

WASHOE COUNTY POLICY
FOR
INSTALLATION OF SPEED HUMPS

BACKGROUND

The quality of life in residential neighborhoods can be significantly affected by the traffic issues of speeding and high vehicle volumes. Factors such as excessive worry for the safety of children, additional effort needed to increase safety precautions such as walking/driving a child to school; noise; discomfort when walking to a neighbor's home - all due to excessive speeding, high numbers of cars, and/or existing substandard improvements - can reduce the standard of living in a residential neighborhood. Conventional methods of reducing/controlling speed such as increasing traffic enforcement and improved/increased signage have not always proven effective. Because of this, nonstandard, relatively untested methods of controlling speed and reducing volumes are evolving.

PURPOSE

Speed humps are one nonstandard means which can contribute to restoring the livability of a residential neighborhood when excess speeds and/or large relative increases in traffic have occurred. The purpose of the speed hump policy will be to provide a request procedure, evaluation methodology, design standards, prioritization mechanism for funding, and procedure for monitoring effectiveness, when speed humps are requested by residents.

Public facilities, such as parks and schools, which are an integral part of residential neighborhoods may also have a need for nonstandard traffic safety mitigation devices. Request procedures from those responsible for the operation and safety of public facilities are also included in this policy document.

REQUEST AND APPROVAL PROCEDURE

1. Request
 - a. A written request for speed humps must be submitted by residents living along the applicable street(s) to the Public Works Department.
 - b. The written request must be in petition form, signed by at least one-half (1/2) of the property owners along the affected street. The form will include the printed name, address and signature of the requesting citizens and an explanation of why speed humps are desired.

- c. Requests for speed humps on streets associated with/adjacent to public facilities such as parks and schools should be made in writing by the official responsible for management of these facilities. The request should include the reason(s) for the request including information on any previous efforts at mitigating the traffic problems with standard traffic control devices.

2. Evaluation

- a. County staff will verify the petition and perform traffic engineering studies to describe traffic conditions.
- b. If the engineering studies show that installation of speed humps will impact other proximate residential streets, a citizen committee, as determined by the applicable CAB/HOA will be formed to work with staff in formulating the final recommendations for use of speed humps.

3. Funding

- a. The proposed street(s), if to be further considered for speed humps, will be prioritized for funding.
- b. An annual level of funding of \$50,000 will be created for the installation of speed humps. If approved requests for speed humps exceed the annual budgeted amount, the humps 1) may be constructed if the residences choose to fund the project themselves; 2) the project can be prioritized and constructed when funds become available; 3) the project can be placed on the CIP for consideration within the overall annual County budget. Budgeted funds remaining from a previous year shall not be carried forward into the succeeding budget year.

4. Approval

All speed hump projects must be approved by the Department of Public Works in accordance with the methodology given in the Washoe County Policy for Installation of Speed Humps.

EVALUATION METHODOLOGY

The County Engineering Division will perform necessary traffic engineering studies such as speed measurements, average daily traffic (ADT) counts, and pass-through traffic counts. The specific minimum criteria which must be met prior to approval of speed hump installation are:

1. Measured 85th percentile speeds for a neighborhood residential street ($ADT \leq 1000$) exceed 30 mph.
2. Measured 85th percentile speeds for a neighborhood collector street ($ADT > 1000$, ≤ 2000) exceed 35 mph.
3. The average daily traffic (ADT) volume is at least 300.
4. The street is classified as a neighborhood collector or residential, with no more than one travel lane in each direction.
5. The installation location must be visible 200 feet from each approach.
6. Speed humps will not be installed on streets where longitudinal grades are greater than 5%.
7. Speed humps will not be installed on major emergency response routes, such as those used for fire station traffic.
8. Installation will not be made where diversion of traffic to other residential streets will occur, unless impacts can be mitigated as evaluated above under REQUEST AND APPROVAL PROCEDURE, 2.
9. Speed humps shall not be installed on either transit (bus) route streets or designated truck routes.
10. The entire street frontage must be residential, park, and/or school.
11. Snow removal considerations at higher elevations may preclude the use of speed humps.
12. Consideration for use of speed humps shall be based on factors such as excessive speeding (85th percentile speed), average daily traffic volumes (ADT), and existing substandard improvements which may affect neighborhood safety including narrow pavement widths, narrow shoulders, with roadside ditches and no sidewalks.

LOCATION, NUMBER AND SPACING GUIDELINES

In addition to the minimum criteria above, the location and number of speed humps shall be based on the following guidelines:

1. The minimum distance from an intersection to a speed hump, where the street with a hump is a through street with no stop sign, shall range from 50 to 200 feet, depending on the type of intersection.

2. A speed hump is not to be installed within a sharp horizontal curve (a curve with a centerline radius of 300 feet or less), or within 100 feet of the beginning or end of such a curve.
3. The first hump at either end of a series shall be placed such that a warning sign can be installed before the hump at a distance equal to at least the minimum safe stopping distance, based on the measured, preinstallation 85th percentile speed.
4. Any speed hump shall be visible to oncoming traffic for at least the minimum safe stopping distance, based on the existing or expected 85th percentile speed.
5. A speed hump shall not be placed over manholes, catch basins, or other utility access points.
6. A speed hump shall only be located where it does not cause substantial adverse impact on established drainage patterns.
7. A speed hump shall only be located where curve, pole, tree or other obstruction (existing or new) would block traffic from driving around the end of the hump.
8. The following guidelines also apply (where determined feasible by the Department of Public Works):
 - a. Speed humps are to be placed near street lights.
 - b. Speed humps are not to be placed within intersections.
 - c. Speed humps are not to be located immediately adjacent to driveways.
 - d. Speed humps are not to be placed within 250 feet of a traffic signal.
 - e. Speed humps and related signing are to be located on property lines, and where shrubbery, fences or other obstructions interfere with the direct view of the humps from residences.
 - f. Speed humps are to be located immediately downhill of drainage inlets.
 - g. Speed humps are not to be located adjacent to fire hydrants.
9. The spacing between speed humps or between a speed hump and a stop sign, sharp curve, jog, cul-de-sac, or other discontinuity that reduces speed to approximately 20 mph shall range from 350 to 550 feet.

Other factors which affect spacing of speed humps are: the desired reduction in the 85th percentile speed, street grade, hump geometry and length of street being modified. The maximum spacing is expected to be no greater than 700 feet.

10. Speed humps are to be installed at right angles to the vehicular travel path.

Other:

1. Roadway edge treatments. On roadways with vertical curbs, humps are to extend fully across the road from curb to curb. If tapering is necessary for drainage or other reasons, the edge taper is to 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 promoted by the tapered hump edges, since drivers can drive with one wheel in the gutter thereby reducing the hump's ability to slow vehicles. If humps are installed with tapers, or used on non-curbed roadways (not recommended), raised pavement markings, 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. If installed on roadways with paved shoulders, the hump should ideally extend across the shoulder to discourage vehicles from attempting to avoid the hump.

2. On-street parking. Care should be taken to ensure the vehicles parked on streets do not diminish the effectiveness of the signing and marking for speed humps. If parking is removed adjacent to or before the hump, the ability of vehicles to avoid tapered humps by "gutter running" will be enhanced. Each hump installation is to be evaluated independently for site-specific parking considerations.
3. Coordination with pedestrian crossings. Mid-block pedestrian crossings coordinated with speed humps are desirable, since vehicular speeds will generally be lowest at speed hump crossings.
4. Aesthetic considerations. Speed humps may be constructed of special materials such as brick pavers or specially treated concrete to enhance their appearance, where funding is available and the materials can be properly maintained by the responsible agency.

5. **Liability considerations.** 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 must be designed, installed, operated and maintained using accepted traffic engineering principles and prudent engineering judgement.

Speed humps not installed in a proper manner and with due care, could constitute a public nuisance, with associated liability exposure. Therefore, complete and proper documents must be retained to justify the decisions made. Local and state laws must be reviewed to identify any requirements pertaining to roadway design, roadway maintenance, traffic control, or other elements related to the use of speed humps or other geometric design features.

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, appropriate signage is to be used to warn and notify drivers of these vehicles of the speed humps and any associated advisory information. It may be necessary to modify the standard hump design to minimize impacts to these users.

5. **Enforcement.** During the initial stages of speed hump experience, it will be desirable to employ special traffic enforcement, targeting violations occurring at or near speed humps and along other nearby routes which may be affected.
6. **Maintenance issues.** Speed humps shall be monitored to ensure that edge ravelling and profile deformation do not exceed established tolerances. Regularly scheduled inspections and maintenance are to be performed to maintain the appropriate design relationship between the hump and the street, so the hump continues to perform its intended purpose. Pavement maintenance activities affecting speed hump markings shall necessitate that they be promptly restored.
7. **Incorporation in new street design.** It is important 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 have not or cannot be achieved, and one of the aforementioned problems is considered likely, it may be appropriate to include speed humps as a part of the new street construction, but only after consideration of less restrictive design or traffic control techniques. Adequate signs, markings and other devices will be required to support their installation.

DESIGN STANDARDS

Speed hump design geometry, depending on the 85th percentile speed desired, shall be according to Washoe County Standard Details.

Signing and striping shall be in accordance with the MUTCD and Washoe County Standard Details.

PRIORITIZATION OF SPEED HUMP INSTALLATION PROJECTS

Priority ranking will be done annually using a point system. Streets under consideration will be investigated and data accumulated. The data collection includes traffic counts, speed surveys, and count of the number of houses fronting the street, and measurement of street frontage by schools, parks, playgrounds, or multi-family dwellings.

Points will be awarded in the following manner:

1. One point for every 50 vehicles that travel the street in a 24 hour study period.
2. One point for each percentage point of traffic exceeding the posted speed limit, and one-half point for each mile per hour speed differential between the posted speed limit and the 85th percentile speed.
3. One point for every residential unit fronting the street, and one point for each 50 feet of school, park, playground, or apartment frontage.

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 must be performed after installation to ascertain if the humps have achieved the desired results without creating unexpected problems.

1. On-site observations. Immediately after installation of speed humps, and at selected times thereafter, observations will be made to determine motorist's behavior patterns and any unusual operating conditions (such as gutter running). The observations will be scheduled during both day and night conditions.
2. Speed studies. Speed studies will be performed before and after hump installation, to determine speeds and the effect on vehicle operating speeds.
3. Volume studies. Traffic volume counts will be made on the subject street and on those street where traffic diversion may be expected.

Counts will be made before installation and after traffic patterns have stabilized, to determine the magnitude and specific location of this diversion. Both turning movements and 24 hour volume counts may be needed to quantify these impacts.

4. **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 signs locations. Increased violation rates are to be considered in speed hump evaluations, and selective enforcement may be necessary to address the problem.
5. **Travel time studies.** Based on the particular requirements of the installation, it may be desirable to perform detailed travel time studies before and after hump installation to determine the effect on overall traffic time along the subject street or through the area.
6. **Accident analysis.** A thorough before and after accident analysis is to be performed to determine if accident trends have been noticeably impacted by the speed hump installation. It may be necessary to establish ongoing analysis at some locations to gauge the longer-term trends of accident rates.
7. **Resident and driver studies.** Within 30 to 60 days after installation (or at end of the established trial period), a survey of adjacent residents and other affected residential areas is to be conducted to assess their concerns and perception of the speed humps' performance. Motorists continuing to travel the street may also be selectively surveyed to assess their opinion of the speed humps' installation. Emergency and service agencies are to be offered the opportunity to comment on the installation.

