

May 23, 2016

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 – Bicycle Box

Dear Mr. Engelmann,

In accordance with the 2009 Manual of Uniform Traffic Control Devices (MUTCD), the City of Cupertino is applying for a Request to Experiment for the continued use of a bicycle box on Stelling Road, at the intersection with McClellan Road.

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

Sincerely,

Request to Experiment

Requesting Agencies – City of Cupertino, CA

California Traffic Control Devices Committee (CTCDC) Sponsor – Michael Sallaberry, Voting Member

The City of Cupertino is requesting permission to experiment with a bicycle box on northbound S Stelling Road, at the intersection with McClellan Road. The intersection is signalized and it's located at the confluence of two bike lanes (See **Figure 1**). The City is seeking FHWA approval as authorized in the Manual of Uniform Traffic Control Devices. This request to experiment (RTE) is somewhat different in that it is being presented post-construction.

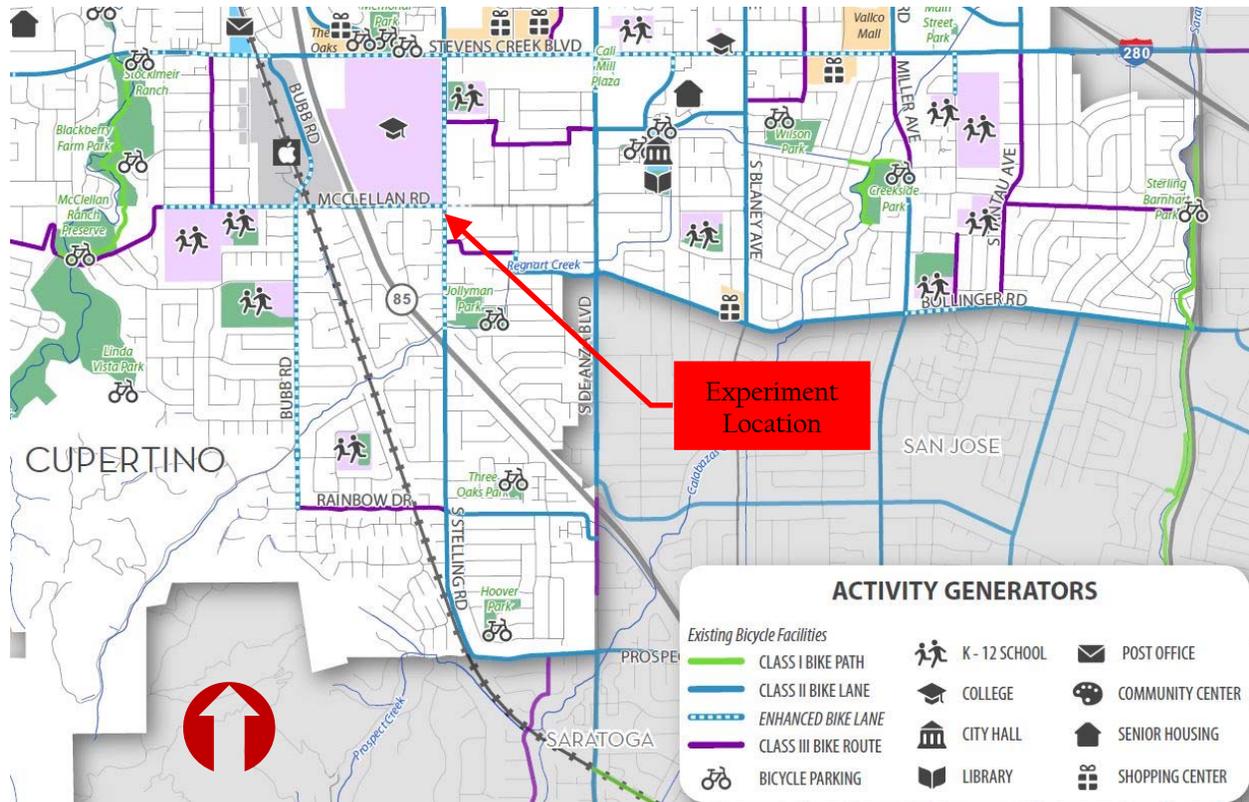


Figure 1: Experiment Location

The City of Cupertino completed a street resurfacing and striping project on Stelling Road in January 2016. The opportunity to redesign the street with Complete Streets features presented itself with the resurfacing. One such feature was a multi-lane bicycle box on northbound S. Stelling Road at the intersection with McClellan Road. Bicycle boxes are experimental features that require a request to experiment as outlined in the MUTCD. Although the City had always intended to go through the RTE process, it was not feasible at the time to wait for the RTE process to be completed before the scheduled resurfacing project. Furthermore, striping must be placed immediately following the paving work. Suspending permanent striping and relying only on cat tracking was not an option the City was willing to consider for safety reasons. Given these circumstances and with the knowledge that the design features of the bicycle box will be consistent with published design guidelines (NACTO, FHWA) and previously approved RTE applications, such as the application submitted by the City of Santa Monica on August 17, 2011., the City opted to install the bicycle

box prior to submitting an RTE application. The City, however, intended to submit an application at the next CTCDC meeting and to FHWA following the installation.

The intended purpose of the bicycle box is to facilitate through and turning movements by bicyclists, both along Stelling Road and to bike lanes currently present on McClellan Road west of the intersection. The City's proposal is aimed at maximizing comfort and safety at this intersection and promoting mobility for all modes of transportation.

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

Proposal

To provide for safe and efficient operation of bicycles at this intersection, the City of Cupertino is proposing to experiment with a bicycle box.

A. A statement indicating the nature of the problem

Because of State Route 85 freeway and the parallel railroad tracks, there are few east-west bike routes connecting to west Cupertino (see Figure 1). McClellan Road is one of the east-west bike routes and is also a major access route to multiple schools, parks and campuses in west Cupertino. Bicyclists traveling northbound on the Stelling Road bike lanes must traverse two lanes of traffic to access the left turning lane to westbound McClellan Road (see Figure 2). This movement places bicyclists in conflict with through moving vehicles.



Figure 2: Intersection configuration before improvements (Image date: February 2014)

Northbound bicyclists approaching the intersection also continue straight on the Stelling Road bike lane. The number of northbound bicyclists turning right is low because there is no receiving bike lane on eastbound McClellan Road. It is desired that a design be approved that facilitates bicyclist left turning movements, maintains through movement, and makes the intersection intuitive and inviting to bicyclists.

Request To Experiment

As part of the design development process, bicycle 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 or left movement. The nature of the bike box will allow right turns on red for automobiles with the supplied right-turn lane. The layout of this intersection is depicted in **Figure 3**.

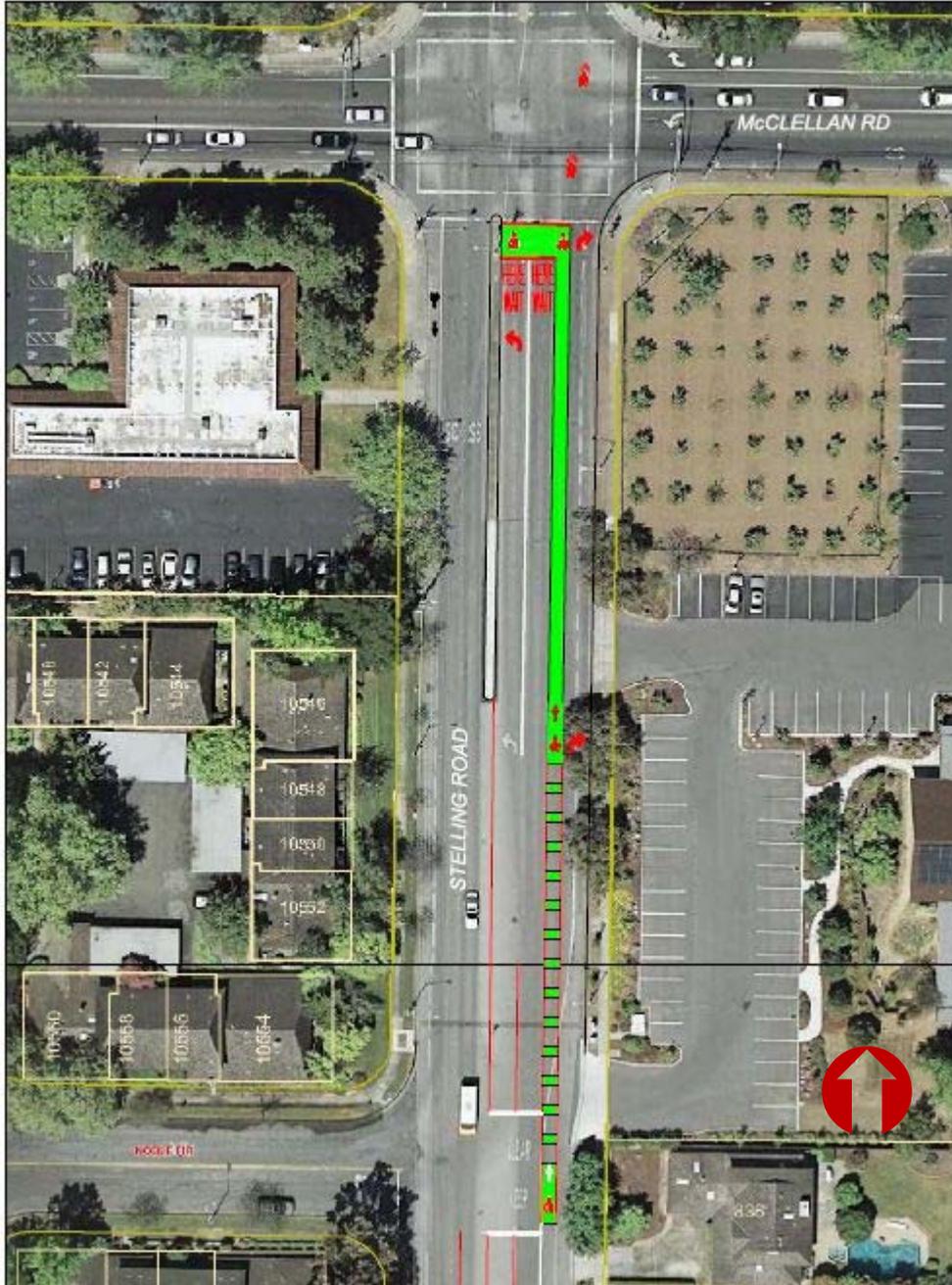


Figure 3: Striping Plan

- B. A description of the proposed change, 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 a multi-lane bicycle box at the northbound approach 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 in the separated bikeways planning guide and on the bicycle/pedestrian page at the following link:

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

- C. Any illustration, photograph, or videos, which would help, explain the experimental device or use of this device.**

The installed layout of the bicycle box is illustrated in **Figure 4**.



Figure 4: Installed Bicycle Box (Image date: January 2016 – Immediately post construction)

- D. Any supporting data as to how the experimental device was developed, if it has been tried, in what ways it was found to be adequate or inadequate, and how was this choice of device or application arrived at.**

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 bicycle 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.

This installation bears a few notable features. First, it is not being used in front of a right turn lane and therefore does not have any of the disadvantages associated with through bicyclists on a green indication coming in conflict with right turning vehicles. This installation provides queuing advantages at the signal for bicyclists and on a red signal indication allows for positioning for a left turn onto McClellan Rd.

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 Cupertino'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 bicycle box was installed in January 2016 at the northbound approach of the Stelling Road and McClellan Road intersection.

The experiment will be for a one-year period (from approval of experiment) 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.

The City of Cupertino conducted 24 hour video observations of the intersection in August of 2015 (Thursday the 27th and Saturday the 29th). We will use these videos for data analysis of the project area prior to implementation.

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

- Crash data compared from the previous five years and one year subsequent to installation
- Conflicts and avoidance maneuvers between motor vehicles and bicycles
- Video observation will be conducted on a Thursday and a Saturday in 24 hour periods for a total of 48 hours of video surveillance. The video will be used to evaluate:
 - Incidents of conflicts between the motor vehicle and bicycle,
 - Conflicts and avoidance maneuvers between motor vehicles and bicycles,
 - Bicycle position and behavior approaching the intersection when making left turns
 - Bicycle position approaching the bicycle box and queued at the intersection
 - Motor vehicle position approaching the bicycle box and queued at the intersection,

The City of Cupertino will provide semi-annual progress reports for the duration of the experiment. The above information will be presented in a final report within 3 months following the completion of the experiment.

- 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 Cupertino agrees to the above conditions.

- I. 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 Cupertino agrees to the above conditions, however based on the information that FHWA is looking to collect, all of this will be available within the final report.