

# reporting the results

VISION ZERO  
SAFE STREETS  
EVALUATION  
PROGRAM



VISION  
ZERO  
SF



# PRESENTATION AGENDA

Safe Streets Evaluation Program

Case Study: Valencia Street

Evaluation Highlights and Upcoming Work

# **SAFE STREETS EVALUATION PROGRAM**

# SAFE STREETS EVALUATION PROGRAM



Inform updates and refinements to project designs, with emphasis on “quick-build” projects



Communicate project effectiveness to the public, decision makers and other transportation professionals



Advance the state of practice for San Francisco street designs



Streamline the design of future projects



# STEP 1: IDENTIFY GOALS & QUESTIONS TO ANSWER

**Safe Behavior**.....Are people behaving safely?

**Effective Design** ..... Are the new design treatments effective?

**Ease of Navigation** .....Are all street users able to travel easily?

**Mobility** .....What are the mobility trends?

**Perceived Safety & Comfort**.....Do people feel safer?

# STEP 2: IDENTIFY TOOLS/METRICS

<b>Safe Behavior</b>	Are people behaving safely?	Driver Yielding Behavior: Crosswalk
		Driver Yielding Behavior: Mixing Zone
		Driver Yielding Behavior: Alleys
		Qualitative Observation of Close Calls
		Collision Analysis
		Mid-block Vehicle/Bike Interactions
		Pedestrian Crossings at Uncontrolled Locations
<b>Effective Design</b>	Are the new design treatments effective?	Bicyclist Compliance at Traffic Devices
		Pedestrian Compliance at Traffic Devices
		Bicycle Path of Travel
		Vehicle Compliance at Traffic Devices
		Vehicle Loading Behavior
<b>Ease of Navigation</b>	Are all street users able to travel easily?	Bicyclist Positioning
		Vehicle Blockage of Bike Lanes
		Vehicle Diversion: Travel Time Runs/Counts
<b>Mobility</b>	What are the mobility trends?	Bicyclist Speeds
		Bicyclist Volumes
		Pedestrian Volumes
		Vehicle Average Daily Traffic
		Vehicle Speeds and Classification
<b>Perceived Safety &amp; Comfort</b>	Do people feel safer?	Public Opinion Surveys

# STEP 3: CREATE & EXECUTE THE PLAN

## Create Evaluation Plan/Matrix

- Goals
- Questions to answer
- Metrics to use / data to collect
- Data collection time period
- Data collection method
- Pre/post data collection dates
- SOPs to use for data collection

## Select Standard Operating Procedures (SOPs)

- Detailed Instructions
- Standard Data Collection Worksheets
- Analysis Templates

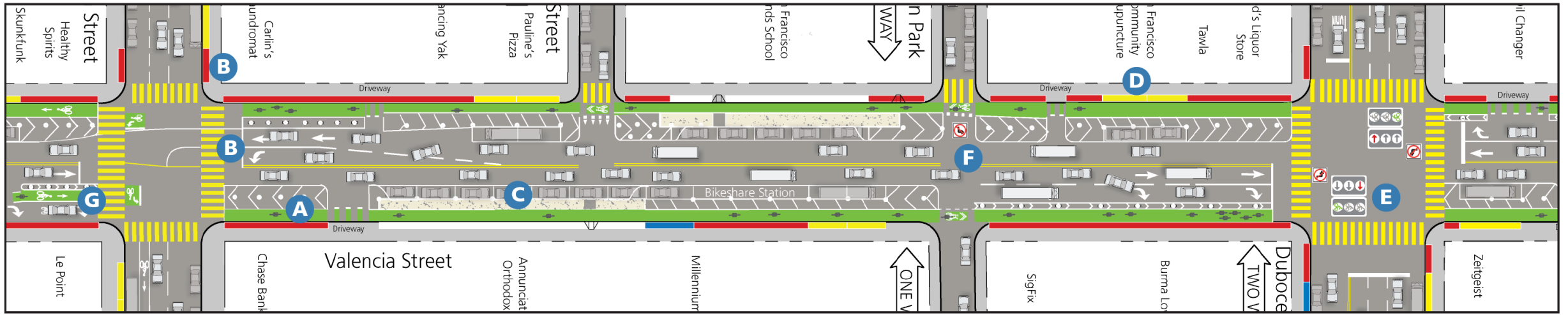
## Collect and Reduce Data

- Collect in-house
- Use contractor

## Analyze Results

- Review reduced data
- Highlight and communicate key findings

# CASE STUDY: VALENCIA STREET- MARKET TO 15<sup>TH</sup> STREETS



## Design Treatment

- A** Parking protected bikeways
- B** Increase visibility at intersection (daylighting & advanced limit lines)
- C** Loading islands w/ protective railing
- D** Increased loading zones
- E** Signal separation
- F** Turn restrictions
- G** Mixing zones

## Safety issue

- Outdated bike facility/dedicated bike space
- Pedestrian visibility
- Pedestrian/Bike conflict (from new bike facility)
- Double parking, dooring (high loading demand)
- Intersection conflicts
- Intersection conflicts
- Intersection safety, bicyclist visibility



# VALENCIA STREET : EVALUATION QUESTIONS

## Safe Behavior

- Are vehicles continuing to block the bike lane? Type and duration? What about double parking?
- Are the new mixing zones helping with conflicts?
- Will new design decrease conflicts, especially dooring and cyclist conflicts with rideshare vehicles?
- Are bikes and pedestrians conflicting at new parking protected bike lanes at high pedestrian volume sites such as schools and churches?
- How many people are riding in the travel lane vs. parking protected lane (is the channel created by the parking protected configuration too narrow?)

## Effective Design

## Mobility

- Has the number of cyclists using the application site increased?

## Perceived Safety & Comfort

- Do cyclists feel safer after design was implemented?
- How do business owners and motorists feel about the changes?

# VALENCIA STREET : EVALUATION PLAN

Intended Outcome		Metrics	Evaluation Tools	Evaluation Location	Data Collection Time Periods			Movements	Data Collection Timeframe			SOP Reference No.
Goal	Objective/Question				Time Period 1	Time Period 2	Notes		Pre-Construction	Interim Evaluation	Post-Construction	
<i>Drop Down Menu</i>	<i>Manual Entry</i>	<i>Manual Entry - Potential Options Below</i>	<i>Drop Down Menu</i>	<i>Manual Entry*</i>	<i>Drop Down Menu</i>	<i>Drop Down Menu</i>	<i>Manual Entry</i>	<i>Manual Entry</i>	<i>Manual Entry</i>	<i>Manual Entry</i>	<i>Manual Entry</i>	
Safe Behavior	Are vehicles continuing to block the bike? Type and duration? Double Parking?	Loading/Curb Behavior	Video with Manual Reduction	Valencia between 14th and 15th (Block Face- East Side)	One Weekday (T,W,Th) 2-Hour Peaks: 9am-11am, 1pm-3pm, 7pm-9pm	Saturday 2-Hour Peaks: 9am-11am, 1pm-3pm, 7pm-9pm	Use High Quality Camera as detailed information is needed, and some video will take place at night when it is dark. Cameras need to be placed so as to accurately capture the entire east and west block faces of Valencia between 14th and 15th.	All movements	Oct-19	May-19	Fall 2019	10
				Valencia between 14th and 15th (Block Face- West Side)					Oct-19	May-19	Fall 2019	10
	Are the new mixing zones helping with conflicts (vs. current condition)	Driver Yielding Behavior: Mixing Zone	Video with Manual Reduction	Northbound Valencia at Duboce, Southeast corner of Valencia and Duboce	One Weekday 2-Hour Peaks: AM/PM			All movements	N/A	May-19	Fall 2019	4b
	Will new design decrease conflicts, especially dooring and cyclist conflicts with rideshare vehicles?	Qualitative Observation of Yielding at Block Face/Mid Block Locations + Dooring	Video with Manual Reduction	Valencia between 14th and 15th (Block Face- East Side)	One Weekday (T,W,Th) 2-Hour Peaks: 9am-11am, 1pm-3pm, 7pm-9pm	Saturday 2-Hour Peaks: 9am-11am, 1pm-3pm, 7pm-9pm	Use High Quality Camera as detailed information is needed, and some video will take place at night when it is dark. Cameras need to be placed so as to accurately capture the entire east and west block faces of Valencia between 14th and 15th.	All movements	Oct-19	May-19	Fall 2019	11
	Valencia between 14th and 15th (Block Face- West Side)			Oct-19					May-19	Fall 2019	11	
Effective Design	Looking at vehicle/bikes in pre condition, looking at vehicle/bikes/peds in post condition. Are bikes and peds conflicting at new parking protected bike lanes at high ped volume sites such as schools and churches?	Close Calls between Peds and Bikes	Video with Manual Reduction	Valencia between 14th and Clinton Park (East Side)	One Weekday (T,W,Th) 2-Hour Peaks: 7am-9am, 2pm-4pm			All movements		May-19	Fall 2019	5a
				Valencia between 14th and Clinton Park (West Side)						May-19	Fall 2019	5a
	How many people are riding in the travel lane vs. parking protected lane (is the channel created by parking protected configuration too narrow?)	Bike Positioning	Video with Manual Reduction	Valencia between 14th and Clinton Park (Block Face- East Side)	One Weekday 2-Hour Peaks: AM/PM		Use biking AM/PM peak	All movements	N/A	May-19	Fall 2019	1
				Valencia between 14th and Clinton Park (Block Face- west Side)							Fall 2019	1
Valencia between 14th and 15th (Block Face- East Side)	Fall 2019			1								
Valencia between 14th and 15th (Block Face- West Side)	Fall 2019			1								
Mobility	Has the number of cyclists using the application site increased?	Bicyclists Volumes	Intersection Movements	Valencia from 14th to 15th	One Weekday 2-Hour Peaks: AM/PM			All movements	Oct-19	May-19	Fall 2019	standard
Perceived Comfort	Do cyclists feel safer after design was implemented?	Public Opinion Surveys	Online Survey with Promotion in the Field	Valencia at 14th/ Valencia at 15th	Three Days: 72-Hours			Northbound/Southbound	N/A		Fall 2019	6

# VALENCIA STREET : SAMPLE SOP (LOADING)

## Vehicle Loading Behavior – SOP Summary

### Related Project Objectives

Safer environment

SOP last updated September 2018.

Vehicle loading behavior refers to stopped or parked vehicles obstructing the travel lane, bike lane or vehicles loading legally along the curb.

The SOP for vehicle loading behavior defines where data is collected, what defines a loading event vs. short-term parking, and how loading events are recorded. This SOP and the diagram included may be utilized to observe double parking in vehicle travel lanes.

### Data Collection Procedures

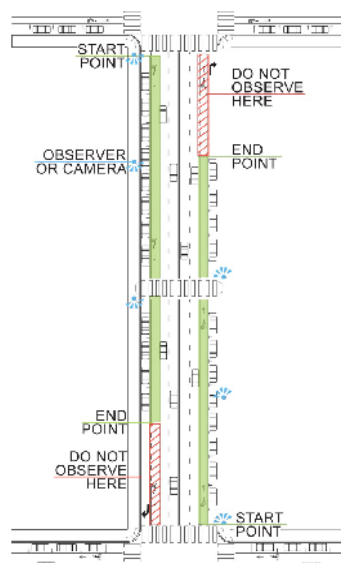
#### Location

- Vehicle loading data are collected along a continuous segment of a block, as shown in Figure 1.
- In most cases, the full length of the block should be observed.
- Intersection approaches (up to 50' from the intersection) should be excluded from the observation area due to turning vehicles and vehicles queuing to turn.

#### Time Period

- Loading behavior data should be collected for a period of at least two hours.
- The time of day and day of the week should be selected based on the area's existing and anticipated loading peak times of day. Consider when volumes of passenger loading are highest and when deliveries are highest. Typical weekday delivery loading peak periods are between 10am-12pm, while passenger loading can vary greatly based on land uses. If peak times cannot be determined, observing loading behaviors for longer periods of time may be preferred (24 hr time period).

Figure 1: Observation Area



### Data Evaluation Procedures

- Vehicle loading data should be analyzed and reported for a given block by 1) vehicle type; 2) frequency for a given time period; 3) duration of the event; and 4) location of event (curbside, bike lane, vehicle lane). Examples of data evaluation are shown in Table 1 and Table 2.
- Vehicle types to be counted and classified include:
  - Passenger vehicles (See Figure 2)
  - TNC (transportation network company) vehicles or taxis (See Figure 3) (look for a rideshare company logo on the vehicle)
  - Delivery service vehicles or light trucks or vans such as box trucks, waste haulers, etc. The larger end of the light truck typology may occupy up to 30 to 40 feet when parked. (See Figure 4)
  - Freight vehicles or heavy trucks with wheelbase length of 40 feet or more, whose total length may approach 55 feet, and may occupy up to 60 feet when parked. (See Figure 5)
- Vehicle types not to be counted include:
  - Bus partially obstructing the bike lane while at a transit stop
  - Bus fully obstructing the bike lane at a transit stop because the stop is blocked

### Tools and Templates

- Video data collection is preferred as it allows for more detailed review of drivers' behaviors, as needed. If data are being collected along both sides of the street, two cameras are recommended – one placed on each side of the street.
- Manual field observation is acceptable if video data collection is not possible. A field data collection sheet template is included in the SOP Excel workbook. Data should be recorded by period, day of week, and direction of travel.
- The SOP Excel workbook includes a data summary template. The data collection team would use this template to summarize the observations made either in the field or by reducing video footage.

Table 1: Example Loading Duration Summary

Average Length (seconds)	< 30 seconds	Between 30 and 60 seconds	Between 1 and 5 minutes	5 minutes or more
148	38%	14%	35%	13%

Table 2: Example Loading Type Summary

Passenger Vehicle	Passenger Vehicle Delivery	TNC (Uber/Lyft)	Small Delivery Vehicle	Large Delivery Vehicle	Taxi	Other
10%	10%	30%	20%	20%	5%	5%

Table 3: Example Loading Location Summary

At Curb	At Curb in White or Yellow Zone	In Bike Lane	In Vehicle Travel Lane	Other
10%	10%	30%	45%	5%

### Clarifications for Data Collection Team

- Provide a graphic showing the start and end points of the loading event area of interest, such as in Figure 1. This will ensure the data collection team orients video recording equipment and/or people correctly.
- The Handbook digital files include an example KML file for indicating to the data collection team where to collect loading behavior data.
- If data will be collected via direct observation in the field, indicate on the graphic which sections of the bike lane segment each person is responsible for observing. This will ensure the full segment is observed and minimize the risk of double counting. The project manager may conduct a site visit in advance to check for visibility constraints.

Figure 2: Passenger Vehicle



Figure 5: Freight/Heavy Truck Vehicle



Figure 3: TNC (Transportation Network Company or Rideshare)



Figure 4: Delivery Service/Light Truck Vehicle



# VALENCIA STREET : SAMPLE SOP (LOADING)

## Vehicle Blockage of Bike Lane: Loading Behavior

Project Name/Number: Valencia Safety Project / 149738  
 Location (incl. direction): Valencia St between 14th and 15th  
 Date (incl. day of week): Tuesday, May 14, 2019  
 Time Period(s): 9 AM to 11 AM, 1 PM to 3 PM, 7 PM to 9 PM

### Site Characteristics (drop down menu for each)

Weather Conditions	Sunny
Bike Facility Type	Protected
Parking Type	On-Street Parallel Parking between Bike Lane and Vehicle Lane

### Site Photos



Insert Photo/Image of Data Collection Location

Caption:

Location	Date	Time Period	Event #	Arrival Time	Arrival Hour	Departure Time	Duration (HH:MM:SS)	Duration (Seconds)	Loading:Type	Loading: Location
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	1	9:00:00	8	9:32:55	0:46:10	2770	Passenger Vehicle	At Curb
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	2	9:07:24	9	9:07:50	0:00:26	26	Passenger Vehicle	In Vehicle Travel Lane
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	3	9:10:02	9	9:11:46	0:01:44	104	Passenger Vehicle	At Curb
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	4	9:17:01	9	9:17:17	0:00:16	16	Passenger Vehicle	At Curb
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	5	9:25:34	9	9:43:59	0:18:25	1105	Small Commercial Vehicle	At Curb
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	6	9:28:03	9	9:31:20	0:03:17	197	Small Commercial Vehicle	In Vehicle Travel Lane
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	7	9:33:01	9	9:36:32	0:03:31	211	Passenger Vehicle	In Vehicle Travel Lane
Valencia St btwn 14th and 15th (East)	5/14/2019	9AM - 11AM	8	9:38:59	9	9:39:07	0:00:08	8	Passenger Vehicle	In Vehicle Travel Lane



## VALENCIA FINDINGS

Number of vehicles  
loading in the bike lane  
dropped from  
**60.5% to .7%.**

Loading duration and  
double parking also  
**dramatically decreased.**

**95% decrease** in  
mid-block vehicle/bike  
interactions or dooring  
conflicts.





## VALENCIA FINDINGS

No close calls/near misses between bikes and pedestrians were observed at loading islands.

98% of cyclists positioned in the bike lane or buffer area.



# PROJECT EVALUATION HIGHLIGHTS



# FOLSOM STREET

83% of bicyclists reported an increase in comfort.

54% of people feel more comfortable walking along Folsom.

48% of people feel more comfortable driving along Folsom after implementation.  
40% reported no change.





## 7<sup>TH</sup> AND 8<sup>TH</sup> STREETS

16% decrease in vehicle speeds on 7th Street following the project.

9% decrease in vehicle speeds on 8th Street following the project.





## TURK STREET

287% increase in bike counts in the peak evening commute; morning commute counts also significantly increased.

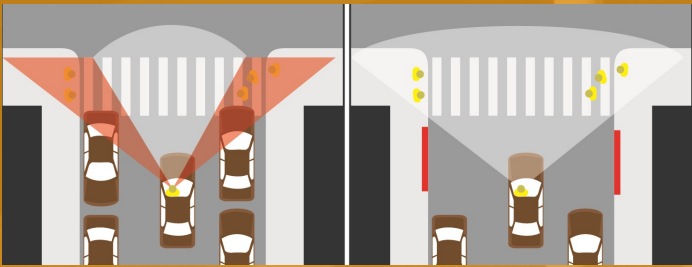
88% fewer loading violations on Turk Street between Jones and Taylor Streets compared to the before condition.





# DAYLIGHTING

14% fewer reported collisions at intersections where daylighting treatments were implemented in the Tenderloin.





# SEPARATED BIKE SIGNALS

81% of bicyclists comply with signal.

92% of vehicles comply with signal.

Close calls dropped from **53** at observed mixing zones to **5** at the same location that was upgraded to a bicycle separated signal

Bike signals reduce the probability of cyclists conflicting with vehicles.





## HOW ARE WE DOING?



People feel safer and more comfortable walking and biking in locations with protected bicycle infrastructure.



Vehicles travel at safer speeds after installation of traffic lane reductions and other traffic calming features.



More people are cycling on the streets with new and upgraded bike lanes, especially protected bike lanes.



Localized improvements such as daylighting and painted safety zones are helping to create a safer walking environment.

# LESSONS LEARNED = BETTER DESIGNS

Mixing zones help with right hook conflicts, but don't solve the problem. Bike signal can solve for this issue.

*Upgrading many of our existing mixing zones to separated bike signals, and scoping them in our new projects*

Polk Street bike signals are currently being evaluated, and we are finding issues with both vehicle and bicycle compliance with the bike signals/red arrows.

*Tweaking signal timing and looking at increasing enforcement*

Partially raised bikeways on Masonic and Polk still experiencing blockage of the bike lane, especially when not enough dedicated loading nearby.

*Moving away from partially raised bike lanes to full protected bike lanes or sidewalk level bike lanes and providing consistent dedicated loading zones.*



## 7TH AND 8TH STREET





**17TH STREET BETWEEN CHURCH AND SANCHEZ**





**FOLSOM STREET**



# UPCOMING WORK

Improving survey tools to be more inclusive

Producing 2<sup>nd</sup> Annual Safe Streets Evaluation Report

Conducting additional countermeasure evaluations including flashing yellow turn arrows and more data at separated bike signal locations

[sfmta.com/safestreetevaluation](https://sfmta.com/safestreetevaluation)

