

Office of the City Manager

ACTION CALENDAR

December 15, 2009

To: Honorable Mayor and Members of the City Council

From: *PK* Phil Kamlarz, City Manager

Submitted by: Claudette Ford, Director, Public Works

Subject: Speed Cushions Evaluation and Vertical Pavement Deflection Trials

RECOMMENDATION

Direct the City Manager to authorize Public Works Transportation staff to:

1. Pursue pilot tests including before and after studies at up to three new locations of new vertical deflection traffic calming devices to reduce the impact on emergency response vehicles and individuals with physical sensitivities, while providing effective neighborhood traffic calming.
  - a. Select locations and devices through regular traffic calming process with input from Fire Department and the Disability Services Specialist.
  - b. Accelerate implementation schedule for selected pilot locations to achieve installation between July and December 2010.
2. Remove the two existing speed cushion installed under pilot projects and replace them with devices similar to other new pilot projects due to concerns relating to emergency response vehicles and individuals with physical sensitivities.

FISCAL IMPACTS OF RECOMMENDATION

A typical speed hump constructed of asphalt costs approximately \$3,000 to \$5,000 depending on street width and contractor bids. Trial deflections are expected to have costs on the same order of magnitude though slightly higher initially due to the experimental nature. Before and after analysis for three locations is estimated to cost \$6,000, including \$2,000 in data collection and \$4,000 in staff time. The Transportation Division has an annual budget of \$50,000 (610-4950-431-6560) for all traffic calming efforts, including any vertical pavement deflections and the proposed trials.

CURRENT SITUATION AND ITS EFFECTS

Since the beginning of the moratorium on new vertical deflection devices (including speed humps and cushions) in 1995, residents have expressed interest in having these forms of traffic calming remain in place or new ones installed. This is especially true on

side streets in residential neighborhoods where vehicle speeds often exceed the posted speed limit, and traffic volume has increased. The Council adopted a recommendation in July 2007 for a pilot project to test speed cushions.

The trial installation to evaluate the effectiveness of two kinds of speed cushions in reducing vehicular speeds on residential streets was conducted in 2008 (Attachment 1). The study parameters were based on whether or not overall traffic speed was reduced, and the results show that, on average, there was a reduction in traffic speed resulting from installation of speed cushions. This study did not include factors related to potential physiological impacts on people with disabilities traveling over the cushions as either passengers or drivers, a separate study evaluating these impacts would cost in the range of \$70,000 to \$80,000. Two other studies were identified that address the issue of physiological impacts, however neither is conclusive as to the potential for harm, nor is there reason to believe another study would provide any further resolution.

The Fire Department evaluation of the 2008 trial shows that ambulances have difficulty traveling quickly and easily over the cushions because they have a narrower wheel base than fire trucks. This slows emergency response speed below the desired level. Consequently, speed cushion devices are not desirable for emergency response routes.

On October 14, 2009, the Commission on Disability passed a motion supporting the continuation of the moratorium on vertical deflection devices being used for traffic calming, with the understanding that additional testing of devices can continue at a limited number of locations (up to three), if these locations are selected in consultation between the Disability Compliance Program, the Fire Department and Traffic Engineering, and the two existing speed cushions installed as part of a prior test are removed.

On October 29, 2009, the Transportation Commission unanimously passed a motion (9-0-0) recommending

“immediate termination of the moratorium on vertical deflection devices, and the prompt installation of new vertical deflection devices for a pilot study at five test sites across the City.

The Transportation Commission supports the recommendation of the Commission on Disability to remove the two currently installed “test” speed cushions. To further mitigate any harm to the neighborhoods that might be caused by the removal of these traffic-calming devices, this commission recommends that both sites be selected as test sites for the new vertical deflection studies, with an additional three test sites to be identified by traffic engineering staff in consultation with the Disability Compliance Officer, the Fire Department and this Commission. To expedite the study of the feasibility of vertical deflection devices as traffic calming tools in Berkeley, the Commission recommends that staff

complete the selection of the sites, and development and installation of devices by June 30, 2010.”

## BACKGROUND

The moratorium on installation of vertical deflection forms of traffic calming began in 1995, due to concerns expressed by the Fire Department. This was initially adopted as part of Council action on a larger report addressing the U.C. Neighborhoods Transportation and Traffic Plan, at which time Council also authorized installation of speed humps along several specific streets. The Council action was for a “one-year moratorium on construction of any new speed humps until completion of the evaluation.” Since then, Council has extended the moratorium on speed humps to include all vertical deflection devices, largely on the request of the Commission on Disability.

In 2007, Council approved a pilot project to test speed cushions in residential areas. The initiative for this proposal came from community meetings to address traffic calming issues, and a resident’s recommendation of cushions as a possible solution. After consultation with the Fire Department, speed cushions were installed on portions of Hearst Avenue and on Addison Street.

## RATIONALE FOR RECOMMENDATION

Traffic Engineering staff is seeking to address concerns of neighborhood groups about traffic impacts in their areas. The trial installation of speed cushions last year has been favorably received by residents, who have requested more of these and other vertical pavement deflections for many locations in Berkeley. Fire Department review of the devices did not conclude that they would eliminate delay to all emergency vehicles. The Commission on Disability concluded that speed cushions did not address their concerns. Staff would like the option to develop and test other forms of vertical deflection as traffic calming tools that balance the needs for neighborhood safety with the concerns of the Fire Department and Commission on Disability. Such trial devices would be developed with input from emergency services providers and the City’s Disability Services Specialist, as well as meeting traffic engineering criteria specified in the City’s Traffic Calming Policy.

While a dollar value can’t be placed on the safety of any pedestrian, there is no conclusive measurement of physiological impacts to people riding in a vehicle as it passes over a vertical deflection and individuals have varying degrees of sensitivity to these effects. Since there is no credible research that would provide a definitive answer to what shape or height of deflection eliminates significant discomfort to a particular proportion of the population, the most practical alternative is to use available information to design and pilot test new vertical deflection devices in up to three new locations with the following performance objectives:

- Slow traffic to be able to comfortably travel over the device at the posted limit;

- Use rocking effect (rotational acceleration) of vertical deflection rather than jerking effect to slow vehicles and minimize undesirable impacts; and
- Minimize the impact or delay to emergency vehicles.

#### ALTERNATIVE ACTIONS CONSIDERED

These alternatives were considered but are not recommended:

1. Use speed cushions solely based on traffic engineering criteria or eliminate the moratorium. This alternative does not reflect the legitimate concerns of emergency services personnel and the disabled community.
2. Prohibit use or consideration of any vertical pavement deflections. This alternative eliminates an effective tool in traffic calming toolbox.
3. Further study the physiological impacts of speed cushions as previously recommended by the Commission on Disability. Based on two existing comparable and credible studies, this alternative is both very costly and unlikely to produce more conclusive results.

#### CONTACT PERSON

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#### Attachments:

- 1: Speed Cushions Trial Effect on Traffic Speed
- 2: Information presented to Commission on Disability October 14, 2009
- 3: Disability Commission Memo

### **Speed Cushions Trial Effect on Traffic Speed**

In July 2007, Council approved a recommendation submitted by the Mayor and two Council Members to conduct a pilot project for speed cushions. Based on site selection criteria (see below), and since vehicle speeds are typically higher at mid-block, speed cushions were installed at mid-block on these two streets in 2008:

1. Hearst Avenue between San Pablo and Curtis, and
2. Addison Street between Bonar and Acton.

The follow up traffic surveys were performed during April and October 2008.

As a result of the trial installation and analysis, staff recommends that speed cushions be included as an option among the range of traffic calming tools available for use in implementing traffic calming measures on residential non-emergency response routes.

#### **Site selection Criteria**

The following Criteria were established for the selection of locations for the installation of Speed Cushions on a trial bases:

1. Streets not on the Emergency Access and Evacuation Network
2. Not primary/collector streets
3. 85<sup>th</sup> percentile speed
4. Proximity to schools, parks, senior centers
5. 5-year collision history with primary collision factor of "Unsafe Speed"
6. Traffic volume
7. Citizen complaints

#### **Traffic Surveys:**

Two traffic surveys consisting of vehicle speed and volume data were recorded over a 24-hour period during April 2008, and again during October 2008. UC Berkeley was in session during all data collection. The following tables summarize the results of these surveys:

### Speed Data

	HEARST WB		HEARST EB		AVG CHANGE
DATE	85TH percentile (MPH)	%CHANGE	85TH percentile (MPH)	%CHANGE	
Winter - 07	29		30		
Spring - 08	26	-10%	25	-17%	<b>-14%</b>
Fall - 08	26	-10%	25	-17%	<b>-14%</b>

	ADDISON WB		ADDISON EB		AVG CHANGE
DATE	85TH percentile (MPH)	%CHANGE	85TH percentile (MPH)	%CHANGE	
Winter - 07	27		27		
Spring - 08	26	-4%	24	-11%	<b>-7%</b>
Fall - 08	26	-4%	20	-26%	<b>-15%</b>

### Volume Data

	HEARST WB		HEARST EB		AVG CHANGE
DATE	DAILY VOLUME	% CHANGE	DAILY VOLUME	% CHANGE	
Winter - 07	647		1060		
Spring - 08	594	-8%	893	-16%	<b>-12%</b>
Fall - 08	648	0%	978	-8%	<b>-4%</b>

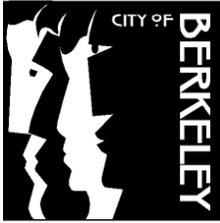
	ADDISON WB		ADDISON EB		AVG CHANGE
DATE	DAILY VOLUME	% CHANGE	DAILY VOLUME	% CHANGE	
Winter - 07	1461		734		
Spring - 08	1532	5%	742	1%	<b>3%</b>
Fall - 08	1222	-16%	718	-2%	<b>-9%</b>

#### Conclusion:

While there was no significant change in the volume of traffic when comparing the before and after installation data, there was a reduction in the speed of traffic traveling on these two streets. In summary:

- On average, both locations experienced a drop in the 85<sup>th</sup> percentile speed\* in the range of 12-14%. From a traffic engineering perspective, this drop is considered to be somewhat significant.
- Changes in volume were not consistent enough to lead to any meaningful conclusions.

\* 85<sup>th</sup> percentile speed is the speed at which 85% or more of the traffic is traveling



Commission on Disability

To: Division of Transportation  
From: Commission on Disability, Paul Church, Secretary,  
Re: Vertical Deflection Devices as Traffic Calming Measures  
Date: 10/21/09

At its October meeting, the Commission on Disability discussed the current situation with traffic calming measures in Berkeley and how traffic calming affects both the neighborhoods and people with disability.

The Commission heard testimony from residents who are directly impacted by the lack of traffic calming measures on their streets and is empathetic to the dangers presented by cars speeding on smaller, neighborhood streets. The Commission also heard from a resident with a disability who is severely, negatively impacted by driving over vertical deflection devices, causing her great pain and additional medical problems.

After consideration of the issues as presented by both sides, the Commission passed a motion in support of the continuation of the moratorium on vertical deflection devices being used for traffic calming, with the understanding that additional testing of devices can continue at a limited number of locations (up to three), if these locations are selected in consultation between the Disability Compliance Program, the Fire Department and Traffic Engineering, and the two existing speed cushions installed as part of a prior test are removed. (Commissioners Gold/Trahan, Ayes: Commissioners Belser, Litvak, Gold, Trahan, Uphoff. Abstain: Commissioner Castello-Kramer)

