
# City of Muskogee

## Traffic Calming Policy and Procedure

Revised by the Public Works Department August 13, 2008

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## 1. INTRODUCTION AND BACKGROUND

This policy applies to all residential streets in the City of Muskogee. This policy is effective upon approval by the City Council. This policy will be implemented upon request from a citizen or determination of a safety hazard by the City staff.

Because of high traffic speeds and high volumes of through traffic encountered on many residential streets in pre-World-War II communities (characterized essentially by grid pattern street systems); newer residential communities planned their streets with curvilinear alignments and cul-de-sacs in a well defined hierarchical system. Although these newer concepts reduced the quantity of "foreign traffic" on most residential streets, it did not eliminate it on all of them. Furthermore, the curvilinear street systems did not accomplish the reduction in vehicle speeds that were envisioned when the design changes were implemented.

The residential speed limit in the City of Muskogee is 25 mph. If this speed limit were obeyed, the resulting pattern of the actual speeds would ideally follow a bell curve with a mean speed of 20 mph and an $85^{th}$ percentile speed of 25 mph. Unfortunately, the 25 mph speed limit is seldom obeyed. This excessive speed in residential areas has resulted in a heavy volume of citizen requests for action to reduce speeding in their neighborhood.

The City of Muskogee has gone through an evolutionary process to arrive at this Traffic Calming Policy. Initial attempts were centered on enforcement, the addition of a Traffic Division within the Muskogee Police Department, and the lowering of the residential speed limit from 35 mph to 25 mph in 2005. Stop signs have also been used in locations where warrants did not exist. This type of fix often increases the pressure to implement haphazard solutions that may not be in the best interests of the neighborhood, the city or the traveling public. This policy and procedure is a result of the evaluation by the City and a review of literature on tests conducted by other cities. This policy represents the current best technology for traffic calming on residential streets. As the technology changes, this policy will be updated to reflect any improvements.

### 1.1. Traffic Calming Principles:

The Public Works Department has collected and researched many cities' traffic calming programs. The following principles are the underlying premise toward the City's effort to minimize the impact of traffic within residential neighborhoods. They are:

- Identification of the **issues and concerns** brought forth by citizens, citizen groups or registered neighborhood associations
- Consideration of **safety** first in all aspects of the planning, design and implementation of traffic calming measures
- Consideration of all **services**
  (school buses, fire, snowplowing, garbage, ambulance, etc.)

- Application of traffic calming on a **neighborhood-wide basis**, (i.e. look at the neighborhood in their entirety).
- Assessment of **operation of adjacent arterials** and consideration of improvements to the arterial network first, thereby reducing or removing incentives for motorist to intrude on residential streets.
- Measurement of **existing conditions**
- Avoidance of intentionally **diverting traffic** off of the target street to other adjacent neighborhood streets
- Avoidance of restricting **ingress/egress** to residences
- Emphasis on using **self-enforcing** traffic calming measures
- Emphasizing of traffic calming measures on residential streets adjacent to **schools,** and those designated or known as school routes, where children walk or bicycle to school.
- Stop Signs, not to be used as Traffic Calming Device (See 3.9.)
- Speed Limit Policy for Residential Streets (See 3.10.)
- Children at Play Sign Policy (See 3.11.)
- Annexation of streets into City of Muskogee city limits (See 3.12.)
- Existing signs within the City of Muskogee city limits (See 3.13.)

## 1.2. Recommended Practices

The Public Works Department recommends the speed hump (see illustration description, "Speed Hump" on page 17) as the primary traffic calming device for existing residential and collector streets. The reasons are cost, ease of construction, and availability of asphalt material. Design and application of speed humps shall follow the Institute of Transportation Engineers (ITE) Guidelines for the Design and Application of Speed Humps. Other proposed traffic calming designs will be at the discretion of the individual designer, however the design will conform to ITE criteria or accepted design practice currently in use.

The City shall continue to work with both residential and commercial developers through the Subdivision Review process as well as concerned citizen groups and neighborhood associations to address unique neighborhood traffic calming opportunities (see **Appendix 1**). Included in those opportunities are neighborhood groups and associations who desire to add traffic calming devices, other than speed humps, to calm traffic and enhance the aesthetics of the neighborhood.

## 2. TRAFFIC CALMING PROCESS

### 2.1. Planning

The traffic calming process is planned at the neighborhood level, but implemented on an uninterrupted street segment basis. Planning on a neighborhood wide basis will help to identify if solving a problem on one street shifts it to another street. Additionally, it will provide an opportunity to plan for a comprehensive series of devices that will work together to improve the traffic operations of a neighborhood.

On receipt of a traffic calming application, the first step in working with the neighborhood, is to clearly define the problem. Because traffic calming addresses quality of life issues, it will be important to consider a wide range of perspectives, observations and perceptions as well as Public Works data.

Subsequent examination will be spent matching specific solutions with the problem(s) identified. **The speed hump will primarily be employed**; however residents may be presented with additional options.

### 2.2. Public Involvement

A successful traffic calming program must involve the public and clearly be understood by all participants. Participation by those living along the affected street and adjacent registered neighborhood associations is essential.

Property owners living along and if necessary around the affected street segment will be asked to complete petitions that account for their participation and either affirm or not affirm their support for the installation(s). The requester of the traffic calming devices(s) will solicit the neighborhood(s) for signatures and submit the petition with a Verification Statement (see **Appendix 5**).

Registered neighborhood associations that are directly affected will be asked to complete the Endorsement Statement (see **Appendix 6**) that acknowledges adjacent streets to the traffic calmed street may see an increase in traffic and/or speed.

### 2.3. Funding

Property owners and/or businesses (beneficiaries) with help from the City of Muskogee will jointly provide funding for warranted and approved traffic calming measures. The beneficiaries will be required to pay for one hundred percent (100%), of the materials used in construction of the traffic calming measure(s), with a minimum payment of $\$500^{\underline{00}}$. The City will provide the labor, machinery and equipment to install the devices. Work will be scheduled on approved measures, upon receipt of the local share.

Traffic calming measures constructed entirely with privately donated funds will become public improvements. The City will provide all future maintenance on these measures.

### 2.4. Possible Effects of Traffic Calming Devices

Traffic calming devices may affect neighborhoods and other aspects of road use, which are shown below.

| What May Be Affected | Effect |
|---|---|
|  Emergency Vehicles | Increase response time |
|  Adjacent Neighborhoods | Increases traffic volume and speed |
|  Utility Vehicles (i.e. sanitation vehicles) | Increases route times |
|  Other roadway Users (i.e. bicycles, roller skates, skate boarders, joggers, pedestrians, handicapped) | Increases likelihood of an unintended negative impact in attempting to negotiate or circumvent the traffic calming device |
|  Residents Immediately Adjacent to the Traffic Calming Devices | Increases noise level from vehicles braking and going over and around the traffic calming devices |
|  On-Street Parking | Loss of on-street parking immediately adjacent to traffic calming device(s) |
|  Neighborhood Aesthetics | Unsightliness of traffic calming device |
|  Future Maintenance Costs | Increased landscaping and street rehabilitation costs (e.g. asphalt, pavement markings or sign maintenance) |

### 2.5. Appeal Process

In the event the Public Works Department finds the residents request does not meet the criteria of this policy, an appeal can be filed in writing within ten (10) days to the City Manager who will then have the item placed on the City Council agenda for review.

## 3. GUIDELINES AND PROCEDURES

### 3.1. Authority and Scope

The Public Works Director administers the traffic calming program and retains the full authority to install or remove traffic calming devices for cause independent of this guideline.

### 3.2. Request Process

Individual residents or neighborhood associations can initiate traffic calming requests. An application (see **Appendix 4**) can be downloaded from the City's website at www.cityofmuskogee.com , or requested by calling the Public Works Department at 684-6331.

**Forward completed applications to:**

City of Muskogee
Public Work Department
301 South Cherokee
Muskogee, Oklahoma 74403

### 3.3. Installation Eligibility

On receipt of a traffic calming application, City staff will identify the area-wide and site-specific study area. Acknowledgement will be sent to the applicant making the inquiry. The Applicant must reside on the requested street segment within the boundaries defined on the traffic calming application. The acknowledgement will confirm that a study is underway and will indicate an anticipated completion date.

Public Works staff will initiate the data collection and review of existing operational and geometric characteristics of the street in question. Eligibility for a traffic calming measure will be determined based upon the warrants (see **Appendix 2**) and a review of the operational and geometric characteristics of the street segment. Traffic calming warrants are based on the following:

- $85^{th}$ percentile speed (see glossary)
- 24-hour traffic volume
- Total number of reported crashes over a two-year period
- Excessive peak hour volume

If the street segment meets criteria and warrants for traffic calming, the applicant will be contacted, a petition packet mailed and the item scheduled for consideration. The applicant will be responsible for contacting all affected property owners, businesses and registered neighborhood associations as identified by City staff.

If the requested street does not meet criteria and warrants, the applicant will be notified through the U.S. Postal Service. No further study action will be taken. The Applicant shall have ten (10) days to file an appeal.

Reconsideration for the street segment in question will not be undertaken for another 12 months unless compelling evidence is otherwise shown.

## 3.4. Project Prioritization

Projects will be prioritized on an as needed basis, or as directed by the City Manager and/or the Public Works Director.

## 3.5. Notification/Evidence of Support

If a speed hump is proposed for the traffic calming device, a petition (see **Appendix 7**) from the project area residents and business owners is required as directed by Public Works Director. It must document that at least seventy five percent (75%) of all property owners and/or businesses, within the project area, support the installation of speed humps or other approved traffic calming technique. All properties within the affected project area must be accounted for, either by signature or by written statement by the contact person why a specific property was not represented. Any request with either no petition or with a petition that does not account for all properties will be considered incomplete and will not further the process.

A verification statement (see **Appendix 5**) confirming the signatures on the petition form are valid and represent at least seventy five (75%) of the property owners and/or businesses of the project area is required from the contact person.

Registered neighborhood associations adjacent to the project area will be asked to sign an endorsement statement (see **Appendix 6**), endorsing the traffic calming installation. In the absence of registered neighborhood associations, the petition may be extended to include nearby streets, which may see an increase in traffic as a result of the impending installation.

## 3.6. Speed Hump Installation Criteria

### 3.6.1. Speed Hump Location Consideration

3.6.1.1. The street shall provide access (via a driveway or on-street parking) to abutting residential and/or commercial properties (residential local or collector streets). Residential properties include multiple dwelling such as apartment complexes.

3.6.1.2. The street shall not have more than one traffic lane in each direction.

3.6.1.3. The street shall have a regulatory speed limit of 25 mph or less.

3.6.1.4. The $85^{th}$ percentile speed on the street section must be at least 6 mph over the regulatory speed limit.

3.6.1.5. Speed humps shall not be located in a horizontal curve, or vertical curve where visibility of the hump is restricted, or on the approach to these curves. Speed humps will not be placed within 100 feet of a horizontal or vertical curve or an approach to a bridge.

3.6.1.6. For speed hump installation, the street should have curb and gutter. Consideration may be given to streets without curb and gutter. In such cases, special care should be used to accommodate drainage and prevent vehicle run-arounds.

3.6.1.7. Street segment boundaries identified for traffic calming should be uninterrupted segments of street, (i.e. no stop signs). If an application does identify a street segment with interrupted points, then the project plan may direct the existing interrupted points be removed.

3.6.1.8. No consideration will be given to speed hump installation on a residential collector street segment where traffic signals are located at beginning and ending terminal points with a higher classified roadway than a collector street. Additionally, the City will reserve the right to remove any traffic calming devices on a residential collector street segment that if at a later date, traffic signals are installed on the terminal points of a segment.

3.6.1.9. Speed humps will not be located in front of a driveway or within an intersection. Speed humps shall be kept a minimum of 100 feet from the near curb line of an intersecting street.

3.6.1.10. Speed humps will not be located within 25 feet of manholes or fire hydrants.

3.6.1.11. Speed humps located near drainage inlets will be placed immediately downstream of the inlet.

3.6.1.12. Speed humps will be located as near as practical to the property line to minimize the intrusion of the speed hump on abutting property frontages.

3.6.1.13. To the extent possible, speed humps will be located near existing mid-block street lighting.

3.6.1.14. A speed hump will not be located in front of a property if the property owner objects to its placement

3.6.1.15. The average daily traffic must be less than 5,000 vehicles per day to qualify for speed humps.

### 3.6.2. Speed Hump Spacing and Location

3.6.2.1. Speed humps typically will be placed 300 to 600 feet apart. Other spacing may be used based on Public Works judgment.

3.6.2.2. Speed humps will typically be placed on single short blocks (300 to 600 feet); a single speed hump will be positioned near the mid-point.

3.6.2.3. On single blocks of moderate length (600 to 1,000 feet), a two speed hump configuration will be used.

3.6.2.4. On very long blocks (1,000 to 1,600 feet), three speed humps will be placed on approximate quarter points.

3.6.2.5. On lengthy continuous street segments or segments comprised of a number of blocks, desirable interior speed hump spacing will be 400 to 600 feet.

3.6.2.6. A street segment or block must be at least 300 feet to qualify for speed hump installation.

## 3.7. Speed Hump Removal

### 3.7.1. Maintenance or Construction Activities

3.7.1.1. Any traffic calming speed hump that is removed or damaged during the course of publicly funded construction will be reinstalled upon completion of that construction at City of Muskogee expense.

3.7.1.2. Speed humps partially or completely removed during routine City of Muskogee maintenance activities will be repaired or reconstructed to original conditions upon completion of these maintenance activities at City of Muskogee expense.

3.7.1.3. Any speed hump that is removed or damaged during the course of privately funded maintenance or construction; it will be reinstalled upon completion of those activities at the expense of the party damaging the speed hump.

3.7.1.4. The replacement of speed humps completely removed through the above actions is not automatic, but contingent upon a review for conformance with current policies and procedures.

### 3.7.2. Citizen Requests

3.7.2.1. Request Process for Removing Speed Hump

3.7.2.1.1. Citizens may request a street segment be reviewed for the possible removal of some or all of the existing humps. An application (see **Appendix 4**) can be downloaded from the City of Muskogee's website, at www.cityofmuskogee.com , or requested by calling (918) 684-6331.

**Forward applications to:**

City of Muskogee
Public Works Department
301 South Cherokee
Muskogee, Oklahoma 74401

3.7.2.1.2. The removal request must originate from a property owner, business or entity whose property is within the affected project area. The affected area will be determined by Public Works staff and will include primarily those properties facing or abutting the street segment on which speed humps are located. A property will be considered part of the affected area if its only ingress and egress route requires traveling over existing speed humps requested to be removed.

3.7.2.2. Eligibility

3.7.2.2.1. City of Muskogee Public Works Department will determine eligibility for removal considered by these factors:

i. The request must not be a duplicate.
ii. The removal segment must correspond with the installation segment.
iii. The speed humps have been in place for at least one year or at least one year has elapsed since any previous speed hump removal occurred.

3.7.2.3. Notification/Evidence of Support

3.7.2.3.1. Subsequent to the determination of eligibility for speed hump removal on a segment, a map of the affected area will be prepared, and a petition packet sent to the contact person for documenting support for the removal. All properties within the affected area must be accounted for, either by signature and indication of preference (in favor or oppose) or by written statement by the contact person why a specific property was not represented. There must be at least a seventy five percent (75%) evidence of support to further the process.

3.7.2.3.2. Requests with either no petition or with a petition that does not account for all properties will be considered incomplete and will not further the process.

3.7.2.4. Removal Determination

3.7.2.4.1. The specific street segment indicated on the removal application will be the basis to identify the speed humps for removal. Final determination for the removal will be at the discretion of the City of Muskogee's Public Works staff. Based on Public Works judgment, the review process may recommend removal of none, some, or all of the speed humps. Factors considered, but not limited to are:

a. Existing speed hump locations and spacing

b. Stop/yield signs along the segment

c. Historical and existing traffic speed and volume information

d. Accident History

e. Presence or absence of sidewalks, schools and parks

3.7.2.4.2. If speed studies conducted along the requested segment or portions of the segment show the $85^{th}$ percentile speed is greater than or equal to 6 mph over the posted speed limit, then no hump removal will occur along the segment or portion of the segment represented by the study.

3.7.2.4.3. Following the removal of any speed hump, the segment may be reconsidered for additional hump removal after at least one year. A new application must be submitted to have a segment considered for additional removal.

## 3.8. Design Standards, Construction, and Maintenance

The City of Muskogee, Public Works Department, will prepare and maintain current design standards and installation and removal procedures for speed humps and other traffic calming devices in accordance with current City of Muskogee design practices and the criteria herein established.

Design and construction or removal of traffic calming devices, along with associated pavement markings and signs, will be the responsibility of the City of Muskogee. Future maintenance of traffic calming devices will be the responsibility of the City of Muskogee, unless a license agreement or other contractual agreement is otherwise executed.

## The following polices have excerpts from the Manual on Uniform Traffic Control Devices

### 3.9. Stop Sign Policy

3.9.1 STOP signs are intended for use where traffic is required to stop. The STOP sign shall be octagon with white letters on a red background.

3.9.2 Because the STOP sign causes a substantial inconvenience to motorists, it should be used only where warranted. A STOP sign may be warranted at an intersection where one or more of the following conditions exist:

3.9.2.1. Intersections of a less important road with a main road where applications of the normal right-of-way rule is unduly hazardous.

3.9.2.2. Street entering a through highway or street.

3.9.2.3. Unsignalized intersection in a signalized area.

3.9.2.4. Other intersections where a combination of high speed, restricted view and serious accident record indicates a need for control by the STOP sign.

3.9.3. Multiway stops are intersections that have three (3) or four (4) approaches. Multiway stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multiway stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multiway stop control is used where the volume of traffic on the intersecting roads is approximately equal.

3.9.4 The decision to install multiway stop control should be based on a Public Works study. The following criteria should be considered in the Public Works study for a multiway STOP sign installation:

A. Where traffic control signals are justified, the multiway stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

B. A crash problem, as indicated by 5 or more reported crashes in a 12-month period, that are susceptible to correction by a multiway stop installation. Such crashes include right- and left-turn collisions as well as right-angle collisions.

C. Minimum volumes:

1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and

2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but

3. If the 85$^{th}$ percentile approach speed of the major-street traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Option:

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;

B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and

D. An intersection of two residential streets and/or collector streets of similar design and operating characteristics where multiway stop control would improve traffic operational characteristics of the intersection.

3.9.5 STOP signs should not be used as speed control

### 3.10. Speed Limit Policy for Residential Streets

3.10.1. All residential streets within the City of Muskogee city limits are 25 mph. The SPEED LIMIT 25 sign will normally be placed at major entry points to neighborhoods, where traffic will be entering from the arterial street. The sign is to serve as a reminder of the prevailing residential speed limit.

### 3.11. Children at Play sign Policy

3.10.1. The Public Works Department frequently receives requests from parents and neighborhood organizations for CHILDREN AT PLAY signs to be installed on their block in residential areas. These requests come from parents concern for the safety of their children in the street or near their homes. Parents and children think the signs will provide added protection; unfortunately, all these signs do is create a false sense of security. By relying on the CHILDREN AT PLAY sign, parents might not monitor their children as closely and the children might think that it is acceptable to play in the street. The street is not a place for children to play.

3.10.2. The Manual on Uniformed Traffic Control Devices (MUTCD) does not recognize the CHILDREN AT PLAY sign.

3.10.3. CHILDREN AT PLAY signs will not be used within the city limits of the City of Muskogee.

### 3.12. Annexation of streets into City of Muskogee city limits

3.12.1. All Traffic Calming Devices shall conform to the City of Muskogee's Traffic Calming Policy that is in place at the time of annexation. Any traffic calming devices that do not meet these requirements will be removed. This decision may be appealed by using the appeal process. ***See (2.5. Appeal Process)***

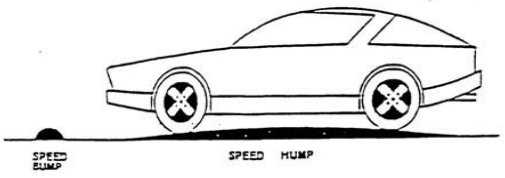
### 3.13 Existing signs within the City of Muskogee city limits

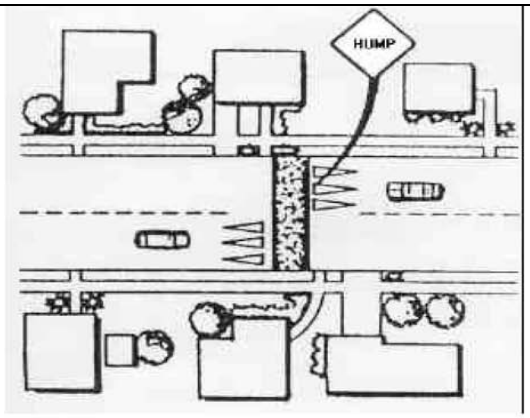
3.13.1. Any sign(s) within the City of Muskogee city limits that does not conform to The Manual on Uniformed Traffic Control Devices (MUTCD) or meet the requirements within the City of Muskogee's Traffic Calming Policy, shall be removed as directed by the City Manager and/or the Public Works Director. This decision may be appealed by using the appeal process.
***See (2.5. Appeal Process)***

# Appendix 1 – Traffic Calming Devices

## Speed Hump

**Definition:** Speed humps are parabolic-shaped humps in the street. The height of the speed hump determines how fast it may be traversed without causing discomfort to the driver or damage to the vehicle. Discomfort increases as speed over the hump increases. Typically speed humps are placed in a series rather than singularly. Speed humps are gradual changes in the roadway surface usually 12-14 feet long and 3-4 inches high and differ dramatically from speed bumps that were traditionally installed on private property. Speed bumps tend to jolt a vehicle and can cause damage or loss of control if taken at excessive speed. Speed humps have little effect on a vehicle driving the posted speed limit, but produce discomfort when the speed limit is exceeded. Speed humps are generally placed approximately 300 - 600 feet apart and require signage and pavement markings in each direction that warns the driver to slow down. Speed humps are effective in reducing speed while not creating hazards to emergency response and transit vehicles.



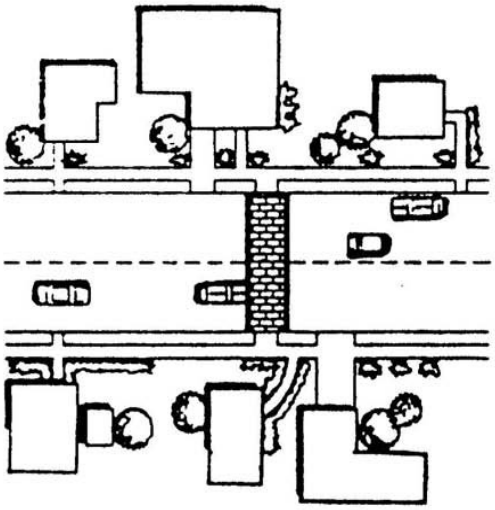




| Advantages | Disadvantages |
|---|---|
| • Reduces vehicle speeds in the vicinity of the hump without increasing crashes. Better if used in a series at 300' to 500' spacing<br>• Self enforcing<br>• Relatively inexpensive | • May create noise particularly if there are loose items in the vehicle or trailer<br>• If not properly designed, drivers may try to skirt around to avoid impact<br>• May be a problem for emergency vehicles<br>• May impact drainage<br>• Driver may speed up between humps<br>• May increase volumes on other streets<br>• Difficult to properly construct<br>• Required signage/markings may be considered unsightly |

| Evaluation Considerations | | | | | | |
|---|---|---|---|---|---|---|
| **Safety** | **Speed Reduction** | **Traffic Reduction** | **Fuel Consumption** | **Pollution** | **Cost** | **Emergency Services** |
| Possible Improvements | Yes | Possible | Small Increase | Small Increase | Low to Medium | Possible Problems |

# Raised Crosswalk

**Definition:** A raised crosswalk is a marked pedestrian crosswalk at an intersection or mid-block location constructed at a higher elevation than the adjacent roadway. The purpose of a raised crosswalk is to reduce vehicular speeds, improve pedestrian visibility and reduce pedestrian-vehicle conflicts. The measure can include textured pavement, which helps to communicate a change in the driving environment.

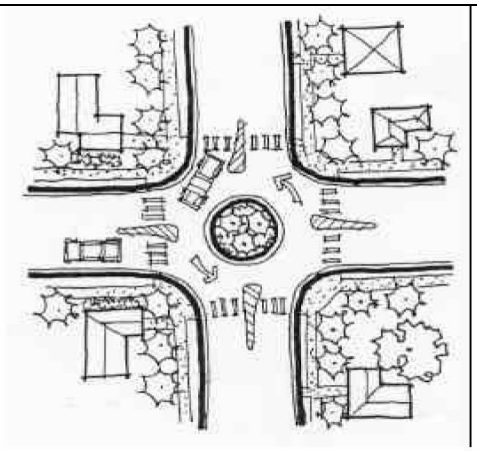


| Advantages | Disadvantages |
|---|---|
| • Slows traffic<br>• Increases pedestrian visibility in the crosswalk<br>• Clearly designates the crosswalks<br>• Requires minimum maintenance; pavement markings must be maintained<br>• Minimal impact on snow removal | • Increases emergency response time<br>• May damage emergency response vehicles if not carefully designed<br>• May increase traffic noise in vicinity of crosswalk<br>• May create drainage issues where raised crossing extends from curb to curb |

| Evaluation Considerations | | | | | | |
|---|---|---|---|---|---|---|
| **Safety** | **Speed Reduction** | **Traffic Reduction** | **Fuel Consumption** | **Pollution** | **Cost** | **Emergency Services** |
| Possible Improvements | Possible | No Effect | No Change | No Effect | Medium | Possible Problems |

# Traffic Circle

**Definition:** Traffic circles are raised circular areas (similar to medians) placed at intersections. Drivers travel in a counterclockwise direction around the circle. Modern traffic circles are "yield upon entry," meaning that cars in the circle have the right of way and cars entering the circle must wait to do so until the path is clear. When a traffic circle is placed in an intersection, vehicles may not travel in a straight line. Traffic circles are raised concrete or landscaped islands that are placed in the center of an intersection. They require that vehicles change course while proceeding through an intersection and this generally results in a speed reduction. Intersections containing traffic circles must have adequate street lighting and signage to provide advance visibility and warning for the required change of course.



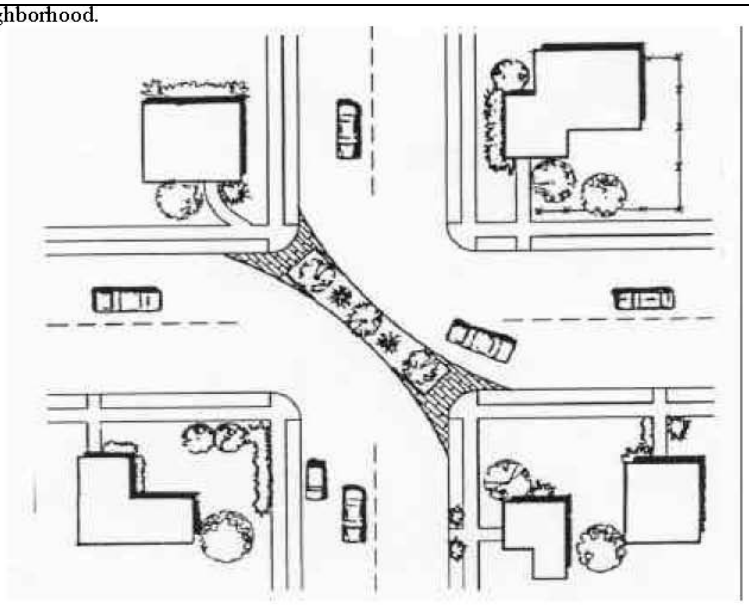
| Advantages | Disadvantages |
|---|---|
| • May reduce crashes by 50 to 90 percent when compared to 2-way, 4-way stop signs, and traffic signals by reducing the number of conflict points at intersections<br>• Reduces speed at intersection approach<br>• Longer speed reduction influence zones<br>• Provides space for landscaping<br>• Cheaper to maintain than a traffic signal<br>• Effective at multi-leg intersections<br>• Provides equal access to intersections for all drivers<br>• Provides a good environment for cyclists<br>• Does not restrict movements, but makes them more difficult | • May be restrictive for larger vehicles if designed to low speed. Providing a mountable apron minimizes limitation<br>• May require additional lighting and signage<br>• If left turns by large vehicles are to be accommodated then right-of-way may have to be purchased<br>• Initial safety issues as drivers adjust<br>• May increase volumes on adjacent streets<br>• Maintenance responsibility if landscaped |

| Evaluation Considerations | | | | | | |
|---|---|---|---|---|---|---|
| **Safety** | **Speed Reduction** | **Traffic Reduction** | **Fuel Consumption** | **Pollution** | **Cost** | **Emergency Services** |
| Improved | Yes at Intersection | Possible | No Effect | Slight Increase | High | Possible Problems |

# Diagonal Diverter

**Definition:** A barrier is placed diagonally across a four-legged intersection, interrupting traffic flow across the intersection. This type of barrier may be used to create a maze-like effect in a neighborhood. These devices place a barrier diagonally across an intersection, which results in the elimination of through movements and turning conflicts. The resulting intersection resembles two back-to-back curves. Diagonal diverters reduce traffic while still allowing access and circulation through the neighborhood.

neighborhood.

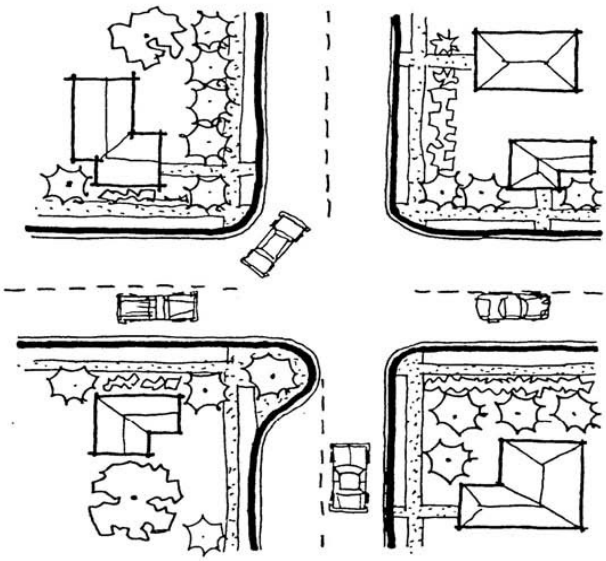


| Advantages | Disadvantages |
|---|---|
| • Eliminates through traffic<br>• Provides area for landscaping<br>• Reduces traffic conflict points<br>• Increases pedestrian safety<br>• Can include bicycle path connection | • May inconvenience residents gaining access to their property<br>• May inhibit access by emergency vehicles<br>• May divert through traffic to other local streets<br>• Altered traffic patterns may increase trip length |

| Evaluation Considerations | | | | | | |
|---|---|---|---|---|---|---|
| **Safety** | **Speed Reduction** | **Traffic Reduction** | **Fuel Consumption** | **Pollution** | **Cost** | **Emergency Services** |
| Possible Improvements | Yes | Yes | Slight Increase | Small Increase | Medium | Possible Problems |

## Semi-Diverter a.k.a. Directional or Half Closure or Entrance Barrier or Curb Extensions

**Definition:** Physical blockage of one direction of traffic on a two-way street. The open lane of traffic is signed "one way," and traffic from the blocked lane is not allowed to go around the barrier through the open lane. These devices limit access to a street from one direction by blocking half of the street. They may also be constructed to limit certain movements at an intersection. Semi-diverters are generally effective in reducing traffic in the direction they block but are still able to allow emergency access.



| Advantages | Disadvantages |
|---|---|
| • Reduces through traffic in one direction and possibly in the other<br>• Allows two-way traffic in the remainder of the street<br>• Good for pedestrians due to shorter crossing distance<br>• Provides space for landscaping<br>• Can be designed to provide two-way access for bicycles | • Reduces access for residents<br>• Emergency vehicles are only partially affected as they have to drive around partial closure with care<br>• Compliance with semi-diverters is not 100%<br>• May increase trip length for some residents<br>• Maintenance responsibility if landscaped |

| Evaluation Considerations | | | | | | |
|---|---|---|---|---|---|---|
| **Safety** | **Speed Reduction** | **Traffic Reduction** | **Fuel Consumption** | **Pollution** | **Cost** | **Emergency Services** |
| Improved Pedestrian Crossing | Possible | Yes | Small Increase | Small Increase | Low to Medium | No Effect |

# Appendix 2 – General Traffic Calming Warranting Criteria

The following must be met to qualify a street segment for traffic calming:

| | |
|---|---|
| Warrant # 1<br>- **and** -<br>Warrant # 2 | Warrant # 1<br>- **and** -<br>0.80 x Warrant # 2<br>- **and** -<br>Warrant # 3<br>- **or** -<br>Warrant # 4 |

| **Warrant** | **Street Classification** (1) | |
|---|---|---|
| | **Collector Street** | **Local Residential Street** |
| 1. 85th-percentile speed | > 6 mph over posted speed | |
| 2. Minimum 24-hour traffic volume (2) | > 1,250 vpd | > 500 vpd |
| 3. Total crashes (3)<br>(Two most recent consecutive years) | 3 | |
| 4. Peak hour volume (4) | phv > 1.5 x 0.10 x vpd | |

vpd = vehicles per day; phv = peak hour volume

(1) As determined by Public Works staff

(2) For every additional 1 mph speed over the 6 mph speed threshold, 100 vehicles per day can be added to the 24-hour traffic volume to help facilitate the warrant meeting requirements.

(3) Only those crashes correctable by the installation of traffic calming devices will be considered in the warrant considerations for the site-specific application.

(4) As rule-of-thumb, peak hour volume for a segment is estimated at 10% of the 24-hour volume. If excessive non-local cut-through traffic is using the segment, this peak hour volume will be exaggerated. Hence, Warrant # 4 is met when the actual peak hour volume is greater than or equal to 1.5 times this computed peak hour volume value.

# Appendix 3 Application for Traffic Calming

## APPLICATION FOR TRAFFIC CALMING

Please provide the name of the street to be considered (Requested Street). Indicate the boundaries of the street segment by identifying intersecting streets (From and To). Consideration will be given for only that described. Complete additional applications for other street segments.

| Street Study Information | |
|---|---|
| **Requested Street:** | |
| **From:** | |
| **To:** | |

Each request must provide a contact person who lives on the requested street within the study area boundary. The contact person will receive all correspondence and be responsible for gathering evidence of support when requested.

| Contact Person Information | | |
|---|---|---|
| **Name:** | | |
| **Address:** | **Phone Number** | |
| | **Home:** | **Work:** |
| **Email Address:** | **Cell:** | |

I understand this request will be processed according to the procedures detailed in the City of Muskogee's Traffic Calming Policy and Procedure.
**I agree to be the contact person for the above request.**

**Signature of Applicant:** _____ **Date:** _____

Remit to: City of Muskogee
Public Works Department
301 South Cherokee
Muskogee, OK 74003

## Appendix 4 Application for Removal of Traffic Calming

# APPLICATION FOR REMOVAL OF TRAFFIC CALMING

Please provide the name of the street to be considered (Requested Street). Indicate the boundaries of the street segment by identifying intersecting streets (From and To). Consideration will be given for only that described. Complete additional applications for other street segments.

| Street Study Information | |
|---|---|
| **Requested Street:** | |
| **From:** | |
| **To:** | |

Each request must provide a contact person who lives on the requested street within the study area boundary. The contact person will receive all correspondence and be responsible for gathering evidence of support when requested.

| Contact Person Information | | |
|---|---|---|
| **Name:** | | |
| **Address:** | **Phone Number** | |
| | **Home:** | **Work:** |
| **Email Address:** | **Cell:** | |

I understand this request will be processed according to the procedures detailed in the City of Muskogee's Traffic Calming Policy and Procedure.
**I agree to be the contact person for the above request.**

**Signature of Applicant: _____ Date: _____**

Remit to: City of Muskogee
Public Works Department
301 S Cherokee
Muskogee, OK 74003

## Appendix 5 Verification Statement

# VERIFICATION STATEMENT
# SPEED HUMP PETITION

There are a total of _____ properties within project area on _____

between _____ and _____.

There are _____ valid signatures on the speed hump petition, which represent _____%

of the properties adjacent to the street within the aforementioned section.

I verify that the signatures on the speed hump petition are valid and only one signature

per property owner and/or business has been considered in the above percentage.

**Signature of Contact Person: _____Date: _____**

| **Contact Person Information** | | |
|---|---|---|
| **Name:** | | |
| **Address:** | **Phone Number** | |
| | **Home:** | **Work:** |
| **Email Address:** | **Cell:** | |

Remit to: City of Muskogee
Public Works Department
301 S. Cherokee
Muskogee, Ok 74403

## Appendix 6 Endorsement Statement

# ENDORSEMENT STATEMENT
# SPEED HUMP PETITION

In a meeting held on the _____ day of _____, _____

the_____ Homeowners Association approved and endorsed the

Traffic Calming Project on _____ from _____

to _____.

The association acknowledges that because of installation of Traffic Calming Devices up to and including speed humps on the above-mentioned street, there may be an increase in traffic on nearby streets.

The contact person has confirmed that signatures on the Traffic Calming Petition are valid and represent seventy five percent (75%) of the property owners and/or businesses adjacent to the street within the section mentioned above.

| | Neighborhood Association Officer Printed Name | Neighborhood Association Officer Signature | Date |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |

# Appendix 7 Petition for Traffic Calming

## TRAFFIC CALMING PETITION FORM

**Page _____ of _____**

Petition to modify the traffic flow on _____ between _____ and _____

**BEFORE YOU SIGN THIS PETITION, KNOW WHAT YOU ARE SIGNING! IT IS RECOMMENDED THAT YOU FIRST READ THE *CITY OF MUSKOGEE'S TRAFFIC CALMING POLICY AND PROCEDURE* GUIDELINES.**

**Note:** The street; mentioned above will be considered for a traffic calming device installation only if the signatures below represent **seventy five percent (75%) or more** of all property owners adjacent to the street. Only one signature from each property owner will be considered. All persons signing this petition do hereby certify that they reside within the area impacted by the traffic calming device.

| Address | Name (Please Print) | Signature | Whether Owner or Renter | Phone Number | | Ok to Install in Front of My Residence (Please Initial) |
|---|---|---|---|---|---|---|
| | | | | Home | Work | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# Traffic Calming Petition Form

**Page _____ of _____.**

| Address | Name (Please Print) | Signature | Whether Owner or Renter | Phone Number | | Ok to Install in Front of My Residence (Please Initial) |
|---|---|---|---|---|---|---|
| | | | | Home | Work | |
| | | | | | | |
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# Appendix 8 Glossary

**24-Hour Volume**: The 24 hour traffic volume for both directions collected as near as practical at the midpoint of the street.

**85th Percentile Speed:** Is that speed below which 85% of all traffic units travel. It is an accepted principal that the majority of drivers on a roadway select safe and proper speeds based on roadway and traffic conditions. The 85th percentile speed is often used because it is on the high end of a "normal' bell curve distribution. Typically, recorded speeds above 85th percentile occur much less frequently than the speeds below it because the highest speeds are often erroneous readings or the result of a few drivers who are either unperceptive of roadway conditions or irresponsible. The generally accepted traffic engineering practice is to set speed limits at the nearest increment to the 85th percentile speed unless other considerations such as accidents and real dangers not perceivable by drivers may indicate the need for a lower speed limit. Since speed limits are generally set using the 85th percentile, it is expected that 15% of the vehicles will exceed the speed limit on a regular basis.

**Access:** Access refers to modes of transportation permitted to enter or exit an area or pass a specific location (such as with a barrier incorporating gaps to permit bicycle access), or specific movements that are permitted at an intersection (such as with an obstruction which permits right turn access only). The term is also used when describing the location of driveways and walkways providing access to a property.
**See *egress and ingress***

**Appeal Process:** The right to appeal the decision of the Public Works Department to the City Council.

**Applicant:** The applicant means property owner, business owner, staff member or citizen requesting the traffic study and the traffic calming measure.

**Application Fee:** An application fee, in the amount of $500$^{\underline{00}}$, will be charged to the applicant prior to performing the detailed traffic study. The application fee will be credited to the applicant if the traffic calming measures are approved for installation. The fee will be refunded if traffic calming measures are not approved. The application fee is not required for Staff generated request.

**Arterial Street**: A major street for which the primary functions is to provide for vehicle movements as defined by the Subdivision Regulations.

**Channelization:** The separation and direction of vehicle and pedestrian movements at an intersection into defined paths through the use of roadway features and signs.

**Chicane:** A series of curb extensions on alternating sides of a roadway, which narrow the roadway and require drivers to steer from one side of the roadway to the other to travel through the chicane. Typically, a series of at least three curb extensions is used.

**Collector Street:** A street for which vehicle movement and access are of equal importance and as defined by the Subdivision Regulations.

**Curb Extension:** A horizontal intrusion of the curb into the roadway resulting in a narrower section of roadway.

**Curb Radius:** The circular curved curb connecting the tangent curb sections of two intersecting streets.

**Curve:** A horizontal or vertical deviation in a roadway. A horizontal curve appears as a bend in the roadway, requiring motorists to turn the steering wheel. A vertical curve appears either as a "crest" or a "sag" to provide for a change in gradient.

**Deflection:** A vertical and/or horizontal change in the course or path of a vehicle as the result of a physical feature of a roadway. For example, a speed hump deflects the wheels, suspension, and chassis of a vehicle in a vertical deflection. A traffic circle requires that the vehicle be steered or deflected horizontally from its straight path to maneuver past the circle.

**Device:** A physical feature of the roadway, constructed for the purpose of affecting the movement of motor vehicles, bicycles and/or pedestrians.

**Directional Closure:** A curb extension or vertical barrier extending to approximately the centerline of a roadway, effectively obstructing (prohibiting) one direction of traffic.

**Diverter:** A raised barrier placed diagonally across an intersection, that forces traffic to turn and prevents traffic from proceeding straight through the intersection.

**Egress:** A way of exiting or traveling away from a location. Is used when describing which vehicle movements may be permitted at an intersection (such as with an egress-only barrier). Is also used when describing the location of driveways and walkways providing egress from a property.
***See access***

**Full Closure:** A barrier extending across the entire width of a roadway, which obstructs all motor vehicle traffic movements from continuing along the roadway.

**Geometry:** When referring to roadway design, geometry refers to the physical characteristics and dimensions of the roadway.

**Guideline:** A recommended practice, method or value for a specific design feature, but not a requirement.
***See standard***

**Ingress:** A way of entering into a location. Is used when describing which vehicle movements may be permitted at an intersection (such as ingress-only barrier). Is also used when describing the location of driveways and walkways providing ingress to a property.
***See access***

**Intersection:** Raised islands located in an intersection, used to obstruct specific traffic channelization movements and physically direct traffic through an intersection.

**Neighborhood:** A district with characteristics that distinguishes it from the area around it and has people who live near each other.

**Plan:** A formulated and sufficiently detailed description of how an objective or number of objectives is to be accomplished. A traffic-calming plan typically describes measures to be used, where they are to be located, in what order and at what times they will implemented, and how the costs of the measures will be funded.

**Posted Speed Limits:** That speed which is posted and displayed on a regulatory sign for a section or type of road, and is the maximum legal travel speed.

**Property Owner:** One who has complete dominion over particular property and who is the one in whom legal or equitable title rests, when applied to a building or land.

**Raised Crosswalk:** A marked pedestrian crosswalk at an intersection or mid-block location that is constructed at a higher elevation then the adjacent roadway.

**Raised Intersection:** An intersection, including crosswalks, constructed at a higher elevation than the adjacent roadways.

**Raised Median:** An elevated median located on the centerline of a two-way roadway to reduce the overall width of the adjacent travel lanes.

**Raised Median Through Intersection:** An elevated median located on the centerline of a two way roadway through an intersection, which prevents left turns and through movements to and from the intersection roadway.

**Requested Street or Requested Street Segment:** That segment of roadway requested for traffic calming consideration by an applicant.

**Right-in/Right-out:** A raised triangular island at an intersection approach that obstructs left Island turns and through movements to and from the intersection street or driveway.

**Roadway:** The reconstruction of a roadway or other transportation facility with Rehabilitation physical improvements to the existing design.

**Roundabout:** Similar to a traffic circle. Roundabouts are typically used on arterial and collector streets, and distinguished by yield signs and a raised median island on all approaches and in some cases, flare of the entry approach to two or more lanes.
***See traffic circle***

**Rumble Strips:** Raised buttons, bars or grooves closely spaced at regular intervals on the roadway that create both noise and vibration in a moving vehicle.

**Self-enforcing:** A traffic calming measure that does not require police enforcement in order to be effective. A speed hump is self-enforcing, for example, whereas a posted maximum legal vehicle speed is not self-enforcing.

**Short-cutting:** Traffic that travels through a neighborhood to bypass congestion on the arterial network or to make use of a more direct route.
***See through traffic***

**Signalized:** An intersection at which signals have been installed, typically to control vehicle movements on all approaches. May also describe a location that has been signalized to permit pedestrians to actuate signals that stop vehicles on an arterial street or collector street so the pedestrians may cross.

**Speed Hump:** A raised area of a roadway, which vertically deflects both the wheels and frame of a traversing vehicle.

**Speeding:** To determine whether speeding is a problem on a street during a particular time period, the 85th percentile speed of all vehicles passing during the time period is typically regarded as the representative speed. The 85th percentile speed is the speed exceeded by the fastest 15% of vehicles. When the 85th percentile speed exceeds the posted speed limits, this is generally considered as indicating a speed problem.

**Stakeholder:** An individual or organization with an interest in transportation issues in a neighborhood or specific location. Examples of stakeholders include residents associations, a chamber of commerce, a local transit agency, cycling advocates, and agency assisting disabled persons, and school boards.

**Standard:** A value for a specific design feature, which practice or theory has shown to be appropriate where the prevailing circumstances are normal, and where no unusual constraints influence the design.

**Streetscaping:** A means of enhancing the street environment for all users of the right-of way, and a means of modifying motorist behavior, through the use of physical features which provide protection, coherence, security, convenience, neighborhood identify, way finding and orientation, aesthetic quality and interest along an urban street.

**Subdivision:** An area composed of subdivided lots.

**Textured Crosswalks:** A crosswalk incorporating a textured and/or patterned surface that contrasts with the adjacent roadway.

**Through Traffic:** Traffic traveling through a neighborhood, and does not originate from, nor is destined to, a location within the neighborhood.
***See short-cutting***

**Timing:** When referring to traffic signals, timing describes the amount of time allocated to each interval within each signal phase. For example, 25 seconds might be allocated to the green interval, followed by 4 seconds yellow interval, followed by a 1 second all red interval before the next phase begins.

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

**Traffic Circle:** A raised island located in the center of an intersection, which requires vehicles to travel through the intersection in a counter-clockwise direction around the island.

**Traffic Generator:** A single land use, generating significant amounts of single or one direction vehicle movements, with either the origin or destination (entering or exiting) inside a study site.

**Traffic Management:** The change in traffic routing or flow with in a neighborhood street system through combination of measures that alter route options.

**Turn Prohibition:** A regulation prohibiting a left turn or right turn at an intersection.

**Unimpeded Street Length:** The length of the street segment between speed impediments, (i.e. stop signs, traffic signals, sharp turns, cul-de-sacs, etc)

**Volume:** When referring to traffic, volume is a measure of the number of vehicles traveling along a section of roadway, or those making a particular movement during a specific time period. Most often, traffic volumes are indicated as vehicles per hour during the peak hour, or vehicles per 24 hour period.