

# ***Shared Lane Markings: When and Where to Use Them***

A group of cyclists is riding on a city street. In the foreground, a large white bicycle symbol is painted on the pavement, with a white arrow pointing forward above it. Several cyclists are riding away from the camera, some wearing backpacks. The street is lined with trees and buildings. A white van is visible in the background. The scene is captured from a low angle, looking down the street.

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Pro Walk/Pro Bike in Seattle  
September 4, 2008

# San Francisco Bicycle Route Network



Bike Network: 208 Total Miles

31 Miles of Bike Path

45 Miles of Bike Lanes

132 Miles of Shared Roadways

53 Miles of Wide Curb Lanes

79 Miles of Narrow Curb Lanes

San Francisco - General Info

Area: ~50 square miles

Population: ~750,000 people

Terrain: Pretty hilly

# The Problem: Shared Lane Roadways

- High incidence of "dooring,"
- Wrong-way riding,
- Sidewalk riding, and
- Motorists squeezing cyclists against the curb or parked cars, or exhibiting other aggressive behaviors.



# Doorings

Doorings are one of the most common bicycle collision type in San Francisco.



[www.cardoordeathtrap.org](http://www.cardoordeathtrap.org)

“The Door is Always Open”



Courtesy of “Department of Public Art” - 1993

# History

- 1995 – Denver develops “bike-in-house”
- 1998 – SF applies elongated version of bike-in-house in green
- 2000 – SF goes to California Traffic Control Device Committee
- 2001 – Plan for experiment approved
- 2003 – Study by Alta completed
- 2004 – CTCDC approves study and recommends language for CA MUTCD
- 2007 – Marking included in draft MUTCD

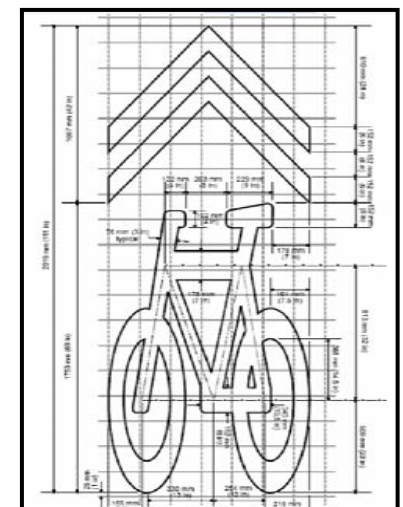


## SF Mayor Willie Brown - 1998



## “Bike-in-House” in Denver

- 1300 markings installed in SF
- 4000+ additional markings planned



Final  
approved  
design

In study of shared roadways, marking was found to:

- Increase distance between cyclists and parked cars
- Increase distance between motorists and cyclists
- Reduce number of cyclists on sidewalk
- Reduce number of cyclists riding the wrong way on road

However, not meant to replace bike lanes!



Tailcard for back of buses - part of educational campaign

# Draft Language for MUTCD

## Section 9C.07 Shared Lane Marking

### Option:

The Shared Lane Marking shown in Figure 9C-9 may be used to:

- A. Assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a bicyclist's impacting the open door of a parked vehicle,
- B. Assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane,
- C. Alert road users of the lateral location bicyclists are likely to occupy within the traveled way,
- D. Encourage safe passing of bicyclists by motorists, and
- E. Reduce the incidence of wrong-way bicycling.

### Guidance:

The Shared Lane Marking should not be placed on roadways that have a speed limit above 50 km/h or 35 mph.

### Standard:

**Shared Lane Markings shall not be used on shoulders or in designated bicycle lanes.**

**If used in a shared lane with on-street parallel parking, Shared Lane Markings shall be placed so that the centers of the markings are at least 3.4 m (11 ft) from the face of the curb, or from the edge of the pavement where there is no curb.**

### Guidance:

If used on a street without on-street parking that has an outside travel lane that is less than 4.3 m (14 ft) wide, the centers of the Shared Lane Markings should be at least 1.2 m (4 ft) from the face of the curb, or from the edge of the pavement where there is no curb.

If used, the Shared Lane Marking should be placed immediately after an intersection and spaced at intervals not greater than 75 m (250 ft) thereafter.

Figure 9C-9. Shared Lane Marking





# Placement Guidelines for San Francisco

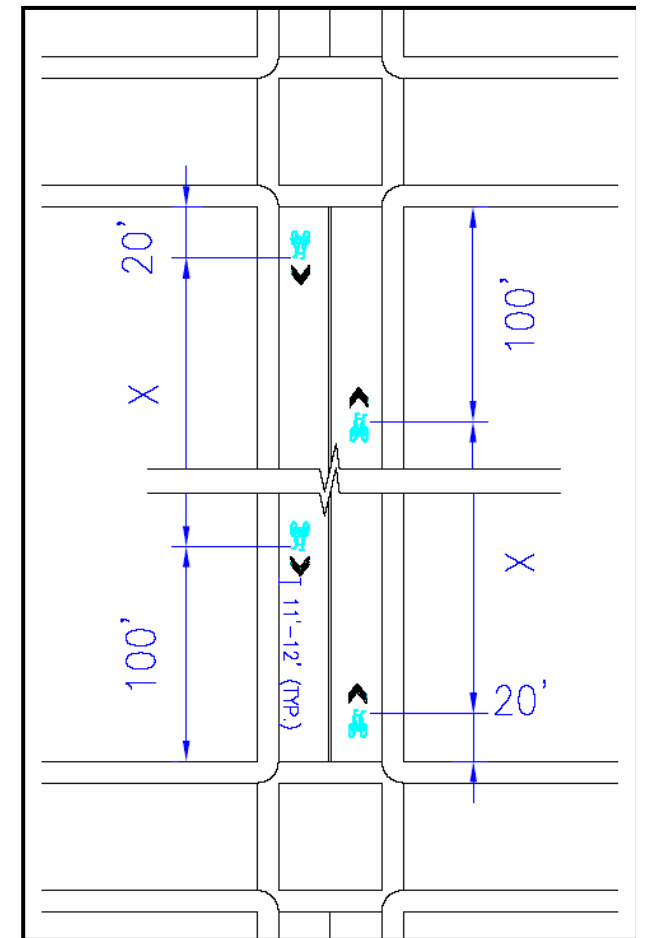
Laterally:

- 11' minimum with parking
- 11.5' general standard with parking
- May increase if higher cycling speeds are expected

If no parking, marking should be placed far enough from curb to direct cyclists away from gutters, seams, and other obstacles, or near center of lane if lane is less than 14' wide

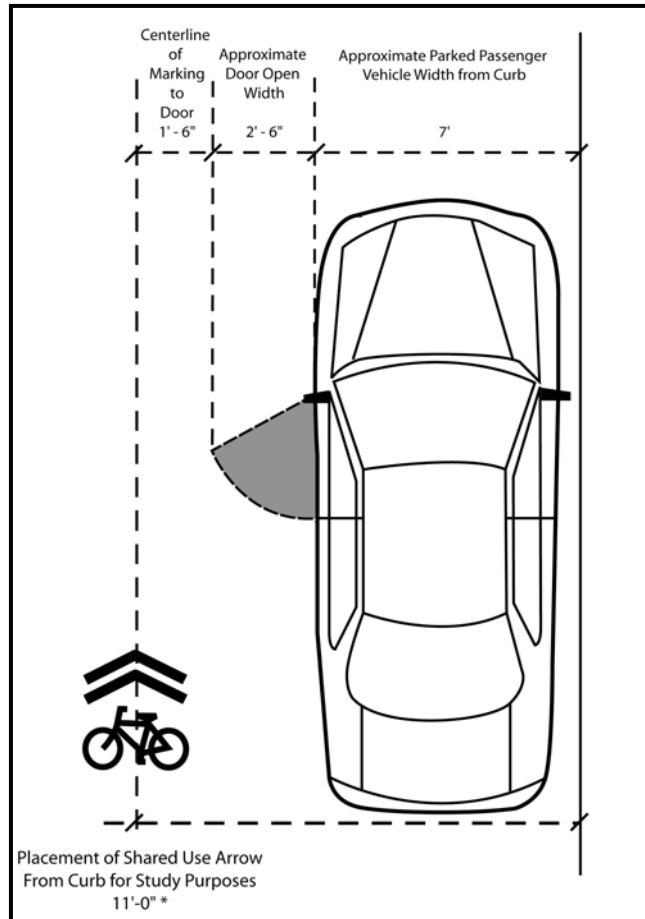
Longitudinally (along roadway):

- $X = 250' \pm 50'$
- X may be decreased if ADT divided by number of lanes is greater than 5000 or if prevailing speeds are 30mph or greater
- X may be increased if ADT divided by number of lanes is less than 2000 or curb lane is wider than 22'





# Plan View of Marking Placement



Marking placed 11' from curb face for study:

Doors open to ~ 9'6"

Bicyclist width: ~ 2'

Summation:  $9'6" + 2' / 2 = 10'6"$

Round up for some buffer to 11' for minimum





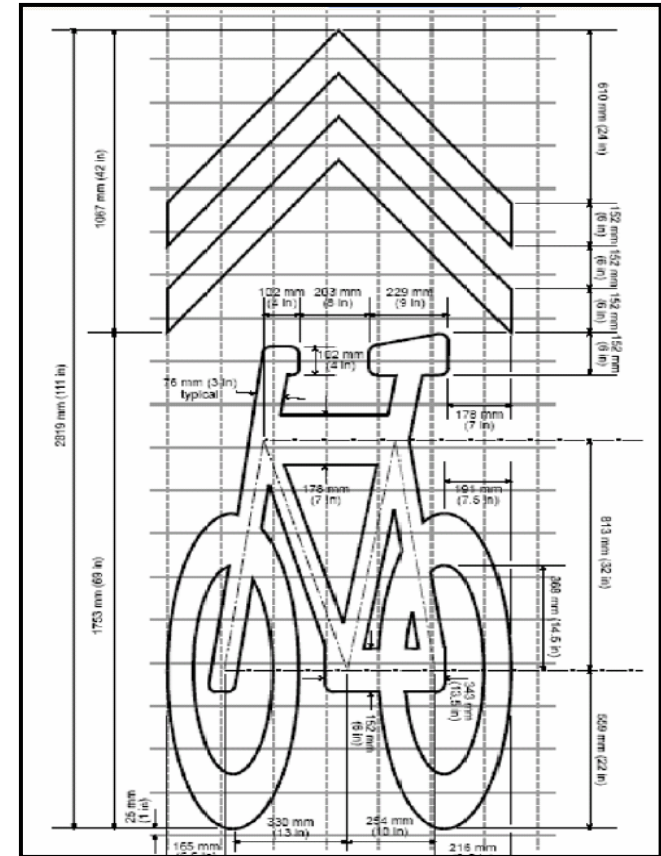
## Placement Along Roadway

Number of markings along a roadway should correspond to difficulty of cyclists trying to take proper travel path.

### Examples:

- On quiet neighborhood street with wide lanes, place marking every 250' or more
- On arterial with heavy traffic, narrow lanes, and high parking turnover, place marking every 100' or less

Consider: If motorists travel 30mph (or ~45 feet per second), motorist will pass marking placed 200' every ~4.5 seconds



# Specific Scenarios

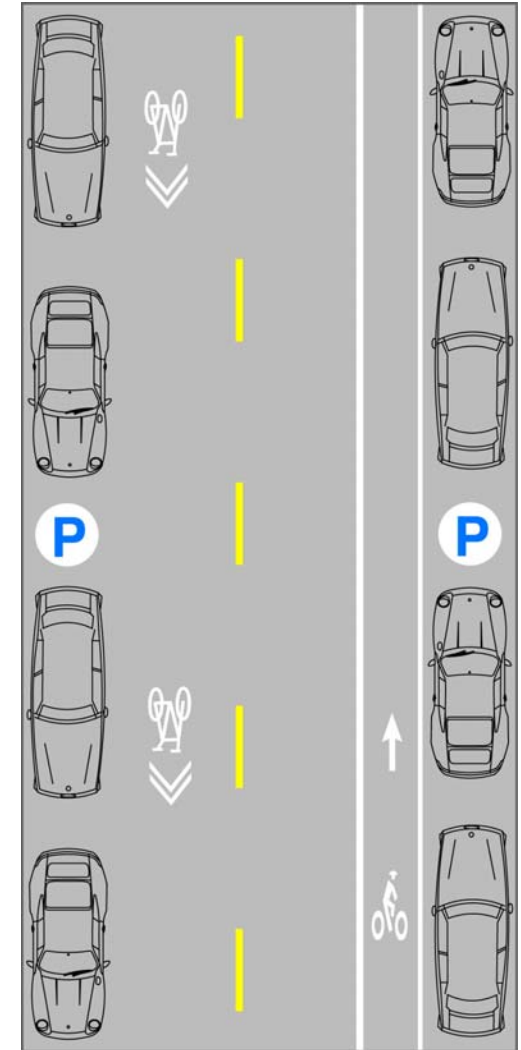




# Hill or Narrow Street



- On hills, where downhill bike lanes are generally not desirable, or
- Where street width has space for bike lane in only one direction\*
- Place marking in middle of lane



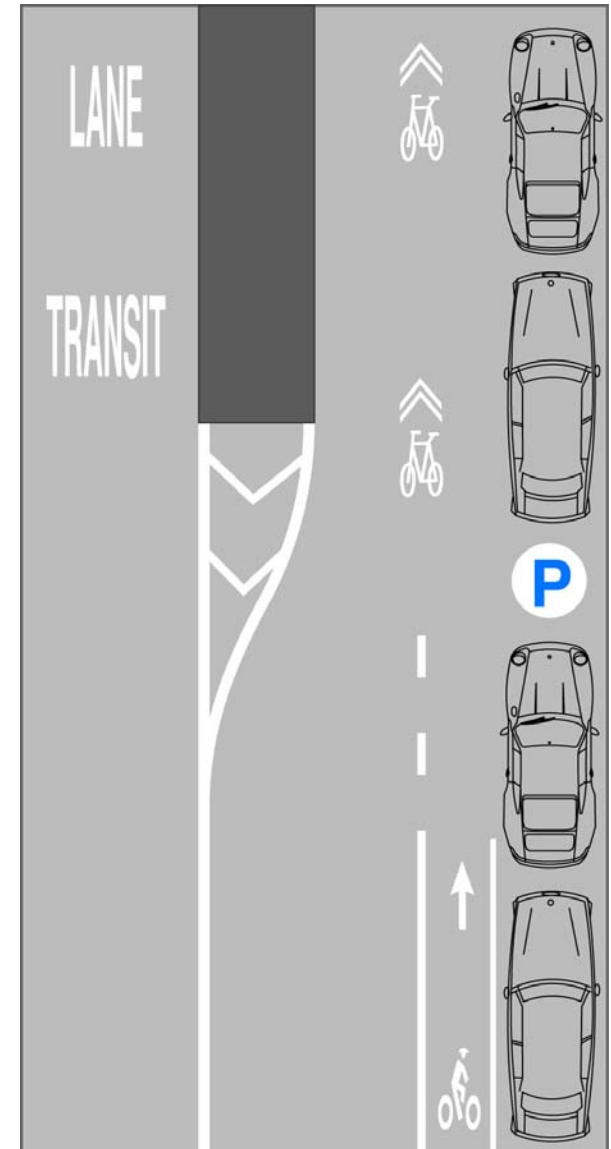
\*Undesirable to split road width and have two 12' to 13' lanes that are not wide enough to ride outside door zone and share lane with motorists, and not narrow enough to easily "take the lane"

# Discontinued Bike Lane due to Roadway Narrowing

- No room for bike lane or for cyclists and motorists to share lane side by side
- Guide cyclists to “take the lane”
- Discontinuity of bike lane undesirable but generally for short distance, so use marking somewhat frequently: spaced 50' - 100'



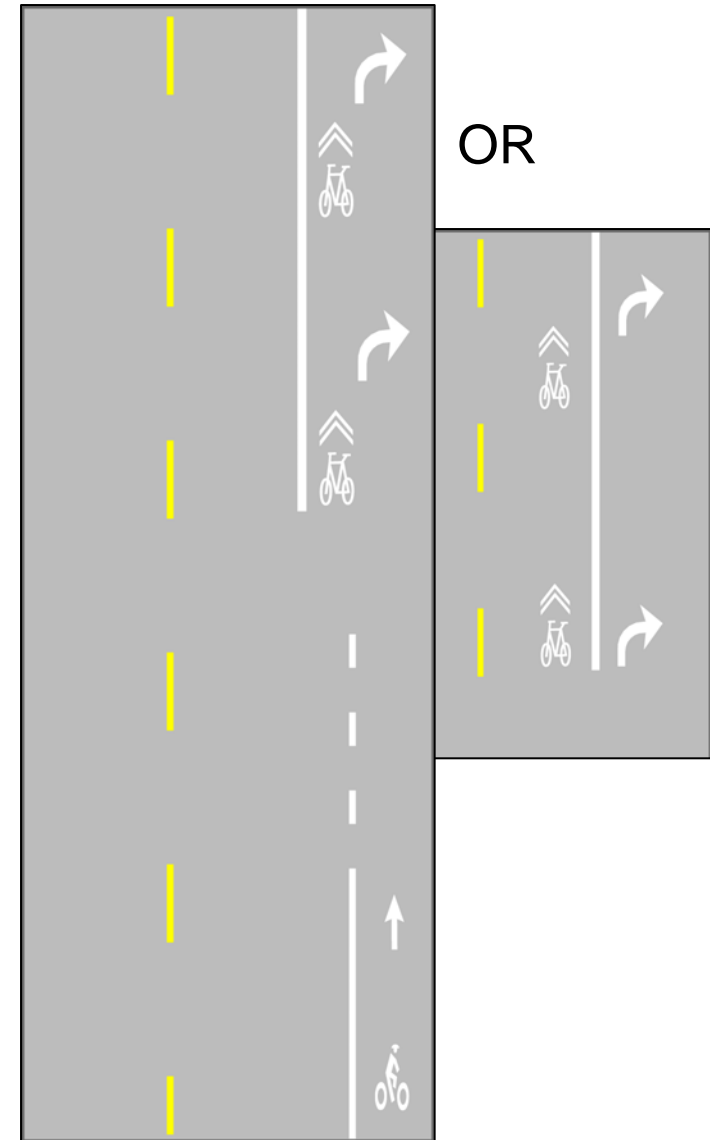
- Consider using BIKE MERGE AHEAD pavement message



# Discontinued Bike Lane for Right Turn Lane

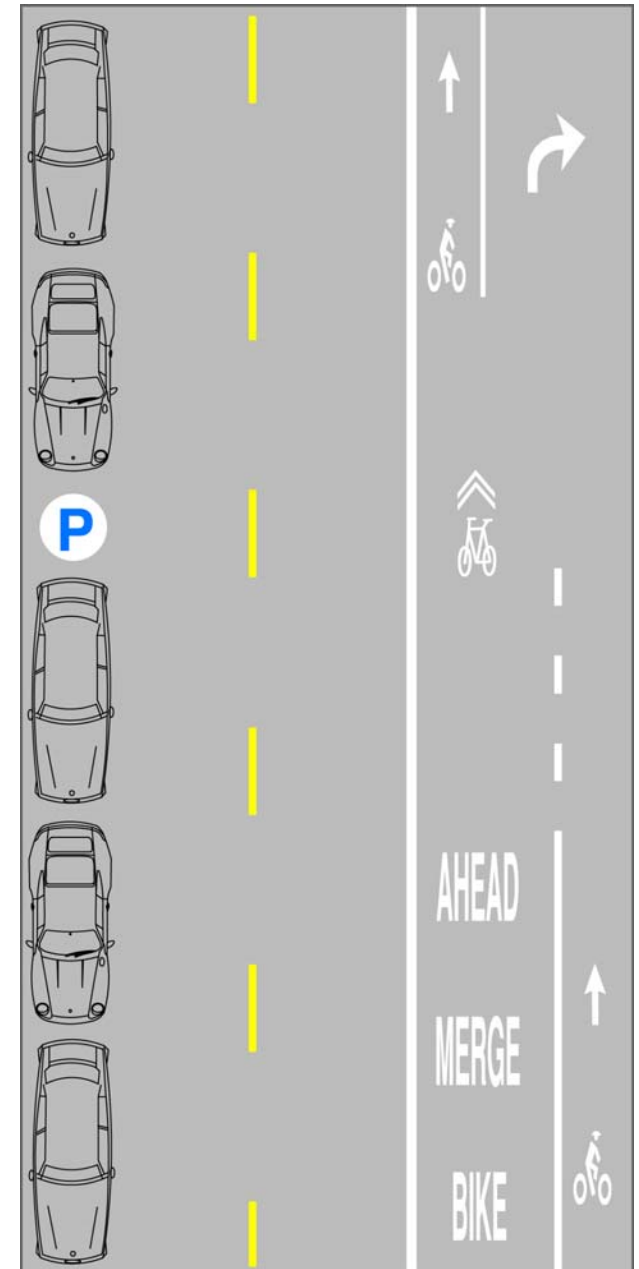


- No room for through bike lane
- Guide cyclists away from right side of right turn lane
- Use judgment for placing marking in left half of right turn lane or in through lane



# Lane Drop for Right Turn Only Lane

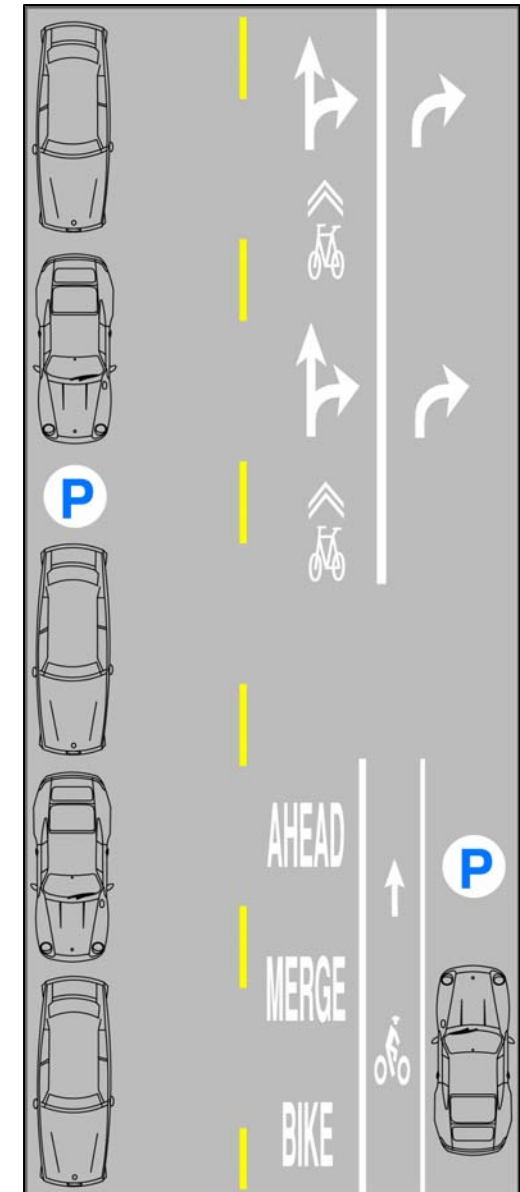
- Travel lane along bike lane becomes right turn only. Avoid this design.
- If unavoidable, use marking to tell motorists that cyclists will be merging across lane
- Place marking in the middle of the lane. Consider using multiple markings if movement is difficult for cyclists
- Consider supplementing with BIKE MERGE AHEAD pavement message





# Double Turn Lanes

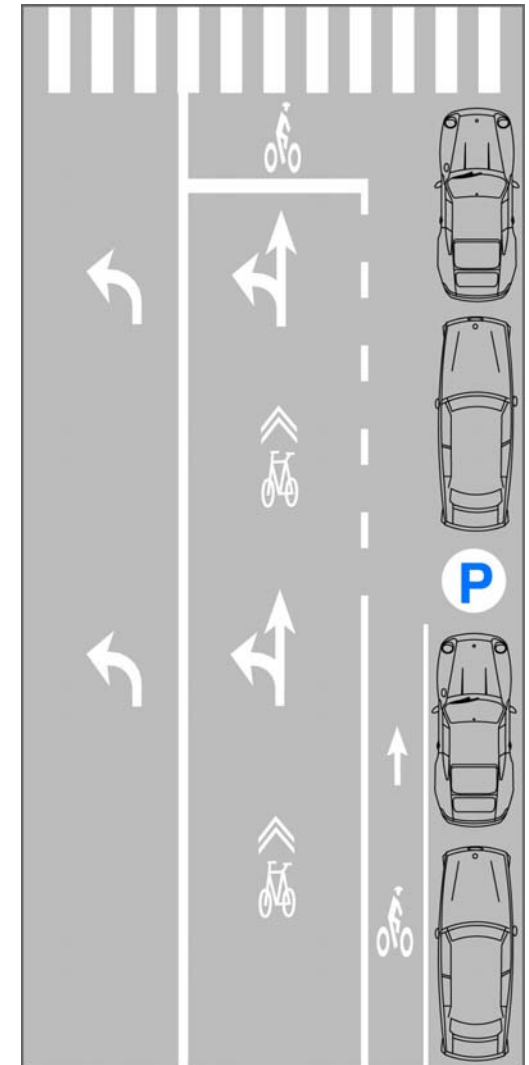
- Double turn lanes not desirable for cyclists (or peds)
- If unavoidable, add markings in middle of through/turn lane
- Consider adding BIKE MERGE AHEAD pavement marking



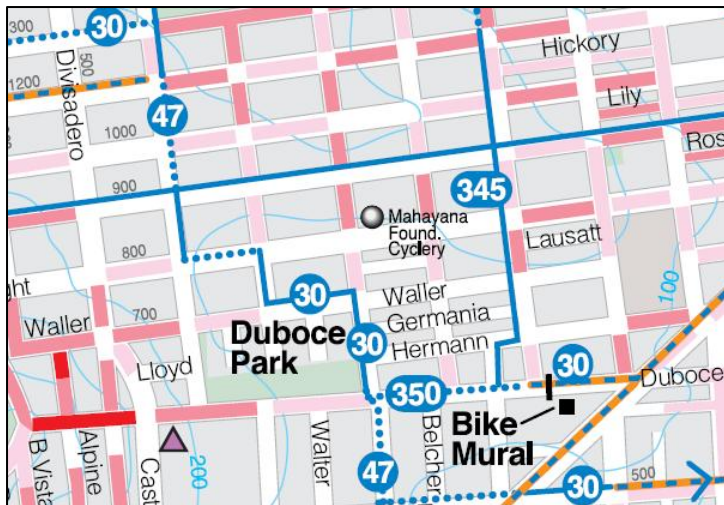
# Double Turn Lanes with Bike Box

Two basic scenarios for cyclists approaching bike box designed to position cyclists for turns or for “taking the lane” after the intersection:

- On a red light, via a bike lane
- On a green, by being in the lane; SLM can be used to help cyclist take the lane



# Route Finding

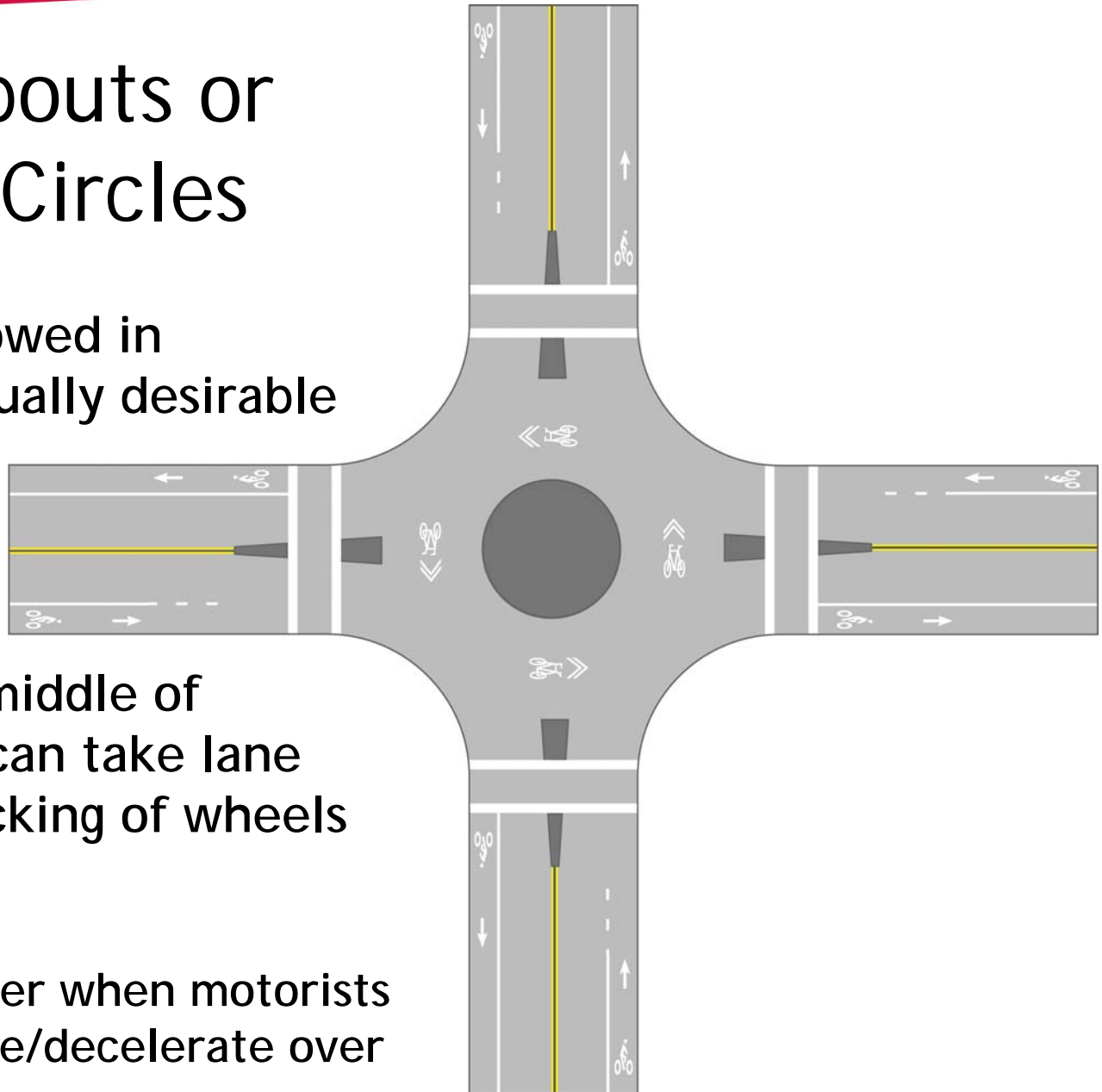


➤ Helpful for guiding cyclists - "follow the bread crumbs"

➤ Place first marking on each block fairly close to intersection (10' to 20' away) - easier to see from cross streets (credit to Dave Snyder)

# Roundabouts or Traffic Circles

➤ Bike lanes not allowed in roundabouts, nor usually desirable



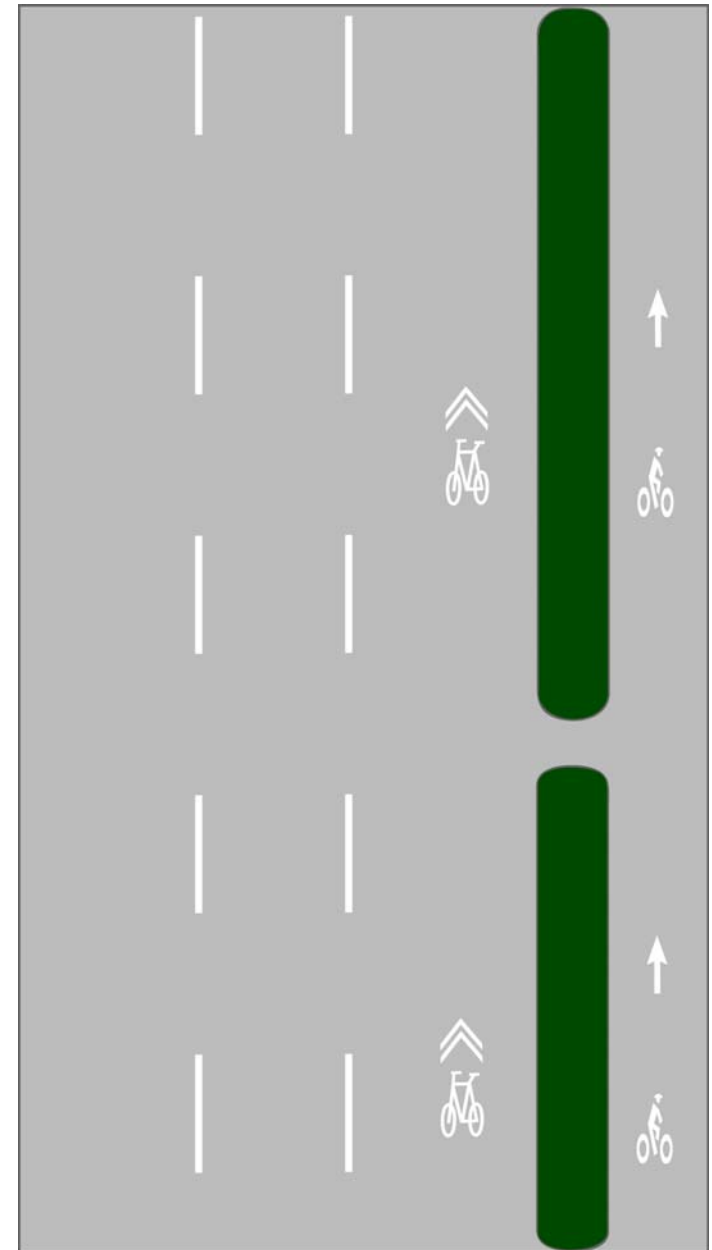
➤ Place marking in middle of roadway so cyclists can take lane and to minimize tracking of wheels over marking\*

\*markings wear out faster when motorists turn across or accelerate/decelerate over them



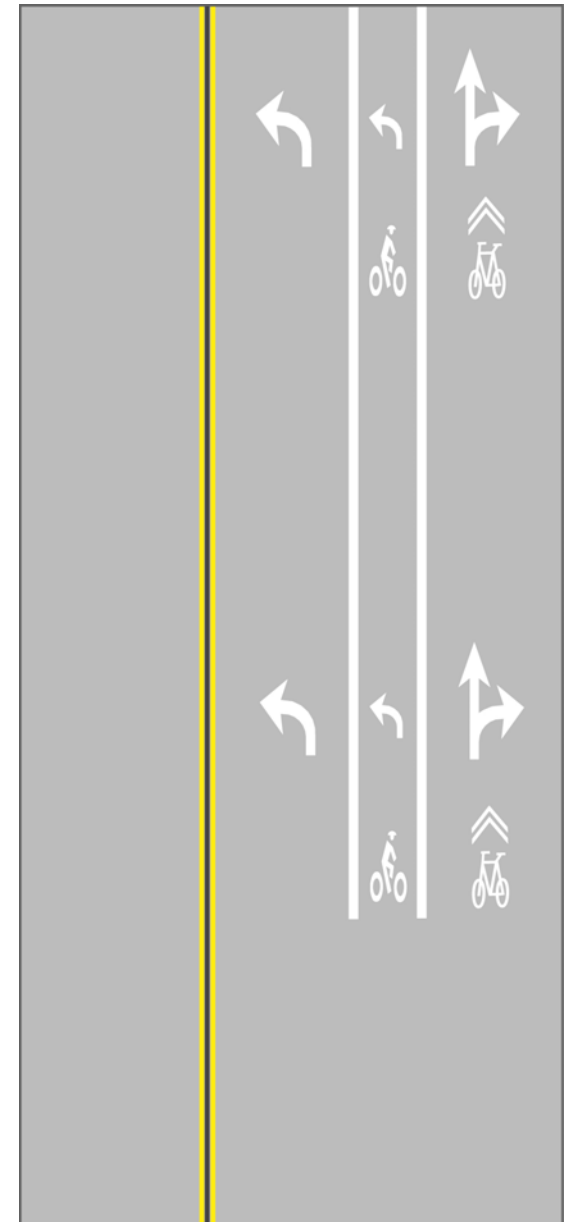
# Along Separated Bikeways

- Separated bikeways along the roadway include one- or two-way paths
- Preferable to still allow cyclists to use roadway, especially faster cyclists
- Marking notifies motorists that cyclists may use roadway
- Place marking in middle of the lane, unless lane is wide enough for cyclists and motorists to safely share lane side-by-side



# Space for Only One Bike Lane

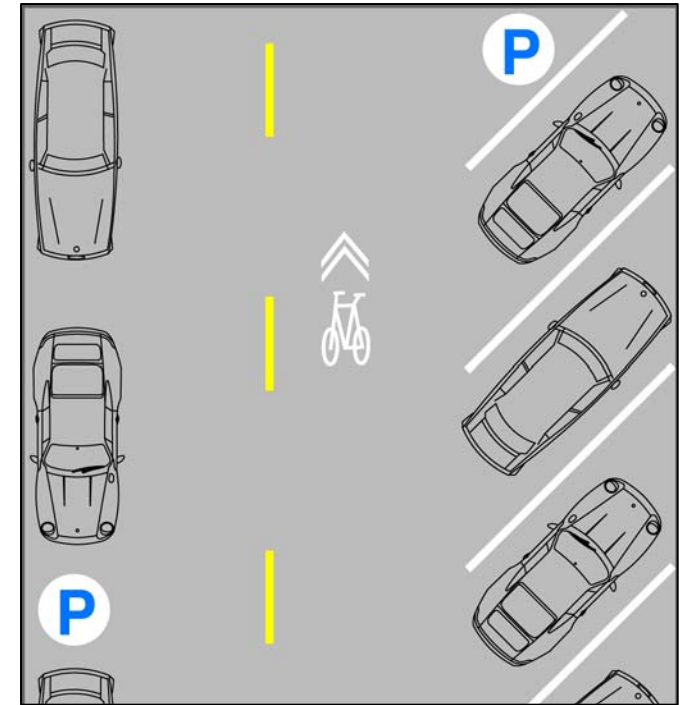
- Desire for bike lanes for through cyclists and left turning cyclists, but space available for only one bike lane
- Preferable to give space to left turns, the more difficult movement
- SLM still gives cyclists some marking in right lane
- Place marking in middle of the lane



# Diagonal Parking

- Bike lane generally not desirable along angled parking\*
- Place marking in middle of lane, unless space from edge of largest anticipated parked vehicle to centerline is very wide (~18'+)
- If lane is very wide, may place marking outside of travel way for motor vehicles
- Still place as far left as possible, 11' to 12' from yellow stripe, to give buffer between backing vehicles and cyclists

\*Consider back-in angled parking



# Materials, Cost, Maintenance

Material Used: Methylmethacralate

Cost per marking: ~\$150

includes planning/engineering and paint shop labor and material, somewhat conservative estimate

Maintenance: 2-5+ years (rough estimate)

depends on care of installation, location of marking relative to tire tracks and intersection, and number of vehicles

Same Marking,  
after 10-11  
million tires:



Installation  
Spring 2003



July 2007

Market @ Gough Sharrow		
Peak Hour Traffic	693	w/hr
ADT	6,930	w/day
/ 2 lanes	3,465	w/lane/day
x 2 axles / vehicle	6,930	tires/marking/day
x 365 days	2,529,450	tires/marking/year
x 50 months/12 mo/yr	10,539,375	Total Tire Contact
Rounded:	<b>10 to 11 million tires</b>	



## For more information:

[www.sfmta.com/bikes](http://www.sfmta.com/bikes)

Click on “Projects & Planning”, then “Sharrows Planning”

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Sharrows along Grand Prix de San Francisco race course