanes and chokers are generally placed on streets with speed limits that are lower than 35-mph.

Advantages -

- Effective vehicle speed reduction
- Minimal impact on emergency vehicles
- Opportunity for landscaping
- Does not restrict resident access

Disadvantages -

- May require on-street parking removal
- Relatively expensive
- May create hazard for bicyclists
- Potentially create drainage issues
- Increased maintenance

Typical Cost: Costs are highly dependent upon the design and may range from \$40,000 to \$50,000. The annual maintenance cost is approximately \$2,000 per block.

Minimum Requirement -

- ✓ Persistent speed problem: 85th percentile speed 33 mph or greater or 66% of all vehicles exceed 25 mph or average of top 5% percentile speeds observed is 40 mph or greater.
- ✓ Two lane street with width of 50 feet or less.
- ✓ Vertical grades less than 8 percent.

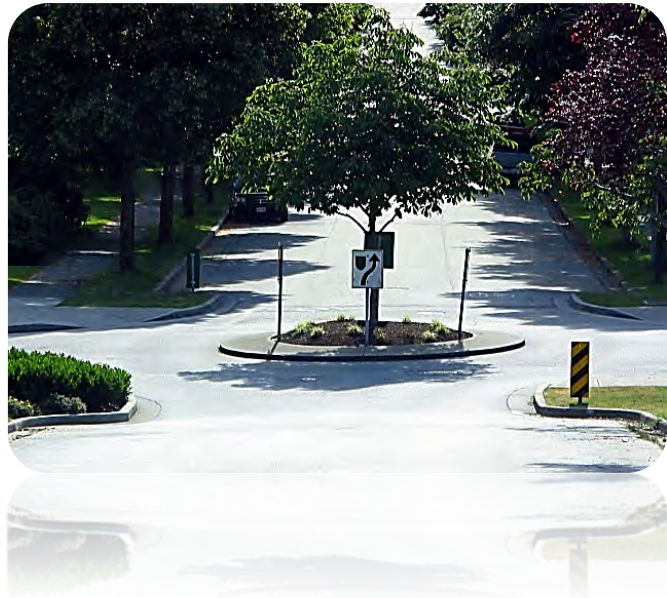


4.3.1.2 Traffic Circle

Traffic circles are raised circular islands typically used in a residential neighborhood for traffic calming. Unlike a modern roundabout, they are typically modest in size and are appropriately scaled for the intersection of neighborhood streets. Traffic circles require drivers to slow down to a speed that allows them to comfortably maneuver around the circle in a counterclockwise direction. Their primary purpose is to reduce speeds through an intersection or, if used in a series, reduce speeds for several blocks. They reduce speeds by forcing motorists to negotiate horizontal curves and also by reducing long straight lines of sight on long straight roadways by providing landscaping in the intersection. Traffic circles are appropriate on streets with low to moderate traffic volumes.

Advantages -

- Effective in reducing vehicle speeds
- Breaks up sight-line on long straight streets
- Opportunity for enhanced landscaping
- Can reduce collision potential
- May reduce collision severity
- Provides better side-street access



Disadvantages -

- May reduce emergency response time
- May impede left turns by large trucks
- May pose conflicts for pedestrians and bicyclists
- May require removal of on-street parking
- Crosswalk location may need to be modified

Typical Cost: Typical construction costs range between \$75,000 and \$100,000. Annual maintenance cost is approximately \$10,000.

Minimum Requirement -

- ✓ Traffic circles are generally not located on steep road ways.
- ✓ Speed limits less than 35 mph.
- ✓ Caution must be applied when using traffic circle on roadways with more than 6,000 average daily trips.
- ✓ Streets not used for frequent, regularly-scheduled public transit routes.

4.3.1.3 Speed Humps and Speed Cushions

Speed humps are a gradual rise and fall in the pavement surface, usually with a circular profile, to a maximum height of 3 or 4 inches over a distance of 12 to 14 feet in the direction of travel. Their vertical deflection encourages motorists to reduce speed.

Speed cushions consist of smaller mounds, raised about three inches in height with length of about ten feet. This is only as wide as a standard passenger car's axle width but the spaces between the cushions allow emergency vehicles (with their wider axle-width) to partially straddle the feature. Several speed cushions are placed across the road. They are usually used in controlling maximum speeds.

Typical average speeds within 100 feet of the humps are not higher than 22 mph, and if positioned no further than 600 feet apart, they usually control average speeds to less than 30 mph and eliminate all speeds above 40 mph. They also may reduce traffic volumes by about 10 to 20 percent if there is an alternate travel path. They should be installed at 300 to 600 foot spacing and properly signed with a 15-mph advisory speed. The preferred marking for humps is similar to the "zebra-striped" crosswalk. Speed humps may be



appropriate on local residential roadways and residential collectors with traffic volumes less than 4,000 average daily trips. Streets considered for these features typically have speed limits of 30 mph or less and have low traffic volumes. Additionally, these tools are typically not installed on streets with steep grades so as not to create additional safety concerns.

Advantages -

- Effective vehicle speeds reduction
- Typically does not result in loss of parking
- Cushions designed to have less impact on emergency vehicles than speed humps

Disadvantages -

- Could increase traffic noise in vicinity of hump
- Impacts all drivers regardless of driving behavior
- Several humps are required to be effective
- Not esthetically pleasing

- Potentially divert traffic to parallel streets
- Adds more signs to neighborhood
- Impacts emergency vehicle response time
- Effects people with certain disabilities
- Impacts school buses and transit

Typical Cost: \$8,500 to \$12,000 per hump. Typical annual maintenance cost is \$1,000 per hump.

Minimum Requirement –

- ✓ Persistent speed problem: 85th percentile speed 33 mph or greater or 66% of all vehicles exceed 25 mph or average of top 5% percentile speeds observed is 40 mph or greater.
- ✓ Two lane street with width of 40 feet or less.
- ✓ Grades less than 5 percent in area of hump.
- ✓ Non-emergency vehicles response route.
- ✓ Streets not used for frequent, regularly-scheduled public transit routes.

4.3.1.4 Gateway Treatment

Gateways may be formed by curb bulb-outs, fences, poles, signs, artwork, and other features that can be combined with each other. They often consist of design features, like planted medians or chokers, which narrow a street in order to reduce the width of the travelway. Speed reduction depends on the amount of horizontal deflection and the width of the travel lanes. Traffic diversion is expected to be minimal.

The primary benefit of gateway treatments is speed reduction. They provide visual cues that tell drivers they are entering a local residential area or that the surrounding land uses are changing.



Advantages -

- Announces a difference in driving environments
- Creates identity for neighborhood
- Can reduce vehicle speeds
- Can discourage cut-through traffic
- Opportunity for landscaping

Disadvantages -

- Require regular maintenance and irrigation
- Might result in loss of parking

Typical Cost: Costs range greatly depending upon the length and design of the median. A typical 40-foot median cost may range between \$35,000 and \$60,000 for construction with additional cost for annual maintenance.

Minimum Requirement –

- ✓ A gateway should be sited so that drivers do not encounter it suddenly. It should be visible over at least the stopping distance for the 85th percentile of the approach speed of vehicles.
- ✓ Street should be wide enough for landscaping
- ✓ The proposed gateway should not create sight distance issue

4.3.2 Pedestrian Safety Improvement Level 2 NTMP Measures

4.3.2.1 Intersection Curb Extension

The purpose of curb extensions is to create a narrower street by extending the curbs toward the center of the roadway or by building detached raised islands to allow for drainage and bike lanes passage. They are used to create shorter pedestrian crossings. In addition, it could also improve sight distance and influence driver behavior by changing the appearance of the street.



Advantages -

- Shorter pedestrian crossing distance
- Enhance pedestrian visibility
- May reduce vehicle speeds
- Provide opportunity for landscaping

Disadvantages -

- Might result in loss of parking
- Need to consider impacts on bicyclists and emergency vehicles
- Might create drainage issues
- Could create right-turn issue for larger trucks

Typical Cost: Costs typically range from \$35,000 to \$60,000 per pair of bulbs, depending upon design and extent of landscaping and/or hardscaping and drainage. Annual maintenance cost is \$400 each intersection.

Minimum Requirement –

- ✓ Curb extension would not encroach on bike lanes
- ✓ The proposed curb extension would not create sight distance issue

4.3.2.2 Raised Crosswalks

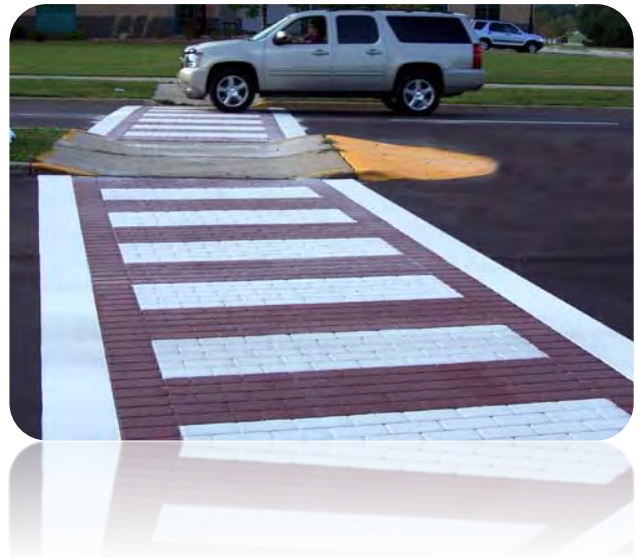
A raised crosswalk is a flat-topped speed hump built as a pedestrian crossing with a maximum height of 3 inches over a distance of 22 feet in the direction of travel. The central 10-foot section of the table is flat. Sometimes the flat portion is constructed with brick or other textured materials. Raised crosswalks are intended to reduce vehicle speeds specifically where a high amount of pedestrians cross the street. Raised crosswalks are typically placed in high visibility locations on streets without steep grades, moderate vehicle volumes and speed limits less than 35 mph.

Advantages -

- Effective vehicle speed reduction
- Improves pedestrian visibility and safety
- May ease street crossings for disabled
- Does not affect access
- Flat portion can be textured

Disadvantages -

- Could result in increased noise impacts
- Might require drainage inlet modifications
- May require extensive signing
- May increase vehicle noise in the vicinity of the raised crosswalk or speed table



Typical Cost: Costs range from \$65,000 to \$150,000, depending upon the specific design and size of the intersection and drainage issues. Annual maintenance cost is \$2,000.

Minimum Requirement –

- ✓ Persistent speed problem: 85th percentile speed 33 mph or greater or 66% of all vehicles exceed 25 mph or average of top 5% percentile speeds observed is 40 mph or greater.
- ✓ Two lane street with width of 40 feet or less.
- ✓ Grades less than 5 percent in area of hump.
- ✓ Non-emergency vehicles response route
- ✓ Streets not used for frequent, regularly-scheduled public transit routes.

4.3.2.3 Rectangular Rapid Flash Beacons (RRFBs)

RRFBs are small rectangular yellow flashing lights that are used along with installations of pedestrian crossing warning signs. They are typically actuated by a pedestrian push button and flash for a predetermined amount of time, to allow a pedestrian to cross the roadway, before going dark. RRFBs are warning devices and are not a legal requirement for a vehicle to stop when they are flashing.

RRFB feature flashing, high-intensity LEDs that alert motorists that pedestrians are using the crosswalk. Studies have shown that RRFBs significantly increase driver yielding behavior by more than 85 percent.

Advantages -

- Increases driver awareness of crosswalk
- Can be activated by pedestrian push-button to alert drivers

Disadvantages -

- May create false sense of security for pedestrians
- Added cost to install and maintain
- At crosswalks, pedestrians may not use push-button

Typical Cost: Costs range from \$20,000 to \$35,000, depending upon the specific design and size of the intersection and drainage issues. Annual maintenance cost is \$2,000.

Minimum Requirement –

- ✓ The Minimum Pedestrian Volume Thresholds are as follows⁷:
 - 20 peds per hour* in any one hour, or
 - 18 peds per hour* in any two hours, or
 - 15 peds per hour* in any three hours
 - 10 school aged pedestrians traveling to/from school in any one hour
- * Young, elderly, and disabled pedestrians count 2x towards volume thresholds
** School Crossing defined as a crossing location where ten or more student pedestrians per hour are crossing

- ✓ Limits for use of RRFB

The City of Boulder has been using pedestrian actuated rectangular rapid flash beacons (RRFBs) at pedestrian crossings on four lane roadways for many years and have collected researched data that showed locations which are not appropriate where there



⁷ Based on the City of Boulder Pedestrian Crossing Treatment Installation Guidelines, Nov. 2011

is a combination of both high traffic volumes and high pedestrian volumes. For example, one of the threshold is that RRFB should not be considered if the total peak hour volumes of both approaches of the street is more than approximately 2,900 vehicles per hour. Additional details are contained in Appendix B.

4.3.3 Reduction in Cut-Through Traffic Level 2 NTMP Measures

4.3.3.1 Diagonal Diverter/Forced-Turn Channelization

Physical feature at intersection approaches to force traffic to make or forego certain movements. The objective is to reduce cut through traffic by forcing through traffic to take other more appropriate routes. Residents must adopt a new driving route to access the affected street. Bicycle and pedestrian access is usually maintained. Similar restrictions in traffic movements may be accomplished by regulatory signing only, but the raised islands provide a physical deterrence that signing by itself cannot provide.

They are typically located on perimeter of neighborhoods on collector and arterial streets at entrances to local streets. They reduce accident potential in the immediate vicinity, but may shift the potential to other streets. If an opening in the barrier provides emergency access with a raised block in the center (“pan basher”), fire and paramedic vehicles will encounter minimal delay, but police vehicles may be more impacted. A forced turn channelization island for right-turns only requires a relatively wide street width for effective implementation. On narrow streets, half closures may be more appropriate. This measure is for local streets only.

Advantages -

- Eliminates through traffic
- May reduce “speeders” who cut through
- Provides area for landscaping
- Reduces intersection conflicts
- Increases pedestrian safety
- Can allow bicycle through movements
- Self-enforcing

Disadvantages -

- Inconvenient for residential access and on-street parking
- May increase trip length for drivers
- May impact emergency vehicle response times
- May shift traffic to other nearby local streets
- May increase congestion/queues on collector/ arterial streets
- Some loss of on-street parking
- Increase in long-term maintenance needs



Typical Cost: Costs range from \$30,000 to \$80,000, depending upon the specific design and size of the intersection and drainage issues.

Minimum Requirement –

- ✓ Non-emergency vehicles response route.
- ✓ Would not divert more than five percent of traffic to another street.
- ✓ Require extensive public meetings and near unanimous consensus from affected residents.

4.3.3.2 Partial Closure

A half closure is a physical barrier at an entrance to a street that restricts turns into a street. Unlike a one-way street, the half closure maintains full access and movement within a street. The objective is to reduce cut through traffic by forcing through traffic to take other more appropriate routes. Ideally, through traffic will be mostly rerouted to streets intended for that purpose (arterials and, to a lesser degree, collectors). Access for emergency vehicles can be provided across the closure. Bicycle and pedestrian access is maintained.

This is one of the most extreme traffic management measures. Residents must adopt a new driving route to access the affected street. This measure is for local streets only.

Advantages -

- Effectively reduces through traffic volume
- May reduce “speeders” who cut through
- Self-enforcing
- Provides opportunity for landscaping
- May reduce pedestrian crossing distance
- Can include bicycle connection

Disadvantages -

- Inconvenient for residential access and on-street parking
- May increase trip length for drivers
- May impact emergency vehicle response times
- May shift traffic to other nearby streets
- May increase congestion/queues on collector and arterial streets.
- Some loss of on-street parking
- Increase in long-term maintenance needs



Typical Cost: Costs range from \$30,000 to \$100,000, depending upon the specific design and size of the intersection and drainage issues.

Minimum Requirement –

- ✓ Would not divert more than five percent of traffic to another street.
- ✓ Require public meetings and buy-in from affected residents.

4.3.3.3 One-Way Street

One-way streets legally limit travel on a street to one direction only. It can be implemented through signs and markings only. The objective is to reduce cut through traffic volume by discouraging a particular direction of through movement. Conversion to one-way is best on narrow streets because wider streets are more subject to deliberate violation and mistaken use. On wider street, physical measures, such as curb bulb-outs may be desirable to change the way the street space is used. This is one of the most extreme traffic management measure. Residents must adopt a new driving route to access the affected street. This measure is for local streets only.

Advantages -

- Effectively reduces through traffic volume
- May provide opportunity for landscaping



Disadvantages -

- Inconvenient for residential access
- May increase trip length for drivers
- May increase traffic speeds on wide streets
- May impact emergency vehicle response times
- May shift traffic to other nearby local streets
- May increase congestion/queues on collector and arterial streets.

Typical Cost: Construction and maintenance costs range from \$4.00 to \$5.00 per linear foot of striping.

Minimum Requirement –

- ✓ Non-emergency vehicles response route.
- ✓ Would not divert more than five percent of traffic to another street.
- ✓ Will not increase existing 85th percentile speed by more than six miles per hour.
- ✓ Require extensive public meetings and near unanimous consensus from affected residents.

4.3.4 Collision Reduction Level 2 NTMP Measures

4.3.4.1 Median Island

A median is a raised island in the center of the roadway with one-way traffic on each side. It could be used to narrow lanes for speed control and/ or to create a barrier to prohibit left-turns into or from a side street. They can also be used for pedestrian refuges in the middle of a crosswalk.

Advantages -

- Collision reduction potential
- Reduced pedestrian crossing distance
- Excellent opportunity for landscaping
- Potential neighborhood entrance feature

Disadvantages -

- May disrupt driveway access
- It may force bicyclists and motor vehicles to share the same space
- May divert traffic volumes, if turning movements are restricted
- Might result in loss of parking
- Might impact emergency vehicles



Typical Cost: Costs range greatly depending upon the length and design of the median. A typical 40-foot median may cost \$35,000 and \$55,000 for construction with additional cost for annual maintenance.

Minimum Requirement -

- ✓ The proposed median would not create sight distance issue
- ✓ Buy off from emergency and fire department

It is emphasized that the related tools would only be utilized for each of the four categories.

4.3.5 Potential Applicable Arterial Streets Traffic Management Measures

The main emphasis of traffic calming on arterials is the deployment of speed management techniques on an arterial corridor. Speed management is a multi-disciplinary approach to manage safe speeds using education, enforcement, design, and technology applications. Such speed management techniques emphasize the needs of all modes of travel and respond to the street's surroundings. The goal is to provide a more consistent and safe speed throughout on

arterial corridor. The benefits of speed management are safer roads with fewer incidents and less severe injuries.

The following are discussions of several effective speed management measures (which may be combined with some of the Level 2 NTMP measures described above) for arterial streets:

4.3.5.1 Signal coordination – Coordinate signals to a target speed of at least the posted speed limit. The traffic signals could be optimized with priority given to maintain progression in both directions on targeted corridor. Motorists could be informed through signage that the signals were timed for the targeted speed limit, and that a “Green Wave” would take them through the corridor without stopping. Vehicles traveling faster than the coordinated speed would stop more frequently.

Other signal techniques for arterials could include:

- ✓ “rest on red” - signal is red until a car drives over a detector placed at a pre-set distance from the intersection. This requires a car to slow at the approach to the but does not require the car to stop as the car would trigger a green light before the car comes to a complete stop.
- ✓ “red light” trigger - speed activated traffic signals where vehicles approaching an intersection at high speeds trigger a red light.

4.3.5.2 Road Diets - A technique that narrows the effective width of the roadway for cars. A typical road diet is the conversion of a four-lane undivided street into a three-lane street of a center turn lane and one travel lane in each direction. This would typically involve removing a lane while increasing the sidewalk width, or adding a median. Or it may also mean adding left turn lanes, dedicated transit lanes, on-street parking, or some combination of each. Extensive studies have shown that a three-lane road diet street would work well with average daily traffic volumes of 15,000 to 18,000. Streets approaching 20,000 vehicles per day may also be accommodated by this configuration, but a capacity analysis is required.

4.3.5.3 Urban Roundabouts - A modern roundabout is a circular intersection where drivers travel counterclockwise around a center island. There are no traffic signals or stop signs in a modern roundabout. Drivers yield at entry to traffic in the roundabout, then enter the intersection and exit at their desired street.

Studies by the Federal Highway Administration have found that roundabouts can increase traffic capacity by 30 percent to 50 percent compared to traditional intersections. Studies have shown that roundabouts reduced injury crashes by 75 percent at intersections where stop signs or signals were previously used for traffic control, according to a study by the Insurance Institute for Highway Safety (IIHS).

Best practices studies have shown that for an appropriately spaced street with volumes less than 14,000 to 15,000 vpd, a combination of road diet and single-lane roundabouts along a corridor is one of the most effective combinations of major street speed management measures

4.3.5.4 Speed Enforcement Corridors – this strategy emphasizes engaging several stakeholder groups for regular, targeted speed enforcement combined with a public awareness program. Typically, this would involve installing speed feedback signs and enforcement techniques could include speed trailers, flashing beacons, flashing speed limit signs, or police enforcement. One of the most common arterial speed management techniques is the radar speed feedback sign, and many municipalities install these devices permanently. The speed feedback sign has evolved from simple speed displays to include flashing “slow down” when vehicles exceed limits. Lastly for this technique, police enforcement of speed remains a fundamental element of arterial speed management.

As mentioned earlier, some of the Level 2 tools would be applicable for arterials. These tools would be evaluated together with speed management techniques when an arterial is evaluated under the NTMP process. The relevance of some of these tools are shown in Exhibit V.

4.4 PROGRAM REVIEW

Based on the experience of various jurisdictions throughout the Bay Area, the success of a Neighborhood Traffic Management Program depends on its adaptability. There is no one program or process that works perfectly for all cities and for that matter all neighborhoods. Therefore, as the City changes, new problems and solutions are discovered, and the procedures are tested, City staff will periodically review the NTMP and identify appropriate changes that would improve its responsiveness to San Carlos residents.

Appendix A NTMP Petition Request Form

City of San Carlos
Neighborhood Traffic Management Program (NTMP)
Petition Request Form (Page 1 of 2)



Contact Name: _____ Organization (If applicable): _____

Day Phone: _____ Email: _____ Today's Date: _____

Address: _____

Describe Issues and Concerns:

Please indicate traffic issues that concern residents in your neighborhood.

_____ speeding _____ traffic volumes
_____ walking/biking _____ Other

Please explain further:

Please describe the boundaries of your neighborhood:

Are you aware of any neighborhood associations that represent your area?

COMPLETE PETITION ON PAGE 2 OF THIS FORM. SEE INSTRUCTIONS BELOW.

- 1. The form requires 50 percent + 1 approval from the addresses on the project street, which is the block or blocks on which the neighborhood traffic management is being requested.
- 2. City staff will determine the voting area based on the project study area. There will be only one vote per household.
- 3. The resident submitting the request form will become the "neighborhood lead" and serve as the primary contact for City staff.
- 4. The neighborhood lead should make a reasonable effort to contact the property owner and the current resident/business at each address on the project street.

For Staff Use Only

Date Received: _____

Petition Approval %: _____

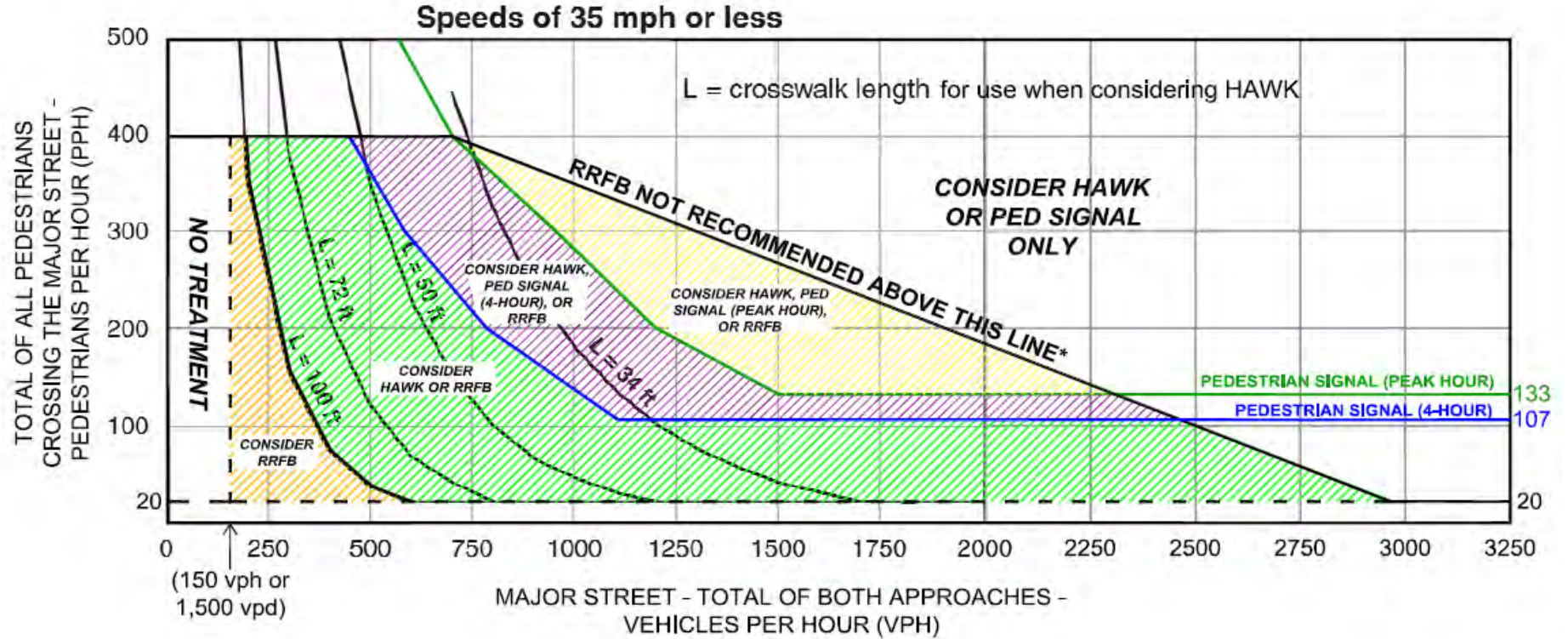
Review Action: _____

Additional Comments: _____

Applicant Notified on: _____

Appendix B Guidelines for the Installation of RRFB

Guidelines for the Installation of Pedestrian Hybrid (HAWK) Beacons, Pedestrian Signals, or Rectangular Rapid Flash Beacon (RRFB) Signs on Low-Speed Roadways



* RECOMMENDATION BASED ON CITY OF BOULDER SAFETY EVALUATIONS AT EXISTING RRFB SITES AND OBSERVED IMPACTS TO VEHICULAR TRAFFIC OPERATIONS

Note: Based on City of Boulder *Pedestrian Crossing Treatment Installation Guidelines*, Nov. 2011



Tech Memo

To: Grace Le, PE
City Engineer
City of San Carlos

From: Christopher Thnay, PE, AICP
Walnut Creek

File:

Date: January 25, 2018

Reference: City of San Carlos - Neighborhood Traffic Management Program (NTMP) Criteria

The purpose of this tech memo is to elaborate on the City of San Carlos - Neighborhood Traffic Management Program (NTMP) screening criteria and recommendations. The Council requested more information at the September 25, 2017 meeting.

Speed Criteria

As proposed in the draft report that was presented to the Council on September 25, 2017, the recommended speed criteria for neighborhood traffic management are listed below:

The 85th-percentile speed must be in excess of the posted speed limit by more than 7 miles per hour (mph).

A review of NTMP plans of surrounding cities showed that many adopted similar speed threshold criteria of 7 mph or more. This include the cities of Los Altos, Mountain View, Sunnyvale, Santa Clara and Palo Alto as shown in **Table 1**.

Based on the typical posted speed limits for the roadway types, the 7-mph criteria would result in the following:

- Local Streets > 32 mph
- Collector Streets > 42 mph
- Arterial Streets > 52 mph

The 85th percentile speed is the speed at which 85 percent of the vehicles on the roadway are driving at or below that speed. This measure is important because it is used to determine the speed limits for the roadway, which must be set at reasonable levels to achieve compliance. It is very common for vehicles to exceed the posted speed limits on residential streets. Nationwide studies have shown that the average 85th percentile speed on a residential street is 32 miles per hour.

| City | Adopted Similar 85th Percentile Speed Threshold Criteria |
|---------------|--|
| Los Altos | 85th speed > 7 mph |
| Mountain View | 85th speed > 7 mph |
| Sunnyvale | 85th speed > 7 mph |
| Palo Alto | 85th speed > 7 mph |
| San Mateo | 85th speed > 7 mph |
| Santa Clara | 85th speed > 8 mph |

Table 1: Speed Threshold Criteria of Some Cities

Therefore, a local street might qualify for speed related traffic calming improvements if the average speed for any stretch of the street meets or exceeds the 32-mph threshold. Additional evaluation would be conducted besides the 32-mph criteria to determine the actual traffic calming device implementation. Satisfying the criteria does not necessarily mean that a traffic calming device should be installed.

As mentioned earlier, the threshold of 7-mph speed increase is used to determine speed limits. Any speed increase above the threshold for each of the roadway types indicates a potential increase in posted speed limit. Posted Speeds that are currently not justified by the engineering and traffic survey would be recommended under certain conditions for an increase to be eligible for radar enforcement.



January 25, 2018
Grace Le, PE
Page 2 of 3

Reference: City of San Carlos - Neighborhood Traffic Management Program (NTMP) Criteria

Justification for recommending reduced Posted Speeds can be based on residential density, pedestrian/bicyclist safety and other factors not readily apparent to drivers but essential to meet the traffic safety needs of the community. The following factors may be considered to adjust and determine the final Posted Speeds:

- Road characteristics, shoulder condition, grade, alignment, and sight distance
- 10-mph pace speed
- Roadside development and environment
- Parking practices and bicycle/pedestrian activity
- Reported crash experience for at least a one-year period

Additionally, the 2014 California Manual of Uniform Traffic Control Devices (CAMUTCD) states that speed zoning with 5-mph increments are preferable in urban areas, and that short speed zones should be avoided. Without justified Posted Speed Limits, speeding citations that are challenged in court may not be upheld.

Speed increase above the threshold for each of the roadway types would indicate a need to explore traffic calming treatments. Having a lower speed increase threshold to qualify under NTMP criteria might qualify more streets for consideration but may not be an effective way to address critical speeding issues.

It is recommended that the speed criteria contained in the NTMP be adopted.

Traffic Volume Criteria

The following are the recommended proposed traffic volume criteria:

Average daily vehicular traffic volume must exceed the amount of traffic that would typically be generated by land uses with direct access on that block:

- Local Streets - 1,200 vehicles per day (vpd)**
- Collector Streets - 4,000 vpd**
- Arterial Streets - 13,000 vpd**

Speeding and cut-through traffic issues experienced by residents in most cities occur throughout the day and not just during the peak hour. In fact, speeding typically does not occur during the peak compute hours due to more congested traffic condition.

| City | Adopted Similar ADT Threshold Criteria |
|-------------|--|
| Menlo Park | Local street > 1,500 vpd Collector street > 3,000 vpd |
| El Cerrito | Local >1,000 vpd; Collector > 2,500 vpd & Minor Arterial > 4,000 vpd |
| Santa Clara | Volume between 1,000 vpd - 3,500 vpd |
| Sunnyvale | ADT > 1000 vpd |
| Los Altos | ADT - 800 to 3,500 vpd |
| San Mateo | ADT > 1000 vpd |

Table 2: ADT Threshold Criteria of Some Cities

Cut-through traffic could occur throughout the day and not just during the peak commute hour, which typically makes up only 10-12 percent of the daily traffic on a street. Therefore, the average daily traffic (ADT) is most commonly used as a volume threshold as shown for some cities in **Table 2**. By using the ADT criteria, it allows the NTMP process to capture any potential issues throughout the day.

It is recommended that the ADT criteria contained in the NTMP be adopted.

Collision Criteria

The following are the recommended proposed collision criteria:



January 25, 2018
Grace Le, PE
Page 3 of 3

Reference: City of San Carlos - Neighborhood Traffic Management Program (NTMP) Criteria

Collision data during the last available 36 months demonstrates that the number of collisions are above the City-wide average for a similar type of street/intersection¹ and have primary collision factors that are correctable by traffic improvements.

Using collision data could reveal locations with potential systematic safety issues that could be addressed through the NTMP.

The City's proposed criteria is consistent with several cities in the Bay Area as shown in Table 3.

It is recommended that the collision criteria contained in the NTMP be adopted.

| City | Adopted Similar Collision Threshold Criteria |
|------------|--|
| Menlo Park | 3 yr. collision data > city average |
| El Cerrito | 3 yr. collision data > city average |

Table 3: Adopted Similar Collision Threshold Criteria

¹ The average collision rate based on Caltrans Statewide rates for urban streets would be acceptable

IN THE CITY COUNCIL OF THE CITY OF LIVERMORE, CALIFORNIA
A RESOLUTION APPROVING THE 2020 NEIGHBORHOOD TRAFFIC CALMING PROGRAM AND PRIORITY LIST

In February 15, 2017, staff submitted a white paper titled *Traffic Behavior and Enforcement* to the City Council during their Goals and Priorities Workshop, to make suggestions on enhancing existing traffic management program. The City Council directed staff to investigate the possibility of streamlining the Traffic Calming Program considering citywide traffic behavior and cut-through routes, and a more proactive approach as opposed to reactive approach in addressing speeding and cut-through traffic concerns in residential neighborhoods.

The 2020 Neighborhood Traffic Calming Program was developed in response to Council direction to be a more efficient, comprehensive, and data driven process to help achieve the goal of improving quality of life in residential neighborhoods by reducing cut through traffic and speeding. A Priority List for implementing traffic calming devices was developed following the process and criteria included in the 2020 Neighborhood Traffic Calming Program.

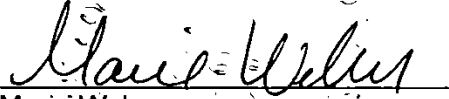
NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Livermore that the 2020 Neighborhood Traffic Calming Program, attached hereto as Exhibit A, and the Priority List for implementing traffic calming devices, attached hereto as Exhibit B, are approved.

BE IT FURTHER RESOLVED that the 2020 Neighborhood Traffic Calming Program replaces the Neighborhood Traffic Calming Program, adopted March 18, 2002 (Resolution No. 2002-62), revised February 9, 2004 (Resolution No. 2004-38).

On motion of Council Member Carling, seconded by Council Member Coomber, the foregoing resolution was passed and adopted on September 28, 2020, by the following vote:

AYES: Council Members Carling, Coomber, Vice Mayor Woerner,
Mayor Marchand
NOES: None
ABSENT: Council Member Munro
ABSTAIN: None

ATTEST:



Marie Weber
City Clerk

APPROVED AS TO FORM:



Tara Mazzanti
Assistant City Attorney

Date: September 30, 2020

Exhibit A- 2020 Neighborhood Traffic Calming Program
Exhibit B- 2020 Neighborhood Traffic Calming Program Priority List

EXHIBIT A

**CITY OF LIVERMORE
2020 NEIGHBORHOOD TRAFFIC CALMING PROGRAM**

INTRODUCTION

Quality of life in residential neighborhoods is adversely affected by speeding vehicles and commute traffic using neighborhood streets to avoid congestion on arterial roadways. The 2020 Traffic Calming Program is intended to reduce speeding and cut-through traffic in residential neighborhoods. A citywide data-driven approach is used to help identify priorities and streamline the implementation process.

BACKGROUND

In 2002, Council approved the Neighborhood Traffic Calming Program, which included Traffic Education, Engineering and Enforcement as Tier 1 measures, and installation of traffic calming devices as Tier 2 measures. The aim of the Neighborhood Traffic Calming Program was to strengthen the Traffic Education, Engineering and Enforcement program by adding a Tier 2 component and providing one comprehensive program that guides the use of additional engineering tools, commonly known as traffic calming devices, in responding to neighborhood traffic issues.

The Neighborhood Traffic Calming Program was implemented from 2002 until it was suspended in 2009, due to funding constraints and limited resources. The program had modest success implementing traffic calming devices on 7 residential streets. However, the program was inefficient and required significant resources to implement. Since that time, traditional Traffic Education, Engineering and Enforcement program continues to be the main tool in addressing traffic safety concerns with some success. However, neighborhood residents continue to express concerns about cut-through traffic and speeding, while frequent speed enforcement in residential areas can be a challenge given police resources and priorities.

On February 15, 2017, staff submitted a White Paper, titled Traffic Behavior and Enforcement, to the City Council Goals & Priorities Workshop, which identified alternatives to the Traffic Calming Program, including using a data driven approach to identify the cut-through traffic impacts and ways to streamline the process. Council directed staff to investigate the possibility of streamlining the TCP considering citywide traffic behavior and cut-through routes and using a more proactive approach as opposed to reactive approach in addressing such neighborhood concerns. The aim of the 2020 Traffic Calming Program is to focus efforts on locations with high cut-through traffic, accident, and speed locations from a city-wide view, using a data driven analysis approach and a streamlined implementation process.

EXHIBIT A

PURPOSE STATEMENT

The purpose of the 2020 Neighborhood Traffic Calming Program is to proactively improve livability and quality of life within residential neighborhoods through the deployment of traffic calming devices on locations with high cut-through traffic, accident, and speed locations.

GOALS AND OBJECTIVES

The City of Livermore continually strives to ensure overall safety, protect its neighborhoods and improve the quality of life for its residents. Traffic conditions on residential streets certainly affect neighborhood livability and one's sense of community. Traffic that is traveling at inappropriate speeds and commuter traffic that is inappropriately using residential roadways can adversely affect a resident's quality of life.

However, implementing traffic calming measures is not a solution for all speeding and cut-through traffic woes. Each neighborhood may have its own unique set of problems that must be analyzed to identify solutions. This program was developed to guide City staff and inform residents about the processes and procedures for implementing traffic calming measures on residential streets. Under this policy, staff will work with residents to identify traffic issues in their neighborhoods and seek appropriate solutions.

The goal of the 2020 Neighborhood Traffic Calming Program is to implement measures approved by a consensus of the neighborhood to affect driver behavior in such a way that improves safety and the quality of life for residents, pedestrians, bicyclists and motorists. This goal is to be balanced with the City's goal to provide quick emergency response times for emergency vehicles including fire trucks, police and ambulances.

The objectives are as follows:

- Make efficient use of City resources by periodically conducting a citywide traffic behavior study and prioritizing streets city-wide with speeding and cut-through traffic.
- Reduce vehicle speeds on residential streets.
- Discourage cut-through traffic.
- Promote conditions that encourage bicycle and pedestrian travel.
- Provide clear guidelines of the process to evaluate traffic calming measures.

COMPATIBILITY WITH GENERAL PLAN

This program is consistent with and assists in achieving the goals and policies identified in the Circulation Element of the City's General Plan adopted by the City Council in February 9, 2004 and amended in 2014. The goals, objectives, and policies identified in the Circulation Element include:

- Goal CIR-2 Promote multi-modal transportation.
 - Objective CIR-2.4 Provide a pedestrian network that encourage walking for transportation and recreation.

EXHIBIT A

- Policy 1. The City shall ensure the safe and convenient movement of pedestrians throughout the City and within neighborhoods.
- Goal CIR-3 Identify and develop a circulation system consistent with the Land Use Element.
 - Objective CIR-3.3 Minimize local cut-through traffic in residential neighborhoods.
 - Policy 1. The City shall provide adequate capacity to the extent possible on major and collector streets to prevent traffic diversion of local cut-through traffic onto neighborhood streets.
 - Policy 2. The City shall consider using traffic calming methods to reduce local cut-through traffic, where appropriate.
- Goal CIR-6 Protect neighborhood quality and community character through circulation planning.
 - Objective CIR-6.1 Use circulation improvements to enhance Livermore's community character and maintain the quality of life in residential neighborhoods.
 - Policy 1. The City shall provide a street system that minimizes traffic on local streets in order to create and preserve a high-quality residential environment.

INTRODUCTION TO TRAFFIC CALMING DEVICES

The Institute of Transportation Engineers defines traffic calming as follows: "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". Traffic calming devices can generally be divided into 4 categories: 1) Vertical deflection, 2) Horizontal shifts, 3) Constrictions and 4) Diverters & Closures. Examples of each of these devices are shown in Appendix B, "Traffic Calming Toolbox".

Vertical deflection devices deflect the path of a vehicle in a vertical direction. These measures require motorists to slow considerably to minimize the impact when the vehicle passes over the device. Vertical deflection devices include speed humps, raised crosswalks and raised intersections.

Horizontal shift devices shift the path of a vehicle in a horizontal direction, forcing motorists to slow to maneuver around the devices. Horizontal shifts have a secondary effect in that they tend to break up the straight sight lines of a roadway, which in turn slows motorists by reducing the comfortable speed of travel. Examples include traffic circles, chicanes, and medians.

Constriction devices narrow the roadway and slow motorists by reducing the comfortable speed of travel. Constrictions include curb extensions, neckdowns and chokers. Other

EXHIBIT A

types of more passive constrictions are on-street parking, narrowed lanes and the addition of bicycle lanes.

Traffic diverters, street closures, and turn restrictions are another type of traffic calming measure. These are generally measures that alter the transportation circulation system by prohibiting access to existing streets.

Some agencies have had traffic calming programs for several decades now. Many of these programs have been successful. However, some agencies have since set up traffic calming removal programs and set moratoriums on implementing new devices. This movement is largely contributed to the proliferation of extremely restrictive traffic calming devices across an agency without due regard for the movement of traffic and the cumulative impacts. Therefore, it is particularly important to determine the need and appropriateness of devices as part of the traffic calming program in order to reduce the likelihood of later implementing a traffic calming removal program.

POLICY STATEMENTS

1. Emergency Response

A critical concern about the use of traffic calming devices is the delay it may create for emergency response vehicles, including fire engines, ambulances and law enforcement vehicles. It is important to be aware of the trade-offs when making decisions about the use of traffic calming devices. The more aggressive devices for slowing traffic will slow emergency vehicle response as well, and in some cases may cause safety concerns.

The City's policy for fire services is to respond to medical and structure fire incidents within 7 minutes, 90% of the time, as measured from receipt of the 911 call, to the fire unit arrival at the incident. The City currently meets this goal. It is important to point out that fire trucks respond to many life threatening medical emergencies, such as heart attack victims, in addition to fire emergencies. Often, a fire truck is the first to respond to a medical emergency, since there are fire stations located throughout the City. Fire stations have been spaced as far apart as is practical, while still meeting the response time goal, so as to avoid having too many fire stations. Thus, to areas at the limits of current response times, any significant traffic calming devices will cause response time failures.

Recognizing the importance of achieving this emergency response time goal as a necessary service to the public, all traffic calming devices will be designed to accommodate all emergency vehicles and to minimize its impacts on emergency vehicle response times. Most arterial and collector streets are considered primary emergency vehicle response routes and are used to access various parts of the city from the fire stations. In order to minimize impacts to emergency vehicle response times, particular attention should be paid to the types of devices used on collector streets. Devices that considerably limit or restrict emergency vehicle access on collector streets will not be allowed.

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- Traffic calming measures shall be designed to accommodate all emergency vehicles and to minimize their impacts on emergency vehicle response times. (Policy 1)
- Traffic calming measures shall be limited on primary response routes. (Policy 2)
- The Fire Department and the Police Department should be involved in the development of the traffic calming measures in neighborhoods and should approve all proposed plans. (Policy 3)

2. Traffic Calming Devices

There are a few basic types of traffic calming devices that have different effects on the motoring public. It is important to understand how each type of device works and its impacts on motorists and emergency vehicles. The following discussion is divided to explain each type of device and the associated policies.

Horizontal shift devices include traffic circles, chicanes, and medians. **Constriction devices** include curb extensions, neckdowns and chokers. Both horizontal shift and constriction devices slow traffic by physically forcing motorists to maneuver around the devices. The use of landscaping within these devices not only enhances the aesthetics of the streetscape but also increases their effectiveness by breaking up the motorist's line of sight, which reduces the comfortable speed of travel. Therefore, these devices, when used in conjunction with one another, are effective for a longer stretch of roadway rather than just in the immediate vicinity of the device. These devices also tend to have relatively lower impacts on emergency response times in that the vehicles can continue to move around the devices without stopping. However, use of these devices usually requires prohibition of on-street parking adjacent to the device.

- Horizontal shift and constriction devices such as medians, traffic circles, chokers and chicanes are acceptable traffic calming devices. (Policy 4)
- Residents fronting the proposed devices must approve any required parking restrictions. (Policy 5)

Vertical deflection devices include speed lumps, speed humps, speed tables, and raised crosswalks and intersections. The vertical deflection devices that **are** included in this program **are raised crosswalks at existing midblock applications and** the speed lump. Speed lumps are similar to speed humps, except they are divided into three lumps with one foot of space between each lump. The space between the lumps is specifically designed to accommodate the axle width of fire trucks. All other vehicles with smaller axle widths have to go over the humps from at least one side of the vehicle. Speed lumps are typically 12 to 14 feet long and 3 inches high.

One of the concerns associated with speed lumps is the potential increased noise in the immediate area where the speed lumps are installed because of braking and accelerating

EXHIBIT A

vehicles. It is important that residents immediately adjacent to the speed lumps concur to their installation.

- Speed lump is the approved vertical deflection device. Raised crosswalk may be considered an option at existing midblock crosswalk locations provided it will not significantly impact response times of emergency response vehicles such as fire engines. (Policy 6)
- Residents fronting the proposed speed lump must approve the installation. (Policy 7)

Time of Day Turn Restrictions prohibit certain turning movements (e.g., right turn, left turn or U turn) at intersections during specific times of day. Careful analysis should be made when using this measure to prevent significant traffic diversion.

- Time of day turn restrictions may be considered for unusual circumstances only if found to not adversely impact any other residential neighborhoods. (Policy 8)

Diverters and street closures are measures that alter the existing transportation circulation system. In developing a solution it is important not to shift the problem to another neighborhood. Diverters and street closures can cause a tremendous amount of traffic diversion over a wide area. These types of measures have impacts that would need to be evaluated in a greater scope than just within a particular neighborhood. The impacts would include the environmental impacts due to changing the transportation circulation system. Many cities have policies that ban or discourage street closures. For these reasons, diverters and street closures are not recommended as traffic calming measures. However the use of diverters and street closures may be used outside of this program and should be evaluated as part of a larger area-wide study if their use is to be considered.

- Diverters and street closures shall not be used as part of this program. (Policy 9)

Stop signs are not traffic calming devices. Residents, however, often request stop signs in an effort to calm traffic. Although residents believe that stop signs will reduce vehicle speeds, studies have shown that vehicle speeds after the vehicle has passed through the stop controlled intersection are as high, and occasionally higher, than without a stop sign, as motorists try to "make up" time lost at the stop sign. The acceleration and deceleration near stop signs generates noise and adversely affect air quality.

Inappropriate use of stop signs also creates significant adverse impact to emergency vehicles. Emergency vehicles are required to verify that a stop controlled intersection is clear of vehicles prior to entering. Many times this means that the emergency vehicle must nearly come to a stop. The delay to an emergency vehicle at a stop sign is similar to that caused by a vertical deflection device.

EXHIBIT A

Stop signs are traffic control devices that should be used when appropriate to assign right-of-way to conflicting traffic movements, not to calm traffic. Stop signs should be installed only at locations where conditions meet established criteria, which has been the past practice of the City. Studies have shown that stop signs that do not meet established criteria (known as unwarranted stop signs) have a higher violation rate. Unwarranted stop signs also create disrespect of traffic control devices in general and affects behavior at other stop controlled intersections. It is for these many reasons that unwarranted stop signs are not to be used in this program.

- Unwarranted stop signs shall not be used as a part of this program. (Policy 10)

3. Maintenance

Many traffic calming devices alter the geometry of the roadway. Poorly designed traffic calming devices could interfere with street sweeping and other existing maintenance activities. This could have a negative effect on the appearance of the neighborhood and the residents' quality of life.

- Traffic calming devices shall be designed to minimize adverse impacts to street sweeping and other maintenance activities. (Policy 11)
- The development of traffic calming devices should be coordinated with the Maintenance Department. (Policy 12)

4. Residential Focus

This program is focused on residential areas since the purpose of the program is to improve quality of life of residents. **Only local residential and residential 2-lanecollector streets will be considered in this program.** Arterial streets are specifically excluded from this program because the nature of arterial streets is to move large numbers of vehicles in a relatively free-flowing manner. Actually, non-neighborhood traffic is encouraged to use arterial streets in order to reduce cut-through traffic in the neighborhoods.

Diverted traffic must also be considered when evaluating traffic calming measures. In developing a solution for one traffic problem, it is important not to shift the problem to another neighborhood or other residential streets within the neighborhood. Therefore, it is necessary to identify a neighborhood boundary to study the effects of proposed traffic calming devices.

Neighborhood participation is important in order to develop a consensus of the issues that adversely affect the neighborhood, evaluate the pros and cons of the various traffic calming measures and ensure that the issues are adequately addressed. It is essential to consider a wide range of perspectives and observations in addition to engineering data. The program is designed so that residents can become actively involved in defining the problem(s) and in the decision-making process in order to have a sense of ownership of the outcome.

EXHIBIT A

In addition to neighborhood participation, it is important that the process reflects the opinions of a majority of the residents and not just a few vocal residents. This is implemented through the use of a petition. In order to implement the proposed traffic calming devices, at least 60% of the households within the neighborhood is required to sign a petition to show positive response on the implementation of the proposed traffic calming devices. A neighborhood meeting will be held to discuss the traffic calming program and the proposed traffic calming devices and locations prior to requiring the 60% petition.

- Traffic calming measures will only be considered on local residential and residential 2-lane collector streets. (Policy 13)
- Traffic calming measures shall not be used on arterial streets or non-residential streets. (Policy 14)
- Minimize diverted traffic to other local or residential collector streets. (Policy 15)
- City staff will identify neighborhood study areas in order to evaluate the potential of diverted traffic. (Policy 16)
- Require a positive response from at least 60% of the households within the identified neighborhood boundary to approve the permanent installation of traffic calming devices. (Policy 17)

5. Minimum Criteria and Prioritization Criteria

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. Since most neighborhood traffic problems involve speeding vehicles or a high cut-through volume of vehicles relative to the street type, these criteria are weighted heavier in the ranking, especially cut-through volume of vehicles. Another factor that is considered in defining the extent of the problem is the average annual reported accidents. Also, the impact traffic will have on a neighborhood depends upon the character of the street in the neighborhood and the amount of pedestrian activity within the neighborhood. Streets that have a greater percentage of fronting homes, schools parks or other public facilities are impacted more than streets that are lined with backing lot treatments. 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.

In addition to prioritizing projects, it is necessary to provide some minimum criteria that must be met in order for a neighborhood to qualify for traffic calming measures. These minimum criteria ensure that City staff and financial resources are used efficiently by not spending resources on streets that do not have a significant traffic problem and to avoid creating unmet expectations by having a long list of projects that may never get built. These minimum criteria are based on vehicle speeds and cut-through volumes.

EXHIBIT A

For the purposes of the minimum and prioritization criteria, the data collected will be rounded up to the nearest whole number.

- The minimum criteria to be used to determine if a street is eligible for traffic calming devices if at least one of the follow criteria is met: (Policy 18)
 - **Cut-through Volume –** Average daily cut-through traffic is at least 250 vehicles
 - **Speed –** 85th percentile speed (critical speed) is at least 8 mph above the posted speed limit
- The prioritization scoring criteria allows 45 maximum points and is as follows (Policy 19):

Cut-Through Volume - Scores calculated in the "Citywide Traffic Behavior Study" (20 points maximum)

Speed

| 85 th percentile speed (critical speed) | Points |
|--|------------|
| 5 mph and less above posted speed limit | 0 |
| 6 mph above posted speed limit | 2 |
| 7 mph above posted speed limit | 4 |
| 8 mph above posted speed limit | 6 |
| 9 mph above posted speed limit | 8 |
| 10 mph above posted speed limit | 10 maximum |

Accident History - One point per accident susceptible to correction by traffic calming device, using the average annual accidents over past 3 years (5 points maximum)

Fronting Homes

| Percentage of the street that has fronting homes | Points |
|--|-----------|
| 25% or less | 0 |
| 25 - 40 % | 1 |
| 41 - 60% | 2 |
| 61 - 75% | 3 |
| 76 – 90% | 4 |
| 91 – 100% | 5 maximum |

EXHIBIT A

Pedestrian Generators (such as parks, schools, public facilities, not including homes)*

| Number of pedestrian generators within neighborhood boundary | Points |
|--|-----------|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 or more | 5 maximum |

* Elementary, middle and high schools will be weighted double points in this category.

6. Traffic Calming Device Removal

Although there are many policies and steps incorporated in the program to avoid the scenario whereby a neighborhood requests to have traffic calming devices removed, it is acknowledged that this may occur. In order for traffic calming devices to be removed from a neighborhood, similar process of neighborhood meeting and consensus requirements should be met. A neighborhood meeting would be held to discuss the issues and the impacts of traffic calming removal. A petition to garner 60% approval would need to be circulated within the original neighborhood boundary that installed the traffic calming device initially. The costs of removing traffic calming devices would be paid 100% by the residents. Therefore, it would require a 51% approval of the property owners to pass an assessment district vote to fund the removal costs.

- Require a positive response from at least 60% of the households within the original neighborhood boundary to remove traffic calming device. (Policy 20)
- Residents shall pay for 100% of the costs to remove traffic calming devices. (Policy 21)

NEIGHBORHOOD TRAFFIC CALMING PROCESS

The process begins once the City receives a request a resident to initiate a traffic study in a residential neighborhood due to concerns about traffic. The process is divided into two distinct tiers, with Tier 1 being Traffic Education, Enforcement and Engineering Program and Tier 2 being the Neighborhood Traffic Calming Program.

First, staff will conduct a Tier 1 analysis. This may include data collection including traffic counts, speed survey, collision history and pedestrian observations. Staff may recommend that the identified problem may be easily reduced or alleviated with Tier 1 implementation measures. Tier 1 implementation measures are usually low cost tools, primarily consisting of education, enforcement and some engineering. Tier 1 implementation measures include:

- targeted enforcement

EXHIBIT A

- improving sight distance by trimming landscaping
- appropriate additional signing, striping or pavement markings
- educational outreach
- placement of the radar speed trailer

If Tier 1 measures do not have a positive effect on traffic and the resident still has a concern, the resident can request to move the request forward to Tier 2. If staff does not recommend the use of Tier 1 measures or the Tier 1 measures have already been implemented without the desired effect, the request may move directly to Tier 2.

Tier 2 involves completing a citywide traffic behavior study. Based on the evaluation results and the speed survey, in order for a request to be considered for Tier 2, the existing traffic conditions must meet the minimum criteria as stated in Policy 18. If these minimum criteria are not met, the request may not proceed for Tier 2 analysis.

The request is then prioritized among other requests utilizing the prioritization criteria as stated in Policy 19. Prioritizing requests provides clear guidelines to staff on how to manage the limited resources effectively by dealing with neighborhoods that have the most pressing issues first.

At the beginning of each fiscal year, the top projects on the priority list will be selected for study during that year, depending upon the availability of funding. Once the project is selected for study, then staff determines a neighborhood boundary to identify the limits of the analysis. In addition, based on the details of the initial request, staff will develop best-fit alternative for implementation of traffic calming devices and its fiscal impact.

A neighborhood meeting will then be held and all of the residents within the boundary will be notified. The purpose of this meeting is to listen to the concerns of the residents, discuss the traffic calming program and process, the conceptual implementation plan of the traffic calming devices and the potential fiscal impacts. This will mostly be an educational meeting, both for staff to learn the concerns of the residents and for the residents to learn of the traffic calming process and its implications as well as the conceptual implementation plan of the traffic calming devices. This meeting is purposely held prior to the circulation of the petition so that the residents are more educated about the process that they are being asked to support. At this meeting, it is required that a neighborhood captain or neighborhood working group be identified in order to coordinate the future outreach efforts within the neighborhood.

City staff will modify the conceptual plan incorporating applicable comments received during the community meeting. The revised plan will be provided to the neighborhood captain or neighborhood working group to collect the signatures.

Since traffic calming measures impact many people in the neighborhood and the measures

EXHIBIT A

tend to be costly, it is necessary to determine if there is adequate support for the process before continuing. Therefore, a petition with signatures from at least 60% of the households within the neighborhood boundary is required to approve the proposed traffic calming project. The neighborhood captain or the neighborhood working group will need to coordinate this effort. If less than 60% of the households sign the petition, the proposed project may not proceed. For the purposes of this program, a household is defined as any owned or rented living unit with its own street address, regardless of how many people live in each unit. Each household is represented by one signature. In addition, 100% of property owners next to any traffic calming devices need to approve the device installation.

Once the required neighborhood approvals are in place, plans and specifications will be prepared. The project will be advertised for construction. The City Council will consider approving the project at the time of award of the construction contract. It is expected that construction would be completed within 12 months of City Council approval.

2020 Neighborhood Traffic Calming Program Priority List

| Rank | Roadway | Points | | | | | | Final Points |
|------|----------------------------------|-------------|---------------------|-------|------------------|----------------|-----------------------|--------------|
| | | Daily Trips | Cut-Through Traffic | Speed | Accident History | Fronting Homes | Pedestrian Generators | |
| 1 | Arrowhead Avenue | 1,277 | 20.0 | 2 | 0 | 5 | 2 | 29.0 |
| 2 | Central Avenue | 1,812 | 20.0 | 0 | 1 | 3 | 2 | 26.0 |
| 3 | Del Monte Street | 1,582 | 17.4 | 0 | 0 | 5 | 3 | 25.4 |
| 4 | Bluebell Drive | 17,675 | 11.5 | 4 | 1 | 5 | 2 | 23.5 |
| 5 | Scott Street | 851 | 7.4 | 6 | 1 | 5 | 1 | 20.4 |
| 6 | Dalton Avenue | 4,879 | 20.0 | 0 | 0 | 0 | 0 | 20.0 |
| 7 | College Ave West of L Street | 6,327 | 8.9 | 2 | 1 | 5 | 2 | 18.9 |
| 8 | L Street | 7,556 | 8.2 | 2 | 2 | 5 | 1 | 18.2 |
| 9 | Fordham Way | 1,157 | 13.2 | 0 | 0 | 5 | 0 | 18.2 |
| 10 | Northfront Rd West of Vasco Road | 2,821 | 17.0 | 0 | 1 | 0 | 0 | 18.0 |
| 11 | Junction Avenue | 3,011 | 3.9 | 4 | 1 | 5 | 4 | 17.9 |
| 12 | College Ave East of L Street | 6,327 | 10.6 | 0 | 1 | 5 | 1 | 17.6 |
| 13 | Crestmont Avenue | 897 | 5.9 | 6 | 0 | 5 | 0 | 16.9 |
| 14 | Alameda Drive | 782 | 1.3 | 8 | 1 | 5 | 1 | 16.3 |
| 15 | P Street | 12,297 | 9.0 | 0 | 1 | 5 | 1 | 16.0 |
| 16 | Sunflower Court | 4,812 | 10.7 | 2 | 0 | 2 | 0 | 14.7 |
| 17 | Lexington Way | 1,677 | 9.7 | 0 | 0 | 5 | 0 | 14.7 |
| 18 | Heather Lane | 3,241 | 5.3 | 4 | 0 | 5 | 0 | 14.3 |
| 19 | Herman Avenue | 3,152 | 11.2 | 2 | 0 | 0 | 1 | 14.2 |
| 20 | Pestana Way | 294 | 1.0 | 6 | 0 | 5 | 2 | 14.0 |
| 21 | Wall Street | 2,081 | 1.4 | 4 | 2 | 4 | 2 | 13.4 |
| 22 | Lomitas Avenue | 1,215 | 4.2 | 4 | 0 | 4 | 1 | 13.2 |
| 23 | Garaventa Ranch Road | 3,152 | 8.1 | 0 | 1 | 1 | 3 | 13.1 |
| 24 | Superior Drive | 1,025 | 7.8 | 0 | 0 | 5 | 0 | 12.8 |
| 25 | Scenic Avenue | 3,586 | 3.9 | 0 | 1 | 5 | 2 | 11.9 |
| 26 | Encino Drive | 2,725 | 2.2 | 4 | 0 | 5 | 0 | 11.2 |
| 27 | Mines Road | 4,522 | 6.1 | 2 | 2 | 0 | 0 | 10.1 |
| 28 | Vancouver Way | 1,845 | 2.5 | 0 | 1 | 5 | 0 | 8.5 |

Notes:

1. Normandy Circle, Alden Lane, Camella Drive, Alexander Street, Sonoma Avenue, Norma Way and Murdell Lane do not meet the minimum criteria.
2. P Street and L Street have more than two travel lanes. The Traffic Calming Program excludes streets with over two travel lanes for traffic calming devices installation.

City of Gilroy Neighborhood Traffic Management Program



Adopted by the Gilroy City Council on
November 18, 2019

Neighborhood Traffic Management Program

Prepared by Hexagon Transportation Consultants Inc., with input from:

Gilroy City Council
Gilroy Public Works
Gilroy Police Department
Gilroy Fire Department

City of Gilroy
Neighborhood Traffic Management Program

Acknowledgment

The Department of Public Works would like to acknowledge the effort and contribution of the City Council and City of Gilroy residents who have provided valuable input and feedback during the preparation of this document. Given that this is a "living document", any future comments and feedback can be submitted at the Your-Voice page below:

<https://yourvoice.cityofgilroy.org/neighborhood-traffic-management-program>

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1. INTRODUCTION

1.1. DEFINING THE PROBLEM

It is the City of Gilroy's policy to make residential streets as quiet and safe as possible. The measures identified in this document are intended to slow down traffic and discourage through traffic on residential streets, while keeping our neighborhoods accessible to police, fire, ambulance services, and the residents of Gilroy.

One of the most persistent and emotional concerns raised by residents of Gilroy is speeding on residential streets. Over past years, many requests have been received regarding excessive traffic speeds and/or volumes. In many respects, the physical makeup of the street determines traffic speeds. Wide streets encourage vehicles to speed where narrow streets tend to force drivers to drive more cautiously at lower speed. Long stretches of streets encourage higher speeds.

Everyone would like to live on a quiet street where there is little traffic and all motorists drive slowly. Nevertheless, the fact is we all must share our streets with our neighbors and other people. Just as we need to drive by other people's houses on other streets on our way to work, school or shopping, other people need to use our street to get to work, school or shopping.

This document presents a programmatic approach to addressing these issues and is ultimately aimed at making residential streets more livable by providing opportunities for neighborhoods to participate in identifying and implementing solutions to their traffic concerns. The document also provides for engineering solutions, in the form of traffic calming, as a supplement to the overall neighborhood traffic mitigation efforts.

No single solution exists for the problem of speeding vehicles on all residential streets. Therefore, many different traffic calming techniques have been developed. These techniques range from the non-physical, such as radar display boards and selective police enforcement, to physical techniques such as street chokers and neighborhood traffic circles. A discussion of the major techniques is found within this document.

A major component of traffic calming is a comprehensive citizen education/participation campaign. A citizen education/participation campaign encourages the neighborhood to help identify, and then take responsibility for the solution. Experience has shown that, except for rare cases of cut through traffic, a majority of the speeding violations in a residential area are from residents who live in the neighborhood itself.

Traffic calming techniques work best when incorporated into a "traffic calming" or "neighborhood traffic management program." Successful programs include the planning process, overall community participation and local authority support. Because residents are the main initiators of traffic calming requests, they need to be part of the process as much as possible. By developing a program early on that addresses neighborhood traffic calming concerns on an area wide basis, it encourages citizens to become actively involved in the improvement process. This way, the City and the neighborhood can work together to create more livable neighborhoods.

1.2. TRAFFIC CALMING PROGRAM DEVELOPMENT

The City's Traffic Calming document was developed with input from various city departments. These include: Police, Fire, and Public Works departments. Research into existing traffic calming practices implemented by neighboring cities was first presented to the City Council on May 15, 2017. Based on input from the public and the City Council, a traffic management plan framework was drafted and presented to the City Council on November 6, 2017. This document encompasses input from the public and the City Council on the plan framework. This document represents the City's attempt to produce a fair policy for all of Gilroy's residents and apply these policies and procedures in a consistent manner. This document/policy will be a "living document" that continues to grow and change over time based on prevailing traffic conditions and emerging technology and /or devices to best serve the residents of our City. It will be updated as needed.

1.3. PURPOSES OF THIS DOCUMENT

The purposes of this document are to:

1. Provide educational opportunities for the public regarding neighborhood traffic management issues and mitigation methods,
2. Develop criteria for the application of traffic calming devices,
3. Define a uniform process for handling neighborhood traffic concerns.

1.4. NEIGHBORHOOD TRAFFIC MANAGEMENT

The City of Gilroy's Neighborhood Traffic Management Program (NTMP) encompasses an overall approach to neighborhood traffic management through a balanced use of the three E's – Education, Enforcement and Engineering. A neighborhood traffic management approach will allow Public Works staff to place greater emphasis on the education and awareness aspect of traffic management while investigating alternative solutions to a neighborhood's traffic problems.

1.5. GOALS OF THE NTMP

Neighborhood Livability: The primary goal of the NTMP is to improve neighborhood livability through a comprehensive process that provides neighbors with the resources to reduce speeding, reduce traffic volumes, and address other traffic related issues that concern them. The NTMP focuses on residential streets with the goal of allowing children and families to feel more secure in their own neighborhoods.

Citizen Participation and Education: This goal strives to provide an educational forum where residents can be actively involved in evaluating the advantages and disadvantages of traffic management efforts. Through the NTMP process, residents can obtain an understanding of traffic calming and traffic safety techniques available in the program.

Implementation of the Goals and Policies of the General Plan: The NTMP also serves to implement some of the goals and policies of the City's current General Plan:

GOAL 12.a: A functional and balanced transportation system that provides access for all, is compatible with existing and proposed land uses, and minimizes emissions of air pollutants.

POLICIES:

12.02: System Function and Neighborhood Protection. Ensure that the existing and proposed highways, streets, bikeways and pedestrian paths serve the functions they are intended to serve, while protecting the character of residential neighborhoods.

12.03: Residential Street System Design. Design street systems in residential areas to encourage direct connections between neighborhoods; to encourage internal movement by bicycling and walking; and to provide safer and quieter neighborhoods.

1.6. BALANCING THE E'S: EDUCATION, ENFORCEMENT AND ENGINEERING

Education, enforcement and engineering – the “3 E’s” – are commonly accepted elements needed for the successful implementation of a neighborhood traffic management program. The experience of other similar programs has shown that use of only one of these E’s, without the other two, often generates a less than satisfactory result. This NTMP process takes an approach which incorporates all three elements.

- ❖ **Education:** Residents will be able to work with City staff through a variety of outlets to make informed decisions about neighborhood traffic concerns and ways to positively influence driver behavior. Educational aspects of the NTMP may include a neighborhood educational forum or other outreach opportunities.

An education approach will allow City staff to work with specific groups to target specific concerns in a way that is currently not considered under the current traffic calming program.

This approach may be able to specifically address a concern without embarking on a costly and time consuming process.

- ❖ **Enforcement:** Some strategies can be put into effect through targeted police enforcement to increase community awareness of speeding problems. The police department is committed to utilizing its available resources to respond to areas experiencing traffic problems as identified by resident concerns and conditions observed by enforcement officers.
- ❖ **Engineering:** As the engineering component of a Neighborhood Traffic Management Program, traffic calming strategies, involving physical features, can be developed using a combination of sound engineering principles and community input.

It is important for neighborhoods participating in the NTMP to recognize that traffic concerns stem from a variety of sources and that the most appropriate solution may not be an engineering one. Elements of the other “E’s” such as education and enforcement are equally valuable and are viable traffic calming measures that can be implemented in a neighborhood.

1.7. TRAFFIC CALMING IN GILROY

WHAT IS TRAFFIC CALMING?

Traffic calming began in Europe around 1970 and has grown from a non-traditional approach to a widely adopted method of reducing traffic problems on residential streets. The term “traffic calming” is defined differently throughout the United States. The Institute of Transportation Engineers, an international educational and scientific association of transportation professionals, defines traffic calming as follows:

“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 (bicyclists, pedestrians, etc...).”

The purpose of traffic calming is to alter a driver’s behavior, either by forcing a vehicle to slow or to use an alternative route, through the use of engineering solutions and the installation of physical devices.

WHAT ARE TRAFFIC CALMING MEASURES?

Neighborhood traffic calming measures attempt to address potential speeding and/or cut-through traffic issues and preserve neighborhood character and livability. Each device has its own characteristic effects on traffic flow. The primary effects produced by these controls fall into the broad categories of speed reduction, traffic volume reduction, increased driver awareness, and increased safety.

The success of traffic calming measures depends on their use in locations and situations for which they are most effective. When appropriately implemented, they tend to be effective and self-enforcing. When implemented inappropriately, they tend to be excessively violated unless aggressive enforcement efforts are made. The City’s enforcement resources are always in high

demand, and it cannot be assumed that there will be resources available to provide aggressive enforcement of new traffic controls.

1.8. LIVING DOCUMENT

The contents of this document include tools for use by citizens, Public Works staff, and other interested parties to help develop effective traffic mitigation plans that adequately accommodate motor vehicles, pedestrians, and bicyclists, while enhancing the neighborhood environment.

To be sure, the most current industry-wide information and tools are available to the program users, this document shall be considered a “living document”. It may be updated from time to time as new neighborhood traffic management and traffic calming techniques are developed and tested, and the City and neighborhoods continue to gain more experience with the program.

2. TRAFFIC CALMING

The City receives many requests, complaints, and suggestions from residents regarding neighborhood traffic issues. City staff typically addresses these concerns by improving lane markings, clarifying or adding signs, increasing police enforcement, etc. Often, these solutions can successfully abate the neighborhood's concern. In some cases, however, the traffic problems experienced in a neighborhood are more chronic (excessive speeding or short-cutting) and may require more permanent, engineered solutions. Generally, it is the City's philosophy that traffic calming measures be applied to keep non-neighborhood traffic off neighborhood streets. However, this traffic must be accommodated somewhere. In most cases, this means more traffic would be diverted to arterials and collectors because these are the streets designed to carry non-neighborhood traffic. Ultimately, the City must balance neighborhood traffic concerns (speeds and volume of traffic) with overall mobility (travel times and level of service).

All streets are eligible for some type of traffic calming measures. However, some measures are more appropriate on certain types of streets than on others. For instance, imagine residents on 10th Street requesting speed cushions to reduce traffic speeds in front of their residences. This measure would severely limit the capacity of the roadway, create significant traffic congestion, cause traffic diversions onto adjacent residential streets and increase the travel times for thousands of commuters every day. This example may appear extreme, but it is useful in demonstrating that some traffic calming measures are not appropriate for some streets. For this reason, an important distinction must be made between streets eligible for certain devices and those not eligible.

To this end, the City of Gilroy has established two categories of traffic calming measures:

Phase 1 measures can be implemented on any public City street. This category consists of easy to implement, low cost, and often less controversial tools such as: neighborhood traffic safety campaigns, radar speed display units, targeted police enforcement, most sign installations (excluding stop signs and turn-prohibition signs), and pavement striping changes. Because these measures are less involved, they can be implemented at the discretion of City staff, and do not require neighborhood consensus building.

Phase 2 measures alter the configuration of streets, impede traffic flow, change travel patterns and can be very controversial. These measures are also considerably more expensive than Phase 1 measures. Because Phase 2 measures are designed to alter travel patterns and/or impede traffic flow, they require significant engineering study and community acceptance prior to installation. For this reason, they are not appropriate for all city streets. The streets eligible for Phase 2 measures are described in the following section. Phase 2 measures require the approval of the City Council. Typical Phase 1 and Phase 2 measures are summarized on Table 1 and described in detail in Appendix A. It is important to note that even though police enforcement is listed as a Phase 1 measure, public safety officers are an integral part of any traffic calming program and will be consulted regularly during a Phase 2 traffic calming study.

2.1. DEFINITION OF A “TRAFFIC CALMING STUDY AREA”

When conducting a Phase 2 traffic calming study, it is necessary to define the area that would be affected/impacted by the installation of a Phase 2 device. There are many ways residents can be affected by a device - they could drive on that street daily, the device may be located on their street, or the device may divert traffic to their street. All residents that live on a neighborhood street within the affected area that could potentially be impacted by the installation of Phase 2 devices must be notified and participate in any Phase 2 traffic calming study. This is what is known as a “Traffic Calming Study Area.” These geographic areas are important because they become the limits of the notification area both when a study is being proposed (the petition process) and when a study is underway (the notification and survey processes). Traffic calming study areas will be defined by the Public Works Director prior to beginning the petition process.

Typically, a traffic calming study area is defined using arterial and/or collector streets as boundaries. Sometimes, however, neighborhoods do not have appropriate arterial or collector border streets that can be identified. This results in larger traffic calming neighborhoods than is necessary. Therefore, Public Works staff will use engineering judgment to size the traffic calming neighborhood appropriately for the neighborhood area being considered given the neighborhood street layout and geometrics. In essence, traffic calming study areas are confined only to neighborhood streets that would be affected by the installation of Phase 2 measures.

2.2. STREETS NOT ELIGIBLE FOR PHASE 2 TRAFFIC CALMING

The City of Gilroy exempts three categories of public streets from Phase 2 traffic calming:

- ❖ Streets designated as “Arterials” in the City of Gilroy General Plan,
- ❖ Streets used as bus routes, and
- ❖ Streets used as truck routes.

GENERAL PLAN ARTERIALS

These roadways provide a high degree of mobility while allowing direct access to abutting properties. In an urban setting, these roadways serve major activity centers and have the highest volume and longest trip demand within a city. They interconnect other major corridors to accommodate trips entering and leaving the city. These roads also serve demand for “*intra-area*” travel between the business district and outlying residential areas. An example of an arterial in Gilroy is Monterey Street.

In addition, Arterials primarily serve intra-urban or local travel, carrying traffic from Collector streets to and from other parts of the City and to limited access roadways. Access to properties bordering these streets is subordinate to the primary function of moving traffic. The typical design speed on an arterial is 45 miles per hour and it has two or four lanes. Parking is generally not provided on arterials.

Phase 2 traffic calming measures are intended for use on neighborhood streets that are not designated in the City of Gilroy General Plan as Arterials for circulation purposes (see Figure 1). The function of a neighborhood street is fundamentally different from that of an arterial, where the main priority is the efficient movement of through traffic during peak hours. On neighborhood streets, efficiency is much less of a concern because of the limited traffic demand. Instead, the primary concern is livability. Permitting Phase 2 traffic calming devices on arterial streets would undermine the effectiveness of the proposed traffic calming policies and procedures. The purpose of the Phase 2 measures is to change driving behavior within residential areas and to discourage the use of local streets by through traffic. For a residential traffic calming program to be successful, it is essential that arterial streets be defined, designed and maintained for through traffic. Sufficient capacity and appropriate operating conditions must be maintained on these more heavily traveled streets so that traffic is not forced onto local streets and into residential areas. Thus, it can be stated that the purpose of Phase 2 traffic calming, which is often to reduce traffic volumes and/or speeds, is inconsistent with the primary function of arterial streets.

GENERAL PLAN COLLECTORS

The primary function of Collector streets is a combination of access and mobility. These streets provide links between Local streets and Arterials. They are designed to serve neighborhood traffic rather than cross-town traffic, though they may include trips between adjacent neighborhoods. The design speed for collectors is typically 35 miles per hour. On-street parking is usually provided. An example of a collector in Gilroy is Church Street.

Collector streets are designated to serve as the intermediate routes connecting local streets to arterial streets. Traffic calming devices designed to address volume concerns are thus inappropriate for collector streets as they would create unwanted traffic diversions onto nearby local streets. Traffic calming devices designed to address speed concerns may be considered on collector streets provided they meet specific criteria. Device installation on collector streets

should not cause diversion to adjacent parallel streets. If there is a potential for this, streets parallel to the collector street must also be addressed with implementation of the neighborhood traffic calming plan.

GENERAL PLAN LOCALS

Unlike others categories, local roads are not intended for use in long distance travel except at the origin or destination end of a trip. These roads are typically classified by default after arterial and collector streets have been identified. Local roads provide the highest level of accessibility and carry no through traffic movement. The primary function of local streets is access to adjacent land uses. Parking is usually provided along local streets and speed limits are typically 25 miles per hour. Local streets will be the primary target for traffic calming devices to mitigate both speeding issues and cut-through traffic issues. Both physical and non-physical devices are allowed on these streets.

The City's functional roadway classifications are identified in the General Plan Circulation Element. The roadway classification definitions are subject to the most current General Plan document.

TRUCK ROUTES

The City of Gilroy does not have designated truck routes within the current General Plan. However, there are streets within the City of Gilroy that are frequented by trucks. Future General Plan updates may include designated truck routes. These streets have design features to accommodate the special demands of truck traffic. For this reason, these streets are often wider than their counterparts and are constructed with higher load bearing pavement sections. Any attempt to divert truck traffic away from these streets would result in an increased number of trucks on local streets. This could cause pavement damage, unsafe conditions for motor vehicles, and complaints from the surrounding residences and businesses. Truck routes are mostly comprised of arterial and collector streets and are listed below:

- ❖ US 101
- ❖ SR 152 (First Street)
- ❖ Monterey Road – north of First Street, south of Tenth Street
- ❖ Leavesley Road – Monterey Street to US 101
- ❖ Railroad Street – Old Gilroy Street to Lewis Street
- ❖ Old Gilroy Street – Railroad Street to Alexander Street
- ❖ Alexander Street – Old Gilroy Street to Tenth Street
- ❖ Chestnut Street – Luchessa Avenue to Tenth Street
- ❖ Luchessa Avenue – Monterey Road to Mayock Road

These current truck routes, or future General Plan-designated truck routes, are unsuitable for Phase 2 traffic calming devices (see Figure 2).

BUS ROUTES

Streets used by the VTA bus system are not eligible for most Phase 2 traffic calming devices. Specifically, those devices that would cause a vertical displacement of the bus (speed cushions and raised surfaces), or devices that would impede the ability of a bus to maneuver (barriers, closures, diverters, and circles) would not be permitted on a designated bus route. Since Phase 2 measures impede traffic flow, they would either divert or significantly slow buses, thereby lengthening travel times for bus passengers. Over the long-term, it is counter-productive to create inefficiencies in the local transit system (which encourages the use of single occupant vehicles) while simultaneously attempting to remove automobile traffic from neighborhoods. In addition to increased travel times, traffic calming measures such as speed cushions can result in increased bus maintenance costs and cause significant discomfort for passengers. For these reasons, it is important to promote transit ridership by maintaining unobstructed routes and promoting transit efficiency. VTA bus routes in Gilroy are shown graphically in Figure 3. In most cases, these routes are located on arterial and collector streets.

2.3. TRAFFIC CALMING CRITERIA

CRITERIA FOR PHASE 1 MEASURES

All streets qualify for Phase 1 traffic calming measures. In order to ensure that expensive Phase 2 measures are installed only where necessary, it is City of Gilroy's policy to exhaust all applicable Phase 1 traffic calming measures before applying Phase 2 measures. Because Phase 1 measures are non-controversial and relatively inexpensive, they can be implemented at the discretion of the Public Works Director and do not require public outreach. This allows City staff to respond quickly to neighborhoods where chronic traffic problems exist. Phase I measures can easily be implemented within a neighborhood so long as they are used in moderation, meet the threshold for some Phase I devices, and do not significantly impact maintenance costs to the City.

CRITERIA FOR PHASE 2 MEASURES

Phase 2 measures may result in significant consequences beyond the street in question. For this reason, the City of Gilroy has developed special minimum criteria for the installation of Phase 2 measures. Changes in these criteria are subject to approval from the City Council. These are described in the next section.

The City of Gilroy does not recognize stop sign installations as a traffic calming measure. Stop signs should be installed per standards and specifications outlined in the California Manual of Uniform Traffic Control Devices (CA MUTCD), which provides uniform standards and specifications for all official traffic control devices in California. Per CA MUTCD, stop signs should not be used for speed control. The City has a standard procedure for responding to stop sign requests that is outside the purview of the NTMP.

GENERAL CRITERIA FOR ALL PHASE 2 MEASURES

ALL of following general criteria must be met to consider the installation of any Phase 2 traffic calming measure:

- ❖ The street must be residential in nature, and be classified as a local street or collector street. (Note: Phase 2 measures to address speeding concerns are permitted on collector streets. Phase 2 measures to address cut-through traffic are not permitted on collector streets.)
- ❖ The street must not be a bus route, used by a VTA bus route, or identified as an arterial in the City of Gilroy General Plan.
- ❖ An appropriate street location for the device(s) shall be available. Appropriate distance from driveways, manholes, drain inlets, water valves, street monuments, fire hydrants, and other appurtenances shall be considered. Devices shall be installed only where a minimum safe stopping sight distance can be provided. Specific guidelines for speed cushions and round-a-bouts are described later in this chapter.
- ❖ A majority of the impacted residents or businesses must support the installation, with higher response rates and support rates on the streets where the traffic calming devices are proposed. This is measured from those who respond to a neighborhood survey. The City will make a good faith effort to survey all impacted residents and property owners within the traffic calming study area of the proposed Phase 2 traffic calming plan. The boundaries of the affected areas as well as the identification of the impacted residents for the survey will be determined by the Public Works Director.
- ❖ Installation must not result in traffic diversions to other neighborhood streets greater than what is allowed on the Portland Impact Threshold Curve (see Figure 4). The Portland impact curve is designed to ensure that any traffic diversion from one neighborhood street to another would be “non-noticeable,” with a couple caveats. It states that streets with almost no daily traffic (100 or less daily trips) could see considerable percentage increases and still have a livable neighborhood and streets that are already heavily impacted by traffic (3,000 trips or more) should not have to deal with even more traffic.
- ❖ Though a traffic calming neighborhood is addressed as a whole, engineering judgment must be used when identifying when to use physical traffic calming devices. Thus, unless determined otherwise, only those streets within the neighborhood that meet the Phase 2 thresholds may be considered for physical traffic calming devices. Other streets within the neighborhood may be treated with Phase 1, non-physical, devices.

These criteria are designed to ensure that those most affected by traffic calming measures are supportive and that suitable locations for the devices exist. Please note that these are minimum criteria. Satisfying the criteria does not necessarily mean that a device will be installed.

PHASE 2 – SPEED CONTROL CRITERIA

Traffic calming measures designed to reduce speeds include: speed cushions, roundabouts/traffic circles, chokers, raised intersections, etc. In addition to the General Criteria stated for all Phase 2 measures, the following criterion must be met to consider the installation of Phase 2 measures intended to slow traffic speeds:

- ❖ The 85th percentile speed on a residential or collector streets must be greater than 7 miles per hour over the posted speed limit, or 70% of the measured traffic must exceed the posted speed limit.

85th Percentile Speed – The 85th percentile speed is defined as, “the speed at or below which 85 percent of all vehicles are observed to travel under free-flowing conditions past a monitored point.” Traffic Engineers use the 85th percentile speed as a standard to set the speed limit at a safe speed, minimizing crashes and promoting uniform traffic flow along a corridor. It is common for vehicles to exceed the posted speed limits on residential streets. Nationwide studies have shown that the average 85th percentile speed on a residential street is 32 miles per hour, or 7 mph over the most commonly used posted speed limit of 25 mph.

70% Criteria – A recent study has shown that there is a direct correlation between the measured 85th percentile speed and the number of vehicles that are known to be exceeding the speed limit. The results of the study indicate that roadways with the 85th percentile speed measured at 32 miles per hour roughly experience 70% of the measured vehicles exceeding the posted speed limit of the roadway.

Therefore, a street would qualify for speed related traffic calming improvements if the measured speed for any stretch of the street meets or exceeds either the “speed limit + 7 mph” threshold, or the 70% threshold. Satisfying the criteria does not necessarily mean that a device will be installed.

The City of Gilroy allows traffic calming measures designed to reduce speeds to be placed on both local streets and collector streets. For collector streets, a six-month pilot period is required prior to permanent placement of physical devices. City of Gilroy Public Works staff will conduct a before-and-after study to determine whether the pilot device on the collector street is effective in reducing the travel speed below the threshold. Permanent devices will be installed on collector streets only if the pilot period proves that the device is effective. For this situation, effectiveness occurs when the device reduces the 85th percentile speed below the “speed limit + 7 mph” threshold, or 70% of vehicles no longer exceed the posted speed limit.

PHASE 2 – TRAFFIC DIVERSION CRITERIA

Traffic calming measures designed to create diversions include: turn restrictions, diverters, median islands, etc. In addition to the General Criteria stated for Phase 2 measures, the following criteria must be met to consider the installation of Phase 2 measures intended to divert roadway traffic:

- ❖ The street must be classified as a “Local” street by the City of Gilroy General Plan.
- ❖ The Average Daily Traffic (ADT) volume on the street must exceed 1,000 trips per day.
- ❖ At least 25% of the daily traffic on a residential street must be “cut-through.”

Cut-through traffic is defined as traffic with neither an origin nor a destination within the neighborhood that the street is designated to serve. The neighborhood area varies based on the designation of the street. The neighborhood area used to identify cut-through traffic will be determined by Public Works staff.

The 1,000 trips per day ADT threshold and the 25% “cut-through” threshold are based on research of other cities in the Bay Area with similar traffic calming policies. These are minimum criteria for screening eligible streets. Satisfying the criteria does not necessarily mean that a device will be installed.

If a street has less than 1,000 daily trips, regardless of the origins and destinations of its traffic, the City of Gilroy deems it is carrying a reasonable amount of traffic and does not qualify for Phase 2 measures. The 25% “cut-through” criterion is designed to separate residential streets that, by their design, will carry more than 1,000 daily trips. In these cases, it is important to determine the percentage of traffic generated from within the neighborhood versus that which “cuts-through” the neighborhood.

PHASE 2 – HIGH COLLISION RATE CRITERIA

Streets that experience high speeds also have a tendency to exhibit a high rate of vehicle collisions. For this reason, collisions will be used to justify the installation of Phase 2 traffic calming devices when either speed or volume thresholds are not met. For the collision criteria to be met, the street segment in question must exhibit more than five (5) reported or documented collisions within the past three years. These collisions must be considered preventable with the implementation of Phase 2 traffic calming devices. The accident rate along the street segment, over the past three years, and how it compares with regional standards for similar types of roadways, will also be considered.

ADDITIONAL PHASE 2 CRITERIA

A number of traffic calming improvements are identified in this document as Phase 2 devices. They include physical improvements, both horizontal and vertical in nature, that either divert traffic or cause vehicles to slow. It should be noted that no traffic calming program will be permitted to incorporate any device that affects the ability of the Fire and/or Police Departments to provide effective and efficient emergency services to the community. All traffic calming plans will be reviewed by Fire and Police and specific devices approved on a case by case basis depending on the programs effect on the delivery of emergency services.

Appendix A describes a number of these devices. Of the Phase 2 devices, the most commonly used are the speed cushion and the traffic circle. These devices require further consideration in addition to the general speed and diversion criteria. Below is a listing of the additional considerations that must be met for the safe and successful installation of a speed cushion or traffic circle.

ADDITIONAL PHASE 2 CONSIDERATIONS – SPEED CUSHIONS

In addition to the General and Speed Control criteria, the following guidelines should be considered for the installation of speed cushions along with engineering judgment:

- ❖ The street should have adequate existing curb and gutter on each side to prevent ponding of water in the area of the speed cushion.
- ❖ The affected street segment should be of an adequate length for a speed cushion to be effectively installed. Typically, a minimum length of 300 - 500 feet is desirable.
- ❖ Speed cushions shall not be installed on streets with posted speed limits greater than thirty (30) miles per hour.
- ❖ The first speed cushion in a series should be located in a position where it cannot be approached at high speed in either direction. To achieve this, the first hump ideally should be located approximately 200 feet from an intersection stop sign.
- ❖ Where possible, speed cushions should not be placed on curves, but on tangent stretches of roadway. However, in areas where placement on curves is unavoidable, proper horizontal and vertical sight distance should be provided.
- ❖ Speed cushions should be located at or near residential property lines and away from driveways, when possible.
- ❖ Speed cushions should be located near street lights to illuminate them for safe bike and pedestrian activity at night.
- ❖ Speed cushions should be accompanied by the appropriate advanced signage and street markings.
- ❖ Spacing between speed cushions should be as even as possible to produce uniform speed along an entire street. Speed cushions in a series should be placed between 200 and 600 feet apart, which may vary depending on the length of the street segment where the devices are placed. Typically, speed cushions are placed farther apart on longer segments than shorter segments. Spacing should allow at least one speed cushion on each block.
- ❖ The existence of Class II or Class III bicycle facilities should be taken into consideration when placing speed cushions in a neighborhood.

As a practical matter, these guidelines cannot always be met. For this reason, these guidelines are subject to review by the Public Works Director, who may modify these criteria in a particular situation to achieve the desired result – the safe and effective application of the speed cushion(s).

ADDITIONAL PHASE 2 CONSIDERATIONS - TRAFFIC CIRCLES AND ROUNDABOUTS

In addition to the General and Speed Control criteria, the following guidelines should be considered for the installation of roundabouts and traffic circles along with engineering judgment (see also Figure 5):

- ❖ The intersection should be a minimum of 55 feet diagonally across (both directions, measured from the curb face).
- ❖ Crosswalks should be located a minimum of 12-feet from the interior circle (measured from the curb face of the circle to the white stripe of the crosswalk).
- ❖ The circle should allow for a minimum 22-foot wide travel lane for circulating traffic (measured from the curb face of the interior circle to the curb return).
- ❖ The interior diameter of the circle should be a minimum of 10 feet (measured curb face to curb face).
- ❖ Traffic circles should not be used in conjunction with stop signs at a given location.
- ❖ The intersection should meet minimum approach volume criteria as prescribed by established traffic engineering publications.
- ❖ The circle should be installed with vertical curb when fire department, or large vehicle, circulation is not affected. For other locations mountable, or rolled, curbs are preferred.
- ❖ The circle should allow for proper sight distance across the intersection.
- ❖ Existing utilities and access to maintenance facilities, such as manholes, should be accommodated when determining what material is to be used within the traffic circle or roundabout.

As a practical matter, these guidelines cannot always be met. For this reason, these guidelines are subject to review by the Public Works Director, who may modify these criteria in a particular situation to achieve the desired result – the safe and effective application of traffic circles and roundabouts.

2.4. PROGRAM THRESHOLDS

Since distinct traffic calming devices are available to address either speed or volume issues within a neighborhood, staff has the flexibility to use discretion on the exact threshold limits. Either threshold, either speed or diversion, may be used when developing a traffic calming program to better pinpoint the concerns of a neighborhood and directly concentrate on a solution to address the concern. Thus, a neighborhood that has speeding concerns, and which meets the speed threshold, may develop a program that only includes speed control devices.

2.5. MEASUREMENT CRITERIA

Typically, mid-week traffic counts, when any nearby school is in session, will provide results that show the highest values for speed and volume on a neighborhood street. Thus, to determine the worst case for traffic on a neighborhood street, traffic counts will be collected for a three-day, mid-week period when an adjacent school (if any) is in session.

2.6. CEQA REVIEW OF TRAFFIC CALMING PLAN

Depending on which Phase 2 traffic calming devices are used in a traffic calming plan, diversion may occur on adjacent streets, or in adjacent neighborhoods. For programs where extensive diversion is expected, an environmental and traffic mitigation study may be conducted in accordance with the California Environmental Quality Act (CEQA). The City Council must approve the environmental review document prior to the review and approval of the traffic calming plan.

2.7. POLICE AND FIRE DEPARTMENT REVIEW OF TRAFFIC CALMING PLAN

The City of Gilroy Fire Department and Police Department are supportive of the neighborhood traffic management and traffic calming plan. However, it is also imperative that the timely delivery of and accessibility of emergency services are maintained. All proposed Phase 2 traffic calming device installations will be reviewed by the Fire Department and Police Department to ensure they are acceptable.

3. TRAFFIC CALMING PROCEDURES

One of the primary interests in developing a neighborhood traffic calming policy is to provide a clear structure for addressing the concerns of the city’s neighborhoods while spending an appropriate amount of staff time to address neighborhood traffic concerns. Traffic concerns may exist throughout an entire neighborhood or may be specific to a particular street, roadway segment, or spot location. The process developed by the City of Gilroy allows for the timely implementation of non-controversial Phase 1 traffic calming measures and a comprehensive public outreach effort for requests of a more controversial nature. The overall traffic calming process is outlined on Figure 6.

3.1. PROCESS INITIATION

The traffic calming process begins with a specific request to the Public Works Department from a neighborhood resident by letter, phone call, or email. After determining the nature of the request, City staff will undertake the following procedure:

1. Forward a copy of the city’s Neighborhood Traffic Management Program to the resident and ask the resident to file a traffic calming request form (see Figure 8). This will help staff understand the nature of the resident’s concern.
2. After receipt of the completed form, staff will review the street in question, collect traffic counts, analyze reported collisions over the past three years, and conduct an analysis of the current traffic conditions using traffic engineering industry-standard best practices.
3. If the traffic analysis indicates that no traffic calming thresholds were met (speed, volume or collisions), staff may recommend the installation of Phase 1 traffic calming improvements to address the resident’s concerns. The requesting party will be notified of the results of the traffic analysis and the installation of any recommended improvements. The resident must wait a minimum of one year to again request traffic calming improvements.
4. If the traffic analysis indicates that one or more traffic calming thresholds are met, staff will identify and install appropriate Phase 1 devices in the area of concern. The requesting party will be notified of the results of the traffic analysis and the recommended improvements to be installed.
5. Following a period of time for traffic to normalize given the installation of the Phase 1 improvements (usually 1 to 3 months), staff will conduct a follow-up traffic

analysis to determine if the traffic calming thresholds are still being met. If the resident’s concerns are abated through the use of Phase 1 traffic calming measures during this trial phase, no further action is then necessary. If this is done, the resident must wait a minimum of one year to again request traffic calming improvements.

6. If one or more traffic calming thresholds are met, City staff will rank the neighborhood based on a priority ranking system and place the neighborhood into a priority list with other ranked neighborhoods.
7. Once the neighborhood is at the top of the priority list, the traffic calming neighborhood support process is commenced as described below.
8. If the petition process is successful, City staff conducts additional traffic analysis to determine if any of the other streets within the defined traffic calming study area meet the thresholds for Phase 2 traffic calming devices. Only those streets that meet the thresholds are eligible for the installation of physical Phase 2 traffic calming devices. Phase 1 improvements may be applied to non-qualifying streets within the study area.

3.2. PRIORITIZING TRAFFIC CALMING REQUESTS

Due to funding and limited traffic staff resources, all neighborhoods that meet Phase 2 traffic calming thresholds will be placed into a priority list based on a priority ranking system. This is a common approach used by many other cities in the Bay Area to efficiently utilize city resources to prioritize projects so that neighborhoods with greater problems are addressed first. The priority ranking system scores a neighborhood using the following metrics:

| Criteria | Point Value |
|--|--|
| Traffic Speed (85 th Percentile) | 2 points for each mph difference between the 85 th percentile speed and the posted or prima facie speed limit |
| Volume | 1 point for each 500 vehicles over 1,0000 vehicles per day 5 points if 40-65% or more ADT on local street is cut through traffic between arterials or collectors 10 points if cut through is higher than 65% |
| Crash History (# of accidents in last 3 years) | 2 point – 1 to 2 accidents 4 points – 3 to 5 accidents 8 points – Over 6 accidents 5 points – Each crash involving a pedestrian or a cyclist in past 3 years 5 points – Each crash resulting in a significant injury 10 points – Each crash resulting in a fatality |
| Pedestrian Generators (15 pts. max) | 5 points for each school, park, library or community center along roadway 3 points if within 1 block |

| | |
|--|---|
| | 2 points if within 2 blocks |
| Support | 3 points for 80% petition support 2 points for 70% petition support |
| Unique Conditions (15 pts. max) | 5 points for designation as a bike facility 5 points for unique roadway geometry that substantially restricts visibility 5 points for high crash rate |

3.3. NEIGHBORHOOD SUPPORT PROCESS

Traffic calming studies require considerable staff resources at taxpayer expense. For this reason, it is important that a significant portion of the neighborhood supports the undertaking of a study. The neighborhood support process is reserved for Phase 2 concerns that meet Speed Control, Traffic Diversion, and/or Collision thresholds. Neighborhood endorsement is demonstrated through a residential petition. These are described below.

TRAFFIC CALMING NEIGHBORHOOD DETERMINATION AND STUDY AREA PETITION

The petition process is necessary to determine whether a resident’s concern is widespread. When conducting a petition, City staff will work with the resident to define the traffic calming study area, which becomes the designated notification area boundaries for all future contact with the residents within the study area. Though the limits of the study area are determined through a collaborative process with staff and the neighborhood, the Public Works Director shall make the final determination of the traffic calming neighborhood boundary limits should the need arise. The study area is typically bounded by arterials and collectors, but staff may use engineering judgment to limit streets from the neighborhood that are far removed from the problem area or would not be impacted by any proposed improvements. Staff will supply the resident with a highlighted map identifying the limits of the petition area and a neighborhood-specific petition form (see Figure 9).

It is the resident’s responsibility to collect signatures from as many residents and property owners in the study area as possible. One signature is collected per property, except in the case of multi-family residential buildings, where each tenant is allowed one signature per unique address, in addition to that of the property owner. A petition is deemed successful if more than 60% of the eligible signees within the designated traffic calming study area sign the petition, and the petition is returned within one month. Additional priority is given for a higher level of neighborhood support.

3.4. PHASE 2 PROGRAM DEVELOPMENT

OUTREACH AND PUBLIC PARTICIPATION

The City of Gilroy recognizes that resident participation is a critical element of the Phase 2 plan development. For this reason, staff will conduct an outreach forum inviting the residences and businesses in the affected area to a neighborhood meeting to introduce traffic calming program concepts.

At the first outreach forum, staff will introduce the concepts of Neighborhood Traffic Management, various traffic calming concepts including the functions of various traffic calming devices, provide an overview of the process with associated timelines, and address any questions. Through this meeting, staff will identify the significant traffic calming interests of the neighborhood.

TRAFFIC CALMING PLAN DEVELOPMENT

Based on the input received during the outreach forum, Public Works staff will develop a draft neighborhood traffic calming plan to meet community needs and address their concerns. Staff will use engineering judgment to determine the most efficient devices, and the most effective placement, to address the neighborhood issues. Every effort will be made to develop the traffic calming program that addresses the neighborhood's interests, while considering excessive device and sign clutter. When placing devices within a neighborhood, staff will make every effort to limit device impacts on driveways, and visual effects to the adjacent resident.

DEPARTMENT REVIEW OF TRAFFIC CALMING PLAN

The draft plan developed by Public Works staff must be reviewed by the various City departments that may have an interest in the elements of the program. These departments include:

- ❖ Public Works Engineering – Evaluation of the traffic plan elements on the City right-of-way, evaluation of any landscaping and irrigation contained within plan elements, and review of the plan costs to determine if within available budget.
- ❖ Planning Division – CEQA Evaluation (if necessary)
- ❖ Police Department – Evaluation to determine if the plan elements can be implemented without any detrimental effect to the delivery of emergency services. Reivew to determine the level of enforcement needed for the plan elements.
- ❖ Fire Department – Evaluation to determine if the plan elements can be implemented without any detrimental effect to the delivery of emergency services.
- ❖ Public Works Maintenance Division – Evaluation to determine plan's effect on street sweeping, access to utilities and/or maintenance facilities (manholes).

Through review of the plan by the various City departments, the following issues may be considered by City staff and discussed with the program proponents:

- ❖ Effectiveness of the selected traffic calming devices
- ❖ Effects on the ability of Police and Fire to successfully provide emergency services to the area
- ❖ Noise impacts
- ❖ Loss of parking
- ❖ Liability exposure implications
- ❖ Visual impacts and aesthetic concerns
- ❖ Increased maintenance costs

Any comments on the traffic calming plan must be addressed through appropriate modification to the traffic calming plan. The plan may not proceed forward unless supported by all interested City departments.

NEIGHBORHOOD MEETING TO INTRODUCE TRAFFIC CALMING PLAN

Once the traffic calming plan has been approved by all interested City departments, a second neighborhood meeting is scheduled to introduce the plan and answer any questions. Based on the comments obtained from the meeting regarding the draft traffic calming plan, Public Works staff may elect to revise the plan accordingly and request a subsequent review from all affected City departments, or decide to move forward if the comments are not substantive.

SURVEY OF NEIGHBORHOOD FOR PROGRAM SUPPORT

As the final stage in the public outreach process, the affected streets within the traffic calming neighborhood are polled using a mailed secret ballot to determine support for the Phase 2 traffic calming plan. Voting on a Phase 2 traffic calming plan shall be as follows:

- ❖ One vote per single family residence
- ❖ One vote per multi-family residence
- ❖ One vote per apartment unit

One vote is allowed for each owner of property within the neighborhood who is a non-resident (one vote regardless of the number of developed or undeveloped properties owned). The neighborhood will have two weeks to return their ballots.

CITY COUNCIL REVIEW OF NEIGHBORHOOD TRAFFIC CALMING PLAN

The results of the traffic calming survey are then summarized in a staff report and presented to the City Council for consideration. Notice of the meeting is provided to the traffic calming neighborhood area, and the meeting is posted through our social media outlets.

For staff to recommend approval of the neighborhood traffic calming program, the following survey results must be achieved:

- ❖ The survey receives at least a 50% response rate
- ❖ 60% of those responding must approve the program
- ❖ A significant majority of the properties within 100 feet of proposed device locations must respond and vote to approve the program

Should the results of the traffic calming survey not meet the above criteria, staff will recommend denial of the traffic calming program to the City Council.

CITY COUNCIL APPROVAL OF PROGRAM FUNDING

During each budget cycle, approved programs will be placed into the City's Capital Improvement Program (CIP), and funding will be sought from the City Council. Staff will recommend approved programs on a prioritized basis using the priority ranking system. Any approved program that does not receive Council approval for implementation funding will have to compete with other approved projects requesting funding during the next budget funding cycle.

3.5. SCHEDULE

Neighborhood traffic calming studies do not lend themselves to predictable schedules. The timing of events varies considerably from case to case. Considerations that affect program timing include:

- ❖ Level of community interest in the program, and number of requests
- ❖ Size of area and complexity of plan alternatives,
- ❖ Time necessary to obtain required petition signatures,
- ❖ Difficulty in scheduling community meetings,
- ❖ Scale and complexity of final design and construction contract requirements,
- ❖ Funding availability,
- ❖ Weather effects on construction season, and
- ❖ Competing demands on staff resources.

Although it is conceivable that a relatively simple project could be completed in as little as 12 months from qualifying petition to installation, as a practical matter, a project duration in excess of 18 months to two years would not be uncommon. Figure 6 shows an example schedule for traffic calming measure installation.

3.6. TRAFFIC CALMING BUDGET

Funding for all costs related to the NTMP, including but not limited to data collection costs, potential consultant costs, plan development, and device installation/removal costs will come from the City of Gilroy General Fund.

3.7. DEVICE REMOVAL

The neighborhood must petition the City to have devices removed. The ensuing process to remove the devices would be very similar to the initial traffic calming program development in terms of public outreach, engineering study, and neighborhood support. Should a neighborhood successfully manage a request for removal of a traffic calming device through this process, the device will be removed once funding becomes available.

TABLES AND FIGURES

Table 1: Summary of Typical Traffic Calming Measures

| Method | Phase | Beneficial Effects | | Undesirable Effects | | | | | Potential Cost * |
|--------------------------------------|-------|--------------------|----------------|---------------------|--------------|------------------|----------------------------|-----------------------------|----------------------|
| | | Reduces Speed | Reduces Volume | Increase Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increase Street Maintenance | |
| Community Outreach/Education | 1 | Possible | Possible | No | No | No | No | No | Varies |
| Police Enforcement of Speed Limits | 1 | Yes | Possible | No | No | No | No | No | Varies |
| Speed Display Units | 1 | Yes | No | No | No | No | No | No | \$ 250 per day |
| High Visibility Crosswalks | 1 | Possible | No | No | Possible | No | No | Yes | \$1,500 - \$30,000 |
| Speed Limit Signs | 1 | Possible | No | No | No | No | No | No | \$280 - \$350 |
| Narrow Lane Striping | 1 | Possible | Possible | No | No | No | No | Yes | \$1,500 - \$3,000 |
| Bott's-Dots/Rumble Strips | 1 | Yes | No | Yes | No | No | No | Yes | \$2,000 - \$4,000 |
| Turn Restriction Signs ** | 2 | No | Yes | Possible | No | Yes | No | No | \$280 - \$350 |
| Curb Extensions *** | 2 | Yes | Possible | No | Yes | No | Yes | Possible | \$15,000 - \$30,000 |
| Speed Cushions **** | 2 | Yes | Possible | Yes | Possible | No | Yes | Yes | \$7,500 |
| Traffic Circles & Round-a-bouts **** | 2 | Yes | Possible | No | Yes | No | Yes | Yes | \$35,000 - \$115,000 |
| Median Barriers *** | 2 | Possible | Yes | No | Possible | Yes | Yes | Possible | \$7,500 - \$45,000 |

* These costs represent potential device construction and/or installation costs on a typical street. They do not include program development or CEQA review.

** Requires significant commitment of Police Department staff resources to enforce on a regular basis to maintain effectiveness.

*** Cost does not include any long term maintenance of green infrastructure, landscaping or irrigation.

**** Speed cushions shall not be installed on streets with the posted speed limits greater than 30 MPH.

Figure 1: Gilroy General Plan Functional Street Classification

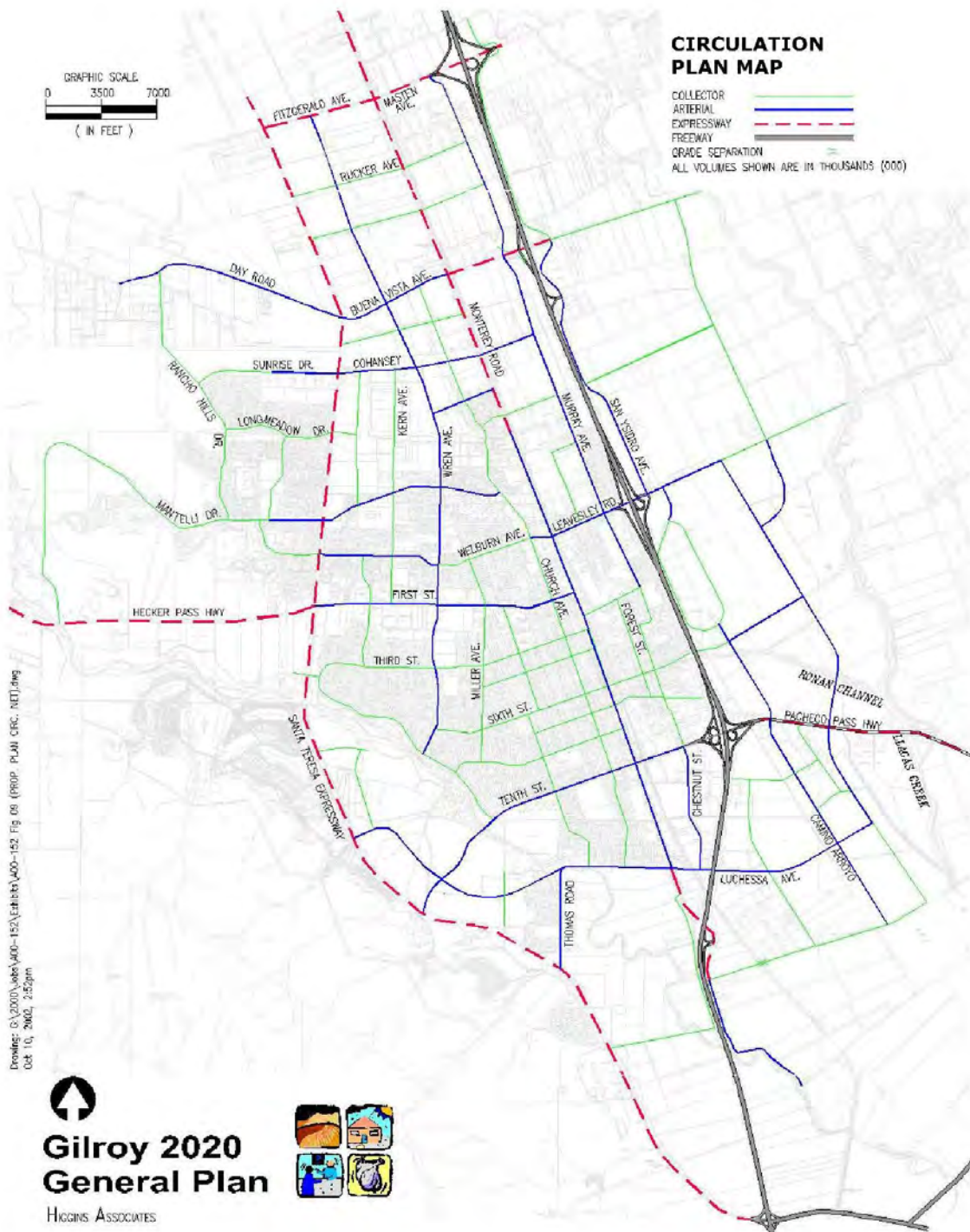


Figure 2: Gilroy Truck Routes

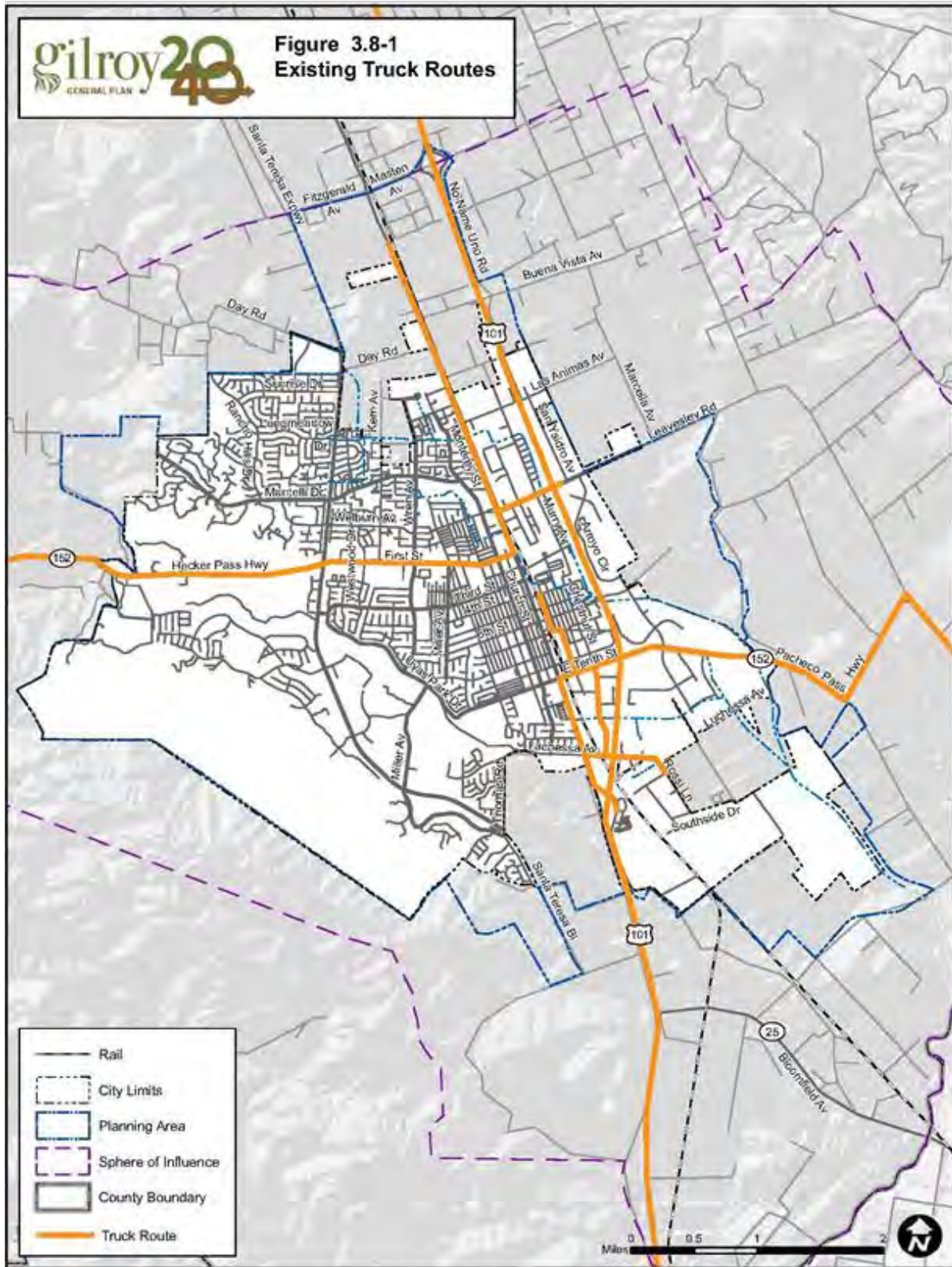


Figure 3: Gilroy VTA Route Map

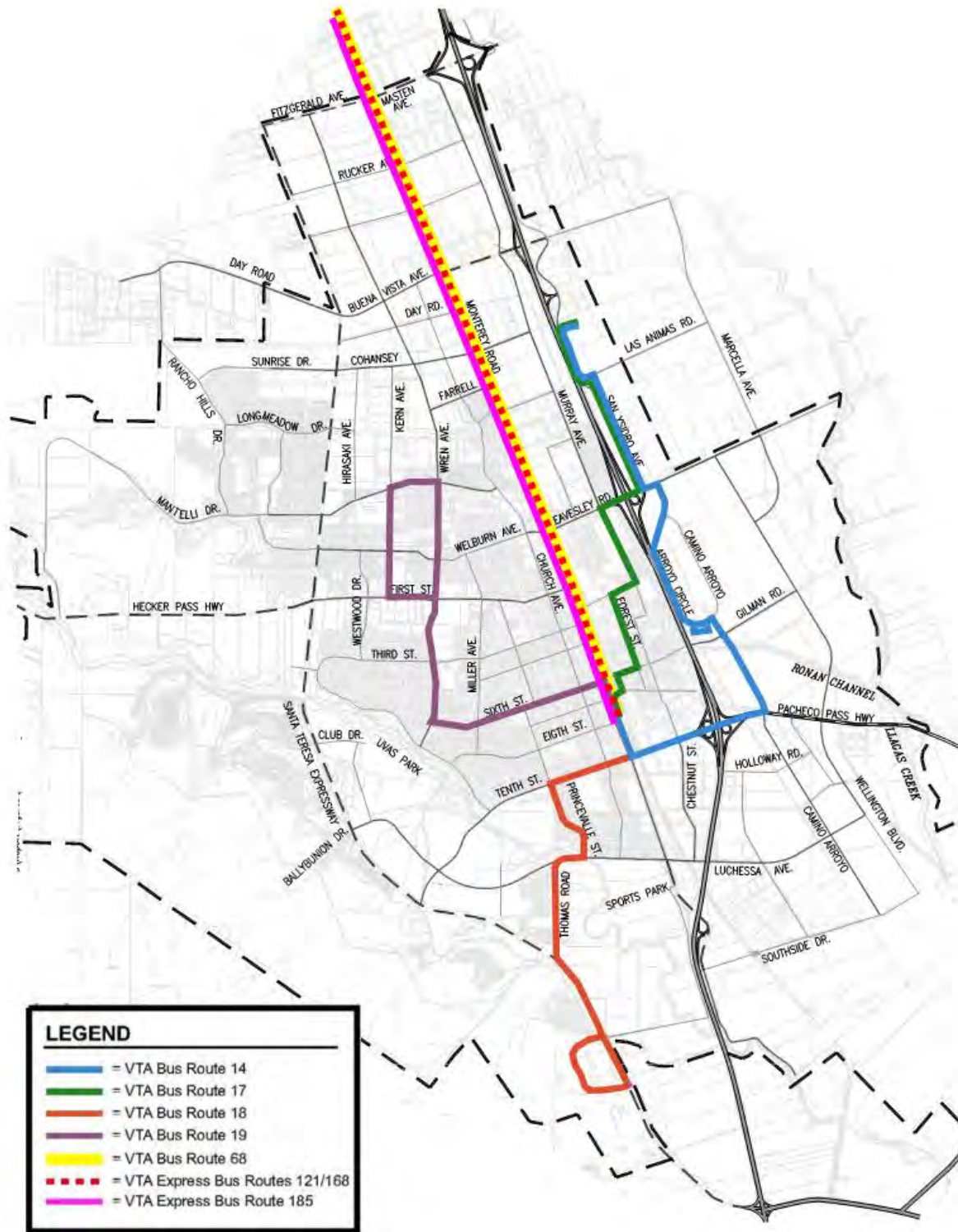


Figure 4: Portland Impact Threshold Curve

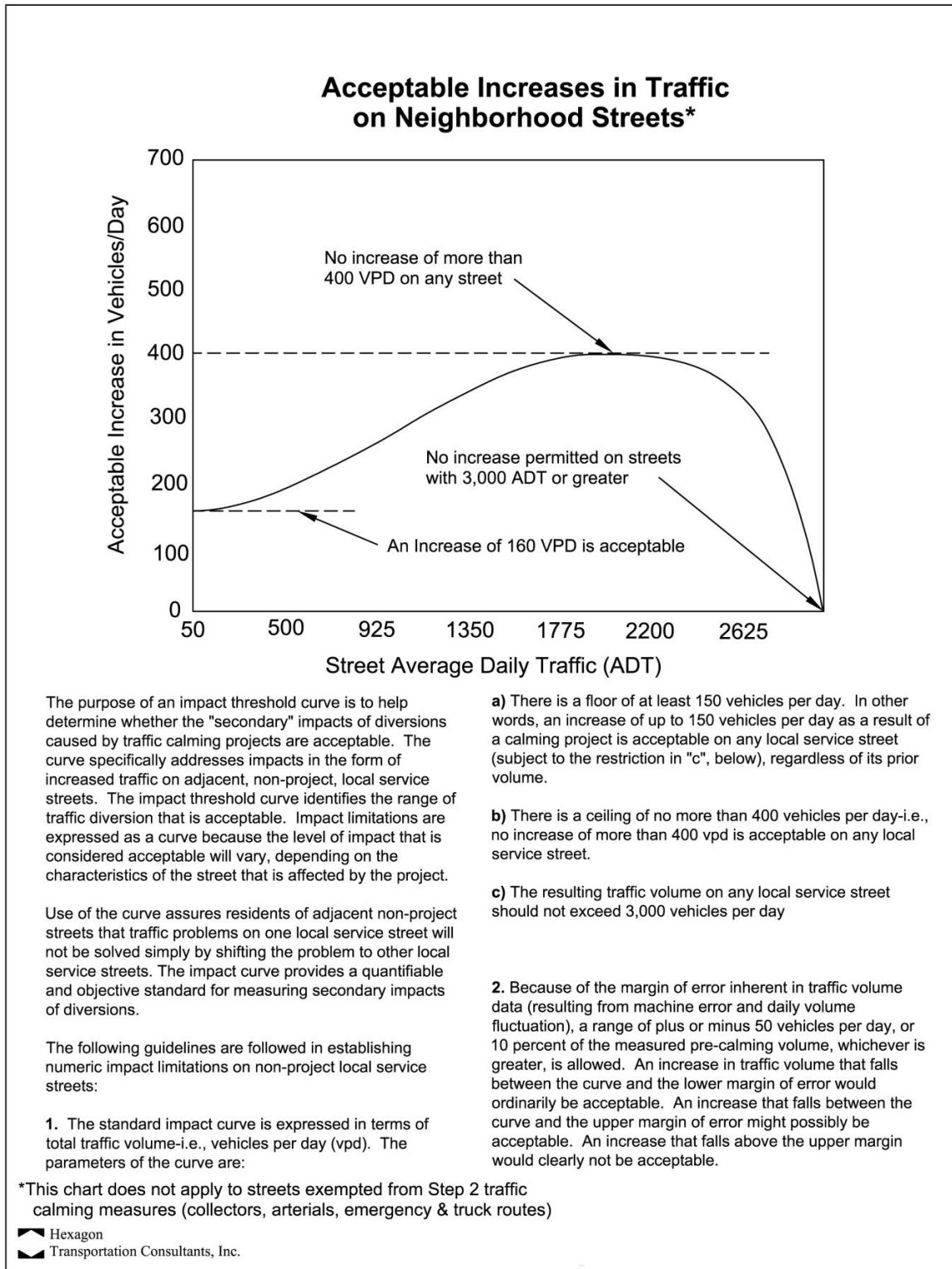


Figure 5: Traffic Circle and Roundabout Criteria

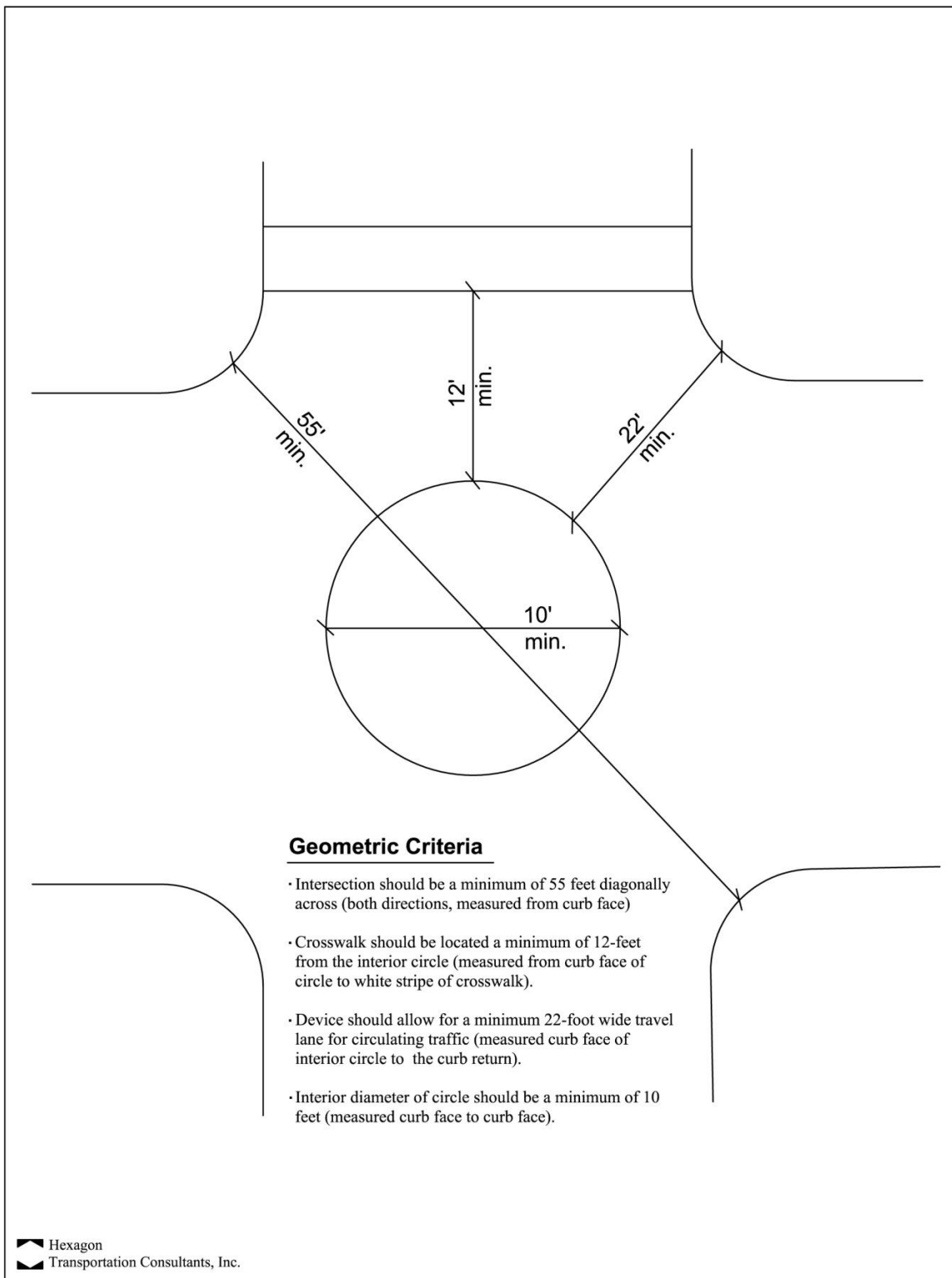


Figure 6: Traffic Calming Procedure

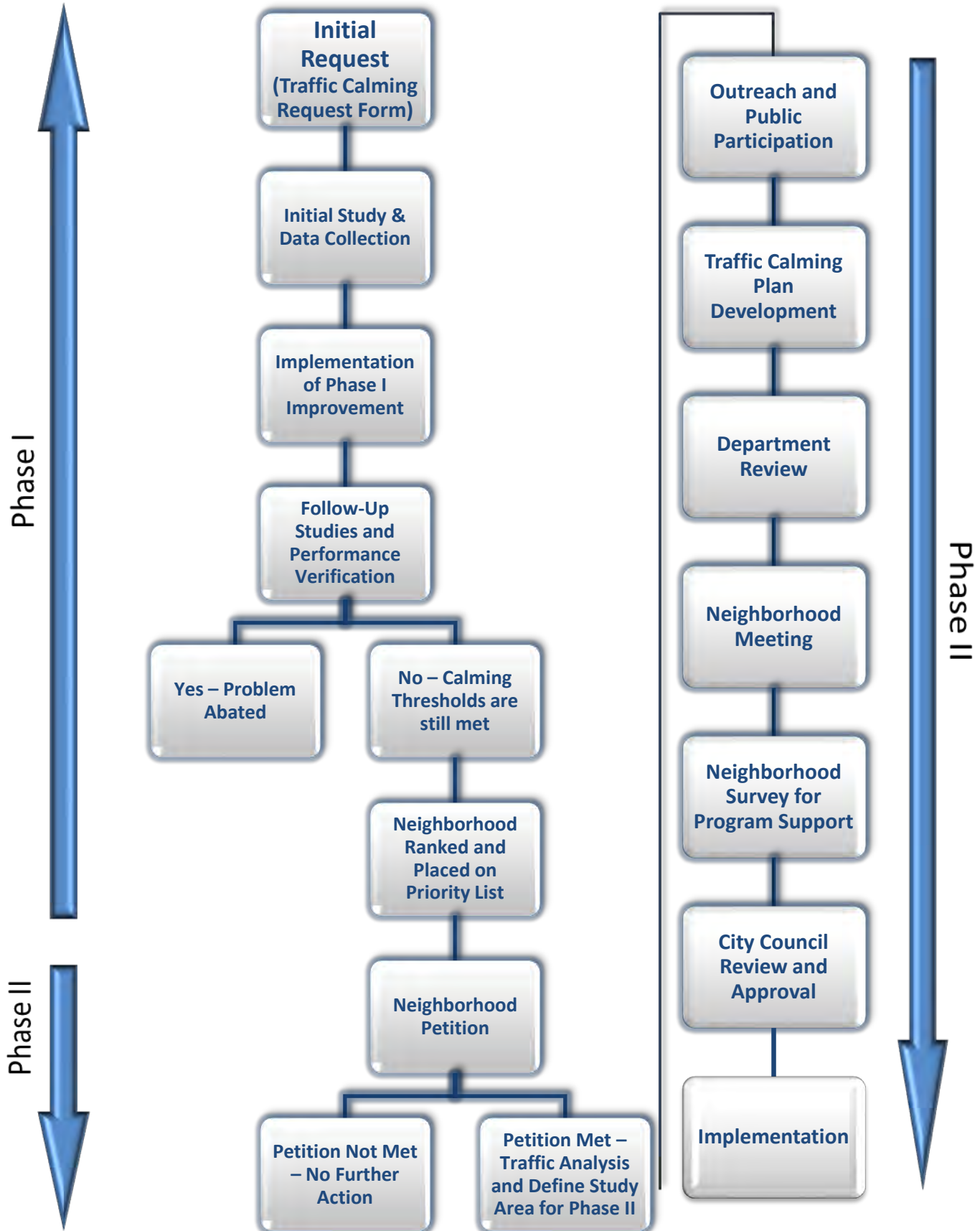


Figure 7: Traffic Calming Procedure Timeline*

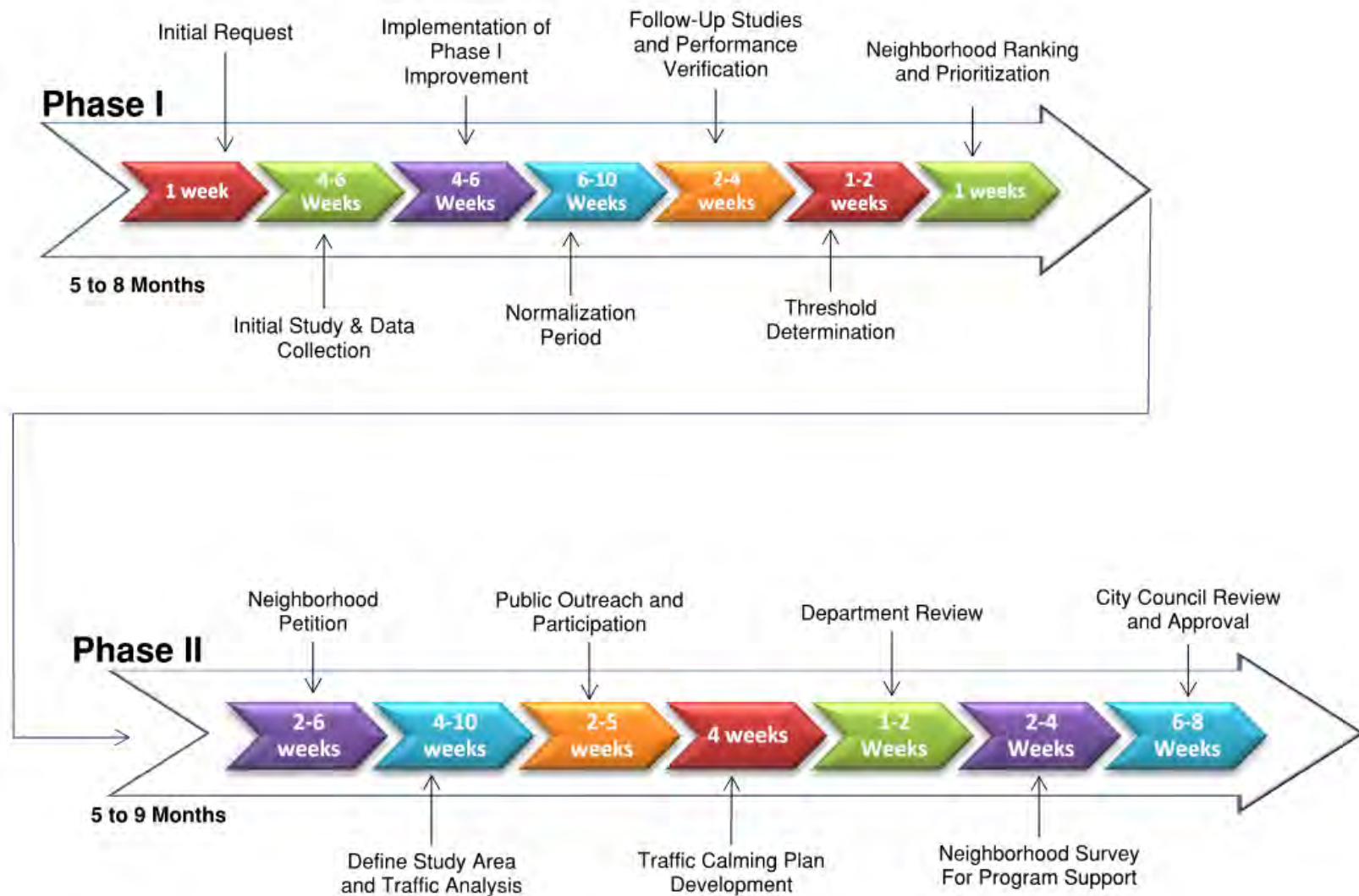


Figure 8: Traffic Calming Request Form

The purpose of this form is to enable neighborhoods to request the possible initiation of a traffic calming study in accordance with the City of Gilroy's Neighborhood Traffic Management program. The form must be filled out in its entirety and submitted to:

The City of Gilroy
Public Works Department
Attn: City Engineer
7351 Rosanna Street
Gilroy, CA 95020

Feel free to attach additional sheets containing pictures, maps, or additional text if the space provided is insufficient. Petitions will not be considered part of the application process.

1. Requesting Individual's Contact Information

Name: _____

Address: _____

Phone Number: _____

Email: _____

2. Please describe the location of the traffic concern (feel free to draw a picture or attach a map):

3. Please describe the nature of the neighborhood traffic problem you are concerned with (attach additional sheets if necessary):

4. Please describe what changes you would like to see on your street and/or what traffic calming measures would be acceptable to you:

Figure 9: Neighborhood Petition Form (Prepared by Staff)

City of Gilroy

Petition for Neighborhood Traffic Calming Measures

THE UNDERSIGNED BELOW AGREE TO THE FOLLOWING:

1. All persons signing this petition do hereby certify that they reside within the impacted area, which is hereby defined as the street segments of (also see attached map):

This Section is Prepared by Staff

2. All persons signing this petition request that the City of Gilroy investigate the possibility of installing physical traffic calming devices on my street in this neighborhood:

This Section is Prepared by Staff

3. All persons signing this petition do hereby agree that the following contact person(s) represent the neighborhood as facilitator(s) between the neighborhood residents and City of Gilroy staff in matters pertaining to items 1 and 2 above:

Name: _____
Address: _____
Phone: _____

Name: _____
Address: _____
Phone: _____

ONLY ONE SIGNATURE PER ADDRESS

| | | | |
|------|---------|---------|-----------|
| Name | Address | Phone # | Signature |
| Name | Address | Phone # | Signature |
| Name | Address | Phone # | Signature |
| Name | Address | Phone # | Signature |
| Name | Address | Phone # | Signature |
| Name | Address | Phone # | Signature |

[Note: Attach additional sheets as necessary]

Appendix A: Traffic Calming Tool Box

Community Outreach/Education

Phase 1

Description: Community outreach involves neighborhood awareness and education campaigns on traffic and traffic safety issues. Campaigns can consist of neighborhood meetings, written correspondence, school safety workshops, or other programs that help inform and educate the public.



Studies have generally shown that people speeding in neighborhoods tend to be local residents.

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> ◆ Provides a forum for residents to discuss their concerns. ◆ Helps city staff and neighborhood representatives identify traffic problems in the community. ◆ Educates the community on traffic calming. | <ul style="list-style-type: none"> ◆ Cultural and language barriers may dissuade resident participation. ◆ Potentially time consuming. |

| Special Considerations |
|--|
| <ul style="list-style-type: none"> ◆ Neighborhood meetings are typically held in convenient locations and during after-work hours. ◆ The meetings are intended to promote discussion among residents and city staff. ◆ When necessary, interpreters should be provided. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Possible | Possible | No | No | No | No | No |

Objective: To educate and inform the community of traffic calming measures and traffic safety in their neighborhoods.

Potential Cost: Varies.

Police Enforcement of Speed Limits

Phase 1

Description: Enforcement encourages motorists to change their driving behavior through the issuance of citations. The police department deploys officers to target neighborhood streets with reported speeding problems.



| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> ◆ Increases driver awareness. ◆ Targets speeding areas. ◆ Can reduce speeding occurrences. ◆ Highest impact on speeding offenders. ◆ Can be implemented immediately. ◆ Provides Police enforcement visibility in neighborhood | <ul style="list-style-type: none"> ◆ Long term beneficial impacts may diminish if not regularly enforced. ◆ Requires frequent police presence, which may not be feasible. |

| Special Considerations |
|---|
| <ul style="list-style-type: none"> ◆ Requires frequent enforcement to be successful. ◆ Police units may not be readily available. ◆ Often beneficial in school zones. ◆ Typically, only streets with documented speeding problems should be monitored. ◆ May be used in combination with recently implemented control devices. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Yes | Possible | No | No | No | No | No |

Objective: To increase driver awareness of speed limits through police enforcement.

Potential Cost: Varies.

Speed Display Units

Phase 1

Description: A radar unit that displays the speed limit and motorists' actual speeds. These devices may be movable or permanent.



| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> ◆ Increases driver awareness of their actual speeds. ◆ Can be implemented immediately. ◆ Conveys illusion of police presence. | <ul style="list-style-type: none"> ◆ Limited effectiveness. ◆ Display units must be relocated weekly. ◆ Not a substitute for Police enforcement. |

| Special Considerations |
|---|
| <ul style="list-style-type: none"> ◆ Can cause motorists to speed up to register a higher speed. ◆ Not suitable for remote areas. ◆ Usually not effective on high volume streets. ◆ Helps alert drivers of their actual speed and provides an opportunity for drivers to reduce speeds without being penalized. ◆ Permanent units usually only considered around schools |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Yes | No | No | No | No | No | No |

Objective: To reduce speeding by altering drivers of their actual speeds.

Potential Cost: Temporary units: \$250 per day.
Permanent units: \$10,000 per installation.

High Visibility Crosswalks

Phase 1

Description: A crosswalk incorporating a striped pattern that catches motorists' attention. These high-visibility crosswalks can also be placed mid-block, but will require pedestrian-activated beacons (RRFB) to alert drivers of crossing pedestrians. Mid-block crosswalks should be placed only after an engineering study.



| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> ◆ Increases crosswalk viability. ◆ Could help to reduce speeds. ◆ Indicates preferred crossing location. | <ul style="list-style-type: none"> ◆ Could create a false sense of pedestrian security. |

| Special Considerations |
|---|
| <ul style="list-style-type: none"> ◆ Pedestrian may ignore traffic and place a greater reliance on the crosswalk. ◆ More difficult to maintain than regular crosswalks. ◆ Should be well lit ◆ Additional signage, markings and devices are required for mid-block crosswalks ◆ While less expensive than raised crosswalks, they are less effective. ◆ Not suitable for all locations. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Possible | No | No | Possible | No | No | Yes |

Objective: To increase crosswalk visibility to drivers.

Potential Cost: \$1,500 to \$5,000 each. Mid-block crosswalks: \$25,000 to \$30,000 each.

Speed Limit Signs and Legends

Phase 1

Description: Speed limit signs and legends installed on residential streets.



| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> ◆ Can help reduce speeding if enforced. ◆ Clearly defines speed limit. ◆ Acceptable by neighborhood. ◆ Relatively inexpensive to install. | <ul style="list-style-type: none"> ◆ Can be ignored by motorists. ◆ Requires on-going enforcement. ◆ Added signage to neighborhood. |

| Special Considerations |
|---|
| <ul style="list-style-type: none"> ◆ An engineering analysis is needed to establish speed limits higher than 25 mph. ◆ Requires enforcement to remain effective. ◆ Motorists have a tendency to disregard unrealistically low speed limits. ◆ Should be used only on streets with identified speeding problems. ◆ Speed limit signs will not be posted less than 25 mph. ◆ To provide additional device effectiveness, associated 25 mph legends can be installed adjacent to sign locations. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Possible | No | No | No | No | No | No |

Objective: To reinforce proper speeds on neighborhood streets.

Potential Cost: \$280 to \$350 per sign or legend.

Narrow Lane Striping

Phase 1

Description: Narrowing lanes requires restriping the pavement to reduce the width of the lanes (usually to 10 feet wide).



| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> ◆ May slow travel speeds. ◆ Easy to modify and implement. ◆ Edge striping may function as Class II Bicycle Lanes | <ul style="list-style-type: none"> ◆ Increased maintenance costs and frequency. ◆ Adds striping to neighborhood streets. ◆ May affect emergency response. |

| Special Considerations |
|--|
| <ul style="list-style-type: none"> ◆ The remaining portion of the road can be used to create bicycle or parking lanes. ◆ Additional striping helps define neighborhood streets by adding centerlines and edge lines. ◆ Can be altered over time. ◆ Possible to use as an intermediate Phase to more definite traffic control devices. ◆ Most effective when there is sufficient opposing traffic. ◆ Effectiveness dwindles as opposing traffic volume drops. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Possible | Possible | No | No | No | No | Yes |

Objective: To slow vehicle speeds by narrowing traffic lanes.

Potential Cost: \$1,500 to \$3,000. Dependent on length of street.

Botts'-dots/Rumble Strip

Phase 1 (Rural location only)

Description: Botts'-dots/Rumble strip are raised pavement marker that provide tactile and auditory feedback to driver.



| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> ◆ Increases driver awareness. ◆ Provides tactile and auditory feedback to driver at desired location (nearby speed limit signs, pedestrian crossing, and etc.). | <ul style="list-style-type: none"> ◆ Can create obstructions for bicycles. ◆ Requires regular maintenance. ◆ Produces high level of noise to adjacent properties so should not be used next to sensitive receptors. |

| Special Considerations |
|---|
| <ul style="list-style-type: none"> ◆ May become obstacle for bicyclists. ◆ Makes it difficult for bicycles and pedestrian access. ◆ Require other measures such as signage and pavement marking. ◆ Not a standalone devise. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Yes | No | Yes | No | No | No | Yes |

Objective: To reduce traffic speed on neighborhood streets by increasing driver aware at nearby signs and markings.

Potential Cost: \$2,000 to \$4,000. Dependent on length and installation interval.

Turn Restriction Signs

Phase 2

Description: Turn restriction signs prohibit specified turn movements on neighborhood streets. Examples of restrictive signage include: “No Left Turns”, “No Right Turns”, or “Do Not Enter”.



| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> ◆ Cost-effective method of reducing cut-through traffic. ◆ Redirects traffic to main streets where higher traffic volumes are acceptable. ◆ Can be directed towards certain times of the day. ◆ Can reduce noise. ◆ No increase to street maintenance. ◆ | <ul style="list-style-type: none"> ◆ Possible traffic diversion to other neighborhood streets. ◆ Success requires on-going enforcement. ◆ Adds signage to the neighborhood. ◆ Limits access to the neighborhood. ◆ Applies to all traffic, including neighborhood traffic. |

| Special Considerations |
|--|
| <ul style="list-style-type: none"> ◆ Little or no effect on vehicle speeds. ◆ Best when used on major or collector streets. ◆ More effective when applied to certain peak hours. ◆ May cause access impacts to neighborhood. ◆ Possible diversion of traffic to other neighborhood streets. ◆ Can be difficult to enforce in some areas. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| No | Yes | No | No | Yes | No | No |

Objective: To reduce traffic volumes on neighborhood streets and redirect traffic to main roadways.

Potential Cost: \$280 - \$350 per sign.

Curb Extensions

Phase 2

Description: Curb extensions narrow a portion of the roadway by extending a portion of the curb into the street. Curb extensions are commonly referred to as “bulb-outs”, which are at the entrance of a roadway, and “chokers”, which are placed mid-segment. Curb extensions also include “Chicanes”, which are a series of alternating mid-segment extensions.



| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> ◆ Shorter pedestrian crossings. ◆ Can decrease vehicle speeds entering a narrowed roadway. ◆ Creates an opportunity for landscaping and green infrastructure. ◆ Allows better pedestrian visibility around parked cars. | <ul style="list-style-type: none"> ◆ May require loss of on-street parking. ◆ Can create a hazard for bicyclists. ◆ May impede emergency response vehicles and other trucks. ◆ Increased maintenance. ◆ Drainage can be a problem. |

| Special Considerations |
|---|
| <ul style="list-style-type: none"> ◆ Expensive to remove if permanent ◆ Curb-extensions can be installed mid-block. ◆ May require additional landscaping. ◆ Can be expensive. ◆ Curb-extensions should not extend into designated bicycle lanes. ◆ At transit stops, curb-extensions enhance service. ◆ Bulbouts need to be designed to accommodate emergency response vehicles, larger vehicle and common truck turning path. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Yes | Possible | No | Yes | No | Possible | Possible |

Objective: To reduce traffic speeds and reduce pedestrian exposure to vehicles.

Potential Cost: \$15,000 to \$30,000 per extension.

Speed Cushions

Phase 2

Description: Speed cushions are asphalt mounds constructed on the roadway surfaces. The City of Gilroy uses speed cushions that are 4 inches high and have a parabolic profile. Speed cushions differ from other raised speed control devices (i.e. speed bump, speed hump, or speed table) because speed cushions typically have wheel cut-outs that allow unimpeded passage by emergency vehicles. Most passenger cars have narrower wheel bases than emergency vehicles and would not be able to pass unimpeded through speed cushions.



| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> ◆ Effectively slow vehicles. ◆ Can result in decrease of traffic volumes. ◆ Can improve pedestrian safety. ◆ Are designed to accommodate fire truck wheel base widths. | <ul style="list-style-type: none"> ◆ Increases noise near speed cushions. ◆ May result in traffic diversion to other neighborhood streets. ◆ Device, signage and advanced striping can be somewhat aesthetically displeasing. ◆ Possible problem for bikes. ◆ Will affect passage of ambulances and other standard wheel based emergency vehicles. |

| Special Considerations |
|--|
| <ul style="list-style-type: none"> ◆ Speed cushions are usually placed 300 to 600 feet apart. ◆ Speed cushions need Fire Department and Police Department approval to ensure adequate delivery of emergency vehicles. ◆ Require advanced warning signs and pavement markings. ◆ Speed cushions shall not be installed on streets with posted speed limits greater than 30 MPH. ◆ May be installed using temporary rubberized devices. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Yes | Possible | Yes | Possible | No | Yes | Yes |

Objective: To reduce vehicle speeds on neighborhood streets.

Potential Cost: \$7,500 per speed cushion.

Roundabouts & Traffic Circles

Phase 2

Description: Roundabouts and traffic circles are raised circular islands placed in the center of an intersection. They require vehicles to slow down to a comfortable speed in order to maneuver around the circle.



| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> ◆ Effectively reduces vehicle speeds. ◆ Reduces potential for collisions. ◆ Provides increased access for side streets. ◆ Opportunity for landscaping. ◆ Minimal noise impacts. ◆ Can be attractive, if well maintained. | <ul style="list-style-type: none"> ◆ Loss of parking. ◆ Can disrupt access for large vehicles. ◆ Very expensive ◆ Possible decrease in emergency response times. ◆ Can increase conflicts between bicycles and automobiles. ◆ Can require increased maintenance. ◆ May require additional right-of-way. |

| Special Considerations |
|--|
| <ul style="list-style-type: none"> ◆ Requires additional signage and pavement markings. ◆ Not recommended at T-intersections and offset intersections. ◆ Most effective when used in combination with other devices or placed in series on short blocks. ◆ Requires curbside parking prohibition within 30 feet of circle. ◆ At slow speeds, buses can maneuver around traffic circles. ◆ Not used at 4-way stop intersections ◆ Installed with vertical curb where vehicle circulation allows; otherwise curbs are designed to be mountable. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Yes | Possible | No | Yes | No | Yes | Yes |

Objective: To reduce vehicle speed by requires drivers to slow down to maneuver around the circle.

Potential Cost: \$35,000 to \$115,000 depending on island treatment and right-of-way requirement.

Median Barriers

Phase 2

Description: Median barriers are raised islands that prevent certain movements at an intersection.



| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> ◆ Reduces cut-through traffic. ◆ Opportunity for landscaping. ◆ Provides refuge area for pedestrians. ◆ Reduce vehicle conflict points at intersection. ◆ Provides location for placement of visible signs. | <ul style="list-style-type: none"> ◆ Impedes emergency response times. ◆ May divert traffic to other neighborhood streets. ◆ High installation costs. ◆ Creates obstacle for motorists. ◆ Can create obstructions for pedestrians and bicycles. |

| Special Considerations |
|--|
| <ul style="list-style-type: none"> ◆ Restricts full access to and from neighborhood streets. ◆ May become obstacle for motorists to drive into. ◆ More permanent measure. ◆ Difficult to alter or remove. ◆ May divert traffic to other neighborhood streets. ◆ Can result in increased emergency response times. ◆ Possibility for varied designs, such as restricted left turns only on major streets. ◆ Requires environmental assessment, CEQA compliance. ◆ Makes it difficult for bicycles and pedestrian access. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|
| Possible | Yes | No | Possible | Yes | Yes | Possible |

Objective: To reduce cut-through traffic on neighborhood streets by restricting left-turn movements.

Potential Cost: \$7,500 to \$45,000. Dependent on length.

Appendix B: Neighborhood Traffic Management Program Public Outreach Brochure

APPENDIX B
Traffic Calming Measures



HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: August 9, 2024
To: Joshua Llamas, City of Sunnyvale
From: Ollie Zhou, Shikha Jain
Subject: Traffic Calming Measures for the Sunnyvale Neighborhood Traffic Calming Program

Hexagon Transportation Consultants, Inc. has completed a review of traffic calming measures in the City's Neighborhood Traffic Calming Program, which was last updated in 2004, as well as reviewed and evaluated additional traffic calming measures in the Federal Highway Administration (FHWA) *Traffic Calming ePrimer*, Caltrans *Traffic Calming Guidance Memorandum, January 28, 2022*, and Sunnyvale's Vision Zero Toolkit. The assessment of the potential costs of implementing each traffic calming measure has also been included in this memorandum.

Sunnyvale Neighborhood Traffic Calming Handbook

Sunnyvale's Neighborhood Traffic Calming Handbook includes a Stage 1 program that does not involve the use of physical controls. Stage 1 measures include radar speed trailer deployment, police enforcement, and signing and striping. If the Stage 1 traffic calming measures are not successful in reducing speeds and cut-through traffic along the residential street, the Stage 2 program is triggered, which could involve physical modifications to the street like speed humps, traffic circles, curb extensions etc. The Stage 1 program and the Stage 2 program is described in detail in the *Traffic Calming Criteria and Threshold Evaluation Memorandum*. An evaluation of the traffic calming measures is included in later sections.

Sunnyvale's Vision Zero Toolkit

Sunnyvale's Vision Zero Toolkit includes measures to improve the safety for drivers, bicyclists, and pedestrians and reduce traffic fatalities and serious injuries. The engineering measures include roadway design measures like bulbouts and curb extensions, pedestrian crossing improvements like high visibility crosswalks, bikeway design improvements like buffered bike lanes, signs, markings & operations improvements like turn restrictions, signal timing and phasing improvements like leading pedestrian intervals (LPIs), speed control strategies like speed humps, and miscellaneous strategies like education and enforcement. Several of these measures are traffic calming strategies that improve safety by reducing speeds and traffic volumes. Measures that are currently included in Sunnyvale's Neighborhood Traffic Calming Handbook as well as measures that could potentially be included have been identified in later sections.

FHWA Traffic Calming ePrimer

The FHWA Traffic Calming ePrimer presents a review of the current traffic calming practice and traffic calming measures including considerations for their appropriate application, design, and installation. It also provides research on the effects of traffic calming measures on mobility and safety for passenger vehicles, emergency response, public transit, and pedestrians and bicyclists. Traffic calming measures, their effectiveness, and considerations for design and installation were reviewed as part of this memorandum.



Caltrans Traffic Calming Guidance Memorandum, January 28, 2022

The Caltrans Traffic Calming Guidance Memorandum provides guidance on traffic calming strategies that can be used as part of highway infrastructure, that are self-enforcing or self-regulating with respect to vehicular speed. It recommends that traffic calming needs should be determined by existing operating vehicular speeds, volume counts, and number of crashes for each location. The guidance includes traffic calming geometric features like roundabouts, bulbouts, traffic islands, and traffic calming control devices like speed reduction markings, crosswalk enhancements, and vehicle speed feedback signs. The guidance document and included traffic calming measures appropriate for two-lane local and collector streets were reviewed as part of this memorandum.

Caltrans Traffic Calming Guide - A Compendium of Strategies, 2022

Caltrans developed the traffic calming guide to build self-enforcing roadways that guide road users to travel at a safe speed, especially through conflict points. The Traffic Calming Guide provides best practices, relevant standards, and resources discussed in the FHWA Traffic Calming ePrimer. For each traffic calming measure, the guide provides the description, placement, performance, maintenance considerations, other considerations, references, and sample projects. All measures were reviewed as part of this memorandum. Measures reviewed and not included based on their applicability for traffic calming in Sunnyvale include speed reduction markings, in-street pedestrian crossing signs, pedestrian hybrid beacons (PHBs), flashing beacons, tee-up intersection and reduce corner radii, road diet, on-street parking, street trees and landscaping, and in-roadway lights. Some of these measures are incorporated as part of other City plans and programs such as safe routes to school, vision zero toolkit, etc.

Traffic Calming Measures

A detailed description, evaluation, and cost assessment of traffic calming measures included in the City of Sunnyvale's Neighborhood Traffic Calming Handbook as well as some measures not included in the handbook but included in other reviewed sources like the Sunnyvale Vision Zero Toolkit, FHWA Traffic Calming ePrimer, or the Caltrans Traffic Calming Guidance Memorandum has been provided in the Appendix. These measures have been evaluated based on whether they would reduce speeds, volumes, or both as well as their effect on noise, parking, access, emergency response, maintenance, and ped/bike safety. The potential cost to install the measures has also been provided. A summary is provided in Table 1 below.

Traffic Calming Measures for the Sunnyvale NTCP

**Table 1
Summary of Traffic Calming Measures**

| Measure | Neighborhood Traffic Calming Handbook | Sunnyvale Vision Zero Toolkit | Traffic Calming Criteria | | | | Undesirable Effects | | | | Improvement | | | Potential Cost Range |
|---|---------------------------------------|-------------------------------|--------------------------|----------------|----------------|--------------|---------------------|----------------------------|-----------------------------|-----------------|--|-------------|-------------------------|--------------------------------------|
| | | | Reduces Speed | Reduces Volume | Increase Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increase Street Maintenance | Speed Reduction | Ped Safety | Bike Safety | | |
| <i>Non-Physical Measures (Stage 1)</i> | | | | | | | | | | | | | | |
| Radar Speed Trailer Deployment | Yes (Stage 1) | Yes | Possible | No | No | No | No | No | No | No | 2 - 7mph | No change | Possible | low cost |
| Traffic Enforcement Action | Yes (Stage 1) | Yes | Possible | No | No | No | No | No | No | No | Varies | No change | Possible | low cost |
| <i>Traffic Signing and Pavement Marker</i> | | | | | | | | | | | | | | |
| E.g. High Visibility Crosswalk | Yes (Stage 1) | Yes | Possible | No | No | No | No | No | No | Yes | N/A | Yes | Possible | \$2 - \$5 per linear foot |
| E.g. Speed Limit Sign & Marking | Yes (Stage 1) | No | Possible | No | No | No | No | No | No | Yes | 2 - 3mph | No change | Possible | \$300 - \$400 per sign |
| E.g. Transverse Rumble Strip | Yes (Stage 1) | No | Possible | No | Yes | No | No | No | No | Yes | 1 - 2mph | No change | Possible | \$0.1 - \$1.2 per linear foot |
| E.g. Narrow Lane Striping | Yes (Stage 1) | No | Possible | Possible | No | No | No | No | No | Yes | 1 - 7mph | No change | Possible | \$2 - \$5 per linear feet |
| Community Outreach/Education | No | Yes | Possible | Possible | No | No | No | No | No | No | Varies | No change | Possible | low cost |
| <i>Physical Measures (Stage 2)</i> | | | | | | | | | | | | | | |
| <i>Vertical Deflection</i> | | | | | | | | | | | | | | |
| Speed Hump | Yes (Stage 2) | Yes | Yes | Possible | Yes | Possible | No | Yes | Yes | Yes | reduces vehicle speeds to a range of 15 to 20mph | Possible | Yes | \$10,000 - \$20,000 per location |
| Speed Cushion/Speed Lump | Yes (Stage 2) | Yes | Yes | Possible | Yes | Possible | No | No | Yes | Yes | 5 - 7mph | Possible | Yes | \$10,000 - \$20,000 per location |
| Speed Table/Raised Crosswalk | Yes (Stage 2) | Yes | Yes | Possible | Yes | Possible | No | Yes | Yes | Yes | 7 - 8mph | Possible | Yes | \$20,000 - \$30,000 per location |
| Raised Intersection | No | No | Yes | No | Possible | No | No | Yes | Yes | Yes | reduces vehicle speeds to a range of 25 to 35mph | Yes | Possible | \$60,000 - \$240,000 per location |
| <i>Horizontal Deflection</i> | | | | | | | | | | | | | | |
| Traffic Circle | Yes (Stage 2) | No | Yes | Possible | No | Yes | No | Possible | Yes | Yes | 1 - 6mph | No change | Requires special design | \$40,000 - \$100,000 per location |
| Roundabout | Yes | No | Yes | Possible | No | Yes | No | Possible | Yes | Yes | Dependant on design of approach lanes | Yes | Requires special design | \$60,000 - \$240,000 per location |
| <i>Street Width Reduction</i> | | | | | | | | | | | | | | |
| Curb Extension/Choker/Chicane | Yes (Stage 2) | Yes | Possible | Possible | No | Yes | No | Possible | Possible | Possible | <5mph | Yes | Requires special design | \$48,000 - \$160,00 per intersection |
| Median Island | Yes (Stage 2) | Yes | Possible | Possible | No | Yes | Possible | Possible | Possible | Possible | 2 - 3mph | Yes | Requires special design | \$60,000 - \$220,000 per location |
| <i>Routing Restriction</i> | | | | | | | | | | | | | | |
| Median Barrier, Forced Turn Island, Barrier, Channelization | Yes (Stage 2) | No | Possible | Yes | No | Possible | Yes | Yes | Possible | Possible | N/A | Possible | Possible | \$6,000 - \$80,000 per location |
| Diagonal Diverter | Yes (Stage 2) | No | No | Yes | No | No | Yes | Yes | Possible | Possible | N/A | Possible | Possible | \$30,000 - \$80,000 per location |
| One-Way Street | Yes (Stage 2) | No | No | Yes | No | No | Yes | No | No | No | N/A | Possible | No change | \$4-\$5 per linear feet |
| One-Way Choker, Half-Closure or Semi-Diverter | Yes (Stage 2) | No | Possible | Yes | No | Possible | Yes | No | Possible | Possible | N/A | Possible | No change | \$30,000 - \$100,000 per location |
| Street Closure and Cul-de-sac | Yes (Stage 2) | No | No | Yes | No | No | Yes | Yes | Possible | Possible | N/A | No change | No change | \$40,000 - \$400,000 per location |
| Woonerf | Yes (Stage 2) | No | Yes | Possible | No | Possible | No | Yes | Possible | Possible | reduces vehicle speeds to a range of 10mph | Possible | Possible | Generally exceeding \$1 Million |

Traffic Calming Measures Appendix

Radars Speed Trailer Deployment

Description

This is a temporary device that is primarily used to educate motorists that they may be significantly exceeding the posted speed limit.



Objective

To reduce speeding by informing drivers of their actual speeds and ask them to slow down if they exceed it.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 1 measure)
Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> Increases driver awareness of their actual speeds. Can be implemented immediately. Conveys illusion of police presence. | <ul style="list-style-type: none"> Limited effectiveness. Not a substitute for Police enforcement. |

Special Considerations

- Can cause motorists to speed up to register a higher speed.
- These signs are most effective on roadways where there are gaps between vehicles¹.
- Helps alert drivers of their actual speed and provides an opportunity for drivers to reduce speeds without being penalized.
- Permanent units usually only considered around schools.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | No | No | No | No | No | No | 2 - 7mph ¹ |

Potential Cost

low cost

¹This countermeasure is most effective when paired with enforcement and can lose its effectiveness over time as drivers become desensitized to the notification when it is not accompanied by enforcement.

Police Enforcement of Speed Limits

Description

This is traditional enforcement activity on the part of Public Safety's traffic enforcement officers. The intent is to modify behavior to result in a safer situation for all drivers and neighbors.



Objective

To increase driver awareness of speed limits through police enforcement.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 1 measure)

Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> Increases driver awareness. Targets speeding areas. Can reduce speeding occurrences. Highest impact on speeding offenders. Can be implemented immediately. Provides Police enforcement visibility in neighborhood. | <ul style="list-style-type: none"> Long term beneficial impacts may diminish if not regularly enforced. Requires frequent police presence, which may not be feasible. |

Special Considerations

- Requires frequent enforcement to be successful.
- Police units may not be readily available.
- Often beneficial in school zones.
- Typically, only streets with documented speeding problems should be monitored.
- May be used in combination with recently implemented control devices.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | No | No | No | No | No | No | Varies |

Potential Cost

low cost

Community Outreach/Education

Description

Community outreach involves neighborhood awareness and education campaigns on traffic and traffic safety issues. Campaigns can consist of neighborhood meetings, written correspondence, school safety workshops, or other programs that help inform and educate the public.



Objective

To educate and inform the community of traffic calming measures and traffic safety in their neighborhoods.

Sunnyvale Neighborhood Traffic Calming Program: No
Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • Provides a forum for residents to discuss their concerns. • Helps city staff and neighborhood representatives identify traffic problems in the community. • Educates the community on traffic calming. | <ul style="list-style-type: none"> • Cultural and language barriers may dissuade resident participation. • Potentially time consuming. |

Special Considerations

- Neighborhood meetings are typically held in convenient locations and during afterwork hours.
- The meetings are intended to promote discussion among residents and city staff.
- When necessary, interpreters should be provided.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | Possible | No | No | No | No | No | Varies |

Potential Cost

low cost

Traffic Signing and Pavement Markers

Description

Installing or upgrading signs and pavement markings on an affected roadway can be a cost-effective measure to reduce speeding. Such improvements include high visibility crosswalks, advisory speed signs and pavement markings, speed activated signs, optical speed bars, transverse rumble strips, narrow lane striping etc. Some of these examples are discussed in detail in the following sheets



Objective

To reduce speeds on neighborhood streets.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 1 measure)

Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • Easy to implement and modify. • Could help to reduce speeds. • Generally inexpensive to install. | <ul style="list-style-type: none"> • Increase maintenance costs and frequency. • Adds signage or striping on neighborhood streets. • Can be ignored by motorists. |

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | Possible | Possible | No | No | No | Yes | Varies |

Potential Cost

Varies (see example sheets for cost examples)

Traffic Signing and Pavement Markers - E.g. High Visibility Crosswalks

Description

A crosswalk incorporating a striped pattern that catches motorists' attention. These high-visibility crosswalks can also be placed midblock, but may require markings, signage, and potentially signals such as pedestrian-activated beacons (RRFB) to alert drivers of crossing pedestrians. Mid-block crosswalks should be placed only after an engineering study.



Objective

To increase crosswalk visibility to drivers.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 1 measure)

Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> Increases crosswalk visibility. Could help to reduce speeds. Indicates preferred crossing location. | <ul style="list-style-type: none"> Could create a false sense of pedestrian security if placed mid-block. |

Special Considerations

- Pedestrian may ignore traffic and place a greater reliance on the crosswalk.
- More difficult to maintain than regular crosswalks.
- Should be well lit.
- Additional signage, markings and devices are required for mid-block crosswalks.
- While less expensive than raised crosswalks, they are less effective.
- Not suitable for all locations.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | No | No | No | No | No | Yes | N/A ¹ |

Potential Cost ²

\$2 - \$5 per linear foot

¹Driver compliance, such as drivers slowing down/stopping for pedestrians have increased significantly, but the references did not analyze the reduction of speeds across the entire corridor. Source: California Department of Transportation (2022). *Traffic Calming Guide - A Compendium of Strategies*

²Cost referenced the San Carlos Neighborhood Traffic Management Program, 2017

Traffic Signing and Pavement Markers - E.g. Speed Limit Signs & Markings

Description

Installing or upgrading signs and pavement markings on an affected roadway can be a cost-effective measure to reduce speeding. Such improvements include advisory speed signs and pavement markings, speed activated signs, and optical speed bars.



Objective

To reinforce proper speeds on neighborhood streets.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 1 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • Can help reduce speeding if enforced. • Clearly defines speed limit. • Generally acceptable by neighborhood. • Relatively inexpensive to install. | <ul style="list-style-type: none"> • Can be ignored by motorists. • Requires on-going enforcement. • Added signage to neighborhood. |

Special Considerations

- Requires enforcement to remain effective.
- Motorists have a tendency to disregard unrealistically low speed limits.
- Should be used only on streets with identified speeding problems.
- To provide additional device effectiveness, associated 25 mph legends can be installed adjacent to sign locations.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | No | No | No | No | No | Yes | 2 - 3mph ¹ |

Potential Cost ²

\$300 - \$400 per sign

¹Source: Federal Highway Administration. *Local and Rural Road Safety Program, 2023*. <https://highways.dot.gov/safety/local-rural/training-tools-guidance-and-countermeasures-locals-practitioners>.

²Cost referenced the San Carlos Neighborhood Traffic Management Program, 2017

Traffic Signing and Pavement Markers - E.g. Transverse Rumble Strips

Description

Transverse rumble strips are raised or grooved patterns installed perpendicular to the direction of travel in the roadway travel lane.



Objective

To slow vehicle speeds by providing an audible and tactile warning of a downstream decision point.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 1 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • May slow travel speeds. • Easy to modify and implement. | <ul style="list-style-type: none"> • Increased maintenance costs and frequency. • Adds striping to neighborhood streets. • Noise pollution from rumble strips may impact surrounding land uses. |

Special Considerations

- Grooved are generally 0.5" deep and raised are no more than 0.5" tall.
- A center gap can be used to reduce the impact to motorcyclists and cyclists.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | No | Yes | No | No | No | Yes | 1 - 2 mph ¹ |

Potential Cost ²

\$0.1 - \$1.2 per linear foot

¹ Source: California Department of Transportation (2022). *Traffic Calming Guide - A Compendium of Strategies*

² Cost referenced FHWA: https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/faqs.cfm

Traffic Signing and Pavement Markers - E.g. Narrow Lane Striping

Description

Narrowing lanes requires restriping the pavement to reduce the width of the lanes.



Objective

To slow vehicle speeds by narrowing traffic lanes.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 1 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • May slow travel speeds. • Easy to modify and implement. • Edge striping may function as Class II Bicycle Lanes | <ul style="list-style-type: none"> • Increased maintenance costs and frequency. • Adds striping to neighborhood streets. |

Special Considerations

- The remaining portion of the road can be used to create bicycle or parking lanes.
- Additional striping helps define neighborhood streets by adding centerlines and edge lines.
- Can be altered over time.
- Possible to use as an intermediate phase to more definite traffic control devices.
- Most effective when there is sufficient opposing traffic.
- Effectiveness dwindles as opposing traffic volume drops.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|-----------------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible ¹ | Possible | No | No | No | No | Yes | 1 - 7 mph ² |

Potential Cost ³

\$2 - \$5 per linear foot

Source:

¹Desmon, Stephanie (2023). *How Narrower Traffic Lanes Could Help Reduce Crashes*. John Hopkins Bloomberg School of Public Health.

²Kahn, R., & Goedecke, A. K. (2011). *Roadway Striping as a Traffic Calming Option*. Institute of Transportation Engineers Journal.

³Cost referenced the San Carlos Neighborhood Traffic Management Program, 2017

Speed Humps

Description

Speed humps are approximately 12 feet in width and vary from 2.5 to 4 inches in height. This raised pavement serves to physically force motorists to reduce their speed. In order to be effective, speed humps should be placed no further than 300 feet apart.



Objective

To reduce vehicle speeds on neighborhood streets.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> Effectively slow vehicles. Can result in decrease on traffic volumes. Can improve pedestrian safety. | <ul style="list-style-type: none"> Increased noise near speed humps. May result in traffic diversion to other neighborhood streets. Device, signage and advanced striping can be somewhat aesthetically displeasing. Vertical element poses possible problem for bikes. May impede emergency response vehicles and other trucks. Increased maintenance. Drainage can be a problem. |

Special Considerations

- Should be placed mid-block and not near an intersection or driveway.
- Should not be placed on a sharp curve.
- Should be placed between 260' and 500' per ITE.
- Need Fire Department and Police Department approval to ensure adequate delivery of emergency vehicles.
- Require advanced warning signs and pavement markings.
- Should not be installed on streets with posted speed limits greater than 30 MPH.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|---|
| Yes | Possible | Yes | Possible | No | Yes | Yes | reduces vehicle speeds to a range of 15 to 20mph ¹ |

Potential Cost ²

\$10,000 - \$20,000 per location

¹Source: California Department of Transportation (2022). *Traffic Calming Guide - A Compendium of Strategies*

²Cost referenced City of San Carlos 2022 bid results for this device or similar devices.

Speed Cushions/Speed Lumps

Description

Speed cushions or speed lumps are asphalt mounds constructed on the roadway surfaces. Speed cushions differ from other raised speed control devices (i.e. speed bump, speed hump, or speed table) because speed cushions typically have wheel cut-outs that allow unimpeded passage by emergency vehicles. Most passenger cars have narrower wheel bases than emergency vehicles and would not be able to pass unimpeded through speed cushions.



Objective

To reduce vehicle speeds on neighborhood streets.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)
Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> Effectively slow vehicles. Can result in decrease on traffic volumes. Can improve pedestrian safety. Are designed to accommodate fire truck wheel base widths. Bicyclist safety and mobility is not affected as a bicyclist can pass through the speed cushion gaps. | <ul style="list-style-type: none"> Increased noise near speed cushions. May result in traffic diversion to other neighborhood streets. Device, signage and advanced striping can be somewhat aesthetically displeasing. Will affect passage of ambulances and other standard wheel based emergency vehicles. A motorcycle can pass through a speed cushion gap without slowing. Passenger car motorists may aim for the gaps when traversing a speed cushion (i.e., one wheel on the hump and one wheel on the flat pavement). |

Special Considerations

- Appropriate for a primary emergency vehicle route or transit route.
- Should be placed mid-block and not near an intersection or driveway.
- Should not be placed on a sharp curve.
- Series of speed cushions should be placed between 260' and 500' per ITE.
- Need Fire Department and Police Department approval to ensure adequate delivery of emergency vehicles.
- Require advanced warning signs and pavement markings.
- Should not be installed on streets with posted speed limits greater than 30 MPH.
- Safety concern when the speed cushion gaps coincide with the street centerline.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Yes | Possible | Yes | Possible | No | No | Yes | 5 - 7mph ¹ |

Potential Cost ²

\$10,000 - \$20,000 per location

¹Source: Federal Highway Administration. *Traffic Calming ePrimer*. Accessed January 5, 2024. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.7>

²Cost referenced City of San Carlos 2022 bid results for this device or similar devices.

Speed Tables/Raised Crosswalk

Description

These are speed humps with a long flat section that are generally used at crosswalk locations. Both speed humps and speed tables require signing and roadway markings to make their presence known to motorists and other roadway users.



Objective

To reduce vehicle speeds on neighborhood streets.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> Effectively slow vehicles. Can result in decrease in traffic volumes. Improve pedestrian safety by enhancing marked crosswalk visibility. | <ul style="list-style-type: none"> Increases noise near speed tables. May result in traffic diversion to other neighborhood streets. Device, signage and advanced striping can be somewhat aesthetically displeasing. Vertical element poses possible problem for bikes. May impede emergency response vehicles and other trucks. Increased maintenance. Require special consideration for drainage. |

Special Considerations

- Speed table can be designed to incorporate bicycle facilities.
- Should be ADA compliant if crosswalk is placed on the speed table.
- Requires Advanced Warning Signs.
- Need Fire Department and Police Department approval to ensure adequate delivery of emergency vehicles.
- Require advanced warning signs and pavement markings.
- Should not be installed on streets with posted speed limits greater than 30 MPH.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Yes | Possible | Yes | Possible | No | Yes | Yes | 7 to 8 mph ¹ |

Potential Cost ²

\$20,000 - \$30,000 per location

¹Source: California Department of Transportation (2022). *Traffic Calming Guide - A Compendium of Strategies*

²Cost referenced City of Cupertino 2019 bid results for this device or similar devices.

Raised Intersection

Description

A raised intersection is a flat, raised area covering an entire intersection with ramps on all approaches. It is essentially a speed table that covers an entire intersection, including the crosswalks.



Objective

To reduce vehicle speeds on neighborhood streets.

Sunnyvale Neighborhood Traffic Calming Program: No

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> Effectively slow vehicles. Can result in decrease in traffic volumes. Improve pedestrian safety by using alternate paving methods to mark the intersection. It has the advantage of calming two streets at once. | <ul style="list-style-type: none"> May impede emergency response vehicles and other trucks. Increased maintenance. Require special consideration for drainage. Crosswalks require tactile pavement for visually impaired pedestrians. |

Special Considerations

- At the intersection of two local roadways with posted speeds less than 35 MPH. Commonly implemented in commercial areas with high pedestrian volumes.
- A raised intersection typically rises to sidewalk level.
- The ramp sections of the intersection are approximately 6 feet in length with no greater than a 8% slope.
- Detectable warning surface and/or color contrasts must be incorporated to differentiate roadway and sidewalk.
- In order to enable a pedestrian with a visual impairment to differentiate between the roadway and the sidewalk, measures such as color contrasts and detectable warning truncated domes at edges must be included.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|---|
| Yes | No | Possible | No | No | Yes | Yes | reduces vehicle speeds to a range of 25 to 35mph ¹ |

Potential Cost ²

\$60,000 - \$240,000 per location

¹Source: Federal Highway Administration. *Traffic Calming ePrimer*. Accessed January 5, 2024. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.7>

²Cost referenced FHWA and upward adjusted by a factor of 4 based on cost comparison with available bid results for some of the reported devices. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.2>

Traffic Circles

Description

This device is a raised circular island in the middle of a residential neighborhood intersection. Direct straight through movements are obstructed by the raised island causing traffic to move to the right and around the circle. The intersection approaches are normally controlled by yield signs that serve to alert motorists to the need to slow their speed entering the intersection.



Objective

To reduce vehicle speed by requiring drivers to slow down to maneuver around the circle.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> Effectively reduces vehicle speeds. Reduces potential for collisions. Opportunity for landscaping. Minimal noise impacts. Can be attractive, if well maintained. | <ul style="list-style-type: none"> Loss of parking. Can disrupt access for large vehicles Expensive to construct and remove if permanent. Possible increase in emergency response times Can increase conflicts between bicycles and automobiles. Can require increased maintenance. |

Special Considerations

- Requires additional signage and pavement markings.
- Not recommended at T-intersections and offset intersections.
- Most effective when used in combination with other devices or placed in series on short blocks.
- Requires curbside parking prohibition within 30 feet of circle.
- At slow speeds, buses can maneuver around traffic circles.
- Installed with vertical curb where vehicle circulation allows; otherwise curbs should be designed to be mountable.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Yes | Possible | No | Yes | No | Possible | Yes | 1 - 6mph ¹ |

Potential Cost ²

\$40,000 - \$100,000 per location

¹Source: Federal Highway Administration. *Traffic Calming ePrimer*. Accessed January 5, 2024. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.7>

²Cost referenced FHWA and upward adjusted by a factor of 4 based on cost comparison with available bid results for some of the reported devices. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.2>

Roundabouts (Not Traffic Circle)

Description

This device is a raised circular island placed within an unsignalized intersection around which traffic circulates. Direct straight through movements are obstructed by the raised island causing traffic to move to the right and around the circle. The intersection approaches are normally controlled by yield signs that serve to alert motorists to the need to slow their speed entering the intersection. Both a small modern roundabout and a mini-roundabout are designed in accordance with roundabout design principles.



Objective

To reduce vehicle speed by requiring drivers to slow down to maneuver around the circle.

Sunnyvale Neighborhood Traffic Calming Program: No

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> Effectively reduces vehicle speeds. Reduces potential for collisions. Opportunity for landscaping. Minimal noise impacts. Turns made smoothly across small modern roundabout apron or mini-roundabout center island. | <ul style="list-style-type: none"> Loss of parking. Expensive to construct and remove if permanent. Bicycles and motor vehicles have to share a lane. Can require increased maintenance. May require additional right-of-way. |

Special Considerations

- Requires additional signage and pavement markings.
- Not recommended at offset intersections.
- Most effective when used in combination with other devices or placed in series on short blocks.
- Requires curbside parking prohibition within 30 feet of circle.
- In a small modern roundabout, the center island is not traversable and can be landscaped. In contrast, the center island of a mini-roundabout is fully traversable.
- Both a small modern roundabout and mini-roundabout use splitter islands to direct traffic entering the intersection. In order to accommodate trucks, fire trucks, school buses and vehicles towing trailers, the splitter islands can be either mountable or at-grade.
- The center island of a mini-roundabout should be a different pavement type than the surrounding roadways to increase its visibility.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|---------------------------------------|
| Yes | Possible | No | Yes | No | Possible | Yes | Dependant on design of approach lanes |

Potential Cost ²

\$60,000 - \$120,000 per location

¹Source: Federal Highway Administration. *Traffic Calming ePrimer*. Accessed January 5, 2024. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.7>

²Cost referenced FHWA and upward adjusted by a factor of 4 based on cost comparison with available bid results for some of the reported devices. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.2>

Curb Extensions, Chokers, Chicanes

Description

These are various methods of narrowing the roadway by extending raised curbs into the street. These can be done at street entries and exits as well as mid-block locations. The narrower street generally results in reduced traffic speeds and provides pedestrians with shorter crossing distances.



Objective

To reduce traffic speeds and reduce pedestrian exposure to vehicles.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> • Shorter pedestrian crossings. • Can decrease vehicle speeds entering a narrowed roadway. • Creates an opportunity for landscaping and green infrastructure. • Allows better pedestrian visibility around parked cars. | <ul style="list-style-type: none"> • May require loss of on-street parking. • Can create a hazard for bicyclists. • May impede emergency response vehicles and other trucks. • Increased maintenance. • Require special consideration for drainage. • Expensive to construct and remove if permanent. |

Special Considerations

- Curb-extensions can be installed mid-block.
- Curb-extensions should not extend into designated bicycle lanes or bicycle bypass lanes should be included to accommodate bicycles.
- At transit stops, curb-extensions enhance service.
- Bulbouts need to be designed to accommodate emergency response vehicles, larger vehicle and common truck turning path.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | Possible | No | Yes | No | Possible | Possible | <5mph ¹ |

Potential Cost ²

\$48,000 - \$160,000 per location

¹Source: California Department of Transportation (2022). *Traffic Calming Guide - A Compendium of Strategies*

²Cost referenced FHWA and upward adjusted by a factor of 4 based on cost comparison with available bid results for some of the reported devices. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.2>

Median Island

Description

This is a median placed in the center of a roadway midblock or at entry or exit points to create a narrower travel way and also reduce pedestrian crossing distances.



Mid-block Raised Median

Objective

To slow vehicles down by narrowing the travel lane and introducing a curb adjacent to vehicular traffic.



Median Island

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)
Sunnyvale Vision Zero Toolkit: Yes

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • Opportunity for landscaping. • Provides refuge area for pedestrians. • Narrows travel lanes. • Does not affect emergency response times • Can be placed at a midblock location or on the approach to an intersection. • Separates opposing vehicle travel lanes and reduces opportunities for vehicle-vehicle collisions. | <ul style="list-style-type: none"> • Expensive to construct and remove if permanent. • May reduces travelway width and force bicyclist and motor vehicle to share travel lane. • Left turns into/out of driveways would be restricted at the location of the median island if the median island is raised. • May impede emergency response vehicles and other trucks if median island is raised. |

Special Considerations

- Retains sufficient width to allow for continued easy flow of emergency vehicles.
- If the median island has sufficient width, it can be designed to provide pedestrian refuge for crossing the affected intersection approach leg.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | Possible | No | Yes | Possible | Possible | Possible | 2 - 3mph ¹ |

Potential Cost ²

\$60,000 - \$220,000 per location

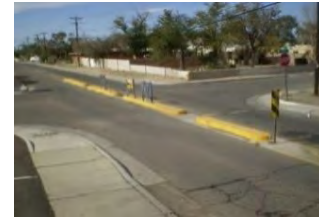
¹Source: Federal Highway Administration. *Traffic Calming ePrimer*. Accessed January 5, 2024. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.7>

²Cost referenced FHWA and upward adjusted by a factor of 4 based on cost comparison with available bid results for some of the reported devices. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.2>

Median Barrier, Forced Turn Islands, Barriers, Channelization

Description

These can be a barrier or raised island along the center of a roadway to prohibit left turns or crossing traffic.



Median Barrier

Objective

To reduce cut-through traffic on neighborhood streets by restricting left-turn movements.



Forced Turn Island

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> • Reduces cut-through traffic. • Opportunity for landscaping. • Provides refuge area for pedestrians. • Reduce vehicle conflict points at intersection. • Provides location for placement of visible signs. • Can improve safety for bicycles and pedestrians. | <ul style="list-style-type: none"> • Impedes emergency response times. • May divert traffic to other neighborhood streets. • Expensive to construct and remove if permanent. • Restricts full access to and from neighborhood streets. • More permanent measure. |

Special Considerations

- Possibility for varied designs, such as restricted left turns only on major streets.
- Bicyclist access can be accommodated by providing a gap/ramp in the median barrier.
- The design of a median barrier or forced turn island should consider the right turn curb radii.
- If the median barrier/forced turn island has sufficient width, it can be designed to provide pedestrian refuge for crossing the affected intersection approach leg.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | Yes | No | Possible | Yes | Yes | Possible | N/A |

Potential Cost ¹

\$60,000 - \$220,000 per location

¹Cost referenced FHWA and upward adjusted by a factor of 4 based on cost comparison with available bid results for some of the reported devices. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.2>

Diagonal Divertors

Description

These are barriers placed diagonally across an intersection to force drivers to make a particular turn but not allow other movements.



Objective

To reduce cut-through traffic on neighborhood streets by restricting straight-through movements.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • Reduces cut-through traffic. • Pedestrians and bicycles can be accommodated by providing walkways/cutouts in the diagonal divertor. • Opportunity for landscaping. • Reduce vehicle conflict points at intersection. • Provides location for placement of visible signs. | <ul style="list-style-type: none"> • Impedes emergency response times. • May divert traffic to other neighborhood streets. |

Special Considerations

- Appropriate signs and markings need to be in place to help the motorist be aware of and see the diagonal diverter.
- The radius should be the minimum needed to allow the design vehicle through.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| No | Yes | No | No | Yes | Yes | Possible | N/A |

Potential Cost ¹

\$30,000 - \$80,000 per location

¹Cost referenced the San Carlos Neighborhood Traffic Management Program, 2017

One-Way Streets

Description

This is when traffic on a street is regulated to only allow traffic to flow in one direction. Usually this is accomplished through sign placement.



Objective

To reduce cut-through traffic on neighborhood streets.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none"> One-way streets can simplify crossings for pedestrians, who must look for traffic in only one direction. Reduces cut-through traffic. | <ul style="list-style-type: none"> May divert traffic to other neighborhood streets. Restricts full access to and from neighborhood. Potential issue with opportunity for motorist to not adhere to one-way restriction. |

Special Considerations

- One-way streets work best in downtown or very heavily congested areas.
- One-way streets operate best in "pairs," separated by a block to no more than one-quarter mile.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| No | Yes | No | No | Yes | No | No | N/A |

Potential Cost ¹

\$4 - \$5 per linear foot

¹Cost referenced the San Carlos Neighborhood Traffic Management Program, 2017

One-Way Chokers, Half-Closures or Semi-Diverter

Description

These are barriers to traffic in one direction that permit traffic in the opposite direction to proceed.



Objective

To reduce cut-through traffic on neighborhood streets by blocking vehicular traffic in one direction.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • Reduces cut-through traffic. • Opportunity for landscaping. • Pedestrians and bicycles can be accommodated by providing walkways/cutouts. • Provides location for placement of visible signs. | <ul style="list-style-type: none"> • Applicable only at an intersection • May divert traffic to other neighborhood streets. • Potential issue with opportunity for motorist to not adhere to one-way restriction. • Expensive to construct and remove if permanent. • Restricts full access to and from neighborhood streets. • Potential drainage issues. |

Special Considerations

- A half closure island may have an opening roughly four feet wide on the curb side of the street to allow drainage flow and to permit bicyclists, but not motorists, to pass through the barrier in the closed direction.
- For an exit-only half closure, movement prohibition and DO NOT ENTER signs are required to advise approaching traffic of the closure.
- A half closure should provide a full lane width in the open direction and sufficient curb radii.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| Possible | Yes | No | Possible | Yes | No | Possible | N/A |

Potential Cost ¹

\$30,000 - \$100,000 per location

¹Cost referenced the San Carlos Neighborhood Traffic Management Program, 2017

Street Closures and Cul-de-sac

Description

This is the complete barricade or termination of a street.



Objective

To reduce cut-through traffic on neighborhood streets by restricting through traffic.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> • Reduces cut-through traffic. • A full closure can be designed to allow bicyclists and pedestrians to pass through. • Opportunity for landscaping. • Reduces vehicle conflict points. | <ul style="list-style-type: none"> • Impedes emergency response times. • May divert traffic to other neighborhood streets. • Potential drainage issue. |

Special Considerations

- At the entrance to the full closure block, a Dead End or Cul-de-sac sign is required.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|-------------------------------|
| No | Yes | No | No | Yes | Yes | Possible | N/A |

Potential Cost ¹

\$40,000 - \$400,000 per location

¹Cost referenced FHWA and upward adjusted by a factor of 4 based on cost comparison with available bid results for some of the reported devices. <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-1#3.2>

Woonerf

Description

This is a design that makes residential streets an extension of the front yards. Essentially there is no identified street with curbs and gutters. Parked cars, landscaping, etc. intrude upon portions of the streetway while still allowing for vehicular travel. They are typically narrow streets without curbs and sidewalks, and vehicles are slowed by placing trees, planters, parking areas, and other obstacles in the street. Motorists become the intruders and must travel at very low speeds below 10mph. This makes a street available for public use that is essentially only intended for local residents.



Objective

To reduce vehicle speeds and cut-through traffic.

Sunnyvale Neighborhood Traffic Calming Program: Yes (Stage 2 measure)

Sunnyvale Vision Zero Toolkit: No

| Advantages | Disadvantages |
|---|---|
| <ul style="list-style-type: none"> • Reduces cut-through traffic. • Reduces vehicle speeds. • Pcreates a public space for social activities and play by local residents. | <ul style="list-style-type: none"> • Impedes emergency response times. • May divert traffic to other neighborhood streets. • Expensive to construct and remove if permanent. • Motorists, pedestrians, and bicycles share space resulting in safety concerns. |

Special Considerations

- ADA considerations are needed to delineate walkways for visually impaired.
- The design needs to keep vehicle speeds very low in order to make the streets safe for children.

Evaluation Considerations

| Reduces Speed | Reduces Volume | Increases Noise | Parking Loss | Restricts Access | Impacts Emergency Response | Increases Street Maintenance | Speed Reduction Effectiveness |
|---------------|----------------|-----------------|--------------|------------------|----------------------------|------------------------------|--|
| Yes | Possible | No | Possible | No | Yes | Possible | reduces vehicle speeds to a range of 10mph |

Potential Cost

Generally exceeding \$1 million

APPENDIX B
Community Outreach Summaries

CITY OF SUNNYVALE TRAFFIC CALMING PROGRAM AND POLICY STUDY COMMUNITY MEETING #1

Summary of Community Outreach Meeting
Tuesday November 7, 2023

The City of Sunnyvale hosted a community outreach meeting on November 7th, 2023 from 5:30-7:30 p.m. to present and take input regarding the city's Traffic Calming Program and Policy Study. The meeting was held at City Hall, 456 W. Olive Ave. in Sunnyvale as well as on-line through a Zoom meeting link. Approximately 25 people participated either in person or on-line in the meeting.

City staff Dennis Ng Transportation and Traffic Manager and Joshua Llamas, Transportation Manager represented the City of Sunnyvale at the meeting. Ollie Zhou, Project Manager, Huy Tran, Associate, Daniel Choi, Associate, and Katie Riutta, Planner, represented Hexagon Transportation. Eileen Goodwin, Apex Strategies, is the Community Outreach lead for the project team.

This was the first community outreach meeting with members of the public regarding this project. The purpose of the meeting was to get input from the community members on the current traffic calming process, traffic calming options and city hot spots needing traffic calming considerations.

Meeting Summary:

The meeting started at approximately 5:30 p.m. After a brief introduction by Eileen Goodwin, the project outreach lead, City Project Manager Joshua Llamas explained the purpose of the project and the history of traffic calming efforts in the City. Then a presentation was given by consultant Project Manager, Ollie Zhou, to orient the attendees on the current city policy and process, traffic calming methods and tools and the scope and schedule of the effort. Ollie explained the scope approach with these bullets:

- Examine other cities' traffic calming programs, best practices;
- Review and examine innovative traffic calming measures;
- Assess potential costs for each traffic calming measure; and
- Seek input from the public and different stakeholders.

He explained that the project is scheduled to take additional community input in the spring of 2024, develop policy recommendations next summer and present those recommendations to the Bicycle Pedestrian Advisory Committee and City Council by October 2024.

Summary of November 7, 2023
Traffic Calming Community Meeting

There was an opportunity for general questions to be addressed from both in person and on-line attendees. The questions and responses given are recorded below.

During the presentation, Eileen Goodwin conducted an informal survey with the attendees on how the attendees heard about the meeting. The responses were split among city e-blasts and subscriber lists, a Bicycle Pedestrian Advisory Committee announcement and word of mouth. NextDoor was also mentioned.

After the presentation and question and answer period, the in-person attendees were asked to participate in a workshop session where stations were set up to take feedback about traffic issues in the various quadrants of the city, the current process and traffic calming tools. The results of those stations were recapped for attendees at the end of the meeting. The detailed feedback (gathered through dots, sticky notes and comments) was captured by the project team separately. The on-line attendees were asked to participate by utilizing the on-line survey which asked for similar feedback to the stations at the in-person workshop. All attendees were encouraged to take the survey and spread the word about the survey to colleagues, neighbors, friends and family.

| Comment/Question | Response |
|---|--|
| How are the streets identified and determined for eligibility for traffic calming measures? | The General Plan, adopted by the City Council, sets what city streets fall in which street categories. |
| Can the General Plan street designations be amended? | It is possible. Please leave that comment at the Process station. |
| When is the next opportunity for feedback again? | Late Spring 2024 there will be another round of outreach. Please sign in so you can be notified directly. |
| Mathilda and Washington streets are seeing an increase of traffic due to new residential development. How can we influence this area for safety and traffic calming measures? | <p>Leave comments at the map station. The streets you are referring to are collectors, and therefore not currently eligible for some traffic calming techniques. However, staff can look at safety issues and potential solutions.</p> <p>You can also advocate for collectors in general to become eligible for traffic calming by leaving comments at the stations or on-line.</p> |

Summary of November 7, 2023
Traffic Calming Community Meeting

| | |
|--|---|
| <p>A resident of the Fisher neighborhood stated the stage 1 traffic calming elements are unlikely to change behavior. He proposed that stage 1 (signage style measures) be eliminated from the process and go straight to more concrete measures. He feels this may or may not lead to more expenditures and if they do lead then developer fees should be paying for the measures not the existing neighbors.</p> | <p>Developer fees must have nexus to the projects they fund. In the case mentioned it is not likely there would be nexus to the existing developer fees but the city is planning to redo the developer fees next year and this issue could be brought up as part of that process.</p> |
| <p>Discussion of the speed thresholds.</p> | <p>Clarification given</p> |
| <p>The Kingfisher intersections need to be dealt with. There are multiple curves and unsafe areas. Traffic calming is needed. How can we measure safety?</p> | <p>There are handbooks for engineers that lay out best practices</p> |
| <p>Can the city make fixes even with post covid traffic patterns?</p> | <p>Yes, city staff can make safety improvements to areas unrelated to the traffic calming process and effort.</p> |
| <p>Is data used by the staff available to the public?</p> | <p>Yes. In the case of data related to the traffic calming requests it is standard procedure that the letter back to the applicant include the city staff's analysis of the data. That information is available to the public through Joshua.</p> |
| <p>I would like to reclassify Washington Avenue.</p> | <p>That could be considered but it may be more beneficial to ask for collectors to be eligible for traffic calming rather than trying to take a specific collector and reclassify it to another type of street.</p> |

Summary of November 7, 2023
Traffic Calming Community Meeting

| | |
|--|---|
| <p>Since the traffic calming policy and process have been in effect how many successful traffic calming petitions have there been? How many total requests? How many in Stage 1 and how many in Stage 2 of implementation?</p> | <p>The city gets about 5 requests a year. Implementation drops off because of the petition, lack of consensus and follow up from the applicant.</p> |
| <p>Does the city staff ever initiate a traffic calming effort?</p> | <p>No. Staff initiates safety projects but not traffic calming.</p> |
| <p>How does someone get the form to start the process for traffic calming?</p> | <p>The form is in the handbook which is on the city's website and can be reached on the webpage for this project.</p> |
| <p>If new housing comes along can an area go from a Stage 1 to a Stage 2 level effort?</p> | <p>Yes, staff is monitoring the traffic calming areas and can do additional studies if necessary.</p> |
| <p>Can traffic humps be placed on Washington Ave?</p> | <p>Not at this time. Washington is currently classified as a collector street and not eligible for traffic humps. Perhaps an outcome of this effort will change that.</p> |
| <p>America Avenue?</p> | <p>That is a local street and could start the petition process.</p> |
| <p>Does noise get considered anywhere in this process? There is noise from speeding too.</p> | <p>Yes, staff discloses that traffic humps often create additional neighborhood noise when they are implemented due to their design and the way certain types of cars interact with them.</p> <p>It is not in the handbook and process to measure neighborhood traffic noise from speeding.</p> |

Summary of November 7, 2023
Traffic Calming Community Meeting

| | |
|--|---|
| Why don't we have traffic inspectors? | The traffic calming process is currently set up to be more reactive than proactive. Neighbors don't always agree there are problems or if they do agree there is a problem they don't always agree on the solution. Whatever goes in as a measure the closest neighbors have to live with 24/7. |
| What is a safety issue process? | The city is always monitoring safety issues. Staff look at accident reports. There are lots of tools that staff can utilize to help make areas safer depending upon what the core issue is. |
| On Washington Avenue people drive too fast. I have seen cats run over. | Comment noted. |

After the question-and-answer session, the attendees went to the six stations to provide feedback. After the community members visited the stations a brief wrap of each station was reported before the meeting adjourned.

Station Report Out—the staff that worked at the stations did a brief wrap up of the themes and feedback received during the station comment period:

- Station 1: Current Traffic Calming Measures
 - People like some of the tools but not all of the tools
 - Bike riders do not like curb extenders
 - Would like a cut out for bike riders if intersection bulb extensions are utilized
- Station 2: Current Traffic Calming Process
 - Would like the city to budget for traffic calming projects to make the city process move faster
 - Community members would like considerations for collectors to be eligible for traffic calming

Summary of November 7, 2023
Traffic Calming Community Meeting

- Recommendation that city staff communicate more clearly regarding what is a safety project versus a traffic calming project and that they are different processes and are treated differently
- Station 3-6: Maps of the City by Quadrant
 - Southeast area: Safety issues identified, Kingfisher is a street with speeding and cut through traffic, Wolfe Road and Sunnyvale Saratoga Road have safety related issues
 - Northeast area: no comments received for this area
 - Southwest area: few comments received, congestion and dangerous conditions noted near Route 85 on and off ramps
 - Northwest area: Washington Avenue is a hot spot, Mathilda and is as well, desire for left turns ?

The meeting adjourned by 7:30.

Meeting Summary by Eileen Goodwin, Apex Strategies

CITY OF SUNNYVALE

TRAFFIC CALMING PROGRAM AND POLICY STUDY

COMMUNITY MEETING #2

Summary of Community Outreach Meeting
Monday September 23, 2024

The City of Sunnyvale hosted a community outreach meeting on September 23rd 2024 from 5:30-7:30 p.m. to present and take input regarding the city's Traffic Calming Program and Policy Study. The meeting was held at City Hall, 456 W. Olive Ave. in Sunnyvale as well as on-line through a Zoom meeting link. Approximately 37 people participated either in person or on-line in the meeting.

City staff Angela Obeso Interim Transportation and Traffic Manager, Lillian Tsang, Principal Transportation Engineer and Joshua Llamas, Transportation Planner, represented the City of Sunnyvale at the meeting. Ollie Zhou, Project Manager, and Shikha Jain, Associate represented Hexagon Transportation. Eileen Goodwin, Apex Strategies, is the Community Outreach lead for the project team and meeting facilitator.

This was the second community outreach meeting with members of the public regarding this project. The purpose of the meeting was to get input from the community members on the suggestions to revise the current traffic calming process and potential for traffic calming options.

The meeting covered a quick overview of the existing program and an update on the study progress. Then potential policy and program updates and changes were presented, and feedback was requested for each potential change.

Meeting Summary:

The meeting started in person and on-line at approximately 5:30 p.m. with a brief introduction and agenda review by Eileen Goodwin, the project outreach lead. Eileen asked the in-person and on-line attendees whether they had attended the previous community meeting in November 2023 for the project or the City Council update in June. Four people indicated they had attended the community meeting and three indicated they attended the Council meeting in June. So, most of the attendees were learning the details of the Study for the first time. Hexagon Project Manager Ollie Zhou explained the purpose of the project and the history of traffic calming efforts in the city. He explained the current city policy and process, review of other cities' traffic calming programs and best practices, traffic calming methods and tools and the scope and schedule of the effort. City Project Manager Joshua Llamas reviewed the potential policy changes. He reviewed the benefits and challenges with each potential policy change related to the following topics:

- Proposed traffic calming definitions

Summary of September 23, 2024
Traffic Calming Community Meeting

- Proposed Objectives for the Traffic Calming Effort
- Suggestions for improving communications and awareness regarding the traffic calming program
- Consider expanding the program to include Residential Collector Streets
- Changes to the initial petition process requirements
- Revision of the speed and volume thresholds
- Consideration of two new traffic calming measures (community meetings/education and raised intersections)
- Potential changes to neighborhood consensus requirements

Prior feedback from the previous community meeting last November and the City Council feedback in June 2024 was shared with the attendees.

There was an opportunity for general questions to be addressed from both in person and on-line attendees. The questions and responses given are recorded below.

The PowerPoint presentation utilized at the meeting are available here [Transportation Projects | Sunnyvale, CA](#) posted on the City's website.

After the presentation and question and answer period, the in-person and online attendees were asked to participate in giving feedback on proposed changes to the current traffic calming process. Specifically, the city council asked the team to

- Define Traffic Calming for Sunnyvale
- Consider including Residential Collector streets for traffic calming
- Make program easier to use
- Improve communication and transparency of the program

To address these topics and other design related issues attendees were asked to give feedback on:

- Proposed traffic calming definitions
- Proposed Objectives for the Traffic Calming Effort
- Suggestions for improving communications and awareness regarding the traffic calming program
- Consider expanding the program to include Residential Collector Streets
- Changes to the initial petition process requirements
- Revision of the speed and volume thresholds
- Consideration of two new traffic calming measures (community meetings/education and raised intersections)
- Potential changes to neighborhood consensus requirements

Summary of September 23, 2024
Traffic Calming Community Meeting

The feedback received by topic appears below. This feedback was captured through calling on in person attendees and also summarizing the questions coming in through the virtual meeting question function. The full transcript of the on-line feedback was made available to the project team for review.

| Comment/Question | Response |
|--|---|
| General Question: Do these raised intersections calm traffic? | The change in the street has shown to slow the traffic down. |
| Feedback on Proposed Definitions | |
| Violations of running stop signs should be added to the traffic calming process. | Running stop signs have a different process to trigger enforcement activities and are not part of the traffic calming effort. |
| Why limit definitions to residential neighborhoods, why not include business districts? | Traffic calming is a tool for residential areas, that is where speeding and traffic volumes are most an issue. Business districts can be looked at separately where there are concerns. |
| Safety should be part of the definition; the safety of kids and adults should be added to the concept. | Safety issues are being proactively addressed by the City through other programs |
| Online input included adding safety to the definitions of traffic calming on streets. Safety should be a priority. | Safety issues are being proactively addressed by the City through other programs |
| An online comment asked about parking zones. | That is a different process and can be address by staff separately |
| An online comment questioned whether just modifying the speed limit would be enough and how it was important to address pedestrian safety. | Comments noted. |
| Feedback on Proposed Objectives | |
| How is data going to be collected and evaluated? Want to see the best practice report. That should be made available. What happens if recommendations have been taken and people disagree with them. | City is the lead for any changes after implementation. |

Summary of September 23, 2024
Traffic Calming Community Meeting

| Comment/Question | Response |
|---|---|
| Questions about data collection times. | Typically weekdays, schools in session, and only in good weather. |
| Data collection is insufficient; most traffic is not typical; need more data. | Sunnyvale standard is one (1) week of data collection. |
| A couple of weeks of data collection would be better than a single week. | Comment noted. |
| Not enough data is collected. Washington Street is busy Add safety for all and safety for kids. Washington to Park. | Comments noted. |
| Metrics collection and success of the improvements how will you judge this? Stage 1 and Stage 2, should be added to the website. | Comments noted. |
| Need to decrease activities at Las Palmas Park at night. Speeding happens at night and night use at Park. PG&E work impacted data collection in November/December last year and likely skewed the data. | Staff has reviewed the data and new data will be collected. |
| Feedback on Proposed Program Communications | |
| Do we publish in the Sunnyvale newsletter? | No, now we post only on the city website. |
| This information should be published in the newsletter. Safety is the top priority, first two pages of website at least. Make it available and increase awareness. | Comments noted. |
| Need to create and explain an appeal process. | Comment noted. |
| Data should be published. | Comment noted. |

| Comment/Question | Response |
|---|--|
| <p>Program communications are in need of development. Need to improve responses back, too many “no’s”. Increase the clarity of what can be done so people know going into the process what is and is not possible. Is “Access Sunnyvale” communications with traffic staff?</p> | <p>Access Sunnyvale is a city program that accesses different departments based on the topic of the query.</p> |
| <p>An online comment suggested more transportation groups should be communicated with.</p> | <p>Comment noted.</p> |
| <p>Feedback on consideration of making residential collector streets eligible for traffic calming measures</p> | |
| <p>What is the classification of collector streets? Benardo is a collector, street parking and speeding there. Please look at it.</p> | <p>Comment noted.</p> |
| <p>Every street matters. Washington Avenue is not listed, but people are driving 60 mph in the evenings. People are constantly blowing through stop signs. Radar is already used. Level to pull a petition there.</p> | <p>Comments noted.</p> |
| <p>Every street should matter. Don’t care “who” about these programs it needs to be more transparent and easier to access improvements. Need some help, clarity. I likes the dashboard for knowing what the status of requests are. Collector streets are safety issues such as on California and North Sunnyvale Avenue.</p> | <p>Comments noted.</p> |
| <p>Why discriminating among streets; we should not be doing that. Emergency response time will be impacted. The Washington area requires a balanced approach, should not be listed as a “con.”</p> | <p>Comments noted.</p> |

Summary of September 23, 2024
Traffic Calming Community Meeting

| Comment/Question | Response |
|--|---|
| An online comment supported including the posting of a list of streets by definition. | Comment noted. |
| Safety on list of “pro’s” and “con’s”. Staff resources, money is there, not a “con,” “may impact” is better wording. Sirens available for emergency responders. Washington Street Park area should be treated like a school area with kids and people. | Comments noted. |
| When did the “collector” streets get classified? | Street types are identified in the city general plan transportation element. Most recent General Plan was adopted in June 2022. |
| Feedback on proposed changes to initial petition process | |
| Define who can petition. | Neighborhood members. |
| What about West Washington? | Not in traffic calming program currently, would be eligible in a different program. |
| Mountain View uses 10% not 50% of neighborhood. It should be 10% in Sunnyvale too. | Comment noted. |
| If this is a safety issue, don’t want to wait. One to two residents seems reasonable for a threshold to start a traffic calming effort. | Comments noted. |
| 50% is reasonable; need criteria for surrounding area. | Comments noted. |
| Online comment that 50% is fine, 100% is not realistic as numbers would be hard to meet. | Comments noted. |
| There should be a radius studied around any traffic calming because they can have effects several miles away. Need to gather feedback and give notices online. | Comments noted. |

Summary of September 23, 2024
Traffic Calming Community Meeting

| Comment/Question | Response |
|---|--|
| 50% is not bad, reduction will tie staff people up. Washington Park, Las Palmas. | Comments noted. |
| Need to define 50%. | Use total universe of addresses so if 10 houses are on the street, then 5 houses would be the 50%. |
| What if 50% don't respond? | Treated as "no" vote. |
| Feedback on proposed revisions to speed thresholds | |
| Define 85%, is 15% faster? | Yes |
| Do you lower the speed limits? | Yes. |
| How many meet the 1,000' threshold? | They are met by two streets. |
| School zone unintended consequences. There is radar enforcement if the street doesn't meet the 1,000' threshold then it is out. Additional enforcement around school zones. | Yes, but this is an either/or, not both. |
| Risk level, but versus reality. Vans and cars parked on streets impact visibility and safety; need prevent larger vehicles at intersections. | Comments noted. |
| What speed is the 85% percentile defined? | 32 mph is based on 25 mph. |
| What sets the speed? | California Vehicle Code. 85 th percentile speed |
| Why not use the speed limit? | Need to check the Vehicle Code. Local streets are not |
| Online Comment: streets need to be safer regardless of 100 to 1000 vehicles using them | Comments noted |
| Online comment: Parents speed up after school zones can this be address? | Comments noted – This would fall under enforcement. |
| Challenge the pro for outlier speeders – they are what is causing accidents. | The 95% level has never been met by itself. |

Summary of September 23, 2024
Traffic Calming Community Meeting

| Comment/Question | Response |
|--|---|
| Clarifications on definition for 85 th percentile speed. Does this mean that 15% exceeds the speed of 32 mph? | Yes |
| Feedback on proposed additional traffic calming measures (public education meetings, raised intersections) | |
| Volleyball players at the Las Palmas park are from other cities. Not effective for meeting because no good way to get their attendance at a meeting. | Comments noted. |
| Addition of traffic cameras should be considered at problem intersections near Fremont High School; Sunnyvale Avenue and on Saratoga Avenue. | Comments noted. |
| Purpose of meeting – traffic calming, not traffic safety; not really addressed. Message to take to Council. Feedback about safety and there should be a separate program to address that. | Comment noted. |
| Think out of box to break habits. Need non-static and the unexpected. Bollards that change location would be a good example. One way in, vs. one way out. Moveable concrete planters, not always the same. | Non-static devices that move locations from one day to the next are not typical traffic calming measures found in online research or other city practices. Static concrete planters that close down streets or part of a street are part of the City’s toolkit. |
| Online comment questions why stop signs are not treated as traffic calming? | Stop signs are required to control traffic at intersections and have to meet certain requirements. They are not added just to calm speeders. |

Summary of September 23, 2024
Traffic Calming Community Meeting

| Comment/Question | Response |
|---|--|
| Feedback on proposed changes to consensus requirements | |
| Disagree with need to get consensus of the impacted property owner – positive for everyone should over-ride that. There are no impacts to the homeowner. | Aesthetics, noise, etc. are potential impacts immediately adjacent to some traffic control measures. |
| This proposal is fine, up to neighbors. | Comment noted. |
| Plan at specific location – range along streets choose where o.k. Speed bumps are able to be placed in multiple locations. | Comment noted. |
| 60% is too high, if there is a safety concern, even one person should be enough. | Comment noted. |
| On-line comment that the 60% level is a fine threshold. | Comment noted. |
| 100% is high – Las Palmas – 80% is better than 100%. If one person is concerned that should be enough. Roundabout on Las Palmas should be looked at. Immediately adjacent to traffic calming is better than the 100' requirement. | Comments noted. |

The meeting adjourned by 7:30 p.m.

Meeting Summary by Eileen Goodwin, Apex Strategies



HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: April 3, 2024
To: Mr. Joshua Llamas, City of Sunnyvale
From: Ollie Zhou, T.E.
Subject: Community Survey Analysis – Neighborhood Traffic Calming Update Study

The City of Sunnyvale's Neighborhood Traffic Calming Program was established in the early 2000s. Hexagon and Apex Strategies are conducting a study to re-evaluate and identify potential updates to the City's program. Hexagon and Apex held the first community meeting in early November 2023. The purpose of that community meeting was to introduce the project, present an overview of the City's existing program, and gather community input related to the program. This community meeting had a workshop component where attendees were given opportunities to give their specific inputs at many different "stations" hosting different topics. An online survey was set up to mimic the workshop component of that community meeting, so members of the public who were not in attendance during the workshop could also provide input on topics discussed during the workshop. The online survey was hosted on the City's website from October 31st, 2023 to December 7th, 2023.

The survey was promoted on the City's website and at the community meeting for the project held on November 7th, 2023. The online participants were encouraged to take the online survey because they could not participate in the station activities set up for the in-person attendees. The questions asked on the survey mirrored the input sought at the in-person stations. The online survey had options for participants to add comments under each question and many people added additional details. The City's online survey received 37 responses, of which 3 respondents attended the workshop in-person, and another 6 respondents attended the community meeting virtually.

It should be noted that the survey was voluntary and had a relatively low response rate compared to the city's population. There was no attempt to have the survey respondents correlated to the demographics of the current population of Sunnyvale, therefore these results are advisory only and cannot be extrapolated to be representative of the population in general.

This memorandum summarizes the results and key takeaways of the survey (Appendix A).

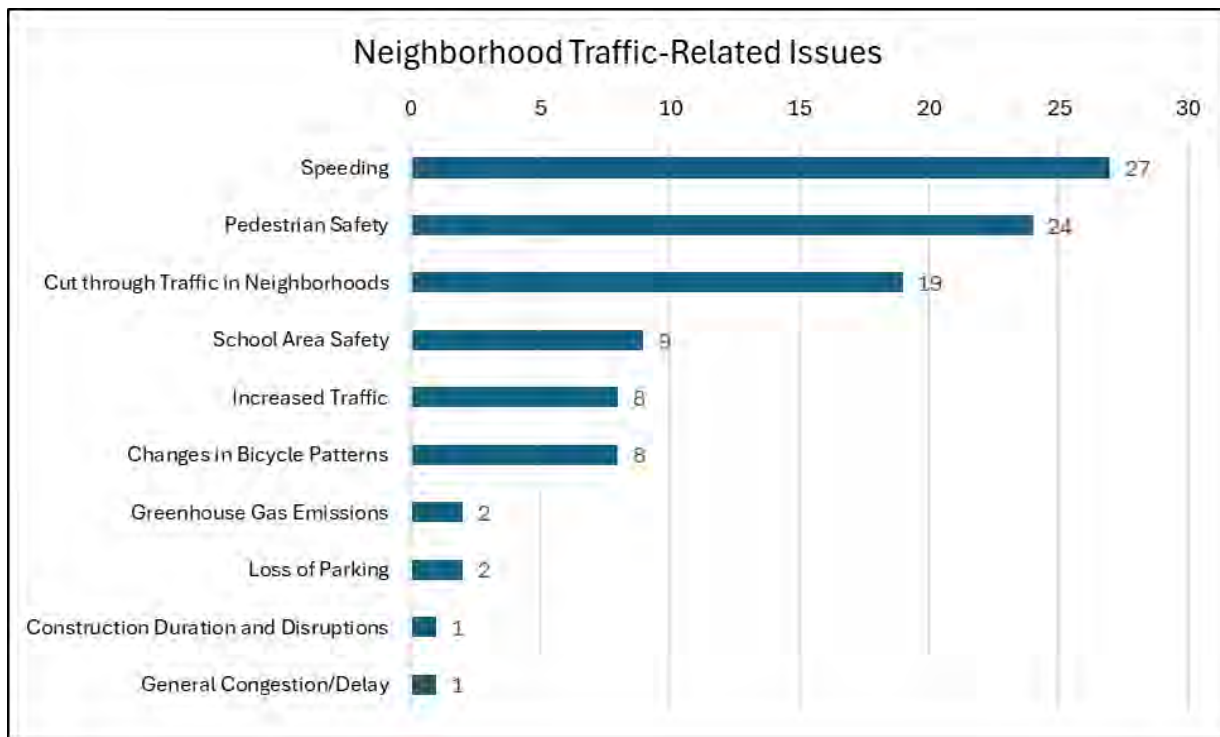
Survey Analysis

Sentiments on Current Traffic Conditions

Survey respondents were asked to choose up to 3 neighborhood traffic-related issues they are most concerned about. As shown on Figure 1, the following 3 issues received the most votes:

- Speeding
- Pedestrian safety
- Cut-through traffic in neighborhoods

Figure 1
Neighborhood Traffic-Related Issues



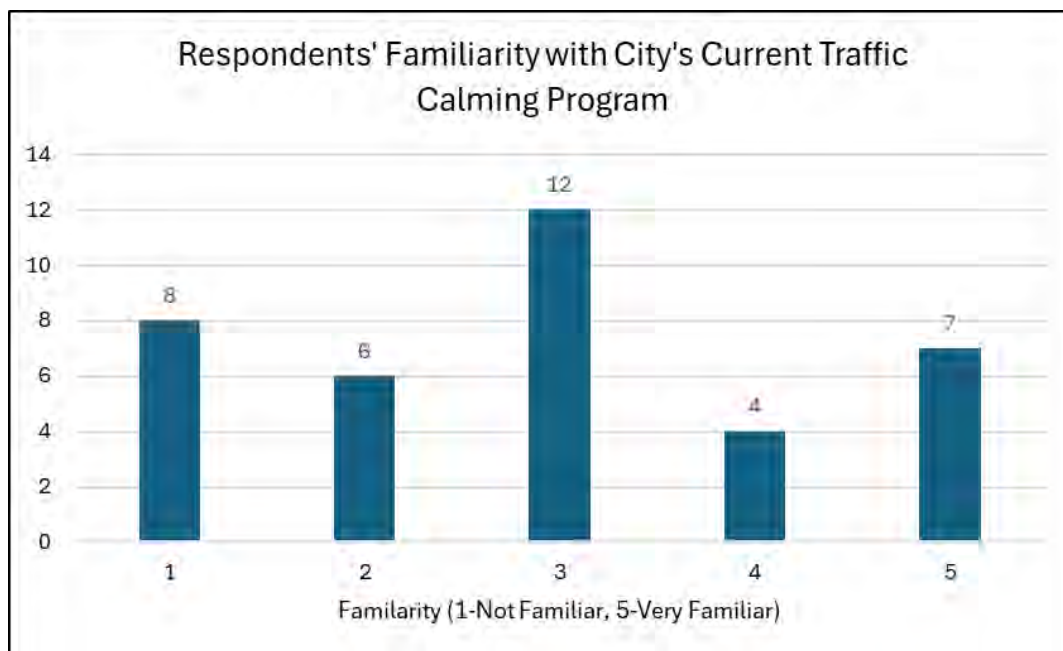
Out of the four responses that picked “Other”, one was related to pedestrian safety, which was aggregated into the “Pedestrian Safety” choice. Two were related to specific requests for stop signs at certain locations. One was related to bias in bicycle studies.

In a subsequent question, 34 out of 37 (92%) respondents agreed with the statement “I regularly experience a situation in Sunnyvale where I believe traffic needs to be significantly slowed down using traffic calming methods.”

Familiarity and Experience with City’s Current Traffic Calming Program

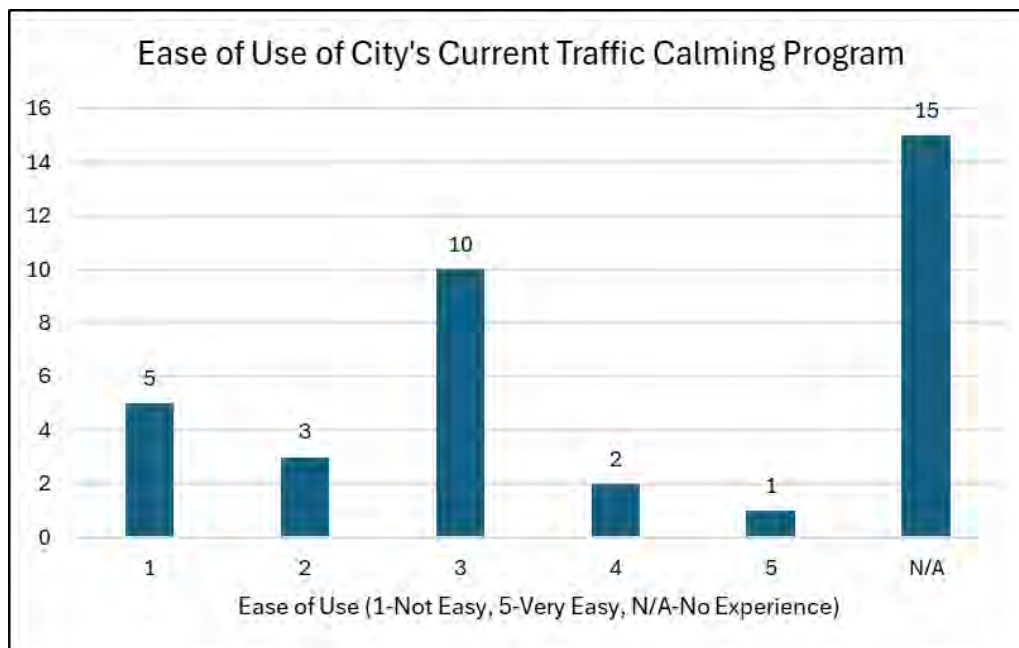
Respondents were asked about their familiarity with the City’s current traffic calming program. As shown in Figure 2 below, the survey respondents had varying degrees of familiarity with the City’s program.

Figure 2
Respondents’ Familiarity with City’s Current Traffic Calming Program



Respondents were also asked about the ease of use of the City's current traffic calming program. As shown in Figure 3 below, almost half of the respondents have no experience with the program. Of the remaining respondents, the majority of them ranked the ease of use at 3 or lower (1=not easy, 5=very easy).

Figure 3
Ease of Use of City's Current Traffic Calming Program

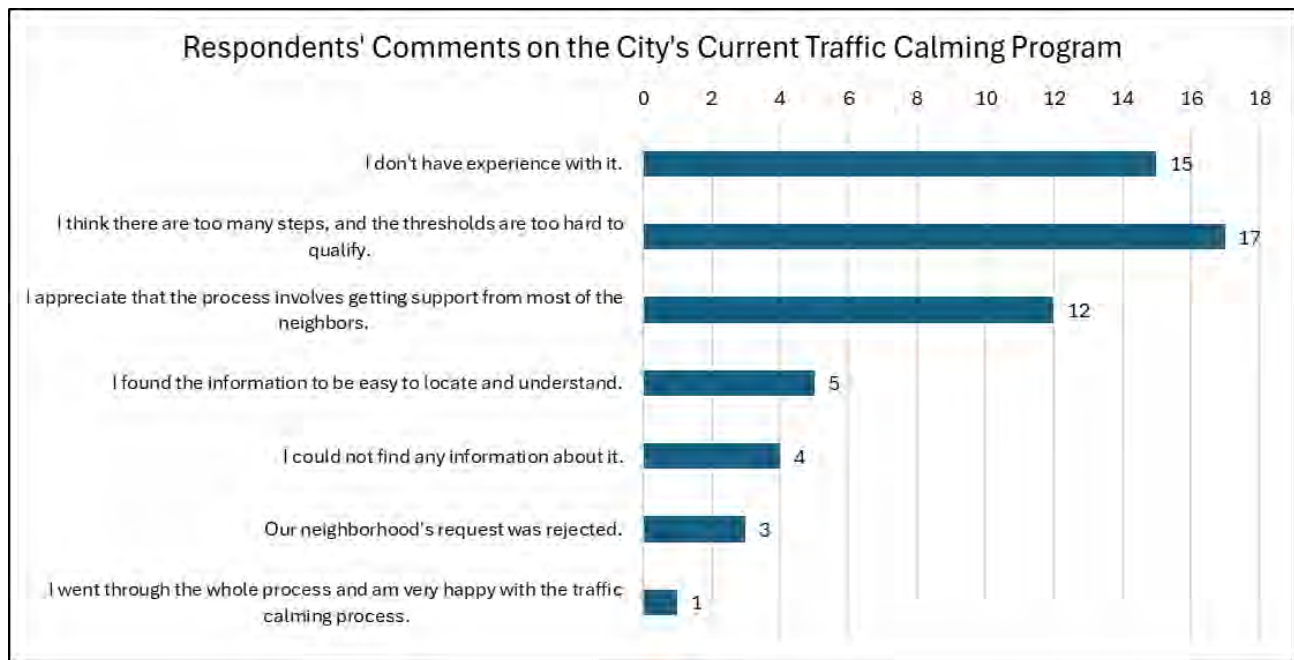


A cross-tabulation of respondents' familiarity with the program and ease of use of the program did not find any meaningful correlations. This is likely due to the limited sample size.

Finally, the respondents were asked to pick up to 3 statements that most closely represent their experience with the City's current traffic calming program. As shown in Figure 4 below, the respondents' top comments about the program are below:

- Too many steps in the program
- The thresholds are too hard to qualify
- Appreciate the neighborhood support element of the program

Figure 4
Respondents' Comments on the City's Current Traffic Calming Program



Sentiments on Specific Traffic Calming Measures

The respondents were asked to pick three measures that they believe are effective at slowing traffic in their opinions, and two measures that they do not want the City to use. As shown in Figure 5 below, respondents generally preferred the following three traffic calming measures:

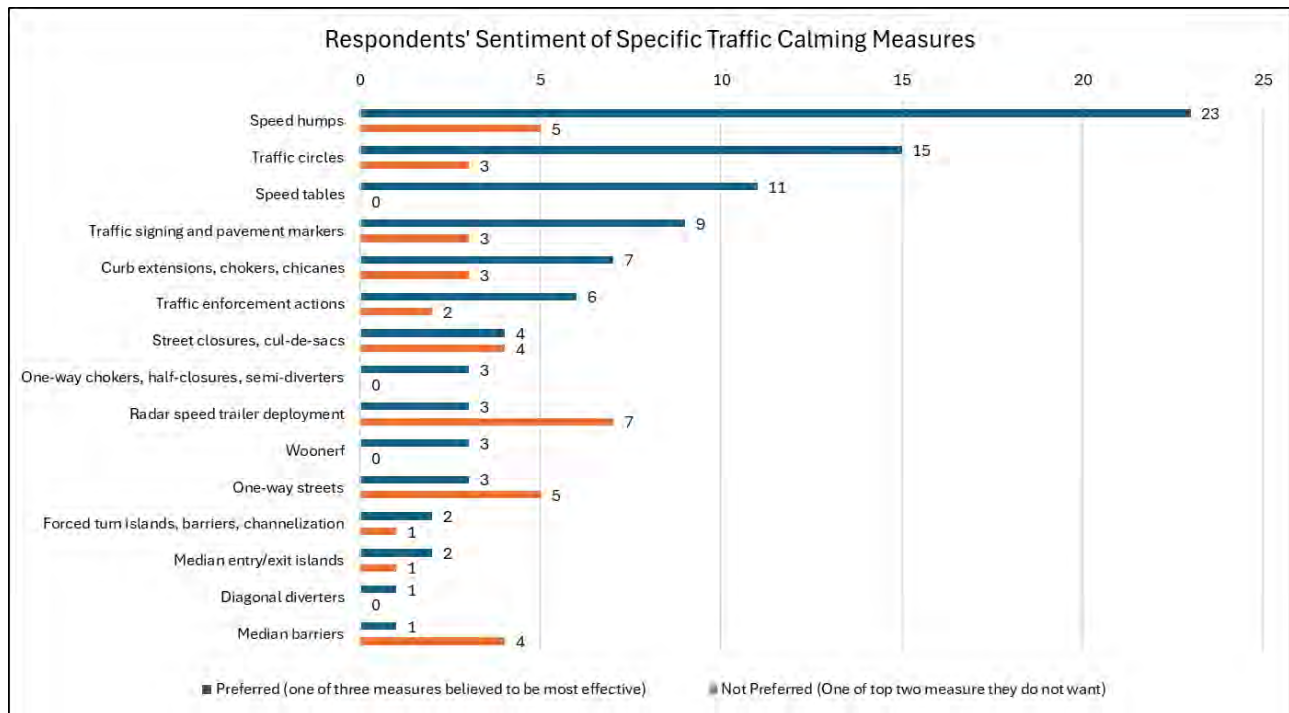
- Speed humps
- Traffic circles
- Speed tables

There were no considerable consensus on measures they did not want the City to use.

It should be noted that 9 respondents picked the "Other" option. Six of them indicated they wanted stop signs. However, stop signs are traffic control devices that must be installed following warrants and guidelines; they are not traffic calming measures. The other 3 respondents wanted specific improvements along a particular street, traffic cameras, and provided a general comment on traffic calming measures. Presuming the respondent mentioning "traffic camera" meant speeding

cameras; speeding cameras are currently allowed only in 6 cities per Assembly Bill 645. Sunnyvale is not included in that bill.

Figure 5
Respondents' Sentiment on Specific Traffic Calming Measures



Respondents' Characteristics

The survey also asked a number of questions related to the characteristics of the respondents. These included their general home location, their work location, their commute mode choices, and their age. The intent of these questions was to discover potential meaningful correlations with the responses discussed above. However, due to the limited number of survey responses, Hexagon did not find any meaningful correlations. A complete summary of the survey responses to these questions can be found in the appendix.

Conclusion

The City of Sunnyvale conducted an online survey to receive input from the community on the City's current traffic calming program. The following is a summary of the top inputs (most votes) received from the online survey responses:

- Respondents were most concerned with 1) speeding, 2) pedestrian safety, and 3) cut-through traffic in neighborhoods.
- While the respondents had varying familiarity with the current program, they generally believed the program was relatively not easy to use.
- Respondents' top comments on the current program included: 1) too many steps in the program, 2) the thresholds are too hard to qualify, and 3) appreciated the neighborhood support element of the program.
- Respondents' top preferred traffic calming measures were 1) speed humps, 2) traffic circles, and 3) speed tables. There was no general consensus on top traffic calming measures the respondents did not want implemented.

APPENDIX A
Survey Responses



Re-evaluate Traffic Calming Program Study

December 7, 2023, 5:31 PM

Contents

| | | |
|------|----------------------|----|
| i. | Summary of responses | 2 |
| ii. | Survey questions | 9 |
| iii. | Individual responses | 11 |

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Summary Of Responses

As of December 7, 2023, 5:31 PM, this forum had: Topic Start

Topic End

Attendees: 58

October 31, 2023, 4:41 PM

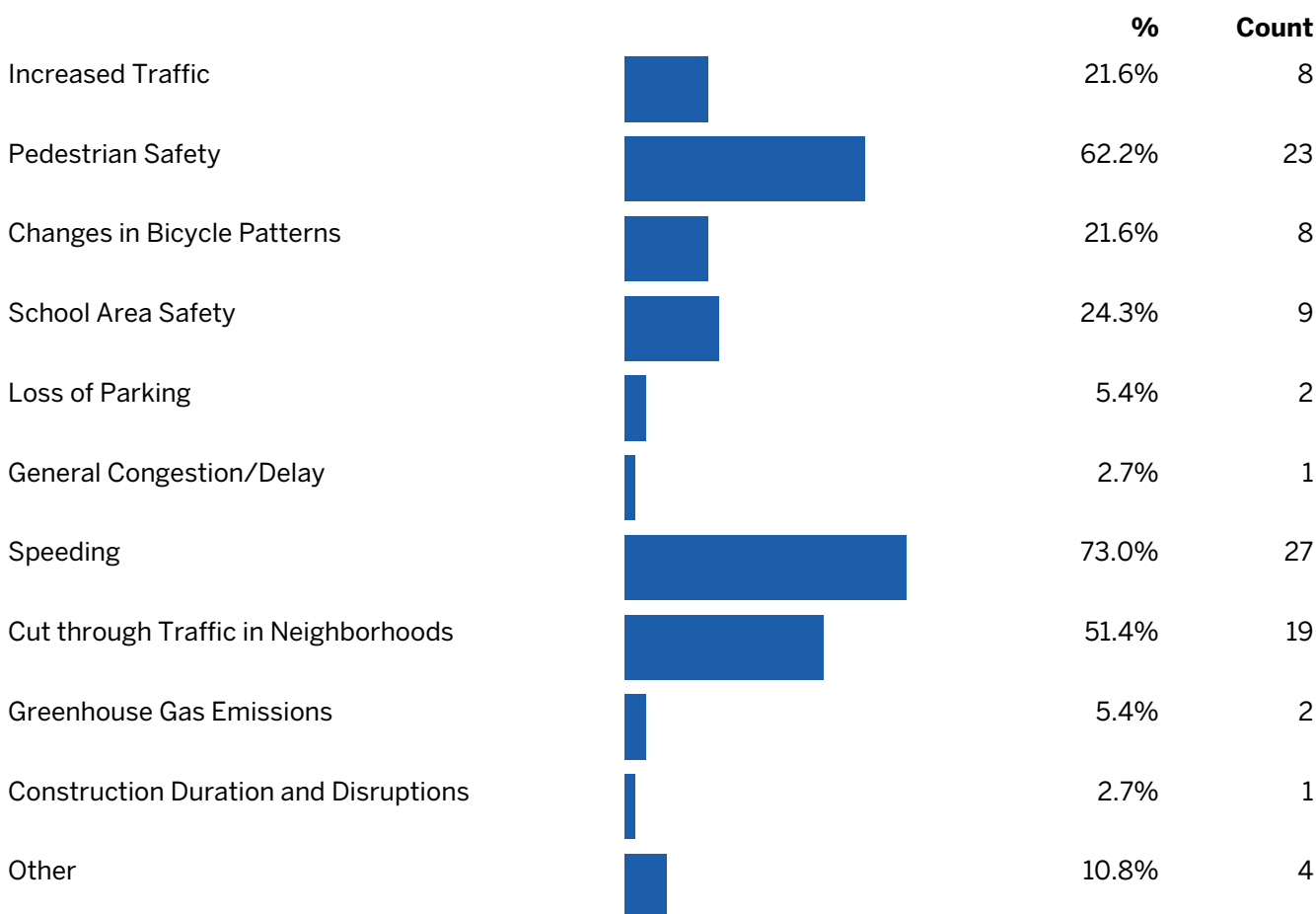
December 7, 2023, 12:00 AM

Responses: 37

Hours of Public Comment: 1.9

QUESTION 1

What neighborhood traffic related issues are you most concerned about? (choose up to 3)



Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

QUESTION 2






True or False. The following statement represents the situation in your neighborhood: "I regularly experience a situation in Sunnyvale where I believe traffic needs to be significantly slowed down using traffic calming methods."

| | | % | Count |
|-------|--|-------|-------|
| True |  | 91.9% | 34 |
| False |  | 8.1% | 3 |

QUESTION 3

How familiar are you with Sunnyvale's current traffic calming program? (1 = Not Familiar, 5 = Very Familiar)



Familiarity with program

| | | % | Count |
|---|---|-------|-------|
| 1 |  | 21.6% | 8 |
| 2 |  | 16.2% | 6 |
| 3 |  | 32.4% | 12 |
| 4 |  | 10.8% | 4 |
| 5 |  | 18.9% | 7 |

QUESTION 4

How easy is Sunnyvale's traffic calming program to use? (1 = Not Easy, 5 = Very Easy, N/A = Have not used)

Ease of use

| | | % | Count |
|---|---|-------|-------|
| 1 |  | 13.9% | 5 |
| 2 |  | 8.3% | 3 |

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

| | | % | Count |
|-----|---|----------|--------------|
| 3 |  | 27.8% | 10 |
| 4 |  | 5.6% | 2 |
| 5 |  | 2.8% | 1 |
| N/A |  | 41.7% | 15 |

QUESTION 5

Which of these statements most closely represent your experience with the City of Sunnyvale's traffic calming program? (choose up to 3)

| | | % | Count |
|--|---|----------|--------------|
| I don't have experience with it. |  | 40.5% | 15 |
| I found the information to be easy to locate and understand. |  | 13.5% | 5 |
| I could not find any information about it. |  | 10.8% | 4 |
| I think there are too many steps, and the thresholds are too hard to qualify. |  | 45.9% | 17 |
| I appreciate that the process involves getting support from most of the neighbors. |  | 32.4% | 12 |
| I went through the whole process and am very happy with the traffic calming process. |  | 2.7% | 1 |
| Our neighborhood's request was rejected. |  | 8.1% | 3 |

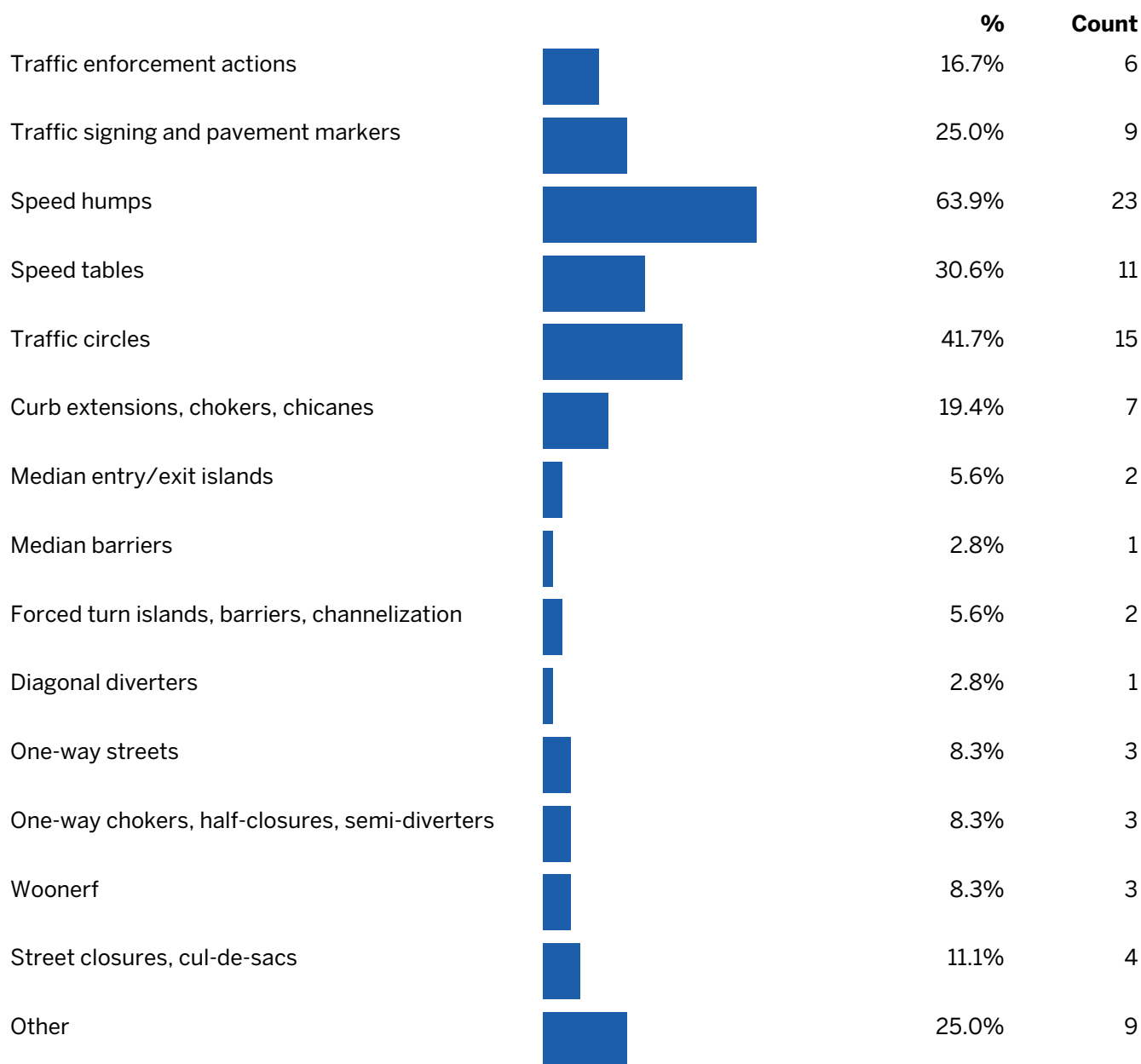
QUESTION 6

In your experience, which of these measures are effective at slowing down traffic? (choose up to 3)

| | | % | Count |
|--------------------------------|---|----------|--------------|
| Radar speed trailer deployment |  | 8.3% | 3 |

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale



QUESTION 7

I do not want the City to use the following measures to slow down traffic. (choose up to 2)



Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

| | | % | Count |
|---|--|----------|--------------|
| Traffic enforcement actions | | 8.0% | 2 |
| Traffic signing and pavement markers | | 12.0% | 3 |
| Speed humps | | 20.0% | 5 |
| Traffic circles | | 12.0% | 3 |
| Curb extensions, chokers, chicanes | | 12.0% | 3 |
| Median entry/exit islands | | 4.0% | 1 |
| Median barriers | | 16.0% | 4 |
| Mid-block raised medians | | 4.0% | 1 |
| Forced turn islands, barriers, channelization | | 4.0% | 1 |
| One-way streets | | 20.0% | 5 |
| Street closures, cul-de-sacs | | 16.0% | 4 |
| Other | | 8.0% | 2 |

QUESTION 8

Where do you live?

| | | % | Count |
|--|--|----------|--------------|
| Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue | | 29.7% | 11 |
| Sunnyvale: North of El Camino Real and East of Fair Oaks Avenue | | 5.4% | 2 |
| Sunnyvale: South of El Camino Real and West of Sunnyvale-Saratoga Road | | 10.8% | 4 |
| Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road | | 29.7% | 11 |






Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

| | | % | Count |
|-------|---|----------|--------------|
| Other |  | 24.3% | 9 |

QUESTION 9

Where is your office located if or when you don't work from home?

| | | % | Count |
|---|---|----------|--------------|
| In Sunnyvale |  | 22.2% | 8 |
| In a neighboring city (Mountain View, Cupertino, Santa Clara) |  | 50.0% | 18 |
| I always work at home |  | 2.8% | 1 |
| I am not employed |  | 11.1% | 4 |
| Other |  | 13.9% | 5 |

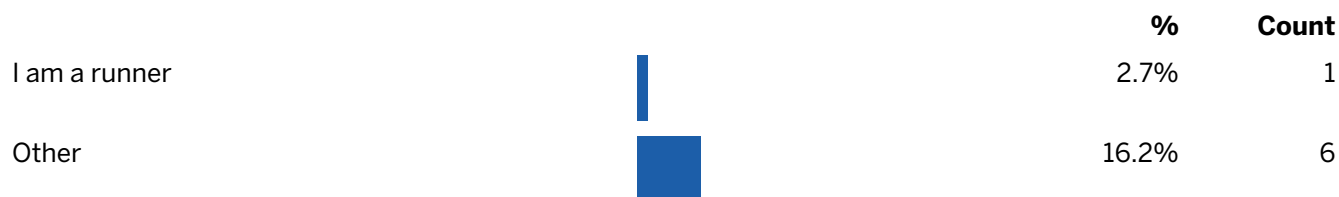
QUESTION 10

How do you typically get around in the city? (choose up to 3)

| | | % | Count |
|-----------------------------|---|----------|--------------|
| I almost always drive alone |  | 56.8% | 21 |
| I carpool |  | 27.0% | 10 |
| I almost always bike |  | 35.1% | 13 |
| I am usually walking |  | 48.6% | 18 |
| I take Caltrain |  | 10.8% | 4 |
| I take the bus |  | 2.7% | 1 |
| I take a shuttle |  | 2.7% | 1 |

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale



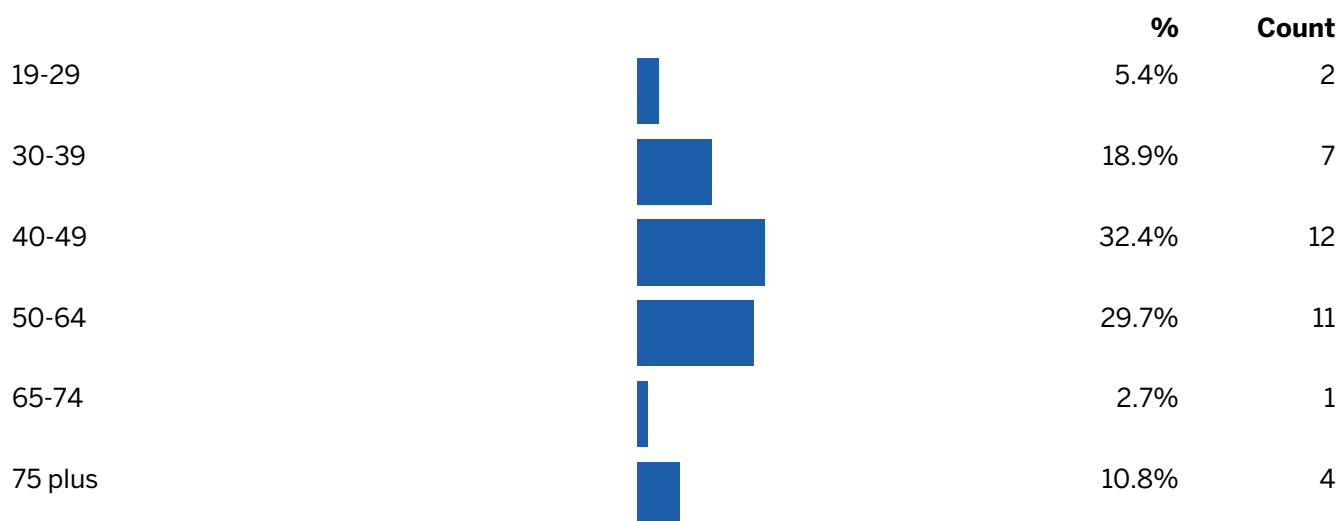
QUESTION 11

I attended the first Community meeting and workshop about this project on Nov. 7.



QUESTION 12

What is your age? (choose one)



Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Survey Questions

QUESTION 1

What neighborhood traffic related issues are you most concerned about? (choose up to 3)

- Increased Traffic
- Pedestrian Safety
- Changes in Bicycle Patterns
- School Area Safety
- Loss of Parking
- General Congestion/Delay
- Speeding
- Cut through Traffic in Neighborhoods
- Greenhouse Gas Emissions
- Construction Duration and Disruptions
- Cost to City
- Other

QUESTION 2

True or False. The following statement represents the situation in your neighborhood: "I regularly experience a situation in Sunnyvale where I believe traffic needs to be significantly slowed down using traffic calming methods."

- True
- False

QUESTION 3

How familiar are you with Sunnyvale's current traffic calming program? (1 = Not Familiar, 5 = Very Familiar)

Row choices

- Familiarity with program

Column choices

- 1
- 2
- 3
- 4
- 5

QUESTION 4

How easy is Sunnyvale's traffic calming program to use? (1 = Not Easy, 5 = Very Easy, N/A = Have not used)

Row choices

- Ease of use

Column choices

- 1
- 2
- 3
- 4
- 5
- N/A

QUESTION 5

Which of these statements most closely represent your experience with the City of Sunnyvale's traffic calming program? (choose up to 3)

- I don't have experience with it.
- I found the information to be easy to locate and understand.
- I could not find any information about it.
- I think there are too many steps, and the thresholds are too hard to qualify.
- I thought it was easy to implement.
- I tried to get my neighborhood engaged on this topic, but I gave up due to no support from my neighbors.
- I appreciate that the process involves getting support from most of the neighbors.
- I went through the whole process and am very happy with the traffic calming process.
- Our neighborhood's request was rejected.

QUESTION 6

In your experience, which of these measures are effective at slowing down traffic? (choose up to 3)

- Radar speed trailer deployment
- Traffic enforcement actions
- Traffic signing and pavement markers
- Speed humps
- Speed tables
- Traffic circles
- Curb extensions, chokers, chicanes
- Median entry/exit islands
- Median barriers

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- Mid-block raised medians
- Forced turn islands, barriers, channelization
- Diagonal diverters
- One-way streets
- One-way chokers, half-closures, semi-diverters
- Woonerf
- Street closures, cul-de-sacs
- Other

QUESTION 7

I do not want the City to use the following measures to slow down traffic. (choose up to 2)

- Radar speed trailer deployment
- Traffic enforcement actions
- Traffic signing and pavement markers
- Speed humps
- Speed tables
- Traffic circles
- Curb extensions, chokers, chicanes
- Median entry/exit islands
- Median barriers
- Mid-block raised medians
- Forced turn islands, barriers, channelization
- Diagonal diverters
- One-way streets
- One-way chokers, half-closures, semi-diverters
- Woonerf
- Street closures, cul-de-sacs
- Other

QUESTION 8

Where do you live?

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue
- Sunnyvale: North of El Camino Real and East of Fair Oaks Avenue
- Sunnyvale: South of El Camino Real and West of Sunnyvale-Saratoga Road
- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road
- City of Mountain View
- City of Santa Clara
- City of Cupertino
- Other

QUESTION 9

Where is your office located if or when you don't work from home?

- In Sunnyvale
- In a neighboring city (Mountain View, Cupertino, Santa Clara)
- I always work at home
- I am not employed
- I am a student
- Other

QUESTION 10

How do you typically get around in the city? (choose up to 3)

- I almost always drive alone
- I carpool
- I almost always bike
- I am usually walking
- I take Caltrain
- I take the bus
- I take a shuttle
- I am a runner
- Other

QUESTION 11

I attended the first Community meeting and workshop about this project on Nov. 7.

- Yes, I was there in person
- Yes, I was there for the online portion only
- No, I didn't attend

QUESTION 12

What is your age? (choose one)

- Under 18
- 19-29
- 30-39
- 40-49
- 50-64
- 65-74
- 75 plus

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Individual Responses

Name not shown

inside Sunnyvale

November 7, 2023, 3:13 PM

Question 1

- Increased Traffic
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 5

Question 4

Ease of use: 2

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.
- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Traffic enforcement actions
- Speed humps
- Traffic circles

Question 7

- One-way streets
- Street closures, cul-de-sacs

Question 8

- Sunnyvale: South of El Camino Real and West of Sunnyvale-Saratoga Road

Question 9

- I am not employed

Question 10

- I almost always drive alone
- I am usually walking

Question 11

- Yes, I was there in person

Question 12

- 75 plus

Name not available

November 7, 2023, 4:50 PM

Question 1

- Pedestrian Safety
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.
- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Speed humps
- Traffic circles
- Other - 4 way stops

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Question 7

- Radar speed trailer deployment
- Street closures, cul-de-sacs

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- I am not employed

Question 10

- I almost always drive alone

Question 11

- No, I didn't attend

Question 12

- 75 plus

Name not available

November 7, 2023, 4:53 PM

Question 1

- Pedestrian Safety
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 4

Question 4

Ease of use: 4

Question 5

- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Speed humps
- Traffic circles

Question 7

- One-way streets

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I carpool
- I almost always bike
- I am usually walking

Question 11

- No, I didn't attend

Question 12

- 40-49

Name not available

November 7, 2023, 5:46 PM

Question 1

- Changes in Bicycle Patterns
- School Area Safety
- Greenhouse Gas Emissions

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Ease of use: N/A

Question 5

- I don't have experience with it.
- I found the information to be easy to locate and understand.

Question 6

- Speed humps
- Speed tables
- One-way chokers, half-closures, semi-diverters

Question 7

- Traffic enforcement actions
- Traffic signing and pavement markers

Question 8

- Sunnyvale: South of El Camino Real and West of Sunnyvale-Saratoga Road

Question 9

- I always work at home

Question 10

- I almost always bike
- I am usually walking

Question 11

- Yes, I was there for the online portion only

Question 12

- 50-64

Name not shown

inside Sunnyvale

November 7, 2023, 6:11 PM

Question 1

- Pedestrian Safety
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: 2

Question 5

- I could not find any information about it.
- I appreciate that the process involves getting support from most of the neighbors.
- Our neighborhood's request was rejected.

Question 6

- Traffic signing and pavement markers
- Forced turn islands, barriers, channelization
- Other - 4 way stop signs

Question 7

- Curb extensions, chokers, chicanes
- Median barriers

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone

Question 11

- No, I didn't attend

Question 12

- 50-64
-

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Name not available

November 7, 2023, 6:39 PM

Question 1

- Increased Traffic
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 2

Question 4

Ease of use: 2

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.
- Our neighborhood's request was rejected.

Question 6

- Radar speed trailer deployment
- Speed humps
- Other - Need to put the sign in the streets merges to Washington Ave "no stop sign on Washington Ave "

Question 7

No response

Question 8

- Other - Waverly and Washington Ave

Question 9

- In Sunnyvale

Question 10

- I almost always drive alone

Question 11

- Yes, I was there for the online portion only

Question 12

- 50-64

Name not available

November 7, 2023, 7:28 PM

Question 1

- Changes in Bicycle Patterns
- School Area Safety
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 4

Question 4

Ease of use: 3

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Speed humps
- Speed tables
- Traffic circles

Question 7

No response

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Question 10

- I carpool

Question 11

- No, I didn't attend

Question 12

- 40-49

Galen Davis

inside Sunnyvale

November 7, 2023, 7:31 PM

Question 1

- Pedestrian Safety
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 5

Question 4

Ease of use: 1

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Speed humps
- Traffic circles
- Woonerf

Question 7

- Median entry/exit islands
- Median barriers

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- Other - Redwood City

Question 10

- I almost always drive alone

Question 11

- No, I didn't attend

Question 12

- 40-49

Name not available

November 7, 2023, 9:04 PM

Question 1

- Increased Traffic
- Loss of Parking
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 5

Question 4

Ease of use: 4

Question 5

- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Radar speed trailer deployment

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- Diagonal diverters
- Street closures, cul-de-sacs

Question 7

- Speed humps
- Curb extensions, chokers, chicanes

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In Sunnyvale

Question 10

- I almost always drive alone
- I almost always bike
- I am usually walking

Question 11

- Yes, I was there for the online portion only

Question 12

- 50-64

Name not available

November 8, 2023, 1:05 AM

Question 1

- School Area Safety
- Loss of Parking
- Speeding

Question 2

- False

Question 3

Familiarity with program: 1

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.
- I appreciate that the process involves getting support from most of the neighbors.

Question 6

No response

Question 7

- Speed humps

Question 8

- Sunnyvale: North of El Camino Real and East of Fair Oaks Avenue

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone
- I carpool

Question 11

- No, I didn't attend

Question 12

- 40-49

Robert Kam

inside Sunnyvale

November 8, 2023, 9:05 AM

Question 1

- Increased Traffic
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Familiarity with program: 5

Question 4

Ease of use: 5

Question 5

- I found the information to be easy to locate and understand.
- I went through the whole process and am very happy with the traffic calming process.
- Our neighborhood's request was rejected.

Question 6

- Traffic signing and pavement markers
- One-way streets
- Street closures, cul-de-sacs

Question 7

- Speed humps

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- In Sunnyvale

Question 10

- I almost always drive alone

Question 11

- No, I didn't attend

Question 12

- 40-49

Name not shown

inside Sunnyvale

November 8, 2023, 11:05 AM

Question 1

- Pedestrian Safety
- Changes in Bicycle Patterns
- School Area Safety

Question 2

- True

Question 3

Familiarity with program: 2

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.
- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Traffic circles
- Curb extensions, chokers, chicanes

Question 7

- Radar speed trailer deployment
- Traffic signing and pavement markers

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone
- I am usually walking
- Other - occasional bike (would like to do more)

Question 11

- No, I didn't attend

Question 12

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

• 40-49

• I carpool

Name not available

November 9, 2023, 11:40 AM

Question 1

- School Area Safety
- Speeding
- Construction Duration and Disruptions

Question 2

- False

Question 3

Familiarity with program: 2

Question 4

Ease of use: 1

Question 5

- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Traffic enforcement actions
- Speed humps

Question 7

- Traffic circles
- Curb extensions, chokers, chicanes

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- I am not employed

Question 10

- I almost always drive alone

Question 11

- No, I didn't attend

Question 12

- 65-74

Name not available

November 10, 2023, 4:28 PM

Question 1

- Pedestrian Safety
- Changes in Bicycle Patterns
- School Area Safety

Question 2

- True

Question 3

Familiarity with program: 5

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.

Question 6

- Speed humps
- Street closures, cul-de-sacs

Question 7

No response

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone
- I almost always bike
- I am usually walking

Question 11

- No, I didn't attend

Question 12

- 40-49

Name not available

November 11, 2023, 8:54 AM

Question 1

- Increased Traffic
- General Congestion/Delay
- Other - Bike group gather to bias the results while auto have no knowledge of these changes. Studies taken during pandemic times when bike use increased and people worked from home more

Question 2

- False

Question 3

Familiarity with program: 5

Question 4

Ease of use: 1

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.
- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Radar speed trailer deployment
- Speed humps

- Other - All actions might work once but they lose effect as people learn to bypass them. They move the proble to another area. .

Question 7

- Speed humps
- Traffic circles

Question 8

- Sunnyvale: South of El Camino Real and West of Sunnyvale-Saratoga Road

Question 9

- In Sunnyvale

Question 10

- I almost always drive alone

Question 11

- No, I didn't attend

Question 12

- 50-64

Name not shown

inside Sunnyvale

November 11, 2023, 9:13 AM

Question 1

- Pedestrian Safety
- Speeding
- Other - We need a stop sign or cross walk on west Washington Avenue. Waverly or Florence and a stop sign on sunset. It's pretty bad over here,

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Ease of use: 1

- True

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.
- I appreciate that the process involves getting support from most of the neighbors.

Question 3

Familiarity with program: 3

Question 4

Ease of use: 3

Question 6

- Traffic enforcement actions
- Traffic signing and pavement markers
- Traffic circles

Question 5

- I found the information to be easy to locate and understand.

Question 7

No response

Question 6

- Speed tables
- Curb extensions, chokers, chicanes
- Woonerf

Question 8

- Other - Washington park area

Question 7

- Traffic enforcement actions
- Street closures, cul-de-sacs

Question 9

No response

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 10

- Other - Equal parts drive/bike/walk

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 11

- Yes, I was there in person

Question 10

- I almost always drive alone
- I carpool
- I am usually walking

Question 12

- 40-49

Question 11

- No, I didn't attend

Name not shown

inside Sunnyvale

November 11, 2023, 11:09 AM

Question 12

- 50-64

Question 1

- Pedestrian Safety
- Speeding

Name not available

November 11, 2023, 2:14 PM

Question 2

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Question 1

- Pedestrian Safety
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 1

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.

Question 6

- Speed humps
- Speed tables

Question 7

No response

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone
- I am usually walking

Question 11

- No, I didn't attend

Question 12

- 40-49

Name not available

November 12, 2023, 4:26 PM

Question 1

- Pedestrian Safety

Question 2

- True

Question 3

Familiarity with program: 1

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.

Question 6

- Traffic enforcement actions
- Traffic signing and pavement markers
- Speed humps

Question 7

No response

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always bike
- I am usually walking

Question 11

- No, I didn't attend

Question 12

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

• 50-64

• I almost always bike

Name not shown

inside Sunnyvale

November 13, 2023, 9:44 PM

Question 1

- Pedestrian Safety
- Speeding
- Greenhouse Gas Emissions

Question 2

- True

Question 3

Familiarity with program: 5

Question 4

No response

Question 5

- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Speed humps
- Traffic circles
- One-way chokers, half-closures, semi-diverters

Question 7

No response

Question 8

- Sunnyvale: South of El Camino Real and West of Sunnyvale-Saratoga Road

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

Question 11

- No, I didn't attend

Question 12

- 50-64

Name not available

November 16, 2023, 7:28 AM

Question 1

- Increased Traffic
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: 3

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Speed tables
- Traffic circles
- Curb extensions, chokers, chicanes

Question 7

- Other - I want the city to use known effective measures to slow down traffic. In other words I do not want the City to use any of the measures above, which would be ineffective; in my area this would be traffic using Dartshire, Kingfisher and Carlisle.

Question 8

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- Other - Retired

Question 10

- Other - Getting around the city varies: I am retired - sometimes drive with my husband, sometimes on errands alone

Question 11

- Yes, I was there for the online portion only

Question 12

- 75 plus

Name not available

November 16, 2023, 7:30 AM

Question 1

- Increased Traffic
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: 3

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Speed tables
- Traffic circles

- Curb extensions, chokers, chicanes

Question 7

- Other - I want the city to use known effective measures to slow down traffic. In other words I do not want the City to use any of the measures above, which would be ineffective; in my area this would be traffic using Dartshire, Kingfisher and Carlisle.

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- Other - Retired

Question 10

- Other - Getting around the city varies: I am retired - sometimes drive with my husband, sometimes on errands alone

Question 11

- Yes, I was there for the online portion only

Question 12

- 75 plus

Name not shown

inside Sunnyvale

November 18, 2023, 12:37 PM

Question 1

- Pedestrian Safety
- Speeding
- Other - Safety of pets due to high speed traffic

Question 2

- True

Question 3

Familiarity with program: 2

Question 4

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

Ease of use: 1

Question 5

- I could not find any information about it.
- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Curb extensions, chokers, chicanes
- Median entry/exit islands
- Median barriers

Question 7

- Radar speed trailer deployment
- Traffic signing and pavement markers

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone
- I almost always bike

Question 11

- No, I didn't attend

Question 12

- 30-39

Name not available

November 25, 2023, 12:54 PM

Question 1

- Pedestrian Safety
- Changes in Bicycle Patterns
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 4

Question 4

Ease of use: 3

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Speed humps
- Traffic circles
- One-way streets

Question 7

No response

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone
- I almost always bike

Question 11

- No, I didn't attend

Question 12

- 40-49

Jeffrey Cucinotta

inside Sunnyvale

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

November 27, 2023, 1:55 PM

Question 1

- Pedestrian Safety
- Changes in Bicycle Patterns
- Speeding

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: 3

Question 5

- I don't have experience with it.

Question 6

- Traffic signing and pavement markers
- Traffic circles
- Curb extensions, chokers, chicanes

Question 7

- Median barriers
- One-way streets

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In Sunnyvale

Question 10

- I almost always bike

Question 11

- Yes, I was there for the online portion only

Question 12

- 30-39

Name not shown

inside Sunnyvale

November 28, 2023, 7:28 PM

Question 1

- Pedestrian Safety
- School Area Safety
- Speeding

Question 2

- True

Question 3

Familiarity with program: 4

Question 4

Ease of use: N/A

Question 5

- I think there are too many steps, and the thresholds are too hard to qualify.
- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Traffic enforcement actions
- Speed humps
- Other - traffic cameras - especially near schools. Too many kids injured biking to/from school. Police presence helps, but thats only temporary

Question 7

No response

Question 8

- Sunnyvale: South of El Camino Real and East of Sunnyvale-Saratoga Road

Question 9

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- I am not employed

Question 10

- I almost always drive alone
- I almost always bike
- I am usually walking

Question 11

- Yes, I was there in person

Question 12

- 50-64

Name not available

December 1, 2023, 3:40 PM

Question 1

- Speeding
- Cut through Traffic in Neighborhoods
- Other - Please add a stop sign at Waverly and Washington

Question 2

- True

Question 3

Familiarity with program: 1

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.
- I could not find any information about it.

Question 6

- Traffic signing and pavement markers
- Speed humps
- Traffic circles

Question 7

- One-way streets

Question 8

- Sunnyvale: North of El Camino Real and East of Fair Oaks Avenue

Question 9

- Other - Los Gatos

Question 10

- I almost always drive alone
- I carpool
- I am usually walking

Question 11

- No, I didn't attend

Question 12

- 30-39

Name not shown

inside Sunnyvale

December 1, 2023, 10:30 PM

Question 1

- Pedestrian Safety
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 1

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Traffic signing and pavement markers
- Other - Stop Sign

Question 7

- Radar speed trailer deployment
- Forced turn islands, barriers, channelization

Question 8

- Other - West Washington Ave (between S Pastoria Ave and S Mathilda Ave)

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I carpool
- I take Caltrain
- I am usually walking

Question 11

- No, I didn't attend

Question 12

- 19-29

Name not shown

inside Sunnyvale

December 1, 2023, 10:42 PM

Question 1

- Increased Traffic
- Pedestrian Safety
- Speeding

Question 2

- True

Question 3

Familiarity with program: 1

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.
- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Traffic signing and pavement markers
- Speed humps
- Speed tables

Question 7

No response

Question 8

- Other - West Washington Ave between Matilda and Pastoria Ave

Question 9

- In Sunnyvale

Question 10

- I carpool
- I am usually walking
- Other - I bike along Washington Ave

Question 11

- No, I didn't attend

Question 12

- 19-29

Name not available

December 2, 2023, 9:54 AM

Question 1

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- Pedestrian Safety
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: 3

Question 5

- I don't have experience with it.

Question 6

- Traffic enforcement actions
- Woonerf
- Street closures, cul-de-sacs

Question 7

- Median barriers
- Mid-block raised medians

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always bike
- I am usually walking
- I take the bus

Question 11

- No, I didn't attend

Question 12

- 30-39

Name not shown

inside Sunnyvale

December 3, 2023, 1:00 PM

Question 1

- Pedestrian Safety
- School Area Safety
- Speeding

Question 2

- True

Question 3

Familiarity with program: 1

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.

Question 6

- Speed humps
- Speed tables
- Traffic circles

Question 7

No response

Question 8

- Other - Washington Park and Florence St

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always drive alone
- I take a shuttle

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- I am a runner

Question 11

- No, I didn't attend

Question 12

- 30-39

Name not shown

inside Sunnyvale

December 3, 2023, 1:22 PM

Question 1

- Pedestrian Safety
- Speeding

Question 2

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: N/A

Question 5

- I found the information to be easy to locate and understand.
- I think there are too many steps, and the thresholds are too hard to qualify.
- I appreciate that the process involves getting support from most of the neighbors.

Question 6

- Traffic signing and pavement markers
- Speed humps
- Other - Stop Sign

Question 7

- Radar speed trailer deployment
- Traffic circles

Question 8

- Other - West Washington Ave and Florence Street

Question 9

- In Sunnyvale

Question 10

- I carpool
- I am usually walking

Question 11

- No, I didn't attend

Question 12

- 30-39

Name not shown

inside Sunnyvale

December 4, 2023, 10:22 PM

Question 1

- Changes in Bicycle Patterns
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 1

Question 4

Ease of use: 3

Question 5

- I don't have experience with it.

Question 6

- Speed tables

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- Curb extensions, chokers, chicanes
- Forced turn islands, barriers, channelization

Question 7

- Speed humps
- Street closures, cul-de-sacs

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I almost always bike
- I am usually walking
- I take Caltrain

Question 11

- No, I didn't attend

Question 12

- 30-39

Kerry Buchholz

inside Sunnyvale

December 5, 2023, 8:45 AM

Question 1

- Changes in Bicycle Patterns
- School Area Safety
- Cut through Traffic in Neighborhoods

Question 2

- True

Question 3

Familiarity with program: 2

Question 4

Ease of use: N/A

Question 5

- I don't have experience with it.

Question 6

- Speed humps
- One-way streets
- One-way chokers, half-closures, semi-diverters

Question 7

No response

Question 8

- Sunnyvale: North of El Camino Real and West of Fair Oaks Avenue

Question 9

- Other - South San Francisco

Question 10

- I almost always drive alone
- I almost always bike
- I take Caltrain

Question 11

- No, I didn't attend

Question 12

- 40-49

Name not shown

inside Sunnyvale

December 5, 2023, 10:32 PM

Question 1

- Pedestrian Safety
- Speeding

Question 2

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

- True

Question 3

Familiarity with program: 3

Question 4

Ease of use: 3

Question 5

- I found the information to be easy to locate and understand.
- I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Speed tables
- Speed humps
- Other - Stop Sign

Question 7

- Radar speed trailer deployment

Question 8

- Other - Waverly Street & West Washington Ave

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I carpool
- I am usually walking

Question 11

- No, I didn't attend

Question 12

- 40-49

Name not available

December 5, 2023, 10:42 PM

Question 1

- Pedestrian Safety
- Speeding

Question 2

- True

Question 3

Familiarity with program: 2

Question 4

Ease of use: 3

Question 5

- I could not find any information about it.

Question 6

- Speed humps
- Speed tables
- Other - Stop sign

Question 7

- Radar speed trailer deployment

Question 8

- Other - West Washington Ave close to Matilda

Question 9

- In a neighboring city (Mountain View, Cupertino, Santa Clara)

Question 10

- I am usually walking
- I take Caltrain
- Other - Crossing Washington to get to Caltrain can be dangerous

Question 11

- No, I didn't attend

Question 12

Re-evaluate Traffic Calming Program Study

Provide input on Traffic Calming Program in Sunnyvale

• 50-64

Question 11

• No, I didn't attend

Question 12

• 50-64

Name not available

December 6, 2023, 5:57 PM

Question 1

- Pedestrian Safety
- Speeding
- Cut through Traffic in Neighborhoods

Question 2

• True

Question 3

Familiarity with program: 3

Question 4

Ease of use: N/A

Question 5

• I think there are too many steps, and the thresholds are too hard to qualify.

Question 6

- Speed humps
- Traffic circles
- Median entry/exit islands

Question 7

• One-way streets

Question 8

• Other - Kingfisher Way

Question 9

• In Sunnyvale

Question 10

• I almost always drive alone