State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

To: DISTRICT DIRECTORS
DEPUTY DIRECTORS
DIVISION CHIEFS

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SUBJECT: TRAFFIC CALMING GUIDANCE

The California Department of Transportation (Caltrans) recognizes all modes of travel are integral to our vision of delivering a brighter future for all through a world-class transportation network. As Caltrans progresses towards achieving a transportation system that improves accessibility and connectivity to essential community destinations for all users, we continue to provide guidance that contributes to the livability and safety of all users of the State highway environment. To this end, we will address the benefit of implementing traffic calming measures. Although State highways are planned, designed, and constructed based on geometric design criteria and traffic control devices approved by the Federal Highway Administration (FHWA), the objective to have an orderly and effective movement of traffic may be compromised by drivers who operate at excessive speeds. This memorandum discusses traffic calming techniques that exist in Caltrans guidance that can be used with the intent to slow speeding vehicles.

According to the FHWA Traffic Calming ePrimer: "The primary purpose of traffic calming is to support the livability and vitality of residential and commercial areas through improvements in non-motorist safety, mobility, and comfort. These objectives are typically achieved by reducing vehicle speeds or volumes on a single street or a street network. Traffic calming measures consist of horizontal, vertical, lane narrowing, roadside, and other features that use self-enforcing physical or psycho-perception means to produce desired effects."

The traffic calming strategies encompass various strategies including law enforcement, public education, as well as temporary and permanent highway features that become part of the highway infrastructure. For the purpose of this memorandum, we will address current Caltrans guidance that can be used to

accomplish traffic calming, as part of highway infrastructure, that is self-enforcing or self-regulating with respect to vehicular speed.

Conventional highways are the target of traffic calming strategies. The highway may be a two-lane or multilane highway where the prevalence of speeding vehicles will have a negative impact on the non-motorized modes of travel.

IDENTIFYING THE NEED FOR TRAFFIC CALMING

Traffic calming needs should be determined by existing operating vehicular speeds, volume counts, and number of crashes for each location. The determination for traffic calming should also include a review of the location's adjacent land uses (e.g. schools, parks, bus stops, senior and other health care facilities, retail, etc). Traffic calming should also be considered where speed limits may be reduced due to implementation of AB-43 (2021, Friedman). Case studies outlining successful traffic calming strategy development are available in the FHWA Traffic Calming ePrimer Module 8.

GEOMETRIC FEATURES

Roundabouts

Guidance for roundabouts is contained in the Highway Design Manual (HDM) Index 405.10. A roundabout is an intersection type that is considered during the Intersection Control Evaluation (ICE) process, which evaluates the various kinds of intersection designs in order to address the purpose and need of an intersection improvement project. A roundabout design has certain attributes that can reduce speeds. The geometric design of approach alignment and circular roadway of a roundabout has the characteristics that will reduce speeds. Roundabouts also typically have splitter islands that can have the benefit of reducing speeds. For more information about the ICE process, see the Traffic Operations Policy Directive (TOPD) #13-02.

Bulbouts (Curb Extensions)

Guidance for bulbouts is contained in the HDM Index 303.4(1). Bulbouts are a type of curb extension used at intersections for the benefit of pedestrians because it shortens the crossing distance and provides more area and visibility for pedestrians. Bulbouts have a traffic calming effect because it requires more attention for the driver, induces a speed reduction for turning maneuvers, and reduces the roadway width.

Traffic Islands

Guidance for traffic islands is contained in the HDM Index 405.4. Traffic Islands are typically for channelization, but could also be used for traffic calming since it introduces a curb adjacent to vehicles and has the effect of slowing vehicles. Pedestrian refuge islands and median raised islands are commonly used. Also, providing landscaping in islands is a complete streets feature that contributes to the livability and sustainability of the environment. If landscaping of islands is pursued, the guidance in the HDM Topic 904 applies.

Angle of Intersection

Guidance for angle of intersection is contained in the HDM Index 403.3. The prevalence of speeding vehicles through skewed intersections can have a negative effect on all users of the intersection. If the State highway alignment has an angle or curve, a reconstruction to design intersections at right angles will induce slower speeds to negotiate the turning movements. This concept is especially useful at interchange ramp intersections with local roads.

TRAFFIC CONTROL DEVICES

In-Street Pedestrian Crossing Signs

California Manual on Uniform Traffic Control Devices Section 2B.12 and 7B.12 contains guidance and requirements on In-Street Pedestrian Crossing and In-Street Schoolchildren Crossing Signs. The In-Street Pedestrian Crossing Signs are used in the roadway at the crosswalk location on the center line, on a lane line, or on a median island or overhead. The intent of the signs is to remind road users of laws regarding right-of-way at an unsignalized pedestrian crosswalk. The In-Street Schoolchildren Crossing signs are used at unsignalized school crossings.

Speed Reduction Markings

California Manual on Uniform Traffic Control Devices Section 3B.22 and Figure 3B-28 contain guidance and requirements on speed reduction markings. Speed reduction markings are transverse markings that are placed on the roadway within a lane (along both edges of the lane) in a pattern of progressively reduced spacing to give drivers the perception that their speed is increasing. These markings are placed in advance of an unexpectedly severe horizontal or vertical curve or other roadway feature where drivers need to decelerate prior to reaching the feature and where the desired reduction in speeds has not been achieved by the installation of warning signs and/or other traffic control devices.

Crosswalk Enhancement

California Manual on Uniform Traffic Control Devices Section 3B.18 and Figure 3B-17(CA) and Traffic Operations Policy Directive (TOPD) 12-03 contain guidance and requirements on Crosswalk Enhancements. Crosswalk enhancements include parking prohibitions, pedestrian crossing regulatory (Yield Here to Pedestrians) and warning (Pedestrian Crossing) signs, with diagonal downward pointing arrow plaques and pedestrian crosswalk, yield (advanced yield lines) and high-visibility crosswalk marking pattern markings. Crosswalk enhancements are used at marked crosswalk at uncontrolled roadways where the speed limit exceeds 40 mph and where the roadways have four or more lanes of travel and an ADT of 12,000 vehicles per day or greater. Crosswalk enhancements can also be useful at calming traffic in other contexts.

The FHWA issued Interpretation Letter 3(09)-24(I) "Application of Colored Pavement" on August 15, 2013 that contains guidance for aesthetic treatments. Crosswalk aesthetic treatments can increase the conspicuity and have a traffic calming effect because the markings identify conflict areas and shared space that can result in lower speeds.

In-Roadway Lights (typically at crosswalks)

California Manual on Uniform Traffic Control Devices Chapter 4N contains guidance and requirements on In-Roadway Lights. In-Roadway Lights are special types of highway traffic signals installed in the roadway surface to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow and/or come to a stop. This includes situations warning of marked school crosswalks, marked midblock crosswalks, marked crosswalks on uncontrolled approaches, marked crosswalks in advance of roundabouts, and other roadway situations involving pedestrian crossings.

Pedestrian Hybrid Beacons

California Manual on Uniform Traffic Control Devices Chapter 4F contains guidance and requirements on Pedestrian Hybrid Beacons. A pedestrian hybrid beacon is a special type of hybrid beacon used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk. A pedestrian hybrid beacon is used to facilitate pedestrian crossings at a location that does not meet traffic signal warrants, or at a location that meets traffic signal warrants, but a decision is made to not install a traffic control signal.

Vehicle Speed Feedback Signs

California Manual on Uniform Traffic Control Devices Section 2B.13 contains guidance and requirements on Vehicle Speed Feedback Signs. Vehicle Speed Feedback sign displaying to approaching drivers the speed at which they are traveling is installed in conjunction with a Speed Limit sign to remind drivers of the speed limit and compare it with their speed to gain compliance.

Flashing Beacons (e.g., curve warnings, point restrictions, low vertical clearance, obstructions)

California Manual on Uniform Traffic Control Devices Chapter 4L contains guidance and requirements on In-Street Pedestrian Crossing Signs. A Flashing Beacon is a highway traffic signal with one or more signal sections that operates in a flashing mode. It is primarily used to supplement warning and regulatory signs, at pedestrian crossings and to warn of obstructions in or immediately adjacent to the roadway. It is also used to provide traffic control as an intersection control beacon. Speed Limit Sign Beacon is a type of flashing beacon used to draw attention to a Speed Limit sign.

Colored Pavement Markings and Bike Boxes

Several Interim Approvals have been issued by FHWA that contain guidance and requirements for Colored Pavement Markings and Bike Boxes:

- April 15, 2011 Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14).
- October 12, 2016 Interim Approval for the Optional Use of Intersection Bicycle Boxes (IA-18).
- July 13, 2017 Interim Approval for the Optional Use of Two-Stage Bicycle Turn Boxes (IA-20).
- December 04, 2019 Interim Approval for Optional Use of Red-Colored Pavement for Transit Lanes (IA-22).

Green pavement is used to supplement other markings to bring attention to conflict areas. Green bike boxes are designated areas to improve bicycle safety and operations when queuing at a traffic signal. Red pavement is used to enhance the conspicuity of transit lanes and transit stops. Colored pavement markings have a traffic calming effect because the markings identify conflict areas and shared space resulting in lower speeds.

IMPLEMENTING TRAFFIC CALMING

The use of geometric features and traffic control devices as discussed in this memorandum is an application of engineering judgement for the improvement

of the State Highway System. Design flexibility that considers community context is essential when applying traffic calming strategies. The project development process will document the purpose and need, as well as any necessary deviation from published standards per Caltrans guidance.

This guidance memorandum is effective until superseded by a subsequent memorandum or appropriate updated guidance documents.

Any questions on the guidance of this memorandum should be directed to the District Design Liaisons for geometric features and the District Traffic Safety Engineers for traffic control devices.

c:
District Deputy Directors, Design
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