AN ORDINANCE OF THE TOWN OF FAIRVIEW, TEXAS

ORDINANCE NO. 95-254

AN ORDINANCE OF THE TOWN OF FAIRVIEW, TEXAS, AMENDING CHAPTER 9 OF THE CODE OF ORDINANCES OF THE TOWN BY ADDING THERETO A NEW ARTICLE III ESTABLISHING POLICY AND DESIGN FOR SPEED HUMPS INSTALLATION WITHIN THE TOWN; PROVIDING A REPEALING CLAUSE; PROVIDING A SAVINGS CLAUSE; PROVIDING A SEVERABILITY CLAUSE; AND DECLARING AN EFFECTIVE DATE.

BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF FAIRVIEW, TEXAS:

SECTION 1. That Chapter 9 of the Code Of Ordinances of the Town of Fairview, Texas, is here by amended by adding thereto a new Article III to read as follows:

CHAPTER 9
ROADS, STREETS & DRAINAGE

"ARTICLE III. SPEED HUMP POLICY & DESIGN

Section 9-9 POLICY GOVERNING SPEED HUMPS

The following EXHIBIT "III-A" is hereby adopted as the Policy of the Town of Fairview governing installation and removal of speed humps within the Town of Fairview.

Section 9-10 The following EXHIBIT "III-B" is hereby adopted as guidelines for the design and application of speed humps within the Town of Fairview.

SECTION 2. REPEALING CLAUSE

All parts of ordinances, inconsistent or in conflict with the provisions of this Ordinance are hereby repealed.

SECTION 3. SAVINGS CLAUSE

An offense committed before the effective date of this ordinance shall be governed by the prior law and the provisions of the Code of Ordinances, as amended, and in effect when the offense was committed and the former law is continued in effect for this purpose.

SECTION 4. SEVERABILITY CLAUSE

If any article, paragraph or subdivision, clause or provision of this ordinance shall be adjudged invalid or held unconstitutional, the same shall not affect the validity of this ordinance as a whole or any part or provision thereof, other than the part so decided to be invalid or unconstitutional.

SECTION 5. EFFECTIVE DATE

This ordinance shall take effect immediately upon its passage as the as the law in such cases provide.

DULY PASSED by the Town Council of the Town of Fairview, Texas, on the 9th day of May, 1995.

APPROVED:

DAVID N. LINK, MAYOR

ATTEST:

Colleen Stein

COLLEEN STEIN, TOWN SECRETARY

APPROVED AS TO FORM:

Lawrence W. Jackson

LAWRENCE W. JACKSON,
TOWN ATTORNEY

Speed Hump Policy

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Town of Fairview

Policy Governing the Installation and Removal of Speed Humps within the Town Limits

EXHIBIT "III-A"

SPEED HUMP POLICY

TOWN OF FAIRVIEW

Introduction

While proper transportation planning, subdivision layout and residential street design are the most effective methods of reducing residential traffic problems, these goals are not always achievable. In many cases, a successful traffic management program is dependent more on public participation and consensus building than on the particular traffic control technique used. The Institute of Transportation Engineers (ITE) has recognized the need for providing transportation professionals and community leaders with strategies and techniques for effectively reducing vehicle speeds and "cut through" traffic in residential neighborhoods. To address that need. the Institute has developed and published their Guidelines for the Design and Application of Speed Humps. A copy of the ITE document is attached to this policy. Refer to Appendix A and B for additional information on speed humps, their construction and installation.

Speed humps should only be installed to address documented speeding and "cut through" traffic concerns supported by proper traffic studies and after consideration of alternative traffic control measures (i.e. proper speed / stop signage). Proper installation will minimize driver frustration and encourage safe driving practices. Studies have shown that speed humps may tend to divert traffic to other streets. If the installation of speed humps is expected to create equal or greater traffic problems on other residential street(s), property owners on the affected street(s) will be notified of the proposed speed hump petition. **NOTE: For the purposes of this policy, each spouse is considered to be a property owner**.

This policy provides reasonable opportunities for property owners most affected by the proposed speed humps to participate in the process that leads to speed hump installation. It also provides for the sharing of speed hump installation costs among the affected neighborhood property owners along with the Town of Fairview.

Eligibility Requirements

All of the eligibility requirements established in the ITE recommended guidelines, including the following requirements shall apply in the consideration of speed hump installations:

- Speed humps will be installed only on streets with no more than one moving lane of traffic in each direction;
- A speed hump will not be located in front of a property if the owner objects;
- A minimum street or street segment length of 1000 feet is required;

- The street must have adequate sight distances to safely accommodate the speed humps;
- The street must not have curves or grades that prevent safe placement of the speed humps. Speed humps may be placed on streets with curves and/or grades, but the speed humps must not be placed within a curve, on a grade greater than 8% or their immediate approaches.;
- The street must be paved. If there are no curbs, a special design must be used to prevent vehicle "run-arounds";
- The land uses on the street where the speed humps are proposed must be composed primarily of low density residential dwellings;
- Minimum distance between a proposed speed hump and a traffic signal or stop sign must be no less than 250 feet;

To help in the decision making process, the Town may ask the designated neighborhood contact or applicant to conduct a traffic speed survey. This survey will be designed to monitor traffic at various times of the day over a specified time period. Instructions, forms and equipment will be furnished by the Town.

Petition Requirements

A petition for speed hump installation must be circulated among all property owners within a defined area called the "petition area". To be considered, the petition must be circulated such that 100% of the property owners within the petition area are given a reasonable opportunity to indicate whether FOR or AGAINST the installation of speed humps in their neighborhood. A designated contact person or applicant from the neighborhood will be responsible for collecting the required signatures and submitting the petition to the Town.

For the petition to be successful, at least 67% of the property owners within the petition area must favor the installation of speed humps in their neighborhood. The Public Works Committee will provide information regarding the proximity of proposed speed hump locations on the subject street and a cost estimate to the applicant before the petition process begins. It is the responsibility of the applicant to obtain the support of the property owners in the petition area and, if required, to notify property owners on other affected streets as defined by the Public Works Committee. All signatures on the petition will be verified by the Town based on tax rolls. An example copy of a Speed Hump Petition is shown in Appendix C.

Petition Area

The petition area includes the entire length of the street segment most affected by the proposed speed humps. Typical petition area illustrations are shown in Appendix D. As defined earlier, a 1,000 foot street or street segment is a minimum requirement for consideration of speed hump installation. The minimum petition area shall include all the property owners lying in a multi-lot area immediately adjacent to the length of the petitioned street segment. The minimum petition area, when practical, will be extended

by at least 3 lots preceding the first speed hump location and 3 lots beyond the last speed hump location. The Public Works Committee will have the responsibility of defining the petition area for a specific speed hump installation petition but, in no case, will it be less than the minimum petition area.

Speed Hump Removal

The process for speed hump removal is similar to that of installation. To have speed humps removed, a petition must be circulated to all property owners in the original installation petition area. This information can be obtained from the Town. The Public Works Committee will have the responsibility for modifying the petition area, if required. In order to be successful, the removal petition must be approved by 67% of the property owners within the petition area. Upon obtaining a successful petition, the applicant must submit it to the Town for final approval.

Cost and Funding

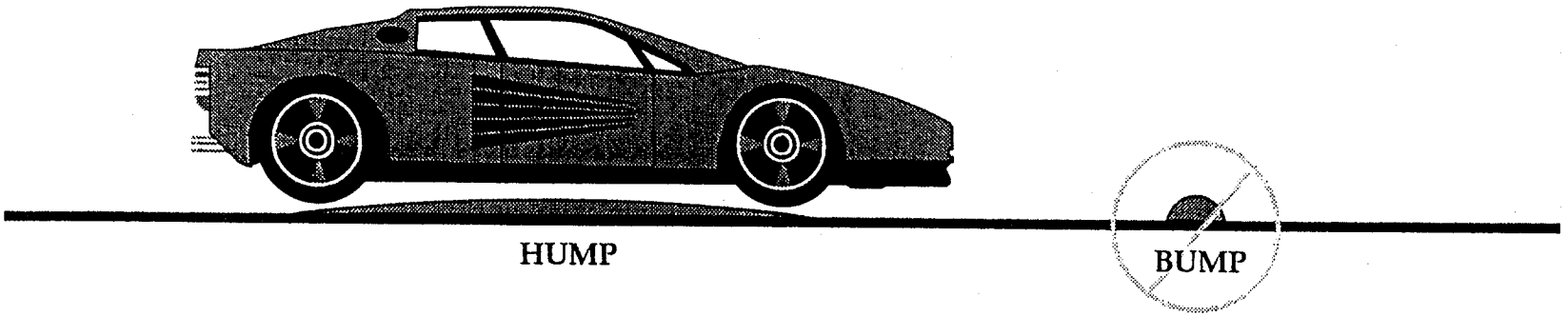
The cost of speed hump installation consists of the cost of asphalt materials, supplemental signs and markings and labor costs. All speed hump installation requests that meet eligibility and petition requirements and are approved by the Town Council will be installed on a 50/50 cost share with the requesting neighborhood. All speed hump removal requests that meet petition requirements and are approved by the Town Council will be removed at the expense of the requesting neighborhood. The applicant will receive a cost assessment from the Town Council and will be responsible for collecting and delivering the collected funds to the Town. Installation or removal will begin as soon afterwards as scheduling permits. The applicant must deliver their total funds (50% share for installation; 100% share for removal) within 6 months after Town approval, otherwise the project will be removed from the approved list and any partial funds collected will be returned to the applicant.

Approved: _____ Date: _____

Approved: _____ Date: _____

Speed Humps vs. Speed Bumps

Appendix A



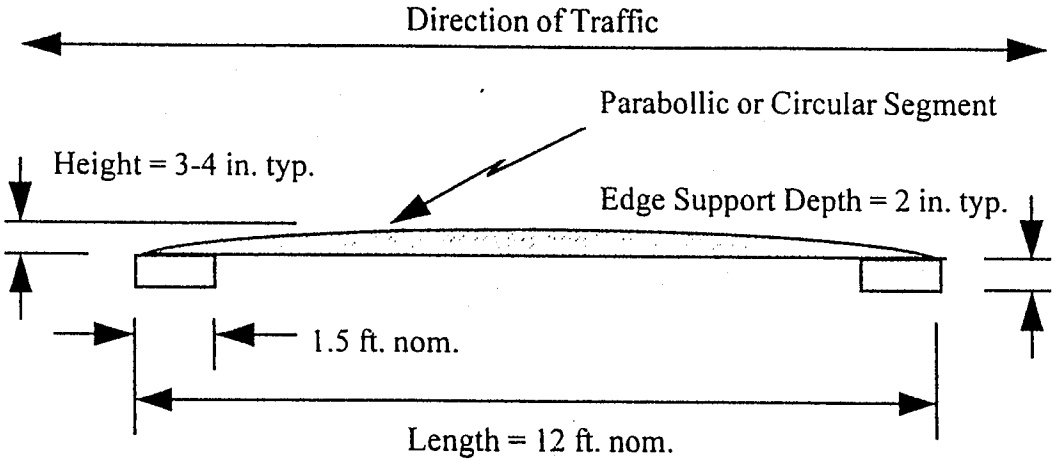
- A "speed hump" is a raised area in the roadway surface extending traversely across the travel way. Normally 3-4 inches high with a travel length of approximately 12 feet.

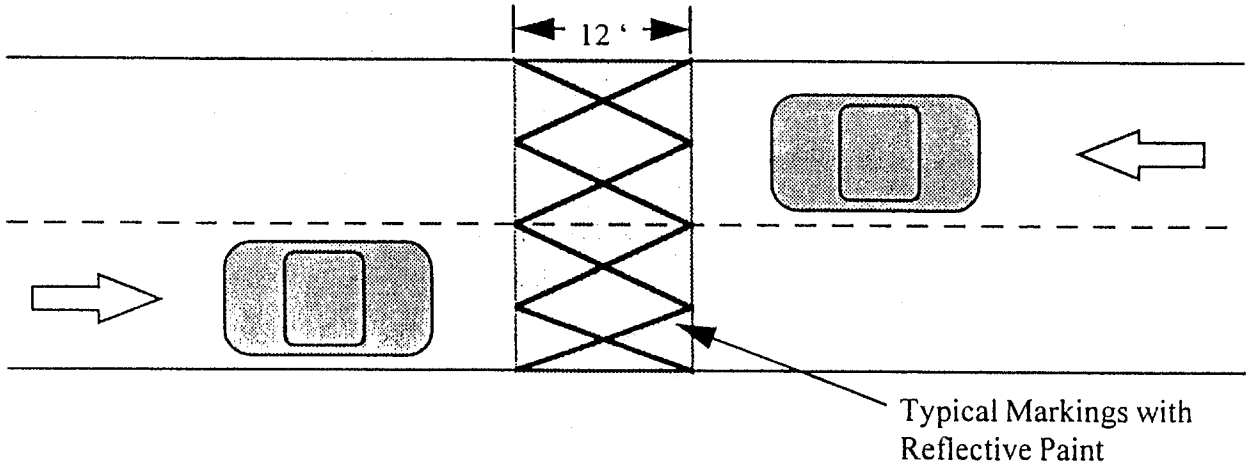
- A "speed bump" is a raised area across a roadway and generally has a height of 3-6 inches with a travel length of 1-3 feet.

Note: Speed BUMPS are NOT RECOMMENDED for installation on town streets.

Speed Hump Construction / Installation

Appendix B





Speed Hump Petition

Appendix C

The undersigned hereby petition the Town of Fairview for "speed humps" on _____ between _____ and _____. I understand that signing this petition does not obligate me to financially participate in their cost. I also understand that the Speed Hump Policy contains provisions for sharing installation costs between the Town and the petitioning property owners and that the "speed humps" will not be installed if the property owner's share is not paid within six months after approval of this petition.

Return completed Petition Forms to the Fairview Town Hall.

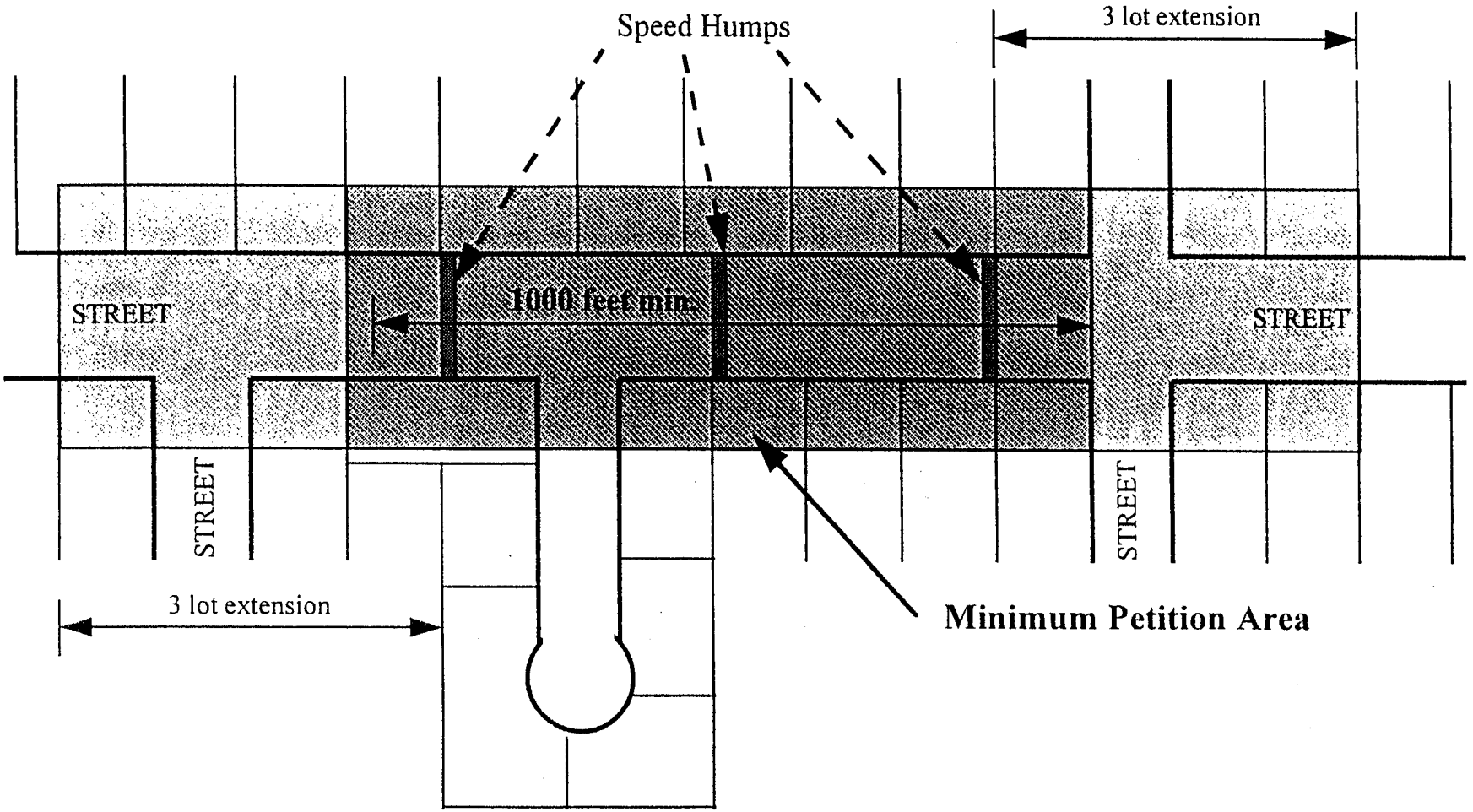
Address	**Name** *(print)*	**Signature**	**Phone**	**OK to install in front of my residence?** *(please initial)*	**Installation Cost Pledge Amount $**

Contact person for request: _____ Address: _____ Phone: _____

Speed Hump Policy

Appendix D

Typical Petition Area



Guidelines for the Design and Application of Speed Humps

Prepared by ITE Technical Council Speed Humps Task Force,
chaired by R. Marshall Elizer,
Director of the Public Works and Transportation Department,
City of Modesto, Modesto, California.

March 1993

EXHIBIT "III-B"

Standard ITE Metric Conversions

During the service life of this document, use of the metric system in the United States is expected to expand. The following common factors represent the appropriate magnitude of conversion. The quantities given in U.S. customary units in the text, tables or figures, represent a precision level that, in practice, typically does not exceed two significant figures. In making conversions, it is important to not falsely imply a greater accuracy in the product than existed in the original dimension or quantity. However, certain applications such as surveying, structures, curve offset calculations, etc. may require great precision. Conversions for such purposes are given in parentheses.

Length

1 inch	=	25 mm (millimeters – 25.4)
1 inch	=	2.5 cm (centimeters – 2.54)
1 foot	=	0.3 m (meters – 0.3048)
1 yard	=	0.91 m (0.914)
1 mile	=	1.6 km (kilometers – 1.61)

Volume

1 cubic inch	=	16 cm^3 (16.39)
1 cubic foot	=	0.028 m^3 (0.02831)
1 cubic yard	=	0.77 m^3 (0.7645)
1 quart	=	0.95 L (liter – 0.9463)
1 gallon	=	3.8 L (3.785)

Speed

foot/sec.	=	0.3 m/s (0.3048)
miles/hour	=	1.6 km/h (1.609)

Temperature

To convert ° F (Fahrenheit) to ° C (Celsius), subtract 32, then divide by 1.8.

Area

1 square inch	=	6.5 cm^2 (6.452)
1 square foot	=	0.09 m^2 (0.0929)
1 square yard	=	0.84 m^2 (0.836)
1 acre	=	0.4 ha (hectares – 0.405)

Mass

1 ounce	=	0.03 kg (kilograms – 0.028)
1 pound	=	0.45 kg (kilograms – 0.454)
1 ton	=	900 kg (907)

Light

1 footcandle	=	11 lux (lumens per m^2 – 10.8)
1 footlambert	=	3.4 cd/m^2 (candelas per m^2 –3.426)

For other units refer to the American Society of Testing Materials (1916 Race Street, Philadelphia, PA 19103) Standard for Metric Practice E 380.

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From an operational standpoint, humps and bumps have critically different impacts on vehicles. Within typical residential speed ranges, humps create a gentle vehicle rocking motion that causes some driver discomfort and results in most vehicles slowing to 15 m.p.h. or less at each hump and 25 to 30 m.p.h. between properly spaced humps in a system. At high speeds the hump can act as a "bump" and jolt the vehicle's suspension and its occupants or cargo. A bump, on the other hand, causes significant driver discomfort at typical residential speeds and generally results in vehicles slowing to 5 m.p.h. or less at the bump. At high speeds bumps tend to have less overall vehicle impact because the suspension quickly absorbs the impact before the vehicle body can react. In general, bicycles, motorcycles, and other vehicles with rigid or near-rigid suspensions are more susceptible to damage and loss of control from "humps" or "bumps" than vehicles with flexible suspensions. However, speed humps represent a lesser risk to those vehicles than do speed bumps.

Speed humps have the advantage of being largely self-enforcing and of creating a visual impression, real or imagined, that a street is not intended for speeding or "through" traffic. Some items to consider prior to speed hump installation are their initial construction and continuing maintenance costs, the potential negative impact on emergency and service vehicles, increases in vehicle noise, the imposition of inconvenient access to some parts of the neighborhood, and, to some, their unsightliness. They are also static and therefore must be appropriate for use at all hours of the day and night. In addition, it is mandatory that they be supported with some combination of traffic control devices such as signs and/or pavement markings to warn motorists of their presence and indicate the expected and appropriate behavior.

Where designed and installed with proper planning and engineering review, speed humps have generally been found to be effective at reducing vehicle speeds without increasing accident rates. In fact, some studies indicate that speed hump installations have actually reduced accident rates on residential streets. Additionally, there is no evidence in the source materials reviewed for this report indicating that properly designed and installed speed humps have caused or contributed to accidents or increased accident rates.

Within the United States, speed bumps of varying design have been routinely installed on private roadways and parking lots without the benefit of proper engineering study regarding their design and placement. Speed humps, on the other hand, have evolved from extensive research and testing and have been designed to achieve a specific result on vehicle operations without imposing unreasonable or unacceptable safety risks. The guidelines for speed humps as presented in this document are primarily based upon those experiences.

1.03 Previous Research and Experience

Speed humps were originally developed in the early 1970's by the Transport and Road Research Laboratory (TRRL) in Great Britain. TRRL first tested along a test track various hump sizes and shapes on several vehicle types operating over a range of speeds. From this work the "TRRL" parabolic profile hump was developed. Since then speed humps have been extensively tested and

used in Europe as well as Australia and New Zealand. The U.S. Federal Highway Administration (FHWA) also performed "off-road" testing of the TRRL humps in St. Louis in 1979 and deemed them safe to proceed with public street tests. In addition, an emerging number of cities in the United States and Canada either use or have tested speed humps since the early 1980's, and in November 1983 a Subcommittee of the California Traffic Control Devices Committee issued a final report which supported the prudent use of speed humps on public streets.

Recent research in Australia has developed an alternative design to the "TRRL" profile humps developed in Great Britain. The so-called "flat-topped" road humps tested by the Australian Road Research Board (ARRB) have yielded observations and results similar to their English counterparts. The flat top section is usually constructed of brick paving with asphalt or concrete ramps and has generally been found more aesthetically acceptable than non-brick treatments. This design tends to reduce the deformation problems experienced with asphalt humps but may increase vehicle noise and maintenance requirements.

The results of speed hump research and testing can be generally summarized as follows:

- Traffic speeds are decreased at the humps and at locations between properly spaced successive humps. Speeds of the fastest drivers are affected as well as those of "average" drivers. The speed distribution generally narrows with the greatest effect on higher vehicle speeds.

- A single hump will only act as a point speed control. To reduce speeds along an extended section of street a series of humps is usually needed.

- Speed humps will often divert traffic to other streets, especially in those situations where a significant amount of traffic is using the street as a shortcut, detour, or overflow from a congested collector or arterial roadway. Volume reductions are also affected by the number and spacing of humps and the availability of alternative routes.

- Speed and volume modifications caused by humps tend to remain constant over time.

- Speed humps have not been found to pose a traffic safety hazard when properly designed and installed at appropriate locations. In fact, accident experience generally remains stable or decreases due to reduced speeds and volume, thereby improving the inherent safety of a particular street or residential area.

- Where humps are successful at reducing speeds, there is probably little net change in road noise or possibly even a reduction in noise levels. Traffic noise will generally decrease with fewer vehicles and lower speeds, but noise may increase at the hump, particularly if significant numbers of trucks use the street.

- Adequate signing and marking of each speed hump is essential to warn roadway users of the hump's presence and guide their subsequent action.

- The need to reduce speeds for speed humps tends to have a negative impact on air quality and energy consumption assuming traffic volumes remain the same. For comparison purposes, this impact is typically less than the effects of a stop sign installation.

- Large trucks, buses, and emergency vehicles must pass over humps at relatively low speeds or significant jolts to the vehicle, discomfort or injury to occupants, and jostling of cargo will be experienced. Speed humps have been used to deter trucks and larger vehicles from using particular streets.

- The majority of local street residents will normally support speed hump installations and endorse their continued use.

It should be noted that some speed hump installations in the United States and other countries have been unsuccessful and ultimately modified or removed. Factors resulting in their removal have included the following:

- Residents' dissatisfaction over the "gentle" hump design (as opposed to the more drastic bump) and its perceived inability to dramatically slow vehicles or reduce traffic volumes to a desired level.

- Local policy decisions to favor traffic circulation needs over resident's quality of life concerns.

- Undesired traffic diversion to other residential streets.

- Aesthetics of the humps and associated signs and markings.

- Increased noise level at the hump caused by vehicle rocking and acceleration/deceleration.

- Impacts on snow plowing and other street maintenance functions.

- Concerns with impacts to emergency vehicle response.

- Concerns with liability for personal injury and damage claims.

- Inadequate funding for the initial and/or continued maintenance costs of the hump and its traffic control devices.

Table 1 is a list of those jurisdictions identified in the source materials that are known to have used or tested speed humps as residential traffic management devices.

Table 1
Partial Listing of Jurisdictions with Speed Hump Experience

United States and Canada

Phoenix, Arizona
Agoura Hills, California
Brea, California
Camarillo, California
Claremont, California
Corona, California
Ceres, California
Modesto, California
Palo Alto, California
Pasadena, California
Placentia, California
Sacramento, California
Sacramento County, California
San Jose, California
San Leandro, California
San Luis Obispo, California
Santa Monica, California
Santa Rosa, California
Simi Valley, California
Thousand Oaks, California
Westlake Village, California
Toronto, Ontario, Canada
Vancouver, British Columbia, Canada
Winnipeg, Canada
Jefferson County, Colorado
Washington, D.C.
Hillsborough County, Florida
Orlando, Florida
Seminole County, Florida
Tampa, Florida
Temple Terrace, Florida
Titusville, Florida
Fulton County, Georgia
Wichita, Kansas
Rockville, Maryland
Boston, Massachusetts
Deephaven, Minnesota
St. Louis, Missouri
Omaha, Nebraska
Columbus, Ohio
Toledo, Ohio
Oklahoma City, Oklahoma
Arlington, Texas
Dallas, Texas
Bellevue, Washington
Seattle, Washington
Appleton, Wisconsin

International

Australia
Belgium
Canada
Finland
France
Germany
Great Britain
Holland
Israel
Japan
New Zealand
Norway
South Africa
Sweden

Research Agencies

Australian Road Research Board (ARRB)
Federal Highway Administration (FHWA), US Department of Transportation
Netherlands Study Center for Traffic Engineering
Transport and Road Research Laboratory (TRRL), Great Britain

The written materials reviewed in the preparation of this report are listed in the "Source Materials" section at the end of the report. This list also includes some documents that were not be obtained for review by the Task Force, but may be of interest or assistance to those interested in speed humps or related design features.

1.04 Conclusions

As discussed above, extensive research and use throughout Great Britain, Australia, the United States and other countries indicates that the use of a properly designed speed hump or speed hump system, installed using the proper engineering analysis and judgment, can be a useful geometric roadway design feature to manage traffic speeds on roadways intended to serve as local residential streets. Speed humps have been found, in general, to reduce traffic speed, volumes, and accidents depending on the site-specific circumstances of the installation. In addition, they discourage through traffic from using a local street as an alternative route to inconvenient or congested arterial and collector systems. Despite concerns over liability, vehicle damage, and emergency vehicle impacts, these problems have not occurred or have been found to be insignificant when considering the positive aspects of humps.

Speed humps are not a cure-all for residential street traffic problems and should be applied only where sound engineering judgment justifies their use. Other passive and active devices and techniques should be considered and possibly tested to determine if less restrictive forms of residential traffic management will address these concerns.

Speed humps should not be considered an option to good residential planning and subdivision street design, nor should they be used to convert streets to playgrounds or otherwise encourage pedestrian activity in public streets.

The lack of guidance and heavy reliance on individual judgment has led to hump-type installations that incorporated poor designs, improper roadway geometric coordination, poor choice of construction materials or methods, and absence of needed signs and markings. The safety of speed humps and their ability to perform their intended use is directly contingent upon their proper design and application. When it is determined that a residential traffic management problem exists and that speed humps are an appropriate technique to reduce or eliminate the problem, this ITE Recommended Practice will assist in establishing locally-adopted guidelines for the design and application of those geometric design features.

1.05 Use of the Proposed Recommended Practice

This ITE Proposed Recommended Practice is to be used in conjunction with good engineering practice. These guidelines do not constitute either final or complete design and evaluation criteria for speed humps, speed hump systems, or residential traffic management control programs. Local conditions must be evaluated for all speed hump installations. In addition, specific terrain, weather, traffic, or land use characteristics may require local modification of these guidelines. Other documents such as the ITE Recommended Guidelines for Subdivision Streets: A Recommended Practice, Residential Street Design and Traffic Control, and other standard practice documents should be consulted as necessary.

2.0 Guidelines for Speed Humps Use

2.01 Engineering Study

Speed humps should only be installed to address documented safety or traffic concerns supported by traffic engineering studies, and after consideration of alternative traffic control measures.

Since speed humps may divert traffic to other street facilities, an estimate of the amount and location of that diversion should be made so that the potential impacts of the proposed humps can be fully considered. If the humps are expected to create equal or greater traffic problems on another residential street, they should not be installed.

2.02 Street Classification and Use

Speed humps should only be installed on those roadway facilities functionally classified as "local" streets as defined in A Policy on Geometric Design of Highways and Streets published by AASHTO, the American Association of State Highway and Transportation Officials. These streets generally permit direct access to abutting lands, connect to higher classification streets, offer the lowest level of mobility, usually contain no bus routes, and deliberately discourage service to through traffic movement. Further, these local streets should be residential in nature.

2.03 Street Width and Number of Lanes

Speed humps should be used only on streets with no more than two travel lanes, or where the overall pavement width is not greater than 40 feet. In addition, the pavement should have good surface and drainage qualities.

2.04 Street Grades

Speed humps should only be considered for use on streets with grades of 8% or less approaching the hump. When installed on streets with significant downgrades, special care should be taken to ensure that vehicles will not approach the humps at excessive speed.

2.05 Horizontal and Vertical Alignment

Speed humps should not be placed within severe horizontal or vertical curves that may result in substantial lateral or vertical forces on a vehicle traversing the hump. Humps should be avoided within horizontal curves of less than 300 feet centerline radius and on vertical curves with less than the minimum safe stopping sight distance. If possible, humps should be located on tangent rather than curve sections.

2.06 Sight Distance

Speed humps should generally be installed only where the minimum safe stopping sight distance (as defined in AASHTO's A Policy on Geometric Design of Streets) can be provided.

2.07 Traffic Speeds

Speed humps should generally be installed only on streets where the posted or prima facie speed limit is 30 m.p.h. or less. Speed humps should be carefully considered on streets where the majority of vehicles travel at relatively fast speeds, e.g., 45 m.p.h. or greater.

When speed humps are installed to address speeding concerns, studies should be performed to confirm the magnitude and extent of the speeding problem to ensure that the installation of humps can be expected to appreciably address that problem.

2.08 Traffic Volumes

Speed humps should typically be installed only on streets with an average daily traffic volume of 3,000 vehicles or less. When considered for installation on streets with higher volumes, their use should receive special evaluation and justification before approval. Consideration should also be given to the establishment of a minimum volume threshold for consideration of speed hump installation.

2.09 Traffic Safety

When installed to address documented or anticipated vehicle or pedestrian accidents, the causes of those accidents should be susceptible to correction by speed humps. Proposed speed hump locations should be evaluated to determine that such an installation will not introduce increased accident potential for the subject street.

2.10 Vehicle Mix

Speed humps should not normally be installed on streets that carry significant volumes (greater than 5%) of long wheel-base vehicles unless there is a reasonable alternative route for those vehicles. Special consideration should also be given to motorcycles, bicycles, and other types of special vehicles that use the street. The impacts that speed humps may have on these individual vehicle types should be considered in the decision to install humps, and ultimately considered in their design and location.

2.11 Emergency Vehicle Access

Speed humps should not be installed on streets that are defined or used as primary or routine emergency vehicle access routes.

2.12 Transit Routes

Speed humps should not generally be installed along streets with established transit routes. If humps are installed on transit routes, their design should consider the special operational characteristics of these vehicles.

2.13 Citizen Support

When speed humps are installed in response to citizen requests, a documented majority of the residents along the affected portion of that street should ideally support their installation.

3.0 Community Relations and Administrative Procedures

3.01 Supporting Ordinances and Regulations

Before initiating a speed hump installation program, agencies should first adopt the appropriate policies, regulations, and/or ordinances to govern elements such as the community involvement process, hump design and location criteria, cost sharing relationships, installation and maintenance requirements, and evaluation/modification procedures.

3.02 Speed Hump Request Procedures

Resident surveys should be required to determine support for speed hump installation after it is determined that a particular street is eligible for humps. Ideally, a documented majority of the residents should be in favor of the installation after consideration of alternative traffic control and traffic management techniques.

3.03 Staff Evaluation

An adequate engineering and safety investigation of any speed hump request should be made to determine that the agencies' adopted guidelines are met for speed hump use.

Since speed humps may have a wide ranging impact not only on the vehicles crossing them but also on the residents living on the immediate and nearby streets, their installation should typically be studied within the context of an overall neighborhood traffic management study. Such a study would involve thorough processes for considering, evaluating, implementing, and monitoring speed humps and any other traffic management techniques utilized.

3.04 Coordination Procedures

Proposed speed hump installations should be reviewed by the police, fire, ambulance and other emergency service departments, adjacent neighborhood residents that may be impacted by the speed hump installation, and other potentially affected groups such as school districts, transit operators and refuse collection agencies. Comments received should be fully considered in the decision-making process.

If humps are to be installed, residents and affected agencies should be notified of the exact objectives, timing, location and other relevant details of the installation. It is also advisable to meet with emergency service providers to more fully inform them of the hump's expected impacts on special vehicle types for various operating speeds.

3.05 Removal Procedures

Removal of speed humps should only be considered after an adequate review period and subsequent engineering analysis has been performed to determine the traffic characteristics along the route and the impacts to the remaining street system. If speed humps are being removed due to a lack of public support, a majority of residents should typically support their removal.

Before making a decision to remove speed humps, all petitioners originally requesting the installation should be given the opportunity to comment on the proposed removal.

3.06 Cost

Consideration should be given to a possible requirement that those individuals requesting speed humps participate in the funding of their installation, maintenance, and removal, if necessary. Regardless of funding source, it is critical that adequate and ongoing resources be allocated to properly inspect and maintain the humps and supporting devices.

4.0 Design and Construction Considerations

4.01 Dimensions and Cross-Sections

For use on typical residential streets the most widely used circular, parabolic speed hump (TRRL profile, 3", 3-1/2" or 4" maximum) is shown in Figure 4.1. The 3" hump can be expected to cause speeds of from 20 to 25 m.p.h. at the hump, with a 4" hump creating crossing speeds of 15 to 20 m.p.h. It should be recognized that lower hump heights will generally result in greater variation of hump crossing speeds. Humps should not exceed 4" in height, and where significant percentages of trucks, buses, or other long-wheel base vehicles are expected, an approximate 3" height is generally considered more acceptable. Some jurisdictions have found 2.5" heights to be effective in selected locations.

An alternative "flat-topped" design that has been successfully tested in Australia is shown in Figure 4.2. Site specific roadway and traffic characteristics should be evaluated to determine if one of these designs, or an alternate, is appropriate for the traffic and roadway conditions at the installation location being considered. Regardless of the design selected, special care should be given during the humps' construction to insure the proper final shape and dimensions.

4.02 Spacing and Location

Current practice indicates that speed humps within a series are normally placed from 200 feet to 750 feet apart. On a street with desirable maximum operating speeds of 30 m.p.h., experience has shown that humps should be spaced at approximately 250 foot intervals. Figure 4.3 (from FHWA Report No. RD-81-031) illustrates the general relationship between hump spacing and vehicle speeds midway between the humps.

FHWA Report No. FHWA/RD-81/031, Improving the Residential Street Environment, offers the following guidelines for determining the number and placement of humps for various street segment lengths:

1. Single short blocks (300 to 500 ft.) with speed control problems are unusual. Where such blocks must be treated, a single hump positioned near mid-block would likely provide satisfactory speed control over the entire block.
2. Where control is required on single block segments of moderate length (500 to 1000 ft.), a two hump configuration should be satisfactory.
3. On very long blocks (1000 to 1600 ft.), three or more humps may be necessary.
4. On lengthy continuous segments or on control segments comprised of a number of blocks, it appears desirable to space interior humps 400 to 600 ft. apart, although spacings up to 750 ft. apart may be satisfactory. At least one hump should be placed in each block of a control segment.

Figure 4.4 illustrates these hump spacing concepts.

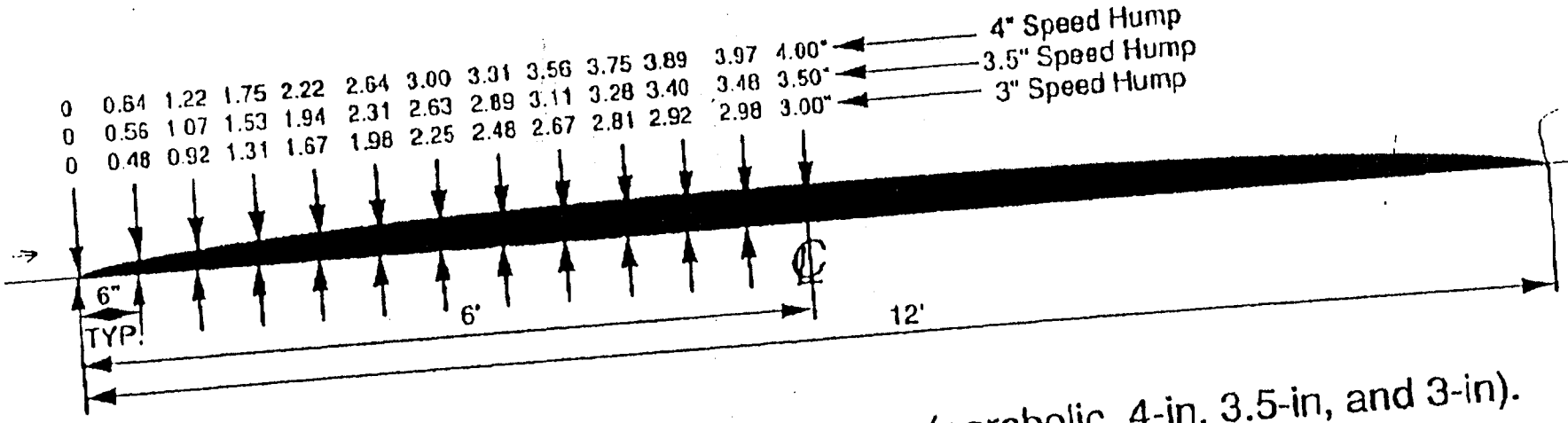


Figure 4.1 - Typical speed hump dimensions (parabolic 4-in, 3.5-in, and 3-in).

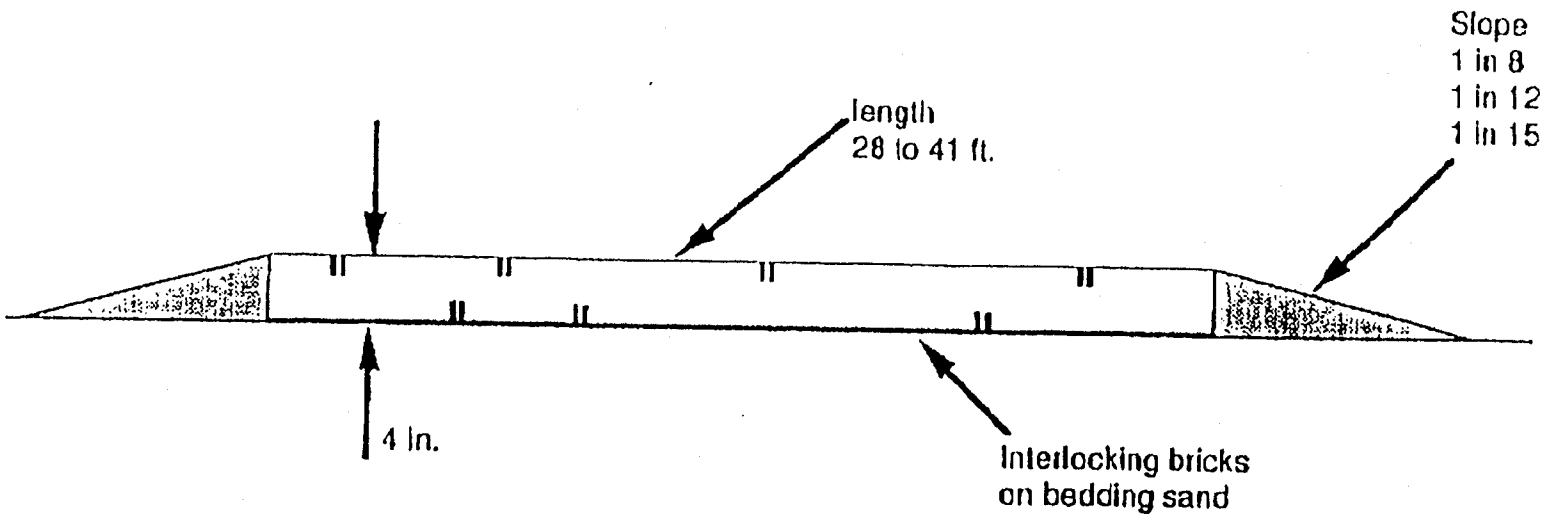
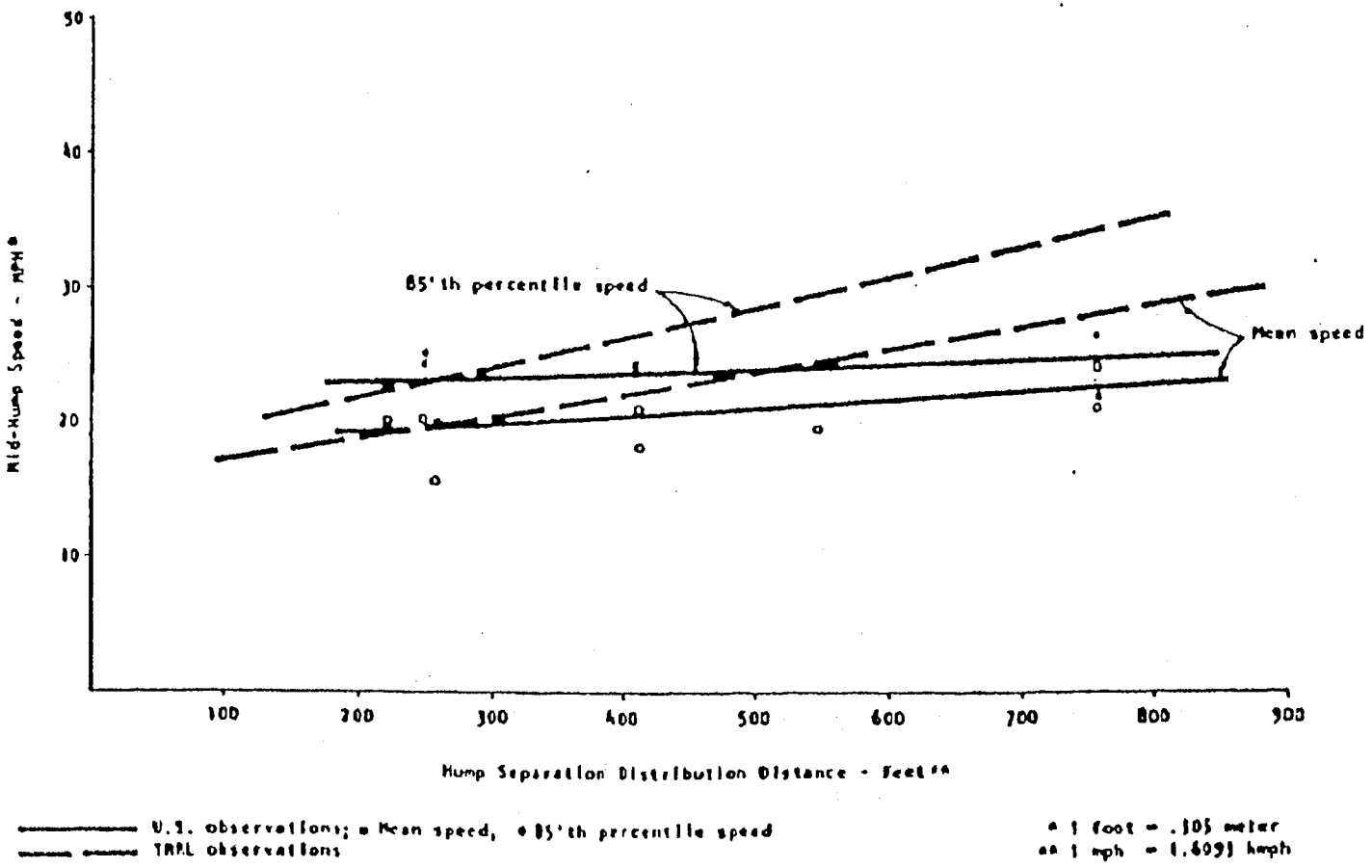


Figure 4.2 - Flat-topped Australian speed hump design.



MIDHUMP SPEED VS SEPARATION DISTANCE
COMPARISON: U.S. VS TRRL RESULTS

Figure 4.3

While local conditions and desired results will influence locally adopted spacing standards, a special Subcommittee of the California Traffic Control Devices Committee developed an approximate spacing equation for a 3" high speed hump from the speed data in Australian and United Kingdom tests. This equation is as follows:

$$Hs = 0.5[2(V_{85})^2 - 700]$$

Where Hs = the optimal spacing between 3" humps (ft.), and

Where V_{85} = the desired 85th percentile speed (m.p.h.)between humps

Based on this equation, the spacing for the 85th percentile speeds of 25 m.p.h. and 30 m.p.h. is 275 ft and 550 ft., respectively.

A series of two or more speed humps are usually more effective than single hump installations. Any one series of humps should generally not be greater than one-half mile in length and the end of one series should not be immediately adjacent to another series.

Speed humps may also be used in pairs to increase their effectiveness. When installed in pairs, humps are generally no closer than 10 feet and no further apart than 40 feet. They should ideally be located adjacent to property lines as opposed to the center of a property in order to minimize residents' aesthetic concerns.

The first hump in a series should normally be located in a position where it cannot be approached at high speed from either direction. To achieve this objective speed humps (at the first hump in a system) are typically installed within approximately 200 feet or less of a small-radius curve or stop sign, or at the top of a hill if installed on a street with significant downgrade.

4.03 Traffic Control

Traffic control consisting of signs, markings and possibly flashing signals is essential to warn roadway users of a speed hump's presence and guide their subsequent action. While no minimum standards exist for devices to be used in conjunction with speed humps, devices typically used by agencies include the following:

- Traffic Signs - The most common warning sign used for speed humps appears to be the standard MUTCD (Manual on Uniform Traffic Control Devices) W8-1 "BUMP" warning sign. While the MUTCD does allow special warning signs for non-standard situations, and some jurisdictions have installed "HUMP" or "ROAD HUMP" signs, most agencies have found the "BUMP" sign to be appropriate for use with speed humps. The sign is typically installed in advance of the hump and at the hump although some agencies install only one or the other. Advance warning signs should be located based on MUTCD Table II-1, " A Guide for Advance Warning Sign Placement Distance." Some agencies also re-

quire installation of an advisory speed plate indicating the recommended crossing speed at the hump. Advisory speed plates are also considered useful in educating unfamiliar roadway users of the recommended crossing speed when humps are initially installed.

- Some agencies install a special supplemental plate indicating multiple humps are in place for a certain length of street segment. These signs typically carry the legend "Next XX Feet" and are installed under the first hump sign preceding a series of humps. Side road approaches that intersect a street within a series of humps should also be evaluated with regard to the need for advanced notification signing. Some agencies install warning signs with supplemental arrow plates indicating the location of speed humps on an intersecting street.

- Although undesirable in residential areas, in certain instances it may also be justified to install special attention flags or flashing lights to speed hump warning signs. These devices are sometimes used in the initial installation period or in locations where unusual combinations of roadway or vehicle operating conditions present special conditions that warrant additional warning devices.

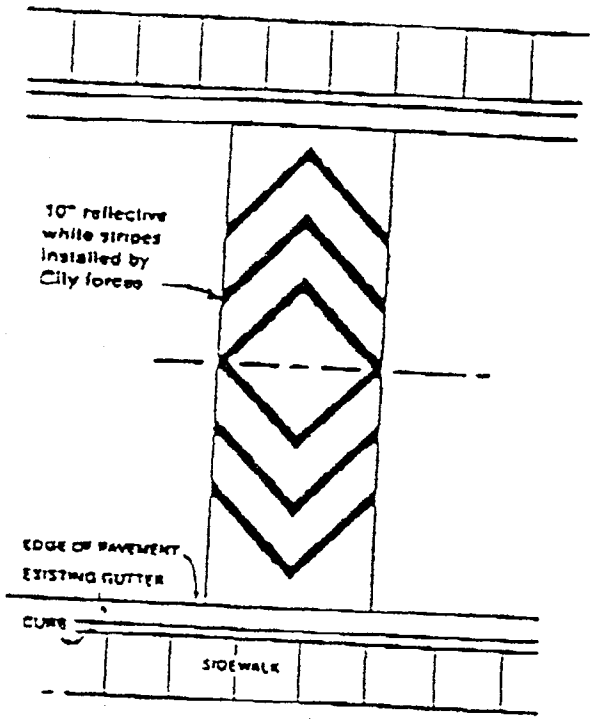
- Markings - Markings in use by agencies include advance word messages (typically "BUMP") and special markings directly in advance of, or on, the hump. Several hump marking designs are in use today, but the design selected should not create confusion with standard crosswalk markings unless the hump location is intended for pedestrian crossings. Pavement word and symbol markings should be installed in conformance with MUTCD guidelines.

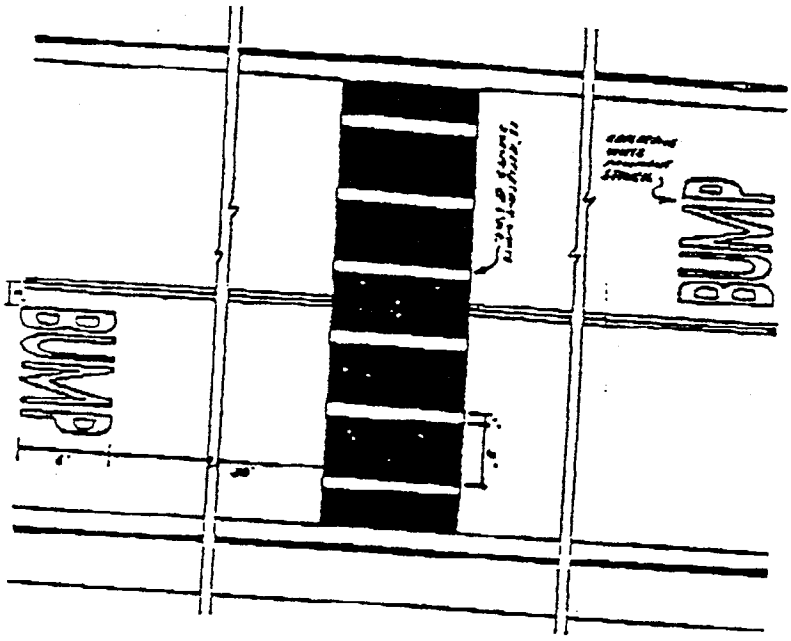
- Some agencies have installed double yellow centerline markings to call additional attention to hump locations and to prohibit passing in the vicinity of the hump, and other agencies have installed reflective markers in advance of or at the hump to improve nighttime visibility.

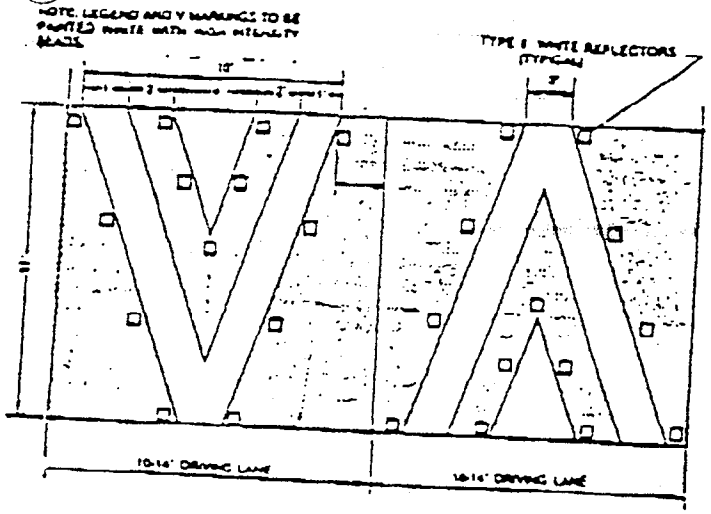
Figures 4.5 and 4.6 illustrate a number of signing and marking designs in use by agencies today. Any agency installing speed humps should review their State and Federal Manual on Uniform Traffic Control Devices for minimum requirements before establishing typical speed hump signing and marking designs for their jurisdiction.

4.04 Installation Angle

Speed humps should be installed at a right angle to the centerline tangent of the roadway.


10" reflective white stripes installed by City forces
EDGE OF PAVEMENT
EXISTING GUTTER
CURB
SIDEWALK


BUMP
BUMP


TYPE II WHITE REFLECTORS (TYPICAL)
10-14' DRIVING LANE
10-14' DRIVING LANE

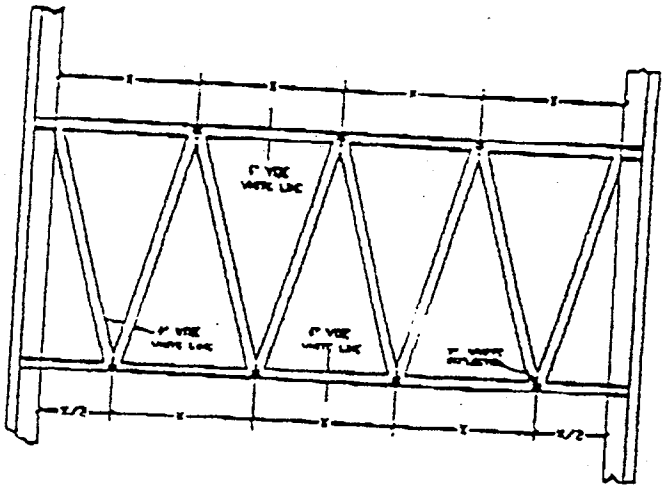


Figure 4.6

4.05 Drainage and Utilities

Speed humps should be installed with appropriate provisions made for roadway drainage and utility access. Humps should generally not be located over, or contain, maintenance access holes, or be located adjacent to fire hydrants.

Ideally a hump should be installed at a location immediately on the downside of an existing drain inlet. If this is not feasible the construction of a bypass drain or other treatment to route water around the hump should be considered.

4.06 Roadway Edge Treatments

On roadways with barrier curbs, humps should ideally extend fully across the road from curb to curb. If tapering is necessary for drainage or other reasons, the edge taper should be accomplished at an angle that will not affect the downstroke of bicycle pedals or subject vehicles to undercarriage damage.

A phenomenon known as "gutter running" may be encouraged with tapered hump edges since drivers can drive with one wheel in the gutter thereby reducing the humps' ability to slow vehicles. If humps are installed with tapers or used on non-curbed roadways, raised pavement markers, delineator posts, or other treatments should be considered to eliminate or reduce the possibility of vehicles attempting to partially or totally avoid the hump. It should be recognized, however, that these devices may have an impact on maintenance and snow removal activities. If installed on roadways with paved shoulders, the hump should ideally extend across the shoulder in order to discourage vehicles from attempting to avoid the hump.

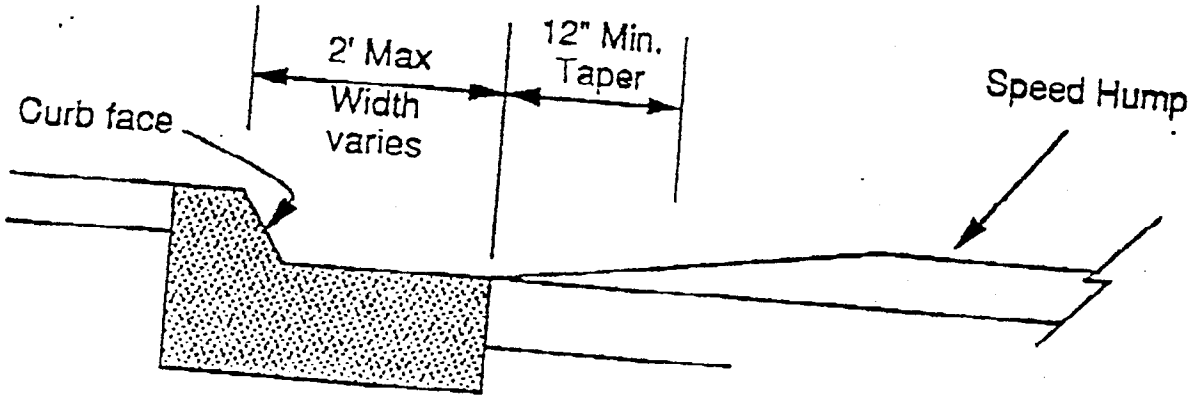
Figure 4.7 illustrates techniques for providing hump tapers and special edge treatments.

4.07 Coordination with Street Geometry

A thorough on-site analysis of roadway geometrics should be performed to ensure that speed humps will not be introduced at a critical point in the roadway system, e.g., a severe combination of horizontal, vertical curvature and/or street gradient.

4.08 Coordination with Traffic Operations

Speed humps should not be installed within 250 ft. of a traffic signal or within an intersection or driveway. This suggestion is not intended to apply to the use of a raised intersection as a valid traffic management technique.



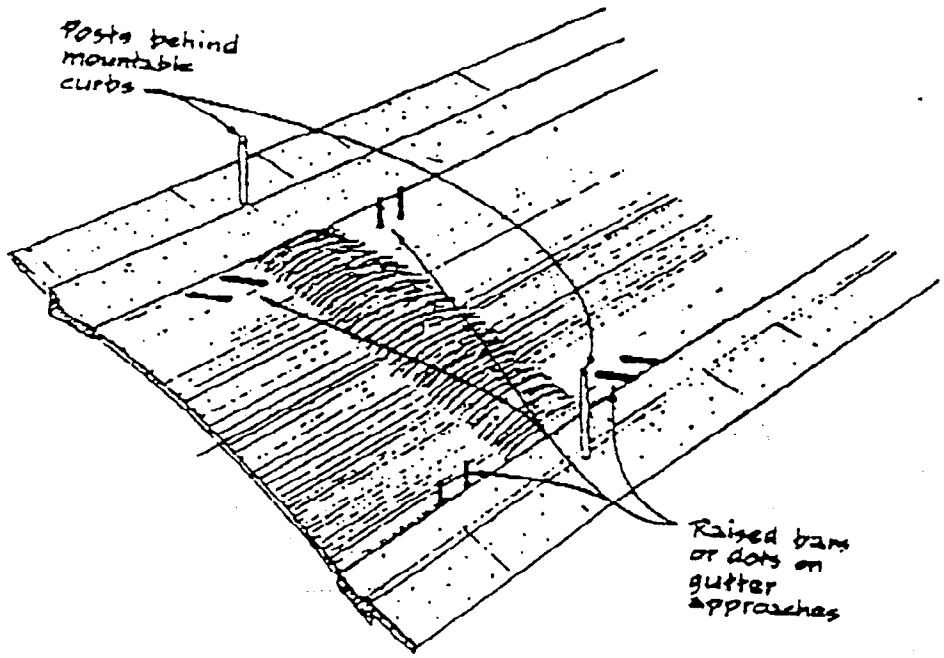


Figure 4.7 - Speed hump taper and edge treatments.

4.09 On-Street Parking

Care should be taken to ensure that vehicles parked on streets do not diminish the effectiveness of the signing and marking for speed humps. Should parking be removed adjacent or in advance of the hump, the ability of vehicles to avoid tapered humps by "gutter-running" will be enhanced. Each hump installation should be evaluated independently for site-specific parking considerations.

4.10 Street Lighting

To improve nighttime visibility, especially where sight distance is less than desirable, coordinating hump locations with existing or planned street lighting should be considered.

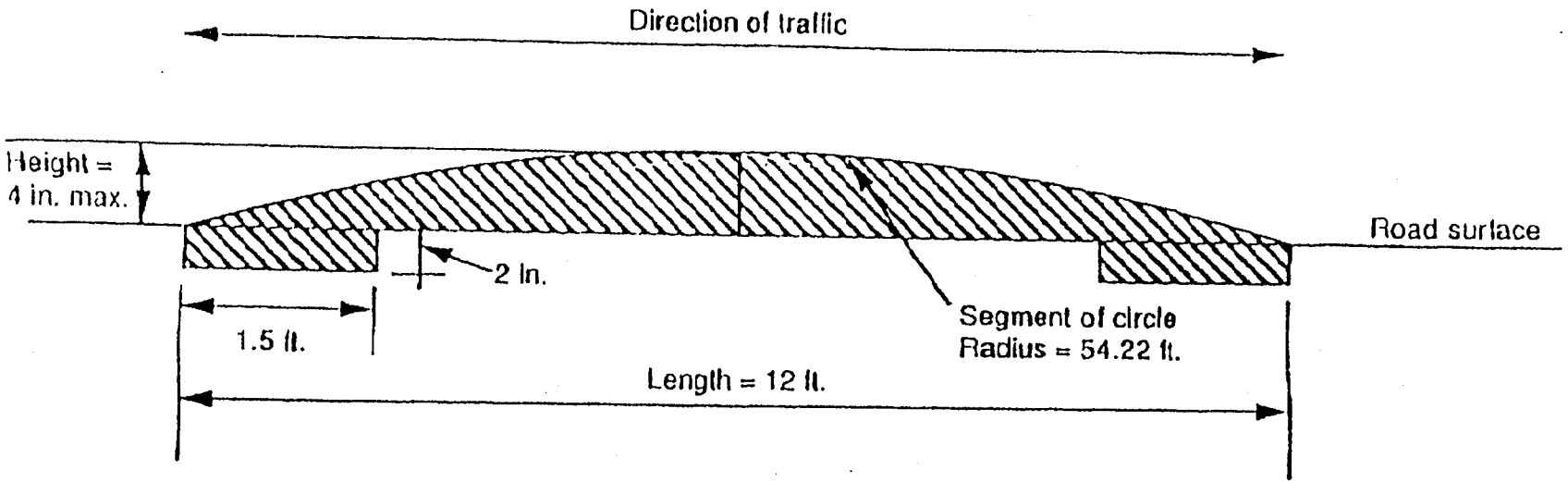
4.11 Construction Materials

The construction of the hump can be pre-cast concrete sections, concrete cast in situ, asphalt or brick/concrete pavers. Experience has shown that the use of soft material will result in deformations as the top of the hump is pushed in the direction of the traffic stream.

4.12 Construction Procedures

It is recommended that a template be constructed to verify the accuracy of the hump profile and to ensure that the desired vertical dimensions are attained within reasonable tolerances (normally one-half inch or less, provided that the hump does not exceed 4 inches). If the profile is incorrect, hump characteristics will be changed which may impact traffic safety or create ineffective speed control.

If the hump is constructed in situ, it is recommended that the road surface be excavated at tapering edges to prevent spalling (as illustrated in Figure 4.8). Some agencies have found that installing humps in two lifts will result in improved accuracy and shape conformity.



Cross section and hump dimensions

Figure 4.8 - Road hump constructed in situ showing road surface excavated at tapered edges to prevent spalling.

5.00 Monitoring and Evaluation

The type, number, and extent of studies performed to determine the effectiveness and impacts of speed humps will vary based upon the particular circumstances of each installation. However, some review should be performed after installation to ascertain if the humps have achieved the desired results without creating unexpected problems.

5.01 On-Site Observation

Immediately after speed hump installation and at selected times thereafter, observations should be made to determine motorists' behavior patterns and any unusual operating conditions (such as gutter-running). These observations should be scheduled during both day and night conditions.

5.02 Speed Studies

Speed studies should be performed prior to hump installation. After installation, speed studies should normally be performed in advance of, at, and beyond each speed hump to determine its impact on vehicle operating speeds.

5.03 Volume Studies

Traffic volume counts should be made on the subject street and on those other streets where traffic diversion may be expected. These counts should be made before installation and after installation when traffic patterns have stabilized to determine the magnitude and specific location of this diversion.

Both intersection turning movement and 24-hour volume counts may be needed to quantify these impacts.

5.04 Stop Sign Obedience

Studies may be desirable before and after hump installation to determine if the speed humps have impacted the compliance rate of affected stop sign locations. Increased violation rates should be considered in speed hump evaluations and selective enforcement may be necessary to address the problem.

5.05 Travel Time Studies

Based on the particular requirements of the installation, it may be desirable to perform travel time studies before and after hump installation to determine the effect on overall travel times along the subject street or through the area.

5.06 Accident Analysis

A before and after accident analysis should be performed to determine if accident trends in the affected area have been noticeably impacted by the speed hump installation. It may be necessary to establish ongoing analyses at some locations to gauge the longer-term trends of accident rates.

5.07 Resident and Driver Surveys

Approximately 30 to 60 days after installation (or at the end of the established trial period), it may be desirable to survey adjacent residents and other affected residential areas to assess their concerns and perception of the speed humps' performance. Motorists continuing to travel the street may be selectively surveyed to assess their opinion of the speed humps' installation. Emergency and service agencies should also be offered the opportunity to comment on the installation.

5.08 Noise Analysis

It may be desirable to perform both before and after studies to determine the speed hump's impact on traffic noise in advance of, at, and beyond each hump site.

5.09 Vibration Analysis

It may be desirable to perform vibration analysis to determine if roadway vibrations transmitted by the hump crossings may have detrimental effects on adjacent properties and structures.

5.10 Pedestrian, Bicycle, and Social Activity

Before and after observations may be made at various times of the day and night to determine if pedestrian, bicycle, and other types of resident activity have been altered as a result of the speed hump installation.

5.11 User Cost Analysis

It may be desirable to perform a "before/after" user cost analysis considering vehicle speeds, travel times, vehicle and driver costs, and other elements. This analysis should be based on the particular characteristics of the speed hump system and other residential traffic management techniques being employed.

5.12 Vehicle Emission Analysis

It may be desirable to perform a vehicle emissions analysis to estimate the speed hump's impact on air quality. This analysis will require both before and after studies of traffic volumes, acceleration/deceleration conditions, and speeds.

6.00 Other Considerations

6.01 Liability Concerns

Speed humps and other pavement undulations are not traffic control devices as defined by the Manual on Uniform Traffic Control Devices. They are, however, geometric design features of the roadway and should be designed, installed, operated, and maintained using accepted engineering principles and prudent engineering judgment.

If speed humps are not installed in a proper manner and with due care, and property damage or personal injury occurs, it is possible that the installing agency could be found to be maintaining a public nuisance, i.e., a known defect in the street system which may result in increased liability exposure. Therefore, complete and proper documents should be retained to justify the decisions made. Local and state laws should also be reviewed to identify any regulations pertaining to roadway design, roadway maintenance, traffic control, or other elements that may be related to the use of speed humps or other geometric design features.

6.02 Vehicle and Cargo Damage

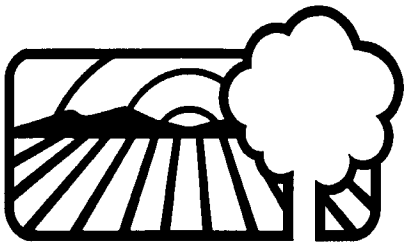
Where streets with speed humps are expected to carry substantial numbers of long wheel-base vehicles or other special vehicle types such as motorcycles and bicycles, a special attempt should be made to warn and notify drivers of these vehicles that speed humps exist and how they should be driven to minimize problems. It may also be desirable to modify the standard hump design to further minimize impacts to these users.

6.03 Coordination with Pedestrian Crossings

If mid-block pedestrian crossings exist or are planned, it may be desirable to coordinate them with speed humps since vehicle speeds will generally be lowest at speed hump crossings. In fact, it may be desirable to install a hump directly adjacent to or within the pedestrian crossing. Pedestrian access can be encouraged by paving any grassed area connecting the hump to nearby sidewalks. In addition to standard signing, pedestrian crossing signs should be installed for any established crossing.

6.04 Aesthetic Considerations

It is possible that speed humps can be constructed of special materials such as brick pavers or specially-treated concrete in order to enhance their appearance. However, consideration should be given to street maintenance requirements in the area and whether or not special materials can be properly maintained by the responsible agency.



CITY OF MODESTO
SPEED HUMP POLICY

Updated April 2006

City of Modesto
Public Works Department
Traffic Engineering & Operations Division

6.05 Incorporation in New Street Design

It is desirable in the planning of new residential subdivisions to configure and design local streets to minimize excessive speed, excessive volumes, and cut-through traffic from outside the immediate neighborhood. However, where adequate subdivision planning and street design cannot be achieved, and one of the aforementioned problems is considered likely, it may be appropriate to include speed humps as a part of new street construction, after consideration of less restrictive design or traffic control techniques. Adequate signs, markings, and other devices should also be provided to support their installation.

6.06 Enforcement Needs

During the initial stages of speed hump experience, it will generally be desirable to employ special police assignment to enforce traffic violations occurring at or near speed humps and along routes experiencing diversion.

6.07 Maintenance Issues

Care should be taken in the initial installation and monitoring of speed humps to ensure that edge ravelling and profile deformation does not exceed established tolerances. Regularly scheduled inspections and maintenance should be performed to maintain the appropriate design relationship between the hump and the street so the hump continues to perform its intended purpose within allowable tolerances. If pavement maintenance activities result in speed hump markings being reduced or eliminated, they should be promptly replaced or supplemented with temporary signs providing the same warning to motorists.

While damage from snow plowing activities was initially a concern in speed hump installation, experience has shown that humps are generally not a detriment to those activities provided that the hump edges are properly maintained.

Speed Hump Fact Sheet

- **What are Speed Humps?**
  Speed humps are raised asphalt structures on the pavement. They are twelve feet in length across the traveled way and between three and four inches in height. In general, two to three humps, located about three to four hundred feet apart are needed to effectively decrease speeds.

  A speed bump is also a raised asphalt structure-but it is much shorter in length than speed humps (6-12 inches). These have been used on private streets and in parking lots for many years.

- **Advantages of Speed Humps**
  Decrease speeds if placed strategically. May divert traffic to the main streets, away from residential areas.

- **Disadvantages of Speed Humps**
  Slow response time of emergency vehicles. May divert traffic to parallel residential streets. There is a possibility of increased noise and pollution for residents living immediately adjacent to the speed humps.

- **All Streets are not Suitable for Speed Hump Installation.**
  In order for a street to qualify for speed hump installation, certain engineering criteria (e.g., traffic volumes, speeds, street function, etc.) have to be met. For instance, a street, which is on a transit route or one that is a main emergency access street for the neighborhood would not be suitable for speed humps.

- **What About my Neighbors?**
  Speed humps affect the entire neighborhood. At least 60% of the residents living on the street (and parallel streets if applicable) should approve the installation of speed humps. Seventy-five percent of residents immediately adjacent to the hump should explicitly agree to the installation.

- **Who Pays for the Speed Humps?**
  Residents of the street who request speed humps have to pay for the construction, striping, and signs. The City will bear the cost of design.

- **How Much do They Cost?**
  The cost changes as equipment, materials, and labor costs change. In 1995, the cost for construction, striping, and signs was approximately $3,200 each.

- **Steps to Follow For Speed Hump Installation:**
  1. Complete the attached Speed Hump Request Form and return it to the Traffic Engineering & Operations Division. You will act as the neighborhood facilitator.

  2. If all the engineering criteria are satisfied, Traffic Engineering staff will send you a petition form.

  3. Collect the signatures of all residents (whether they approve or disapprove) on the street and parallel streets if applicable. Return the petition to the Traffic Engineering & Operations Division.

  4. Traffic Engineering staff will prioritize the requested speed hump locations. If a street qualifies for installation that year, the Traffic Engineering staff will complete the design and contact the residents with the planned locations of the humps and each household's share of the cost.

  5. Collect the approval signatures and the money from each resident (Check or money order only. Made payable to: City of Modesto) who approved the speed hump installation.

  6. The speed humps will be installed by the end of the year.

Speed Hump Installation Policy

1. Speed humps are an appropriate mechanism for reducing speeds, but will achieve their intended goals only when installed on streets that meet specific criteria with respect to traffic data, street function, and resident acceptance. Evidence of resident acceptance should be obtained in the form of a petition from the entire neighborhood affected by speed hump installation. There is a possibility of increased noise and disturbance to residents living immediately adjacent to the speed humps. Therefore, explicit acceptance should be obtained from these residents before installing the humps.

2. Speed humps should only be used on local residential streets and minor collector streets where the primary function is to provide access to abutting residences. An average motorist has to reduce to 16 mph before crossing the hump. To expect motorists on streets intended to serve more than just abutting residences to reduce speeds to 16 mph every 300 feet would be detrimental to traffic flow. Such an installation would inevitably lead to extreme driver frustration and substantial negative public reaction to speed humps. Installation of speed humps on streets other than local residential and minor collector streets will prevent emergency services from providing a timely response during crises and likely create diversion of through traffic onto local residential streets and minor collector streets. There are no absolute criteria, which distinguish a purely residential street from other low volume streets that provide important services to residents (in addition to those immediately abutting the street in question). In general, when the traffic volumes are above 2,500 vehicles per day, the street is a major collector or arterial street. However, in cases where the traffic volumes do not provide a clear guidance as to the function the street performs, professional engineering judgment will play a major role in determining whether the street is suitable for speed hump installation.

3. Speed humps should not be installed on a street unless it is determined that speeding exists to an unacceptable degree.

4. The speed limit on streets eligible for speed hump installation should not be greater than 30 mph. The need to reduce speeds substantially at speed humps would make these devices inappropriate for streets with speed limits higher than 30 mph because of the severe speed differential such an installation would create along the street. Such a speed differential could contribute to accidents.

5. The street should not be an important emergency vehicle access route. The factors to be considered are whether the street is an important primary emergency route and whether the speed hump installation will significantly increase response times. They should not be installed on transit routes.

6. Speed humps should be installed only on those streets where there is adequate vertical and horizontal alignment and sight distance to accommodate the installation of speed humps.

7. The installation of speed humps on a street should not significantly divert traffic to adjoining residential streets. The potential for such a diversion should be examined by the Traffic Engineering staff on a case-by-case basis and engineering judgment should be used. If there is a significant diversion to adjoining streets, concurrence from residents on these streets should be obtained.

8. The cost of speed humps will change as materials and labor costs change. The Speed Hump Fact Sheet has the latest cost estimate for speed hump construction. Since speed humps directly benefit the residents on the streets, they shall be financed by residents who approve their installation. While the City can bear the cost of design and ongoing maintenance, the residents of the street should pay for the cost of construction, striping, and signs (labor, equipment, and materials). The collection of money should be made before the speed humps are installed.

9. Speed humps should not be located close to existing controls. The minimum spacing between humps should be such that the effect of two humps does not overlap. According to guidelines set by the Institute of Transportation Engineers (ITE)*, the effect of speed humps is between 200 to 600 feet depending on the length of the street block. Spacing of speed humps should be as per these guidelines, though the exact spacing should be determined on an individual basis based on engineering judgment.

10. Speed humps are still relatively new design features. Therefore, the Traffic Engineering staff shall have the authority to make any alterations in design or procedures relating to speed humps as future circumstances dictate.

* Recommended guidelines for the design and application of speed humps, ITE Special Task Force, Institute of Transportation Engineers, May 10, 1991.

SPEED HUMP PETITION

The undersigned approve/disapprove the installation of speed humps on _____ between _____ and _____. The undersigned have read the speed hump installation and removal policy and fully understand the procedures. The undersigned agree to abide by the installation, removal, and cost procedures underlined in the Speed Hump Policy.

Return petition forms to:

City of Modesto
Public Works Department
Traffic Engineering & Operations Division – Speed Hump Program
P. O. Box 642
Modesto, CA 95353

Address	Name (Printed)	Approve (Signature)	Disapprove (Signature)	Telephone Number

(Add additional sheets as necessary)

Installation of Speed Humps Procedure

The following procedure shall be used to determine a street's eligibility for speed hump installation:

1. The request for speed humps shall be initiated by a citizen(s) in writing. When Traffic Engineering staff receives a request for speed humps from a citizen (by telephone, writing, or e-mail), the Traffic Engineering staff shall first send the requester the standard Speed Hump Request form together with a Speed Hump Fact Sheet. The Speed Hump Fact Sheet describes in brief, the salient aspects of speed humps, the criteria for installation, and cost policies. The requester shall return the completed form to the Traffic Engineering & Operations Division.

2. Subsequent to receipt of request, City staff shall conduct a traffic and engineering study to check if all the criteria for speed hump installation are met. The warrant sheet with the following requirements shall be used at a minimum:

   - The street or street segment shall be a two-lane residential or a minor collector street where the primary function is to provide access to abutting residences. Engineering judgment should be used while making a decision as to the exact function the street performs.
   - The posted speed limit on the street shall not be more than 30 mph.
   - At least 15 percent of the vehicles shall exceed the posted speed limit.
   - At least 10 percent of the vehicles shall exceed speed limit by at least 10 mph.
   - The traffic volumes on the street shall be between 500-2,500 vehicles/day.
   - The street or street segment shall be at least 750 feet long.
   - The installation of speed hump(s) shall not adversely affect response times of emergency services. This shall be determined by Traffic Engineering staff in conjunction with the affected emergency service(s).
   - The street is not part of a transit route.

3. The Traffic Engineering staff shall inform petitioner(s) of the decision. If all of the above requirements are met, the petitioner(s) shall obtain the approval/disapproval of all residents on the street on forms supplied by the City. If the Traffic Engineering staff find that there would be a substantial diversion to parallel streets (more than 25%) due to speed hump installation, the petitioner(s) shall also obtain the approval/disapproval of residents on the parallel streets. All the residents (of the street requesting speed humps only) who approve the speed hump installation are required to bear the construction and labor costs of the speed humps. The City shall contribute, as its share, the design cost and the on going maintenance costs. For vote counting purposes, each household (house, apartment, or condominium) is counted as one vote. For eligibility at least 60% of the households on the street (or the neighborhood as the case may be) need to approve the installation of speed humps. Once the design is complete, the Traffic Engineering staff shall inform the petitioner of the location of the speed humps. The petitioner shall then obtain the explicit concurrence of at least 75% of the residents living next to the humps (75 feet in both directions). If 75% of the residents living next to the hump do not agree to the location of the hump, the Traffic Engineering staff shall meet with the petitioner(s) and/or affected residents and discuss alternate locations. In any case, unless 75% of the residents living immediately adjacent to the speed humps concur, the street shall not be eligible for speed hump installation. If the residents concur, then the street is eligible for speed hump installation.

4. In case of multiple requests from various neighborhoods, for the purpose of scheduling the installation, the speed hump requests shall be prioritized based on the following point system:

No.	Description		Points
1.	Percentage of vehicles exceeding speed limit (e.g., 40%)		40
2.	Vicinity to schools and parks (within one block) (e.g., yes)		+5
3.	On emergency service route (e.g., yes)		-5
4.	Percentage of households approving speed humps (e.g., 80%)		+80
5.	Number of reported accidents due to speeding (e.g., 2)	X5	+10
	TOTAL POINTS		130

5. Speed humps shall be installed as a single project once a year. A fixed number of humps shall be installed each year, contingent upon available staff resources. The priority system will be used to rank the streets. On the basis of the street's rank in the priority list, the petitioner(s) shall be informed of the status of the speed hump installation. If the street does not qualify for speed hump installation that year, it will be given the highest priority next year.

6. The speed hump design shall typically be done in-house. The construction of speed humps shall typically be contracted out by bid. The striping and signing shall also be done in-house by the City's Traffic Paint and Traffic Sign sections. If the street qualifies for speed hump installation in that year, the cost of speed hump construction and signs and striping (including labor, equipment, and materials) shall be collected from the residents who approve speed hump installation. The collection of money shall be made before the contract for speed humps is awarded.

7. The construction of speed humps shall be in accordance with the plans, Standard Provisions, State of California, Standard Provisions, City of Modesto, Special Provisions for Speed Humps.

8. Location of speed humps shall be at least 100 feet from existing traffic control devices unless decided otherwise by Traffic Engineering staff. The spacing between humps shall be based on guidelines set by the Institute of Transportation Engineers (ITE)*. The exact spacing shall be determined on an individual basis based on engineering judgment. Speed humps shall not be located on curves less than 300 feet in radius.

9. On streets where the curb is of roll-over type, typically, posts supplemented by type "P" reflective marker tape shall be installed on either side of the hump to prevent motorists from traveling over the curb.

10. Speed humps are relatively new design features. Therefore, the Traffic Engineering staff has the authority to make any alterations or modifications to the above installation procedure as needed by future circumstances.

* Recommended guidelines for the design and application of speed humps, ITE Special Task Force, Institute of Transportation Engineers, May 10, 1991.

Removal of Speed Humps Procedure

The following procedure shall be used to determine a street's eligibility for speed hump removal:

1. The request for speed humps shall be initiated by a citizen(s) in writing.

2. Since speed humps are installed and removed only once a year, speed humps shall not be considered for removal within one year of installation.

3. If the above requirements are met, the Traffic Engineering staff shall inform petitioner(s) of the decision. The petitioner(s) shall obtain the approval or disapproval of all households on the street on forms supplied by the City. All the residents who approve the speed hump removal are required to bear the cost of removal (labor and equipment). If 60% of the residents approve of the removal of the speed humps, the street will be eligible for speed hump removal.

4. The speed hump removal shall be contracted out to bid as part of the speed hump installation project.

5. The Traffic Engineering staff has the authority to make any alterations or modifications to the above removal procedure as the need may be, at anytime in the future.

* Recommended guidelines for the design and application of speed humps, ITE Special Task Force, Institute of Transportation Engineers, May 10, 1991.

Speed Hump Request Form

I/WE, (names) _____

residing on (street name) _____ at (write address number below):

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

request the installation of speed humps on _____

between _____ and _____. I/WE will act as the facilitator(s) between the neighborhood residents and the Traffic Engineering staff. The facilitator's duties will include collection of signatures from residents, and if speed hump installation is approved, collection of money from neighborhood residents.

Signature: _____ Date: _____

Printed Name: _____

Signature: _____ Date: _____

Printed Name: _____

Return the signed request form to:

City of Modesto
Public Works Department
Traffic Engineering & Operations Division – Speed Hump Program
P. O. Box 642
Modesto, CA 95353