

CALIFORNIA TRAFFIC CONTROL DEVICES COMMITTEE (CTCDC) AGENDA**December 10, 2015 Meeting (9:45 am to end)****Caltrans Headquarters****(Enter from N Street)****1120 N Street****Sacramento, CA 95814****Caltrans Basement Board Room**

The Meeting is open and public/local agencies are invited to attend. For further information regarding this meeting, please contact Chris Engelmann at (916) 653-1816, or email chris.engelmann@dot.ca.gov. Electronic copies of this meeting Agenda and minutes of the previous meetings are available at <http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/index.htm>.

Organization Items**1. Introduction****2. Membership**

- a. Election of Chairman and Vice Chairman
- b. Welcome new members
- c. Appreciation Certificates

3. Approval of Minutes of the September 3, 2015 Meeting**4. Public Comments**

At this time, members of the public may comment on any item not appearing on the agenda. Matters presented under this item cannot be discussed or acted upon by the Committee at this time. For items appearing on the agenda, the public is invited to make comments at the time the item is considered by the Committee. Any person addressing the Committee will be limited to a maximum of five (5) minutes so that all interested parties have an opportunity to speak. When addressing the Committee, please state your name, address, and business or organization you are representing for the record.

5. Items under Experimentation

- i. **Final Report on Yellow LED Border on Ped Signals – Rob Stinger, Caltrans**
 - See item 12-9 in Discussion Items.

Agenda Items**6. Public Hearing**

Prior to adopting rules and regulations prescribing uniform standards and specifications for all official traffic control devices placed pursuant to Section 21400 of the California Vehicle Code, the Department of Transportation is required to consult with local agencies and hold public hearings.

Consent Items (minor discussion with vote expected)

<u>Agenda Item</u>	<u>Description</u>	<u>Submitted by:</u>	<u>Lead</u>	<u>Page #s</u>
15-28	Confirm subcommittee participants for SB 632 inquiry	Caltrans	Tong	8

Information Items (New items that may be voted on or brought back as an Action Item in a future meeting)

<u>Agenda Item</u>	<u>Description</u>	<u>Submitted by:</u>	<u>Lead</u>	<u>Page #s</u>
15-18	Proposal for street names for bridges over paths and at path intersections	Walt Seifert	Jones	9 - 11
15-22	Overview of CA MUTCD updates (information only)	Caltrans	Tong	12
15-23	Request to add "ROADSIDE" as alternate on SG49C FREEWAY ASSIST CALL 511 sign	SACOG	Tong	13 - 15

Action Items (Continuing discussion from prior meetings with vote expected)

<u>Agenda Item</u>	<u>Description</u>	<u>Submitted by:</u>	<u>Lead</u>	<u>Page #s</u>
None	-	-	-	-

7. Request for Experimentation

<u>Agenda Item</u>	<u>Description</u>	<u>Submitted by:</u>	<u>Lead</u>	<u>Page #s</u>
15-24	Request to experiment with bike boxes in the City of Mountain View	City of Mountain View	Walter	16 - 21
15-25	Request to experiment with bike boxes in the Town of Tiburon	Town of Tiburon	Jones	22 - 32
15-26	Request to experiment with Kit Fox Crossing Signs	Caltrans D6	Marshall	33 - 44

8. Discussion Items

<u>Agenda Item</u>	<u>Description</u>	<u>Submitted by:</u>	<u>Lead</u>	<u>Page #s</u>
12-9	Report on Yellow LED Border Pedestrian Signal	Caltrans	Tong	45 - 49
15-27	Centerline Marking ADT Thresholds	Caltrans	Jones	50 - 52

9. Tabled Items

<u>Agenda Item</u>	<u>Description</u>	<u>Submitted by:</u>	<u>Lead</u>	<u>Page #s</u>
15-15	Proposal for striping a space for bicycle use at locations with right-turn-only lanes	Caltrans	Tong	53

10. Next Meeting

March 3, 2016

Caltrans District 5

1150 Laurel Lane

San Luis Obispo, CA

11. Adjourn

5. Items under Experimentation

Some reports are available at: <http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/status.htm>

- 09-9 Experiment with Steady Red Stop Line Light
(Greenwood)

Status:

7-28-15: Here is some background and current status information on the “In-Roadway Warning Lights” (IRWLs).

8(09)-8(E)-Red In-Roadway Lights at LRT Grade Crossings-Los Angeles, CA (Reference# HOTO-1)

The Los Angeles County Metropolitan Transportation Authority (Metro), in cooperation with the City of Los Angeles and the County of Los Angeles, has received permission from the FHWA to conduct a demonstration of an In-Roadway Warning Light (IRWL) system that would supplement existing traffic signal indications at (10) intersections along the Metro Gold Line Eastside Extension and (2) intersections along the Metro Blue Line. This non-standard traffic control system, which is composed of a series of LED lights embedded in the roadway is designed to increase the awareness of the street running light rail trains among motorists approaching the intersection. The IRWLs are intended to supplement (not substitute) the circular red signal indications being shown to the cross-street traffic and the red left turn arrow signal indications being shown to the traffic in the left-turn lanes on the roadway that is parallel to and on both sides of the LRT tracks. The added lights enhance warning indications for motorists when trains approach the intersections, deterring them from making illegal left turns and increasing compliance with red traffic signal indications. The system uses red in-roadway lights that steadily illuminate when LRT traffic is approaching or occupying the crossing.

Installation of the IRWLs at the (12) grade crossings is now complete and the two-year monitoring period began on May 1, 2015. Progress reports will be submitted to the FHWA every 6 months and will include data collected at the trial and control locations. The approved Evaluation Plan analyzes traffic violations observed by photo enforcement and in-field observation. Collected data will be summarized and compared to data collected prior to the IRWL installation. A final report will be developed once the monitoring period is complete on April 30, 2017.

For more information, please contact Lia Yim, YimB@metro.net

- 09-21 Experiment with Separated/Protected Bikeway On the Left Side of
(Greenwood)

Two One-Way Streets in the City of Long Beach (Rte 9-112E)

Status: No Update at this time

- 10-3 Experiment with Second Train Warning Sign “Additional Train May
(Greenwood)

Items under Experimentation

Approach” with a Symbol Sign (Submitted by City of Riverside)

Status: No Update at this time. See a report on the following website:

<http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/reports/Final%20Report%20Additional%20Train%20May%20Approach%20Sign.pdf>

- 11-3 Experiment with Buffered Bicycle Lanes on 2nd St.between Bayshore
(Greenwood)
& PCH in Naples
Status: No Update at this time.
- 11-12 Experiment with Circular Rapid Flashing Beacon and RRFB
(Greenwood)
Status: No Update at this time.
- 11-13 Experiment with a Sign “RECKLESS DRIVING PROHIBITED” (Winter)
Status: Experiment is on-going and has been extended to collect more data.
- Arnel G. Dulay, P.E., T.E.
Head, Traffic Investigations II Section
Traffic and Lighting Division
(626) 300-4748; Dulay, Arnel [ADULAY@dpw.lacounty.gov]
- 11-19 Experiment with 2nd advance California Welcome Center Destination Sign (Tong)
Status: No Update at this time.
- 12-9 Request to Experiment with Yellow LED Border on Pedestrian Signal (Tong)
Status: (11-6-2015) Experiment has been completed. Rob Stinger will provide a presentation to the CTCDC.
- The complete report is posted on the following website:
<http://www.dot.ca.gov/hq/traffops/engineering/ctcdc/reports.htm>
- Rob Stinger, P.E.
Chief - Traffic Engineering & Operations
Caltrans District 2
530-225-3229
- 12-18 Request to experiment with Red Colored Transit-only Lanes (SF)
(Patterson)
Status: (1-8-15)
- 12-19 Request to Experiment with Highlighted Shared Lane Markings (LA City)
(Bahadori)
Status: No new update.

Items under Experimentation

- 12-21 Request to Experiment with In-Roadway Warning Lights (IRWL) System that would supplement existing traffic signals along the Metro Gold Line (LA Metro) (Winter)
Status: No new update.
- 12-25 Request for permission to experiment with various Bicycle Treatments (Santa Monica) (Winter)
Status: No new update.
- 13-01 Request to Experiment with Green & Shared Roadway Bicycle Markings – Proposed by the City of Oakland (Patterson)
Status: No new update

Jason Patton, PhD**Bicycle & Pedestrian Program Manager**

Transportation Planning & Funding Division

Department of Engineering & Construction

City of Oakland | Public Works Agency | APWA Accredited Agency

250 Frank H. Ogawa Plaza, Suite 4344 | Oakland, CA 94612

(510) 238-7049 | (510) 238-7415 Fax

jpatton@oaklandnet.com

- 13-02 Request to Experiment with Bike Boxes and Wide Bike Strip Stripe (Patterson)
-Proposed by the City of Davis
Status: (12/1/2014) City of Davis installed experimental bike boxes in September 2014. Experimentation is ongoing.
- 15-12 Evaluation of Traffic Calming in Treatments in Princeton, CA (Hallaberry)

Status: (11/23/2015) - This email is to confirm that the subject experimental project (03-COL-45-Princeton) has been constructed and is now ready for vehicle speed determination. We have contacted the Caltrans District 3 office and made them aware that the project's construction phase is complete and ready to be re-evaluated for traffic speeds. As soon as we obtain updated speeds (including the 85th percentile speed) we will document our findings in a memorandum and submit to FHWA, CTCDC staff, and Caltrans District 3 staff.



Scott M. Lanphier, PE, CFM
Director of Public Works+
1215 Market Street
Colusa, CA 95932
530-458-0466 (p)
530-458-2035 (f)
slanphier@countyofcolusa.org
www.countyofcolusa.org

6. Public Hearing**Consent Items (New items that are voted on with minimal discussion)****Item 15-28 Confirm Subcommittee participants for SB 632 inquiry**

Recommendation: Request the committee to confirm participation to address the inquiry by the Senate Committee on Transportation and Housing on SB 632.

Agency Making Request/Sponsor: Caltrans/ Duper Tong, voting member

Background

AB 632 proposes legislation that raises engineering issues that are beyond the expertise of the Senate Committee on Transportation and Housing. The CTCDC has been requested to review and examine these issues and report back in 2016. A recommendation to form a subcommittee is being proposed to in this agenda item.

Item 15-18 Proposal for street names for bridges over paths and at path intersections

Information Items (New items that may be voted on or brought back as an Action Item in a future meeting)

Item 15-18 Proposal for street names for bridges over paths and at path intersections

Recommendation: Request the committee to recommend to include in the CA MUTCD street names at intersections with shared-use paths and at overpass or bridges when a bike path crosses under the overpass or bridge as outlined below.

Agency Making Request/Sponsor: Walt Seifert/ Bryan Jones, non-motorized voting member

Background

Chapter 2 (Section 2D.43) of the California MUTCD recommends Street Name (D3-1), D3-1a or G7-1(CA) signs at all urban area street intersections. Shared use (bike) paths are not specifically mentioned in this section, so it is not completely certain whether this street name signage mandate for “all street intersections” applies to street intersections with bike paths. If the mandate does apply, it is not covered further in Part 9 of the California MUTCD, which deals with bicycle facilities.

California MUTCD Part 9, Traffic Control for Bicycle Facilities, (Section 9B.20) mentions Street Name signs. However, there is only a single mention and that mention is in a list of other guide signs that may be used to provide direction, destination and destination information for bicycle travel.

A D3-1 Street Name sign is illustrated, along with other guide signs, in Figure 9B-4. However, Street Name signs are not included, even as an option, in either of the Part 9 illustrations of intersections, Figure 9B-5 (intersection of shared use path and roadway) or Figure 9B-7 (shared use path crossing).

The AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012), Figures 5-17 through 5-20 does include D3-1 Street Name signs as options at mid-block path/roadway intersections.

Street Name signs at intersections are a standard, commonsensical way to guide motorists and other road users. They are also needed to guide bicyclists at shared use (bike) path intersections with streets and other paths. Street Name signs at intersections that name both streets and paths would help bicyclists with way finding, reduce their confusion and anxiety about way finding, and help prevent out-of-direction travel that may occur when intersections are not signed. As a matter of equity and uniformity, Street Name signs should be the standard at all intersections, including street/ path and path/ path intersections. Being lost or taking a wrong turn has more taxing physical consequences when human powered transportation is employed rather than vehicular transportation.

Intersection signs would also help identify that a bike path exists, both to cyclists and passing motorists (who are potential cyclists.) Unsigned paths can either be overlooked or simply seem too enigmatic to use. Intersection signs are a form of promotion and even, perhaps, a reinforcement of warning signs that may be installed near a path. Ultimately, the need and desire is to make cycling navigation easier

Item 15-18 Proposal for street names for bridges over paths and at path intersections

and bike paths a more prominent part of the transportation system. This will help achieve Caltrans' goal to triple the number of bicycle trips by 2020.

Unsigned structures carrying roadways above bicycle paths are anonymous, but with signs installed, they can become useful in orienting bike path users. Whether or not the bike path has a direct connection to the roadway, knowledge of what the roadway is helps with way finding and reduces confusion on the part of path users. **Comment: Caltrans supports identifying overhead structures when desired, but would not support signs mounted onto the structure (Caltrans maintenance forces are not resourced to take on additional maintenance of these types of signs). Instead, consider a separate post with a sign identifying the overcrossing (i.e. I-5 overcrossing or similar) with an agreement with a local agencies to maintain the sign.**

While a common criticism of signs is that they can create clutter or don't fit in with a natural setting, these objections don't apply to signs on overcrossings or bridges. The signs are insignificant compared to the mass and scale of the structures themselves. The signs not only add useful information, they may even make the structures a bit less forbidding and more attractive.

Other jurisdictions (Phoenix is an example) have such signs on overpasses and bridges.

Benefits

Making Street Name signs mandatory at bicycle path intersections with streets and other paths will:

- Reduce ambiguity in California MUTCD Part 2 guidance.
- Improve way finding for bicyclists and other path users.
- Standardize intersection signage and treat path intersection equitably with street intersections
- Promote bicycling and physical activity by identifying path locations and names to bicyclists and motorists.
- Help Caltrans reach its goal of tripling trips by bicycle.



This concept of adding signs to structures for bike paths is not supported by Caltrans

Proposal

Proposed text changes are provided in red.

Section 2D.43 Street Name Signs (D3-1 or D3-1a)**Standard:**

01 Street Name (D3-1 or D3-1a or G7-1(CA)) signs shall be installed at all street/ shared use path intersections and at all shared use path/ shared use path intersections.

Guidance:

01 a Street Name (D3-1 or D3-1a or G7-1(CA)) signs (see Figure 2D-10 and 2D-10(CA)) should be installed in urban areas at all street intersections regardless of other route signs that might be present and should be installed in rural areas to identify important roads that are not otherwise signed.

Option:

02 For streets that are part of a U.S., State, or county numbered route, a D3-1a Street Name sign (see Figure 2D-10) that incorporates a route shield may be used to assist road users who might not otherwise be able to associate the name of the street with the route number.

Standard:

03 The lettering for names of streets and highways on Street Name signs shall be composed of a combination of lower-case letters with initial upper-case letters (see Section 2A.13).

Section 9B.20 Bicycle Guide Signs (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c, D3-1, D3-1a and G7-1(CA), D11-1, D11-1c)

04 Destination (D1-1, D1-1a) signs or Bicycle Destination (D1-1b, D1-1c, D1-2b, D1- 2c, D1-3b, D1-3c) signs (see Figure 9B-4) may be installed to provide direction, destination, and distance information as needed for bicycle travel. If several destinations are to be shown at a single location, they may be placed on a single sign with an arrow (and the distance, if desired) for each name. If more than one destination lies in the same direction, a single arrow may be used for the destinations.

Standard:

04a Street Name (D3-1 or D3-1a or G7-1(CA)) signs shall be installed at all streets and shared-use path intersections and at all intersections between two or more shared-use paths. See Section 2D.43

New proposed Section in Part 9:

Section 9B.104 (CA) Guide Signs on Overpasses and Bridges**Standard:**

01 Street Name (D3-1 or D3-1a or G7-1(CA)) signs identifying the crossing or bridge a bike path or shared-use path is passing shall be installed alongside the path.

Item 15-22 Overview of CA MUTCD updates (information only)

Recommendation: This item is for information only.

Agency Making Request/Sponsor: Caltrans

Background:

On November __, Caltrans updated the CA MUTCD with most recommended changes approved by the CTCDC. The following is a summary of the changes:

(This list is pending approval by FHWA at the time this agenda was published. It is intended to be updated prior to the CTCDC meeting).

Item 15-23 Request to add “ROADSIDE” as alternate on SG49C FREEWAY ASSIST CALL 511 sign

Recommendation: Request the committee to vote to recommend to modify the CA MUTCD to provide “ROADSIDE” as an alternate text for the SG49C (CA) sign.

Agency Making Request/Sponsor: Caltrans/Duper Tong, voting member

Background:

In the Capitol Valley Regional Service Authority for Freeways and Expressways (CVR-SAFE) region we are in the process of beginning a call box modernization project that will increase spacing between our call boxes along freeways and our conventional highways. In one case, along State Route 160 in Sacramento County, we will be removing all call boxes. As a mitigation measure we wish to install SG49C signs to direct motorists to our 511 telephone system when they require assistance.

The Office of Traffic Management (OTM) at Caltrans agrees with the proposed revision. The OTM contacted the CVR-SAFE to clarify the intent of the proposed sign panel wording “ROADSIDE ASSIST CALL 511” in regard to the SG49C sign panel deviation as part of the approved Call Box Modernization Plan. The intent of the proposed sign is to provide a stranded or disabled motorist with roadside assistance information. Therefore, given the purpose of the sign to provide a disabled motorist with roadside assistance, the OTM supports this change by the CVR-SAFE.

Sacramento Area Council of Governments

1415 L Street, Suite 300 Sacramento, CA 95814

tel: 916.321.9000 fax: 916.321.9551 tdd: 916.321.9550 www.sacog.org



October 8, 2015

California Department of Transportation Office of Traffic Engineering P.O. Box 942873 Sacramento, CA 94273-0001 Attn: Chris Engelmann

Re: Approval Request for the Capital Valley Regional Service Authority for Freeways and Expressways – SG49C sign panel deviation

Mr. Chris Engelmann-

This letter serves as request for approval of our proposed deviation to the State Standard sign panel SG49C, for use by the Capitol Valley Regional Service Authority for Freeways and Expressways (CVR-SAFE) as part of our recently approved Call Box Modernization Plan.

CVR-SAFE has receive approval to proceed with our call box modernization plan from both the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). In the approval letter from Caltrans we were directed to contact you with respect to our request for a deviation from the Standard SG49C sign panel.

Our request is to modify the wording as follows:

Table with 3 columns: FREEWAY, ASSIST, CALL 511, (Original); ROADSIDE, ASSIST, CALL 511, (Proposed)

This proposed deviation is driven by the locations in which the signs will be installed in the CVR-SAFE region. Many of the roadways where this sign and service will be used are rural or conventional highways and not on freeway segments. To alleviate potential confusion on the public’s part, our program has been using the term “Roadside Assist” rather than “Freeway Assist” to identify the service.

If you require additional information on this project please contact me at:

Markus E. Heiman, PE 1415 L Street Suite 300 Sacramento, CA 95814 916-340-6232 mheiman@sacog.org

Sincerely,

Markus E. Heiman CVR-SAFE Project Manager

- Auburn Citrus Heights Colfax Davis El Dorado County Elk Grove Folsom Galt Isleton Lincoln Live Oak Loomis Marysville Placer County Placerville Rancho Cordova Rocklin Roseville Sacramento Sacramento County Sutter County West Sacramento Wheatland Winters Woodland Yolo County Yuba City Yuba County

Proposal:

The requested is to permit the use of the word “ROADSIDE” as an alternate to “FREEWAY” where appropriate.

(CA MUTCD text modifications are to be developed prior to the meeting.)



SG49C (CA)

7. Requests for Experimentation:**Item 15-24 Request to experiment with bike boxes in the City of Mountain View**

Recommendation: Request to authorize to conduct experiment bike boxes in the City of Mountain View.

Agency Making Request/Sponsor: The City of Mountain View/ Jay Walter, voting member

Background: See below

September 29, 2015

Chris Engelmann, PE, TE
CA MUTCD Editor
CTCDC Executive Secretary
1120 N St., Sacramento, CA 95814
Division of Traffic Operations, MS 36
California Department of Transportation

RE: Request to Experiment – Bike Box

Dear Mr. Engelmann,

In accordance with the 2009 Manual of Uniform Traffic Control Devices (MUTCD), I am forwarding a Request to Experiment for the use of bicycle boxes within the City's 'The Rails – Bicycle and Pedestrian Improvements' package of bikeway projects.

Enclosed is the City of Mountain View's description of our project that further details the use of the bicycle boxes and our plan for monitoring and evaluating the devices.

The City of Mountain view is anticipating installing these treatments in the spring of 2016. Your timely attention to this request is greatly appreciated.

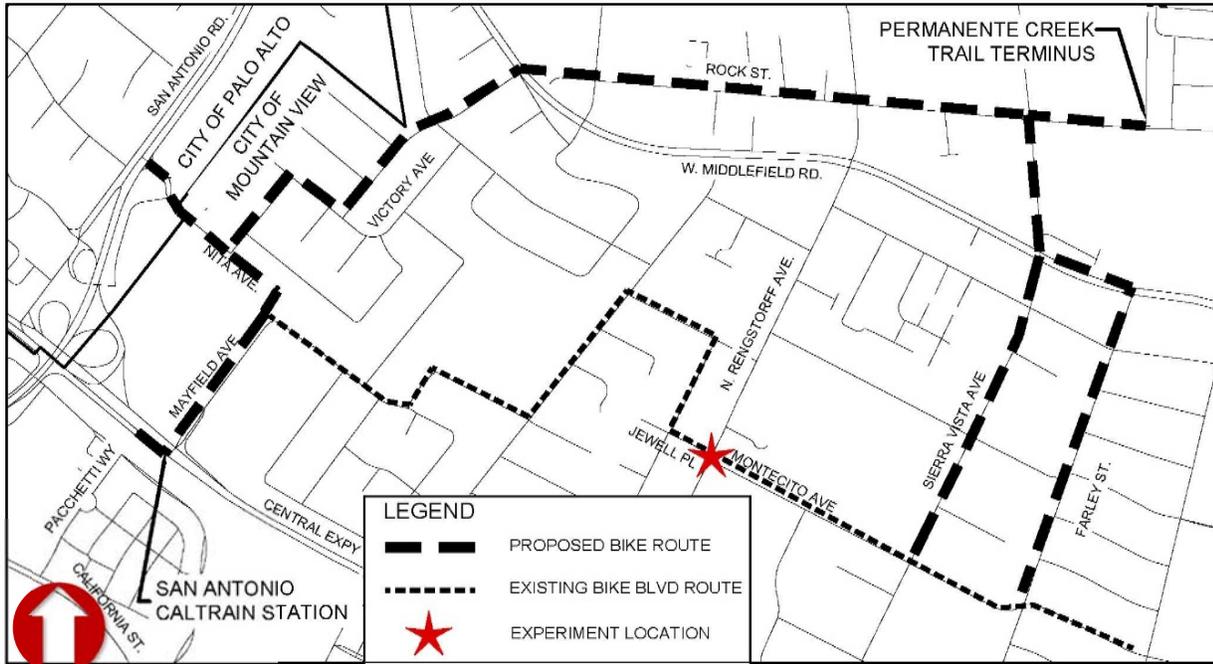
Request to Experiment

Requesting Agencies – City of Mountain View, CA

California Traffic Control Devices Committee (CTCDC) Sponsor – Jay Walter, Voting Member

The City of Mountain View is requesting permission to experiment with a pair of opposing bike boxes at the signalized intersection of Montecito Ave, N. Rengstorff Ave and Jewell Place. The intersection is an off-set intersection with unique geometry and will be a component of the improvements associated with a larger project named 'The Rails' which includes several corridors of bikeway improvements to the City of Mountain View (See **Figure 1**). The City is seeking FHWA approval as authorized in the Manual of Uniform Traffic Control Devices.

Item 15-24 Request to experiment with bike box in the City of Mountain View



Figure

1: Proposed Experiment Location within ‘The Rails’

There is an existing bike route along a corridor which includes Montecito Ave and Jewell Pl. This route is being enhanced to meet the intent and level of service expected of a bicycle boulevard including shared lane pavement markings, wayfinding signage and speed/volume management. The intended purpose of the bike boxes are to facilitate through and turning movements by bicyclists, both along the bike boulevard and to bike lanes currently present on Rengstorff Ave. The City’s proposal is aimed at maximizing comfort and safety at this intersection.

This submittal format is in compliance with Section 1A.10 of the MUTCD.

Proposal

To provide for safe and efficient operation of bicycles along the bicycle boulevard, the City of Mountain View is proposing to install a pair of bicycle boxes.

A. A statement indicating the nature of the problem

A bike route is being improved to function as a bicycle boulevard which must cross Rengstorff Ave. This Montecito/Jewell intersection with Rengstorff Ave has an offset to the right and has a pair of approach lanes in each direction as shown in Figure 2. For through movement bicyclists must take an offset path through the intersection. Bicyclists are currently in alignment with the far side corner and sidewalk which puts this path in conflict with vehicular paths of travel. The side streets actuate the signal at Rengstorff Avenue and currently have loops that can detect bicycles.



Figure 2: Existing intersection configuration

Some bicyclists may be turning onto the bike lanes on Rengstorff and it is desired that a design be approved that facilitates bicyclist turning movements, makes the intersection intuitive and inviting to bicyclists, and makes through movements across Rengstorff logical and safe.

As part of the design development process bike boxes with bicycle specific detection were identified to provide an ingress lane to allow bicyclists to queue at the head of the intersection and position for a through, right or left movement. The minor street approaches rest in a red signal indication and will have a minor amount of green time that results in minimal chances of a bicyclist arriving on a stale green signal, this condition leverages the advantages of a bike box while reducing the potential of a bicyclist conflicting with moving vehicles. The nature of the bike box will also prohibit right turns on red. The layout of this intersection is depicted in **Figure 3**.

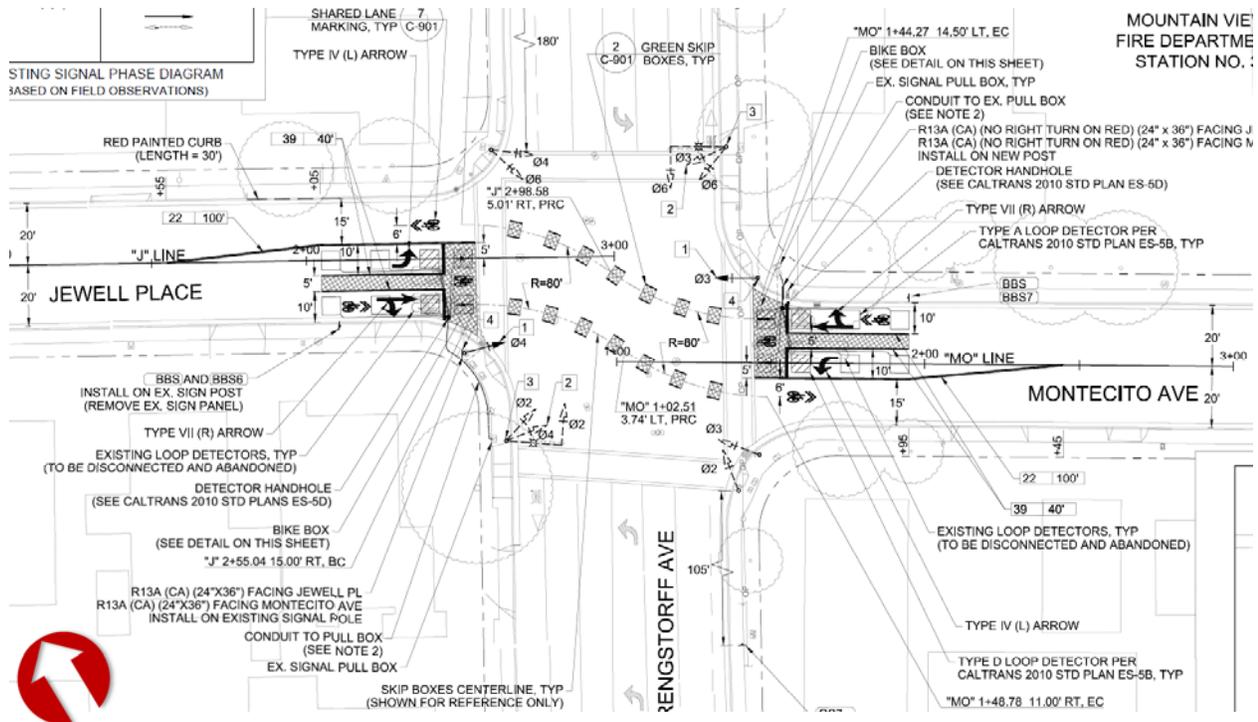


Figure 3: Striping Plan

- B. A description of the proposed change to the traffic control device or application of the traffic control device, how it was developed, the manner in which it deviates from the standard, and how it is expected to be an improvement over existing standards.

This experiment would evaluate the use of bicycle boxes at east and west bound approaches to this intersection.

The bicycle box is a treatment depicted in the NACTO Urban Bikeway Design Guide that is composed of a white outer box with a green background and a bicycle stencil in accordance with MUTCD Figure 9C-3. Bicycle Boxes are addressed by FHWA at the following link:

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/mutcd/bicycle_box.cfm

- C. Any illustration that would be helpful to understand the traffic control device or use of the traffic control device.

The proposed layout of the proposed bicycle boxes is illustrated in **Figure 4**.

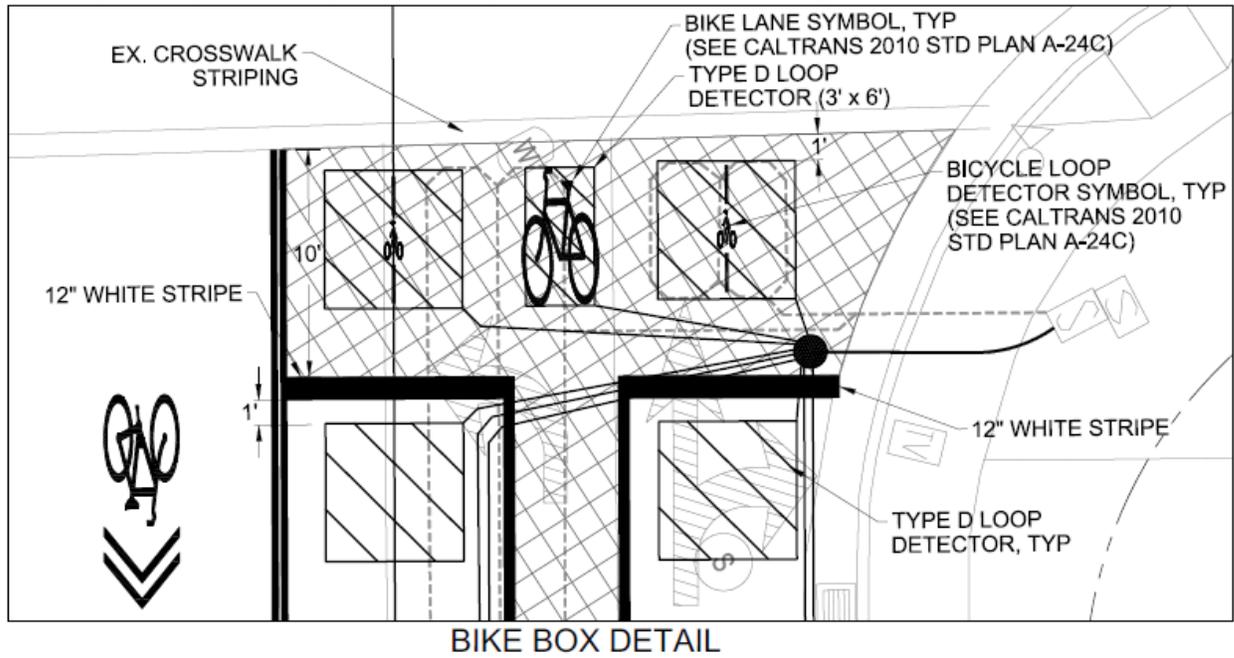


Figure 4: Proposed Bicycle Boxes

- D. Any supporting data explaining how the traffic control device was developed, if it has been tried, in what ways it was found to be adequate or inadequate, and how this choice of device or application was derived.

The bicycle box has been in use in the United States for nearly a decade. Formalized design guidance is currently found within the NACTO Urban Bikeway Design Guide, however this guidance was created based on existing practice within the United States as well as guidance provided from other countries. FHWA has recently released limited guidance on the use and design of bike boxes within the 2015 Separated Bike Lane Planning and Design Guide. Many configurations within the United States have been developed by various cities. The Bicycle and Pedestrian page under the Office of Planning, Environment and Realty within FHWA lists 25 approved requests to experiment being approved since 2008 for this treatment.

It is our opinion that this configuration represents the ideal case of the bike box as the approaches are actuated phases and the intersection has unique geometry which makes the front queuing aspect of the bike box appealing.

Alternatives to the bike box would include the use of exclusive bike signals which would reduce the performance of the signal and require additional, more expensive retrofits to the project.

- E. A legally binding statement certifying that the concept of the traffic control device is not protected by a patent or copyright.

To the best of the City of Mountain View's knowledge, the concept of using bicycle boxes to supplement standard traffic control devices are not protected by patents or copyrights.

F. The time period and location(s) of the experiment.

The experiment located at Jewell Place, Rengstorff Ave and Montecito Ave is part of a larger project that is expected to commence construction in the early spring of 2016 and be completed by September 2016. The evaluation of the proposed bike boxes will occur approximately 6 months from project opening unless interim approval for the use of bicycle boxes is granted through FHWA at any time during this review period.

G. A detailed research or evaluation plan that must provide for close monitoring of the experimentation, especially in the early stages of its field implementation. The evaluation plan should include before and after studies as well as quantitative data describing the performance of the experimental device.

Bicyclist and motorist behavior and interaction will be observed by staff or by video at the proposed bike boxes approximately 6 months after installation. Variables to be studied and recorded in the field will be:

- Crash data compared from previous 5 years and one year subsequent to installation
- Conflicts/ avoidance maneuvers between the motor vehicle and the bicycle
- Video observation of a total of 24 hours of taken at peak am and peak pm bicycle and motor vehicle traffic times. Video to be captured between Tuesday-Thursday for two weeks to determine the following:
 - Incidents of conflicts between the motor vehicle and bicycle,
 - Conflicts/avoidance maneuvers between the motor vehicle and the bicycle,
 - Motor vehicle and bicyclists' compliance with the turn on red prohibition,
 - Bicycle position approaching the bike box and queued at the intersection,
 - Motor vehicle position approaching the bike box and queued at the intersection,

The above information will be presented in a brief report at the end of the year. The number of bicyclists and motorists will be provided as well for comparison purposes.

H. An agreement to restore the site of the experiment to a condition that complies with the provisions of this Manual within 3 months following the end of the time period of the experiment. This agreement must also provide that the agency sponsoring the experimentation will terminate the experimentation at any time that it determines significant safety concerns are directly or indirectly attributable to the experimentation. The FHWA's Office of Transportation Operations has the right to terminate approval of the experimentation at any time if there is an indication of safety concerns. If, as a result of the experimentation, a request is made that this Manual be changed to include the device or application being experimented with, the device or application will be permitted to remain in place until an official rulemaking action has occurred.

The City of Mountain View agrees to the above conditions. An agreement to provide a progress report at 6 months for the experimentation and an agreement to provide a copy of the final results of the experimentation to the FHWA's Office of Transportation Operations within 3 months following completion of the experimentation. The FHWA's Office of Transportation Operations has the right to terminate approval of the experimentation if reports are not provided in accordance with this schedule.

The City of Mountain View agrees to the above conditions.

Item 15-25 Request to experiment with bike boxes in the Town of Tiburon

Recommendation: Request to authorize to conduct experiment with bike boxes in the Town of Tiburon

Agency Making Request/Sponsor: Town of Tiburon/ Bryan Jones, voting member

Background: The town of Tiburon in conjunction with Caltrans District 4 is implementing a number of bicycle improvements. Among these is the proposed use of bike boxes. FHWA request for experimentation has been requested.

October 8, 2015

Chris Engelmann
California Traffic Control Devices Committee
1120 N Street, MS 36, Room 4500
Sacramento, CA 95814

Office of Transportation Operations, HOTO-1
Federal Highway Administration
1200 New Jersey Avenue, S.E.
Washington, DC 20590

Request to Experiment – SR 131 Tiburon Blvd/Blackfield Drive Bike Boxes

Dear Mr. Engelmann:

The California Department of Transportation (Caltrans) District 4 Pedestrian and Bicycle Branch, within the Office of Transit and Community Planning, is submitting a joint request with the Town of Tiburon to experiment with bike boxes and a 12-inch wide bike lane stripe as part of the Blackfield Crossing Improvements Project. The project, which also includes new bicycle lanes and green-colored pavement markings, will improve connectivity for bicyclists crossing Tiburon Boulevard (State Route 131) at the Blackfield Drive/Greenwood Cove Drive intersection.

The proposed experimental features are partially located within Caltrans right of way. Therefore, the Town of Tiburon will be required to obtain an encroachment permit to install the proposed improvements. The District 4 Pedestrian and Bicycle Branch has facilitated early coordination between the Town and Caltrans on the proposed project, including a pre-permit coordination meeting at the District office. The meeting summary is attached.

If you have any questions, please contact Sergio Ruiz in the District 4 Pedestrian and Bicycle Branch at (510) 622-5773 or by email at sergio.ruiz@dot.ca.gov.

Sincerely,



INA GERHARD
District Office Chief
Office of Transit and Community Planning

Enclosures

- (1) Request to Experiment – SR 131 Tiburon Blvd/Blackfield Drive/Greenwood Cove Drive Multimodal Improvements
- (2) Pre-Encroachment Permit Meeting Summary for Tiburon Blvd/Blackfield Drive/Greenwood Cove Drive Multimodal Enhancements Project

c: Patrick Barnes, PE, Town Engineer/Director of Public Works, Town of Tiburon

Town of Tiburon • 1505 Tiburon Boulevard • Tiburon, CA 94920 • P. 415.435.7373 F. 415.435.2438 • www.ci.tiburon.ca.us

October 1, 2015

Mr. Chris Engelmann
California Traffic Control Devices Committee
1120 N Street, MS 36, Room 4500
Sacramento, CA 95814

Office of Transportation Operations, HOTO-1
Federal Highway Administration
1200 New Jersey Avenue, S.E.
Washington, DC 20590

Subject: Request for Experiment – Blackfield Crossing Improvements (Bike Boxes and Wide Stripe)

Mr. Engelmann:

The Town of Tiburon is requesting permission to experiment with Bike Boxes and a 12-inch Wide Bike Lane Stripe as part of the Blackfield Crossing Improvements project. The project will improve connectivity from the Town’s Class 1 bike path (and Bay Area Trail) to a local school as well as a residential neighborhood and shopping center. Construction is scheduled for summer 2016.

Enclosed is our statement in support of the experiment. If you have any questions, please contact me at (415)435-7388 or pbarnes@townoftiburon.org. Town staff presented this item at its November 18, 2014 Bicycle Advisory Committee meeting.

Sincerely,

Patrick Barnes, PE
Town Engineer/Director of Public Works
Town of Tiburon



Frank X. Doyle
Mayor

.....

Erin Tollini
Vice Mayor

.....

Jim Fraser
Councilmember

.....

Alice Fredericks
Councilmember

.....

Emmett O'Donnell
Councilmember

Margaret A. Curran
Town Manager

Requesting Agencies – Joint request by the California Department of Transportation, District 4 Pedestrian and Bicycle Branch and the Town of Tiburon

California Traffic Control Devices Committee (CTCDC) Sponsor – Bryan Jones, Voting Member, Caltrans Non-Motorized

1. Problem Statement

Blackfield Drive at Tiburon Boulevard is an important crossing for many students in the Tiburon area. There is an active community of dozens of students that bicycle to Bel Aire Elementary School with a “biking school bus”, and older students that ride alone or in groups to Del Mar Intermediate School. The intersection connects to Greenwood Cove Drive and the Tiburon Linear Park. Most bicyclists travel in the north-south direction across Tiburon Boulevard. However, both the northbound southbound approaches lack signage or pavement markings to indicate a preferred alignment for bicyclists through the intersection.

During the morning and afternoon school commute times, large numbers of elementary and middle school students cross the intersection. Those traveling with the “biking school bus” queue at the intersection without a defined queuing space. Middle school-age student bicyclists riding alone or in small groups ride southbound on the narrow west sidewalk and cross at the crosswalk, or ride on the east sidewalk and cross at the crosswalk opposite the direction of traffic. Some bicyclists ride with southbound traffic, but alternate between the middle and right vehicular lanes; these bicyclists either queue to the right of stopped vehicles or used the pedestrian refuge island. In the northbound direction, some bicyclists cross in the crosswalk while others cross with traffic. Northbound bicyclists are potentially susceptible to right-hook crashes given the large corner radius.

In addition to students traveling to and from school, Blackfield Drive at Tiburon Boulevard is an important access point for bicyclists travelling between Greenwood Beach Road, which connects to the Tiburon Linear Park and multiuse path, and areas to the west along Tiburon Boulevard, including the Mill Valley-Sausalito Path, which connects to several communities along Richardson Bay. This results in Tiburon Boulevard (SR 131) being frequently used by bicyclists from the City of Mill Valley and other points west. Although it lacks a defined bicycle facility, many bicyclists use the roadway shoulder as a bike lane.



Exhibit 1: "Biking school bus" at northbound Greenwood Cove Drive waiting to cross Tiburon Boulevard.



Exhibit 2: Bicyclists queued at southbound Blackfield Drive waiting to cross Tiburon Boulevard.

2. Proposed Treatment

The SR-131 Tiburon Boulevard / Blackfield Drive / Greenwood Cove Drive Multimodal Improvements project includes the following components that are consistent with the California Manual on Uniform Traffic Control Devices (CA-MUTCD) and Federal Highway Administration Interim Approval for Use of Green Colored Pavement for Bike Lanes (IA-14) with blanket approval in California:

- Bicycle lanes from Cecilia Way to Greenwood Cove Drive.
- Bicycle traffic signal detection at the Blackfield Drive and Greenwood Cove Drive approaches at the Tiburon Boulevard intersection.
- Dashed green pavement markings at conflict areas
- Bicycle lane extension markings through the intersection

The Town of Tiburon and Caltrans District 4 are requesting permission to experiment with bike boxes at the SR 131 / Tiburon Boulevard intersection with Blackfield Drive and Greenwood Cove Drive.

3. Supporting Statements

Bike boxes are identified in the National Association for City Transportation Officials' (NACTO) Urban Bikeway Design Guide for signalized intersections. The treatment is intended to improve bicyclists' visibility ahead of queued traffic during a red signal phase and help facilitate through- and left-turn movements for bicyclists. The Town and Caltrans are requesting approval to experiment with two bike boxes, one at the southbound Blackfield Drive approach and one at the northbound Greenwood Cove Drive approach with SR 131 / Tiburon Boulevard. Typical application of a bike box is a signalized intersection with high volumes of bicycles and motor vehicles, especially those locations with potential bicyclist left turns and/or frequent vehicular right turns. The intersection meets these criteria.

Installing bike boxes at both the Blackfield Drive and Greenwood Cove Drive approaches will help provide room to accommodate high numbers of bicyclists traveling through the intersection, allow bicyclists making left turns onto Tiburon Boulevard to position themselves correctly, and reduce the risk of right-hook conflicts by delineating the bicyclists' path of travel and proper positioning.

Bike boxes will extend the width of the bicycle lane and vehicular through-lane and be set back from the existing pedestrian crosswalks. They will be marked with solid bike lane stripes, solid green-colored pavement, and bicycle symbol pavement markings. Right turns are currently channelized with "pork chop" islands at each corner. Motorists are restricted from making right turns from the lanes approaching the proposed bike boxes. Vehicular-bicycle weaving areas will be marked with dashed green bike lane markings ahead of the intersection approaches.



Exhibit 3: SR-131 Tiburon Boulevard / Blackfield Drive concept plan.

4. Experiment Location and Time Period

Bike boxes would be installed at the Blackfield Drive (southbound) and Greenwood Cove Drive (northbound) approaches at their intersection with SR 131 Tiburon Boulevard. The experiment will be for a one-year period.

5. Evaluation Plan

The bike boxes will be evaluated by measuring the following:

	Evaluation Metric	Evaluation Method
1	Crash analysis	CHP collision records
2	Incidents of conflicts between the motor vehicle and bicycle	Before and after peak hour observations of yielding and crossing behavior
3	Conflicts/avoidance maneuvers between the motor vehicle and the bicycle	Before and after peak hour observations of yielding and crossing behavior
4	Motor vehicle right-turn movements approaching the intersection, particularly through the conflict area, and compliance with right-turn restriction from the through lane	Before and after peak hour observations of vehicular right turn positioning

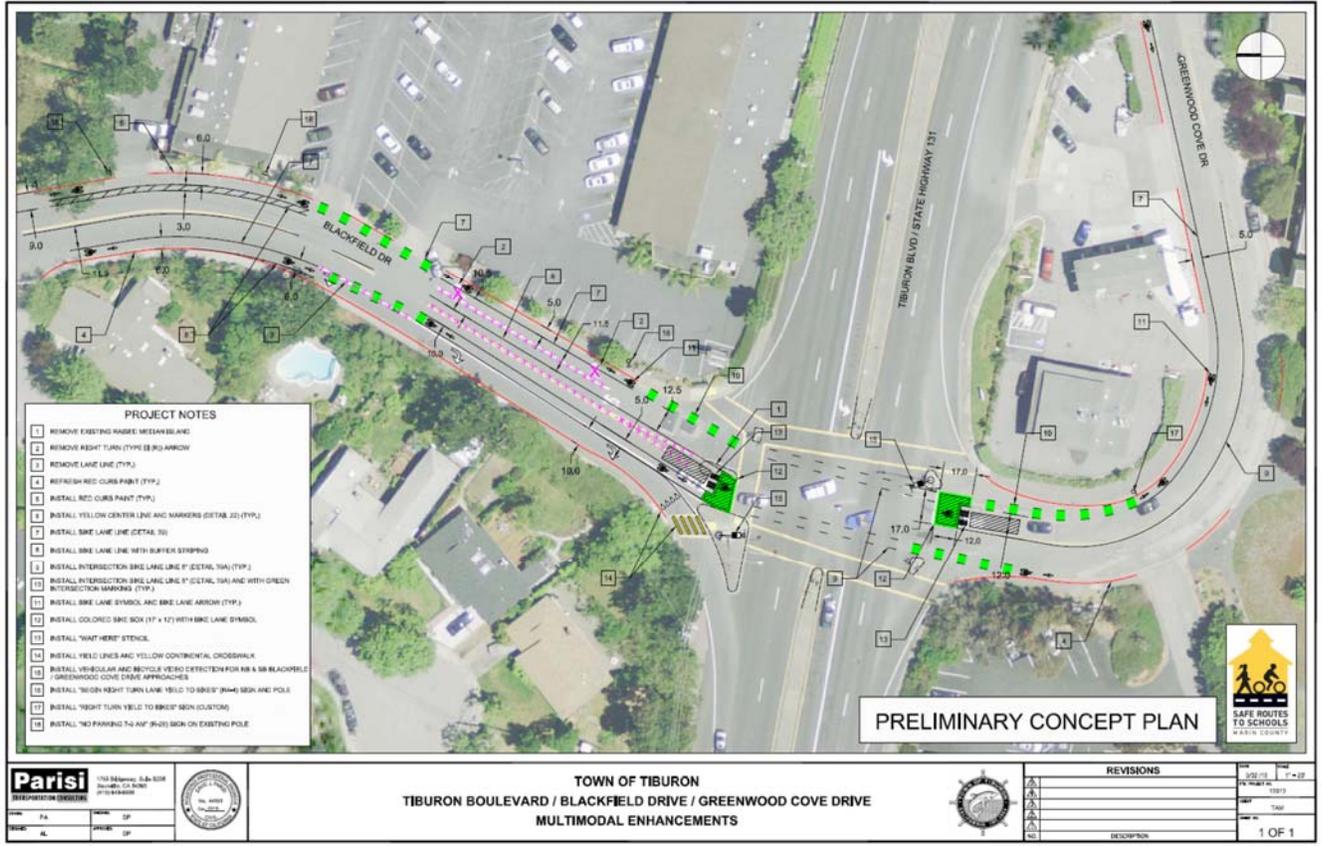
	Evaluation Metric	Evaluation Method
5	Bicycle position approaching the bike box	Before and after peak hour observations of bicyclist approach positioning
6	Bicycle position queued at the intersection	Before and after peak hour observations of bicyclist queuing positioning
7	Vehicle position queued at the intersection	Before and after peak hour observations of vehicular compliance with bike box striping
8	Traffic counts (vehicles and bicycles)	Before and after peak hour vehicular and bicyclist counts

6. Agreement to Restore

The Town of Tiburon will restore the site of the experiment to a condition that complies with the provisions of the California MUTCD, e.g. remove the bike boxes, within three months following the end of the time period of the experiment. The Town agrees to terminate the experiment if the Town, the California Traffic Control Devices Committee (CTCDC) or the Federal Highway Administration (FHWA) determine that significant safety concerns are directly or indirectly attributable to the experimental treatment. The Town understands that if as a result of the experiment, a request is made that the California MUTCD be changed to include the treatment being experimented with, the treatment will be permitted to remain in place until an official rulemaking action has occurred.

7. Reporting Requirements

The Town of Tiburon will provide progress reports every six months for the duration of the experiment for one year and will provide a copy of the final results within three months following the completion of the experiment.



Tiburon Boulevard/Blackfield Drive/Greenwood Cove Drive
Multimodal Enhancements
Pre-Encroachment Permit Meeting Summary
August 11, 2015, 1:30 p.m. – 2:30 p.m.

Overview

After self-introductions, David provided a brief overview of the purpose and need and preliminary concept plan. Blackfield Drive and Greenwood Cove provide an important connection for bicyclists between residential neighborhoods, a school, and the downtown area of Tiburon via an existing multi-use path at Blackie's Pasture. Many students cross Tiburon Boulevard at this location on their commute, sometimes as part of organized "bike trains" led by parent "engineers". This intersection is also a key link for bicyclists travelling to and from the Strawberry neighborhood via Tiburon Boulevard, and the Bay Trail.

The project has been fully funded and the target for construction is summer of 2016, before the school year begins.

Project Features

It was noted that the removal of the right-turn lane from Blackfield Drive into the Cove Shopping Center would help improve operations since motorists making a right often overtake the through-lane before turning right. The lane removal would also provide space for a bike lane.

Bike Boxes

A major component of the project includes bike boxes at the Blackfield Drive/Greenwood Cove Drive approaches. The bike boxes would facilitate bicyclists queuing at the intersection to cross or access Tiburon Boulevard by providing additional storage for large groups of bicyclists and by allowing bicyclists to better position themselves to make through or left turn movements.

Bike boxes are not currently approved as a traffic control device and would require a request to experiment from Federal Highways Administration and the California Traffic Control Devices Committee (CTCDC). The current plan of action is to submit a joint Request to Experiment from the Town of Tiburon and Caltrans District 4. Sergio would be the Caltrans District 4 point of contact for this effort. The Town/Parisi will develop a draft Request to Experiment package for Caltrans review and input. Resources will need to be identified to conduct data collection and prepare reports. Sergio can provide limited support, if needed. The next available CTCDC meeting is December 10, 2015. The deadline to submit an agenda item is October 23. However, according to the CTCDC Sponsor Guidelines, all documents for an agenda item must be submitted at least 60 days prior to a meeting. Therefore, a request to experiment package should be completed by the first week of October. The request package should also be submitted to FHWA well before the CTCDC meeting. Sergio will seek additional details from Chris Engelmann (HQ Traffic) on the process and key dates. David and Sergio will both look into which CTCDC voting member can be the official sponsor for the request.

A key feature for bike boxes, per FHWA requirements and NACTO Urban Bikeway Design Guide, is the prohibition of right turns on red to prevent motorists from encroaching onto the bike box during a red signal phase. David agreed to look into how this could be accomplished at the Greenwood Cove Drive approach. For the Blackfield Drive approach, which includes a right-turn slip lane, the request to experiment package would need to clearly show that motorists cannot make a right from the through-

lane approaching the bike box. It was noted that the California Vehicle Code already restricts right turns at this type of configuration and a sign could be placed, if needed, to remind motorists of the right-turn restriction.

Bike Lane Approaching Blackfield Drive

Hung Tran suggested that the roadway space approaching Tiburon Boulevard be reallocated to provide a bike lane to the left of the right-turn only lane so that bicyclists wouldn't need to share the lane with right-turning motorists. This could potentially be accomplished by removing the 4 foot median near the intersection and/or removing the striped buffer from the northbound bike lane. Since this would further separate right-turning motorists from through-bicyclists, this could help make the case for meeting the no-turn-on-red prohibition at the bike box. David concurred that this is a good idea and the design team will investigate if it is possible based on project funding and other constraints.

Detection

There are existing pressure-type detectors on the side streets; these are obsolete and inactive. The current detection is via loops. David asked if video detection could be considered for the side streets, either for both motorized vehicles and bikes in the bike boxes, or just for the bike boxes. Einar said that he would be okay with video detection for side street movements.

Bike Lane Striping through the Intersection

David asked if Caltrans would be amenable to allowing bike lane striping across Tiburon Boulevard to guide cyclists across the wide intersection. This could potentially be done with a set of dashed markings, which is allowed per the CA MUTCD. Sergio and others from Caltrans thought this could be very helpful and suggested it be considered as part of the design, subject to review by other functional units.

ADA

It was noted that the project would not disturb any of the curbed "pork chop" islands, which do not meet current ADA standards. Restriping alone would not trigger upgrading pedestrian facilities to current ADA standards. This intersection is slated for ADA improvements by Caltrans, but not in the near future.

Maintenance

After the meeting, Pat confirmed that there is a Maintenance Agreement between Caltrans and the Town of Tiburon from 1980, amended in 2014. The team will need to get input from Caltrans Maintenance to determine if the existing Maintenance Agreement covers the work proposed as part of this project.

Marin County Jurisdiction

The permit application should include a letter of approval from Marin County since the southern portion of the project is in County jurisdiction.

Item 15-26 Request to experiment with experiment with Kit Fox Crossing Sign

Recommendation: Request to authorize to conduct experiment with Kit Fox Crossing Signs.

Agency Making Request/Sponsor: Caltrans District 6/ Rick Marshall, voting member

Background: See the next page for background information.



**San Joaquin Kit Fox Crossing Signs
Bakersfield, CA
Request to Experiment**

Submitted To:
California Traffic Control Devices Committee
Federal Highway Administration, Office of Traffic Operations

Submitted By:
California Department of Transportation,
Environmental Division District 6
September 2, 2015

Overview

The California Department of Transportation (Caltrans) requests permission to experiment with San Joaquin kit fox (*Vulpes macrotis mutica*) crossing signs as a traffic control device that will inform drivers of the potential presence of an endangered species on the roadway. The purpose of the experiment is to comply with the conditions of Biological Opinions 0ESMF00-2012-F-0258-1, and 81420-2010-F-0865-1 (Attachment 1). This experiment is proposed for State Route (SR) 178 in Bakersfield, CA from between Fairfax Road and Bedford Green, east of the City of Bakersfield (Figure 1). The experiment includes installing the proposed signs, carcass survey by a qualified biologist five (5) days per week (except on holidays), and statistical analysis to determine sign efficacy.

As specified by Section 1A.10 of the Manual on Uniform Traffic Control Devices (MUTCD), this request includes the following information: a problem statement, description and use of the proposed traffic control device, evaluation plan, reporting requirements, experiment termination/site restoration, patent/copyright infringement statement, proposed time period and location of the device, and supporting data.

Problem Statement

The City of Bakersfield, in Kern County, California is home to an urban population of San Joaquin kit fox (kit fox), a federally endangered, state threatened species, and is at risk of extinction due primarily to profound habitat degradation, fragmentation and loss (Bjurlin, et.al., 2005). Roads in urban areas pose a potential threat to kit foxes in Bakersfield, and when capacity increasing projects are implemented, the threat to kit foxes by vehicle strike increases as well. The US Department of Transportation Federal Highway Administration (FHWA) has included the San Joaquin kit fox in its list of the 21 endangered species for which direct road mortality is one of the major threats to certain populations or to the survival of the species as a whole (FHWA 2014).

When Caltrans proposes to implement projects in areas that have the potential to support endangered and threatened species, it initiates consultation with various regulatory agencies including the United States Fish and Wildlife Service (USFWS). After consultation is completed, a Biological Opinion (BO) is issued, with terms and conditions for protection of the species included in the document. These terms and conditions (also known as avoidance, minimization and mitigation measures), are Caltrans responsibility to implement before, during and after construction activities. There are two projects that are currently in construction (SR 178 Morning Drive Interchange; Caltrans EA #06-0C940 and SR 178 Widening EA #06-0F350) that have completed the Section 7 consultation process. Both projects have received BOs that identify terms and conditions that require the installation of a new traffic control device; a "kit fox crossing" sign to alert motorists of the potential for these animals to be on the road.

The Thomas Roads Improvement Projects (TRIP) are a series of 11 major and minor road improvement projects in various stages of construction in Bakersfield. Morning Drive and 178 Widening are two of the 11 projects. The TRIP projects as a whole significantly change areas and likely cause foxes to alter their movement patterns. Any pre-project mortality occurrences would not apply to the newly configured areas. There are now roads (e.g., Westside Parkway, Morning Drive extension, etc.) where there weren't roads before. There is no historical data for these areas. Enclosed is a CD with the 2014 construction monitoring notes for the Morning Drive Project. There were multiple sightings of kit fox within the project limits. Kit fox continue to use the SR 178 corridor for movement.

Location of Proposed Experiment

Caltrans is proposing to install the kit fox crossing signs on SR 178, in Bakersfield. Heading eastbound, the signs will begin at Fairfax Ave, and be installed in six evenly distributed locations between the beginning, middle, and end of the project limits, at Miramonte Drive. Traveling westbound, the sign installation will begin at Miramonte Drive, and be installed at six locations, evenly distributed between the beginning, middle, and end of the project limits at Fairfax Avenue, (See Figure 1 and Figure 2). These proposed sign numbers and locations were agreed upon by the USFWS and will fulfill the mitigation requirements for the BO's.

Description and Use of the Proposed Traffic Control Device

Caltrans would install the kit fox crossing signs along the five (5) mile stretch of SR 178. There will not be any additional devices or striping included in this installation (See Figure 3 for conceptual installation).

State of the Practice

Wildlife crossing signs are installed all over the state of California for a variety of species, and are common practice in most states in the U.S (see Figure 4). These species include desert tortoise, deer, big horn sheep, bears, and even general "wildlife crossing" signs. Figure 2C-11 of the MUTCD has an entire section devoted to such signs (FHWA 2009). The FHWA has presented examples of mitigation strategies as a part of a strategy for reducing "wildlife vehicle collisions" (FHWA. 2012). Desert tortoise warning signs have been installed on various roads throughout Kern County, and in conjunction with exclusion fencing and installed under-crossings have resulted in a reduction of desert tortoise roadkill by 93% (FHWA 2012)

Washington State has found deer crossing signs with flashing beacons attached to be effective in warning motorists of the potential for animals on the road (WSDOT, 2014).

USFWS has agreed that it is not the intention of the Service to set precedence with this signage. The warning sign placement was specifically incorporated into these projects and will not become an expectation throughout all projects in the Bakersfield area.

Evaluation Plan

To evaluate the benefit of the signs, Caltrans is proposing to install two different types of kit fox crossing signs. The Morning Drive project area will have the standard unlit sign installed, and the 178 Widening project area will have the kit fox crossing sign installed with a flashing beacon installed atop the sign (see Figure 3). The biological monitor will drive both project areas, five (5) days per week (except for holidays), looking for any evidence of kit fox, and also any evidence of vehicle strike of kit fox. They will collect data for two years. Data collection will include any kit fox sign (i.e., scat, tracks, carcass, etc.), as well as incidental roadkill. The data will then be analyzed and a report will be prepared with the results of the experiment.

Reporting Requirements

Caltrans will prepare semi-annual progress reports for the duration of the experiment, and will provide a copy of the final results within three months following the completion of the experiment.

Experiment Termination/Site Restoration

Caltrans will remove all the signs within three (3) months of the termination of the experiment if the California Traffic Control Devices Committee (CTCDC) or the FHWA determines that device is not accomplishing the task of reducing the instances of vehicle strike on kit fox.

Patent/Copyright Protection

To the best of our knowledge, the design of the proposed sign is not protected by any copyright or patent.

Conclusion

Caltrans seeks approval from the CTCDC and FHWA to contribute research on the effectiveness of wildlife crossing signs. The experiment addresses whether or not adding a flashing beacon to the wildlife crossing sign will prove to be more effective in alerting the public to the presence of kit fox in the area, thereby reducing the instances of vehicle strike. The experiment will evaluate if the installation of the wildlife crossing signs are helpful in minimizing the number of kit foxes killed by vehicle strike in the Bakersfield area. Caltrans looks forward to working with the CTCDC and FHWA on this experiment.

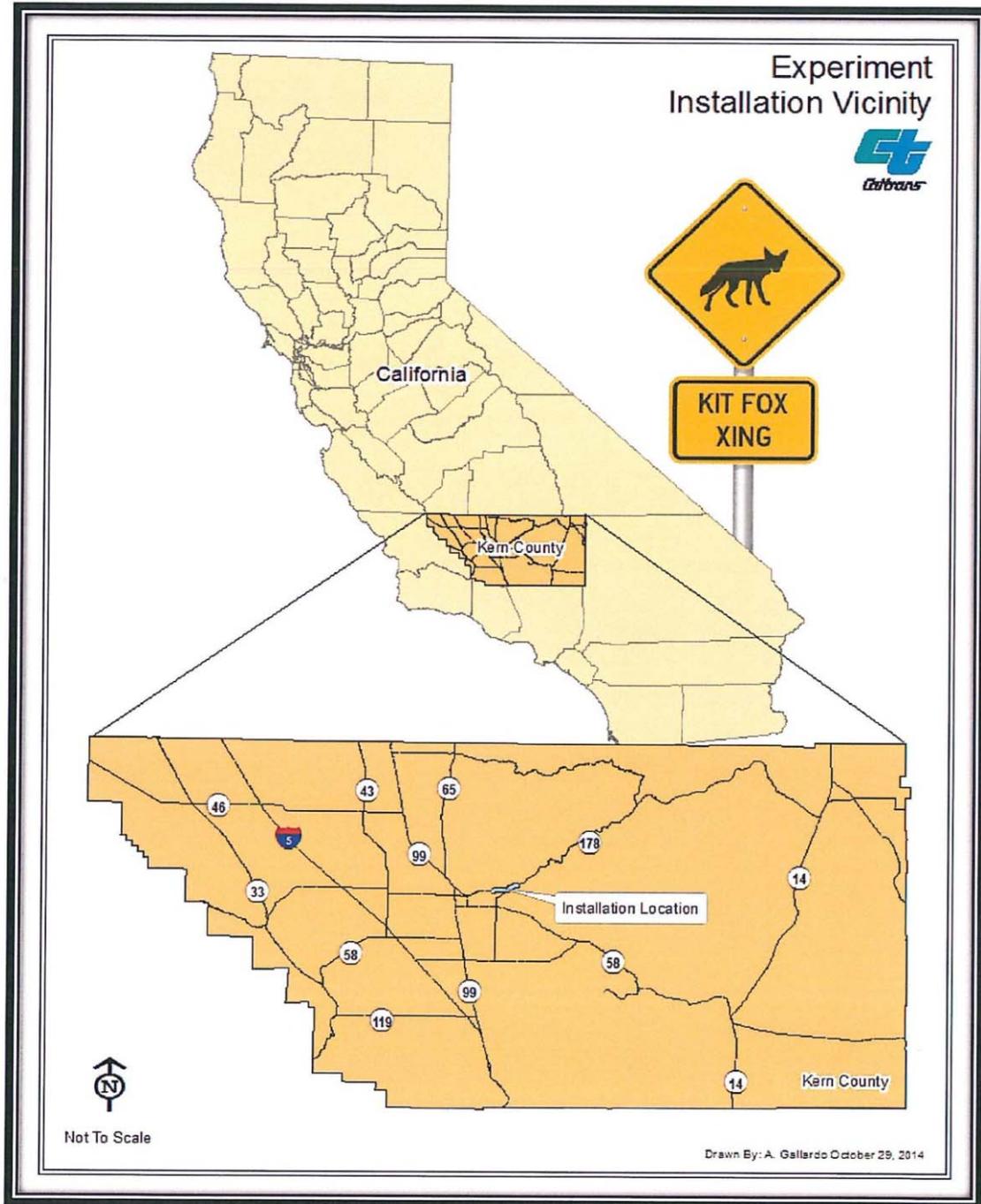


Figure 1

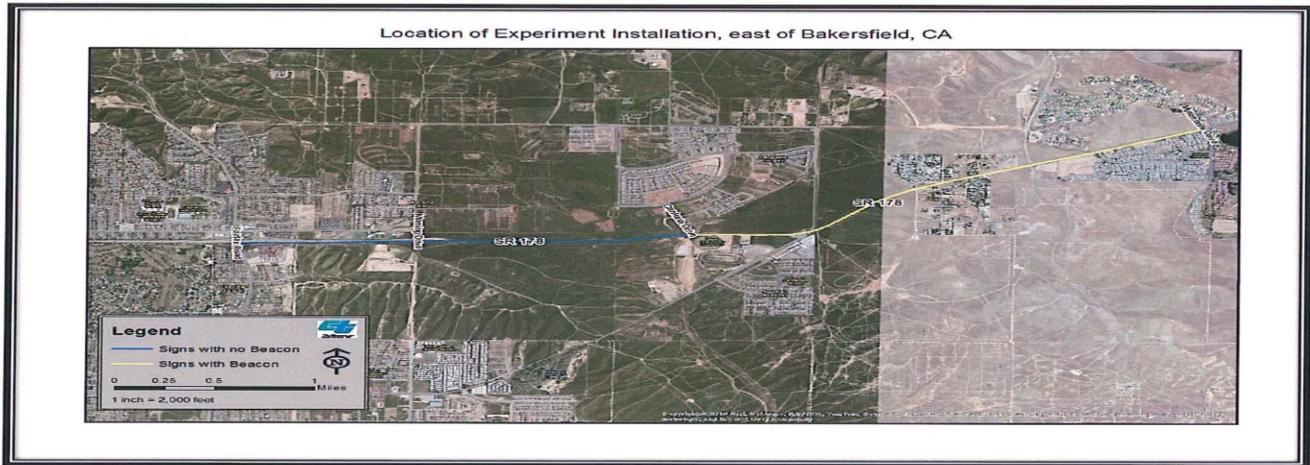


Figure 2



SR 178 at Morning Drive Overcrossing looking east

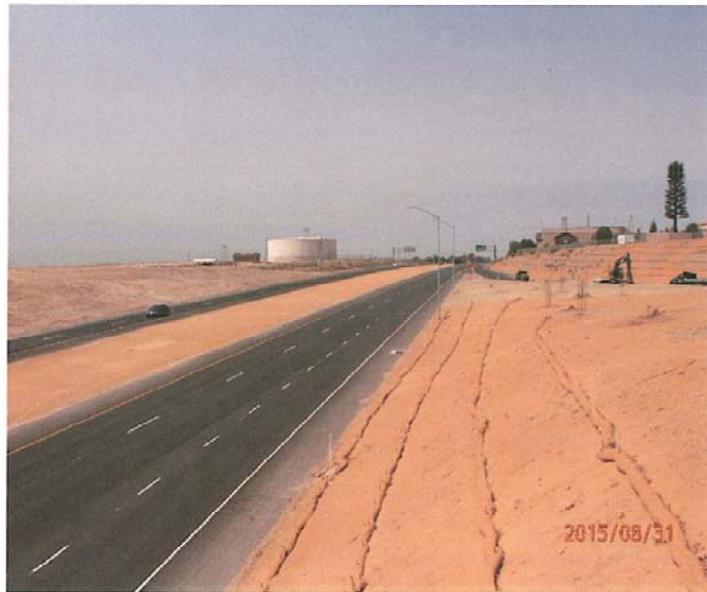


Figure 3 photos by Chris Hinds SR178 looking west

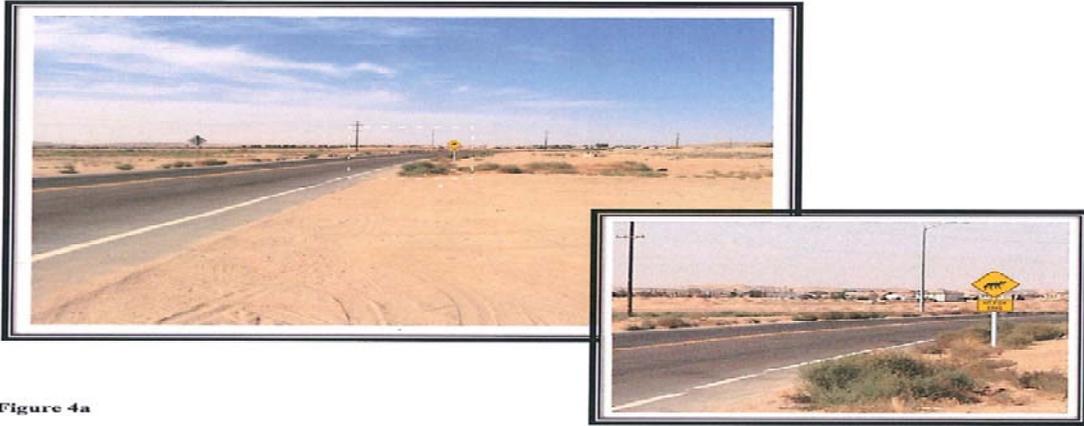


Figure 4a

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Figure 4b



11



Figure 5a (Desert Tortoise Crossing Sign Installed in California)

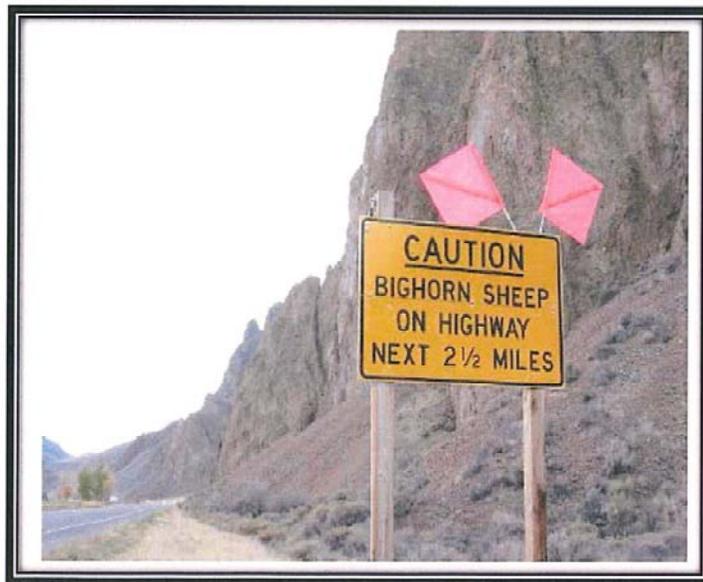


Figure 5b (Big Horn Sheep Crossing Sign Installed in Idaho)

Photo by Marcel Huijser

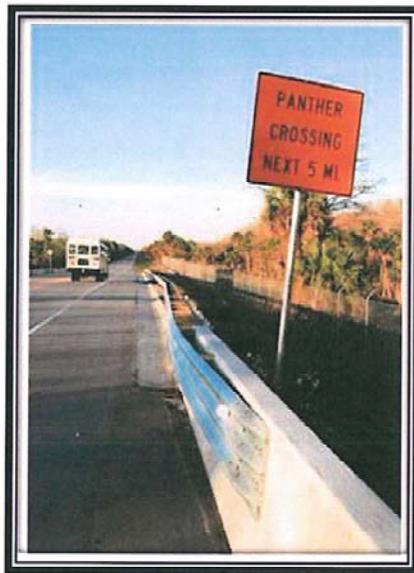
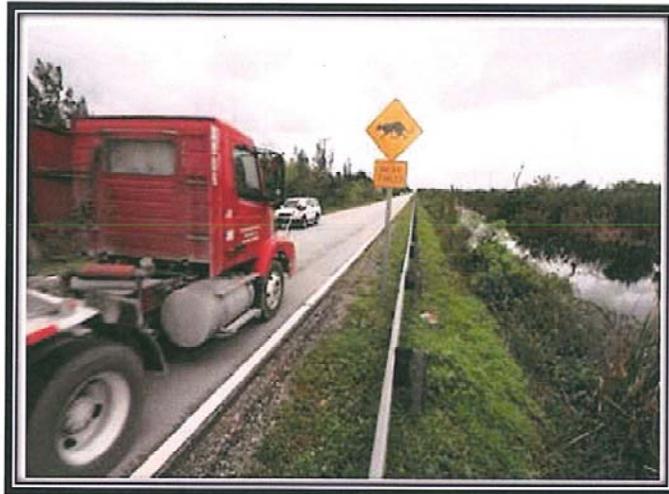


Figure 5c (Panther Warning Signs Installed in Southern Florida)

Photo by Marcel Huijser

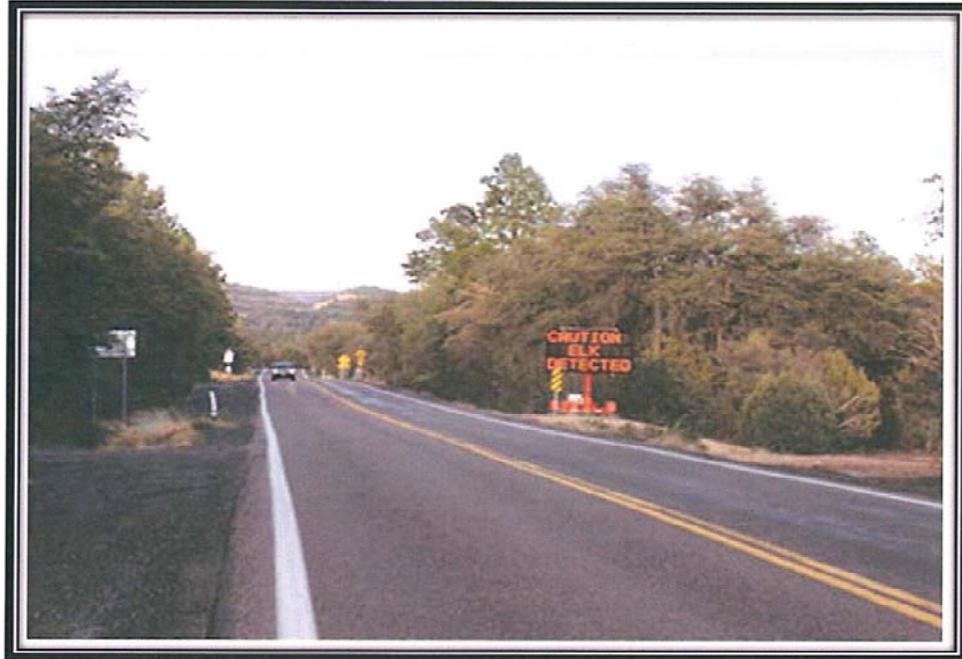


Figure 5e (Detection System Installed in Preacher Canyon Arizona)

Photo by Norris Dodd



Figure 5f (Caltrans District 2 Project; Disabled Due to Technical Issues)

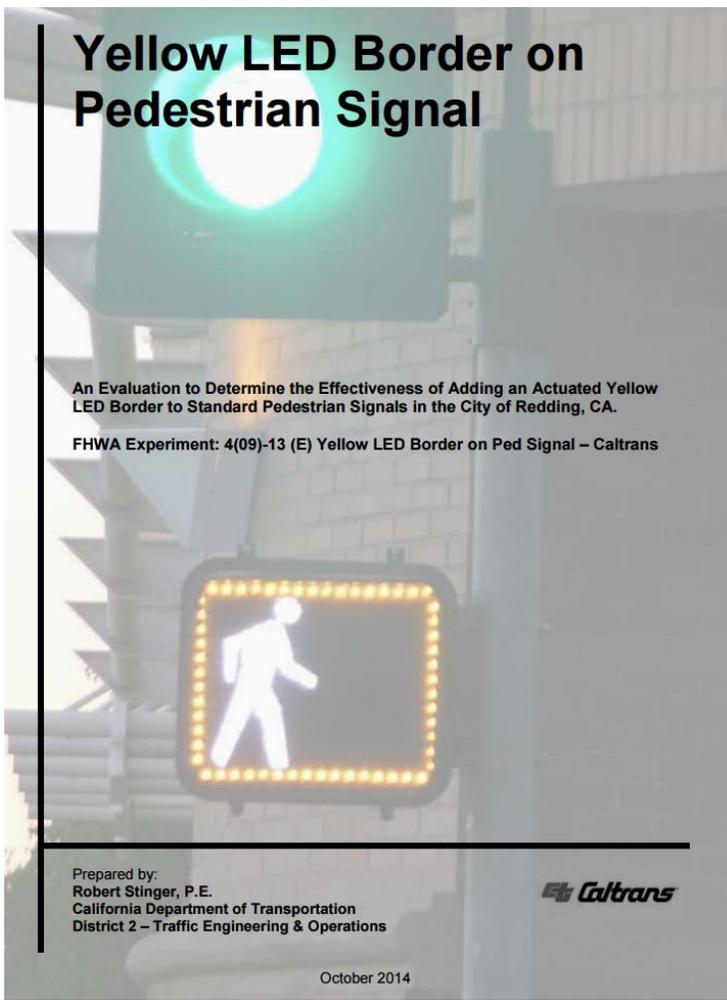
8. Discussion Items

Item 12-9 Report on Yellow LED Border on Pedestrian Signal

Recommendation: The CTCDC is requested to hold discussion on direction to take at this point. Should this device be adopted as a traffic control device in the CA MUTCD?

Agency Making Request/Sponsor: Caltrans District 2/ Duper Tong, voting member

Proposal: Rob Stinger of District 2, Caltrans will provide a report on the Yellow LED Border on Pedestrian Signal Heads



Stinger Jr, Rob F@DOT

To: Bruce.Friedman@dot.gov

Cc: MUTCDTEAM@dot.gov; kevin.d.korth@dot.gov; ronnie.bell@austintexas.gov; Anderson, Teri

L@DOT; Anderson, Don L@DOT; SnORT; Gale, Sue S@DOT; Lombardi, Ted B@DOT; Styer, Martha V@DOT

Subject: RE: Final Report: 4(09)-13(E) Yellow LED Border on Ped Signal - Caltrans

Thank you for reviewing the report and providing feedback. I am glad you didn't have any problems with the attachment.

I was not sure if you wanted me to provide responses to your comments, but I thought it might be helpful for Ronnie Bell and the STC task force. My responses are provided in **red italic font**

I appreciate your help throughout this process – thanks Bruce!

Rob Stinger, P.E.

Chief - Traffic Engineering & Operations

Caltrans District 2

530-225-3229

From: Bruce.Friedman@dot.gov [mailto:Bruce.Friedman@dot.gov]

Sent: Tuesday, November 18, 2014 2:51 PM

To: Stinger Jr, Rob F@DOT

Cc: MUTCDTEAM@dot.gov; kevin.d.korth@dot.gov; ronnie.bell@austintexas.gov

Subject: RE: Final Report: 4(09)-13(E) Yellow LED Border on Ped Signal - Caltrans

Rob,

Thank you for conducting this experiment, for providing numerous progress reports during the course of the study, and for submitting an excellent and well-written final report.

The following are my observations and comments after reviewing the report:

1. Your conclusions are interesting in that you show a “modest reduction in pedestrian-vehicle conflicts” of approximately 17%, but more significant decreases in pedestrian violations (stepping off the curb when the steady DW is being displayed) of approximately 28% and extra pushbutton presses of approximately 60%. These conclusions are interesting because the purpose of conducting the experiment was to see if conflicts between motor vehicles and pedestrians could be reduced by alerting drivers to the presence of a pedestrian wanting to use the crosswalk. While there was some improvement in driver behavior when the yellow LED border was activated, the largest improvement was in pedestrian behavior. *As discussed in the Introduction part of the report, the need to improve driver behavior is what sparked the concept of adding an actuated yellow border. Although the primary objective of the enhancement was to reduce vehicle-pedestrian conflicts, it was recognized that pedestrians would also benefit from the yellow border. Since pedestrian signals are meant for foot traffic, and they do not control vehicular traffic, it was not surprising the results showed a greater impact with pedestrians.*

2. It makes sense that when you give pedestrians positive feedback that their pushbutton press was received by the traffic signal controller, they tend to be more patient to wait for the

next Walk interval to start and they do not feel the need to press the pushbutton again. Pedestrians spend more time at the intersection, and their attention is focused on the pedestrian signal head, so it makes sense that they would notice the experimental device more than drivers notice it, and because it lights up simultaneously with their pressing of the pushbutton, it is easier for them to determine its meaning.

Thank you for the comment.

3. I agree that the reduction in pedestrian-vehicle conflicts is conservative, because if these devices were installed at a much larger number of intersections, drivers would have an easier time of noticing the yellow LED borders, in figuring out what they mean, and in adjusting their driving behavior. *Thank you for the comment.*

4. I'm concerned about the effect of widespread use of yellow LED borders at actuated intersections within a jurisdiction, but not at other intersections, such as pretimed intersections. Will drivers conclude that pedestrians are not present at a pretimed intersection because they do not see an illuminated yellow LED border? *This concern has been expressed by others. Since pedestrian signals do not control traffic, the expectation is that drivers will continue to follow the rules and drive safely. However, in low light or inclement weather conditions, I think there is always a possibility that a driver may "let their guard down" if they expect to see an illuminated yellow LED border for a pedestrian waiting to cross. Perhaps the YPB pedestrian signals could include some additional feature so that they are "identifiable" to pedestrians and motorists before the button is pushed. An example would be to have a small circle or dot of yellow LEDs somewhere on the module face that is illuminated (along with the UPRAISED HAND) until the button is pushed - it then turns off when the border comes on. If the pedestrian signal doesn't have a "yellow dot", it's not a YPB.*

Should buttons be placed at pretimed intersections also, even though they are not needed to generate a Walk interval, just to allow pedestrians to turn on the yellow LED border? *I like your idea, but it seems if you go to the trouble to add buttons to activate the border you might as well make the signal fully pedestrian actuated instead of pre-timed. I originally thought for pre-timed signals that the yellow border would come on 5-10 seconds after the end of the walk phase... to let motorists and peds know that the WALK indication is coming. I think it has benefits, but the downside is that it doesn't necessarily mean a pedestrian is present when the border is lit.*

5. You recommend adding the yellow LED border to the MUTCD as an optional device to be used at "standard countdown pedestrian signals." Is there a reason that these borders should not be used where countdown pedestrian signal are not present? According to Paragraph 1 of Section 4E.07, countdown pedestrian signal are not required for crosswalks where the pedestrian change interval is 7 seconds or less. *The border would work fine on non-countdown type pedestrian signals. I referred to "standard countdown pedestrian signals" because there is a Caltrans Directive to switch to countdown timers on State operated traffic signals. Since we are in the process of phasing out the "old style" pedestrian signals, I did not think it was necessary to mention pedestrian signals without countdown timers. Thank you for pointing out Section 4E.07.*

6. You also recommend that yellow LED borders not be used where the posted speed limit is more than 40 mph. Is there a reason for this recommendation? I would think that they would be helpful at signalized intersections along a 45-mph arterial roadway where speeds (including turning speeds) are higher, where intersections are larger, and where encountering pedestrians is less frequent. *I agree with your thoughts completely. I made the recommendation to stay within the intersection characteristics that were studied. I was concerned that if we made recommendations for situations that are not similar to the five locations evaluated, additional studies would be required.*

7. Why was the yellow color for the LED border chosen? *It was honestly the first color that popped in my head. Yellow is a color commonly used in transportation to get the attention of motorists, so it seemed like the natural color to use for this application.*

Were other colors also considered? *Other colors were not given much consideration because we didn't want the illuminated border to be a distraction or look out of place with the rest of the signal indications. A different color may get more attention in the beginning, but as motorists and pedestrians begin to understand its purpose, I think the color doesn't really matter as long as it is visible.*

8. In the paragraph at the bottom of Page 1 and the top of Page 2, the upraised hand signal indication is called "red" in two places, when the actual color of the upraised hand signal indication is orange. *Thank you for the comment. I was aware that the official color in our specifications is Portland Orange, but I thought I had read something that referred to the "red upraised hand". Apparently, I must have mentally added the "red" part because I cannot find that wording in any of the documents I have reviewed. The indications have always appeared red to me in the field, so I assumed they used that color to describe the DON'T WALK symbol.*

9. At the bottom of Page 31 in response to the 4th question, I noticed that only 2 of 12 pedestrians surveyed said that the yellow LED borders are noticed by drivers and cause them to drive more cautiously. Apparently, pedestrians do not feel that drivers are influenced by the devices. On the other hand, at the top of Page 32 in response to the 5th question, 6 of 12 pedestrians said that the yellow LED borders are effective. Do they mean that they are effective in getting the pedestrians to be more patient and cautious? *Good comment. The pedestrians who took the survey were not aware that the primary objective of the device was to reduce vehicle-pedestrian conflicts. The 5th question was meant to get an overall opinion about the device and whether it is a good addition to pedestrian signal heads – from the pedestrian point of view. Although most appeared to be skeptical about its effect on drivers, I think the respondents generally appreciated the reassurance the YPB provided when waiting to cross.*

10. Also at the top of Page 32 in response to the 5th question, 6 of 12 pedestrians said that the yellow LED borders are a good addition to pedestrian signal heads. Perhaps a better question would be, "Are the yellow LED borders a wise expenditure of funds, or would the funds be better spent on a different type of pedestrian safety improvement?" *I would be concerned about asking a generic "is this a wise expenditure of funds?" type question without providing more specifics, like the cost of adding the YPB feature vs. the costs of other pedestrian safety improvements. Another option would have been to make a suggestion in the*

comment section (Question #6) to provide feedback about the expenditure of funds for the device. From the standpoint of evaluating a concept for improving pedestrian safety, I did not think cost would be a significant factor – especially when it is a small modification to a standard piece of equipment. The same question could be asked about the optional feature currently allowed in the MUTCD – the animated eyes symbol (Section 4E.04, paragraph 12). If manufactured on a large scale, it is anticipated that the cost increase to “upgrade” to the YPB modules will be minimal when compared to annual maintenance and electrical costs associated with traffic signals.

By copy of this e-mail message, I am asking Ronnie Bell to distribute a copy of this report to the members of the Signals Technical Committee when he distributes his January meeting agenda in early December. I am also asking Ronnie to request that the STC task force on pedestrian signals discuss this report and determine if they want to take make any recommendations for action by the full STC.

Thanks again for submitting this report and for doing the experiment.

Bruce

Bruce E. Friedman, P.E.

Transportation Specialist, MUTCD Team
Federal Highway Administration
Office of Transportation Operations, HOTO-1
1200 New Jersey Avenue SE
Mail Stop E86-201
Washington, DC 20590
Phone: 850 553 2234

Item 15-27 Discussion on centerline marking thresholds

Recommendation: The CTCDC is requested to hold discussion regarding use of centerline markings requirements for ADT greater than 6,000.

Agency Making Request/Sponsor: Caltrans/ Bryan Jones - Active Transportation, voting member

Background: See email string below for information.

From: Bruce Dughi <bdughi@yahoo.com>
Date: September 25, 2015 at 9:21:07 PM PDT
To: "Miller, Rock" <Rock.Miller@stantec.com>, Bryan Jones <bryanjones@altaplanning.com>, John Ciccarelli <johnc@bicyclesolutions.com>
Cc: Dave Snyder <dave@calbike.org>, Dan Gutierrez <dan.gutierrez@charter.net>
Subject: Re: following up (re: centerlines & CA MUTCD)
Reply-To: Bruce Dughi <bdughi@yahoo.com>

Today, center lines are suggested rather than required for 4000 < ADT < 6000. Santa Maria Ave ADT = 5000. The problem is that Alameda County Public Works is extremely conservative and insists on following the suggestion. I think we should try to increase the requirement to something greater than 6000 but we should certainly remove the suggestion between 4000 and 6000.

I love the idea of suggestion lanes but why would that be limited to low volume? No matter what the volume, the bicycle should travel at least 4 feet from parked cars. Suggestion lanes are more important for higher volume roads in order to give cyclists a chance. Otherwise motorists just run you over. They should be independent of center lines.

Bruce

From: "Miller, Rock" <Rock.Miller@stantec.com>
To: Bryan Jones <bryanjones@altaplanning.com>; John Ciccarelli <johnc@bicyclesolutions.com>
Cc: Bruce Dughi <bdughi@yahoo.com>; Dave Snyder <dave@calbike.org>; Dan Gutierrez <dan.gutierrez@charter.net>
Sent: Friday, September 25, 2015 3:48 PM
Subject: RE: following up (re: centerlines & CA MUTCD)

There is no requirement for a striped centerline below 6000 daily vehicles or for narrow roadways. I am thinking that raising the threshold nationally will be difficult. Above 6000, there is almost continuous simultaneous opposing traffic.

I have observed the suggestion lanes in Minnesota and think this is a worthwhile treatment, but they are only done on lower volume roadways, nothing carrying close to 6000 daily

vehicles. I think FHWA is still accepting experiments for agencies who want to test the treatment.

I am in complete support of not striping centerlines on lower volume roadways, unless there is a unique reason to stripe them. It is much more comfortable to ride my bike if cars can move to the left to pass me without crossing a stripe.

Rock

Rock Miller

Senior Principal, Transportation Planning & Traffic Engineering

Stantec

38 Technology Drive Suite 100 Irvine CA 92618-5312

Phone: (949) 923-6021

Cell: (714) 743-1415

Fax: (949) 923-6121

Rock.Miller@stantec.com



Hi Bruce,

It looks like you forwarded to me a reminder to follow up with a suggestion for the MUTCD regarding your request to reduce the requirements to place center lines. I heartily agree. I'm cc'ing Bryan Jones and John Ciccarelli who are the bike/ped representatives on the CTCDC to ask for their opinion.

John & Bryan,

What do you think? The relevant section is pasted below Bruce's note to me. I see a couple ways to go about this:

- 1) reduce the ADT required for placement of a double yellow line
- 2) change the 'shall' to 'should' and add language noting that on low volume streets, the lack of a center line slows traffic and permits motorists to pass bicycles with more space.

I'll also note that this section will have to be addressed if we implement so-called 'advisory bike lanes' in California which we should do, like, yesterday. :-)

- Dave

<<forwarded message below>>

Dave,

Can you ask Caltrans to modify their MUTCD to delete the 6,000 ADT requirement for center lines or increase it to 12,000? In Castro Valley, our roads are very narrow with mostly 10-12 ft travel lanes which is not wide enough for both car and bike to travel safely. On streets without center lines, cars readily move into the oncoming lane to pass, thereby leaving loads of space. Cars generally refuse to cross lines, however, crowding as they pass within the narrow lane. Centerlines are bad for bikes because they create narrow, unsafe lanes.

We now have [studies](#) that demonstrate the importance of removing centerlines for the safety of cycling. Additionally, we have examples in Portland and Minneapolis where they have removed centerlines to improve cycling safety.

<http://www.bikewalktwincities.org/how-get-bike-lanes-when-there-isnt-enough-space-0>

<http://streetsblog.net/2014/09/25/portland-experiments-with-advisory-bike-lanes/>

I high lighted the trouble spot from the latest MUTCD below. Thanks.

Bruce

California MUTCD 2014 Edition

(FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California)

Chapter 3B – Pavement and Curb Markings November 7, 2014

Part 3 – Markings

Page 667

CHAPTER 3B. PAVEMENT AND CURB MARKINGS

Section 3B.01 Yellow Center Line Pavement Markings and Warrants

Dave Snyder

Executive Director

California Bicycle Coalition

Enabling more people to bicycle for the health, safety, and prosperity of all Californians.

[Join or renew](#) as a CalBike member.

[916-251-9433](tel:916-251-9433) | dave@calbike.org

8. Tabled Items**Agenda Item 15-15 Proposal for striping a space for bicycle use at locations with right-turn-only lanes**

Agency Making Request/Sponsor: Caltrans/ Duper Tong, voting member

Background:

Per the Highway Design Manual, Section 403.6 (see next page), locations with right-turn-only lanes should provide a minimum 4-foot width for bicycle use between the right-turn and through lane when bikes are permitted. The Caltrans Division of Design has suggested that striping guidance be provided in the CA-MUTCD to reflect the advisory standard mentioned above.

9. Next Meeting

March 3, 2016
Caltrans District 5
1150 Laurel Lane
San Luis Obispo, CA

10. Adjourn