

**Request for Permission to Experiment
with Green Pavement & Shared Roadway Bicycle Markings
(Draft – February 9, 2012)**

The City of Oakland seeks permission to experiment with the use of green pavement as a traffic control device in conjunction with the shared roadway bicycle marking (sharrow). The experiment is proposed for 40th Street between Adeline Street and Webster Street in proximity of the MacArthur BART Transit Station and Transit Village development. In California, the use of non-standard traffic control devices must be reviewed and approved by the California Traffic Control Devices Committee and by the Federal Highway Administration. The City will request permission to experiment in 2012. If approved, the experiment would be conducted in 2012 and 2013.

Problem Statement

The California Vehicle Code requires bicyclists to “ride as close as practicable to the right-hand curb or edge of the roadway” (CVC 21202(a)). Exceptions to this requirement include roadways with “a substandard width lane” defined as “a lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the lane” (CVC 21202(a)(3)). In the City of Oakland, the majority of urban arterials and collectors have lane widths that are too narrow for a bicycle and vehicle to operate side by side in a safe manner. Where there is sufficient width, the City is in the process of adding bicycle lanes as per a citywide analysis of roadway widths completed for the City of Oakland’s Bicycle Master Plan (2007). On multi-lane urban arterials and collectors that are too narrow for bicycle lanes, the typical pattern of use is bicyclists riding within the door zone, immediately adjacent to curbside parallel parking. Drivers typically pass such bicyclists without changing lanes, encroaching into the adjoining travel lane and providing insufficient width for the bicyclist to operate safely.

On multi-lane roadways, CVC 21654(a) requires slow moving vehicles to operate “in the right-hand lane for traffic or as close as practicable to the right-hand edge or curb.” Because of the exceptions to CVC 21202(a), a bicyclist may use the full extent of the right-hand lane if that lane is too narrow for a bicycle and vehicle to travel safely side by side within the lane. Thus the safe and legal behavior for the bicyclist is to “control” the travel lane, riding clear of the door zone with overtaking drivers deliberately changing lanes to pass safely. A minority of bicyclists operates in this manner, based in part on the cultural expectation of drivers that bicyclists should “get out of the way.” In Oakland, this cultural norm is enforced through intimidation: documented incidents include drivers honking, yelling, driving aggressively, and physically assaulting bicyclists.

Traffic operations on multi-lane urban arterials and collectors used by bicyclists are thus prone to the following issues:

- (1) Bicyclists ride too close to vehicles parked parallel along the street, exposing themselves to collisions with opening car doors.

- (2) Overtaking drivers pass bicyclists by “squeezing by,” encroaching on the adjoining travel lane and providing insufficient width for bicyclists to operate safely.
- (3) Bicyclists controlling the right-hand lane in a safe and legal manner are subject to intimidation by overtaking drivers.

The City seeks to address these operational issues by experimenting with roadway delineation and signage that may promote: (a) safe and legal lane positioning by bicyclists; and (b) safe and legal passing by drivers in shared lane situations.

Location of Proposed Experiment

The City of Oakland’s Bicycle Master Plan, part of the Oakland General Plan, calls for the installation of bikeways to improve access to major transit stations. One of the most important stations is MacArthur BART located in North Oakland. As of 2008, 8.2% of BART patrons accessed the station by bicycle despite the lack of bikeways serving the station. In terms of absolute numbers, this station has the fourth largest number of bicyclists accessing the station out of the 43 BART stations in the San Francisco Bay Area. The entrance to the station is located on 40th Street, a four-lane urban arterial with two travel lanes in each direction, a 16-foot raised median with turn pockets at the intersections, and parallel parking lanes on both sides of the street. Average daily traffic is approximately 16,000 vehicles and there are seven traffic signals on this 1.0 mile segment of roadway.

The City has made multiple efforts to develop a bikeway in the 40th Street corridor that would connect to the City of Emeryville’s bikeway network at Adeline Street and to Oakland’s bikeway network at Webster Street. The City of Oakland’s Bicycle Master Plan designated 40th Street as a proposed bikeway in 1999 and that proposal was reaffirmed by a comprehensive plan update in 2007. In 2006 and 2008, respectively, the City completed two studies on the removal of travel lanes and the installation of bicycle lanes. The City is not implementing the “road diet” option at this time because of (1) concerns from the public transit agency – Alameda-Contra Costa Transit District (AC Transit) – regarding delays to bus operations; and (2) future year traffic forecasts whereby the road diet would create significant and unavoidable impacts to motor vehicle delay under the California Environmental Quality Act. The City then studied the feasibility of maintaining the four travel lanes and adding bicycle lanes by narrowing the raised medians. This proposal was opposed by neighborhood groups who, over the duration of the City’s studies have adopted and landscaped the medians.

Given these constraints, the City’s policy direction is to install an “arterial bike route” to improve bicycle access on 40th Street to the MacArthur BART station. The City’s Bicycle Master Plan defines an arterial bike route as the treatment for arterial and collector streets where bicycle lanes are not feasible and parallel streets do not provide viable alternatives. The design treatments include use of the shared roadway bicycle marking (sharrow), parking edge line stripes or parking Ts to help delineate the door zone, and bicyclist actuation marked by bicycle detector symbols at all actuated approaches to traffic signals. In particular, the sharrow advises bicyclists to ride clear of the door zone and alerts drivers to the presence of bicyclists.

On 40th St, the curbside travel lanes are not wide enough for bicyclists and drivers to safely share the lane side-by-side. While the City of San Francisco has documented the positive effect sharrows on bicyclist positioning, the City of Oakland is seeking a design treatment to enhance

and improve the use of sharrows on multi-lane roadways where bicyclist demand is high. Oakland has multiple locations where such a treatment would be beneficial: multi-lane collectors and arterials where bicycle lanes are not feasible due to right-of-way constraints.

Description and Use of the Proposed Traffic Control Device

The City is proposing to install a five-foot wide strip of green pavement centered in the curbside travel lane along the length of the project, excluding intersections and crosswalks. This experimental traffic control device would be used in conjunction with the following standard traffic control devices:

- Sharrows spaced at intervals of approximately 135 to 200 feet with a minimum of two sharrows in each direction on each block;
- Parking edge line stripe delineating the right edge of the curbside travel lane along the length of the project, excluding intersections, crosswalks, and bus stops;
- Bicycle detector symbols on all actuated approaches to traffic signals in the project area with the symbols centered in the rightmost lane serving the bicyclist's destination;
- Bicycles May Use Full Lane Signs (R4-11) on the far-side of each intersection with a collector or arterial roadway (six intersections);

The City is also proposing to experiment with a supplemental warning sign (black legend on yellow background) with the message "change lanes to pass." While the R4-11 communicates the safe and legal bicyclist behavior, the supplemental sign will communicate the safe and legal behavior for drivers overtaking bicyclists. Bicycle Route Signs (D11-1) were installed along the length of the corridor in May 2010 and will remain throughout the experiment.

The treatment is proposed for 0.8 miles of 40th Street from Adeline Street to Martin Luther King, Jr Way and from Telegraph Avenue to Webster Street. No change is proposed on the connecting 0.2 miles of 40th Street from Martin Luther King, Jr Way to Telegraph Avenue where bicycle lanes were installed along the MacArthur BART station entrance (and under State Highway 24) as part of a streetscape project in 2009.

State of the Practice

The City's request to experiment is based on results to date of comparable experiments in Long Beach, CA and Salt Lake City, UT. The Long Beach context is comparable with respect to the length of the roadway segment, the roadway cross-section, and the traffic signal density. The final report from Long Beach's experiment identifies increased use by bicyclists, improved bicyclist positioning, and reduced bicyclist collision rates relative to the number of bicyclists. Communication with staff at Salt Lake City, UT confirmed that their experiment has produced positive results: heightened awareness of the shared lane condition and better bicyclist positioning. The City of Oakland seeks to build on this experience to date by implementing a promising treatment to address a known design challenge and contribute to this body of research.