



CITY OF COLTON ENGINEERING DEPARTMENT

SPEED HUMPS

LOVE THEM OR HATE THEM



WHAT ARE SPEED HUMPS:

Speed humps are asphalt or concrete raised “bumps” placed across residential streets. They are designed to calm traffic in residential areas. Speed humps are one of the most requested traffic calming improvements for residential streets. They are designed to warn drivers to slow down and are effective in reducing driving speeds. They are not the same as speed bumps encountered in parking lots. Those have a higher profile and are designed for traffic that is already traveling less than 25 mph.

Speed Humps are a gradual hump with a height of 3 inches at the crown and are typically 18 feet long in the direction of travel, with a parabolic or flat raised section. In succession, they are generally spaced every 400 to 500 feet, although they may be spaced as far apart as 750 feet. When humps are installed, advance signage and pavement markings are required.

Generally the speed humps are only applicable in residential settings that have posted speed limits of 25 or 30 mph. The humps are never installed in areas with restricted visibility, such as sharp curves, hillcrests, steep grades, or at intersections or driveways. Humps are designed in such a way as to accommodate larger vehicles such as school buses and fire trucks; they do impede emergency vehicles to the degree that they may slow down response time. Generally there is an additional time of approximately 3 to 5 seconds per hump for fire trucks and up to 10 seconds for an ambulance with a patient.

Speed humps are not typically used on major roads, bus routes, or primary emergency response routes. Also they may not be constructed on grades greater than 8 percent.

Speed humps work well in combination with textured crosswalks, curb extensions, and curb radius reductions.

WHY ARE SPEED HUMPS DESIRABLE ?:

- ◆ Speed humps can help control speeding on local neighborhood streets
- ◆ They can reduce average speeds by as much as 7 mph.
- ◆ Unlike traditional Police enforcement, speed humps provide continuous service.
- ◆ They may also help discourage cut-through traffic by diverting it elsewhere.

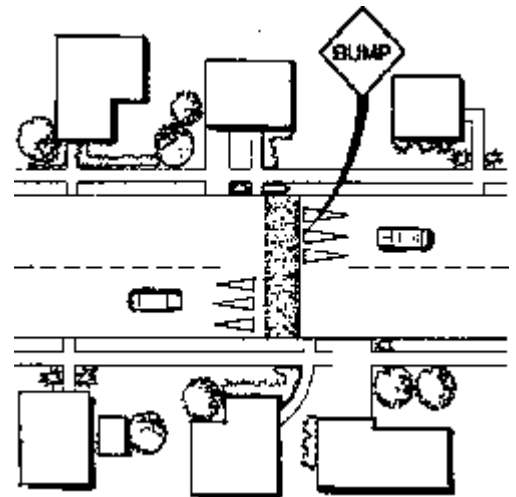
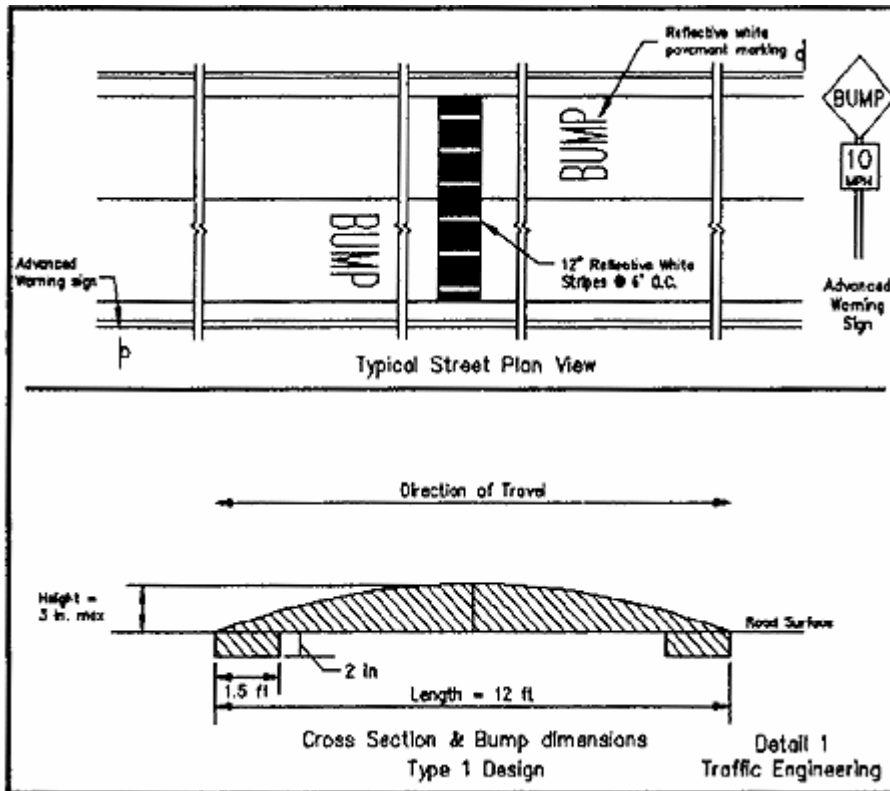
ARE THERE ANY DRAWBACKS TO THE INSTALLATION OF SPEED HUMPS ?:

Yes, as with any consideration, there are two sides to the story. Some of the disadvantages include:

- ◆ Residents living near speed humps must tolerate increase noise levels as vehicles traverse speed humps day and night.
- ◆ Vehicles may drive on sidewalks or through front yards to avoid speed humps.
- ◆ Traffic may be diverted to previously quiet parallel streets in the neighborhood.
- ◆ Emergency service response time may suffer.
- ◆ Motorized street sweeping equipment cannot be used at speed hump locations.
- ◆ Speed humps interfere with street repaving, decreasing the effectiveness of both the speed hump and the new pavement surface.
- ◆ Speed humps block the flow of drainage water on some streets and cause flooding problems.
- ◆ Speed humps require additional signage and striping, which some residents consider unattractive.
- ◆ There is an initial cost of installation and on going maintenance of speed humps.
- ◆ May expose the City to additional liability.

DESIGN/INSTALLATION ISSUES:

- ◆ Typically 14 to 18 feet in length.
- ◆ Speed hump shapes include parabolic, circular, and sinusoidal.



- ◆ Hump height range between 3 and 4 inches with trend towards 3 to 3 ½ inches maximum.
- ◆ Installation of additional signage and pavement markings
- ◆ Taper edge near curb to allow gap for drainage

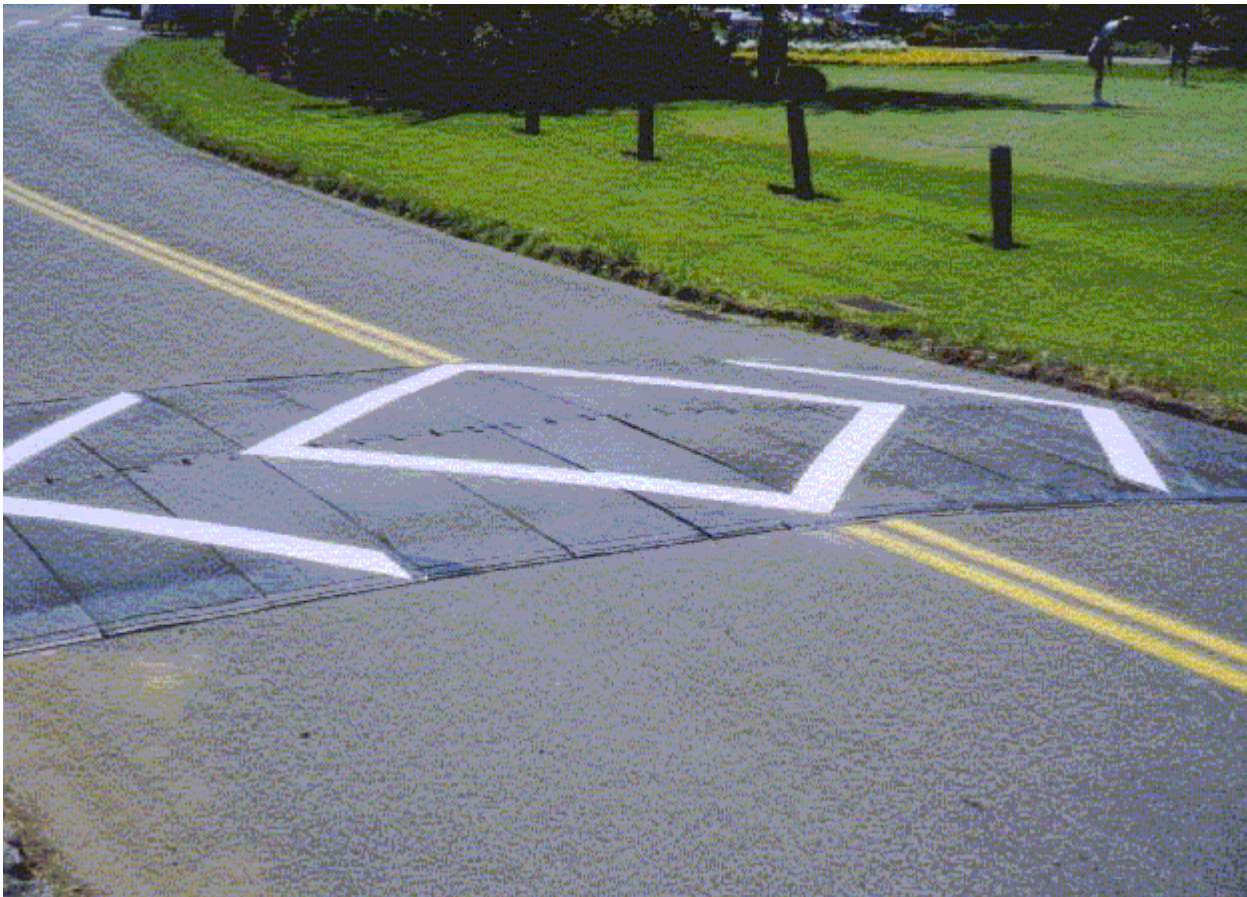
DESIRABLE CRITERIA:

- ◆ Classification: The street should be classified as a residential or residential collector according to the City Circulation Element.
- ◆ Speed Limit: The enforceable speed limit should not exceed 25 mph.
- ◆ Street Configuration:
 - a. Not more than 40 feet wide, unless approved by the City Engineer.

b. Not have a grade in excess of 8% where speed humps are to be considered.
C. Have adequate vertical and horizontal alignment and sight distance as determined by the City Engineer.

- ◆ Traffic Volume: The street should have a volume in excess of 600 and less than 5,000 vehicles per day.
- ◆ Not recommended for Streets where drainage flows down the center of the roadway.
- ◆ Speed hump should not be installed within 200 feet of a STOP or YIELD sign.

[WHICH STREETS SHOULD HAVE SPEED HUMPS:](#)



Unless chronic speeding problem exist on the street, speed humps are not warranted. Traffic control, such as Police enforcement, is usually a better alternative. Speed humps are used for streets where traditional methods of slowing traffic have not been effective. A residential street will qualify for a speed hump installation based on the following criteria:

- ◆ The two-lane street must be mainly residential or else have a park or school on the street.

- ◆ The residential street (or part being considered) must be at least 750 feet long with no four-way intersections.
- ◆ There can be no other traffic control devices on the street segment such as four-way stop signs, traffic signals, etc.
- ◆ The speed limit must be 30 miles per hour or less.
- ◆ There may not be any Regional Transit bus routes on the street.
- ◆ The street cannot be a designated emergency response route.

DESIGN METHODOLOGY IN THE INSTALLATION OF SPEED HUMPS:

The request for adding speed humps or any other residential traffic control device usually results from residents who are concerned about traffic safety in their neighborhoods. Because of general increased traffic flow, more traffic naturally moves through residential neighborhoods. Due to poorly designed roadways, it is easy for cars to use local streets as shortcuts between collectors and arterials. In addition, drivers often do not obey the residential speed laws, which are generally lower than on collectors and arterials.

Installing street humps is not a small project nor does it have a small impact.

Nothing should be implemented, or even considered, unless there is strong urging from residents along the effected street. Even then, there are a number of things that should be evaluated and implemented before installation.

1. Traffic engineering studies of the area need to be done to determine if the path in question is a good candidate for speed humps utilizing the criteria mentioned earlier. These studies include safe sight distance, pedestrian activities, vehicle classification, traffic count, speed studies. Current Land Use, school routes, “as built” plans, other control devices, and stop sign compliance should also be examined.
2. If the traffic engineering studies show that there is a prevailing problem, the next step should be to enforce existing laws and ordinances regarding speed limits, revising them if necessary.
3. The third strategy is to educate residents on the causes of the speed problem and the potential solutions to it. They should be well informed on the advantages and disadvantages of each possible solution. This can be done in a number of ways including town meetings, flyers, posters, and door to door education.
4. Installation of traffic control devices, including regulatory, warning, and guide signs, in conformance with the Manual on Uniform Traffic Control Devices.
5. Consider legal liability. Review the current laws and regulations regarding speed humps. Courts have held the installing agency liable for damage and personal injuries resulting from speed humps.
6. If none of the above strategies alleviates the speed problem, then speed humps should be considered. The plan, however, should not be implemented until other alternatives have been explored, all groups affected are informed and/or consulted concerning the matter, and traffic engineering studies have been conducted and conclude that there is a need for speed humps.

7. Speed humps are designed for residential roads that have two lanes or less at a posted speed limit of 30 mph or less, and 85th percentile speeds of 31-34 mph. Local roadways that carry traffic volumes of 600-5000 vehicles per day are good candidates. Traffic volumes less than 600 do not typically impact neighborhoods enough to require speed humps. Speed humps will not have a significant positive effect on streets with volumes greater than 5000 vehicles per day. Roads with high volumes need other traffic control devices to alleviate problems

LOCATION:

The first speed hump in a series should be placed 50-200 feet from a small radius curve or stop signs assuring that vehicles are not approaching at high speeds. If installed on a street with significant gradeline, the first hump in a series should be placed at the top of the grade

If possible, speed humps should be placed on property lines for noise abatement. Although the overall noise level along a hump controlled section of roadway is not increased significantly; the noise of a vehicle traversing a hump can increase. Humps can also be placed on property lines for aesthetic reasons. Humps should be placed near streetlights to increase nighttime visibility.

To be effective along a section of roadway speed humps should be placed in series of 500 to 600 feet intervals when considering the geometric of the roadway. On a flat, straight street, historically it has been found that 500-foot intervals are ideal for maintaining speeds of 25 mph.

Each speed hump or series of humps must have accompanying warning signs in accordance with State Traffic Manual.

Each speed hump must be painted with a pattern that makes them visible to drivers and provide a safe and reasonable sight distance.

Speed humps should not be placed on sharp curves (either vertical or horizontal). If the curves are too sharp, it can result in lateral and/or vertical forces on the vehicle when traversing the speed hump. Speed humps should not be placed on a vertical curve with less than the safe stopping sight distance. Placing humps on horizontal curves increase the risk of losing control of a vehicle because it will not approach perpendicular to the hump.

Standard speed humps are 18 feet long, which is longer than the average wheel base length for cars (10 ft). This allows the car to maintain control while passing over the hump and omits "bottoming out". Vehicles with a wheel base longer than 12 feet will experience the same effect as a speed bump (jolting of cargo and passengers). If traffic volumes consist of more than 5% long wheel base vehicles, speed humps should not be installed. Because the wheel base length of most buses is greater than 12 feet, speed humps should not be placed on transit routes.

Speed humps should not be placed on major emergency vehicle response routes. In the City of Riverside, Fire department and Ambulance drivers reported having to slow down to 10 mph when crossing each hump to avoid damage to on board equipment, thus increasing emergency response time.

Speed humps along a street can divert traffic to a nearby route. If traffic-engineering studies show that the diverted traffic may cause equal or greater problems on a nearby route, speed humps should not be installed.

EXPECTED RESULTS:

Research has shown that speed humps, when designed and installed properly, reduce vehicle speeds to 15-20 mph when traversing speed humps and 25-30 mph in between properly spaced speed humps. When traversing a speed hump the vehicle experiences a gentle rocking motion that increases with speed. This enables the speed humps to be self-enforced because the vehicle occupants will experience discomfort when passing over a hump at higher speeds and a jolting when passing over at excessive speeds.

Although speed humps have been proven to be effective at reducing speeds, there are drawbacks. Installed speed humps have actually been removed in response to resident complaints. The major complaints have been aesthetics of having speed humps and the increased noise level at each hump although the net noise change throughout the controlled strip is insignificant.

Although they are the most important group, more than just the residents are affected by the installation of speed humps. Other groups such as emergency service providers, street maintenance providers, school districts, transit operators, refuse collection agencies will be affected and should, therefore, be informed and consulted concerning the installation of speed humps.

Bicyclists and Motorcyclists

Bicyclists and motorcyclists will have the most direct physical impact of all travelers passing over the speed humps. It should be noted that if the hump has a length that is shorter than the wheel bases of a bicycle (3.5 feet), the hump should be no higher than 2 inches so that the toes of a bicyclist do not strike the humps.

Liability

Speed humps are not addressed in the State Traffic Manual for Uniform Traffic Control Device but are instead geometric roadway design features. If not installed properly and property damage or personal injury occur, the installing agency may be held liable. In fact, many California courts have held public agencies liable for damage and/or injury resulting from both speed humps and speed bumps. It is prudent to document justification for all decisions made concerning installation. It is also important to review state and local laws to identify regulations pertaining to roadway design, roadway maintenance, traffic control, or other elements that might be related to the use of speed humps or other geometric design features.

RESIDENTS PETITIONING SHOULD BE A REQUIREMENT OF A SPEED HUMP PROGRAM:

Petitions help show whether strong resident support for speed humps exists. The City will designate an “affected area,” usually consisting of homes along the street where speed humps are proposed. Residents must obtain support from at least 70 percent of residents in the affected area, and must obtain support from every resident whose home is within 100 feet of a proposed speed hump.

TYPICAL COST ASSOCIATED WITH SPEED HUMP INSTALLATION:

In discussing speed hump criteria with local jurisdictions around Colton, the approximate cost of speed hump installation is between \$2,000.00 and \$3,000.00. Since it is critical to have strong resident support in the installation of the speed humps, it is the policy of all the jurisdictions that were contacted to have the applicant or group of residents requesting the installation to pay approximately one third to half the cost of the speed hump.

CONCLUSION:

The procedure for installation begins with the residents’ request and continues with traffic engineering studies to determine the need for speed humps. These studies include but are not limited to safe sight distance, pedestrian studies, vehicle classification, traffic count, and average speed. Current land use, school routes, "as built" plans, other control devices, and stop sign compliance should also be examined.

If it is determined that speed humps are the best solution for a roadway, then the installation can begin. The humps installed should follow the design criteria. They should be 18 feet long and 3 inches high, have accompanying warning signs in accordance with the State Traffic Manual, and be painted with a pattern that makes them visible to drivers and provide a safe and reasonable sight distance.

If designed, installed, and maintained properly, speed humps can be a safe, effective method of reducing vehicle speeds through residential areas.

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