



Planning & Community Development Department
Transportation Engineering and Management Division
1685 Main Street, Room 115
Santa Monica, CA 90401

June 19, 2013

Mr. Devinder Singh, Executive Secretary
California Traffic Control Devices Committee – MS36
P.O. Box 942874
Sacramento, CA 94274-0001

**SUBJECT: Update to Experiment 12-25 – Various Bicycle Treatments
(Buffered Bike Lanes)**

Dear Mr. Singh / CTCDC Committee:

In December 2012, the City of Santa Monica was granted permission to conduct an experiment through our “Request for Permission to Experiment – Various Bicycle Treatments”. Per the request of the CTCDC, the City has separated each bicycle treatment into a standalone experiment. This update discusses buffered bicycle lanes that are not expressly approved for use in the State of California. The purpose of the experiment is to determine the effectiveness of buffered bicycle lanes to encourage bicycling, increase driver awareness, increase bicyclists’ comfort level, and increase yield compliance from cyclists and motorists.

Should you have any questions or require any additional information, please contact me directly.

Respectfully,

Jay Dinkins, P.E.
Transportation Engineer
Transportation Engineering and Management Division
Planning & Community Development Department
City of Santa Monica
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Tel: 310.458.8963

1. Background

As documented in the 2010 General Plan Land Use and Circulation Element (LUCE), Santa Monica aspires to make this City a place in which 14-35% of all trips are made by bicycle. The City is currently implementing its adopted 2011 Bicycle Action Plan to achieve that result. The Bike Action Plan presents a program of specific practical actions that will encourage people to switch to bicycling, not only because it is environmentally friendly, but also because they will want to enjoy its safety, comfort, and convenience. The City's Open Space Element identifies walking on streets as residents' number one recreational activity. With a successfully implemented Bike Action Plan, bicycling will be a close second, and increases in the number of people who choose to commute by bicycle will surely increase.

Although this is a local plan developed in response to this community's needs and desires, it is also prepared within a national, state, and regional context that, more and more, seeks to encourage and support local communities in their efforts to become less car-focused, more energy efficient and less polluting. In addition to implementing Santa Monica's LUCE, the Bike Action Plan implements components of state and regional plans, including California Bicycle Transportation Account requirements and Metro's Strategic Bicycle Transportation Plan. Because of its leadership in implementing these State and regional goals, the City anticipates continuing funding support from national, State and regional levels of government.

2. Problem Statement

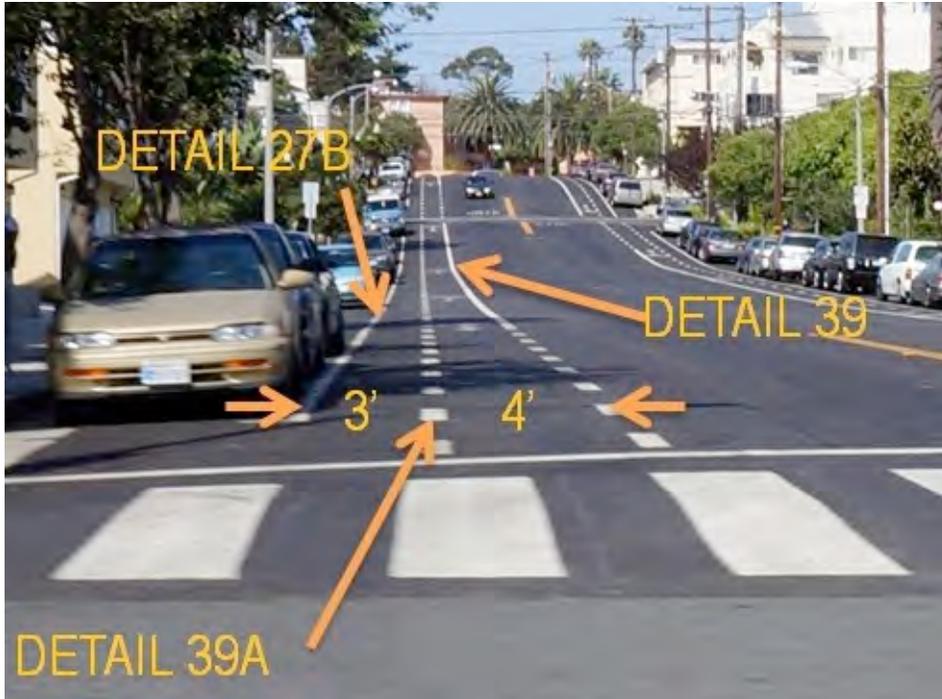
Like many jurisdictions throughout the State and nation, Santa Monica is concerned with compliance and ensuring that motorists and cyclists yield right-of-way to each other at signal controlled intersections. To address cyclist and motorist compliance, the City has pursued modified applications of a buffered bike lane to designate a space for cyclists, and to bring attention to the cyclist from the motorist's perspective.

3. Proposed Changes

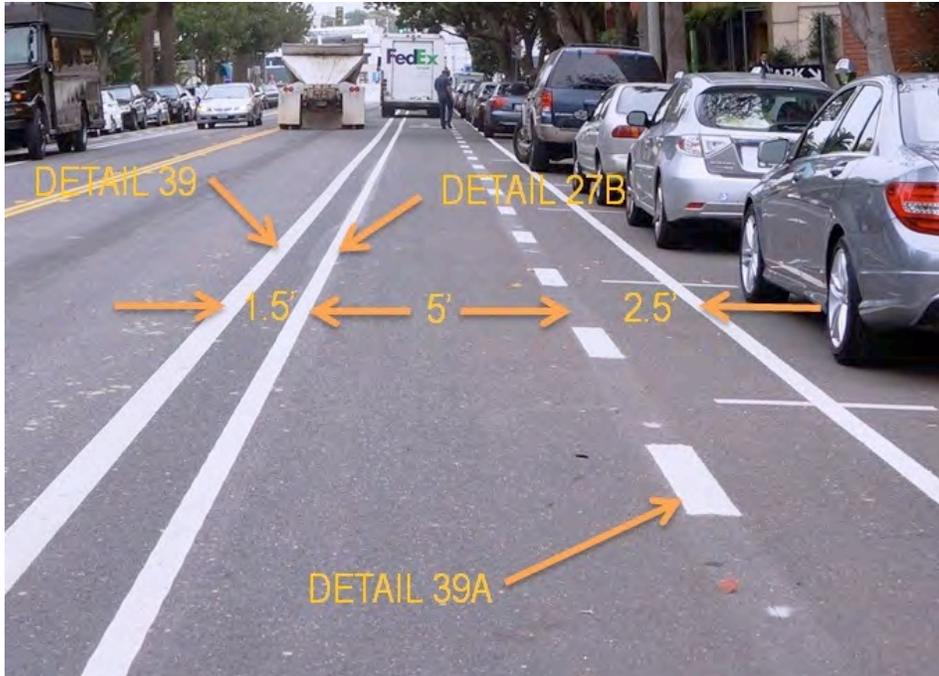
Buffered bike lanes are conventional Class II bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent vehicle travel lane and/or parking lane. All parking lanes are 7 ft. wide, and travel lanes are at least 10 ft. wide. Bike lanes and buffers vary as described below. None of following bike lanes is designed for side-by-side riding, although this behavior will be monitored during the experiment. All bike lanes will extend to the crosswalks of signalized intersections with a 5 ft. or 6 ft. bike lane.

The City would like to experiment by installing buffered bike lanes on various streets with the following varying buffer types and widths:

- **Parking lane buffer.** For this type of buffered bike lanes, a minimum 2.5-foot buffer will be installed between the parking lane and the bike lane using Caltrans Detail 39A (6 in. white dashed bike lane line). The 6 in. solid white outside line dividing the bike lane from the traffic lane will become a 6 in. dashed white line approximately 50 feet in advance of each intersection. The 6 in. white dashed parking buffer will continue to the intersection stop bar. The parking buffer will be installed on new bike lanes where space permits. Given the high parking turnover rate of many of the busy commercial streets throughout the City, the parking buffer will be a high priority. Project segments include Montana Avenue between Ocean Avenue and 17th Street (16 blocks, approximately 6,500 feet), Bicknell Avenue between 4th Street and Main Street (3 blocks, approximately 900 feet), and Main Street between Pico Boulevard and Marine Street (12 blocks, approximately 4,800 feet). The diagram below illustrates the cross section of this buffered bike lane.



- **Traffic lane buffer.** Where space permits, a 1.5-foot traffic lane buffer will be installed along with the parking lane buffer. The traffic lane buffer will be installed on streets with higher vehicle speeds and where the bike lane is so wide that it might be mistaken for a travel lane or a parking lane. The striping for the traffic lane buffer will be a combination of Caltrans Detail 39 (6 in. solid white bike lane line) on the traffic side and Caltrans Detail 27B (4 in. solid white edge line on the bike lane side). The traffic side buffer will transition to the 6 in. white dashed parking buffer which will continue to the intersection stop bar. The traffic side buffer will contain traverse markings and occasional breaks at driveways. Project locations include 6th Street between Colorado Avenue and Wilshire Boulevard (4 blocks, approximately 2,700 feet) and 14th Street between Pico Boulevard and Washington Avenue (9 blocks, approximately 6,900 feet). The diagram below illustrates the cross section of this bike lane.



4. Evaluation Plan

The objective of this experiment is to evaluate the effectiveness of the buffered bike lane treatments. The evaluation process will include a “before” and “after” study of both motorist and cyclist behavior and reactions to the experimental treatments. Experimentation requirements outlined in the MUTCD will be used to guide this process. These “before” and “after” studies will be conducted via random observations by City staff at various times of day, interviews with cyclists, and by soliciting direct feedback from Santa Monica’s various bicycle advocacy groups and other regular bicycle riders.

Observations that will be documented include:

- Wrong way riding
- Bicycle lane use (including bicyclists' adherence to the buffer zones, bicycle travel in the traffic buffer for and extended distances, and how pairs of bicyclist travel in/out of the buffered lane)
- Motorists' adherence to the bike lanes and buffer zones (including if motorists will misinterpret the traffic buffer markings to mean that crossing the traffic buffer is prohibited)
- Conflicts between cyclists and motorists
- Bicycle volumes
- Feedback from facility users
- Crash data at affected intersections

The evaluation plan will consist of the following elements:

- Evaluate Existing Setting – Existing traffic facilities and conditions at the locations of all new bicycle facilities under the experiment will be documented. This evaluation has already been completed by the City.
- Pre-Installation Evaluation – Driver behavior and reactions to bicycles will be observed and documented with existing traffic facilities. If appropriate, average numbers of bicycles using the existing facilities will be estimated based on observations. Note that much of this evaluation has already been completed by the City.
- Post-Installation Evaluation – Driver behavior and reactions to bicycles will be observed and documented with the new buffered bike lanes. Feedback from local bicycle groups will be solicited, and any accident records will be reviewed and analyzed. If appropriate, average numbers of bicycles using the new buffered bike lanes will be estimated based on observations.
- Reporting to CTCDC – Regular reports documenting the City's observations will be prepared and submitted to CTCDC at least twice during the one (1) year evaluation period.

5. Experiment Schedule

The following schedule for experimentation is proposed:

Pre-Installation Evaluation	Fall 2012
Bicycle Treatments Installation 2013	Spring/Summer
Bicycle Treatments Experiment Period 2013 to Fall/Winter 2013	Spring/Summer
Evaluation 2013 - Summer 2014	Spring/Summer

6. Current Status

As of June 2013 the City of Santa Monica is in the process of installing and/or modifying the various buffered bike lane treatments at the locations specified. Some of the buffered bike lane treatments were installed in late 2012 and are currently being modified to conform with the proposed experiment. The modification of existing and installation of new buffered bike lane treatments is being coordinated with the City's annual roadway resurfacing project and will be completed according to the proposed schedule described in item 5 above. The City anticipates the evaluations to begin later in the summer.



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**SUBJECT: Update to Experiment 12-25 – Various Bicycle Treatments
(Left- and Right-Turn Sharrow Markings)**

Dear Mr. Singh / CTCDC Committee:

In December 2012, the City of Santa Monica was granted permission to conduct an experiment through our “Request for Permission to Experiment – Various Bicycle Treatments”. Per the request of the CTCDC, the City has separated each bicycle treatment into a standalone experiment. This update discusses using a modified left- and right-turning shared lane marking (“SLM” or “sharrow”) that is not currently approved for use in the State of California. The purpose of the experiment will be to determine the effectiveness of a modified sharrow to increase driver awareness, increase bicyclists’ comfort level, and increase yield compliance from cyclists and motorists.

Should you have any questions or require any additional information, please contact me directly.

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2. Problem Statement

Like many jurisdictions throughout the State and nation, Santa Monica is concerned with compliance and ensuring that motorists and cyclists yield right-of-way to each other at signal controlled intersections. To address cyclist and motorist compliance, the City has pursued a modified application of shared lane markings, or sharrows, to designate a space for cyclists, and to bring attention to the cyclist from the motorist's perspective. The purpose of this modified application will be to better direct bicyclists to intersecting bike facilities, and to alert motorists to the presence of bicycles preparing to turn off of a street.

3. Proposed Changes



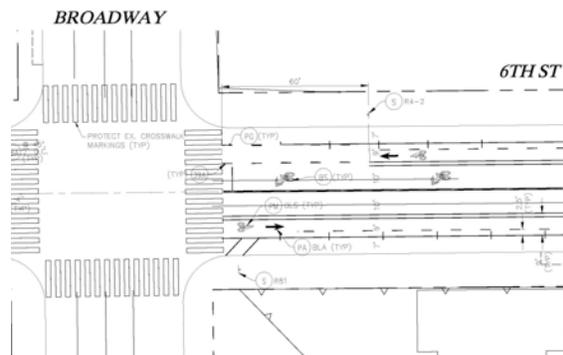
The shared lane marking (SLM), or sharrow, is often placed in the travel lane to indicate that a bicyclist may use the full lane and to suggest where in that travel lane to position his/herself. In the City of Santa Monica the suggested location is typically based on where to best avoid parked car door conflicts and where to direct

bicyclists to command possession of the full lane. The City requests testing a modified sharrow marking with the two chevrons above the bike symbol pointing left or right. This modified sharrow indicates the recommended location in the vehicle lane where a cyclist should position his/herself to make the legal and safe turn. These markings are only to be installed where a left-turn pocket is not present, and where a designated bikeway intersects with another designated bikeway. A designated bikeway is defined as a street that has a Class II bicycle facility and is a strategic bike connection through the city with high bicycle traffic volumes. This marking will, in turn, act as advance guidance for cyclists that he/she is approaching an intersecting bikeway.

Proposed Locations

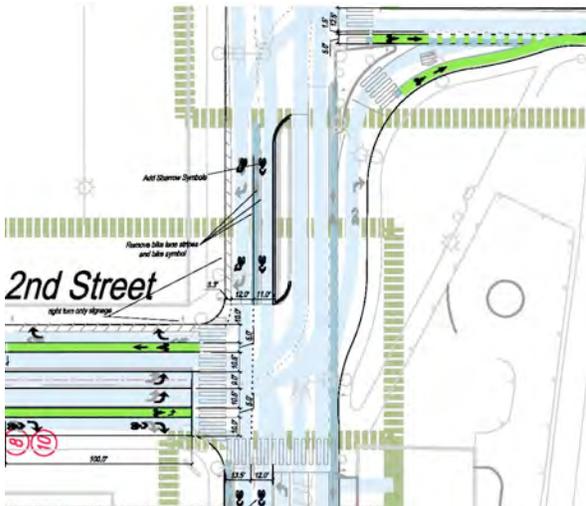
Various intersections along 6th Street

The left turn sharrows will be installed on 6th Street at the intersections of Broadway and Arizona Avenue. Broadway is the most heavily traveled east-west bicycle facility in the City. Arizona Avenue is another east-west street similar in bicycle popularity two blocks north and parallel to Broadway. Sixth Street is a two-lane roadway which features newly installed bike lanes that connect Colorado Avenue to Wilshire Boulevard, making it the main Class II bike facility in Downtown Santa Monica. With the lack of left-turn pockets on 6th Street, cyclists must wait in the only travel lane to turn left onto the bike lane on Broadway or Arizona Avenue. The left-turn sharrow will suggest where the cyclist should position themselves to safely and legally execute the turn. The left-turn sharrow will also remind motorists that bicycles may be present in the vehicle lane at this location, and may be waiting to make left-turns.



Colorado Avenue at Main Street/2nd Street

Second Street and Main Street form an important bikeway through Santa Monica. The 2.5-mile bikeway stretches from the southern City Limit to the north end of the city, connecting Venice Beach via Main Street, downtown Santa Monica and Montana Avenue on the north end of 2nd Street. The connection at Colorado Avenue where the existing Class II bike lane jogs from Main Street to



2nd Street is a challenging offset intersection with high volumes of vehicles and bicycles. In addition to the existing activity, a new Bike Center opened a year ago at the intersection of Colorado Avenue at 2nd Street and has proven to be a regular destination for locals and tourists alike. The Bike Center includes bike rentals, repair and secure bike parking with changing facilities and lockers. The intersection geometry as well as the volume of cyclists using this bikeway highlights the need for innovative

improvements like a right-turn sharrow. The right-turn sharrow will provide an opportunity to suggest where a cyclist should appropriately position his/herself to make the right turn from Colorado Avenue onto 2nd Street.

4. Evaluation Plan

The objective of this experiment is to evaluate the effectiveness of the above-mentioned modified sharrows. The evaluation process will include a “before” and “after” study of both motorist and cyclist behavior and reactions to the experimental treatments. Experimentation requirements outlined in the Manual of Uniform Traffic Control Devices will be used to guide this process. These “before” and “after” studies will be conducted via random observations by City staff at various times of day, interviews with cyclists, and by soliciting direct feedback from Santa Monica’s various bicycle advocacy groups and other regular bicycle riders.

Observations that will be documented include:

- Conflicts between cyclists and motorists
- Cyclist’s position on the modified sharrow
- Cyclist’s path as they approach the left turn sharrow

- Bicycle volumes
- Feedback from facility users
- Crash data at affected intersections

The evaluation plan will consist of the following elements:

- Evaluate Existing Setting – Existing traffic facilities and conditions at the locations of all new bicycle facilities under the experiment will be documented. This evaluation has already been completed by the City.
- Pre-Installation Evaluation – Driver behavior and reactions to bicycles will be observed and documented with existing traffic facilities. If appropriate, average numbers of bicycles using the existing facilities will be estimated based on observations. Note that much of this evaluation has already been completed by the City.
- Post-Installation Evaluation – Driver behavior and reactions to bicycles will be observed and documented with the modified sharrow. Feedback from local bicycle groups will be solicited, and any accident records will be reviewed and analyzed. If appropriate, average numbers of bicycles using the modified sharrow will be estimated based on observations.
- Reporting to CTCDC – Regular reports documenting the City’s observations will be prepared and submitted to CTCDC at least twice during the one (1) year evaluation period.

5. Experiment Schedule

The following schedule for experimentation is proposed:

Pre-Installation Evaluation	Fall 2012
Bicycle Treatments Installation 2013	Spring/Summer
Bicycle Treatments Experiment Period 2013 to Summer 2014	Spring/Summer
Evaluation 2013 - Summer 2014	Spring/Summer

6. Current Status

As of June 2013 the City of Santa Monica is in the process of installing the modified sharrow markings at the locations specified. The installation is being coordinated with the City's annual roadway resurfacing project and will be completed according to the proposed schedule described in item 5 above. The City anticipates the evaluations to begin later in the summer.