City of Albuquerque

Neighborhood Traffic Management Program – NTMP

~~Streets and Traffic Enhancement Program – STEP~~

A Summary of Traffic Calming Policy and Neighborhood Traffic Management Strategies

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Contents

ABSTRACT

This ~~Streets and Traffic Enhancement Program (STEP)~~ Neighborhood Traffic Management Program (NTMP) policy manual was developed for the City of Albuquerque (City), as directed by City Council Resolution (R-09-17). The content contained herein is based on review of the approved 1997 and proposed 2010 Neighborhood Traffic Management Plan (NTMP), as well as traffic calming national best practices. The 2010 plan was the result of cooperative efforts between industry leaders and multiple City departments including Albuquerque Police, Albuquerque Fire, Planning, Legal, Municipal Development, and City Councilors. Resources used in developing this updated policy manual include the Institute of Transportation Engineers (ITE) *Traffic Calming State of the Practice*, similar traffic calming programs and policies from cities across the nation, as well as the previous City of Albuquerque NTMP. The City's Traffic Engineering Division and Department of Municipal Development provided oversight and coordination. This manual represents a collaborative effort between City management, staff, and stakeholders to develop a city-wide 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.

PART I – INTRODUCTION

This section of the manual introduces and discusses the subject of traffic calming, the goals and objectives of the City's new ~~Streets and Traffic Enhancement Program (STEP)~~ 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 ~~STEP~~ NTMP administrator at the City's Traffic Engineering Division (TED) is provided.

What is traffic calming?

The City is experiencing growth in traffic volume as its population continues to increase. 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 non-motorized 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 Albuquerque.

What are the program's goals and objectives?

The goals of the ~~STEP~~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 phases outlined in this manual, residents can assess the various benefits and trade-offs of implementing projects within their own neighborhoods. Because the involvement of residents is a key component in managing neighborhood traffic, the ~~STEP~~ NTMP is designed to encourage residents' active participation in identifying traffic issues, developing practical solutions, and supporting the ultimate outcome. This policy manual encourages residents to become actively involved in the decision-making process by following the phases outlined to implement traffic calming measures.

How is this manual used?

This ~~STEP~~ 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. The proposed process in this manual is consistent with the existing City of Albuquerque Neighborhood Traffic Management Program (NTMP). 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 Traffic Engineering Division (TED) 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[1]
- 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 ~~STEP~~ 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 City of Albuquerque's (COA) Geographic Information System (GIS) Division.

How will projects be ranked?

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 ranked City-wide based on a point score system. The project applicants will be notified of the resulting project rank after the evaluation.

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 projects be maintained?

Any new infrastructure within the City requires regular and sustained maintenance. Many traffic calming measures are unique in that more frequent maintenance may be required to maintain effectiveness. As an example, because of wear caused by vehicles and snow removal equipment, high-visibility crosswalks have proven to require regular maintenance. As a result, maintenance requirements and estimated life-cycle costs will be considered as part of the evaluation, prior to acceptance and implementation of traffic calming measures. In some cases, such as enhanced landscaping, the petitioning residents or neighborhood group may be asked to

contribute through organized volunteer efforts to ensure landscaping is maintained and does not become unsightly.

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 TED. 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?

How will previous requests for traffic calming be handled?

The City has long maintained a list of citizen complaints and requests for traffic calming. A backlog of a dozen projects that were previously warranted and approved will serve as the initial projects under this program. Based on the 2010 NTMP, speed humps were the only device being considered at that time. This new ~~STEP~~ NTMP formalizes the process of requesting, evaluating, and implementing traffic calming measures and includes nearly 40 new devices for neighborhood traffic management. Because resident concerns and traffic conditions may have changed and since the additional devices being considered may better address neighborhood concerns, all requests that were not previously approved for traffic calming and made prior to adoption of this policy manual must be resubmitted for consideration. Once a qualifying project is on the priority list it will remain but will be reprioritized biennially (in odd years to correspond with the bond cycle), with all previously approved projects and newly submitted projects.

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 contact the COA TED for an application. Applications are available at one of the following addresses:

Mailing Address: Attn: Traffic Engineering Division
~~STEP~~ NTMP Request
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Email Address: ~~STEP@cabq.gov~~ NTMP@cabq.gov

Website: http://www.cabq.gov/traffic/STEP or dial 311

PART II – IMPLEMENTATION PROCESS

This section of the manual discusses the implementation process for the ~~STEP~~ NTMP, including definition of the qualifying criteria for traffic calming measures and an outline of the process and phases 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 petitioning parties and the City's Traffic Engineering Division. A flowchart is provided to illustrate the ~~STEP~~ NTMP decision-making process and the roles of both the applicant and the City are highlighted.

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 TED is keenly aware of neighborhood traffic issues and, through observations, data collection, and review of historical traffic data, may recommend specific streets or neighborhoods that could benefit from traffic calming measures. The plan development and implementation process phases include:

- Preliminary actions
- Implementation measures
- Assessment of effectiveness

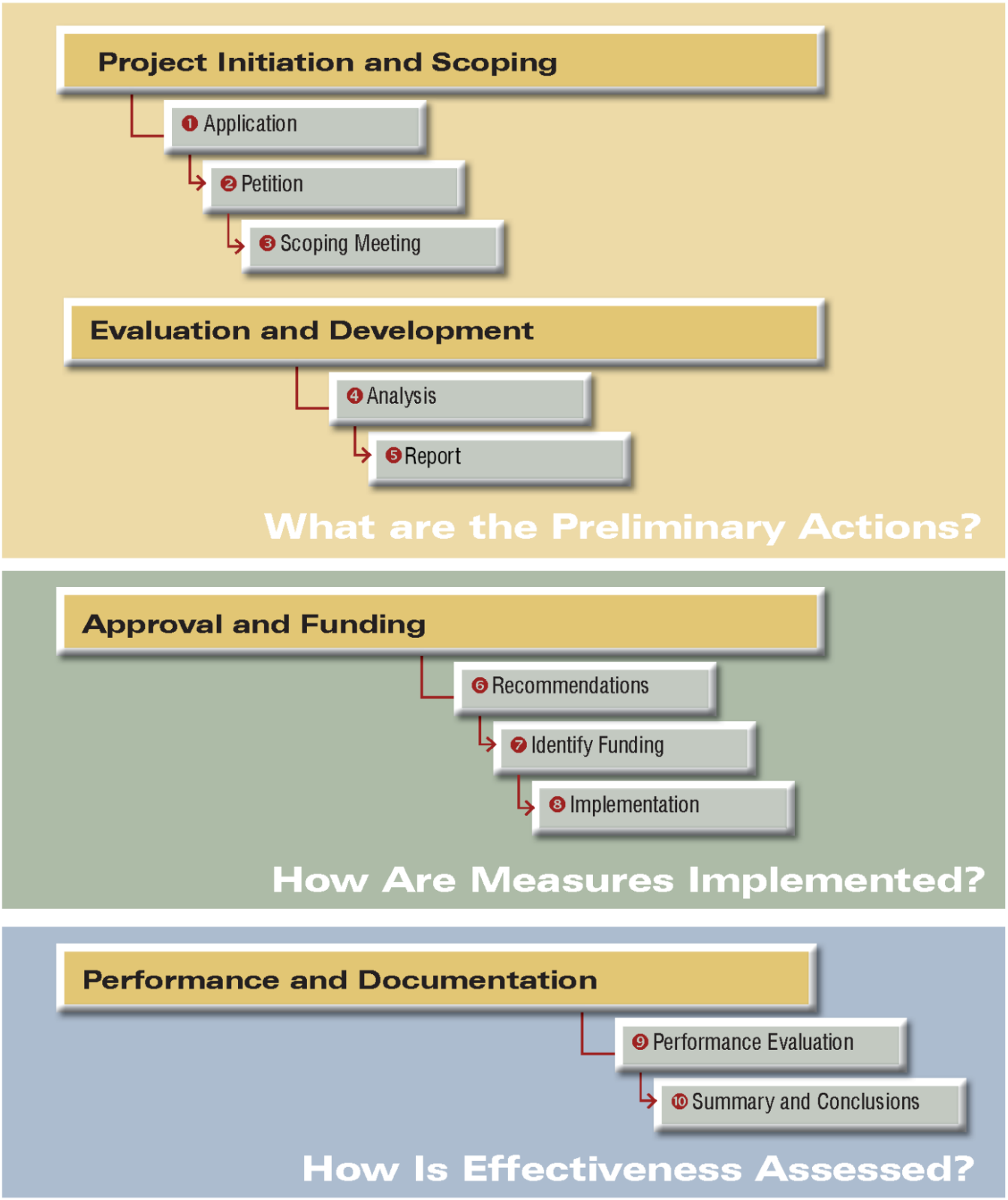
Every request for traffic calming will be reviewed by City staff. Upon receipt, staff will determine if the request meets ALL of the following ~~five~~ three minimum guidance thresholds:

1. Functional classification as a local or collector roadway ~~with less than 3,000 vehicles per day~~
~~2. Not a designated emergency response route (a)~~
2. Has a demonstrated need for traffic management determined through engineering study or Traffic Engineering Division observation that indicates a **high likelihood** of **two** of the following threshold criteria:
    - Reported crashes in the past 3 years that could be corrected with traffic calming~~, or~~
    - ~~Daily traffic in excess of 1000~~ 500 ~~vehicles per day, or~~
    - Peak-hour traffic volume greater than 400 vehicles in one direction~~, or~~
    - 25 percent of peak-hour traffic is non-local cut-through traffic~~, or~~
    - 85th percentile speed exceeds the posted speed limit by 5 mph or more. (*See Glossary of Terms for further explanation*)
3. Has not been considered for traffic calming measures within the last 5 years
~~5. Does not have curves, grades, or other features that result in traffic calming devices having a negative impact on the neighborhood.~~

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.
~~a Only non-physical control measures and those physical control measures that do not slow emergency vehicles will be considered on designated emergency response routes.~~
~~b Only non-physical control measures and those physical control measures that do not exacerbate known existing conditions will be considered.~~

Only after a street or area meets all three ~~five~~ of these minimum criteria will it qualify for traffic calming evaluation and implementation. As illustrated in Exhibit 1, City staff will communicate to the applicant the ~~STEP~~ NTMP framework and sequence of phases necessary to implement traffic calming.

EXHIBIT 1
~~STEP~~ NTMP **Framework**



What are the preliminary actions?

As illustrated in Exhibit 1, the preliminary actions include Phases 1, 2, and 3 as part of the project Initiation and Scoping, and Phases 4 and 5 under Evaluation and Development. These phases are described in detail below.

Initiation and Scoping

Phase 1: Application

All City residents are eligible to apply for participation in the ~~STEP~~ NTMP. Individuals are encouraged to work with or form a group of residents in the area of concern. Applications for participation in the ~~STEP~~ NTMP are available via mail, email, and website or by dialing 311. Completed applications should be returned to the TED office.

Upon receipt of a completed application, the TED will perform a search for applicable data. Data are considered applicable if it has been collected by the City Department of Municipal Development (DMD)/TED 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, TED will make arrangements for field observations or data collection as necessary, and will inform the applicant of any extra time and/or funds this may require.

The TED will respond in writing to the applicant. ~~The response will inform the applicant if applicable data is available and within 3 years of the application.~~ The response will ~~also~~ 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 TED, the applicant will continue to Phase 2.

Applicant Responsibility: To the best of their ability, identify the neighborhood traffic issue(s) of concern. Submit a completed application to the City. Form a neighborhood working group.

City Responsibility: Acknowledge receipt of the application within 10 business days. Review and respond to all submitted applications. Determine if the request meets the minimum guidance criteria. Research available data. Define the petition area. Work with the applicant to define next steps.

Phase 2: Petition

After receipt of an application, TED will determine whether there is applicable data or whether funding is available to collect new data, and ~~Pending available funding and once the TED has determined if there is applicable data,~~ 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 TED based on ~~STEP~~ NTMP guidelines. The petition area may include residents that are not in the immediate neighborhood but who cannot reasonably avoid new traffic calming devices when going to and from their home. This provision is included so that if the road conditions in Ordinance O-05-97 are met these residents are notified and included in the petition area.

A petition will be considered complete if two-thirds of the affected households have signed the petition. The petition process is used by the TED only to determine if there is sufficient neighborhood support to expend City staff resources on data collection. The TED may modify or expand the petition area to address unique

circumstances. TED 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 TED will add the area and traffic concern, as described on the initial application, to a list of data collection and analysis needs.

Applicant Responsibility: Circulate the petition to affected households and obtain the required two-thirds signatures.

City Responsibility: Maintain a list of data collection and analysis needs for neighborhood traffic management. Add the application to this list if it qualifies.

Phase 3: Scoping Meeting

If needed, City staff 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 group 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 ~~limitations~~, and current and ongoing education and enforcement efforts. Residents are encouraged to attend the scoping meeting and voice their concerns.

Applicant Responsibility: Attend the scoping meeting with the intent to work collaboratively to identify the study area, understand the neighborhood traffic issues, define the data collection effort, and specify the analysis that will be conducted.

City Responsibility: Conduct the scoping meeting with the intent to work collaboratively to identify the study area, understand the neighborhood traffic issues, define the data collection effort, and specify the analysis that will be conducted.

Evaluation and Development

Phase 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 two 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
- ~~Daily traffic in excess of 500 vehicles per day~~
- Peak-hour traffic volume greater than 400 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. (*See Glossary of Terms for further explanation*)

The data used in the analysis will be readily available to the applicant. If the analysis shows that the issue meets one or more of the minimum thresholds shown above, city staff will use the criteria listed in Exhibit 2 (on the following page) 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 Part IV of this manual will be used to develop neighborhood traffic calming plans and identify specific traffic calming measures that are recommended for implementation.

Applicant Responsibility: None.

City Responsibility: Collect the necessary data and perform the engineering traffic analysis. Assess the extent of the traffic problem and recommend traffic calming measures for implementation.

Phase 5: Report

The TED 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. TED 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 TED with a form signed, by that applicant, acknowledging that they have provided the report to all affected neighborhood associations registered with the City Office of Neighborhood Coordination, 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. An example of this form is provided in Part VI of this document.

Applicant Responsibility: Distribute the recommendation report to affected households and neighborhood associations. Provide written feedback to the City to collaboratively identify reasonable traffic calming measures that can be implemented within available funding.

City Responsibility: Prepare the recommendations report with the intent to work collaboratively to identify reasonable traffic calming measures that can be implemented and identify available funding, funding deficiencies and potential sources of funding. ~~within available funding~~.

EXHIBIT 2

Criteria Definitions

Criteria	Max Pts	Definition
Crashes	25	**5 points for each reported and preventable crash within the past 3 years** A reported crash is an accident that results in death, injury, or property damage.
Speed	20	**2 points for each mph that the 85th percentile speed is above the posted speed limit.** The posted speed limit is the maximum speed legally permitted on a given road. The 85th percentile speed is the speed at or below which 85 percent of vehicles travel. It is commonly used as a benchmark when posting speed limits. The TED will conduct speed studies. (Example: speed limit is 25, 30 mph=2*(30-25)=10 points)
Traffic volume	15	**Total traffic volume per day divided by 100** Total volume is the number of vehicles crossing a section of road at any selected period of time. Traffic volume per day is determined by the TED. (Example: Total Volume is 400 = 400/100 = 4 points)
Cut-through traffic	15	**1 point for every 30 cut-through vehicles per day.** Cut-through traffic uses local or collector streets to travel through a residential neighborhood without having an origin or destination within the neighborhood. The TED will conduct volume counts by referencing license plate numbers
Community support	5	**1 point for 50% support of proposed ~~implementation~~ intervention** **2 points for 60% support of proposed ~~implementation~~ intervention** **3 points for 70% support of proposed ~~implementation~~ intervention** **4 points for 80% support of proposed ~~implementation~~ intervention** **5 points for >80% support of proposed ~~implementation~~ intervention**
Bicycle routes	5	**5 points based on officially designated routes and/or observed bicycle activity** Bike routes refer to roads, tracks, paths, or marked lanes designated for use by cyclists from which motorized traffic is generally excluded.
Sidewalks and pedestrians	5	**5 points based on sidewalk availability and/or observed pedestrian activity** A sidewalk is a raised concrete or asphalt path for pedestrians at the side of a road.
~~Activity Centers~~ High-traffic destinations	5	**5 points if the street is within 0.25 mile of any major destination or high activity site. Points are assigned on an all or none basis.** (Example: school, park, shopping center, senior center, or city facility) Note: proposed edit removes "major activity center" to preclude confusion with the ABQ/BernCO Comprehensive Plan, which uses this term to refer specifically to areas of very intensive activity, such as UNM and Downtown.
Sight distance	5	**5 points for sight distance issues** Stopping sight distance is defined as the distance needed for drivers to see an object on the roadway ahead and bring their vehicles to a safe stop before colliding with the object. Sight distance issues may be due to horizontal and vertical curves. The TED will make this determination.
Total Possible Points	100	
Existing measures	-5	**Reduction of up to 5 points if there are existing traffic calming measures** (Example: speed humps, raised crosswalks, etc.)
~~Engineering conditions~~	~~-10~~	**~~Reduction of up to 10 points if there are curves, grades, parking, sidewalks, bike lanes, landscaping, drainage, or other existing conditions that would make implementing traffic calming measures difficult or create adverse affects~~**
~~Environmental condit~~	~~-10~~	**~~Reduction of up to 10 points if traffic calming would impact regular maintenance or snow removal activities, increase noise levels, or create visual impacts~~**

How are traffic calming measures implemented?

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

Approval and Funding

Phase 6: Recommendations

The TED 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 TED will refine the cost estimate.

Applicant Responsibility: None.

City Responsibility: Update the traffic engineering report, finalize recommendations, and refine the cost estimate. Provide a copy of the study to the applicant. Notify residents who cannot avoid traffic calming devices while traveling to or from their homes that traffic calming measures are being considered for their neighborhood.

Phase 7: Identify Funding

Requests for ~~STEP~~ NTMP funding for projects must compete with other requests for traffic calming funding and will be ranked City-wide based on their point score. 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 a City Councilor or other neighborhood representative.

Applicant Responsibility: Determine if non-City funding is available for construction and/or maintenance of traffic calming measures, e.g., federal, state or private grants, homeowners' association dues, ~~or~~ direct neighborhood support, or other discretionary funding. Contribute financially or through organized volunteer efforts for maintenance.

City Responsibility: Rank projects based on their point score. Identify those projects that will be constructed. Attempt to include a specific neighborhood traffic enhancement project in each capital program.

Phase 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.

Applicant Responsibility: None.

City Responsibility: Determine if traffic calming measures should be initially implemented on a temporary or permanent basis.

How is effectiveness assessed?

Once projects have been constructed and operational for at least 6 months, a post-implementation evaluation process will be conducted. Phases 9 and 10 outline 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

Phase 9: Performance Evaluation

The TED 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 Phase 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 TED 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.

Applicant Responsibility: Notify the City of any positive or negative feedback that may be received from neighborhood residents or groups.

City Responsibility: Conduct a post-implementation study to determine the traffic calming measure's effectiveness.

Phase 10: Summary and Conclusion

The TED 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 TED may assess the extent and cost of maintenance for future planning.

Applicant Responsibility: None.

City Responsibility: Provide a copy of the post-implementation study to the applicant.

PART III – TRAFFIC MANAGEMENT STRATEGIES

This section of the ~~STEP~~ 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 that 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 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 local 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. Unwarranted stop signs may actually lead to increased speeding as drivers try to make up the lost time. The added delay also unnecessarily increases vehicle emissions, fuel consumption, operating cost, and noise. Excessive stops signs may cause drivers to divert to other neighborhood streets. Sometimes, the need for stop signs can be eliminated by removing obstructions and improving sight distance. The MUTCD explicitly states that stops 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.

Performance and Cost Measures

Exhibit 3 summarizes the toolbox of available traffic calming devices and their effectiveness at addressing specific concerns. More detailed information is provided in PART IV – NEIGHBORHOOD TRAFFIC CALMING MEASURES TOOLBOX. For each of the physical and non-physical traffic calming devices eight performance measures were assessed. Each of the following eight performance measures were rated very good, good, fair, poor, or not applicable:

- Speed
- Volume
- Cut-through
- Crashes

- Emergency vehicles
- Pedestrian
- Bicycle
- Noise

The likely capital cost was determined for each traffic control device, and a range of costs in 2012 dollars was provided. The ultimate cost of any improvement may vary substantially based on the number of devices implemented, the length of the improvement, or the extent of necessary reconstruction. It is not the intent of this manual to determine detailed costs, but rather to provide generalized costs for comparison between devices. Costs were categorized as follows:

- $ = $0 to $25,000
- $$= $25,000 to $50,000
- $$$ = $50,000 to $100,000
- $$$$ = $100,000+

EXHIBIT 3

Toolbox Summary

See detailed device pages for more information

Very Good · Good · Fair · Poor · N/A Not Applicable

Effectiveness of traffic control measure at addressing concern

Traffic Management Strategy	Speed	Volume	Cut Through	Crashes	Emergency Vehicle	Pedestrian	Bicycle	Noise	Cost
Non-Physical Control Measures									
Targeted Police Enforcement	Very Good	Poor	Fair	Fair	Very Good	Very Good	Very Good	N/A	$$
Radar Speed Trailer	Good	Poor	Poor	N/A	Very Good	Very Good	Very Good	N/A	$$
Permanent Radar Speed Sign	Good	Poor	Poor	N/A	Very Good	Very Good	Very Good	N/A	$$
Centerline / Edgeline / Laneline Striping	Fair	Fair	Poor	N/A	Very Good	Very Good	Very Good	N/A	$
Speed Reduction Markings	Fair	Poor	Poor	N/A	Very Good	Very Good	Very Good	N/A	$
Speed Limit Signage	Fair	Poor	Poor	Fair	Very Good	Very Good	Very Good	N/A	$
Speed Limit Pavement Markings	Fair	Poor	Poor	N/A	Very Good	Very Good	Very Good	N/A	$
Raised Pavement Markers	Fair	Poor	Poor	Fair	Very Good	Very Good	Fair	Poor	$$
High Visibility Crosswalks	Fair	Poor	Poor	Good	Very Good	Very Good	Good	N/A	$$
Parking Strategies	Fair	Fair	Fair	Fair	Fair	Good	Fair	N/A	$$
Education and Community Involvement	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	$
Signed Turn Restriction	Poor	Good	Good	N/A	Very Good	Very Good	Very Good	N/A	$
Speed Control – Narrowing Measures									
Neckdowns and Bulbouts	Good	Fair	Fair	Fair	Fair	Good	Fair	N/A	$$
Lane Narrowing with Center Island /Pededstrian Refuge	Fair	Poor	Fair	Fair	Good	Good	Fair	N/A	$$$
Two-Lane Choker	Fair	Fair	Fair	Fair	Good	N/A	Fair	N/A	$$$
One-Lane Choker	Very Good	Very Good	Very Good	Poor	Poor	N/A	Poor	N/A	$$$
Roadside and Median Landscaping	Fair	N/A	N/A	N/A	N/A	Fair	Fair	N/A	$$$
Road Narrowing / Detached Sidewalks	Good	N/A	N/A	N/A	Good	Very Good	Fair	N/A	$$$
Speed Control – Horizontal Measures									
Traffic Circle	Very Good	Fair	Fair	Good	Fair	Fair	Fair	Fair	$$$
Roundabout (Single Lane)	Good	N/A	Poor	Very Good	Fair	Good	Fair	Good	$$$$
Chicane	Good	Fair	Fair	N/A	Good	Good	Fair	Fair	$$$
Lateral Shift	Fair	N/A	Fair	N/A	Good	Fair	Fair	N/A	$$$
Realigned Intersection	Good	Fair	Fair	N/A	Good	N/A	N/A	N/A	$$$
Medians and Partial Medians	Fair	Fair	Poor	Fair	Fair	Fair	Fair	N/A	$$$
Speed Control – Vertical Measures									
Speed Hump	Very Good	Good	Good	Fair	Poor	Good	Good	Poor	$
Speed Table	Very Good	Good	Good	Fair	Poor	Good	Good	Poor	$
Speed Kidneys	Very Good	Good	Good	Fair	Good	Good	Good	Fair	$
Raised Crosswalk	Good	Good	Good	Fair	Poor	Good	Good	Poor	$
Raised Intersection	Good	N/A	N/A	Fair	Poor	Very Good	Good	N/A	$$$
Volume Control Measures									
Full Closure (gate, midblock cul-de-sac, intersection cul-de-sac)	Good	Fair	Very Good	Fair	Poor	Good	Good	Good	$$$$
Partial Closure	Good	Fair	Very Good	Fair	Fair	Good	Good	Good	$$$$
Diagonal Diverter	Good	Fair	Very Good	Fair	Fair	Good	Good	Good	$$$$
Median Barrier	Fair	Fair	Very Good	Good	Fair	Good	Good	Good	$$$$
Forced Turn Island	Fair	Fair	Very Good	Good	Fair	Good	Good	Good	$$$
Two-Way Street Conversions	Good	Fair	Fair	Fair	Good	Good	Good	N/A	$$$$
One-Way Couplet Conversions	Poor	Fair	Fair	Good	Fair	Good	Good	N/A	$$$

PART 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 individual devices are grouped so that the reader can compare and identify those measures that best address the traffic issues and are most appropriate for the specific neighborhood.

The toolbox is divided into three categories:

1. **Non-Physical Measures**
2. **Speed Management Traffic Calming Measures**
3. **Traffic Volume Management Traffic Calming Measures**

This ~~STEP~~ NTMP manual consists of nearly 40 new potential devices to address neighborhood traffic management concerns and each device is described in detail in the following pages of this manual.

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

Part VII of this manual presents the current City of Albuquerque street functional classification map. This map indicates those roadways that are classified as locals or collectors which are eligible for traffic calming.

Part VIII of this manual presents the current City of Albuquerque emergency response routes map. This map indicates which streets are heavily utilized by emergency responders and are therefore eligible only for those traffic calming devices that are non-physical or that do not impede emergency response vehicles.

A glossary of terms, references, and the acknowledgments sections are provided at the end of this manual.

Targeted Police Enforcement

DESCRIPTION:

Targeted police enforcement is the deployment of officers to specific streets or neighborhoods for a period of time to conduct radar speed enforcement and enforcement of traffic laws. The presence and actions of police has the immediate effect of reducing speeding, aggressive driving, stop sign violations, turn-restriction violations, and other traffic law violations but is likely not long term unless a sustained effort occurs.

APPLICATION:

On neighborhood streets where speeding, other traffic law violations, and/or related crashes have been documented, the City of Albuquerque, Traffic Engineering Division may respond by submitting a request to the Albuquerque Police Department Metro Traffic Division for focused enforcement at the specified locations. Because APD resources are limited, the duration of the targeted enforcement may be for a limited time. Targeted enforcement may also be requested in conjunction with new neighborhood traffic-management strategies to help drivers become aware of new restrictions or measures, such as turn prohibitions. The level of deployment can vary from one motor unit officer for a low-volume street to a team of patrol units at higher-volume locations.

Repeated short-term deployments over a longer term may be more cost-effective and results in a greater effect than one longer deployment (for example, eight 1 hour periods scattered over a few weeks rather than one 8 hour day).

If regular drivers on a street see police enforcement at different times at the same location, they may be conditioned to anticipate enforcement in the future.

If a radar speed trailer is deployed placing a police unit beyond a radar speed trailer, this may cause motorists to associate enforcement actions with the trailer, resulting in greater effectiveness of the radar speed trailer at a location.

Advantages

- Highly effective in reducing speeding and other traffic law violations including stop sign running and illegal turns.
- Can be deployed on short notice and for the specific hours for which problems have been identified.
- Results are immediate.
- Can reduce crashes related to speeding and other violations.
- Low cost if used temporarily.
- Does not affect emergency vehicles.
- Targets violators without affecting normal traffic.
- Where neighborhood traffic-management measures have been recently deployed, the officers can issue warnings or citations at their discretion. This can promote public education regarding the new devices or restrictions.

Disadvantages

- Effectiveness may be temporary, especially if the enforcement is deployed only once.
- Enforcement is limited to APD availability.

Effectiveness Scorecard

Speed	●
Volume	◕
Cut-through	◒
Crashes	◒
Emergency Vehicle	●
Pedestrian	●
Bicycle	●
Noise	N/A
Cost	$$

● Very Good ◕ Good ◒ Fair ◔ Poor N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Radar Speed Trailer

DESCRIPTION:

Radar speed trailers are mobile units placed on the side of the road that use radar to sense an oncoming vehicle's speed and display that speed back to the approaching driver. This is intended to give the driver an external visual indication of their speed, which if excessive, may remind them to slow down. The radar speed trailers have no cameras and do not take any photos of offending drivers for enforcement purposes.

APPLICATION:

The Albuquerque Police Department (APD) maintains a fleet of radar speed trailers, distributed among the several area commands. The Metro Traffic Division also maintains radar speed trailers.

On neighborhood streets where speeding has been documented, the City of Albuquerque, Traffic Engineering Division may respond by submitting a request to APD for deployment of a radar speed trailer(s) at the specified locations. Because these APD resources are limited, the number and duration of the trailer deployment may be limited.

Radar speed trailers must be deployed on the side of the road where they will be safe from traffic, not block sidewalks or bicycle lanes, and not obstruct sight distance at intersections and driveways. The radar speed trailers must also be positioned so that they are not blocked by parked vehicles.

Advantages

- Have been shown to be effective in prompting some speeding drivers to slow down.
- Can be deployed on short notice and easily moved.
- Results are immediate.
- Deployment is low cost.
- Does not slow emergency vehicles.
- Alerts violators without affecting normal traffic.

Disadvantages

- Effectiveness may be temporary once removed.
- Limited to APD availability.
- Requires enough space to set up, and may reduce available parking.
- Units are subject to vandalism.
- Some drivers may try to register a high speed.

Effectiveness Scorecard

Speed	Very Good
Volume	Poor
Cut-through	Poor
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Permanent Radar Speed Sign

DESCRIPTION:

Permanent radar speed signs, also called driver feedback signs, are post-mounted signs installed on the side of the road that use radar to sense an oncoming vehicle's speed and display that speed back to the approaching driver. They are usually installed with a regulatory speed limit sign on the same post. This is intended to give the driver an external visual indication of their speed, which if excessive, may remind them to slow down. The radar speed signs have no cameras and do not take any photos of offending drivers for enforcement purposes.

APPLICATION:

On neighborhood local or collector streets where a problem of speeding traffic has been documented, radar speed signs may be installed to help reduce traffic speeds. A location must be selected where there is enough room within the City right-of-way to install the radar speed sign so that it is visible for enough distance to be effective. City of Albuquerque standards are used for the construction of the concrete foundation and pole. The radar speed signs are available from a number of manufacturers. The signs can be hard-wired for electrical power where service is available, or they may include a photovoltaic panel for solar electric power. Some radar speed signs are available with the ability to record traffic-speed data for later download and analysis.drivers may not understand the difference between the two units, and assume that the radar speed trailers may issue them an automated citation. This misunderstanding may lead to increased effectiveness of the radar speed trailers.

Advantages

- The visual reminder of drivers' speeds has been shown to be effective in prompting some speeding drivers to slow down.
- Radar speed signs do not slow emergency vehicles.
- Radar speed signs alert violators without affecting normal traffic.
- Can be implemented with metered electric service or solar powered.

Disadvantages

- Effectiveness may reduce over time as regular drivers become desensitized.
- Some drivers may ignore, knowing that the radar speed signs do not include automated enforcement.
- Some drivers may try to register a high speed.
- Units and solar panels are subject to vandalism and theft.

Effectiveness Scorecard

Speed	Good
Volume	Poor
Cut-through	Poor
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

TBG102212202416DEN

Centerline / Edge Line / Lane Line Striping

DESCRIPTION:

While most local neighborhood streets exist without any traffic striping, centerline, edge line, and lane line striping can be used to create designated travel lanes, bicycle lanes, parking lanes, and/or medians. As a neighborhood traffic calming measure, striping is positioned to reduce travel lane widths, making drivers feel more restricted and thereby inducing them to lower their speeds.

APPLICATION:

On neighborhood local or collector streets where a problem of speeding traffic has been documented, traffic stripes may be painted where there was previously none, or existing stripes may be removed and new stripes painted in the new desired configuration. This installation is most suited to long, straight, and wide streets where drivers feel unconstrained and speeds are high.

On curvilinear streets, striping can reinforce lane designations, causing drivers to slow to maintain their travel within their lane. Centerlines, edge lines, and lane line markings should be installed according to the guidance provided in Chapter 3: Markings of the MUTCD.

The City standard lane width is 12 feet wide. Travel lanes may be reduced to 11 feet to provide more of the street for bicycles and/or parking. Reduction of the travel lanes to the minimum 10 foot width may be considered in special cases.

Caution should be used in applying centerline striping alone, as it may give drivers a sense of ownership of their half of the road and thereby increase speeding. A better treatment may be to provide edge lines with no centerline, indicating to drivers that they must share the two-way space with all traffic.

Advantages

- Striping is relatively easy and low-cost to install and modify.
- Traffic striping does not slow emergency vehicles.

Disadvantages

- Regular maintenance is required. Stripes must be repainted approximately every 4 years.
- Removal of pre-existing traffic stripes or of recent striping in order to change the configuration may leave unsightly scars on the pavement surface.
- Effectiveness may be low.

Effectiveness Scorecard

Speed	Good
Volume	Good
Cut-through	Poor
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Speed Reduction Markings

Advantages

- Markings are relatively easy and low cost to install.
- Traffic striping does not slow emergency vehicles.

Disadvantages

- Long-term effectiveness is undocumented.
- Regular maintenance is required. Markings must be reapplied approximately every 6 years.

DESCRIPTION:

Speed reduction markings are series of various shapes of transverse pavement markings set at progressively reduced spacing, intended to enhance the driver's perception of speed. Essentially, gradually decreasing distance between markings gives the driver the illusion of traveling faster than they actually are and thus ideally causing them to slow down. Such markings are most appropriate for unexpected curves and may be short transverse markings placed along each edge of the lane, as described in MUTCD Section 3B.22. Transverse markings are placed within the lane, as described in MUTCD Section 3B.26 as advance speed hump markings. Both these types of markings are also called Optical Speed Bars. Some jurisdictions have used chevron-shaped in-lane markings, otherwise known as Converging Chevron Markings.

APPLICATION:

On neighborhood local or collector streets where a problem of speeding traffic has been documented, speed reduction markings may be applied. Because optical speed bars and converging chevron markings are placed in the tire paths of vehicles, they are subject to increased wear. For this reason, thermoplastic marking material is usually used instead of paint.

Application of these types of speed reduction markings should conform to the standards and guidance in the MUTCD.

Effectiveness Scorecard

Speed	Fair
Volume	Poor
Cut-through	Poor
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

Speed Limit Signage

Advantages

- Speed Limit signs provide a clear indication of the speed limit and undisputable basis for enforcement.
- Speed Limit signs are relatively easy and low-cost to install.
- Speed Limit signs do not slow emergency vehicles.

Disadvantages

- Signs alone do not guarantee responsible driving behavior.
- Overuse of unnecessary signs creates visual clutter that detracts from the conspicuity of other important signs and leads to loss of effectiveness.
- Posted speed limits that are below 25 MPH, below the 85th percentile speed for a roadway, or at an unrealistically low speed will not be respected by most drivers, and will breed disrespect for speed limits in general.
- Signs require regular maintenance. Signs must be replaced approximately every 8 years.
- Signs must be replaced approximately every 8 years.

DESCRIPTION:
Regulatory Speed Limit signs (MUTCD R2 1) are installed along streets to notify and remind drivers of the legal speed limit.

APPLICATION:
The prima facie speed limit on residential streets per the City of Albuquerque Code of Ordinances is 25 MPH:

Because by default, the 25 MPH speed limit applies on all residential streets, the City does not post regulatory Speed Limit signs on every such street. However, where a problem of speeding traffic has been documented, signs may be installed to remind drivers to check their speed.

If used, the City will install Speed Limit signage in conformance with the City of Albuquerque Code of Ordinances and the MUTCD. Speed Limit signs of nonconforming designs or colors, or nonconforming speed values (other than multiples of 5 MPH) will not be installed.

Requests for posting speeds lower than the prima facie residential speed limit of 25 MPH will be subject to the requirement in the City of Albuquerque Code of Ordinances that an engineering and traffic study be conducted.

Effectiveness Scorecard

Speed	Fair
Volume	Poor
Cut-through	Poor
Crashes	Fair
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$

Very Good · Good · Fair · Poor · Not Applicable

Quick Glance

SPEED LIMIT 25

Speed Limit Pavement Markings

DESCRIPTION:

Speed limit pavement markings are numerals applied in the traffic lane to remind drivers of the regulatory speed limit. In addition, a "SLOW" word legend may be applied with the speed legend.

APPLICATION:

Where a problem of speeding traffic has been documented, speed limit pavement markings may be installed to remind drivers to check their speed.

On residential streets, the prima facie speed limit is 25 MPH (see discussion on the sheet for Speed Limit Signs). On these streets, speed limit pavement markings may be used alone without posting a regulatory speed limit sign. On streets where the speed limit is greater or less than 25 MPH, speed limit pavement markings must be placed in conjunction with regulatory signs, as the pavement markings alone are not enforceable under state traffic laws or City of Albuquerque ordinances.

Advantages

- Provides a clear indication of the speed limit to drivers who are watching the road.
- Do not become obscured by street-side vegetation growth, parked trucks, or other obstructions.
- Relatively easy and low cost to install.
- Do not slow emergency vehicles.

Disadvantages

- Used alone do not guarantee responsible driving behavior.
- Used alone have not been shown to significantly reduce traffic speeds.
- Require regular maintenance. Markings must be reapplied approximately every 6 years.

Effectiveness Scorecard

Speed	Fair
Volume	Poor
Cut-through	Poor
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Raised Pavement Markers

DESCRIPTION:

Raised pavement markers (RPMs), also known as "Botts' Dots," are 4 inchdiameter by 3/4 inch high nonreflective round ceramic or plastic markers that are epoxied to the pavement to supplement or substitute for painted markings.

Retroreflective raised pavement markers (RRPMs) are typically 4 inch-square raised markers that have one- or two-way retroreflective faces that make them visible to traffic at night.

As a traffic-calming device, RPMs can be used to delineate a centerline or lane line, making drivers feel more restricted and thereby inducing them to lower their speeds. Unlike painted stripes alone, RPMs provide tactile feedback to drivers as their tires roll over them, alerting drivers that they are crossing out of their lane.

APPLICATION:

On neighborhood local or collector streets where a problem of speeding traffic has been documented, RPMs may be installed along a centerline either alone or with a painted line (see the toolbox application for centerline striping). This is most suited to curvilinear streets, where RPMs can reinforce lane designations, causing drivers to slow to maintain their travel within their lane.

RPMs may also be applied to supplement or substitute for painted hatching of pavement areas not open to normal travel, such as where the roadway has been narrowed for traffic calming, or on approach to a bulbout, median, or island.

RPMs and RRPMs should always match the color (yellow or white) of the pavement markings for which they supplement or substitute. The MUTCD guidelines recommend that where RPMs substitute for painted markings, that RRPMs be included at specific spacing and locations for nighttime visibility.

Advantages

- RPMs/RRPMs are relatively easy and low cost to install.
- RPMs/RRPMs do not slow emergency vehicles.

Disadvantages

- Regular maintenance is required. RPMs must be replaced as they become dislodged over time.
- RPMs should not be used on any streets, such as in the Northeast foothills, where the roads may be plowed after snowfall.
- Residents may complain of noise from vehicles driving over RPMs.
- RPMs should not be positioned along bicycle lanes or edge lines on shoulders used by bicycles.

Effectiveness Scorecard

Speed	◒
Volume	◔
Cut-through	◔
Crashes	◒
Emergency Vehicle	●
Pedestrian	●
Bicycle	◒
Noise	◔
Cost	$$

● Very Good ◕ Good ◒ Fair ◔ Poor N/A Not Applicable

Quick Glance

SPEED LIMIT 25

TBG102212202416DEN

High Visibility Crosswalks

DESCRIPTION:

High visibility crosswalks utilize striping patterns, advance markings, raised pavement markers, enhanced signage, activated flashing beacons, and/or activated in-pavement lights to improve the visibility of the crossing. Various special pavement treatments may also be used to create a visual and tactile demarcation of the crosswalk, including colored pavement, pavers, patterned concrete, or applied surfacings.

APPLICATION:

At locations where safe pedestrian crossings are a concern due to poor visibility, speeding traffic, or vulnerable user types (school children, elderly, vision or hearing impaired pedestrians), the various treatments listed above may be employed to address the specific deficiencies identified. The standard crosswalk marking style in the City of Albuquerque is the continental type (a series of 24" x 10' bars), which is highly visible. Enhancements are best applied only where there is a high volume of pedestrian usage.

Advantages

- Increases driver awareness of the crossing.
- Attracts pedestrians to a single crossing location.
- Pavement treatments can be aesthetically pleasing.

Disadvantages

- May give pedestrians a falsely high sense of safety.
- More complex installations (lights, pavement treatments) can be costly.
- May result in increased maintenance costs for pavement treatments, beacon systems, and in-pavement lights.

Effectiveness Scorecard

Speed	
Volume	
Cut-through	
Crashes	
Emergency Vehicle	
Pedestrian	
Bicycle	
Noise	N/A
Cost	$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

Parking Strategies

DESCRIPTION:

In many city neighborhoods, parking issues are just as important to the residents as are traffic speeding and volume issues. While some parking treatments can themselves serve traffic calming purposes, consideration of parking issues should be made when applying any of the traffic calming tools outlined in this program. Several of the non-physical, narrowing, and horizontal measures may reduce or eliminate available parking, while others may offer opportunities to create additional parking.

APPLICATION:

As part of any assessment for implementing traffic calming, the parking issues in the neighborhood should be identified at the outset. Is the supply of parking adequate for the demand? Are there parking intrusion issues from nearby land uses? The City of Albuquerque has implemented residential permit parking on some streets around Downtown, the State Fairgrounds, and UNM to address intrusion issues. While parallel parking is the default on most neighborhood streets, streets may be converted to angled or perpendicular parking to increase available spaces.

Advantages

- Reconfiguring the use of available street width can increase parking where needed.
- No Parking zones near intersections and driveways can improve safety for motorists, pedestrians and cyclists.
- The presence of perpendicular or angled parked vehicles reduces traffic speeds.

Disadvantages

- Angled and parallel parking preclude bike lanes.
- Frequent driveways limit parking treatment options.
- Angled and parallel parking increase backing-out collision potential.

Effectiveness Scorecard

Speed	
Volume	
Cut-through	
Crashes	
Emergency Vehicle	
Pedestrian	
Bicycle	
Noise	N/A
Cost	$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

Education and Community Involvement

DESCRIPTION:

Educational traffic calming measures include working with neighborhoods to make residents aware of speed limits, traffic laws, and safe driving habits, and enlisting their support in practicing and promoting safe and lawful driving habits. Individual program components may include presentations at neighborhood meetings, local workshops, school programs, yard signs, neighborhood flyers or letters, and individual pledge letters to obey speed limits and traffic laws.

APPLICATION:

Public education is an important element in any traffic calming program. While most neighborhood traffic problems are perceived to be caused by "outsiders," the majority of traffic—and problem traffic—in a neighborhood is usually fellow neighbor drivers. Public education programs seek to make all drivers more aware of their own driving behavior and the impact it has on others. As such, it is recommended that neighborhoods applying for traffic calming treatments first attend a traffic calming educational forum with the City.

Staff from the City of Albuquerque, Traffic Engineering Division and the Albuquerque Police Department are available to address neighborhood association meetings or other groups regarding safe driving and the traffic calming program. The Albuquerque Police Department offers "Slow Down Albuquerque" campaign yard signs free to residents who make a personal commitment to not speed on Albuquerque streets. Details are available at http://www.cabq.gov/police/programs/slow-down-albuquerque.

Advantages

- Heightens driver awareness of traffic laws and their own driving behaviors.
- Allows residents to meet, share their views, and move toward consensus on the issues.
- Communicates the identified issues to City staff.

Disadvantages

- May require considerable City staff time.
- Meetings need to be actively led to maintain focus.

Effectiveness Scorecard

Speed	◒
Volume	◒
Cut-through	◒
Crashes	◒
Emergency Vehicle	◒
Pedestrian	◒
Bicycle	◒
Noise	◒
Cost	$

● Very Good ◕ Good ◒ Fair ◔ Poor N/A Not Applicable

Quick Glance

Signed Turn Restrictions

DESCRIPTION:

Regulatory movement prohibition signs (conforming to R3 1, R3 2, R3 3, R3 4, R3 18, or R3 27 of the MUTCD) are placed at intersections to prevent turning movements associated with cut-through traffic patterns.

APPLICATION:

On neighborhood streets where a problem of cut-through traffic has been documented, movements at intersections feeding the cut-through route may be restricted by signage so that traffic is routed to a more appropriate collector or arterial. If the problem is documented to occur mainly during a certain period, such as morning or afternoon school drop-off times, the movement prohibition can be posted to apply only during those hours.

Turn prohibitions are most effective when placed on an arterial or collector on the periphery of a neighborhood to prevent cut-through traffic from entering the neighborhood. Wherever posted, an assessment should be made of the resulting downstream route as well as alternate cut-through routes to assure that the problem is not just pushed to another location or neighborhood.

Prohibitions are most effective when limited to posted hours. For full-time movement prohibitions, physical measures are more effective and appropriate.

In other cities, violation rates have been shown to be about 50 percent in the absence of enforcement. The violation rate can be lowered 20 percent with active enforcement.

Advantages

- Effective in addressing time-of-day cut-through traffic problems.
- Movement prohibition signs are relatively easy and low cost to install.
- Movement prohibition signs do not slow or divert emergency vehicles.

Disadvantages

- Compliance is low for signs alone without enforcement.
- May increase trip length for some drivers.
- May adversely affect downstream or adjacent traffic patterns.
- Signs require regular maintenance. Signs must be replaced approximately every 8 years.

Effectiveness Scorecard

Speed	Good
Volume	Good
Cut-through	Good
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

Neckdowns and Bulbouts

DESCRIPTION:

Neckdowns are raised curb extensions at intersections that reduce the roadway width from curb to curb. Neckdowns increase pedestrian comfort and safety at intersections by shortening crossing distances for pedestrians and drawing attention to pedestrians via raised peninsulas. They also tighten the curb radii at the corners, reducing the speeds of turning vehicles. The magnitude of speed reduction is dependent on the spacing of neckdowns between points that require drivers to slow.

APPLICATION:

Neckdowns implemented midblock as a vehicle speed control measure and pedestrian enhancement are most effective when constructed with permanent raised curbs but can be implemented using striping. Bulbouts occur at the corners of intersections using raised curbs to extend the sidewalks and narrow the travel lanes. This slows vehicles by providing visual cues of pedestrian activity as well as by reducing the curb radii. Both the crossing distance and the time pedestrians are exposed to traffic are reduced.

Advantages

- Decreases vehicle speeds
- Reduces pedestrian crossing distance
- Clearly delineates areas of pedestrian activity

Disadvantages

- May reduce on-street parking
- Complicates drainage design
- Reduces bicycle lane and/or side of road area used by bicyclists
- May slow right-turning emergency response vehicles

Effectiveness Scorecard

Speed	Good
Volume	Fair
Cut-through	Fair
Crashes	Fair
Emergency Vehicle	Fair
Pedestrian	Good
Bicycle	Fair
Noise	N/A
Cost	$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

Lane Narrowing with Center Island/ Pedestrian Refuge

DESCRIPTION:

The construction of a center island on a wider street can serve to reduce the width of the travel lanes and to provide a pedestrian refuge area. This device has similar effects on speed and pedestrians as the neckdown by providing visual cues to an area of pedestrian activity, reducing vehicle speeds, and shortening the pedestrian crossing distance

APPLICATION:

A center island can be constructed strictly as a speed reducing measure at a midblock location without the pedestrian refuge. Where pedestrians are present the median island can be designed to serve as a pedestrian refuge. When combined with high visibility signage a center island can encourage pedestrian crossing at a desired location. Another variation of this device is as a neighborhood gateway. At an intersection or entryway, the center island provides an area for neighborhood signage and landscaping.

Advantages

- Decreases vehicle speeds
- Reduces pedestrian crossing distance
- Clearly delineates areas of pedestrian activity
- Opportunity for landscaping, visual enhancement, and neighborhood

Disadvantages

- May reduce on-street parking
- Longer islands may impact driveway access and result in u-turns
- May impact snow removal operations

Effectiveness Scorecard

Speed	
Volume	
Cut-through	
Crashes	
Emergency Vehicle	
Pedestrian	
Bicycle	
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

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Two-lane Choker

DESCRIPTION:

For a two-lane choker, curb extensions are constructed midblock to narrow the travel way but still provide for one lane in each direction. The resultant narrower street cross section decreases vehicle speeds and can reduce cut through traffic.

APPLICATION:

Similar to neckdowns, two-lane chokers are implemented midblock as a vehicle speed control measure. They are most effective when constructed with permanent raised curbs but can be implemented using signing, striping, and delineators. The raised curb extensions, approach signing, and narrower travel lanes slow vehicles and discourage cut through travel by providing visual cues of a slower speed environment.

Advantages

- Decreases vehicle speeds
- Can reduce cut through traffic

Disadvantages

- May reduce on-street parking
- Complicates drainage design
- May require additional maintenance
- Reduces bicycle lane and/or side of road area used by bicyclists

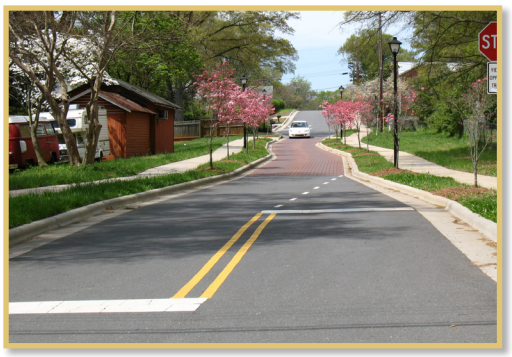
Effectiveness Scorecard

Speed	◒
Volume	◒
Cut-through	◒
Crashes	◒
Emergency Vehicle	◔
Pedestrian	N/A
Bicycle	◒
Noise	N/A
Cost	$$$

● Very Good ◕ Good ◒ Fair ◔ Poor N/A Not Applicable

Quick Glance

One-lane Choker



pedbikesafe.org

DESCRIPTION:

For a one-lane choker, curb extensions are constructed midblock to narrow the travel way to a single lane width. This configuration forces vehicles to slow down, yield, and negotiate oncoming traffic. While two-way access is maintained approaching the choker only a single lane is provided at the device. This results in a much narrower street cross section that decreases vehicle speeds and reduces cut through traffic.

APPLICATION:

One-lane chokers are implemented midblock as a vehicle speed control measure on lower speed and lower volume local streets. They are constructed with permanent raised curbs but can be implemented using signing, striping, and delineators with reduced effectiveness. The raised curb extensions, approach signing, and narrow single lane travel way slows vehicles and discourages cut through travel by providing visual cues of a slower speed environment and forcing vehicles to negotiate oncoming traffic. cut through travel by providing visual cues of a slower speed environment.

Advantages

- Decreases vehicle speeds
- Reduces cut through traffic

Disadvantages

- Perceived to be less safe because oncoming vehicles are required to share a single travel lane
- May reduce on-street parking
- Complicates drainage design
- May require additional maintenance
- Reduces bicycle lane and/or side of road area used by bicyclists

Effectiveness Scorecard

Speed	●
Volume	●
Cut-through	●
Crashes	◔
Emergency Vehicle	◔
Pedestrian	N/A
Bicycle	◔
Noise	N/A
Cost	$$$

● Very Good ◕ Good ◓ Fair ◔ Poor N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Roadside and Median Landscaping

DESCRIPTION:

Landscaping involves adding plants, trees, or other vegetation to the roadside and/or medians. Landscaping is used to break long vistas of pavement in order to narrow the appearance of a roadway and add mass to the appearance of median devices. Landscaping also improves the aesthetics of a neighborhood street.

APPLICATION:

Landscaping is best suited for wide, straight neighborhood roadways with unobstructed views and a history of speeding. Landscaping may be used in conjunction with other traffic calming devices, such as medians and detached sidewalks, or it may be added to the roadside as an isolated source for reducing speed.

Advantages

- May reduce vehicle speed
- May improve pedestrian safety
- Enhances neighborhood appearance
- Provides an opportunity to partner with citizens committed to maintaining landscaping

Disadvantages

- Requires regular maintenance
- May be difficult to establish and maintain certain plantings
- Increases water usage in a semi-arid climate

Effectiveness Scorecard

Speed	Fair
Volume	N/A
Cut-through	N/A
Crashes	N/A
Emergency Vehicle	N/A
Pedestrian	Fair
Bicycle	Good
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Road Narrowing/ Detached Sidewalks

DESCRIPTION:

A detached sidewalk is a sidewalk that is separated from a curb by grass, trees, landscaping, street lights, or other streetscape elements. Narrowing the roadway in order to detach sidewalks physically narrows the travel lanes. The use of vertical elements in the streetscape further reduces the optical width of a roadway, and discourages speeding.

APPLICATION:

Detached sidewalks are a useful application for residential streets with wide travel ways, a history of high speeds, and pedestrian traffic.

Advantages

- Increases pedestrian safety and reduces the width of pedestrian crossings
- Enhances streetscape
- Reduces vehicle speeds

Disadvantages

- Landscaping maintenance may be required
- Detached sidewalks are not as effective as physical measures in slowing speeds
- Expensive

Effectiveness Scorecard

Speed	Good
Volume	N/A
Cut-through	N/A
Crashes	N/A
Emergency Vehicle	Good
Pedestrian	Very Good
Bicycle	Fair
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

Traffic Circle

DESCRIPTION:

Traffic circles are raised islands, placed in intersections, around which traffic circulates. Yield signs can be used as traffic controls at the approaches of the traffic circle. Circles prevent drivers from speeding through intersections by impeding through movements and forcing drivers to slow down to yield

APPLICATION:

Traffic circles are effective at neighborhood and local street intersections where large vehicle traffic is not a major concern but speeds, volumes, and safety are recorded problems.

Advantages

- Effective at slowing travel speed
- Improves safety
- Provides increased access to main street from side street

Disadvantages

- Slows emergency vehicles and can be difficult for large vehicles to circumnavigate
- May eliminate some on-street parking
- May require modifications to curb, gutter, and sidewalks

Effectiveness Scorecard

Speed	●
Volume	◒
Cut-through	◒
Crashes	◔
Emergency Vehicle	◒
Pedestrian	◒
Bicycle	◒
Noise	◒
Cost	$$$

● Very Good ◔ Good ◒ Fair ◠ Poor N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Roundabout (single-lane)

DESCRIPTION:

Roundabouts require traffic to circulate counterclockwise around a center island. Unlike traffic circles, roundabouts are used on higher volume streets to allocate right-of-way among competing movements. They are larger than neighborhood traffic circles, have raised islands to channel approaching traffic to the right, and do not have stop signs. Roundabouts provide inexpensive-to-operate traffic control as an alternative to a traffic signal.

APPLICATION:

Roundabouts are typically substituted for a traffic signal. They are most appropriate for new developments, due to the right-of-way requirements and construction cost. If being considered in an established location the following should be considered as criteria for application:

- Locations with a history of accidents
- Intersections where queues need to be minimized
- Intersections with irregular approach geometry
- Intersections that have a high proportion of U-turns
- Locations with abundant right-of-way

Advantages

- Enhanced safety compared to traffic signals or stop signs
- Minimize queuing at approaches
- Less expensive to operate than traffic signals
- Generally aesthetically pleasing if well landscaped

Disadvantages

- May be difficult for large vehicles to circumnavigate
- Must be designed so that the circulating lane does not encroach on the crosswalks
- May reduce on-street parking
- Landscaping must be maintained by the residents or by the municipality

Effectiveness Scorecard

SPEED LIMIT 25	Speed	◔
	Volume	N/A
	Cut-through	◠
	Crashes	●
	Emergency Vehicle	◒
	Pedestrian	◔
	Bicycle	◒
	Noise	◔
$	Cost	$$$$

● Very Good ◔ Good ◒ Fair ◠ Poor N/A Not Applicable

Quick Glance

Chicane

DESCRIPTION:

Chicanes are curb extensions that alternate from one side of the roadway to the other, forming s-shaped curves. Chicanes insert curvature in an otherwise straight stretch of roadway. They generally fall into two categories: single-lane and two-way. Single lane chicanes consist of staggered build outs narrowing the road so that traffic in one direction has to give way to opposing traffic. Two-way chicanes use build outs to provide curvature, but the lanes are separated by road markings or a central island.

APPLICATION:

On a neighborhood street with a recorded speed problem, chicanes may be installed to reduce speeds in order to negotiate the lateral displacements in the vehicle path. They are most effective when placed on existing streets that have long, straight, flat roadway sections. They are also most effective when used in a series. They are useful at locations where speed is a problem, but the noise associated with speed humps and related measures would be unacceptable.

Advantages

- Offer visual traffic calming effect by reducing line of sight
- Can reduce pedestrian crossing distance
- Recuces travel speeds
- Negotiable by emergency vehicles
- Provide opportunities for

Disadvantages

- May divert traffic to adjacent roadways
- The effect on vehicle speeds is limited
- May require bicyclists to merge with vehicular traffic for a short distance
- May require removal of some on-street parking
- Curb realignment and landscaping can be costly, especially if there are drainage issues

Effectiveness Scorecard

Speed	Good
Volume	Fair
Cut-through	Fair
Crashes	N/A
Emergency Vehicle	Good
Pedestrian	Good
Bicycle	Fair
Noise	Fair
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Lateral Shift

Advantages

- Community acceptance is generally higher
- Fewer maintenance issues
- Does not reduce traffic volumes unless design includes a lane reduction
- Negotiable by emergency vehicles
- Opportunities for landscaping

Disadvantages

- Impacts snow maintenance
- May require additional effort to properly design
- May reduce on-street parking

DESCRIPTION:
A lateral shift consists of curb extensions along straight streets that cause travel lanes to jog. It is like a chicane, however the roadway alignment only shifts once. Relative to chicanes, speeds remain higher since the configuration does not include a series of alternating curb extensions.

APPLICATION:
Lateral shifts may be used on neighborhood collectors where high traffic volumes and high posted speeds prevent more abrupt measures.

Effectiveness Scorecard

Speed	Fair
Volume	N/A
Cut-through	Fair
Crashes	N/A
Emergency Vehicle	Good
Pedestrian	Fair
Bicycle	Fair
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Realigned Intersection

DESCRIPTION:

Realigned intersections are changes in alignment that convert T-intersections with straight approaches into curving streets that meet at right-angles. A former "straight-through" movement along the top of the T becomes a turning movement. They are one of the few traffic calming measures available for T-intersections since the straight top of the T makes deflection difficult to achieve, which is necessary for traffic circles.

APPLICATION:

Re-alignment can be an effective treatment at neighborhood T-intersections where a speeding problem has been documented.

Advantages

- Realigned intersections can effectively reduce speeds and improve safety at T-intersections that are commonly ignored by motorists.

Disadvantages

- The curb realignment can be costly
- They may require some additional right-of-way to cut the corner

Effectiveness Scorecard

Speed	Very Good
Volume	Fair
Cut-through	Fair
Crashes	N/A
Emergency Vehicle	Very Good
Pedestrian	N/A
Bicycle	N/A
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Medians and Partial Medians

DESCRIPTION:

A median is a raised curb island placed at the center of a roadway. Medians are typically concrete and may include landscaping to provide additional visual enhancement. They provide physical separation between on-coming traffic lanes, narrow the travel lanes, and can create the perception of a narrower roadway. They can also act as a refuge for pedestrians in certain applications.

APPLICATION:

Medians may be used for speed reduction, turn restrictions, enhanced safety, or a mix of all three. Medians are best suited for wide residential streets with a history of high speeds to narrow the travel lanes, interrupt sight distances, and reduce pedestrian crossing distances.

Advantages

- May help reduce travel speed
- Separates opposing traffic lanes
- Shortens pedestrian crossings
- Can improve safety both for vehicles and pedestrians

Disadvantages

- Potential for increased maintenance if landscaped
- Medians are not as effective as speed humps or traffic circles in slowing speeds
- May interrupt emergency access and operations
- May interrupt driveway/side street access and result in U-turns at the end of medians
- Can create drainage issues

Effectiveness Scorecard

Speed	Very Good
Volume	Very Good
Cut-through	Poor
Crashes	Very Good
Emergency Vehicle	Very Good
Pedestrian	Very Good
Bicycle	Very Good
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Speed Hump

DESCRIPTION:

Speed humps are common traffic management devices that are familiar to most drivers. Speed humps consist of raised pavement placed across the entire roadway width creating a vertical deflection to slow vehicles. The humps are often 12 feet in length and between 3 and 3.5 inches high.

APPLICATION:

Speed humps are installed on neighborhood streets to address speed, volume, and cut-through traffic. To be considered for speed humps a local residential street must carry more than 500 vehicles per day and have traffic going more than 5 mph over the speed limit. Speed humps are designed and constructed to allow vehicles to travel at or near the posted speed limit. They are spaced close enough together to limit drivers speeding in between them but far enough apart to not cause a nuisance to local residents.

Advantages

- Decreases vehicle speeds
- Discourages cut through traffic
- Inexpensive and easy to construct

Disadvantages

- May cause speeding between humps
- May divert traffic to an adjacent neighborhood street
- May increase noise levels as vehicles decelerate and accelerate

Effectiveness Scorecard

Speed	●
Volume	◒
Cut-through	◒
Crashes	◓
Emergency Vehicle	◠
Pedestrian	◒
Bicycle	◒
Noise	◠
Cost	$

● Very Good ◒ Good ◓ Fair ◠ Poor N/A Not Applicable

Quick Glance

Speed Table

DESCRIPTION:

Speed tables are trapezoidal shaped speed humps with a flat section in the middle and ramps on the ends. They are sometimes constructed with textured materials on the flat section and are generally long enough for the entire wheelbase of a passenger vehicle to rest on the flat section. The long flat design allows cars to pass without slowing as significantly as with speed humps. Speed tables can also be used in conjunction with curb extensions, curb radius reductions, and textured crosswalks.

APPLICATION:

A speed table may be appropriate on local residential streets with recorded high traffic speeds and a traffic volume of at least 400 vehicles per day and up to 4,000 vehicles per day. Short streets are unlikely to benefit from the treatment.

Advantages

- Effective at slowing travel speed
- Possible reduction in traffic volumes depending on available alternate routes
- Possible decrease in collisions
- In cases with crosswalk, increases pedestrian visibility and likelihood that driver yields to pedestrian
- Typically preferred by EMS compared with speed humps

Disadvantages

- May inadvertently divert native trips to another route to avoid the calming measure
- Textured materials can be expensive, if used
- May increase noise and air pollution
- May not be appropriate along bus or emergency routes
- Drainage impacts need to be considered in the design

Effectiveness Scorecard

Speed	●
Volume	◒
Cut-through	◒
Crashes	◓
Emergency Vehicle	◠
Pedestrian	◒
Bicycle	◒
Noise	◠
Cost	$

● Very Good ◒ Good ◓ Fair ◠ Poor N/A Not Applicable

Quick Glance

Speed Kidney

Institute of Transportation Engineers Journal December 2012

Advantages

- Decreases vehicle speeds
- Discourages cut through traffic
- Inexpensive and easy to construct

Disadvantages

- May cause speeding beyond the speed kidney
- May divert traffic to an adjacent neighborhood street
- May increase noise levels as vehicles decelerate and accelerate

DESCRIPTION:

Speed Kidneys are an arrangement of three speed lumps elongated with a curvilinear shape in the direction of traffic. The main speed lumps of the speed kidney are placed in the travel lane, while a complimentary speed lump is placed between the lanes. Passenger vehicle drivers choosing drive over the speed kidneys in a straight path experience vertical discomfort as two or four wheels traverse the different parts of the speed kidney. Passenger vehicle drivers may also choose to take a curvilinear path to avoid the vertical deflection. In either case, field evaluation has documented speed reductions. The effective width of the speed kidney is narrow enough to allow emergency vehicles and trucks to follow a straight path straddling the in-lane lump

APPLICATION:

Speed kidneys may be installed on neighborhood streets to address speed, volume, and cut-through traffic and are designed and constructed to allow vehicles to travel at or near the posted speed limit. Speed Kidneys have the advantage over speed humps, speed lumps, and speed cushions that passenger car drivers may adapt their travel path to the device and avoid any vertical deflection. Bicyclists may also negotiate the device without crossing any vertical deflection. Design parameters should follow those recommended by researchers at the Universitat Politècnica de València and as documented in the December 2012 issue of the ITE Journal.

Effectiveness Scorecard

Speed	●
Volume	◕
Cut-through	◕
Crashes	◒
Emergency Vehicle	◕
Pedestrian	◕
Bicycle	◕
Noise	◒
Cost	$

● Very Good ◕ Good ◒ Fair ◔ Poor N/A Not Applicable

Quick Glance

Raised Crosswalk

DESCRIPTION:

A raised pedestrian crosswalk is a speed table with crosswalk markings and signage to channelize pedestrians crossing a road. This type of calming measure raises the crosswalk to the level of the sidewalk to improve the visibility of pedestrians to motor vehicle drivers. They are trapezoidal in shape with a flat area for crossing pedestrians and ramps for the vehicle approaches traversing the raised crossing. The crossing often incorporates textured pavement materials.

APPLICATION:

Neighborhood streets with recorded speeding problems and haphazard pedestrian crossing locations will benefit most from this traffic calming measure. They can be used at intersections, mid-block crossings, and school crossings.

Advantages

- Improved safety for pedestrians and vehicles
- Effective at slowing travel speed, but not to the extent of speed humps
- Possible traffic volume decreases at locations where cut-through traffic is a problem
- Typically preferred by EMS compared with speed humps

Disadvantages

- Drainage impacts need to be considered in the design
- May increase noise and air pollution
- Textured materials are expensive, if used
- May inadvertently divert native trips to another route to avoid the calming measure

Effectiveness Scorecard

Speed	◒
Volume	◒
Cut-through	◒
Crashes	◓
Emergency Vehicle	◠
Pedestrian	●
Bicycle	◒
Noise	◠
Cost	$

● Very Good ◒ Good ◓ Fair ◠ Poor N/A Not Applicable

Quick Glance

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Raised Intersection

DESCRIPTION:

A raised intersection refers to a roadway intersection that is entirely elevated above the travel way. It is essentially a speed table for the entire intersection. They are constructed with ramps on all vehicle approaches and often include textured materials on the flat, elevated section. Typically, they are raised to the level of the sidewalk or slightly below it, creating a pedestrian area that includes the sidewalk and crosswalks.

APPLICATION:

For neighborhood streets, raised intersections are best suited for intersections with substantial pedestrian activity. A raised intersection may not be appropriate if the street is a bus or emergency route.
Detectable warnings need to be included for those with vision impairment.

Advantages

- Enhances the pedestrian environment and increases safety at the intersection
- Eliminates need for curb ramps
- Can calm two streets at once
- Can have positive aesthetic value

Disadvantages

- Impacts to drainage need to be considered in design
- Textured pavement materials can make it difficult for vision impaired to identify detectable warnings
- Less effective in reducing speeds than speed humps, speed tables, or raised crosswalks
- They are expensive

Effectiveness Scorecard

Speed	Good
Volume	N/A
Cut-through	N/A
Crashes	Fair
Emergency Vehicle	Poor
Pedestrian	Very Good
Bicycle	Good
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Full Closure
(gate, midblock cul-de-sac, intersection cul-de-sac)

DESCRIPTION:
Full closures typically involve the placement of temporary barriers or construction of permanent barriers across a street to completely close it to vehicular traffic. The closures vary from concrete barriers and bollards to gates and landscaped islands. Often gaps are left in the barriers to permit bicycle and pedestrian access. Automatic gates or removable bollards are sometimes used to accommodate emergency vehicles.

APPLICATION:
Full closures are particularly effective at addressing high volume, high speed, and cut through traffic. This device is often seen as a last resort for addressing neighborhood traffic problems because of the high degree of controversy, lengthy implementation time, and legal process needed to allow the closure of a public street.

Advantages
- Eliminates cut through traffic
- Reduces speeds and volume in immediate area

Disadvantages
- Statutory actions required for implementation
- Delays emergency vehicles
- Traffic diverted to adjacent streets may create new traffic problems
- Increased travel time and out of direction travel for local residents

Effectiveness Scorecard

Speed	Good
Volume	Fair
Cut-through	Very Good
Crashes	Fair
Emergency Vehicle	Poor
Pedestrian	Good
Bicycle	Good
Noise	Good
Cost	$$$$

Very Good · Good · Fair · Poor · Not Applicable (N/A)

Quick Glance

Partial Closure

DESCRIPTION:

Partial closures, also known as half street closures, typically involve the placement of temporary barriers or construction of permanent barriers across a portion of a street to prevent vehicular traffic in one direction. The partial closure most often occurs at an intersection for a short distance. The closures can consist of curb extensions, concrete barriers, bollards, and signs. Gaps in the barriers permit bicycle and pedestrian access and allow for drainage.

APPLICATION:

Partial closures are particularly effective at addressing high volume, high speed, and cut through traffic. When paired on multiple streets, particularly in a grid street system, partial closures can make travel through a neighborhood more circuitous.

Advantages

- Eliminates cut through traffic one direction
- Reduces speeds and volume in immediate area

Disadvantages

- Statutory actions required for implementation
- Delays emergency vehicles
- Traffic diverted to adjacent streets may create new traffic problems
- Increased travel time and out of direction travel for local residents

Effectiveness Scorecard

Speed	Good
Volume	Fair
Cut-through	Very Good
Crashes	Fair
Emergency Vehicle	Fair
Pedestrian	Good
Bicycle	Good
Noise	Good
Cost	$$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

Diagonal Diverter

DESCRIPTION:

Diagonal diverters involve the placement of temporary barriers or construction of permanent barriers diagonally across an intersection. The barrier connecting the opposing corners of the intersection serves to redirect through traffic movements while allowing turning movements. Gaps in the barriers permit bicycle and pedestrian access and allow for drainage.

APPLICATION:

Diagonal diverters are particularly effective at addressing high volume, high speed, and cut through traffic. When staggered on multiple streets, particularly in a grid street system, diagonal diverters can make travel through a neighborhood more circuitous

Advantages

- Reduces cut through traffic
- Reduces speeds and volume in immediate area

Disadvantages

- Statutory actions required for implementation
- Delays emergency vehicles
- Traffic diverted to adjacent streets may create new traffic problems
- Increased travel time and out of direction travel for local residents
- The adjacent corners of the intersection may require reconstruction to maintain adequate width for two-way traffic.

Effectiveness Scorecard

Speed	◔
Volume	◒
Cut-through	●
Crashes	◒
Emergency Vehicle	◒
Pedestrian	◔
Bicycle	◔
Noise	◔
Cost	$$$$

● Very Good ◔ Good ◒ Fair ◠ Poor N/A Not Applicable

Quick Glance

Median Barrier

DESCRIPTION:

Median barriers, sometimes called median diverters, involve the construction of permanent raised islands along the centerline of a street. The median islands are extended through an intersection to effectively block cross street through traffic and left turning movements. Gaps in the island can permit bicycle and pedestrian access.

APPLICATION:

Median barriers are effective at addressing high volume, high speed, and cut through traffic. The median barrier prohibits both through traffic and left turning movements at two of the four intersection approaches. This essentially creates a right in right out condition which can make travel through a neighborhood more circuitous.

Advantages

- Discourages cut through traffic
- Reduces speeds and volume in immediate area
- May improve intersection safety by eliminating vehicular conflict points

Disadvantages

- Delays emergency vehicles
- Traffic diverted to adjacent streets may create new traffic problems
- Increased travel time and out of direction travel for local residents
- May increase u-turning movements and encourage wrong way travel
- May require additional right of way and/or impact on street parking

Effectiveness Scorecard

Speed	
Volume	
Cut-through	
Crashes	
Emergency Vehicle	
Pedestrian	
Bicycle	
Noise	
Cost	$$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Forced Turn Island

DESCRIPTION:

Forced turn islands involve the construction of raised islands at intersection approaches to prohibit certain turning movements. They can be implemented on a temporary or trial basis using parking blocks, delineators, and signage; or on a permanent basis with raised concrete curbs, barriers, bollards, and signs.

APPLICATION:

Forced turn islands are implemented to eliminate undesirable turning movements that allow neighborhood cut through traffic. When used in combination with turn restriction signage, median closures, and partial closures, forced turn islands provide additional means to direct through traffic to the collector roadway network and off neighborhood streets. Like these other devices, forced turn islands are just another way of making travel through a neighborhood more circuitous.

Advantages

- Reduces cut through traffic
- Reduces speeds and volume in immediate area
- May improve intersection safety by eliminating vehicular conflict points

Disadvantages

- Delays emergency vehicles
- Traffic diverted to adjacent streets may create new traffic problems
- Increased travel time and out of direction travel for local residents
- May increase u-turning movements and encourage wrong way travel

Effectiveness Scorecard

Speed	◒
Volume	◒
Cut-through	●
Crashes	◔
Emergency Vehicle	◒
Pedestrian	◔
Bicycle	◔
Noise	◔
Cost	$$$

● Very Good ◔ Good ◒ Fair ◓ Poor N/A Not Applicable

Quick Glance

SPEED LIMIT 25

Two-way Street Conversions

DESCRIPTION:

Two-way street conversions involve changing the operation of a one way street to two way traffic. One-way couplets were historically established to provide greater capacity for traffic moving into and out of downtown areas. As travel patterns have changed and urban neighborhoods have become more established many cities are converting one-way couplets into two, two-way streets.

APPLICATION:

Two-way street conversions are most appropriate in areas where long established one-way couplets are no longer needed to accommodate the peak hour traffic demand or in areas where changing the character of the street is seen to have a positive neighborhood or economic development benefit. Two-way street conversions involve the reconstruction of traffic signals, signing, and striping.

Advantages

- May reduce vehicle speed
- May improve neighborhood character
- May create economic development opportunities

Disadvantages

- Introduces more vehicle, bicycle, and pedestrian conflicts
- Reduces through traffic capacity
- May impact bicycle lanes and parking

Effectiveness Scorecard

Speed	Good
Volume	Fair
Cut-through	Fair
Crashes	Fair
Emergency Vehicle	Good
Pedestrian	Good
Bicycle	Good
Noise	N/A
Cost	$$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

SPEED LIMIT 25

One-way Couplet Conversions

DESCRIPTION:

One-way couplets consist of a pair of parallel one-way streets that carry traffic in opposing directions. Couplets are established to provide greater capacity for automobiles particularly in areas with heavy peak directional demand. In a grid system, one-way couplets are often separated by a single city block, have fewer turning movements at intersections, and better synchronization of traffic signals.

APPLICATION:

One-way couplets are most appropriate for core urban areas with an established grid street system where the emphasis of mobility over land access is desired. Recognizing the need to maintain capacity for peak hour travel, this strategy is meant to manage rather than restrict or redirect vehicles. One-way couplets can be designed and configured to reduce the pedestrian crossing distances, establish bicycle lanes, and/or create needed on-street parking.

Advantages

- Higher automobile capacity than equivalent two-way streets
- May reduce pedestrian crossing distances
- Fewer intersection turning movements may increase safety
- Provides opportunities to create bicycle lanes and/or on-street parking

Disadvantages

- Without other traffic management strategies speeds may increase
- Delays emergency vehicles
- Increases travel time and out of direction travel for local residents

Effectiveness Scorecard

Speed	Good
Volume	Fair
Cut-through	Fair
Crashes	Good
Emergency Vehicle	Fair
Pedestrian	Good
Bicycle	Good
Noise	N/A
Cost	$$$

Very Good · Good · Fair · Poor · N/A Not Applicable

Quick Glance

PART V – NEIGHBORHOOD TRAFFIC CALMING REQUEST [APPLICATION FORM]

CITY OF ALBUQUERQUE — ~~STEP~~ NTMP APPLICATION
*** * * REQUEST FOR NEIGHBORHOOD TRAFFIC CALMING MEASURES * * ***

Section I
Date: _____

On this date, we, the residents of _____, request that the City of Albuquerque's Traffic Engineering Division initiate a ~~STEP~~ 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:

_____

_____

_____

_____

_____

_____

_____

Section II
We understand that the ~~STEP~~ 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 Traffic Engineering Division on components of the Study.

We also understand that initiating a ~~STEP~~ 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.

Section III
All persons signing this official request certify that they reside in the neighborhood referenced in Section I above, and agree with the identified concern(s) checked in Section I. 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 Albuquerque Traffic Engineering Division for the purposes of this ~~STEP~~ NTMP Study.

Sign and submit to the **City of Albuquerque Traffic Engineering Division** (*600 Second NW, Albuquerque, NM 87103* or ~~STEP~~ NTMP *@cabq.gov*):

Designated Neighborhood Contact(s)

Name	Address	Telephone	email

Supporting Neighborhood Resident Applicants

Name	Address	Telephone	email
Name	Address	Telephone	email
Name	Address	Telephone	email

PART VI – NEIGHBORHOOD TRAFFIC CALMING PETITION FORM

CITY OF ALBUQUERQUE — ~~STEP~~ NTMP
*** * * NEIGHBORHOOD TRAFFIC CALMING PETITION * * ***

Section I
Date: <INSERT DATE SENT TO NEIGHBORHOOD CONTACT>

Representatives from the <INSERT REQUESTING NEIGHBORHOOD> neighborhood, on <INSERT APPLICATION DATE> requested initiation of a ~~STEP~~ NTMP Study. Based on available data, the households and properties identified in the attached **Exhibit 1** 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 Albuquerque Traffic Engineering Division (*600 Second NW, Albuquerque, NM 87103* or *STEP@cabq.gov*)

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

Name (print)	Address	Telephone	Email	Signature
Name (print)	Address	Telephone	Email	Signature
Name (print)	Address	Telephone	Email	Signature
Name (print)	Address	Telephone	Email	Signature
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Name (print)	Address	Telephone	Email	Signature

(PLEASE COPY THIS PAGE FOR ADDITIONAL SIGNATURES)

CITY OF ALBUQUERQUE — ~~STEP~~ NTMP
*** * * NEIGHBORHOOD TRAFFIC CALMING PETITION * * ***

Section III

EXHIBIT 1 – Affected Neighborhood Households Map

<City of Albuquerque Traffic Engineering Division to include GIS map
showing highlighted affected neighborhood households and appropriate street names for use in petition signatures>

PART VII – STREET FUNCTIONAL CLASSIFICATION MAP

To be provided by the City

PART VIII – EMERGENCY RESPONSE ROUTES MAP

To be provided by the City

GLOSSARY OF TERMS

Emergency Response Routes – a system wide identification of the fastest most efficient routes for emergency response vehicles (police, fire, and ambulance).

Functional classification – a hierarchical street designation for mobility and access. Higher mobility streets such as arterials tend to have less access. Local neighborhood streets with numerous driveways and cross streets have low mobility but high access(e.g. major arterial>minor arterial>collector>local).

Neighborhood Traffic Management Program (NTMP) – a program for traffic calming within the City of Albuquerque. This policy document defines the roles, responsibilities, and procedures for implementing traffic calming measures under the NTMP.

~~Streets and Traffic Enhancement Program (STEP) – This new program for traffic calming within the City of Albuquerque.~~

Traffic Calming - The combinations of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users. (ITE)

85th Percentile Speed – the speed at or below which 85 percent of vehicles travel. If the speeds of 100 vehicles were recorded, 85 vehicles would be at or below the 85th Percentile Speed, and exactly 15 would be above the 85th percentile speed. If the 85h percentile speed (determined from a speed study) is 5 mph or more over the posted speed, then the speed criterion threshold is met.

REFERENCES

1) Traffic Calming: State of the Practice, an Informational Report: Institute of Transportation Engineers and the Federal Highway Administration, August 1999.
2) US Traffic Calming Manual: American Planning Association and American Society of Civil Engineers, 2009.
3) Neighborhood Traffic Management Program, City of Albuquerque City Council per Resolution R-09-17.
4) Neighborhood Traffic Calming: Sunnyvale, CA, June 12, 2008.
5) Neighborhood Traffic Management Program: Placer County, CA, February 28, 2007.
6) Traffic Calming Design Manual: Delaware State Department of Transportation, September 1, 2000.
7) Neighborhood Traffic Management Program: City of Centennial, CO. April 16, 2007 revised April 5, 2010.
8) Traffic Calming Best Practices and Recent Trends webinar: American Society of Civil Engineers, Presented by Nazir Lalani, August 3, 2012.

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Milt Davis, District 5

Tony Sylvester, MRCOG/District 6

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Darrell Spreen, District 8

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Zeke Lynch, CH2M HILL

Amy Elliott, CH2M HILL

Tim Wagner, former CH2M HILL

Jim Barrera, URS