



**SFMTA**

Municipal  
Transportation  
Agency

# Low Stress Bicycle Networks: San Francisco

NACTO Designing Cities 2015

Monica Munowitch, AICP

October 29, 2015

- What are San Francisco's bicycling **targets**?
- What are the main **challenges** to developing a low stress network?
- How is **data** utilized to improve comfort?
- What are successful **design solutions**?

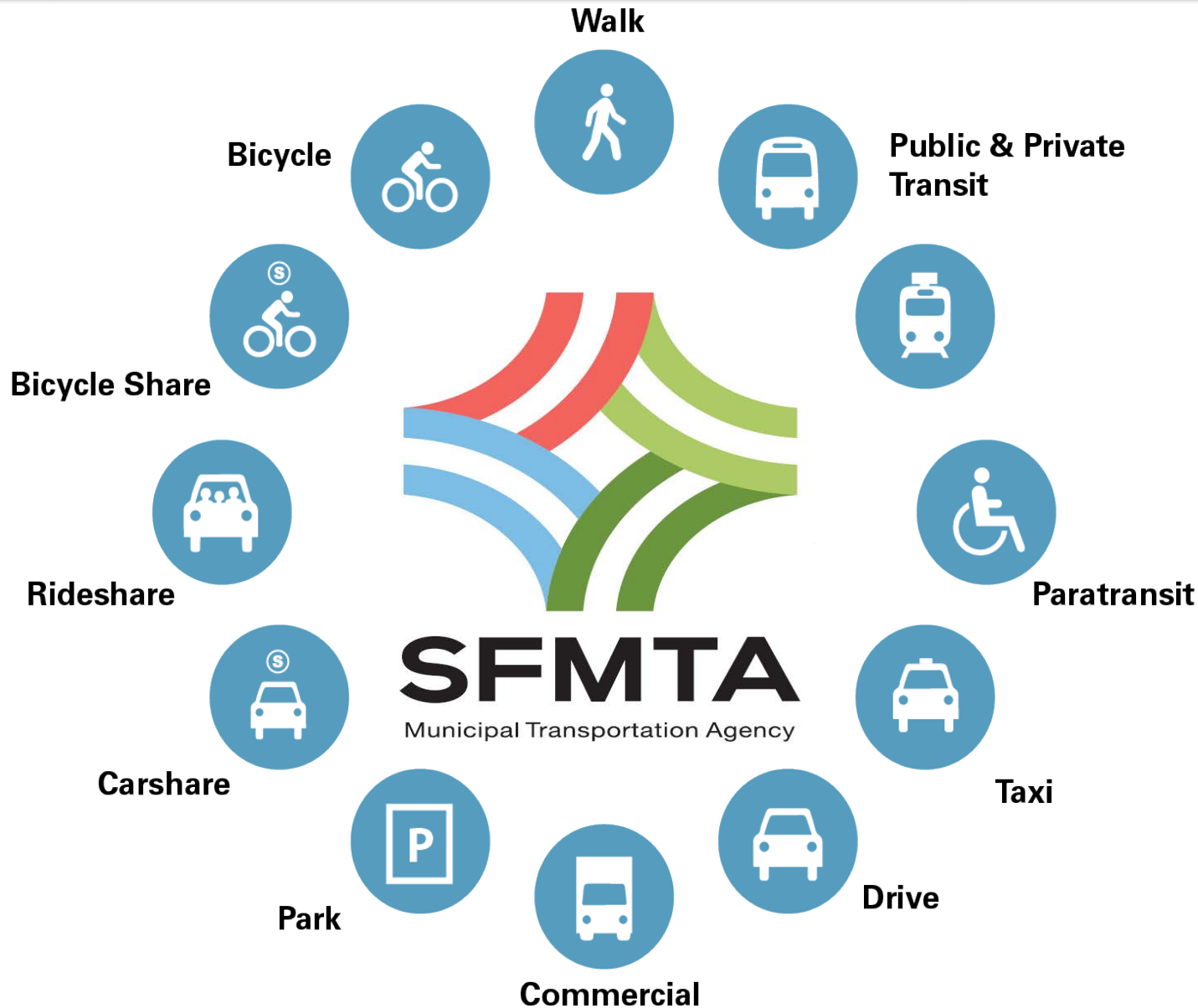
# SFMTA=Many Modes!

Background

Goals

Challenges

Solutions

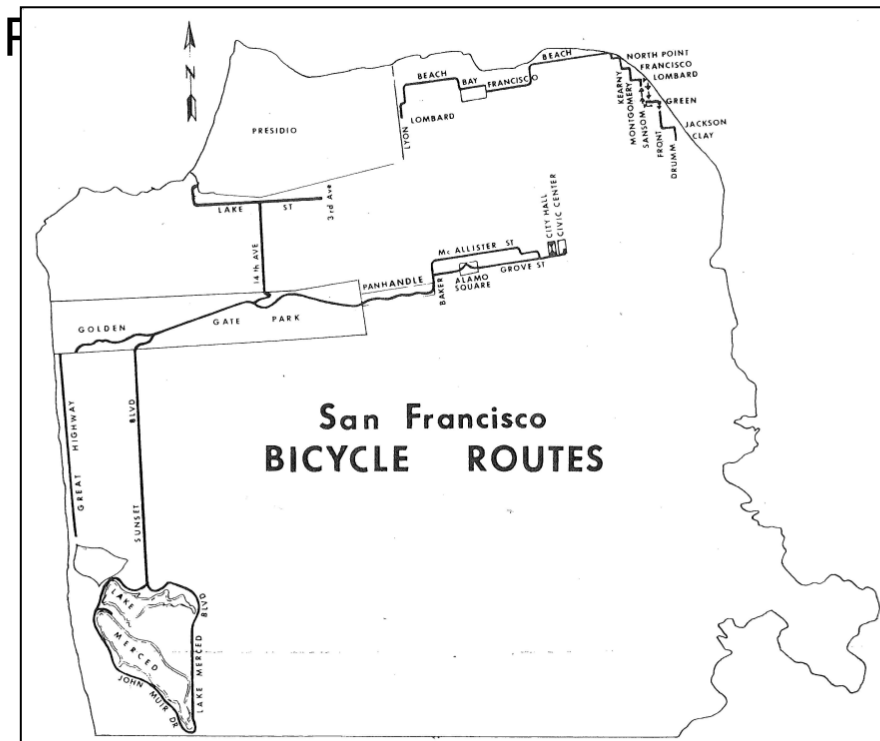


Late 1800s – “Good Roads” movement

1970s – Earth Day, 1<sup>st</sup> SF bike lane (Lake Street),

SFBC

1990s – 1<sup>st</sup> SF Bicycle Coordinator, Critical Mass, Bik



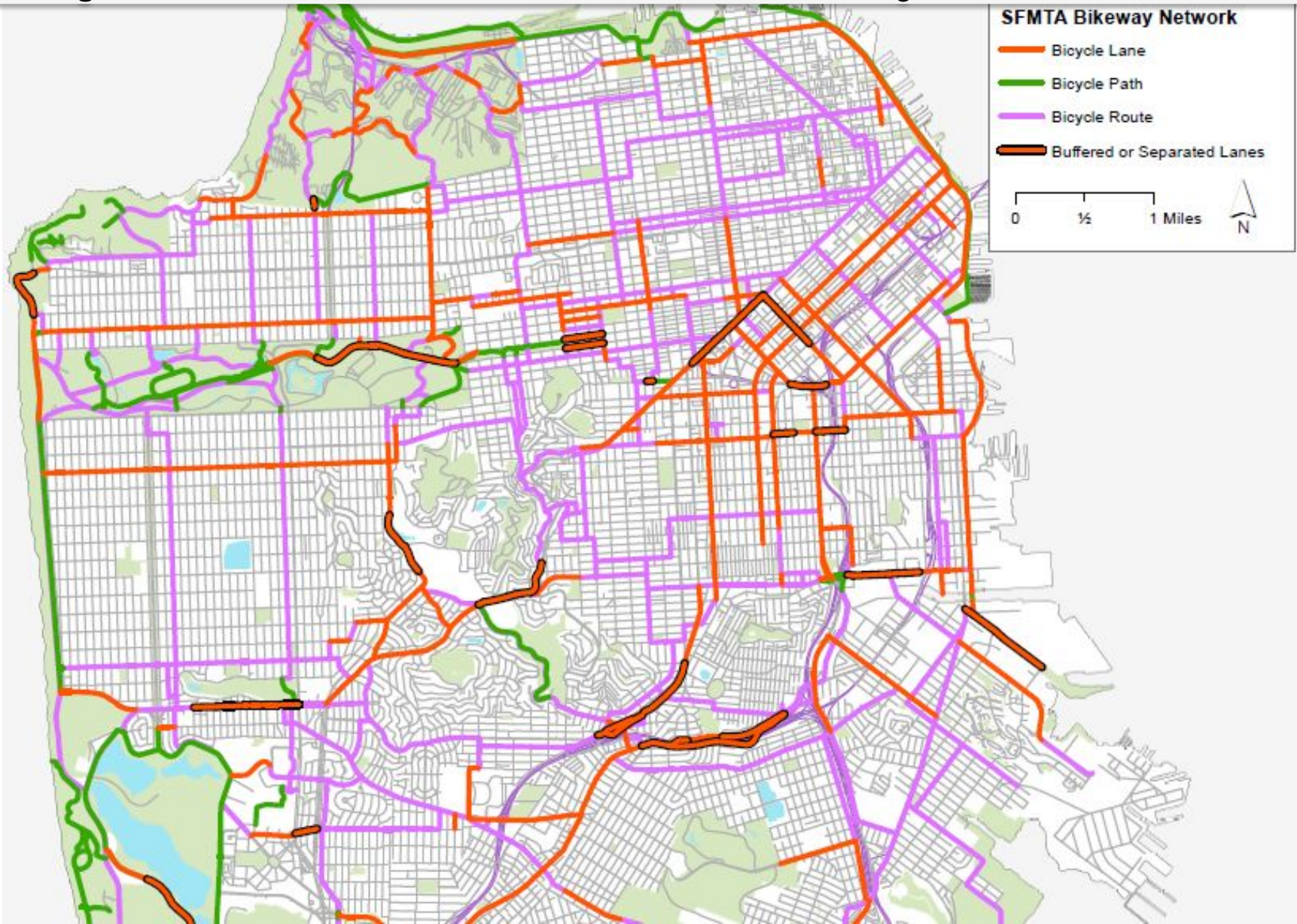
# Bicycle Route Network

Background

Goals

Challenges

Solutions



# Bicycle Planning

Background

Goals

Challenges

Solutions



# Strategic Plan Targets

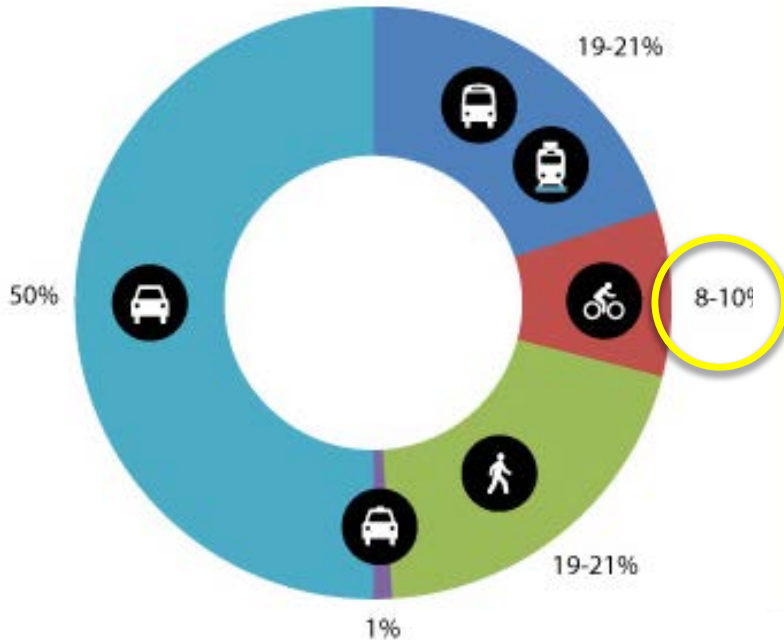
Background

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Solutions

## 2018 Mode Share Goal



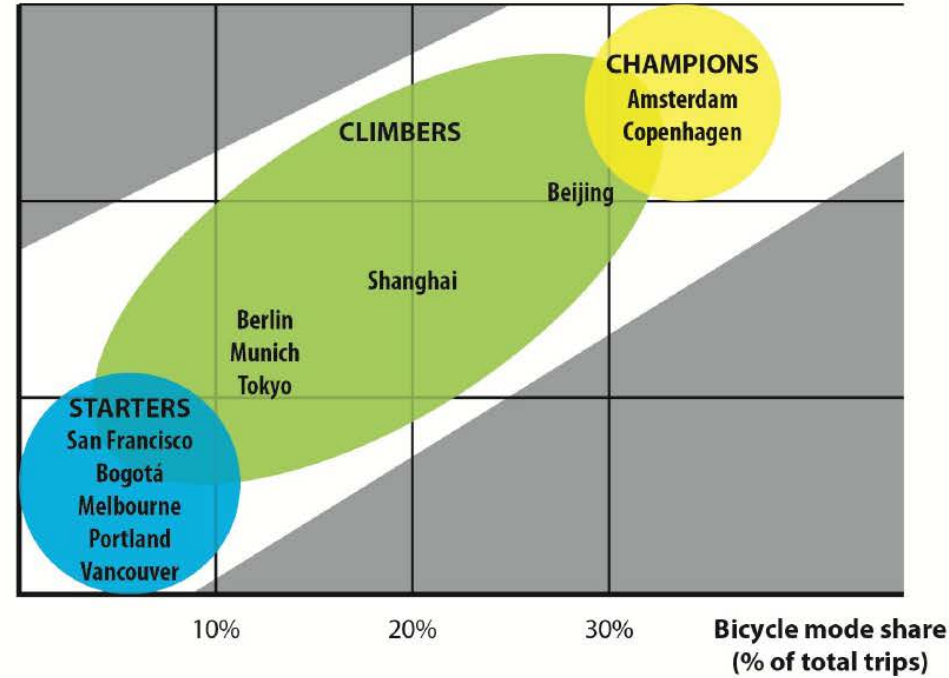
50% auto/50% non-auto

Bicycling conditions

Good

Moderate

Poor



**70%** of severe or fatal crashes involving occur on **12%** of streets

Background

Goals

Challenges

Solutions

1. Sensitive political environment
2. Limited right of way
3. Over capacity transit
4. Limited resources
5. Hills

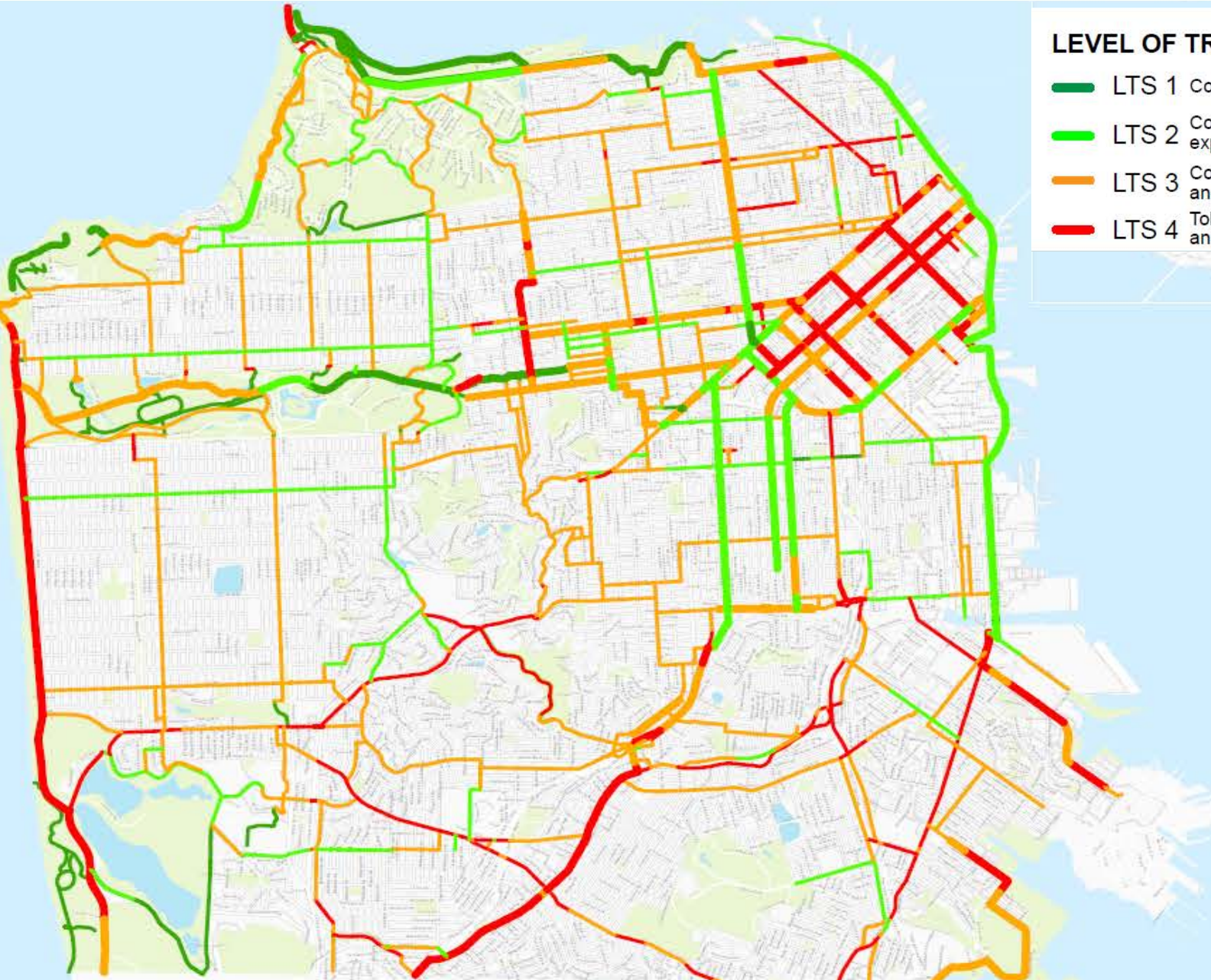


<http://tardytotheparty.com/2014/03/12/move-to-san-francisco-in-3->



Photo by Frank Chan

# Level of Traffic Stress



## LEVEL OF TRAFFIC STRESS

- LTS 1** Comfortable for all user groups
- LTS 2** Comfortable for most adults, experienced children & youths
- LTS 3** Comfortable for intermediate and experienced adults
- LTS 4** Tolerated only by the "strong and fearless"

# Level of Traffic Stress

**LTS 1 Everyone feels comfortable to ride**



**LTS 2 Adults feel comfortable to ride**



**40 miles LTS 4**  
**105 miles LTS**



**LTS 3 “Enthusied and Confident” will ride**

**LTS 4 Only “Strong and Fearless” will ride**

# Bay to Beach Route

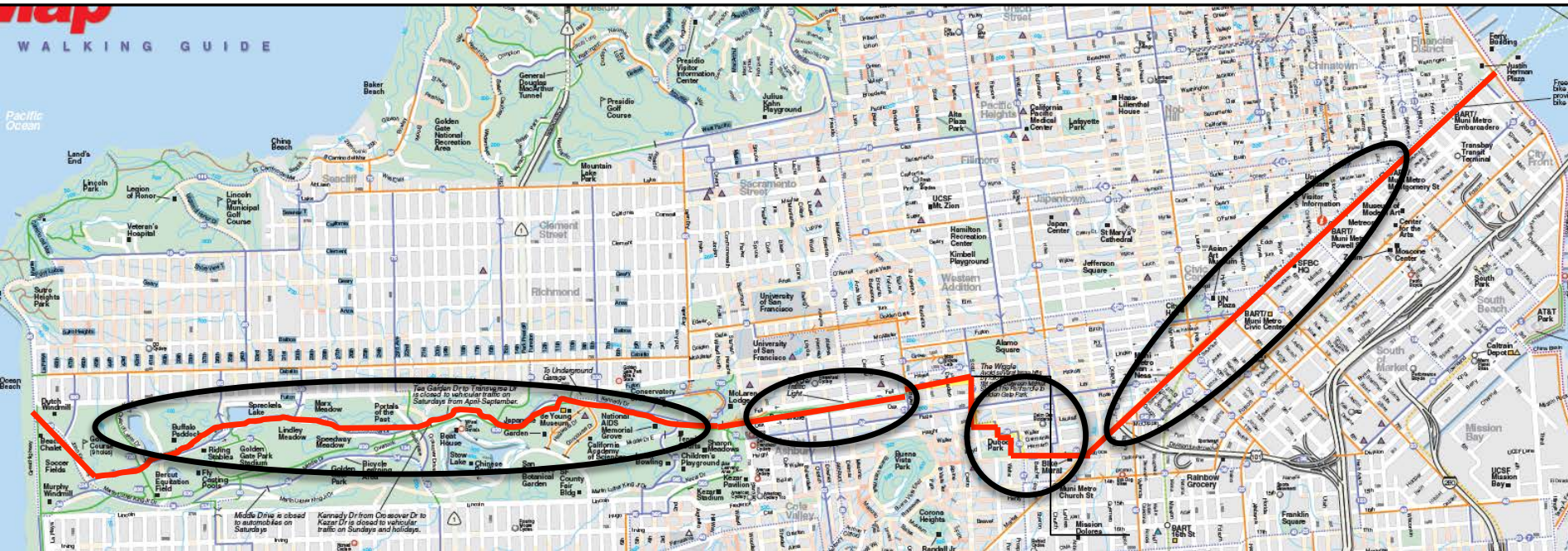
## Background

## Goals

## Challenges

## Solutions

1. Market Street: Green Buffered Lanes, Hot Spot
2. The Wiggle: Green-back Sharrow
3. Fell and Oak Streets: Separated Bike Lanes
4. JFK Drive: Parking Separated Bike Lanes



# Market Street

Background

Goals

Challenges

Solutions



# Two Stage Turn Queue Area

Background

Goals

Challenges

Solutions



**Improve challenging  
left turns across 3  
lanes + tracks**



# Market and Duboce

Background

Goals

Challenges

Solutions

## Before



## Connect a two-way path with one-way bike lanes

## After



# “The Wiggle”

Background

Goals

Challenges

Solutions



**Green-back sharrows provide better route wayfinding**



# Fell Street: Pre-2003

Background

Goals

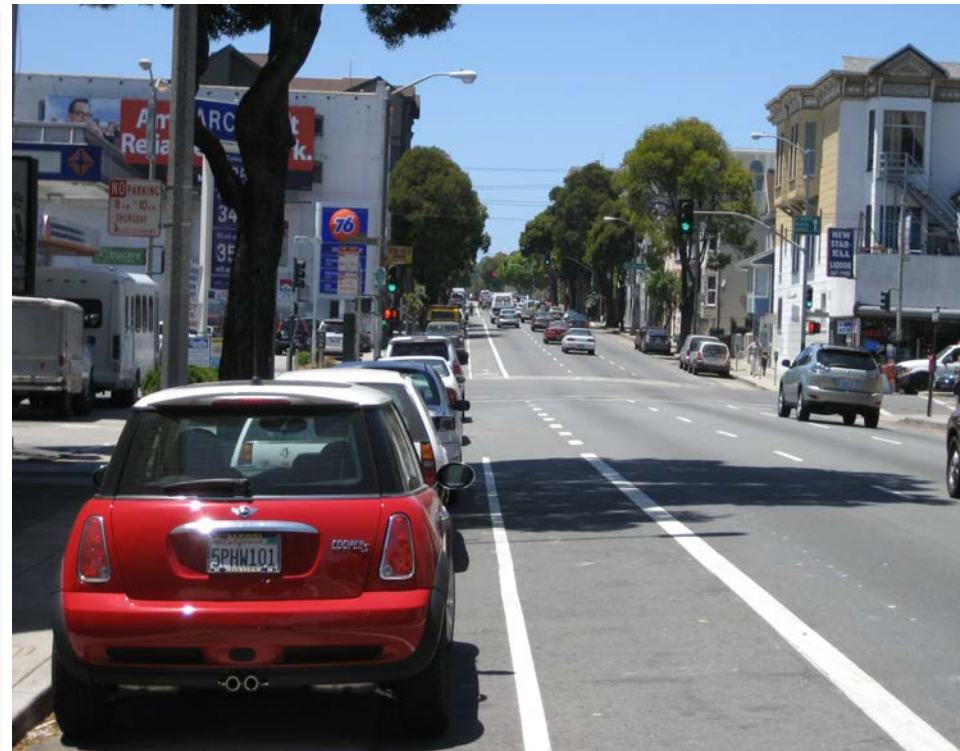
Challenges

Solutions

## Pre- 2003



## Bike Lanes Added in 2003



# If you build it, they will come...

Background

Goals

Challenges

**Solutions**



# Oak and Fell Streets

Background

Goals

Challenges

Solutions



**Separate bikeway from traffic stream**



# JFK Drive Separated Bikeway

Background

Goals

Challenges

Solutions



**Before**

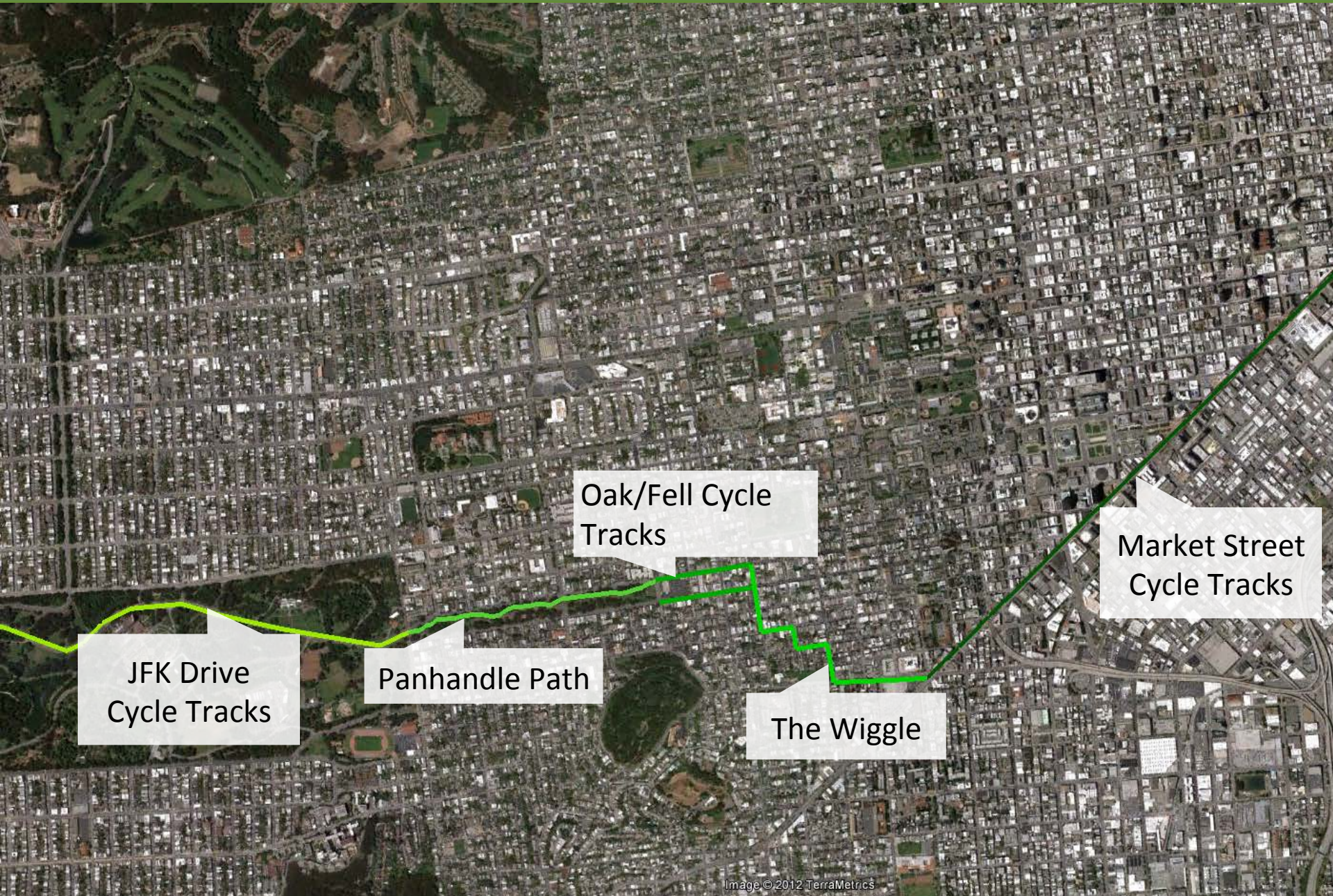


**After**

Photo:  
Frank Chan

**Make bikeway in Golden Gate Park more inviting**

# Bay to Beach Route



Oak/Fell Cycle Tracks

Market Street Cycle Tracks

JFK Drive Cycle Tracks

Panhandle Path

The Wiggle

- Overcoming main challenges?
  - > Partnerships, outreach
- Utilizing data to improve bicycling comfort?
  - > Long range planning, LTS
- Addressing designing challenges?
  - > Quick and effective, hot spots, connectivity



# Questions?

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# Embarcadero Parkway

Background

Goals

Challenges

Solutions

**Before**



**After**



# Bay to Beach Route

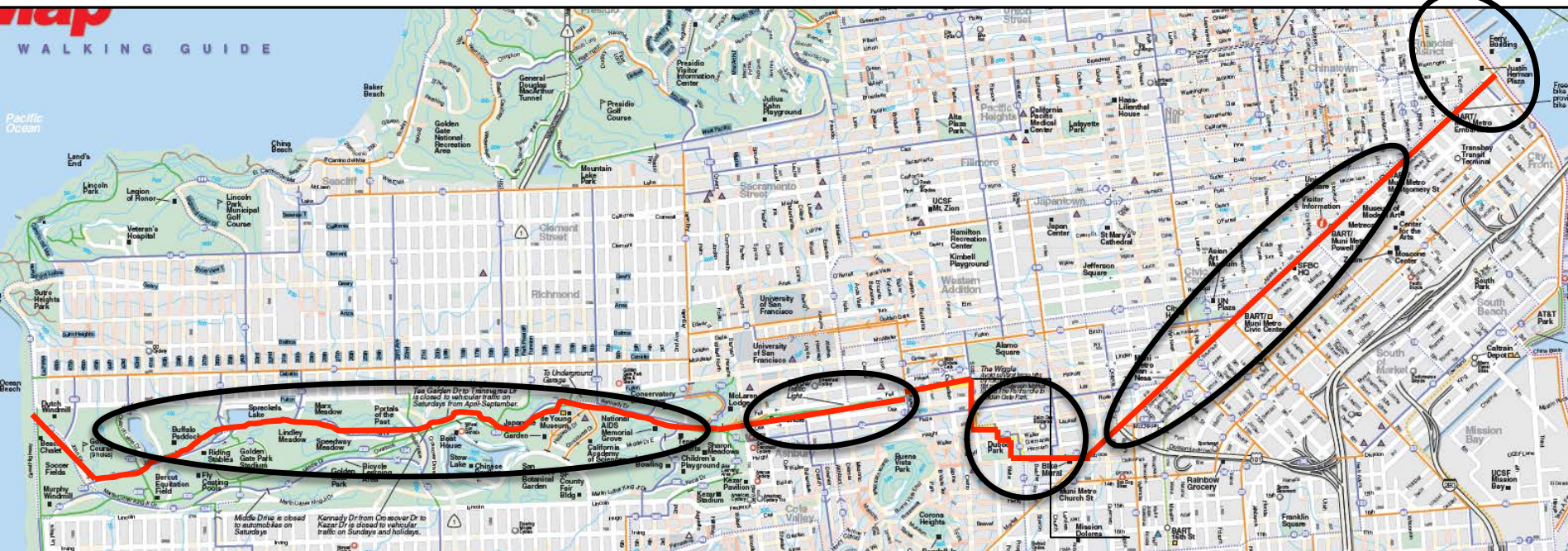
## Background

## Goals

## Challenges

## Solutions

1. Embarcadero Boulevard: Green lanes
2. Market Street: Green Buffered Lanes, Hot Spot
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5. JFK Drive: Parking Separated Bike Lanes



# Bicycle Strategy Outreach

## Background

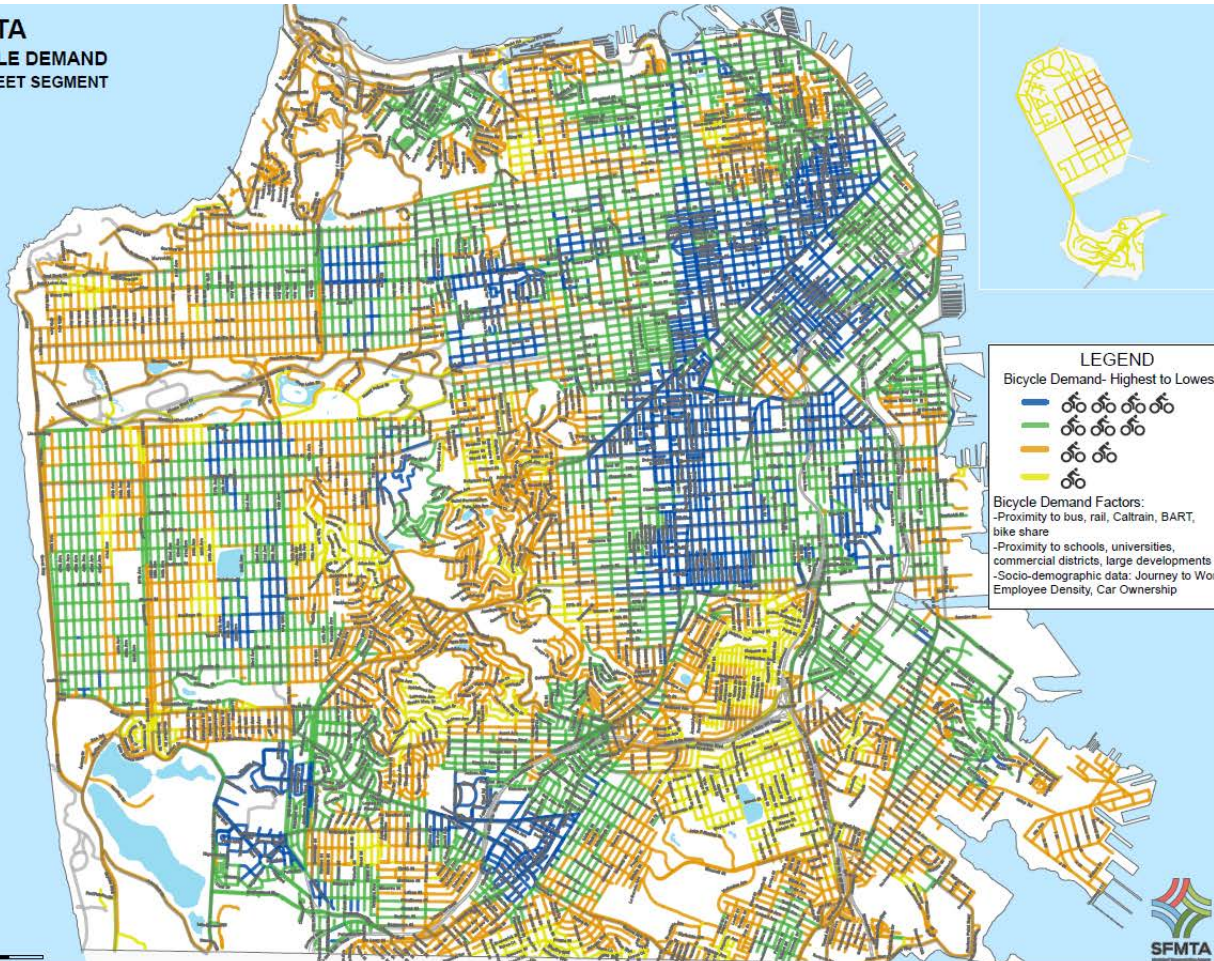
## Goals

## Challenges

## Solutions



**SFMTA**  
BICYCLE DEMAND  
BY STREET SEGMENT



## Purpose:

- Data driven approach to analyze demand by area
- Identify smart investments to focus network expansion

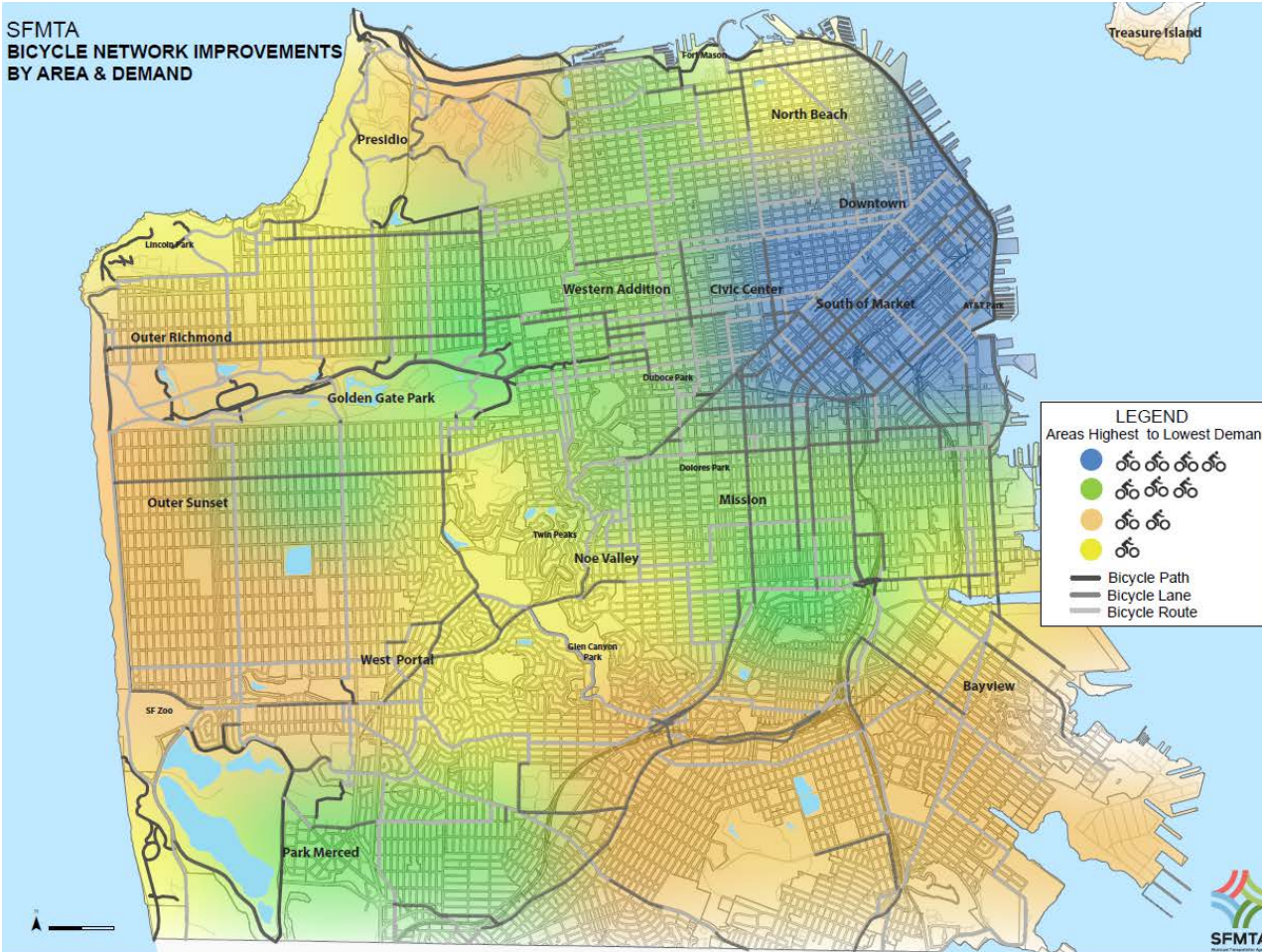
# Bicycle Strategy Workshop

- Purpose: Engage with community to vet data driven methodology
- 50 representatives attended
  - Shared experiences and ideas about bicycling to prioritize investments by area and treatment types



# Allocation of Bicycle Facility Improvements

Workshop Input:  
75% improvements  
focus in highest  
demand areas



# Workshop feedback: Focus on the basics, improve safety and comfort



Intersection Treatment  
for Comfort & Safety



Interim Cycle Track

- Focus on low cost and quickly implementable treatments
- Use data driven approach to improve comfort and safety
- Focus on safety education



Neighborhood Connector



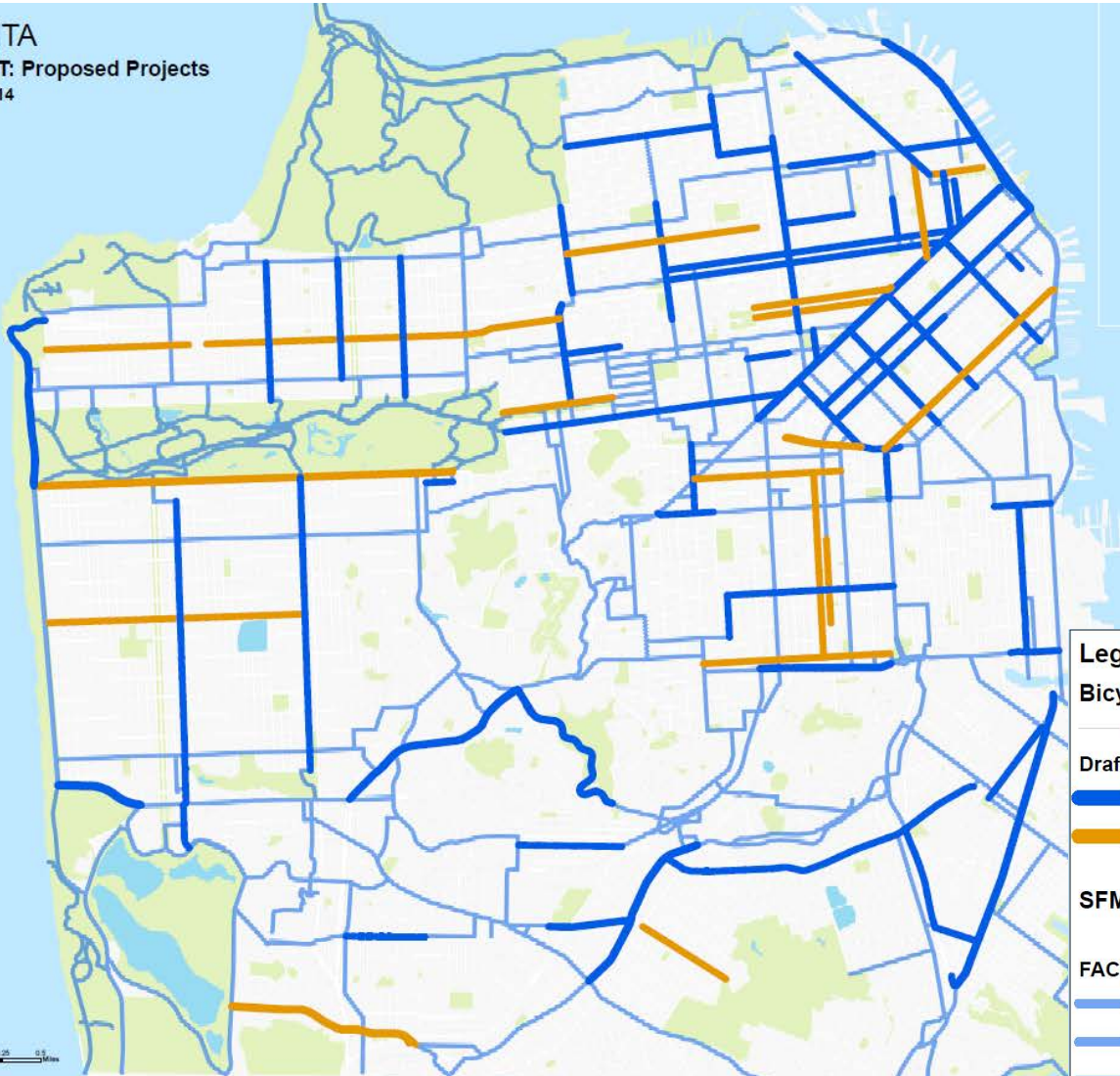
Standard Bicycle Lane

# Draft Upgrades & Expansion

CIP Projects:  
 Outreach Input +  
 Comfort Analysis +  
 Demand Analysis =

50 Upgraded miles  
 20 Expanded miles

SFMTA  
 DRAFT: Proposed Projects  
 2.20.2014



**Legend**

**Bicycle CIP**

- Highways

**Draft\_Proj**

- █ Upgraded Facilities
- █ Expanded Facilities

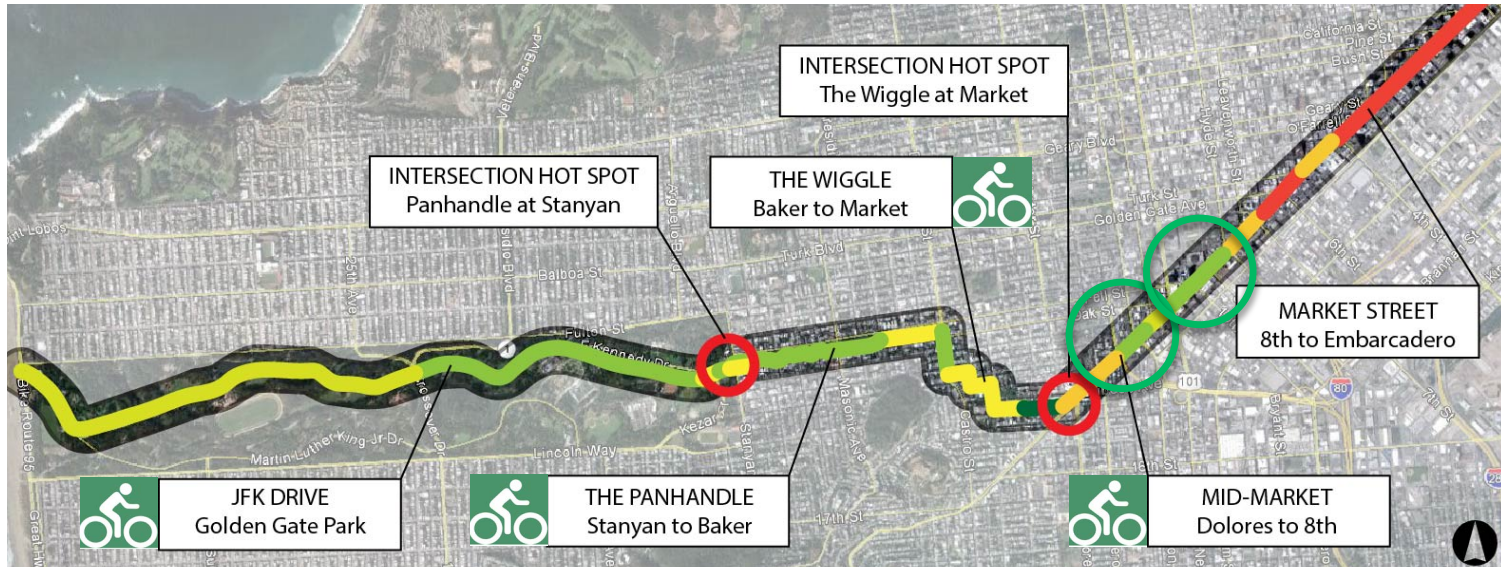
**SFMTA\_Bikeway\_Network**

**FACILITY\_T**

- █ BIKE LANE
- █ BIKE PATH
- █ BIKE ROUTE

# Key Upgrades- Bay to Beach

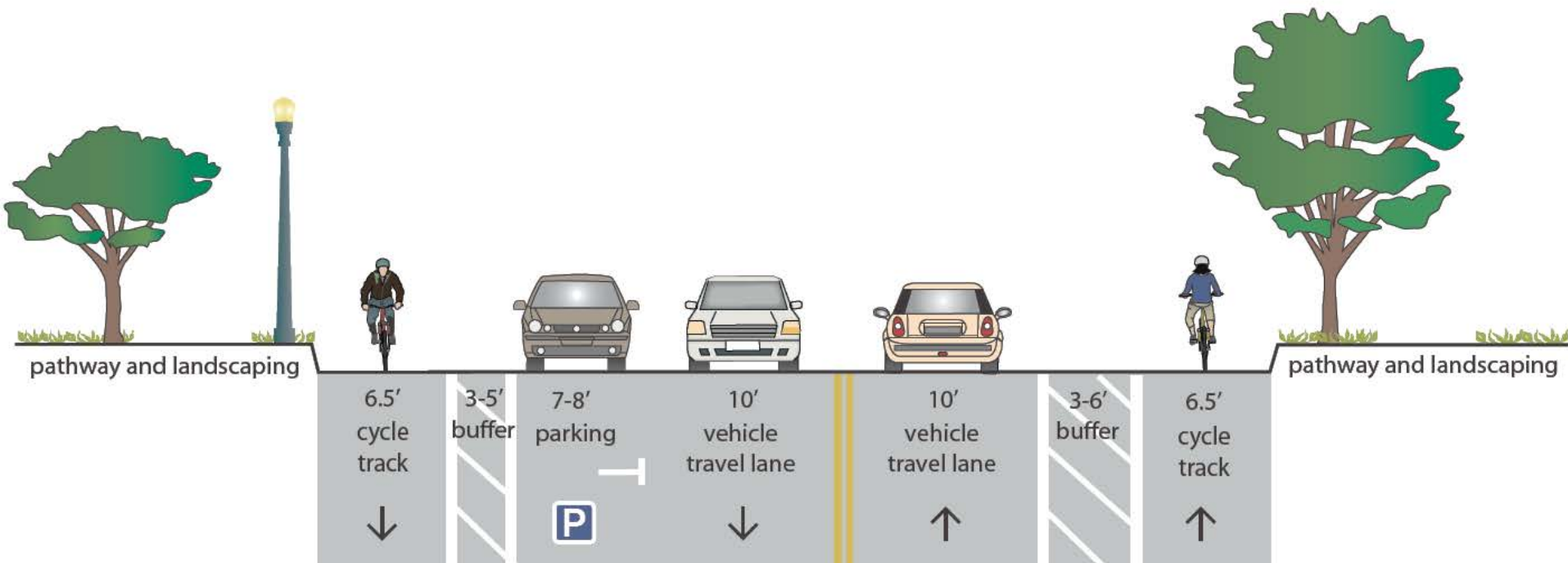
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# JFK Drive Separated Bikeway

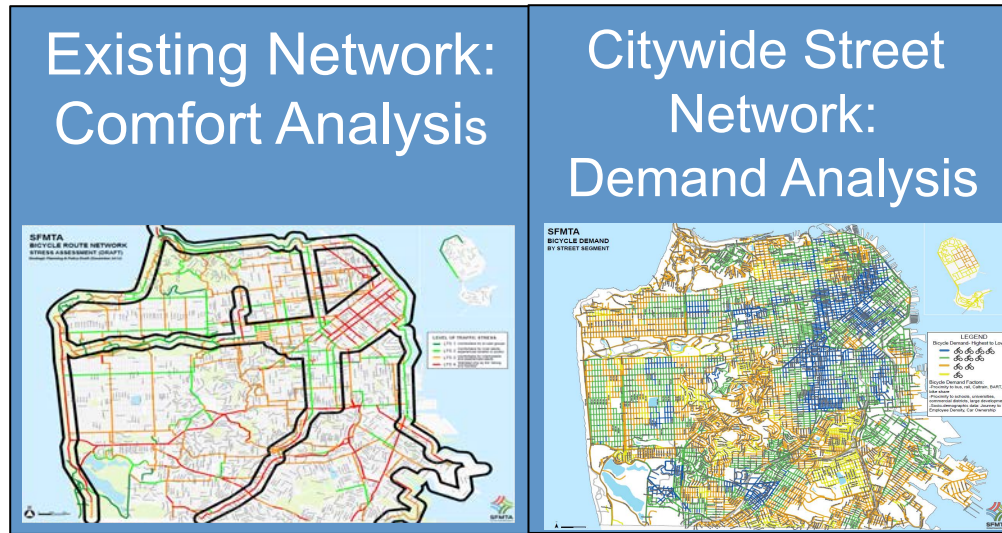
## Proposed Design

Proposed cross-section: 46-52 feet  
(e.g. near the Conservatory of Flowers)



# Prioritization Framework

Strategy Miles (upgrade/expansion)



Outreach/ Workshops



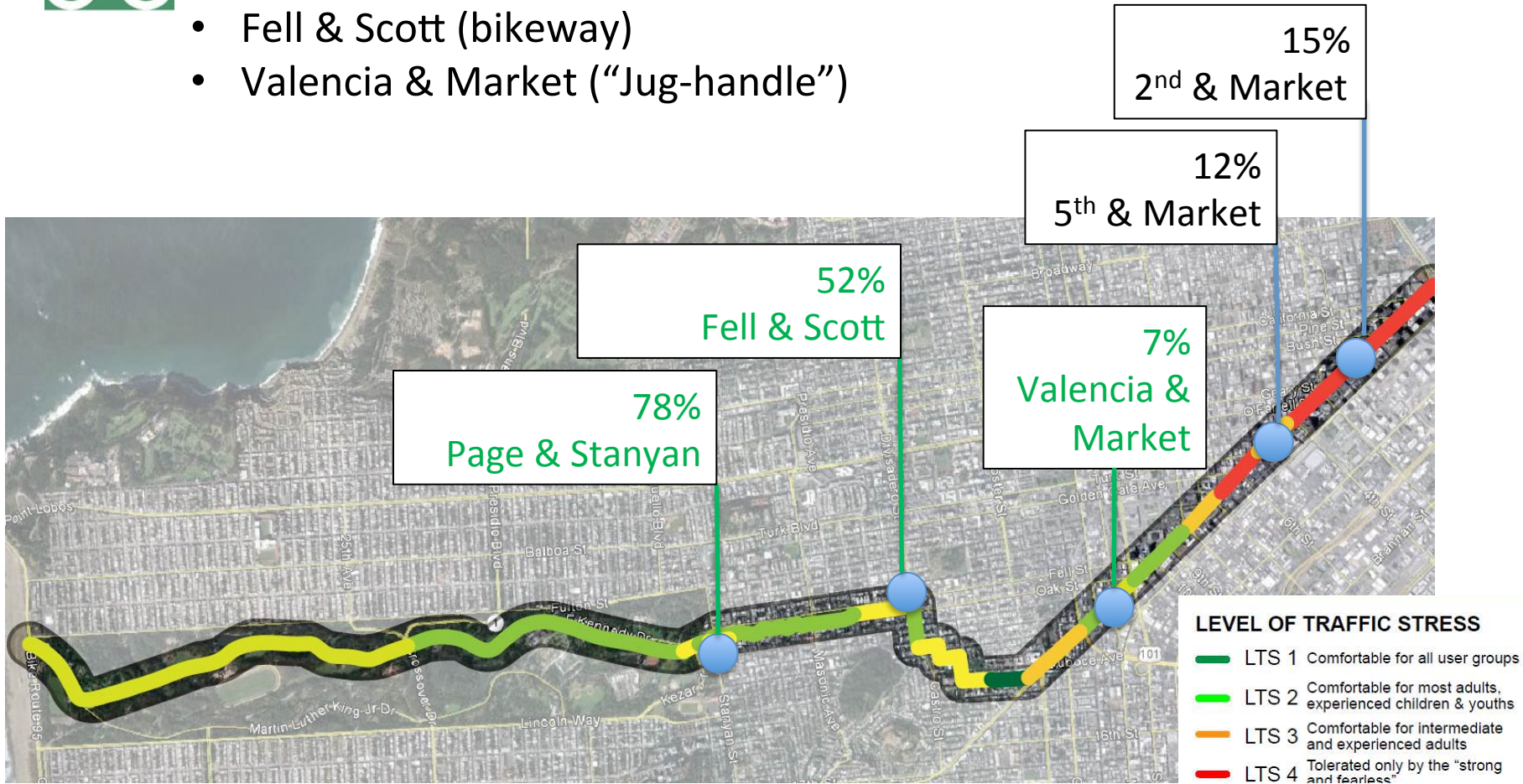
Capital Improvement Program

# Growth in People Bicycling 2011-2013



Bicycle improvements made between 2011-2013 at:

- Page & Stanyan (signal)
- Fell & Scott (bikeway)
- Valencia & Market (“Jug-handle”)



**33%** average growth on corridor & higher growth at locations with improvements

# Standard Bike Lanes Not Enough

