2.7

DEPARTMENT OF
PUBLIC WORKS

TRAFFIC ENGINEERING
DIVISION

CITY OF SACRAMENTO
CALIFORNIA

1000 I STREET
SUITE 170
SACRAMENTO, CA
95814

PH 916-264-5307
FAX 916-264-8404

July 12, 2002

APPROVED
JUL 30 2002
OFFICE OF THE
CITY CLERK

City Council
Sacramento, California

Honorable Members in Session:

SUBJECT: AMENDING THE SPEED HUMP PROGRAM GUIDELINES TO INCLUDE THE INSTALLATION OF SPEED LUMPS

LOCATION AND COUNCIL DISTRICT: Citywide, all council districts.

RECOMMENDATION:

This report recommends that City Council adopt the attached resolution amending the Speed Hump Program Guidelines to include the installation of speed lumps on residential streets.

CONTACT PERSON: Karen Shipley, Program Specialist, 264-8365

FOR COUNCIL MEETING OF: July 30, 2002

SUMMARY:

This report provides information about the recent testing of speed lumps on residential streets. Results of the testing show a reduction in traffic speeds as well as positive feedback received from residents. Staff is recommending to amend the Speed Hump Program Guidelines to include the installation of speed lumps on residential streets with a speed limit of 30 miles per hour or lower that are designated as an emergency response route or a Sacramento Regional Transit bus route. Council action will amend the Speed Hump Guidelines as shown on Exhibit A to the resolution.

COMMITTEE/COMMISSION ACTION: None

BACKGROUND INFORMATION:

The City of Sacramento has been installing speed humps to control vehicle speeds on residential streets since 1980. However, speed humps are not approved for residential streets that are designated as an emergency response route by the Fire Department, or are a Sacramento Regional Transit bus route.

In September 2000, City Council approved the testing of speed lumps on streets throughout Sacramento. The streets selected for testing varied in street width, characteristics and traffic volumes. Residents were balloted to determine if the street should be tested with speed lumps. As a result, speed lumps were placed on eleven streets. Several months after installation, new traffic data was gathered to compare with data taken before the speed lumps were installed. Additionally, residents were sent a survey asking them if they wanted to keep the speed lumps or have them removed. Overall results showed that traffic speeds were lowered by an average of 31% or 11 miles per hour. 84% of residents who returned their survey indicated that they wanted to keep the speed lumps. Complete results by street of this data are shown on Attachment A.

The test of speed lumps included five streets with Sacramento Regional Transit (RT) bus routes. At the conclusion of the test, RT indicated that they would support the development of a program for the citywide use of speed lumps on residential streets with bus routes. City staff will continue to work with RT on the design of lumps for streets with specific concerns due to traffic volume and street width.

Testing for emergency response fire trucks was done for a comparison in response time of identical length streets; one with no speed humps, one with two speed humps and one with two speed lumps. Results shown in the following chart indicate that there is almost no difference in response time between a street with no speed humps and a street with speed lumps.

	RESPONSE TIME IN SECONDS (943' street)		
Type of equipment	**Street without humps**	**Street with 2 speed lumps**	**Street with 2 speed humps**
Fire engine #10	22.10 seconds	22.51 seconds	35.18 seconds

The Sacramento Fire Department would prefer that residential streets have no speed humps and are concerned about the maintenance of their trucks and shifting of equipment with regard to traversing speed lumps. Staff will continue to work with the Fire Department on the design of speed lumps to address their concerns.

Based on the effectiveness of slowing traffic and the positive feedback received from residents, staff is recommending that the speed hump program be amended to include the installation of speed lumps. Due to the cost of construction being slightly higher for speed lumps, the recommendation is to install speed lumps only on emergency response routes and bus routes, and continue to install the traditional speed humps on other residential streets.

One of the streets tested with speed lumps has a designated bicycle lane and parking lane. A lump was installed through the parking lane and partially into the bicycle lane. While this design accommodates bicyclists, there have been concerns raised about some vehicles trying to avoid going over the lump with all four tires, and instead, veering to the right so that the right tires are in the bicycle lane portion not covered by a speed lump. Future design of speed lumps on streets with bicycle lanes will need to be carefully considered.

FINANCIAL CONSIDERATIONS

At this time, no funding has been identified for the construction of speed lumps. Staff is recommending that a list of qualified streets requesting speed lumps be established during FY03. It is anticipated that qualifying speed lump streets will be merged with speed hump streets and ranked by council district. Annual funding of the Speed Hump Program will go towards construction of speed humps/lumps of the top ranked streets.

ENVIRONMENTAL CONSIDERATIONS:

Pursuant to Section 15378 (b) (3), this is not a project under the California Environmental Quality Act.

POLICY CONSIDERATIONS:

The Speed Hump Program is consistent with the City's Strategic Plan for enhancing and preserving neighborhoods.

ESBD CONSIDERATIONS:

No goods or services are being purchased.

Respectfully submitted,

Martin W. Hanneman
City Traffic Engineer

RECOMMENDATION APPROVED:

ROBERT P. THOMAS
City Manager

Approved by:

for Michael Kashiwagi
Director of Public Works

Attachment

ATTACHMENT A

RESULTS OF SPEED LUMP TESTING

District	Street	Speed Reduction		Resident Response	
		In MPH	By %	Survey Return Rate	% in favor of keeping lumps
1	Mendel Way	8	-23.5%	45%	89%
2	Claire Avenue	13	-33.3%	41%	100%
2	Colfax Street	13	-37.3%	40%	75%
4	35th Avenue	7	-19.1%	61%	50%
4	Vallejo Way	8	-25.2%	63%	100%
5	Fairgrounds Drive	10	-36.6%	36%	80%
6	Jansen Drive	14	-37.25	65%	93%
7	Village Wood Dr.	15	-46.9%	33%	73%
7	Pocket Road	13	-31.6%	69%	88%
8	Tangerine Ave.	11	-30.0%	71%	100%
8	Tamoshanter Wy	7	-20.9%	42%	95%
AVERAGES:		**11.3**	**-31.1%**	**49.6%**	**84%**

APPROVED

JUL 3 0 2002

OFFICE OF THE CITY CLERK

RESOLUTION NO. 2002-504

ADOPTED BY THE SACRAMENTO CITY COUNCIL

ON DATE OF _____

RESOLUTION AMENDING THE SPEED HUMP PROGRAM GUIDELINES TO INCLUDE THE INSTALLATION OF SPEED LUMPS ON RESIDENTIAL STREETS

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF SACRAMENTO THAT:

The Speed Hump Program Guidelines are hereby amended to include the installation of speed lumps on residential streets as shown on Exhibit A.

_____
MAYOR

ATTEST:

_____
CITY CLERK

FOR CITY CLERK USE ONLY

RESOLUTION NO.: _____

DATE ADOPTED: _____

CITY OF SACRAMENTO
SPEED HUMP PROGRAM

Introduction

The City of Sacramento has had a speed hump program since 1980. Over the years, several revisions have been made to the program including street length criteria, change from undulations to speed humps, program name change, minimum speeding requirement and the installation of speed lumps on emergency response and bus routes. For simplicity of these guidelines, the term "speed hump" will refer not only to the traditional speed humps, but also the newer split hump design being called "speed lumps." Designs for both speed humps and speed lumps are included in these guidelines.

Definitions

Speed Bump – Single asphalt bumps covering approximately one foot and approximately 5 inches in height. Found in shopping centers and parking lots. Not installed on public streets.

Speed Hump – Single asphalt hump, parabolic in shape, covering 12 feet of street with a height between 3 ¼ and 3 ¾ inches. Installed on streets in Sacramento since 1995. Not installed on emergency response or bus routes.

Speed Lumps – Asphalt mounds, parabolic in shape, covering 12 feet of street with a height between 3 ¼ and 3 ¾ inches. The center mound or lump, has a width of 5 ½ feet to accommodate the wheelbase of fire trucks and buses. The lumps adjacent to the center lump vary in width to accommodate the street width. Depending on the street width, a 5 ½ foot lump may be placed in each travel lane. First testing of speed lumps in Sacramento was done in February 2000. Speed lumps have been approved by the Fire Department for use on emergency response routes and by Sacramento Regional Transit for use on bus routes.

Speed Survey – A survey of traffic speeds and volume conducted by the use of a magnetic sensor(s) or air pressure hose(s) to determine the percentage of traffic exceeding the speed limit. The speed survey shall be 24-hours in length.

Undulations – A set of adjacent speed humps placed on the street. Undulations were installed on Sacramento streets prior to 1995.

85th Percentile Speed – Otherwise known as the critical speed, is the speed at or below which 85% of the traffic is moving. The 85th percentile speed is used as one of the criteria to determine if a street qualifies for speed humps.

Program Categories

The City of Sacramento has three types of speed hump categories: Residential, Parks and Schools, and Bypass. The objectives, qualifying criteria, and priority ranking system for each of these categories are presented in subsequent sections of this report. Also in this report are construction specifications, locations selection guidelines, signs and markings, relocation and removal requirements, other funding, Regional Transit, Fire Department emergency response route, and public notification. Between 1980 and 1995, the city installed undulations (2 humps) for traffic calming. Since 1995, the city has installed speed humps (one hump) because it was determined that one hump was just as effective at slowing traffic as two humps, less costly and easier to find spacing for installation on streets.

Program Objectives

Speed humps serve to reduce vehicular speeds as well as to reduce cut-through traffic on local residential streets. Both of these effects are realized when speed humps are installed on a street, regardless of the type of program for which a street qualifies. The principle purpose of each of the three programs is as follows: The Residential Speed Hump list serves to reduce vehicular speeds on streets which include park and/or school frontage; and the Bypass Speed Humps list serves primarily to reduce inappropriate traffic volumes on certain streets.

Other, less costly, forms of traffic control (e.g., stop signs) should be considered the primary means of discouraging speeding and/or bypass traffic. Stop signs are less costly to install and can be installed immediately at locations which qualify. When these forms of traffic control are inappropriate, the location may be studied further to determine whether or not it qualifies for speed humps. The application of speed humps is limited to streets where geometric configuration or design fails to passively deter many drivers from exceeding the speed limit or from using streets as bypass routes. The proper application of speed humps enhances public safety.

Qualifying Criteria

In order for a residential street to be studied for speed humps, a petition from ten residents from the affected street must first be submitted.

A street qualifies for the installation of speed humps when the results of an investigation demonstrate that the criteria presented on page two of this document are met for the respective types of programs. Once a street has qualified, it will be assigned points and ranked with other qualifying streets based on the criteria on page three of this document.

Streets, which have already qualified for one of the speed hump categories under previously established criteria shall remain on the speed hump priority list. Their point totals, however, shall be adjusted, as necessary, in accordance with the priority ranking system as set forth in this document.

Qualifying Criteria *by Category*

Residential

The segment must be 750 feet in length between traffic controls, four way intersections, and/or curves with less than a 250-foot radius.

Posted speed limit must be 30 mph or less.

Street frontage of subject street segment must be at least 75% residential.

Street will not be considered for speed humps, but will be considered for speed lumps if it is a part of the Regional Transit bus network, or identified as an emergency response route by the Fire Department.

A minimum of 25% of ballots mailed shall be returned and a two-thirds majority of residents that vote are in favor of the installation of speed humps. **

A speed survey shall indicate that the 85th percentile speed is at five or more miles per hour over the speed limit.

Parks & Schools

The segment must be 500 feet in length between traffic controls, four-way intersections, and/or curves with less than a 250-foot radius.

Posted speed limit must be 30 mph or less.

Street frontage of street segment must contain a school * or park.

Street will not be considered for speed humps, but will be considered for speed lumps if it is a part of the Regional Transit bus network, or identified as an emergency response route by the Fire Department.

A minimum of 25% of ballots mailed shall be returned and a two-thirds majority of residents that vote are in favor of the installation of speed humps. **+

A speed survey shall indicate that the 85th percentile speed is at five or more miles per hour over the speed limit.

Bypass

The segment must be 500 feet in length between traffic controls, four way intersections, and/or curves with less than a 250-foot radius.

Posted speed limit must be 30 mph or less.

Street frontage of subject street segment must be at least 75% residential.

Street will not be considered for speed humps, but will be considered for speed lumps if it is a part of the Regional Transit bus network, or identified as an emergency response route by the Fire Department.

A minimum of 35% of ballots mailed shall be returned and a two-thirds majority of residents that vote are in favor of the installation of speed hump. **

A speed survey shall indicate that the 85th percentile speed is at five or more miles per hour over the speed limit.

Minimum average daily traffic (ADT) of 500 vehicles per day.

The street(s) must serve to bypass *** major streets with a four-way stop, a signalized intersection, or another street with speed humps.

* Preschool, Day care school, elementary, middle, or high school.

** One vote per household is allowed; voter(s) must reside at the household (whether they are owners or tenants), as they are the primary users of the street being considered for speed humps.

\+ If the survey of residents on a parks and schools street does not demonstrate a two-third majority favoring the installation of speed humps, the City Council member representing the district in which the street is located may override the survey.

*** To be considered a "bypass" location, the ADT must be at least 50% higher than the volume that would be expected using the following trip generation rates: 10-trips/day/single family residential (SFR) unit, 6-trips/day/multi family residential (MFR) unit, 50 trips/day/acre of school, and 5 trips/day/acre of park. Land uses which do not front the bypass location itself, but which could reasonably be expected to use the bypass street(s) should be considered when determining the expected volume.

When Voting Requirement Not Met

If a street fails to receive the necessary two-thirds majority approval, the street may not be considered again for speed humps/lumps for five (5) years.

Priority Ranking System

The following point allocation method will be used in order to rank streets qualifying for the speed hump categories:

Residential	Parks & Schools	Bypass
One point for every 50 vehicles traveling the street in a 24-hour study period.	One point for every 50 vehicles traveling the street in a 24-hour study period.	One point for every 25 vehicles traveling the street in a 24-hour study period.
One point for each residential unit fronting the street.	One point for each residential unit fronting the street, plus two points for each 50 feet of school, park, playground, or apartment frontage.	One point for each residential unit fronting the street, plus two points for each 50 feet of school, park, playground, or apartment frontage.
Two points for every 85th percentile speed of traffic exceeding the speed limit.	Two points for every 85th percentile speed of traffic exceeding the speed limit.	One point for every 10 vehicles that are considered "bypass traffic."

Construction Specifications (Single Hump)

Upon installation of the single humps, the asphalt concrete speed hump will have a width of 12 feet, a minimum height of three and one-quarters inches and a maximum height of three and three-quarters inches (3 ¼" to 3 ¾"), and a vertical curvature of 72 feet (refer to Figure 1). Speed hump will extend from lip of gutter to lip of gutter. There will be a two-foot (2') horizontal taper originating at the crest of the speed hump and converging at the lip of curb. Asphalt concrete shall be mixed and placed in accordance with Section 22 of the City of Sacramento Standard Specifications. Page 9 is a drawing of the proposed speed hump cross section.

Construction Specifications (Speed Lumps)

Upon installation of speed lumps, the asphalt concrete speed lumps will have a width of 12 feet, a minimum height of three and one-quarter inches and a maximum height of three and three-quarters inches (3 ¼" to 3 ¾"), and a vertical curvature of 72 feet (refer to Figure 2). The center lump (or lumps if the design requires one lump in each travel lane) will be five and one-half (5 ½') feet across. There will be a gap between lumps of one-foot (1') to accommodate the wheelbase of fire trucks and buses. The outside speed lumps will extend from the center lump to the lip of gutter. There will be a two-foot (2') horizontal taper originating at the crest of the speed lump and converging at the lip of curb. Asphalt concrete shall be mixed and placed in

accordance with Section 22 of the City of Sacramento Standard Specifications. Page 10 is a drawing of the proposed speed lump cross section for a typical residential street of 33 feet or less in width.

Location Selection Guidelines

In selecting precise locations for the speed hump installation, the following guidelines shall be adhered to:

- Speed humps shall not be located over manholes, water valves, or street monumentation, or whenever possible, within twenty-five feet of fire hydrants, as they prevent/impede access to these facilities.

- Speed humps should be located five to ten feet away from driveways, whenever possible, to minimize their effect on driveway access.

- Speed humps should be located on or near property lines, whenever possible, to minimize the impact on (access to) individual properties.
- Speed humps should be located near streetlights, whenever possible, in order to enhance their visibility at night.

- Speed humps should be located a minimum distance of 200 feet from corners, whenever possible, and should never be located within a corner radius.

- Where speed humps are constructed on streets having curves with greater than a 250-foot radius, no speed humps shall be located on the horizontal curve(s).

- Speed humps shall be spaced at a minimum interval of 250 feet and a maximum interval of 600 feet. Speed humps will be placed no closer than 200 feet from traffic control devices or four-way intersections.

- No less than two speed humps will be placed on a residential or parks and schools street, as two humps are the minimum for effective speed control. When speed humps are to be installed at a Bypass location, one hump may be placed if the street segment or one of the streets in a series of street segments is less than 600 feet in length. The maximum number of speed humps is dictated by street length and spacing requirements.

- To deter driver from driving around speed humps where no vertical curb exists, a two-inch (2") pipe shall be set in the sidewalk, centered on the speed hump in each approach direction. The pipes shall be placed at a maximum of six inches (6") form the back of curb (refer to Figure 3).

Signs and markings

All signs and markings required with the speed humps shall be part of the contract bid package.

There are two types of advanced warming devices used to alert motorists of upcoming speed humps: street signs and pavement markings. The signing includes a 30-inch sign stating "SPEED HUMPS AHEAD" in four-inch (4") series "C" letters, above which is a pictorial of a speed hump. A second sign recommending a speed of 15 mph is placed directly below the warning sign (refer to Figure 2).

Pavement markings shall include twelve-inch (12") wide longitudinal ladder markings at four feet (4') on center, which are stenciled across each speed hump. IN addition, raised reflectorized pavement markers shall be installed and placed on the centerline, positioned on the crest and in the front of the speed hump from approach directions. This provides warning during the night and early morning hours (refer to Figure 3). All warning devices should be easily visible on approaches to speed humps.

Relocation of Speed humps or Additional Speed humps

Changing the location or adding additional speed humps on a street may be considered when all of the criteria listed below are met.

1. For Residential and Parks and Schools Locations: Speed humps are ineffective in reducing speeds of vehicles based on speed survey conducted for *24*-hour period. If less than 30 cars are observed in one hour, the survey shall be 1-1/2 hours in length. The average speeds must each be less than two mph lower than those speeds demonstrated prior to the installation of speed humps in order to be considered ineffective.

   For Bypass Locations: Speed humps are ineffective in reducing the volume of vehicles, based on an average daily traffic (ADT) count. Traffic volumes must be reduced by less than 10% from the street's ADT count prior to the installation of speed humps in order to be considered ineffective.

2. Speed humps were placed in a location conflicting with the adopted guidelines, and another location exists which does not conflict with the adopted guidelines.

3. There is a petition with a two-thirds majority of the street's residents in favor of the speed humps relocation. One resident signature per household having driveway access onto the street in question is allowed; a resident may be either an owner or tenant.

A community meeting should be held, with the support of the district's City Council member, to discuss the advantages of speed humps. If the decision is made to relocate existing speed humps, a Council report and resolution must be drafted. When approved by the City Council, the relocation procedures may be initiated. Relocation of speed humps which may have been installed for less than two years will only be considered if the City is compensated by those requesting speed hump relocation for the full cost of relocating the speed humps, including design, construction, inspection, and administration.

Removal of Speed Humps

Removing speed humps from a street may be considered when all of the criteria listed below are met:

1. For Residential and Parks and Schools Locations: Speed humps are ineffective in reducing speeds of vehicles based on speed survey conducted for a 24-hour period. If less than 30 cars are observed in one hour, the survey shall be 1½ hour in length. The 85th percentile and average speeds must each be less than 2 mph lower than those speeds demonstrated prior to the installation of speed humps in order to be considered effective.

   For Bypass Locations: Speed humps are ineffective in reducing the volume of vehicles, based on an average daily traffic (ADT) count. Traffic volumes must be reduced by less than 10% from the street's ADT count prior to the installation of speed humps in order to be considered ineffective.

2. Speed humps were placed in a location conflicting with the adopted guidelines, and no other location exists which does not conflict with the adopted guidelines.

3. There is a petition with a two-thirds majority of street's residents' signatures in favor of the speed hump removal. One resident signature per household having driveway access onto the street in question is allowed; a resident may be either an owner or tenant.

A community meeting should be held, with the support of the district's City Council Member, to discuss the advantages of speed humps. If the decision is made to remove existing speed humps, a Council report and resolution must be drafted. When approved by the City Council, the removal procedures may be initiated. Removal of speed humps which have been installed for less than two years will only be considered if the City is compensated by those requesting speed humps removal for the full cost of the original installation, including design, construction, inspection, and administration. This would not apply if a street became a Regional Transit bus route.

Other Funding

A street which qualifies for any one of the speed hump categories may be funded by an individual or a group of individuals. The individual or group of individuals must enter into a memorandum of understanding (MOU) with the City of Sacramento, wherein they agree to pay for all costs associated with the installation of speed humps on their street (construction, inspection, administration, etc). Once a MOU is executed, the location to receive speed humps shall be included in the next City CIP speed hump project. Private payment for speed humps does not relieve a location from the requirement of a two-thirds majority of residents favoring the installation of speed humps, or from any other criterion set forth in these guidelines.

Regional Transit

Regional Transit (RT) adopted a policy on bus routing with regard to speed humps in 1982. This policy authorizes RT staff to modify bus routes so they do not utilize streets with existing or future speed humps, and to coordinate future placement of such devices. The Department of Public Works' policy is to provide RT with the locations of future speed humps so that problems, which this might create, can be avoided. Speed humps will not be placed on streets where RT bus service exists. However, RT has approved speed lumps for placement on bus routes.

Fire Department Emergency Response Routes

The City of Sacramento Fire Department has expressed concerns regarding speed humps, and desires that they not be placed on streets, which they identify as emergency response routes. The Department of Public Works' policy is to provide the Fire Department with the locations of future speed humps so that they can identify emergency response routes. Speed humps will not be placed on streets, which the Fire Department identifies as emergency response routes. However, the Fire Department has approved speed lumps for emergency response routes on a case-by-case basis.

Public Notification

Public notifications, which are used for balloting and to inform residents of purposed speed humps and to have them vote, may be distributed by one of two methods:

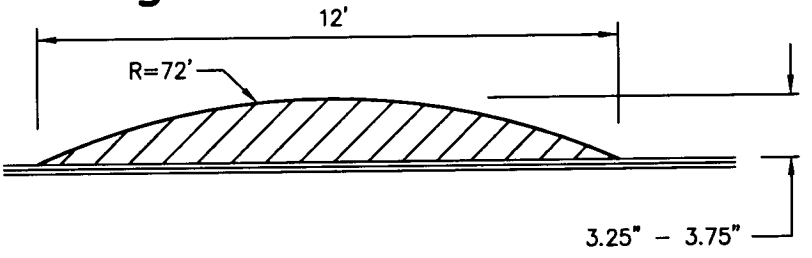
1. Door hangers, with ballots attached, may be hand delivered by an area youth group or a temporary service.

2. The fliers/ballots may be mailed out to residents of affected streets.

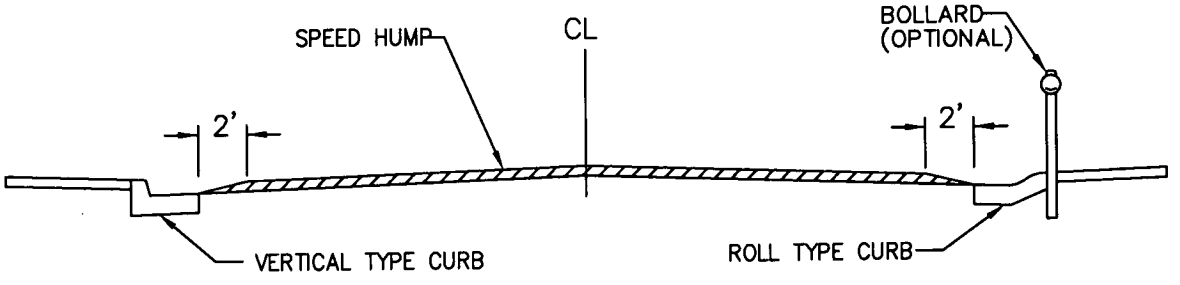
Note: Fliers, which require a response, should be sent far enough in advance to reach the public two and one half (2 ½) weeks prior to the response deadlines.

Revised: July 30, 2002

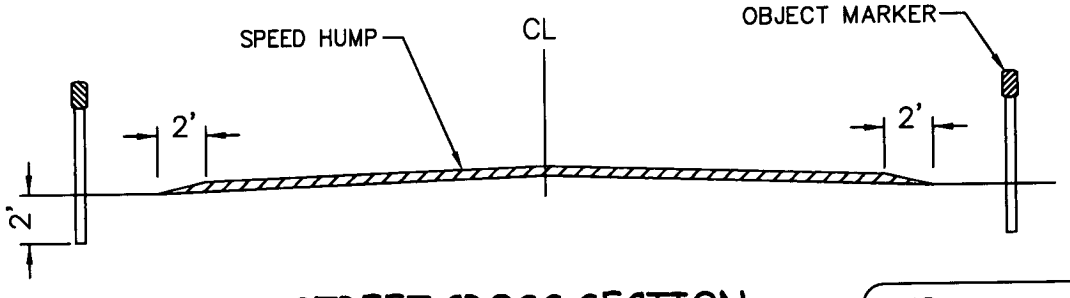
Neighborhood Traffic Management Program



SPEED HUMP CROSS SECTION



STREET CROSS SECTION
(WITH SPEED HUMP)



STREET CROSS SECTION
IN UNIMPROVED AREAS
(WITH SPEED HUMP)

TITLE:

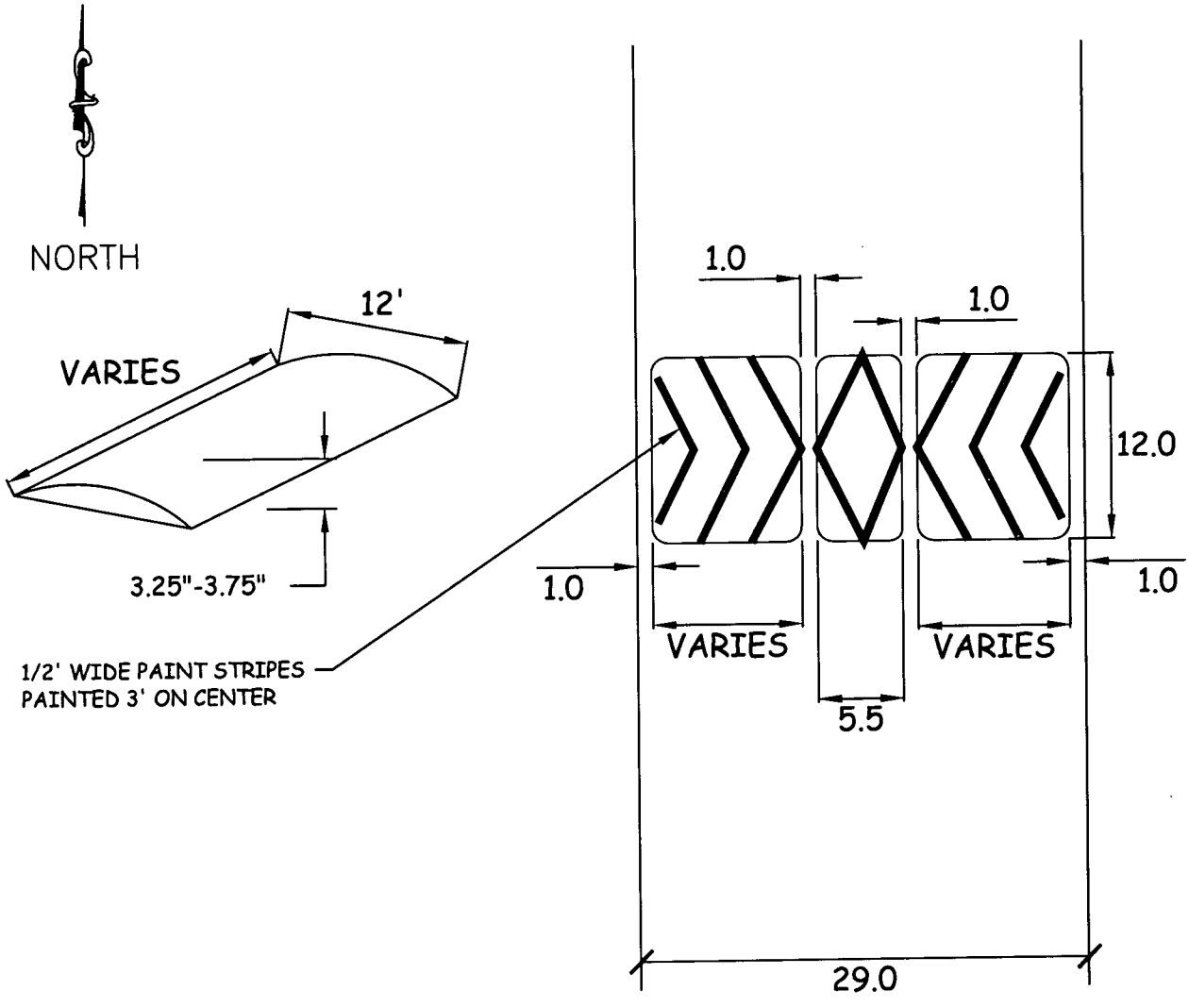
SPEED HUMP

REVISION DATE: 07/09/02

SPEED HUMP CROSS SECTION

Department of PUBLIC WORKS CITY OF SACRAMENTO

Neighborhood Traffic Management Program



THE SPEED-LUMP DRAWING SHOWN IS FOR A 36 FOOT WIDE OR NARROWER STREET. IF A STREET IS WIDER, ANOTHER CENTER LUMP MAY BE ADDED, EACH CENTER LUMP (ONLY ONE SHOWN) IS 12 FEET DEEP, 5 1/2 FEET WIDE. THERE IS 1 FOOT BETWEEN OUTER LUMPS AND THE CENTER LUMP WITH 1 FOOT FROM CURB FOR DRAINAGE. THIS WOULD REQUIRE CARS TO SLOW DOWN SUBSTANTIALLY IN ORDER TO PASS. IT MAY BE NECESSARY FOR VEHICLES TO PULL TO THE RIGHT AND ALLOW AN OPPOSING EMERGENCY VEHICLE TO PASS.

TITLE:

SPEED-LUMP
EMERGENCY/ R.T. ROUTE

REVISION DATE: 07/09/02

TYPICAL CONSTRUCTION DETAIL

NOT TO SCALE

Department of PUBLIC WORKS CITY OF SACRAMENTO