Guidelines on Traffic Calming Devices

Capital Projects Division
Public Works Department
City of Kansas City, Missouri

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INTRODUCTION

Traffic calming is an integrated approach to traffic planning that seeks to create a more livable urban environment by reducing the undesirable impacts that traffic can have on neighborhoods. Traffic calming guidelines for Kansas City have been developed to preserve a vital urban environment where people can live and work without being threatened by traffic related problems. The most common traffic problems on local streets and residential collectors are associated with the following elements.

- Excessive speeds
- Cut through traffic
- Through truck traffic

These in turn can lead to related problems such as traffic noise, accidents, and difficulties for pedestrians and bicyclists.

Traffic calming looks at three kinds of possible solutions education, enforcement, and engineering. Education solutions instruct people on ways they can help ease traffic problems, for example, by reducing their speed or traveling by bus or bicycle instead of automobile. Enforcement solutions enlist the help of the Police Department's Traffic Enforcement Unit to focus enforcement efforts on the streets and increase community awareness of speeding problems. Engineering solutions include providing a variety of traffic calming device options that can help reduce speed, decrease truck or passenger car volumes, and improve safety on local streets and residential collectors.

The goal of Kansas City's Traffic Calming Program is to provide for the safe and efficient movement of persons and goods while preserving, enhancing, and reclaiming the neighborhoods' livability. The objectives of these guidelines are to:

- Develop criteria for the selection and placement of traffic calming devices for speeding traffic, cut through traffic, and through truck traffic on local streets and residential collectors.
- Types of Traffic Calming Devices
- Establish a process for plan development and implementation.

These topics are discussed in the following sections of the guidelines.

CRITERIA FOR CONSIDERATION OF PLACEMENT OF TRAFFIC CALMING DEVICES

In order to make efficient use of available funds, keep frustration levels of drivers to a minimum, and to minimize negative impacts of calming devices such as effects on emergency vehicles, increase in traffic volumes on other neighborhood streets, appropriate criteria for the selection of street or street segment(s) for the installation of traffic calming devices must be developed. Separate criteria have been prepared for the selection of devices for reducing speeds, decreasing cut through or excessive truck volumes, and eliminating through traffic.

I. Criteria to be met for the selection of street or street segment(s) for calming devices to reduce speeds:

- The street must be classified as a local facility or residential collector with curb and gutter where 75 percent of the properties with frontage on the street must be in residential zoning.
- The posted speed limit must be no more than 30 M.P.H. and the 85th percentile speed observed is at least 7 M.P.H. over the speed limit.
- All other efforts have failed to lower speeds.

II. Criteria to be met for the selection of street or street segment(s) for calming devices to reduce the volume of cut through traffic:

- The street must be classified as a local street or residential collector.
- The typical weekday 24-hour traffic volume must exceed 500 vehicles per day for local streets and 1,500 vehicles per day for residential collectors. Alternative actions should be considered when traffic volumes on the study street exceed 5,000 vehicles per day. A system analysis is recommended to thoroughly examine potential improvements on the major routes that would provide the needed capacity.
- Other arterial and collector facilities are available to accommodate diverted traffic.

III. Criteria to be met for the selection of street or street segment(s) for calming devices to reduce through truck traffic:

- The street must be classified as a local street or residential collector.
- At least 4 percent of the traffic volume on the roadway section should be composed of trucks.
- The street segment under consideration must be at least two blocks in length.
- Other arterial and collector facilities are available to accommodate diverted truck traffic.

IV. Criteria to be met for the selection of street or street segment(s) for calming devices to eliminate through traffic:

- The street must be classified as a local street.
- The typical weekday 24-hour traffic must exceed 500 vehicles per day.
- The segment that is closed should be no greater than one block in length.
- The proposed closure must be approved by the Police and Fire Departments.
- The street segment proposed for closure must not be used by school or A.T.A. buses.

TYPES OF CALMING DEVICES

Stop signs are often requested to reduce vehicular speeds. However, stop signs have been found to be ineffective in reducing speeds and are only installed to assign right-of-way at locations wherever necessary. Unless the traffic conditions at the intersection meet the criteria in the Manual on Uniform Traffic Control Devices for stop sign applications or multiway stop applications, a stop sign will not be installed as a traffic calming device.
However, there are several physical controls available to reduce vehicular speeds and cut-through traffic or through truck traffic. The most successful and commonly used techniques for reducing speeds are speed humps Other successful and commonly used devices to reduce cut-through traffic or through truck traffic include traffic circles, diagonal diverters, entrance gates, forced turn channelization, improvement of major streets, one way streets, semidiverters, and turn prohibitions. Cul-de-sacs are used to eliminate through traffic.

The most appropriate device from the above list will be selected for traffic problems identified in the Kansas City area. A brief explanation of the physical devices and their impacts follow.

Devices to Reduce Speeds: As mentioned above, speed humps are commonly used to reduce speeds. These devices are described below.

Speed Humps: (Detail 1) is a permanent section of pavement 14 ft. long. The speed hump design is 3 inches at their highest point and varies in width, depending on the width of the road traversing. The number of speed humps installed on a street depends on the length of the street. For speed humps to be effective, they must be installed in a series, approximately 250 to 600 feet apart. Speed humps can only be installed on paved residential streets with curbing. Speed humps should be located a minimum distance of 150 feet from the intersection. Speed humps must be installed at least 15-20 feet away from the driveways and alleys. Speed humps must not be placed on residential collector streets with a double yellow centerline and where the typical weekday 24-hour traffic volume exceeds 1,500 vehicles-per-day. The street segment under consideration must be at least 550 feet. The grade of the street must not exceed 8%, and drainage of the street must not be compromised.

It has been found that speed hump installations provide a substantial reduction in overall speeds on the streets they have been installed.

Devices to Reduce Cut through Traffic and Excessive Truck Traffic: Several successful physical controls have been used to reduce cut through traffic and excessive truck traffic. These devices are described below. However, alternates such as improving arterial streets, installing turn prohibitions, one-way street conversions or other appropriate measures may also be considered.

Traffic Circles are traffic calming devices that can be used to control the speed of traffic through an intersection along with discouraging traffic from cutting through. They appear as landscaped circular shaped islands in the center of intersecting roadways. The reduction in street width caused by the introduction of a traffic circle causes drivers to slow down as they pass the restriction. To truly be effective, approach splitter islands need to be installed to direct traffic counterclockwise through the intersection. However, this device may have limited effects on mid-block speeds. There is also evidence that properly designed and installed traffic circles reduce vehicle accidents at intersections due to slower speeds by motorists negotiating the device. These devices if installed may also result in the reduction of traffic volumes.

Semidiverters: Typically used to deter traffic from cutting through a residential neighborhood from a congested arterial street. The semi-diverter is a physical reinforcement to the regulatory "Do Not Enter" and turn prohibition signs on the crossing street. Semi-diverters have the advantage of providing minimal impediment to emergency vehicles and allowing two-way traffic flow once past the restriction.

Forced Turn Channelization: Limits certain traffic movements at intersections through a combination of signal and traffic islands. Channelization is intended to make travel through a neighborhood difficult but does not restrict it entirely. Adverse safety impacts are minimal and violation rates are generally low.

Diagonal Diverters: A diagonal diverter converts an intersection into two unconnected streets by placing a barrier diagonally through the intersection. This prevents direct uninterrupted movement through the neighborhood by forcing a turn at the barrier. Nonlocal traffic must traverse a longer distance through the neighborhood, diminishing the street's attractiveness as a through route. It has an advantage over cul-de-sacing in that traffic is not "trapped" on the street, making the installation more acceptable to local residents and the street more accessible to emergency vehicles. The violation rate is low, landscaping potential exists, and adverse safety impacts are minimized through proper design, advance signing, and pavement markings. The main drawback of a diagonal diverter is that use of the device in a simple installation simply diverts traffic onto another local street. It is important that the installation of the diagonal diverter be a part of a system of neighborhood traffic control devices that considers the needs of the neighborhood as a whole, not just one street.

Intersection Cul-de-sacs and Mid-block Cul-de-sacs: Cul-de-sacing is a commonly used and very effective way of eliminating non-local traffic on a street. However, there are inherent problems in closing a street. The response time of emergency vehicles may be increased and residents will have only one-way to and from the street. If unwanted through

traffic is a persistent problem and a high violation rate is noted with other traffic devices, cul-de-sac may be an alternative. Cul-de-sacs can be landscaped to add to the environment of the street.

PROCESS FOR PLAN DEVELOPMENT AND IMPLEMENTATION

PROCEDURE FOR REQUESTING TRAFFIC CALMING DEVICES (SPEED HUMPS)

The City of Kansas City has established a mechanism by which Traffic Calming Devices (speed humps) can be installed to address speeding concerns on residential streets. Some of the effects are listed below:

ADVANTAGES

- Significant reduction of travel speeds at or near the devices. For effective speed reduction, a series of devices is needed along long, straight streets.
- The devices provide 24-hour, year-round service in an attempt to control high travel speeds along residential streets.
- May discourage cut-through traffic that is using residential streets due to congested conditions on an adjacent arterial or major collector street.
- Average daily traffic volumes may decrease on residential streets thus reassigning traffic volumes to appropriate street classification usage (collector, arterial).

DISADVANTAGES

- Inability to reduce travel speeds to a desired level for the neighborhood.
- Will increase response times for emergency vehicles into area.
- Traffic diversion may cause increased volumes on other streets within the neighborhood.
- Increased noise level due to vehicle shifting cargo and acceleration/deceleration at the device.

Since there are some disadvantages associated with these devices, the City of Kansas City needs to assure that strong neighborhood support exists for their installation. Therefore, the following procedure has been established to guide residents through the request procedure.

1. The requestor of Traffic Calming (Speed Humps) will be given the opportunity to receive a copy of these guidelines. To continue with the process, the requestor will need to review the guidelines and determine whether they wished to become the neighborhood liaison.

2. The neighborhood must have a liaison willing to serve as a contact person with whom the City can work throughout the request process. This person should contact Capital Projects Division, Public Works at 816-513-9846 for a preliminary inspection.

3. In the preliminary inspection, a City representative from Capital Projects Division, Public Works will check for traffic conditions on the street where the devices are desired. A location may not be studied more than once in a twelve-month period, unless significant changes in traffic conditions occur. Devices shall be considered for installation only when a location meets all of the warranting criteria.

The warranting criteria for consideration of speed humps are as follows:

- The devices must be located on a paved, residential street (alleys are not eligible);
- The street should have vertical curb abutting the proposed device locations. Devices may be placed on streets with roll curb after a review to determine the best possible location. In this case, it may be necessary to take additional measures to prevent drivers from going around the device, however streets without curb will not be considered;
- The posted speed limit on the street shall be 30 m.p.h. or less;
- The 85th percentile speed on the street should be at least 7 m.p.h. over the posted speed limit(a speed study may or may not need to be required);
- Traffic volumes on the street must fall between 500 and 1,500 vehicles per day.
- Devices shall not be located within 150 feet of a stop sign or traffic signal on the subject street;
- The street is not designated as an arterial or major collector street;
- Speed humps can be installed on a street with longitudinal grades less than 8 percent and where the sight distance is not restricted.
- Drainage on the street shall not be compromised due to the installation of the device;
- The Kansas City Fire Department retains the right to veto any street segment.

If the location meets the warranting criteria and favorable conditions exist, the neighborhood liaison along with the Capital Projects Division, Public Works representative will review possible device locations.

4. Adequate neighborhood support must be shown for the project.

Affected Property Owner Survey

A survey is needed for those property owners who would be directly and indirectly affected by the devices. The Capital Projects Division, Public Works representative will determine affected properties in the area. At a minimum, the affected properties will include all that abut the street on which the devices are being considered, and a minimum of 300 feet on each side of any connecting streets. If a street parallel to the subject street is encountered prior to three properties or the 300 foot distance, no additional property owners need be notified on that street unless City staff recommends additional notifications. Also, the neighborhood liaison must live in the affected area, or be an officer with the Neighborhood homes association to be eligible to act as the neighborhood liaison. The neighborhood liaison must then circulate a survey of acceptance (petition) to the affected property owners. The survey must confirm at least 75% approval from the affected property owners to install the devices. Property owners who do not respond to the survey process or mark "no opinion" are considered opposed to the installation. All property owners within 50 feet along each side of the device must approve of the installation. If there is less than 75% approval from affected residents, or if it is not possible to place the devices on the street under consideration due to opposition from adjacent property owners, no device will be installed. The City of Kansas City Public Works, Capital Projects Division does not have funding for traffic calming. The neighborhood can either fund the project or request funding from PIAC (Public Improvement Advisory Committee). Please call PIAC at 816-513-1322 for information. Please include the completed survey upon submitting your request for

funding to PIAC. If the neighborhood funds the project, please submit the completed survey to City of Kansas City, Missouri Public Works, Capital Projects Division.

4. Once neighborhood support is confirmed (via the neighborhood survey for speed hump installations) and the project is funded, City staff will identify exact locations for the devices based on input from the survey. Shortly prior to construction, City staff will confirm that property owners within 50 feet of each proposed device continue to support the installation at that location. In the event that support is withdrawn, staff and the neighborhood liaison will determine whether a suitable alternate location exists and whether to proceed with the remaining device installations.

Removal of Speed Humps or Speed Cushions

Once devices have been in place for at least one year, a survey (petition) requesting removal may be conducted and submitted to the Capital Projects Division, Public Works. All affected properties, which were previously identified in the neighborhood survey process, shall be involved in the removal process as well. A petition signed by 75% of residents or owners in the originally defined petition area and all the residents directly affected is required. Property owners who do not respond to the survey process or mark "no opinion" are considered opposed to the removal of the devices. Once the survey has been verified, the cost of the removal of the devices will be the responsibility of the residents signing the petition. Devices removed from a location under this process cannot be reconsidered for re-installation for three years after the devices are removed.

Design/Construction Specifications

The City of Kansas City has adopted a speed hump design, a 14-foot long speed hump. The speed hump design is 3 inches at their highest point and varies in width, depending on the width of the road traversing. (See Detail 1).

Definition of Terms

Local Street or Residential Collector: These facilities are defined as roadways not included on the major street plan and where 75 percent of the properties with frontage on the street is in residential zoning.

Trucks: Are vehicles having three or more axles or measure greater than 32 feet or weight 20,000 pounds or more.

85th Percentile Speed: Is the speed at or below which 85 percent of the motorists are observed to be traveling at.

Residents Directly Affected: Are residents fronting the segment of the street where the proposed traffic calming device and supplemented signs will be installed.

Neighborhood Acceptance Form (Petition)

Petition for Installation of a Traffic Calming Device to eliminate Cut-through traffic

Instructions

Please obtain the name, address, signature, and phone number of residents favoring the proposed action. Obtain only one signature per household. Upon completion, return the neighborhood acceptance form to: City of Kansas City, Public Works Department, Capital Projects Division, Traffic Operations Center, 5310 Municipal Avenue, Kansas City, MO 64120. Make as many copies of this form as necessary but return them all together.

The City of Kansas City requires that one hundred percent (100%) of the residents or owners within the petition area must support the proposal (including vacant property(s)) in the proposed blocks(s). The petition area should include residences on the proposed study street section and residents on all other streets that are required to use the facility on which the traffic calming device is to be installed; such as, an intersecting street with a cul-de-sac.
Furthermore, residents on other streets that do not have a reasonable alternate travel path (as determined by the Director of Public Works) to a collector or arterial roadway may be included in the petition area. Please contact the Capital Projects Division at 816-513-9846 for help in identifying the petition area.

The attached is a sample acceptance (petition) form that may be used for this purpose.

Neighborhood Acceptance Form (Petition)

Petition for Installation of a Traffic Calming Device to eliminate Cut-through traffic

We, the undersigned, request the installation of a traffic calming device to eliminate cut-through traffic along_____ from_____ to_____.

Name (print)	Address	Signature	Telephone

Neighborhood Acceptance Form (Petition)

Petition for Installation of Traffic Calming Devices (Speed Humps) to reduce speeds

Instructions

Please obtain the name, address, signature, and phone number of residents favoring the proposed action. Obtain only one signature per household. Upon completion, return the neighborhood acceptance form to: City of Kansas City, Public Works Department, Capital Projects Division, Traffic Operations Center, 5310 Municipal Avenue, Kansas City, MO 64120. Make as many copies of this form as necessary but return them all together.

The City of Kansas City requires that seventy five percent (75%) of the residents or owners within the petition area must support the proposal (including vacant property(s)) in the proposed blocks(s). The petition area should include residences on the proposed study street section and residents on all other streets that are required to use the facility on which the traffic calming device is to be installed; such as, an intersecting street with a cul-de-sac.
Furthermore, residents on other streets that do not have a reasonable alternate travel path (as determined by the Director of Public Works) to a collector or arterial roadway may be included in the petition area. Please contact the Capital Projects Division at 816-513-9846 for help in identifying the petition area.

The attached is a sample acceptance (petition) form that may be used for this purpose.

Neighborhood Acceptance Form (Petition)

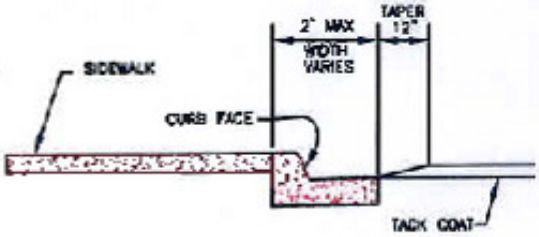
Petition for Installation of a Traffic Calming Devices (Speed Humps) to reduce vehicular speeds

We, the undersigned, request the installation of Speed Humps to reduce vehicular speeds along_____ from_____ to_____.

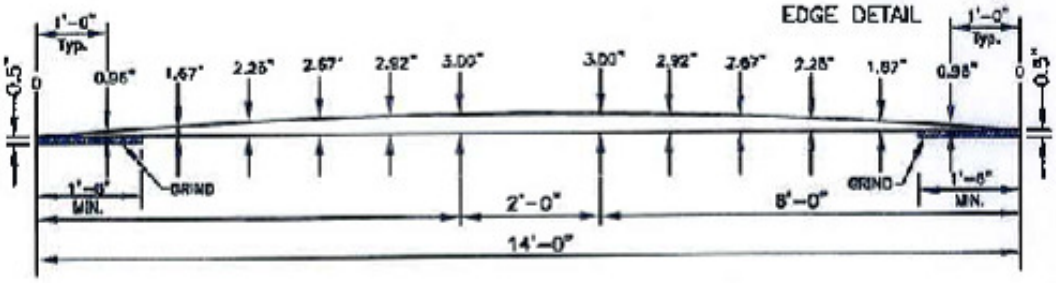
Name (print)	Address	Signature	Telephone

SPEED HUMP SPECIFICATIONS

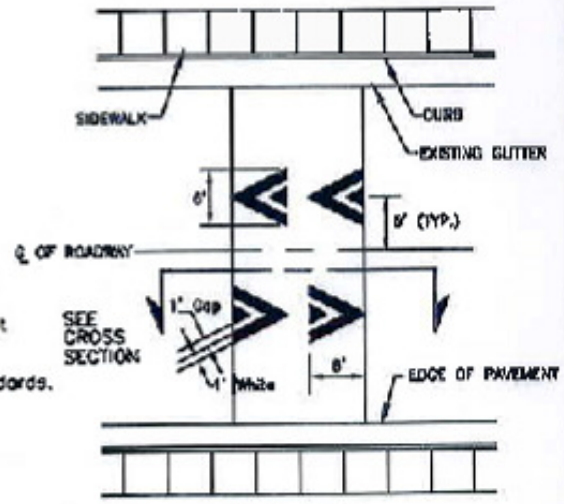
IMPORTANT: Speed Humps to be 3" in height to provide maximum effectiveness, while not being overly restrictive to emergency police and fire vehicles.



EDGE DETAIL



CROSS SECTION



PLAN VIEW

1. Speed humps shall not be placed over manholes, water valves, survey monuments, ect.
2. Speed humps shall not be installed in a location such that roadway drainage is compromised.
3. Speed humps to be constructed with RC Type 01-3 Asphaltic Concrete or as Directed by KCMO. A tack coat shall be applied prior to application of pavement material.
4. Striping to be installed by contractor per KCMO Standards. Contact City of KCMO sign shop one week prior to installation to coordinate placement of signs.

DETAIL 1:14' SPEED HUMP

KANSAS CITY, MISSOURI PUBLIC WORKS DEPARTMENT	
SPEED HUMP	
DRAWN BY: BV DATE: 1/16/10	APPROVED BY: JERRY NELSON DATE: