

South of Market Intersection Gridlock Enforcement Pilot Final Report



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Introduction

Intersection blocking is an issue at many intersections throughout San Francisco. “the box,” as this behavior is often referred to, is illegal, contributes to congestion, spurs driver frustration and rude behavior, reduces pedestrian safety, and contributes to degradation of neighborhood quality of life. In an effort to reduce the incidence of intersection blocking, improve and coordinate modal movements through intersections, and improve pedestrian safety, the SFMTA stationed Parking Control Officers (PCOs) at two locations in the fast growing South of Market Neighborhood in San Francisco from July through September 2014. The purpose of the Pilot was to determine the efficacy of enforcement in reducing intersection blocking (box) during PM Peak periods in locations near the Bay Bridge. The data from the Enforcement Pilot show a reduction **by over 50%** in intersection and crosswalk during traffic enforcement by the MTA.

Overview

The Enforcement Pilot (Pilot) was conducted over a three month period during Giants daytime game days, from July 2014 to September 2014 in the South of Market Neighborhood of San Francisco (SoMa).

The goals of the pilot were to:

1. Reduce the incidence of box- at the two pilot locations;
2. Improve cross traffic flow of all modes through the intersection during priority signal phase;
3. Improve pedestrian safety; and
4. Evaluate the effectiveness of varied enforcement approaches;

Pilot details

Measures

For the Pilot, two variables were used to measure intersection :

1) Vehicles the Intersection: Number of vehicles within the intersection as marked by the inside perimeters of crosswalks after signal has changed to red.

2) Vehicles the Crosswalks: Number of vehicles at least half a car-length within the perimeters of marked crosswalks after signal has changed to red.



A third variable was used as a qualitative measure to assess the impact to the pedestrian experience due to intersection :

3) Obstructed Pedestrians: Approximate number of pedestrians observed weaving around cars that are the crosswalk after signal has changed to red.

Conditions

These variables were measured under three conditions:

- 1) Baseline – no enforcement measures in place,
- 2) PCOs using hand signals to actively manage the intersection,
- 3) PCOs issuing citations.

The Pilot sought to assess the impact of traffic enforcement overall, as well as the efficacy of each approach, in reducing intersection .

Locations

Two locations in the growing SOMA neighborhood in San Francisco were selected for the pilot: Bryant Street and 2nd Street, and Harrison Street and Main Street (see Figure 1: Pilot Locations). The Harrison and Main Street intersection was selected because residents in the neighboring community distinguished this intersection as an area close to their residences of high concern. The Bryant and 2nd Street intersection was selected based on observations made during an area walk-through of the neighborhood and, in part, because this intersection is not currently a location with regular traffic enforcement.

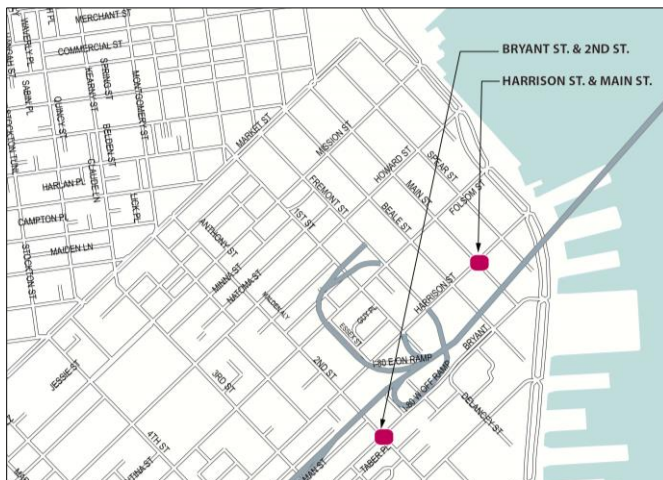


Figure 1: Pilot Locations

Dates & Times

On six days, for two hours during the PM peak period (3:30-6:30PM), SFMTA Summer Interns collected data at the two selected locations. Baseline data was collected on the first two days of the Pilot when no PCOs were present (July 3 and July 19). PCOs issued citations during the second two days of the pilot (July 30 and August 13) and PCOs actively managed the intersection using hand signals during the final two days of the Pilot (August 28 and September 11). All days that data was collected were Giants afternoon game days. Giant's game days were selected because game days increase both traffic and pedestrian activity in this area.

Table 1 provides an overview of the dates, times, and type of enforcement activity that occurred during the Pilot. Table 2 provides an overview of the staffing and a cost estimate of the Pilot.

Data collection methods

Instances of intersection and crosswalk , as defined above, were collected at every signal change (signal cycle). This data was recorded in a basic spreadsheet template; other relevant traffic and safety observations that were not directly related to intersection were also noted.

Table 1: Date, Time & Data Collection Method, Enforcement Pilot, San Francisco

Date	Time Period	Data Collection Method
7/03/2014	3:30-6:30PM	Baseline; No PCO present
7/19/2014	3:30-6:30PM	Baseline; No PCO present
7/30/2014	3:30-6:30PM	PCO issued citations
8/13/2014	3:30-6:30PM	PCO issued citations
8/28/2014	3:30-6:30PM	Active management by PCO
9/11/2014	3:30-6:30PM	Active management by PCO

Note: Specific collection times within the designated time period were determined by individual Summer Intern

Table 2: Staffing & Cost Estimate, Enforcement Pilot, San Francisco

	Staff	Shifts	Intersections	Hours/ Shift	Rate	Total Hours	Cost
4	Student Design Trainees	6	2	2.5	\$ 82.64	120	\$ 9,917.02
4	Parking Control Officers (PCOs)	6	2	2.5	\$ 89.67	120	\$ 10,760.67
2	Senior PCOs	6	2	2.5	\$ 105.07	60	\$ 6,304.31
Total Pilot Staff Cost							\$ 26,982.01*

Total Cost per Shift \$ 4,497.00

Note: Costs are preliminary and subject to change

Results

To control for variations the data collection, a one hour period (4-5PM)—or 60 cycles—worth of data was selected for every shift at every intersection for the data analysis.

Baseline Data

To determine baseline data, the data collected during the two baseline collection days, July 3 and July 19, was averaged. Averaging the data allowed us to establish a baseline norm. Tables 3 and 4 display the baseline data by location.

Table 3: Baseline average of instances of , Main and Harrison

	Intersection	Crosswalk	Obstructed Pedestrians
7/03/2014	149	185	137
07/19/2014	338	260	109
Baseline Average	244	223	123

Table 4: Baseline average of instances of , 2nd and Bryant

	Intersection	Crosswalk	Obstructed Pedestrians
7/03/2014	159	133	370
07/10/2014	450	219	2847
Baseline Average	305	176	1609

Enforcement Data

Table 5 provides the instances of crosswalk and intersection over the study period for Main and Harrison Street; Table 6 provides the same information for 2nd and Bryant Street.

Table 5: Instances of during PCO Enforcement, Main Street and Harrison Street

	Intersection	Crosswalk	Obstructed Pedestrians
7/30/2014	44	163	140
8/13/2014	44	70	54
8/28/2014	74	111	75
9/11/2014	3	32	31
Pilot Average-PCO Days	41	94	75

Table 6: Instances of during PCO Enforcement, 2nd and Bryant

	Intersection	Crosswalk	Obstructed Pedestrians
7/30/2014	137	167	759
8/13/2014	196	204	714
8/28/2014	131	149	663
9/11/2014	131	128	782
Pilot Average-PCO Days	149	162	255

Table 7 provides the total number of instances of , by type, for the baseline and PCO enforcement period, and the pilot overall.

Table 7: Total Instances of Intersection Main and Harrison Street and 2nd and Bryant Street (Combined Data)

	Intersection	Crosswalk
Total baseline	1096	797
Total PCO enforcement	760	1024
Grand total	1856	1821

Citation Data

During the first two days of the Pilot when PCOs were on duty (July 30 and August 13), they were directed to issue citations to drivers the intersection. Over these two days, a total of 95 citations were issued at a total fee of \$10,160. A remittance of \$9.00 per citation is due to the State, totaling \$855 and resulting in a net revenue of \$9,205¹. Due to a misunderstanding of orders, during the second day (August 13) no citations were issued at 2nd and Bryant Street; rather PCOs were actively directing traffic at this location. Tables 7 and 8 provide an overview of citations by type, quantity and value.

Table 7: Citation Data, Pilot Locations, July 30, 2014

Code/ Description	2 nd / Bryant	Main/ Harrison	Total	Cost	Total Fees
V22526A Intersection Blocking	27	18	45	\$100	\$4,500
V22526B Intersection Blocking Turning	27	5	33	\$116	\$3,712
Total	54	23	77		\$8,212

Table 8: Citation Data, Pilot Locations, August 13, 2014

Code/ Description	2 nd / Bryant	Main/ Harrison	Total	Cost	Total Fees
V22526A Intersection Blocking	-	15	15	\$100	\$1,500
V22526B Intersection Blocking Turning	-	3	3	\$116	\$348
Total	-	18	18		\$1,848

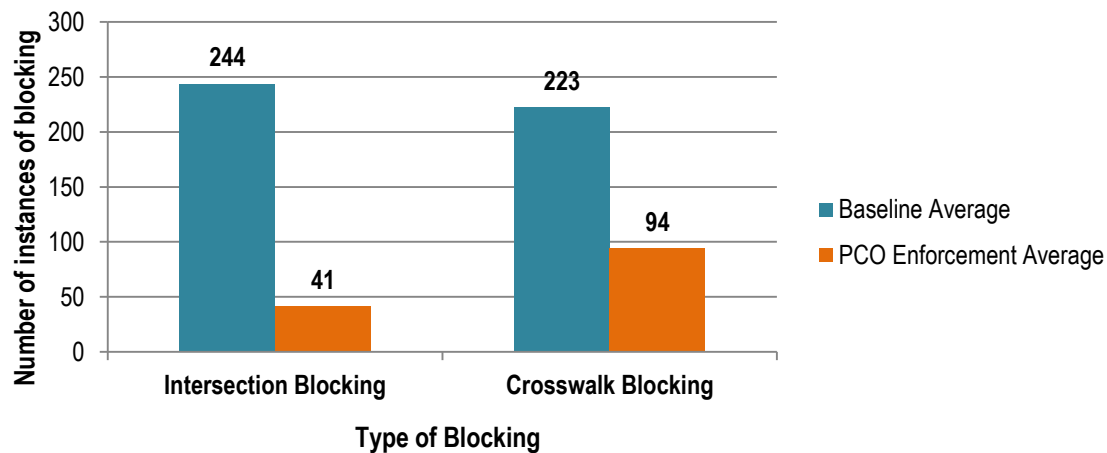
Discussion: What does the data suggest?

The data show that intersection and crosswalk are lower when PCOs are present as compared to when no traffic enforcement activity is happening at the intersection (Figures 1 and 2).

¹ Costs are preliminary and subject to change.

Main Street & Harrison Street Intersection and crosswalk data

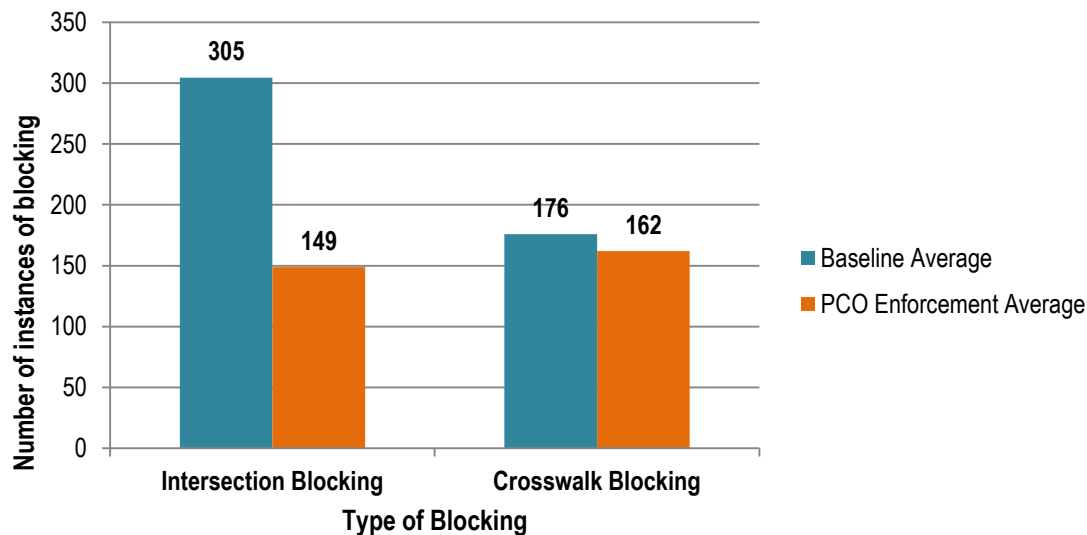
Figure 1: Average incidence of before and after introduction of PCO, Main and Harrison Street



The data show an **83% decrease** in intersection and a **58% decrease in crosswalk** at Main and Harrison Street when PCOs were present.

2nd Street & Bryant Street Intersection and crosswalk data

Figure 2: Average incidence of before and after introduction of PCO, 2nd Street and Bryant



The data shows a **51% decrease** in intersection and an **8% decrease** in crosswalk at 2nd and Bryant Street when PCOs were present.

While the data shows an increase in crosswalk at 2nd and Bryant Street, this increase can be interpreted as an indication of a reduction in intersection. That is, it suggests that

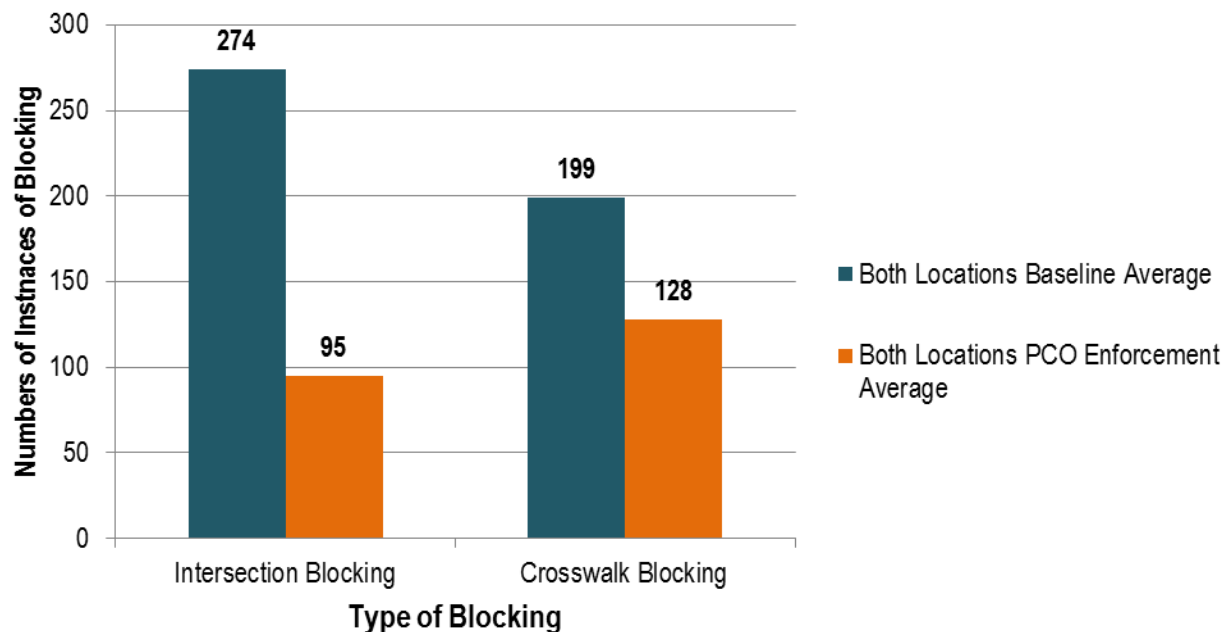
vehicles were stopping short of the intersection —the desired behavior—but not quite soon enough, such that they blocked in the crosswalk instead.

When the data for both pilot locations is combined to determine the average instance of during PCO enforcement days at both locations as compared to the baseline average at both locations, we then see a **65% decrease** in average instances of intersection and a **36% decrease** in average instances of crosswalk overall. Figure 3 displays this result.

Comprehensive Intersection and crosswalk data

When analyzed together, the data show a clear indication that enforcement by Parking Control Officers results in an overall decrease in intersection blocking. In the following chart, a combined average at both intersections shows a **57% decrease** in the incidents of intersection and crosswalk.

Figure 3: Average incidence of both intersection and crosswalk blocking before and after introduction of PCO, Main and Harrison Street and 2nd and Bryant Street (data combined)



Pedestrian Obstacle

Ensuring the safety of pedestrians is a key priority of the SMFTA. When an intersection or crosswalk is blocked, it is difficult and unsafe for a pedestrian to cross the street, particularly for pedestrians with special mobility needs. By reducing instances of intersection blocking, the pedestrian crossing experience is safer and more pleasant.

Although we did measure instances of pedestrian , we opted not to analyze the results. This is because we reasoned that even one pedestrian unable to safety cross the street due to a blocked intersection or crosswalk is one too many.

Enforcement type

A goal of the pilot was to evaluate the comparative effectiveness of two different enforcement approaches: issuing citations and active management using hand signals. Because citations were not issued on August 31 at the 2nd Street and Bryant Street location due to a miscommunication, it is not possible to compare which method was more successful at reducing instances of the box at this location. Complete data for Main and Harrison Street allows for evaluation of which approach was more successful at reducing instances of intersection and crosswalk at this intersection.

To evaluate the enforcement approaches, we first averaged the instances of on citation days as well as the instances of on hand signal days to determine the average incidence of that occurred for each enforcement approach. We then determined the percent change from baseline. This allowed us to be able to compare the comparative efficacy of the enforcement approaches. We did this for instances of intersection and crosswalk .

For *intersection* , the average instances of intersection at Main and Harrison Street during the Pilot period was 44 on the citation days and 39 on the hand signal days. The percent change from when there was no enforcement by PCOs (baseline) of instances of intersection was 82% and the percent change from baseline of instances of crosswalk was 84%, a negligible difference. That is, there was a very slight difference in intersection by enforcement approach at this intersection. This difference, however, is too small to warrant the conclusion that one type of approach was more successful at reducing instances of intersection over the other. Table 9 displays this result.

Table 9: Percent change from baseline of instances of intersection by enforcement approach, Main Street and Harrison Street.

	Average instances of intersection	% change from baseline
Citation Days (7/30; 8/13)	44	82%
Hand Signals Days (8/28; 9/11)	39	84%

We did, however, see a difference in instances of *crosswalk* by enforcement type. There was a larger average percent reduction in crosswalk the days the PCOs utilized hand signals as compared to the days when the PCOs issued citations, 68% vs. 48%. Table 10 displays this result.

Table 10: Percent change from baseline of instances of crosswalk by enforcement approach, Main Street and Harrison Street

	Average instances of crosswalk	% change from baseline
Citation Days (7/30; 8/13)	117	48%
Hand Signals Days (8/28; 9/11)	72	68%

The data suggests that hand signals were more effective at reducing instances of crosswalk and that the type of PCO activity did not make a difference with regard to intersection . Due the small sample set (one location and four data points), the results should be interpreted with caution. Without data from 2nd and Bryant Street it is difficult to confirm the validity of this conclusion. More observations at both locations are necessary to state with confidence the efficacy of one enforcement approach over the other.

Limitations:

Several study limitations should be noted:

- Construction activity in SoMa during the Pilot period likely impacted traffic activity in the area.
- Delays on east-bound Bay Bridge due to crashes, weather, etc. likely impacted levels of traffic activity during Pilot shifts.
- PCOs manually altered the signal timing at the intersections; thus signal times were not consistent throughout the Pilot period.
- Public awareness of traffic laws likely had some impact (either positive or negative) on driver behavior, but the pilot did not measure knowledge or attitudes towards intersection .
- The pilot was limited to six days; the small sample size likely contributes to reduced statistical validity.
- Traffic conditions likely varied between shifts.
- Differing driver behavior during Giants game days, versus driver behavior during daily commute periods.
- Two of the Pilot dates occurred just prior to a holiday weekend and thus likely had lower levels of traffic activity than would a non-holiday.
- Variations in data collection due to differences in interpretation of the constructs being measured.
- Variations in data collection due to human error.
- Variations to the enforcement approach due to miscommunications.

Recommendations

Instances of intersection and crosswalk blocking were reduced during the Enforcement Pilot when PCOs were stationed at the intersections. This suggests that traffic enforcement by SFMTA Enforcement does minimize intersection blocking, helps to organize traffic patterns through intersections, and that traffic enforcement by the MTA could have an impact on pedestrian safety. Per these results, as well as general observations made by the Student Interns who collected the data and the PCOs who managed the intersections, we recommend the following:

Focused Enforcement “Saturation” and Media Campaign²:

In working to improve blocking issues in SoMa and beyond, San Francisco might consider a more aggressive plan to put ticketing PCO officers at intersections during the peak periods, similar to the “Don’t Block the Box Campaign” the City embarked on in the late 1980s. The SFMTA could establish targeted enforcement at key intersection locations along routes to the Bay Bridge during the PM Peak; the enforcement would be utilized in conjunction with an active marketing and media campaign.

Several other cities already have made efforts to educate and enforce box- violations.

In 2008³, New York City gave traffic enforcement officers the ability to issue parking violations for the intersection, similar to the strategy employed by this pilot. In addition to giving traffic enforcement officers this citation authority, Mayor Bloomberg, as one of the 16 initiatives in his PlaNYC sustainability plan, also hired an additional 117 traffic enforcement agents. The Mayor and others highlighted the fact that reduced intersection violations not only improve blocking, but also yielded positive spillover effects such as the increased economic benefits of reduced traffic, and the public health benefit of fewer idling cars. New York City’s changes came after the city conducted a study, showing that very few traffic enforcement officers were ticketing intersection violators⁴.

Boston began a “Don’t Block the Box” campaign in 2012 by posting signs with the fine listed and having officers issue citations⁵. Many of these intersections (11 of 18) were in the Longwood Medical area and Medical Academic and Scientific Community Organization (MASCO) was a partner in the project. MASCO led an initiative called “Karma Commuting,” which was a campaign aimed at educating area drivers on driving

² See Preliminary Recommendations for detailed information

³ http://www.nyc.gov/portal/site/nycgov/menuitem.c0935b9a57bb4ef3daf2f1c701c789a0/index.jsp?pagelD=mayor_press_release&catID=1194&doc_name=http%3A%2F%2Fwww.nyc.gov%2Fhtml%2Fom%2Fhtml%2F2007a%2Fpr161-07.html&cc=unused1978&rc=1194&ndi=1

⁴ <http://newyorkparkingticket.com/wp-content/uploads/2009/07/BLOCK-THE-BOX-REPORT.pdf>

⁵ http://www.boston.com/yourtown/news/fenway-kenmore/2012/08/boston_launches_dont_block_the.html

best practices⁶. The campaign had two phases; the first phase tested driver's knowledge of road rules and had drivers pledge to be a "courteous commuter." Phase two engaged drivers in a video contest to share their commute stories. In crafting their own initiative, San Francisco should think about the role of partners in promotion and education activities.

Evaluate Automated Enforcement Legislation for Intersection Blocking

Automated enforcement can be an effective way to reduce instances of intersection . SFMTA is currently awaiting a state legislative opinion on whether to use automated enforcement (cameras), to ticket cars the box. Currently Washington, DC uses cameras to enforce box-⁷. The SFMTA might consider preparing a case for a possible legislative proposal of automated enforcement of box- in the event that the pending legislative opinion does not rule in favor of this use of cameras. The legislative proposal would require a problem statement, data and experience, and justification to be compiled in advance of the legislative session in January 2015⁸.

⁶ <http://www.masco.org/directions/karma-commuting-show-and-tell>

⁷ <http://www.nbcwashington.com/news/local/DC-Police-Adding-Cameras-to-Enforce-Stop-Signs-Blocking-the-Box-Yielding-to-Pedestrians-221531301.html>

⁸ Kate Breen, personal communication, September 3, 2014