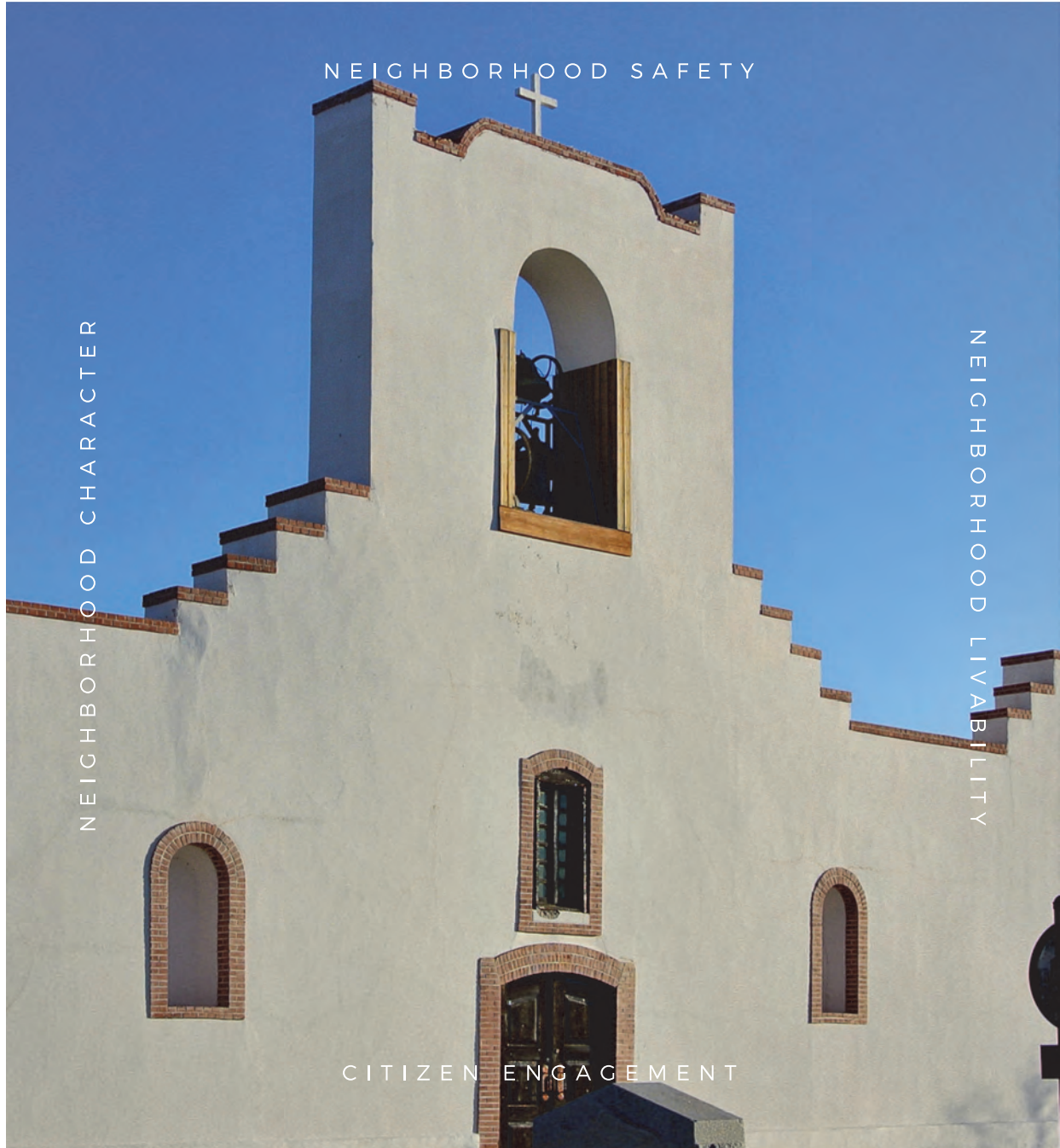


# City of Socorro

## NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM





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This Neighborhood Traffic Management Program (NTMP) policy manual was developed for the City of Socorro (City). This manual represents a collaborative effort between City management, staff, and stakeholders to develop a citywide policy to better manage neighborhood traffic, address citizen concerns, and outline an open and transparent process on how traffic calming projects are identified, prioritized, and implemented.

# EXECUTIVE SUMMARY

The Neighborhood Traffic Management Program (NTMP) addresses speeding and cut-through traffic on local residential streets using a set of traffic-calming tools. These include physical tools, such as speed tables, road diets, and realigned intersection, as well as non-physical tools like speed reduction markings and targeted police enforcement.

## Traffic Management Procedure

This manual outlines the process by which neighborhoods may request traffic calming, establishes the criteria for determining applicability and appropriate measures, and the toolkit of traffic calming strategies. The procedure for requests for traffic calming is as follows:

1. Residents, property owners, or homeowner's association or neighborhood association president/board member apply for traffic calming.
2. Planning and Zoning Department assesses whether the street segment meets the minimum thresholds established in the NTMP Initial Assessment:

### Initial Assessment for NTMP Requests

This process will be evaluated by the City of Socorro's Planning and Zoning Department to determine if the request will meet preliminary criteria as described in the Neighborhood Traffic Management Program (NTMP) document. The proposed process for the NTMP is as follows:

1. Any roadway that is greater than a collector roadway is not eligible for traffic calming. Classifications of roadways are determined by the city's planning department and El Paso Metropolitan Planning Organization.
2. The roadway must be used to provide access to abutting residential properties (local residential street) and/ or to collect traffic for such streets (residential collector).
3. There must be no more than one moving lane of traffic in each direction.
4. Traffic volumes must be more than 500 vehicles per day.
5. The roadway must be paved and have a speed limit of 20-30 MPH as determined in accordance with State Law.
6. The roadway segment must be a 1/3 mile or more in length and must be continuous without interruption by a traffic control device.
7. The application for traffic calming must be completed by a total of 10 residents, or 2/3 of residents if less than 10 exist, that are affected by the roadway segment. Information

must be provided to ensure neighborhood is in agreeance for new traffic calming measure. A president or board member representing a homeowner's association or neighborhood association may also file an application.

8. A petition shall be sent by the designated neighborhood contact to the City Clerk. The petition must be complete and signed by two-thirds of the affected property owners for that street segment being considered. Affected property owners will be determined by the city.

*Note: The application will then be considered only upon completion of these steps. Incomplete application(s) will not be processed. For requests made, you may check back within 4-6 weeks for status of application.*

### **Priority Listing for NTMP Requests**

After the request passes the initial assessment, a priority listing will be executed for NTMP requests. The proposed priority process is as follows:

1. Residential street sections with at least 51 percent of the houses facing the street for traffic calming.
2. Residential street sections with two or more preventable accidents within 3 years. This would be followed by residential street sections with one or more preventable accidents within 3 years.
3. Residential street sections with 1,000 or more vehicles per day for traffic calming. This will require a traffic count which is less expensive than a full study. This would be followed by residential street sections with 750 vehicles per day for traffic calming. This would be followed by residential street sections with 500 vehicles per day.
4. Collector street sections with 1,000 or more vehicles per day for traffic calming. This would be followed by collector street sections with 750 vehicles per day for traffic calming. This would be followed by collector street sections with 500 vehicles per day for traffic calming.
5. The Planning and Zoning Department will hold a scoping meeting with applicants and other stakeholders to assess the traffic problem.
6. Planning and Zoning Department collects traffic data and analyzes the traffic problem to determine if it meets at least three of the Engineering Criteria established by the NTMP Policy Manual:
  1. Reported crashes in the past 3 years that could be corrected with traffic calming
  2. Peak-hour traffic volume greater than 500 vehicles in one direction

3. 25 percent of peak-hour traffic is non-local cut-through traffic
4. 85th percentile speed exceeds the posted speed limit by 5 mph or more
7. Planning and Zoning Department provides report detailing problem and recommended solutions from Traffic Calming Toolkit.
8. Applicant distributes copies of the report (or instructions on how to obtain it on City website) to households in petition area.
9. Planning and Zoning Department takes feedback and adjusts as necessary, determines priority of project in relationship to other requests, identifies funding or potential sources of funding via capital improvement program.
10. Denial or approval by city council.
11. Implementation, if applicable, by Public Works Department.



A close-up photograph of several large, thick, green aloe vera leaves. The leaves are covered in numerous small, clear water droplets, giving them a fresh and dewy appearance. The lighting is soft, highlighting the texture of the leaves and the glistening water. The colors range from a vibrant green to a deep, almost blackish-green at the edges and in the shadows.

# SECTION I - INTRODUCTION

CITY OF SOCORRO  
NEIGHBORHOOD TRAFFIC MANAGEMENT PLAN

## SECTION I – INTRODUCTION

Section One of the manual introduces and discusses the subject of traffic calming, the goals and objectives of the City's new Neighborhood Traffic Management Program (NTMP), and how to use this manual to petition for and identify appropriate traffic calming measures in neighborhoods throughout the City. This section also provides an explanation of how various neighborhood traffic issues (e.g., speeding and cut-through traffic) are evaluated, what types of streets are included in the neighborhood traffic calming program, and how traffic management projects are identified, selected, and prioritized. Finally, contact information for the NTMP administrator at the City's Planning and Zoning Department is provided.

### **What is traffic calming?**

Many residents are expressing concern about the increase in speeding and cut-through traffic on local residential streets. 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 nonmotorized street users." In response to the public's concern for the safety and livability of their neighborhoods, the City has developed this policy manual as a guide for implementing neighborhood traffic calming projects in the City of Socorro.

### **What are the program's goals and objectives?**

The goals of the NTMP are to address neighborhood traffic safety, preserve neighborhood character and livability, and engage residents through neighborhood involvement. The program will identify improvements that meet these goals through a collective understanding among the residents and City staff of neighborhood traffic issues and concerns, as well as potential solutions. Primary goals and objectives of the program include:

- **Improve Neighborhood Traffic Safety.** Excessive traffic speeds are a hazard to neighborhood safety and security. The first goal of this program is to help promote and maintain a safe and pleasant environment for residents, pedestrians, bicyclists, and motorists in the City's neighborhoods.
- **Preserve Neighborhood Character and Livability.** Traffic management plays a vital role in the character and livability of neighborhoods. The measures presented in this manual are intended to reduce the negative effects that automobile use may have in residential areas and increase the livability of the City's neighborhoods.



- **Increase Neighborhood Involvement.** Through the decision-process steps outlined in this manual, residents can assess the various benefits and trade-offs of implementing projects within their own neighborhoods. This policy manual encourages residents to become actively involved in the decision-making process by following the steps outlined to implement traffic calming measures.

### **How is this manual used?**

This NTMP policy manual was developed as a guide for City staff and to inform residents about the processes and procedures for implementing neighborhood traffic calming measures. The manual includes a summary of the City's goals and objectives for the program, as well as a defined process for implementation, and a toolbox of traffic calming measures. The procedures to implement neighborhood traffic calming measures are described in Section II – Implementation Process. Public participation is highly encouraged as is substantial neighborhood involvement. Available funding will be targeted to those projects receiving higher priority ranking through the process. Projects will be prioritized based on identified needs, available funding, and benefits.

### **How are traffic problems evaluated?**

City staff in the Planning and Zoning Department will collect and evaluate traffic data, identify system needs, and using the guidelines in this manual will identify a range of appropriate solutions based on the data and engineering judgment. In order of importance, the following lists the most widely used criteria for determining the need for traffic calming on residential streets:

- Crash frequency – the number and types of crashes is important in understanding multimodal safety and identifying counter measures
- 85th percentile speeds – an industry accepted threshold for assessing speeding
- Traffic volumes and vehicle mix – impacts from automobiles and trucks are different and may require different mitigation measures
- Cut-through traffic volumes – understanding the origin and destination of trips can help tailor traffic calming strategies
- Community/neighborhood input and support – key to the development, implementation, funding, and maintenance of traffic calming plans and devices
- Bicycle and pedestrian activity – protecting these most vulnerable users and providing comfortable environments encourages commuter and recreational use of alternate modes of transportation

- Established and planned public transportation routes – transit users congregate at public transit stations and stops

Because safety is the most important aspect of traffic calming, crash frequency will serve as the primary evaluation criteria. Traffic issues such as speeding and daily volume will serve as secondary criteria. Community support and participation are also important criteria and are critical to the success of the program.

### **What types of streets are appropriate for neighborhood traffic calming?**

This NTMP has been created for residential streets which are functionally classified as either local or collector roadways. The traffic calming measures presented in this manual are not typically suitable for streets with higher functional classifications such as major or minor arterial roadways. Functional classification maps are available from the Planning and Zoning Department.

### **How will projects be selected?**

After a submitted application has been reviewed and compared successfully against the evaluation criteria, it will be considered for implementation. Based on the process defined in Part II of this manual, requests for traffic calming measures will be presented to the city council for recommendations into the capital improvement program or for immediate implementation based on available funds. The project applicants will be notified of the resulting city council action(s).

### **How will projects be prioritized and funded?**

The highest-ranking projects will be included in the City's Capital Improvement Program (CIP) and will be implemented as funding is available. The number of implemented projects will depend on the City's fiscal resources. Previously qualifying projects will not have to be reevaluated and will remain on the priority list. Projects will continue to be ranked for up to 5 years, at which point they will no longer be considered. This time condition has been set to ensure that projects do not become outdated due to changes in resident concerns and traffic conditions.

### **How will the effectiveness of projects be measured?**

Once projects have been constructed and operational for at least 6 months, a post-implementation evaluation will be conducted by the Planning and Zoning Department. This evaluation will consist of a technical memorandum that determines whether the traffic calming measures, or devices have been effective, whether any changes or additional measures are required, or whether, due to ineffectiveness or other undesirable effects, devices should be removed.

This process will answer the following questions:

- Has the traffic calming measure been effective?
- Has it accomplished the desired goal?
- Has it created undesirable adverse effects?
- If implemented on a trial basis, should a more permanent traffic calming measure be constructed?
- Are additional measures needed to enhance effectiveness?

### **Who should residents contact?**

If a resident or neighborhood group believes they have neighborhood traffic issues that may be addressed through traffic calming, they are encouraged to apply using one of several methods. The preferred method for requesting Neighborhood Traffic Management is by using the online form located on the City's website:

Website: <http://ci.socorro.tx.us/planning-zoning/>

You may also print the form located at the end of this document and hand deliver, send via U.S. Mail, or e-mail to:

Mailing Address:

**NTMP Request  
c/o City Clerk  
City of Socorro  
124 S. Horizon Blvd.  
Socorro, Texas 79927**

Email Address:

[cityclerk@ci.socorro.tx.us](mailto:cityclerk@ci.socorro.tx.us)





# SECTION II - IMPLEMENTATION PROCESS

CITY OF SOCORRO  
NEIGHBORHOOD TRAFFIC MANAGEMENT PLAN

## SECTION II – IMPLEMENTATION PROCESS

This section of the manual discusses the implementation process for the NTMP, including definition of the qualifying criteria for traffic calming measures and an outline of the process and steps residents and neighborhood groups would take to petition for implementing traffic calming measures in their neighborhoods. Additionally, this section highlights the expectations and responsibilities of the City and petitioning parties.

### **How does the decision process work?**

The request for traffic calming measures on a neighborhood street can be initiated by a resident, neighborhood group, or homeowners' association with specific concerns about speeding, traffic volume, cut-through traffic, or other traffic issues considered detrimental to the safety and livability of their neighborhood. The plan development and implementation process steps include:

- Preliminary actions
- Implementation measures
- Assessment of effectiveness

Every request for traffic calming will be reviewed by City staff. Upon receipt, staff will determine if the request meets ALL the following three minimum thresholds:

1. Functional classification as a local or collector roadway
2. Has a demonstrated need for traffic management determined through engineering/traffic study or Planning and Zoning Department observation that indicates a high likelihood of three of the following criteria:
  - Reported crashes in the past 3 years that could be corrected with traffic calming
  - Peak-hour traffic volume greater than 500 vehicles in one direction
  - 25 percent of peak-hour traffic is non-local cut-through traffic
  - 85th percentile speed exceeds the posted speed limit by 5 mph or more.
3. Has not been considered for traffic calming measures within the last 5 years

#### *Notes:*

- a. On designated emergency response routes, only non-physical control measures and those physical control measures that do not slow emergency vehicles will be considered.*

- b. Only non-physical control and narrowing measures will be considered on roadways with daily traffic exceeding 3,000 vehicles per day.*
- c. The analysis phase of the Implementation Process described herein will consider unique street characteristics, such as curves, grades, or other features. Only non-physical control measures and those physical control measures that do not exacerbate known existing conditions caused by such characteristics will be considered.*

Only after a street or area meets all three of these minimum criteria will it qualify for traffic calming evaluation and implementation. City staff will communicate to the applicant the NTMP framework and sequence of steps necessary to implement traffic calming.

The preliminary actions include Steps 1, 2, and 3 as part of the project Initiation and Scoping, and Steps 4 and 5 under Evaluation and Development. These steps are described in detail below.

## **Initiation and Scoping**

### **Step 1: Application**

All City residents are eligible to apply for participation in the NTMP. Applications for participation in the NTMP are available via mail, email, and website. Completed applications should be returned to the City Clerk.

Upon receipt of a completed application, the Planning and Zoning Department will perform a search for applicable data. Data are considered applicable if it has been collected by Planning and Zoning Department or a City approved contractor no more than 3 years prior to the application. On the application, it is important to note significant changes, such as a new adjacent development, that have affected traffic within a neighborhood because these changes can be used to determine the applicability of data. If no data are available, Planning and Zoning Department will plan for field observations or data collection as necessary and will inform the applicant of any extra time and/or funds this may require.

The Planning and Zoning Department will respond in writing to the applicant. The response will indicate if the minimum criteria, as described in this manual, have been met, or whether additional observation and data collection will be necessary. If the application has applicable data but the minimum criteria are not met, the application will be denied, and a date will be

provided for the current data expiration. Applicants must re-apply for participation if they would like a neighborhood to be considered after the data has expired. If the three minimum guidance criteria are met, the application will be accepted by the Planning and Zoning Department, the applicant will continue to Step 2.

### **Step 2: Petition**

After receipt of an application, Planning and Zoning Department will determine whether there is applicable data or whether funding is available to collect new data, and the applicant will be provided with a petition form. This petition form will be accompanied by a map of the area as determined by the Planning and Zoning Department based on NTMP guidelines.

A petition will be considered complete if two-thirds of the affected property owners have signed the petition. The petition process is used by the Planning and Zoning Department only to determine if there is enough neighborhood support to expend City staff resources on data collection. The Planning and Zoning Department may modify or expand the petition area to address unique circumstances. Planning and Zoning Department will identify these circumstances and provide written explanation to the applicant for any changes to the petition area.

Upon completion of a successful petition, the Planning and Zoning Department will add the area and traffic concern, as described on the initial application, to a list of data collection and analysis needs.

### **Step 3: Scoping Meeting**

City staff, if needed, will conduct an initial scoping meeting with the petitioning resident or neighborhood group. This meeting will be a collaborative working meeting to discuss the study area, understand the neighborhood traffic issues, define the data collection effort, and provide specifics on the analysis that will be conducted. The petitioner and city staff may visit the neighborhood to observe firsthand the traffic issues and concerns. The scoping meeting will serve as an opportunity for City staff to communicate to residents the next steps in the process, scope of the program, sources and limitations of funding, and current and ongoing education and enforcement efforts. Residents are encouraged to attend the scoping meeting and voice their concerns.

## **Evaluation and Development**



#### **Step 4: Analysis**

Once a clear understanding of the neighborhood traffic issues is reached and the extent of the study area has been defined, City staff will collect the necessary data to perform the needed engineering traffic analysis. This analysis will demonstrate whether a traffic issue meets three or more of the following threshold criteria for traffic calming measures:

- Reported crashes in the past 3 years that could be corrected with traffic calming
- Peak-hour traffic volume greater than 500 vehicles in one direction
- 25 percent of peak-hour traffic is non-local cut-through traffic
- 85th percentile speed exceeds the posted speed limit by 5 mph or more.

The data used in the analysis will be readily available to the applicant. If the analysis shows that the issue meets three or more of the minimum thresholds shown above, city staff will use physical and nonphysical traffic management strategies to assess the extent of the neighborhood's traffic problems.

The results of the engineering traffic analysis and the toolbox of traffic calming measures described in Section IV of this manual will be used to develop neighborhood traffic calming plans and identify specific traffic calming measures that are recommended for implementation.

#### **Step 5: Report**

The Planning and Zoning Department will summarize the results of the analysis and prepare a recommendation report. The recommendation report will consist of a summary of the scoping meeting, data collected, analysis conducted, preliminary findings, and recommended traffic calming measures. Planning and Zoning Department shall make the report available as a pdf on the City website and provide the report via e-mail to the applicant. The applicant shall provide the City Clerk with a form signed, by that applicant, acknowledging that they have provided the report to all affected neighborhood associations registered with the City, and that they have attempted to contact all households in the petition area to either provide the report or information on how to access it on the City website.

Once a traffic calming plan has been developed, has neighborhood support, and is suggested for implementation by City staff, Steps 6, 7, and 8 outline the actions needed to obtain approval and funding.

## **Approval and Funding**

### **Step 6: Recommendations**

The Planning and Zoning Department will update the traffic engineering report based on the feedback from the public and make final recommendations. Specific devices and locations for traffic calming measures will be identified and recommended for implementation. As projects near the top of the priority list, the Planning and Zoning Department will refine the cost estimate.

### **Step 7: Identify Funding**

Requests for NTMP funding for projects must compete with other requests for traffic calming funding and will be ranked City-wide based on their evaluation. The highest-ranking projects will be implemented first, and the number of projects executed will depend on the City's resources. Projects will continue to be ranked for up to 5 years, at which point they are no longer considered. This time condition has been set to ensure that projects do not become outdated due to resident and traffic condition changes. Nothing in this section shall prevent earlier implementation if funding is identified for a given project by city council.

### **Step 8: Implementation**

Projects may be implemented on a temporary or permanent basis. Non-physical measures will be implemented first because they are easiest to install and are the least expensive. If the effects of a traffic calming measure are uncertain, it may be implemented initially on a temporary basis. Once a device or series of devices has proven effective, permanent traffic calming measures may be constructed.

Once projects have been constructed and operational for at least 6 months, a post-implementation evaluation process will be conducted. Steps 9 and 10 outlines how this process will determine whether the devices have been effective, if any changes or additional measures are required, or whether, due to ineffectiveness or other undesirable effects, the devices should be removed.

## **Performance and Documentation**

### **Step 9: Performance Evaluation**

The Planning and Zoning Department may revisit and reevaluate the traffic calming measures that have been implemented by conducting a post-implementation study. This study shall determine if the traffic calming measures have been effective and if they accomplished their desired goal by using the same criteria identified in Step 4. Any unanticipated or undesirable effects will be noted, and ineffective devices will be removed. If a device was implemented on a temporary or trial basis, the Planning and Zoning Department will determine if a more permanent traffic calming measure should be constructed. Finally, any additional measures that could enhance the effectiveness or improve overall neighborhood traffic calming will be identified.

### **Step 10: Summary and Conclusion**

The Planning and Zoning Department may document the results of the post-implementation study and make recommendations on whether to maintain, improve, and/or remove traffic calming measures. Based on the initial operational period, the Planning and Zoning Department may assess the extent and cost of maintenance for future planning.



# **SECTION III - TRAFFIC MANAGEMENT STRATEGIES**

**CITY OF SOCORRO  
NEIGHBORHOOD TRAFFIC MANAGEMENT PLAN**



## SECTION III – TRAFFIC MANAGEMENT STRATEGIES

This section of the NTMP policy manual describes the strategies and intent of typical traffic control devices and the different levels of neighborhood traffic calming measures used by the City. This section explains the use of stop signs and pavement markings and discusses the potential removal of unwarranted traffic control devices. For traffic calming measures addressing speed and traffic volumes, an explanation of the expected effectiveness and performance measures is discussed. There are two primary types of traffic management strategies: non-physical and physical measures.

### Non-Physical Traffic Management Strategies

Non-physical strategies provide a non-invasive form of calming traffic that is inexpensive and easy to implement, and that can also be removed easily if the measure is unsuccessful. For these reasons, non-physical measures will be applied prior to implementing any physical traffic calming measures. Non-physical traffic calming strategies can take multiple forms. A discussion of some of the most common non-physical strategies is provided below.

- **Safety Education and Community Involvement** involves efforts to make the public mindful of their own driving behavior and the impact it has on others. Programs are often centered on promoting safe and lawful driving habits and may include programs geared toward drivers, bicyclists, pedestrians, or safe interaction amongst all users. Public meetings can provide a means for communicating concerns to City staff while allowing residents to share views and form consensus.
- **Police Enforcement** involves the presence of police officers to monitor speeds and issue citations for law violations such as stop sign, speed limit, turn restriction, and other traffic law violations. Visible presence is highly effective while an officer is present. Police enforcement can be useful for implementation of a new traffic calming measure, as well as provide a visible reminder of existing measures.
- **Pavement Markings** include a variety of painted roadway guidance such as various forms of striping and painted markings and raised pavement markers. Painted striping and raised pavement markers are used to reduce travel lane widths, making drivers feel more restricted and thereby reducing their speeds. Striping is also used to create higher visibility for pedestrians at crosswalks and separate bike traffic from vehicle traffic. Painted markings are associated with reminding drivers of regulations such as speed limits, appropriate turn movements, or shared-use facilities. Painted markings

and pavement markers may also be used to provide added visibility. Pavement markings are relatively easy and low-cost to install, maintain, and modify. Markings can reduce speeds, prevent unwanted turn movements, and heighten driver awareness.

- **Signage** may be used for a variety of warnings, regulations, and restrictions. Regulatory signs, such as speed limit signs are a useful way to remind drivers of the regulatory speed limit in their neighborhood. Signed turn restrictions may be installed to prohibit certain movements at an intersection at certain times of day in cases where cut-through traffic is common. Signage may also be added to restrict certain types of vehicles on neighborhood streets. While tools like radar speed units are indeed physical devices placed along the road, they are included in the non-physical category because they do not physically slow or divert traffic by causing vehicles to have to drive over or around them. Signage can reduce or restrict unwanted traffic and provide clear definitions of legal speed limits or provide other warnings and reminders. Signage is not self-enforcing and may decrease the aesthetics of a neighborhood or increase traffic on unintended streets.

**Note:** *Stop signs are not included as a traffic calming strategy in this manual as they are not intended as a traffic calming device. Stop signs are intended to assign right-of-way at intersections. Guidance for their placement is included in the Texas Manual on Uniform Traffic Control Devices. Multi-way stop control should not be installed at an intersection as a speed control measure; studies have shown that stop signs are ineffective for this purpose. Furthermore, unwarranted multi-way stops illicit poor compliance from drivers and create a lack of respect for stop signs in general. Unwarranted stops increase accidents and diminish safety, especially for pedestrians and children, and they increase noise and pollution from vehicles stopped at the intersection.*

## **Physical Traffic Management Strategies**

Physical strategies consist of physical changes in the roadway design for the purpose of reducing the average roadway speed (speed management) or daily traffic volume (volume management), improving the vehicle pedestrian design, or a combination of these elements. Physical strategies may be considered in instances where non-physical strategies have first been implemented, evaluated, and found to be unsuccessful. Physical strategies are discussed below.

- Speed Management can be achieved through either horizontal or vertical measures. Horizontal speed management strategies include treatments that create physical horizontal deviations or deflections in the roadway with the purpose of influencing driver behavior by physically changing the driver's path. Examples of horizontal speed strategies include traffic circles, roundabouts, and lateral shifts. Vertical speed management strategies refer to physical treatments that involve vertical displacement to influence speed through ride discomfort. Examples of vertical speed strategies include speed humps, raised crosswalks, and rumble strips.

Physical speed management strategies offer the benefit of self-enforcing speed limits and enhancing pedestrian safety. Additionally, horizontal speed strategies can often be designed to add aesthetic value to neighborhoods. Some concerns of physical speed management strategies include the higher cost compared to non-physical measures, emergency service limitations, increased noise and air pollution for some strategies, and difficulty of removal if they prove ineffective.

- Traffic Volume Management strategies include treatments that are intended to reduce and redirect traffic movements but are unlikely to have a significant influence on operating speeds. Examples of traffic volume management strategies include closures, diagonal diverters, and forced turn islands. Traffic volume strategies are effective at reducing or eliminating cut-through traffic and can often reduce speeds as well. The main concerns of traffic volume management strategies are their cost, additional delays for emergency vehicles and residents, and the potential for diverting cut-through traffic to adjacent streets.
- Removal of an Unwarranted Traffic Control Device is sometimes needed to improve traffic management. The overuse of traffic control devices, particularly stop signs, can desensitize drivers and lead to noncompliance. The MUTCD explicitly states that stop signs should not be used for speed control. If the total bicycle, pedestrian, and vehicular traffic entering an intersection from all approaches is less than 2,000 vehicles per day, a four-way stop may not be warranted. When determined through engineering study, four-way-stop controlled intersections may be converted to two-way stops.



An aerial photograph of a street intersection. A roundabout with a central tree island is visible. To the left is a green lawn, and to the top left is a swimming pool. The text "SECTION IV - NEIGHBORHOOD TRAFFIC CALMING MEASURES TOOLBOX" is overlaid in white, bold, sans-serif font.

# SECTION IV - NEIGHBORHOOD TRAFFIC CALMING MEASURES TOOLBOX

CITY OF SOCORRO  
NEIGHBORHOOD TRAFFIC MANAGEMENT PLAN

## **SECTION IV – NEIGHBORHOOD TRAFFIC CALMING MEASURES TOOLBOX**

This section of the manual provides a detailed toolbox of traffic calming measures for use in developing neighborhood traffic calming plans. Each measure includes a brief description, noted positive and negative aspects, and an accompanying illustration or photograph. In selecting the correct set of tools to address an identified and documented problem, it is important to understand these considerations, as well as the initial and long-term costs associated with each tool.

The toolbox is divided into two categories:

1. Non-Physical Measures
2. Physical Measures

The city council may direct an amendment or update of the NTMP manual to incorporate best practices devices to address neighborhood traffic management concerns. City staff has authority to implement broad non-physical measures devices, as such, are too numerous to document, however, the physical measures devices are described in detail in the following pages of this manual.

Sections V of this manual include application forms for initiating a request for neighborhood traffic calming, as well as a neighborhood sign-up sheet for required signatures.



# PHYSICAL MEASURES

## Bulb-Out/Corner Extension

### Description:

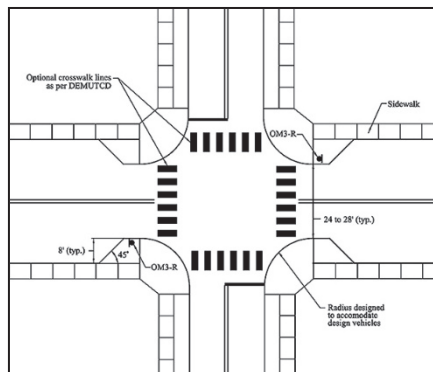
- Horizontal extension of the sidewalk into the street, resulting in a narrower roadway section
- If located at a mid-block location, it is typically called a choker

### Applications:

- When combined with on-street parking, a corner extension can create protected parking bays
- Effective method for narrowing pedestrian crossing distances and increase pedestrian visibility
- Appropriate for arterials, collectors, or local streets
- Can be used on one-way and two-way streets
- Installed only on closed-section roads (i.e. curb and gutter)
- Appropriate for any speed, provided an adequate shy distance is provided between the extension and the travel lane
- Adequate turning radii must be provided to use on bus routes



(Source: James Barrera, Horrocks, NM)



(Source: Delaware DOT)

### Design/Installation Issues:

- Effects on vehicle speeds are limited due to lack of deflection
- Must check drainage due to possible gutter realignment
- Major utility relocation may be required, especially drainage inlets
- Typical width between 6 and 8 feet
- Typical offset from travel lane at least 1.5 feet
- Should not extend into bicycle lanes

**Potential Impacts:**

- Effects on vehicle speeds are limited due to lack of deflection
- Can achieve greater speed reduction if combined with vertical deflection
- Smaller curb radii can slow turning vehicles
- Shorter pedestrian crossing distances can improve pedestrian safety
- More pedestrian waiting areas may become available
- May require some parking removal adjacent to intersections

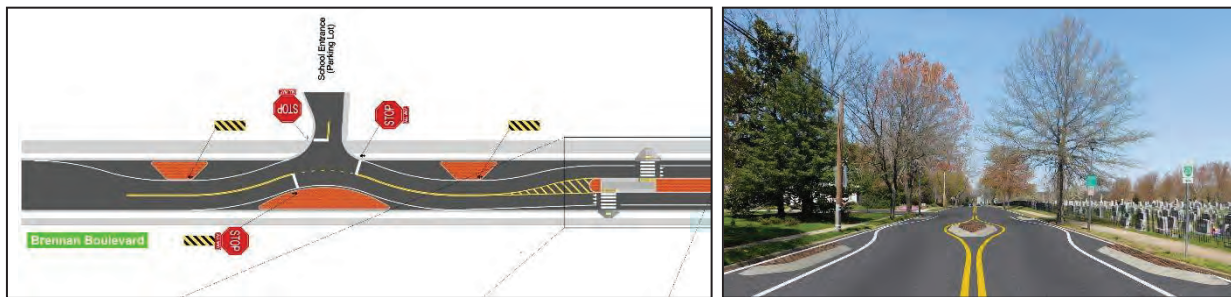
# Chicane

## Description:

- A series of alternating curves or lane shifts that force a motorist to steer back and forth instead of traveling a straight path
- Also called deviations, serpentine, reversing curves, or twists

## Applications:

- Appropriate for mid-block locations but can be an entire block if it is relatively short
- Most effective with equivalent low volumes on both approaches
- Appropriate speed limit is typically 35 mph or less
- Typically, a series of at least three landscaped curb extensions
- Can use alternating on-street parking from one side of a street to the other
- Applicable on one-lane one-way and two-lane two-way roadways
- Can be used with either open or closed (i.e. curb and gutter) cross-section
- Can be used with or without a bicycle facility



(Source: Delaware Department of Transportation)

## Design/Installation Issues:

- Chicanes may still permit speeding by drivers cutting straight paths across the center line
- Minimize relocation of drainage features
- May force bicyclists to share travel lanes with motor vehicles
- Maintain sufficient width for ease of emergency vehicles and truck throughput

## **Potential Impacts:**

- No effect on access, although heavy trucks may experience challenges when negotiating
- Limited data available on impacts to speed and crash risk
- Street sweeping may need to be done manually
- Minimal anticipated volume diversion from street
- May require removal of some on-street parking
- Provides opportunity for landscaping
- Unlikely to require utility relocation
- Not a preferred crosswalk location
- Bus passengers may experience discomfort due to quick successive lateral movements



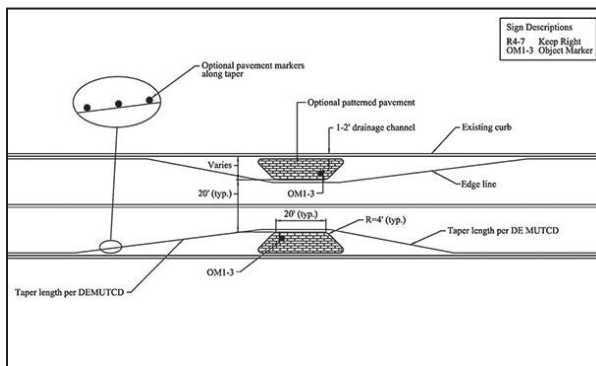
# Choker

## Description:

- Curb extension is a lateral horizontal extension of the sidewalk into the street, resulting in a narrower roadway section
- If located at an intersection, it is called a corner extension or a bulb-out
- If located midblock, it is referred to as a choker
- Narrowing of a roadway through the use of curb extensions or roadside islands

## Applications:

- Can be created by a pair of curb extensions, often landscaped
- Encourages lower travel speeds by reducing motorist margin of error
- One-lane choker forces two-way traffic to take turns going through the pinch point
- If the pinch point is angled relative to the roadway, it is called an angled choker
- Can be located at any spacing desired
- May be suitable for a mid-block crosswalk
- Appropriate for arterials, collectors, or local streets



(Source: City of An Arbor, Michigan)



(Source: Delaware DOT)

## Design/Installation Issues:

- Only applicable for mid-block locations
- Can be used on a one-lane one-way and two-lane two-way street
- Most easily installed on a closed-section road (i.e. curb and gutter)

- Applicable with or without dedicated bicycle facilities
- Applicable on streets with, and can protect, on-street parking
- Appropriate for any speed limit
- Appropriate along bus routes
- Typical width of 6 to 8 feet; offset from through traffic by approximately 1.5 feet
- Locations near streetlights are preferable
- Length of choker island should be at least 20 feet

### **Potential Impacts:**

- Encourages lower speeds by funneling it through the pinch point
- Can result in shorter pedestrian crossing distances if a mid-block crossing is provided
- May force bicyclists and motor vehicles to share the travel lane
- May require some parking removal
- May require relocation of drainage features and utilities

# Closure

## Description:

- **Half closures** are barriers that block travel in one direction (creates a one-way street) for a short distance on otherwise two-way streets; sometimes called partial closures or one-way closures
- **Full-street closures** are barriers placed across a street to completely close the street to through- traffic, usually leaving open space for pedestrians and bicyclists; they are sometimes called cul- de-sacs, dead-ends, or mini-parks

## Applications:

- Appropriate for local streets (half and full), at intersection (half and full), or mid-block (full closure only)
- Typically applied only after other measures have failed or are deemed inappropriate or ineffective
- Typically found on closed-section roadways (i.e. curb and gutter)
- Can be applied with and without dedicated bicycle facilities and on roads with on-street parking
- Often used in sets to make travel through neighborhoods more circuitous
- Not appropriate along bus transit routes
- Can be used to assist crime prevention



(Source: James R. Barrera, Horrocks, NM)

## Design/Installation Issues:

- Potential legal concerns
- Can be placed at intersections or mid-block locations
- Barriers may consist of landscaped islands, walls, gates, side-by-side bollards, or other obstructions that result in openings smaller than the width of a typical passenger car

- Appropriate signing needed at entrances to full-closure street blocks
- May require modifications to maintain surface drainage capacity
- Should consider traffic diversion patterns and associated impacts
- Possible to make diverters passable for pedestrians and bicyclists

**Potential Impacts:**

- Concerns regarding street network connectivity and capacity
- May result in traffic diverting to other local streets (should be used in groups/clusters)
- No significant impact on vehicle speeds beyond the closed block
- Can improve pedestrian crossing safety

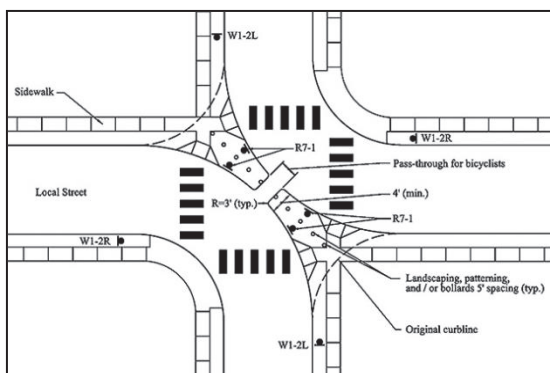
# Diagonal Diverter

## Description:

- Barriers placed diagonally across four-legged intersections, blocking through movements
- Sometimes called full diverters or diagonal road closures

## Applications:

- Typically applied only after other measures are deemed ineffective or inappropriate
- Provisions are available to make diverters passable for pedestrians and bicyclists
- Often used in sets to make travel through neighborhoods more circuitous



(Source: Delaware DOT)



(Source: PennDOT LTAP)

## Design/Installation Issues:

- Possible legal issues associated with closing public streets (e.g., business and/or emergency access)
- Can only be placed at intersections
- Can be used on both one-way and two-way streets
- Typically found on closed-section roads (i.e. curb and gutter)
- Typical maximum appropriate speed limit is 25 mph
- Maintain drainage as necessary to mitigate potential flooding
- Corner radii should be designed to allow full-lane width for passing motor vehicle traffic



- SU-30 default design vehicle
- Appropriate signing and pavement markings needed on approaches
- Openings for pedestrians and bicyclists should allow movement between all intersection legs
- Barriers may consist of landscaped islands, walls, gates, side-by-side bollards, or any other obstruction that leave an opening smaller than the width of a typical passenger car

### **Potential Impacts:**

- Concern regarding impacts to emergency response, street network connectivity, and capacity
- Should consider traffic diversion patterns and associated impacts
- No significant impacts on vehicle speeds beyond the approach to the diverter
- Not appropriate for bus transit routes
- Improved pedestrian and bicycle safety

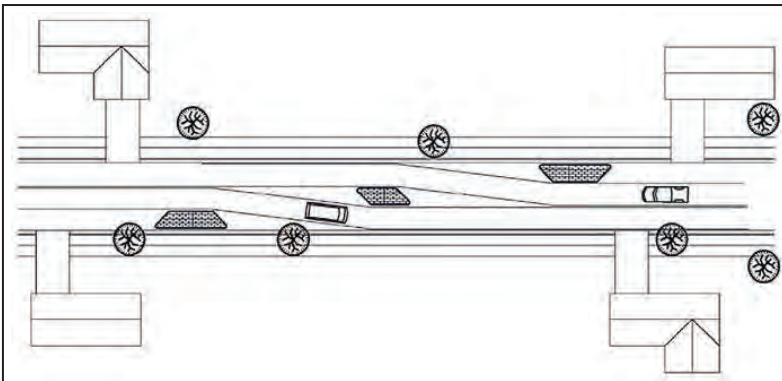
# Lateral Shift

## Description:

- Realignment of an otherwise straight street that causes travel lanes to shift in at least one direction
- A chicane is a variation of a lateral shift that shifts alignments more than once

## Applications:

- Appropriate for local, collector, or arterial roadways
- Appropriate for one-lane one-way and two-lane two-way streets
- Appropriate on roads with or without dedicated bicycle facilities
- Maximum appropriate speed limit is typically 35 mph
- Appropriate along bus transit routes



(Source: Delaware Department of Transportation)



(Source: Google Street View)

## Design/Installation Issues:

- Typically separates opposing traffic through the shift with the aid of a raised median
- Applicable only to mid-block locations
- Can be installed on either open- or closed-section (i.e. curb and gutter) roads
- Location near streetlights preferred
- May require drainage feature relocation
- Should not require utility relocation

## Potential Impacts:

- Without islands, motorists could cross the centerline to drive the straightest path possible
- No impact on access
- May require removal of some on-street parking

- Limited data available on impacts on speed, volume diversions, and crash risk
- Provides opportunities for landscaping
- Can provide locations for pedestrian crosswalks

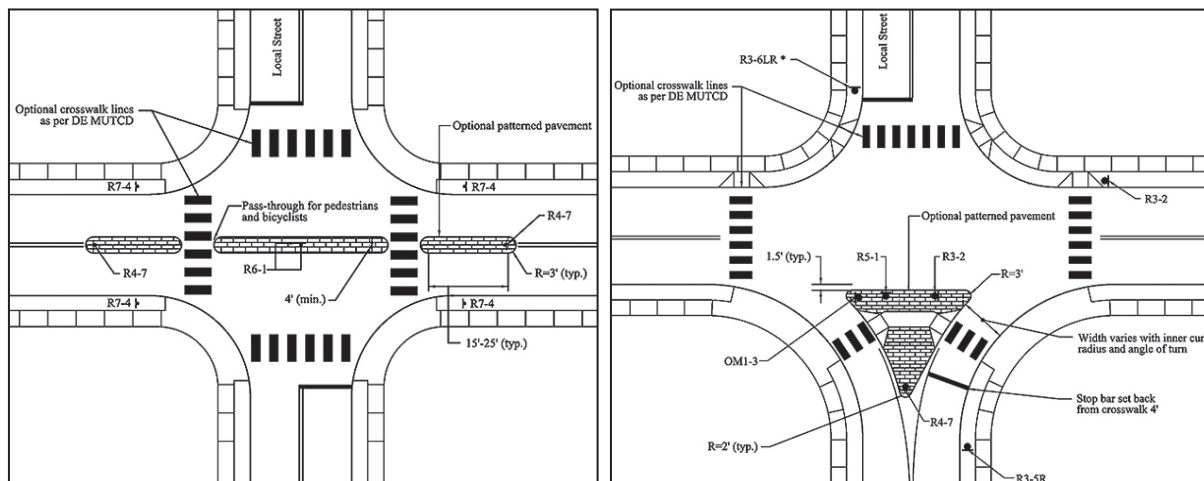
# Median Barrier/Forced Turn Island

## Description:

- Raised islands along the centerline of a street and continuing through an intersection that block the left-turn movement from all intersection approaches and the through movement from the cross street; also called median diverter, intersection barrier, intersection diverter, and island diverter
- Raised island that forces a right turn is called a forced turn island

## Applications:

- For use on arterial or collector roadways to restrict access to minor roads or local streets and/or to narrow lane widths
- Typically applied only after other measures have failed or been deemed inappropriate/ineffective
- Barriers are made passable for pedestrians and bicyclists
- Often used in sets to make travel to/through neighborhoods more circuitous



(Source: Delaware Department of Transportation)

## Design/Installation Issues:

- Potential legal issues associated with blocking a public street (e.g., business/emergency access)
- Placed on major roads on approaches to and across intersections with minor roads
- Should extend beyond the intersection to discourage improper/illegal turn movements
- Barriers may consist of landscaped islands, mountable features, walls, gates, side-by-

side bollards, or any other obstruction that leave an opening smaller than the width of a passenger car

**Potential Impacts:**

- May divert traffic volumes to other parallel and/or crossing streets
- May require removal or shortening of on-street parking zones on approaches/departures
- May impact access to properties adjacent to intersection
- No significant impacts on vehicle speeds beyond the approaches to intersection



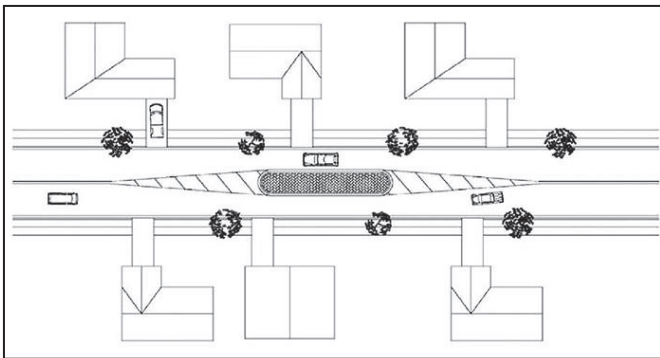
# Median Island

## Description:

- Raised island located along the street centerline that narrows the travel lanes at that location
- Also called median diverter, intersection barrier, intersection diverter, and island diverter

## Applications:

- For use on arterial, collector, or local roads
- Can often double as a pedestrian/bicycle refuge islands if a cut in the island is provided along a marked crosswalk, bike facility, or shared-use trail crossing
- If placed through an intersection, considered a median barrier



(Source: Delaware DOT)



(Source: James Barrera, Horrocks, NM)

## Design/Installation Issues:

- Potential legal issues associated with blocking a public street (e.g., business or emergency access)
- Barriers may consist of landscaped islands, mountable facilities, walls, gates, side-by-side bollards, or any other obstruction that leave an opening smaller than the width of a passenger car
- Can be placed mid-block or on the approach to an intersection
- Typically installed on a closed-section roadway (i.e. curb and gutter)
- Can be applied on roads with or without sidewalks and/or dedicated bicycle facilities
- Maximum appropriate speed limits vary by locale
- Typically, not appropriate near sites that attract large combination trucks

**Potential Impacts:**

- May impact access to properties adjacent to islands
- No significant impact on vehicle speeds beyond the island
- Little impact on traffic volume diversion
- Safety can be improved without substantially increasing delay
- Shortens pedestrian crossing distances
- Bicyclists may have to share vehicular travel lanes near the island
- May require removal of some on-street parking
- May require relocation of drainage features and utilities

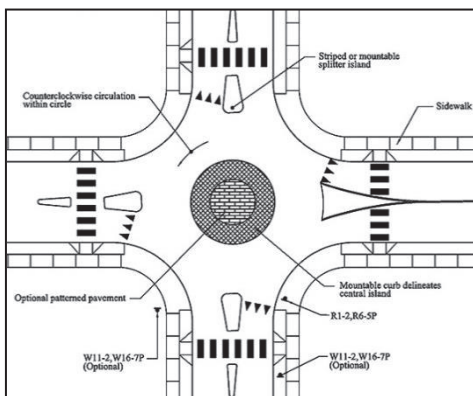
# Mini Roundabout

## Description:

- Raised islands, placed in unsignalized intersections, around which traffic circulates
- Motorists yield to motorists already in the intersection
- Require drivers to slow to a speed that allows them to comfortably maneuver around them
- Center island of mini roundabout is fully traversable, splitter islands may be fully traversable

## Applications:

- Intersections of local and/or collector streets
- One lane each direction entering intersection
- Not typically used at intersections with high volume of large trucks or buses turning left
- Appropriate for low-speed settings



(Source: Delaware DOT)



(Source: Gary Schatz)

## Design/Installation:

- See NCHRP Report 672 for design details
- Typically, circular in shape, but may be an oval shape
- Controlled by YIELD signs on all approaches with pedestrian crosswalks, if included, one car-length upstream of YIELD bar
- Preferable for roadway to have urban cross section (i.e., curb and gutter)
- Can be applied to road with on-street parking
- Can be applied to roads both with and without a bicycle facility. Bicycle facilities, if provided, must be separated from the circulatory roadway with physical barriers;

cyclists using the circulatory roadway must merge with vehicles. Bicycle facilities are prohibited in the circulatory roadway to prevent right-hook crashes.

- Key design features are the fastest paths and path alignment.

**Potential Impacts:**

- Slight speed reduction
- Little diversion of traffic
- Bicycle and motorist will share lanes at intersections because of narrowed roadway
- Large vehicles/buses usually drive over the center island for left turns

# On-Street Parking

## Description:

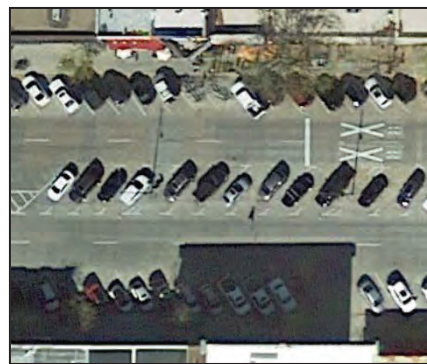
- Allocation of paved space to parking
- Narrows road travel lanes and increases side friction to traffic flow
- Can apply on one or both sides of roadway
- Can be either parallel or angled, but parallel is generally preferred for maximized speed reduction

## Applications:

- High likelihood of acceptability for nearly all roadway functional classifications and street functions
- More appropriate in urban or suburban settings
- Can be combined with other traffic calming measures
- Can apply alternating sides of street for chicane effect
- Can combine with curb extensions for protected parking, including landscaping for beautification
- Can apply using time-of-day restrictions to maximize throughput during peak periods
- Can be used on one-way or two-way streets
- Preferable to have a closed-section road (i.e. curb and gutter)
- Appropriate along bus transit routes



(Source: PennDOT LTAP)



(Source: Google Earth, Fort Collins, CO)

## Design/Installation Issues:

- Appropriate distance needed between travel lane and parking lane
- Impact is directly affected by demand; must have parked vehicles present to be effective



- If used for chicane effect, must verify parking demand to ensure that majority of spaces are occupied when effect is desired most during the day; can use parallel, angled, or combination
- Should not be considered near traffic circles nor roundabouts
- Should not be applied along median island curbs
- For lower-demand locations, can counteract negligible impact with curb extensions or other road- narrowing features

**Potential Impacts:**

- Can be blocked in by snow during plowing operations; required vehicle removal
- May limit road user visibility and sight distance at driveways/alleys/intersections
- Can put bicyclists at risk of colliding with car doors
- May be impacted if other traffic calming measures are considered or implemented
- Provides buffer between moving vehicles and pedestrian facilities

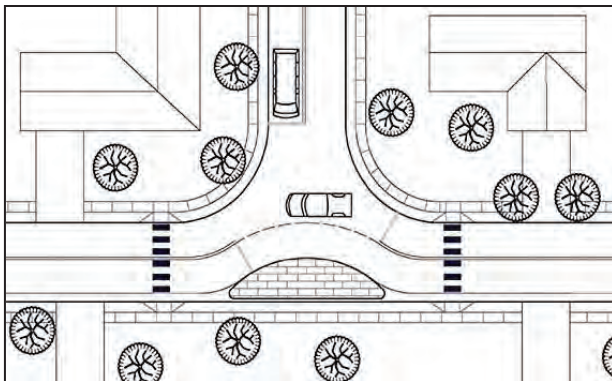
# Realigned Intersection

## Description:

- Reconfiguration of an intersection with perpendicular angles to have skewed approaches or travel paths through the intersection
- Also called modified intersection

## Applications:

- Appropriate for collector or local streets
- Most applicable at T-intersections
- Can be used where on-street parking exists
- Applicable on one-way and two-way roadways
- Mostly installed on closed-section roads (i.e. curb and gutter)
- Can be applied with and without a dedicated bicycle facility
- Can be applied with or without on-street parking



(Source: Delaware Department of Transportation)



(Source: Delaware DOT)

## Design/Installation Issues:

- Need to avoid relocating drainage features such as catch basins, concrete channels, valley gutters, inlets, and trench drains
- Bicyclists and motorists may have separate lanes or may share lanes at intersections
- Be cognizant of pedestrian crossing needs (e.g., ADA, wheelchair ramps at T-intersections)
- Default design vehicle SU-30
- Typical maximum speed limit of 25 mph
- May be appropriate for buses if adequate turning radii can be provided

**Potential Impacts:**

- Limited-to-no impact on access
- Minimal anticipated diversion of traffic
- Can result in speed reductions between 5 and 13 mph within intersection limits
- Provides opportunity for landscaping
- Can improve pedestrian safety
- Consider additional intersection lighting

# Road Diet

## Description:

- Revision of lane use or widths to result in one travel lane per direction with minimum practical width, with goal of reducing cross-section; common application involves conversion of four-lane Two-way road to three-lane road – two through lanes and center two-way left-turn lane (TWLTL)
- Can also involve narrowing of existing travel lanes
- Alternate cross-section uses can include dedicated bicycle facilities, left-turn lanes, on-street parking, raised medians, pedestrian refuge islands, sidewalks, etc.

## Applications:

- High likelihood of acceptability for nearly all roadway functional classifications
- Can be applied in urban, suburban, or rural settings
- Appropriate for most common urban speed limits
- Can be applied at/near intersections or along road segments
- Appropriate along bus routes



(Source: Chuck Huffine, Phoenix, AZ)



(Source: Chuck Huffine, Denver, CO)

## Design/Installation Issues:

- Must consider transitions from adjacent roadway sections and through intersections
- AADT can be considered but is not the primary volume factor that needs to be evaluated

## Potential Impacts:

- Usually reduces number of available travel lanes – impacts demand that can be accommodated; typical acceptable threshold of 1000 vehicles per direction during

peak hour

- Reduction of through lanes tends to reduce speeds
- Can improve pedestrian crossing ease and safety
- Can improve bicycle accessibility if travel lanes can be used for shoulders/bike lanes instead

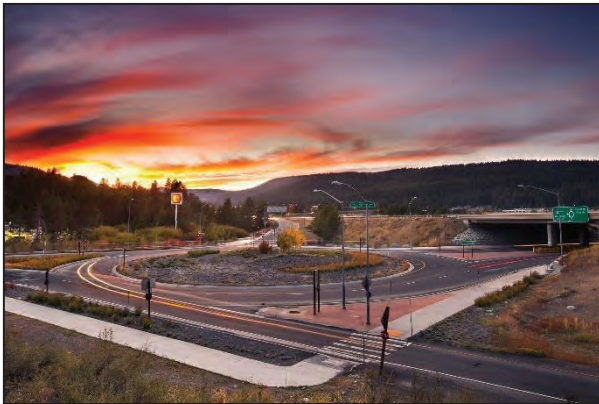
# Roundabout

## Description:

- Raised islands placed in unsignalized intersections around which traffic circulates
- Approaching motorists yield to motorists already in the intersection
- Requires drivers to slow to a speed that allows them to comfortably maneuver around them
- Different from traffic circles or mini-roundabouts; possible substitute for traffic signal control

## Applications:

- Intersections of arterial and/or collector streets
- One or more entering lanes
- Can be used at intersections with high volumes of large trucks and buses, depending on design



(Source: Grant Kaye)



(Source: PennDOT LTAP)

## Design/Installation:

- See NCHRP Report 672 for design details
- Design vehicle is determined specifically for each site ranging from emergency vehicles to over size/overweight vehicles
- Typically circular in shape but may be an oval shape
- Key physical elements are center islands, truck aprons, and splitter islands
- Controlled by YIELD signs on all approaches with pedestrian crosswalks, if included, one car- length upstream of YIELD bar
- Key design features include: fastest paths, swept paths, and path alignment
- Large vehicles circulating around the center island for all movements may traverse the apron



- Landscaping needs to be designed to allow adequate sight distance per NCHRP 672
- Preferable to have a closed-section road (i.e. curb and gutter)
- Bicycle facilities, if provided, must be separate from the circulatory roadway with physical barriers; cyclists using the circulatory roadway must merge with vehicles. Bicycle facilities are prohibited in the circulatory roadway to prevent right-hook crashes.

**Potential Impacts:**

- Limited impact on access, except for access points immediately adjacent to intersection
- Limited impact on roadways with on-street parking
- May draw additional traffic but with reduced delays and queues

# Speed Cushion

## Description:

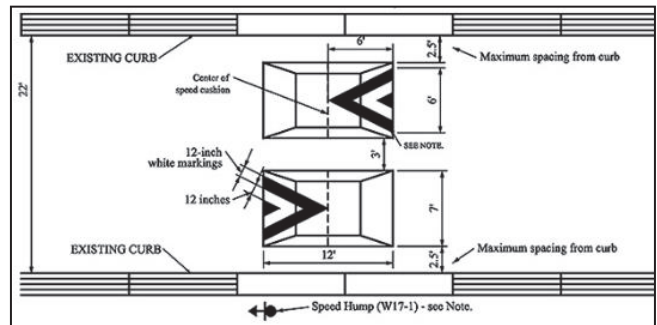
- Two or more raised areas placed laterally across a roadway with gaps between raised areas
- Height and length similar to a speed hump; spacing of gaps allow emergency vehicles to pass through at higher speeds
- Often placed in a series (typically spaced 260 to 500 feet apart)
- Sometimes called speed lump, speed slot, and speed pillow

## Applications:

- Appropriate on local and collector streets
- Appropriate at mid-block locations only
- Not appropriate on grades greater than 8 percent



(Source: James Barrera, Horrocks, NM)



(Source: Delaware Department of Transportation)

## Design/Installation Issues:

- Two or more cushions at each location
- Typically 12 to 14 feet in length and 7 feet in width
- Cushion heights range between 3 and 4 inches, with trend toward 3 - 3 ½ inches maximum
- Speed cushion shapes include parabolic, circular, and sinusoidal
- Material can be asphalt or rubber
- Often have associated signing (advance-warning sign before first cushion at each cushion)
- Typically have pavement markings (zigzag, shark's tooth, chevron, zebra)
- Some have speed advisories

## Potential Impacts:

- Limited-to-no impact on non-emergency access
- Speeds determined by height and spacing; speed reductions between cushions have been observed averaging 20 and 25 percent
- Speeds typically increase by 0.5 mph midway between cushions for each 100 feet of separation
- Studies indicate that average traffic volumes have reduced by 20 percent depending on alternative routes available
- Average collision rates have been reduced by 13 percent on treated streets

# Speed Hump

## Description:

- Rounded (vertically along travel path) raised areas of pavement typically 12 to 14 feet in length
- Often placed in a series (typically spaced 260 to 500 feet apart)
- Sometimes called road humps or undulations

## Applications:

- Appropriate for residential local streets and residential/neighborhood collectors
- Not typically used on major roads, bus routes, or primary emergency response routes
- Not appropriate for roads with 85<sup>th</sup>-percentile speeds of 45 mph or more
- Appropriate for mid-block placement, not at intersections
- Not recommended on grades greater than 8 percent
- Work well in combination with curb extensions
- Can be used on a one-lane one-way or two-lane two-way street



(Source: City of Boulder, Colorado)



(Source: PennDOT LTAP)

## Design/Installation Issues:

- ITE recommended practice - "Guidelines for the Design and Application of Speed Humps"
- Typically, 12 to 14 feet in length; other lengths (10, 22, and 30 feet) reported in practice in U.S.
- Speed hump shapes include parabolic, circular, and sinusoidal
- Typically spaced no more than 500 feet apart to achieve an 85th percentile speed between 25 and 35 mph
- Hump heights range between 3 and 4 inches, with trend toward 3 - 3 ½ inches maximum
- Often have associated signing (advance warning sign before first hump in series at

each hump)

- Typically have pavement markings (zigzag, shark's tooth, chevron, zebra)
- Taper edge near curb to allow gap for drainage
- Some have speed advisories
- Need to design for drainage, without encouraging means for motorists to go around a hump

**Potential Impacts:**

- No impact on non-emergency access
- Average speeds between humps reduced between 20 and 25 percent
- Speeds typically increase approximately 0.5 to 1 mph midway between humps for each 100 feet Beyond the 200-foot approach and exit of consecutive humps
- Traffic volumes diversion estimated around 20 percent; average crash rates reduced by 13 percent

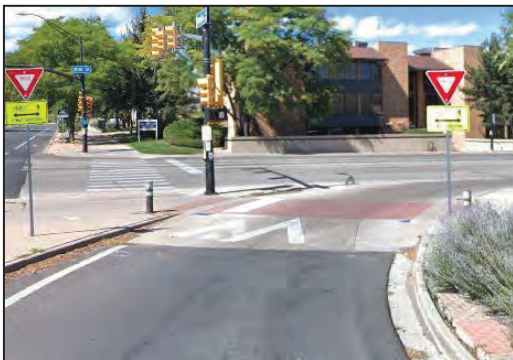
## Speed Table/Raised Crosswalks

### Description:

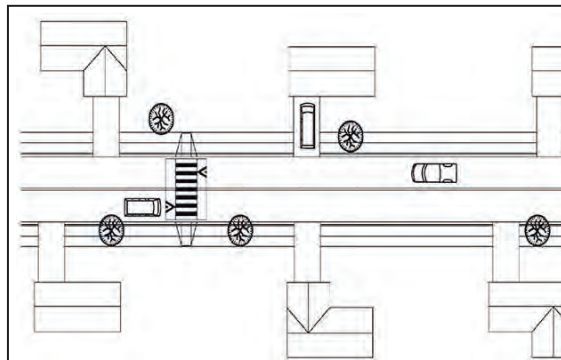
- Long, raised speed humps with a flat section in the middle and ramps on the ends; sometimes constructed with brick or other textured materials on the flat section
- If placed at a pedestrian crossing, it is referred to as a raised crosswalk
- If placed only in one direction on a road, it is called an offset speed table

### Applications:

- Appropriate for local and collector streets; mid-block or at intersections, with/without crosswalks
- Can be used on a one-lane one-way or two-lane two-way street
- Not appropriate for roads with 85<sup>th</sup> percentile speeds of 45 mph or more
- Typically, long enough for the entire wheelbase of a passenger car to rest on top or within limits of ramps
- Work well in combination with textured crosswalks, curb extensions, and curb radius reductions
- Can be applied both with and without sidewalks or dedicated bicycle facilities
- Typically installed along closed-section roads (i.e. curb and gutter) but feasible on open section



(Source: Google Maps, Boulder, Colorado)



(Source: Delaware DOT)



## **Design/Installation Issues:**

- ITE recommended practice – “Guidelines for the Design and Application of Speed Humps”
- Most common height is between 3 and 4 inches (reported as high as 6 inches)
- Ramps are typically 6 feet long (reported up to 10 feet long) and are either parabolic or linear
- Careful design is needed for drainage
- Posted speed typically 30 mph or less

## **Potential Impacts:**

- No impact on non-emergency access
- Speeds reductions typically less than for speed humps (typical traversing speeds between 25 and 27 miles per hour)
- Speeds typically decline approximately 0.5 to 1 mph midway between tables for each 100 feet beyond the 200-foot approach and exit points of consecutive speed tables
- Average traffic volumes diversions of 20 percent when a series of speed tables are implemented
- Average crash rate reduction of 45 percent on treated streets
- Increase pedestrian visibility and likelihood of driver yield compliance
- Generally, not appropriate for bus rapid transit routes

# Traffic Circle

## Description:

- Raised islands placed in unsignalized intersections around which traffic circulates
- Approaching motorists yield to motorists already in the intersection
- Require drivers to slow to a speed that allows them to comfortably maneuver around them
- Approaches not designed to modern roundabout principals - no deflection

## Applications:

- Appropriate at intersections of local streets
- One lane each direction entering intersection
- Not typically used at intersections with high volumes of large trucks or buses turning left
- appropriate for both one-way and two-way streets in urban and suburban settings



(Source: Scott Batson)



(Source: Scott Batson)

## Design/Installation Issues:

- Typically, circular in shape but may be an oval shape
- Usually have landscaped center islands
- Recommend YIELD signs on all approaches
- Preferable for roadways to be closed section (i.e. curb and gutter)
- Can be applied to roads with on-street parking
- Can be applied to roads both with and without dedicated bicycle facilities; bike lanes not striped in circulatory roadway
- Key design features include offset distance (distance between projection of street

curb and center island), lane width of circulatory roadway, circle diameter, and height of mountable apron for large vehicles

**Potential Impacts:**

- Minimal anticipated traffic diversion
- Bicyclist and motorists will share lanes at intersections because of narrowed roadway
- Large vehicles/buses usually not able to circulate around center island for left turns
- Landscaping needs to be designed to allow adequate sight distance, per AASHTO
- Minimize routing of vehicles through unmarked crosswalks on side-streets
- May require additional street lighting



# SECTION V - FORMS

CITY OF SOCORRO  
NEIGHBORHOOD TRAFFIC MANAGEMENT PLAN

RESTAURANT

**NEIGHBORHOOD TRAFFIC CALMING REQUEST  
CITY OF SOCORRO — NTMP APPLICATION FORM**

**Part A**

Date: \_\_\_\_\_

On this date, we, the residents of, request that the City of Socorro's Planning and Zoning Department initiate a NTMP Study in our neighborhood to address the following concern(s):

- ☐ Safety
- ☐ Speeding
- ☐ Excess Traffic
- ☐ Cut-Through Traffic
- ☐ Bicycle or Pedestrian
- ☐ Commercial Vehicle Restriction
- ☐ Parking
- ☐ Noise
- ☐ Other (Please describe: ) \_\_\_\_\_

Description of neighborhood conditions or recent changes in traffic, leading to this application:

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**Part B**

We understand that the NTMP process involves active participation of our community and that the decision-making process may require us to set and attend neighborhood meetings, further petition campaigns, and coordinate with the Planning and Zoning Department on components of the Study. We also understand that initiating a NTMP Study does not guarantee implementation of traffic calming devices or policies, which are dependent on both the findings of the study and available fiscal resources.

**Part C**

All persons signing this official request certify that they reside in the neighborhood referenced in Part A above, and agree with the identified concern(s) checked in Part A. All persons signing this official request also agree that the designated contact person(s) below will represent the neighborhood as facilitator(s) between the neighborhood residents and the City of Socorro's Planning and Zoning Department for the purposes of this NTMP Study.

Sign and submit to the City of Socorro c/o City Clerk (124 S. Horizon Socorro, TX 79927 or [cityclerk@ci.socorro.tx.us](mailto:cityclerk@ci.socorro.tx.us))

**Designated Neighborhood Contact(s)**

Name: \_\_\_\_\_ Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

**Supporting Neighborhood Resident Applicants**

Name: \_\_\_\_\_ Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

Name: \_\_\_\_\_ Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

**NEIGHBORHOOD TRAFFIC CALMING REQUEST  
CITY OF SOCORRO — NTMP PETITION FORM**

Date: \_\_\_\_\_

Representatives from the neighborhood, on requested initiation of a NTMP Study. Based on available data, the households and properties identified in the attached Exhibit 1, **to be provided by applicant**, are considered to be in the affected area. An initial assessment of available data has been conducted, and to continue processing the application neighborhood support is required. Two-thirds of the shown households/properties on Exhibit 1 must agree with the application and sign the petition below. The completed petition should be submitted to the City of Socorro c/o City Clerk (124 S. Horizon Socorro, TX 79927 or [cityclerk@ci.socorro.tx.us](mailto:cityclerk@ci.socorro.tx.us)).

**Section II (ONLY ONE SIGNATURE PER ADDRESS)**

Name(print): \_\_\_\_\_ Address: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Email: \_\_\_\_\_ Signature: \_\_\_\_\_

Name(print): \_\_\_\_\_ Address: \_\_\_\_\_ Telephone: \_\_\_\_\_  
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**Section II (ONLY ONE SIGNATURE PER ADDRESS)**

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