



Do open streets initiatives impact local businesses? The case of Sunday Streets in San Francisco, California



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ABSTRACT

Background: Ciclovias, known in the U.S. as open streets initiatives, close streets to vehicles to increase open space and physical activity opportunities for local communities. In San Francisco, California, the open streets initiative known as Sunday Streets, was founded in 2008 to promote bicycle use in neighborhoods most underserved for recreational resources and experiencing higher than average burden of chronic diseases. In addition to health impacts, open streets initiatives create an opportunity for greater business activity along the routes. This relatively less explored outcome is the focus of this paper.

Methods: Impacts on businesses along Sunday Streets routes were estimated from survey data collected on the types of businesses, revenue, customer activity, level of engagement with the initiative as well as employment.

Results: Overall there was a modest increase in business activity along Sunday Streets routes with increases in revenue, customer activity and sales as well as employment, demonstrating an unintended outcome for a program originally intended for improving health behaviors.

Conclusions: Sunday Streets increased business activity along its routes. Engaged businesses perceived greater benefits. Merchant engagement with open streets initiatives offers additional community benefits.

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1. Introduction

A global movement to increase health-benefiting physical activity has led to the adoption of strategies and programs that convert existing public infrastructure such as streets and sidewalks into temporary parks. Ciclovias, known in the U.S. as open streets initiatives, use streets closed to vehicles to increase physical activity (PA) resources for local communities (Zieff et al., 2014). The Open Streets Project (Alliance for Biking and Walking and The Street Plans Collaborative) reports that over 100 different U.S. cities hosted an open streets event between 2009 and 2013, although there are many others worldwide, with the number of participants ranging from thousands to over one million (e.g. Bogota, Colombia) (Zieff et al., 2014; Sarmiento et al., 2010). A cost-benefit analysis of open streets initiatives found that the health benefits far outweigh the costs (Montes et al., 2012).

The open streets event in San Francisco, California, known as Sunday Streets (SS), was founded in 2008 to promote bicycling among ethnic minority and low-income residents of areas most underserved for recreational resources and with high rates of chronic disease (Zieff et al., 2013). An additional goal, achieved through deliberate route development, had been to unite different neighborhoods (e.g. Bayview and Dogpatch) with historical social divisions (ICF Macro) and to increase social cohesion within communities (ICF Macro, 2011). Several studies show that SS is associated with positive health outcomes for the participants by offering opportunities for outdoor recreation (Wilson et al., 2013); increasing overall PA behavior (+5 min/week); and for integrating communities (Zieff et al., 2014). Among the approximate 8000–25,000 attendees, 29% reported increasing their overall PA as a result of attending SS, while more than 75% of the participants came from “targeted” neighborhoods with numerous barriers to PA (Zieff et al., 2014). In addition to direct health impacts, the

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large scale of open streets events creates an opportunity for increased economic activity for the businesses on host routes, a topic of study absent from the literature and the aim of this study.

Sunday Streets SF is a public, non-profit organization with public and private funding that implements SS with the San Francisco Municipal Transportation Agency (SFMTA) as a main fiscal sponsor. The City and County of San Francisco agencies who initially contributed to, and in many cases continue to support, SS include: Mayor's Office; Economic Development; Environment; Public Works; Recreation and Parks; Public Health (via the active living coalition, Shape Up SF); and the Police Department as well as the National Park Service (Zieff et al., 2013).

During the first Sunday Streets held on the Embarcadero route in conjunction with San Francisco's Fisherman's Wharf Health and Safety Fair in 2008, Fisherman's Wharf merchants were studied to determine the business impact from street closures and lack of parking. This study found that 68.4% of the participants visited the fair specifically to participate in SS and more than 65% purchased a meal while there (Destination Analysts, Inc. 2009). By 2009, due to their experiences and observations of the popularity of SS, Fisherman's Wharf merchants, as well as those in other districts, began requesting SS in their neighborhoods (King, 2009).

Unlike most open streets initiatives, Sunday Streets SF developed multiple routes on different dates, keeping in line with its goal of creating open spaces in "park poor" communities as well as where merchant support exists (ICF Macro, 2011). Routes were also constructed to avoid re-routing public transit and to accommodate community needs (e.g. avoiding church hours). Community groups were engaged for the development of programming and event implementation. There was also an effort to distribute SS across San Francisco with an aim towards eventually connecting with existing and planned bike routes. Each route, traversing through many different neighborhoods, is named after the primary neighborhood in which it is located to make identification of the routes easier.

The intermittent schedule and lack of permanent infrastructure create a unique form of participant utilization and business impact making it difficult to study open streets initiatives and compare with other community events. Organizers of one-off sporting events and festivals tend to over-estimate participant spending (Matheson, 2006) and report general positive impacts of events on the local economy (Moore, 2012). Specific benefits for the retail sector (Janeczko et al., 2002) and increased property values and attractiveness to business and trained employees (Virginia Outdoors Plan, 2007) have been demonstrated by large events and festivals. Increased tourism, including tourist spending, and increased community cohesion have been identified as benefits of developed outdoor space and parks (Harnik et al., 2009). Direct and indirect impact models of recreational and tourist attractions, and evaluations of sports stadiums report inconsequential impact on development and minor economic growth (Rosentraub et al., 1994; Prophet, 2012; Santo, 2005). Among these types of events, a lack of consistent methodology has made it difficult to accurately identify the area of jurisdiction (Weisbrod and Weisbrod, 1997), evaluate expenditures against attraction of large numbers of local visitors (Crompton, 2010) and conduct a relative evaluation of social and economic costs and benefits (Wood, 2005).

Although there is some evidence that a district's "walkability" impacts business activity, the types of businesses that actually benefit from walkability have yet to be determined (Hack, 2013; Moudon et al., 2006). For a 2003 study of the Valencia district commercial corridor in San Francisco (site of a SS route), local merchants were asked to report about the impact of traffic calming and bicycle lanes installed in 1999. The study found that 56% of business owners believed the number of local residents shopping there had increased, 37% reported increased sales, and 65% reported positive impact on business and/or sales (Drennan). Further, a preliminary evaluation in St. Louis found that participants tend to spend money at open streets events and a majority reported increased awareness of new businesses along the route (Hipp et al., 2012).

To date, there has been no rigorous evaluation of the impact of open streets initiatives on business activity. In 2012, the SFMTA commissioned this study of SS impact on businesses along 5 routes that they selected (Mission, Bayview, Chinatown, Western Addition, Excelsior). That year, there were 10 SS events; ¹the other routes were on the Embarcadero, Great Highway, as well as 3 repeated events in the Mission. The Mission route was chosen to pilot the feasibility of holding regular and repeated events and 4 events were scheduled, one each month, from May through August. The SFMTA specifically identified its interest in understanding the business impact of multiple events on the Mission route. These routes represent the northeast (Chinatown); central (Mission, Excelsior, Western Addition); and southeast (Bayview) quadrants of the city, each with predominant ethnic minority and low-income populations (Sustainable Community Index)². Sunday Streets routes for 2012 are indicated on a map of San Francisco (see Appendix A).

In this study, we present results from data that we collected from six SS events: twice from the Mission route and once each from Bayview, Chinatown, Western Addition and Excelsior routes, focusing on the impact of SS on customer activity, sales and revenue outcomes, and employment for businesses operating along these routes.

2. Methods

2.1. Data collection

Survey data were collected from merchants along SS routes using an instrument developed for this study. The survey instrument included types of questions and categories drawn from existing surveys used to evaluate one-time festivals and tourism events, with additional questions that took into account the intermittent and multiple sites of SS (Moore, 2012; Wood and Barta 2002). A 5-question (short form) survey on type of business, customer activity, revenue and employee numbers was developed to collect baseline data on business activity during Sundays, two weeks before and two weeks after the event. To gather event data, a 9-question (long form) survey was used that additionally included questions about merchant engagement with the event and perception of impact. (See Appendix B for surveys).

The surveys were pilot tested on merchants along the routes during the Embarcadero SS and the first Mission SS. Based on feedback from merchants and research assistants, changes were made to the survey tool. For example, we added an open-ended question asking for specific description of the types of activities businesses used for engagement with SS. The pilot test also demonstrated the difficulty in collecting data on Sundays during SS events when store employees were busy assisting additional customers in crowded shops. Finally, close-of-business time varied, with businesses closing before, during, or after the end of the SS event, and managers and employees did not often have the necessary information ready. Moreover, many businesses are closed on Mondays. Thus, it was determined that collecting data on Tuesday mornings would give merchants time to collect revenue data from the previous Sunday and thoroughly respond to the survey.

¹ <http://www.sundaystreetsf.com/2012-sunday-streets/>, accessed March 23, 2015.

² www.sustainablecommunitiesindex.org, accessed August 20, 2014.

Table 1
Response rate.

Route	Number of businesses on the route	Number of businesses surveyed
Bayview	25	13 (52%)
Chinatown	115	46 (40%)
Excelsior	108	44 (41%)
Mission 1	199	76 (38%)
Mission 2	199	117 (59%)
Western Addition	44	21 (48%)
Entire sample	690	317 (46%)

Table 2
Impact of Sunday Streets on key business activity indicators.

Neighborhood	Average of walk-ins			Average # of purchases			Average revenue (\$)		
	Baseline	Event	p-Value	Baseline	Event	p-Value	Baseline	Event	p-Value
Bayview	138	148	0.89	125	137	0.88	1468	1590	0.85
Chinatown	58	59	0.85	38	36	0.72	1230	1332	0.73
Excelsior	71	86	0.66	63	81	0.65	1105	1529	0.5
Mission 1	62	74	0.41	55	64	0.57	2114	3278	0.19
Mission 2	124	85	0.02	94	68	0.09	1784	1880	0.8
Western Addition	164	220	0.41	157	245	0.18	2045	2100	0.96
Overall	96	80	0.09	79	77	0.91	1690	2155	0.06

Note: Variance ratio test, which preceded two sample *t*-test, is based on 10% significance level. *P*-values reported are to test if event outcomes are not different from baseline outcomes.

Data were collected between March and September of 2012. The research assistants compiled a list of all businesses located on each route, gave in-person invitations to join the study and handed out a flyer describing the project. At that initial meeting, some businesses indicated that they did not want to participate in the study. These businesses were counted in the refusals. A second group of businesses were eliminated because they: were not open on Sunday or during Sunday Streets hours (11 am–4 pm) or did not sell items or offer services such as churches, community centers and non-profit organizations. All data were collected beginning approximately one hour after start of business day and merchants were asked to report about the previous Sunday's business activity. To account for spatial and temporal heterogeneity, data were also collected from at least one different route on the same day as data collection for a SS event to provide comparison data. This protocol was followed for four out of the five routes allowing us to compare off-SS routes with SS routes during the same time frame and on chosen routes. (See Appendix C for data collection schedule).

Certified translators translated all surveys, consent forms and recruitment materials into Chinese- and Spanish-language versions. Project approval was received from the San Francisco State University Institutional Review Board.

2.2. Data analysis

Data were entered using MS Excel and analyzed with Stata 11 and MS Excel. The observational data is discussed directly. Data are reported according to the question asked (e.g. absolute numbers, average/mean). Data collected from merchants two weeks prior and two weeks after SS were assumed to reflect a typical Sunday and were combined to form a baseline measure. Impact of the SS event was estimated by comparing baseline and event outcomes of interest collected from all participating businesses along each of the selected SS routes. Both bivariate and multivariate methods of analysis were done.

In addition to the descriptive analysis, multivariate statistical analysis was conducted to examine whether SS had a statistically significant impact on surveyed businesses. Two kinds of outcomes were examined: actual impact and perceived impact. Revenue measured as dollars earned was used as an objective measure of actual impact (question 4 on both short form and long form surveys). Perceived impact was inferred from a self-reported measure of whether or not SS had an impact on the merchant and whether it increased, decreased or resulted in no change in customer activity and sales (questions 6 and 7 from the long form survey).

Eq. 1, estimated using ordinary least squares, examines the average impact of SS on revenue earned by various types of businesses.

$$\text{Revenue} = b_1 + b_2S + b_3T + b_4S^*T + e \tag{1}$$

where *S* is the indicator variable for SS (1 if a business is surveyed on SS; 0 if it is surveyed on a baseline Sunday), *T* is the business type, *e* is the error term. Operationally, *b*₂ represents the average impact SS has on revenue, *b*₃ represents the revenue associated with each business type and *b*₄ will determine how SS impacts revenue for each type of merchant. If *b*₂ is positive and statistically significant, we can say that SS events are associated with an increase in revenue for the businesses located along the routes. Introducing business types (*T*) and interaction terms between business type and event (*S*^{*}*T*), (*b*₂ + *b*₄) would indicate the average impact of SS on revenue by controlling for various business types.

To estimate a similar impact by route, Eq. 2 is estimated where *N* is a vector of indicator variable for the SS route. This equation helps us estimate the average impact of the event on revenue earned on different routes.

$$\text{Revenue} = b_1 + b_2S + b_3N + b_4S^*N + e \tag{2}$$

where *b*₂ represents the average impact SS has on revenue, *b*₃ represents the revenue associated with each route and (*b*₂ + *b*₄) determines how SS impacts revenue for the average merchant along each route.

A subset of the entire data is used to conduct a difference-in-difference model to look at the difference in average outcome in the SS group at baseline and treatment minus the difference in average outcome in a comparison group at baseline and at treatment. This will help us to estimate the true impact of the event by taking out any differences across routes, timing of events and any other unmeasured variables that could bias our results. While a typical difference in difference estimation uses data from a matched comparison group to compare to a treatment sample, we collected data from two SS routes (Mission 2 and Western Addition) as treatment data and on the same Sunday dates collected comparison data from two other SS routes (Chinatown and Bayview/Dogpatch) not holding an event on that Sunday. All four of these routes share Sunday Streets SF criteria for route development. To get this difference-in-difference estimate, Eq. 3 helps us estimate the true impact of the event by taking out any differences across routes, timing of events and any other unobserved variables that could bias our results.

$$\text{Revenue} = b_1 + b_2S + b_3t + b_4S^*t + e \tag{3}$$

Table 3
Level of involvement, reported impact and type of impact on businesses during Sunday Streets (percentage of businesses).

	Active or occasional involvement	Limited or no involvement	Reported having impact	Reported having no impact	Decrease in customer activity and sales	Increase in customer activity and sales
Bayview	56	44	44	44	-	56
Chinatown	25	75	53	21	38	22
Embarcadero	25	75	47	26	20	35
Excelsior	43	57	50	28	19	31
Mission 1	39	61	64	25	29	49
Mission 2	39	61	60	25	21	52
Mission Pilot	43	57	69	21	13	63
Western Addition	38	63	67	8	17	67
Entire sample	34	66	56	25	21	44

Note: For impact, businesses also reported “I don’t know” and for customer activity and sales, businesses also reported “No change.”

Table 4
Perceived change in customer activity and sales during Sunday Streets for businesses that perceived an impact (percentage of businesses).

Route	Decrease	No change	Increase
Bayview	0	44	56
Chinatown	38	41	22
Embarcadero	20	45	35
Excelsior	19	50	31
Mission 1	29	22	49
Mission 2	21	26	52
Mission Pilot	13	25	63
Western Addition	17	17	67
Entire sample	21	35	44

is estimated where S denotes difference between baseline and treatment, t denotes difference between comparison and treatment, b_4 is the difference-in-difference estimator that measures the true impact of the SS event.

To examine the perceived impact of SS on local businesses, a fourth model was estimated to examine the likelihood of SS having an impact (question 6 on the 9-question survey). The dependent variable in this model is a binary variable (yes = 1; no/I do not know = 0). A probit model was used for this estimation. We examined the likelihood of impact according to the type of business, type of route as well as the kind of engagement the business had with the event. Marginal effects from the probit estimation are reported in the results.

In addition to whether the businesses perceived an impact, we also examined the kind of perceived impact. The 9-question survey included a question on whether SS led to an increase, decrease or no change in customer activity and sales for individual businesses (question 7). Since the outcome variable is a categorical variable with three possibilities, in a fifth model, a multinomial logit estimation was conducted using increase or decrease in customer activity and sales as the dependent variable with “no change” as the reference category. This model includes all the categories of businesses as control variables and examines the likelihood of increase or decrease of customer activity and sales for all business types depending on whether the businesses were involved in SS or not.

3. Results

3.1. Data description

Out of a total of 690 merchants invited to participate in the survey, 317 completed the surveys resulting in a response rate of 46%. (See Table 1). Distribution of businesses varied by route. For example, on the Chinatown route, there is a predominance of gift shops, specialty stores and stores with small household items, whereas in the Bayview/Dogpatch, Mission, Excelsior and Western Addition, restaurants predominate.

Table 2 is a summary of the impact of SS on key business activity indicators. While the surveys allowed for a range of responses,³ we consistently used the middle of the range to determine approximate average numbers. Although most routes showed an increase in the average number of customers entering stores, businesses during the second Mission event showed a large and statistically significant decrease. The second Mission event caused an overall decrease in average number of walk-in customers during a SS event compared to a baseline Sunday. In terms of customer purchases, 1st Mission event, Bayview, Excelsior and Western Addition routes showed an increase in average number of customers who made a purchase during a SS event while Chinatown and 2nd Mission event reported a slight decrease. However, only the decrease in the 2nd Mission event was statistically significant. Overall, there was a slight decrease in the average number of customer purchases during SS. While we consider data analysis by route to be most valuable, we also conducted some initial analyses disaggregated by business types, bearing in mind the substantial differences in commercial activity along different routes (Zieff and Chaudhuri, 2013) and the different characteristics of each route. Restaurants showed a decrease in walk-ins as well as purchases whereas clothing, gifts and services showed an increase both in walk-ins and purchases during SS.

Businesses experienced an overall net increase in revenue during SS compared to baseline and this was statistically significant at 0.10 level. Almost 18% of businesses reported hiring or scheduling additional employees to work on SS Sundays. On average, 2 extra workers were hired or scheduled by businesses that reported hiring or scheduling additional employees specifically for SS. The majority of

³ Businesses hesitate to provide actual numbers but are more likely to answer these questions if a range is provided.

Table 5
Impact of Sunday Streets on revenue by business and neighborhood, OLS estimates.

Variables	(1) revenue	(2) revenue	(3) revenue	(4) revenue	(5) revenue
Explanatory variables					
Sunday event	464.13*	413.68*	357.10	407.65	122.29
	(1.94)	(1.77)	(0.33)	(1.47)	(0.09)
Restaurant		561.70	412.14		
		(0.98)	(0.53)		
Grocery		394.64	550.85		
		(0.56)	(0.58)		
Gifts		−475.56	−610.80		
		(−0.75)	(−0.69)		
Housewares		−58.39	559.96		
		(−0.06)	(0.45)		
Services		−1,007.89	−929.38		
		(−1.54)	(−1.07)		
Clothing		501.54	330.83		
		(0.78)	(0.38)		
Sporting goods		2299.27***	2727.01**		
		(2.77)	(2.27)		
Specialty goods		−780.64	−620.37		
		(−1.22)	(−0.71)		
Event*restaurant			331.30		
			(0.29)		
Event*grocery			−380.57		
			(−0.27)		
Event*gifts			268.76		
			(0.21)		
Event*housewares			−1,489.68		
			(−0.78)		
Event*service			−256.73		
			(−0.19)		
Event*clothing			390.68		
			(0.30)		
Event*sporting goods			−760.03		
			(−0.45)		
Event*specialty			−335.09		
			(−0.26)		
Bayview				−491.25	−651.77
				(−0.65)	(−0.61)
Excelsior				−724.02	−1014.39
				(−1.50)	(−0.69)
Mission1				548.78	−5.68
				(1.29)	(−0.00)
Mission2				−143.35	−335.88
				(−0.36)	(−0.24)
Western Addition				109.84	−74.77
				(0.18)	(−0.05)
Chinatown				−717.27	−890.04
				(−1.52)	(−0.61)
Event*Chinatown					−19.59
					(−0.01)
Event*Excelsior					301.13
					(0.19)
Event*Mission 1					1041.76
					(0.70)
Event*Mission 2					−26.01
					(−0.02)
Event*Westaddn					−67.29
					(−0.04)
Constant	1690.40***	1592.69***	1618.62**	1834.41***	2119.77
	(10.56)	(2.88)	(2.18)	(4.65)	(1.51)
Observations	531	531	531	531	531
R-squared	0.01	0.08	0.08	0.03	0.04

t-statistics in parentheses

*** $p < 0.01$.** $p < 0.05$.* $p < 0.10$.

businesses who used extra employees, added an additional worker, although several businesses added up to 9 additional workers for a total of 70 extra employees hired or scheduled just for SS.

In general, 34% of businesses were actively or occasionally involved (e.g. sidewalk sales) with SS. Chinatown and Embarcadero were least engaged with the event (Table 3).

Table 6
Impact of Sunday Streets on revenue by business, difference-in-difference estimates.

	Revenue
Explanatory variables	
SS route (vs. non-SS route)	– 123.38 (515.68)
Event (vs. baseline)	– 387.76 (562.15)
Pure effect of Sunday Streets	452.72 (657.06)
Restaurants	659.43 (710.90)
Grocery	– 760.29 (965.54)
Gifts	–737.68 (762.84)
Housewares	214.93 (984.21)
Services	– 1210.72 (823.98)
Clothing	72.69 (771.35)
Sporting goods	2856.78 (1313.30)
Specialty	– 475.60 (763.91)
Constant	1844.95 (744.44)
Observations	183
R-squared	0.14

Standard errors in parentheses

*** $p < 0.01$.

** $p < 0.05$

* $p < 0.10$.

Approximately 56% of respondents perceived that Sunday Streets had an impact on their business, while almost 25% reported the event having no impact (See Table 3). The remaining businesses reported “I don’t know”. When characterizing the type of impact, 44% of businesses reported an increase in customer activity and sales during SS, compared with 21% who reported a decrease. The remaining businesses reported no change. Even though 56% of businesses perceived an impact, 65% reported the kind (increase or decrease) of impact.

Table 4 shows perceived change in customer activity and sales by those businesses that perceived an impact, disaggregated by route. Of Chinatown businesses that perceived an impact, 38% perceived a decrease (largest reported decrease on all routes) and 40% perceived no change in customer activity and sales. This finding is consistent with verbal reports about declines in business activity from numerous Chinatown merchants. On all other routes, 31–67% of businesses reported a positive impact.

Of those businesses that were actively involved with SS, majority showed an increase in customer activity and sales with the exception of Excelsior and Western Addition. Interestingly, 100% of businesses in Chinatown that were actively involved experienced an increase in customer activity and sales (See Fig A1).

3.2. Empirical analysis

Table 5 presents ordinary least squares estimation results for Eqs. 1 and 2. According to the first column, looking at the impact of SS alone, there is a positive and statistically significant impact on revenues. Revenue earned by businesses increased by about \$464 on average. In the second column, we report results of Eq. 1 when we add all the business types as control variables. Controlling for business types, SS events continue to have a positive and statistically significant association with revenue. Sporting goods stores do significantly better than other businesses. In the third column, we estimate the full equation (Eq. 1) where we add interaction terms between SS and business types. Adding these additional controls, sporting goods stores show some decline in revenue during SS but still do better compared to other stores. We do a similar exercise using routes (Eq. 2) and report these results in columns 4 and 5. On adding route indicators to account for spatial heterogeneity, the impact of SS on revenue remains positive but ceases to be statistically significant.

To account for spatial and temporal heterogeneity and to get the true event impact, Table 6 reports results from the difference in difference estimation (Eq. 3). Pure effect of SS event still shows a positive revenue impact although it is not statistically significant. A consistent result is that sporting goods stores earn greater revenues compared to other stores.

Results from the fourth model are reported in Table 7 that show that being involved significantly impacts businesses (column 1). Results reported in column 2 of Table 7 show that merchants who were actively involved with the event reported significantly greater impact than those who were only occasionally involved. According to column 3, restaurants, clothing and sporting goods (compared to “other” businesses) report a positive impact that is statistically significant. Mission businesses reported significant impact but the magnitude of impact gradually lessened for subsequent SS events along the same route.

To examine the nature of impact and its causes, we estimated the fifth model and present these results in Table 8. Our findings show that involvement of businesses in the SS event is significantly and positively associated with perceived increase in customer activity and sales and this seems particularly true for restaurants and clothing stores. The implications of these results are discussed in Section 4.

Table 7
Perceived impact of Sunday Streets by level of engagement, by businesses and by routes, marginal probit estimates.

	(1) Impact=yes	(2) Impact=yes	(3) Impact=yes	(4) Impact=yes
Explanatory variables				
Involved	0.19*** (0.05)			
Actively involved		0.23*** (0.06)		
Occasionally involved		0.14** (0.07)		
Restaurants			0.25** (0.12)	
Grocery			0.14 (0.14)	
Gifts			0.03 (0.14)	
Housewares			0.12 (0.22)	
Services			0.08 (0.16)	
Clothing			0.26** (0.11)	
Sporting goods			0.34*** (0.11)	
Specialty goods			0.14 (0.13)	
Bayview				–0.03 (0.17)
Chinatown				0.06 (0.09)
Excelsior				0.03 (0.10)
Mission 1				0.16*** (0.08)
Mission 2				0.12* (0.07)
Western Addition				0.18 (0.13)
Mission pilot				0.21*** (0.07)
Observations	342	342	377	377

Standard errors in parentheses

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.10$.

4. Discussion

This study sought to understand the impact of SS on businesses along five routes by comparing non-event Sundays with event Sundays. Results suggest a modestly positive impact on business activity and revenue (with the exception of Mission 2). Merchants that were actively involved with the event perceived to benefit more compared to those who were not engaged. Feedback from merchants on impact ranged from positive comments (e.g. SS has community and social benefits) to negative comments (e.g. merchants lost business from lack of customer access to street and parking garages) (Zieff and Chaudhuri, 2013). Although revenues were higher on SS Sundays, controlling for other factors, the difference between treatment and control ceased to be statistically significant. We believe that these modest impacts are due to the fact that the routes are different from each other in terms of location, the type of businesses that predominate as well as turnout on each of these routes.

SS is viewed as an event of the community and is strongly supported by residents (Zieff and Kim, 2013). An important purpose of this event is to foster community involvement and our results showed that businesses that were more engaged with the event reported higher customer activity and sales. This suggests that merchants would benefit more if they supported this community goal for SS and strategies for greater involvement in the event would give them a greater pay-off.

In 2012, Sunday Streets SF experimented with multiple events along the same route. Sunday Streets had a bigger impact during the 1st Mission event in terms of additional revenue earned compared to later events along the same route. More businesses were involved and a greater proportion of them reported an impact during this 1st Mission event. However, although revenue was higher for the 1st Mission, a slightly higher proportion of businesses in the 2nd Mission perceived an increase in customer activity and sales. This may be because a larger sample of businesses responded for the 2nd Mission event it could also be due to larger participation at the second event that led to the perceived increase in customer activity and sales which in fact did not reflect in terms of revenue. The successively lower impacts in later events may be attributed to growing customer awareness of businesses in the area. If proximity brings many participants to SS, those living in event neighborhoods may have less need for or interest in shopping or exploring new stores during the events. In addition, advertisements for SS emphasize the health and outdoor benefits, rather than the goal of consumer activity. Because SS is a “free” community event, it may attract participants with less disposable income, and for whom SS would not be viewed as a shopping

Table 8
Impact of level of involvement in the SS event on perceived increase or decrease in customer activity and sales compared to no change, multinomial logit estimates.

	Customer activity and sales	
	Decrease	Increase
Explanatory variables		
Level of involvement	–0.34 (0.25)	0.63*** (0.17)
Restaurants	1.26 (0.81)	1.55** (0.64)
Grocery	1.28 (0.91)	0.94 (0.75)
Gifts	0.72 (0.87)	0.40 (0.71)
Housewares	0.46 (1.39)	0.65 (1.12)
Service	0.89 (0.95)	0.29 (0.83)
Clothing	0.77 (1.04)	1.80** (0.76)
Sporting goods	–12.29 (630.27)	1.22 (0.97)
Specialty	1.41 (0.87)	1.08 (0.71)
Constant	–1.50* (0.78)	–1.30** (0.62)
Observations	333	333

Standard errors in parentheses

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.10$.

opportunity. Community stakeholders and policymakers should consider advertising aimed at improving business involvement and activity if they want to adopt the goal of economic benefit from open streets. The comparison of two Mission events suggests that repeating events too many times along the same route may become successively less beneficial for businesses and that time of year when it occurs (in early summer vs. late summer) may matter.

There are several limitations to this study. Collecting data from merchants three times resulted in survey fatigue. There were some attrition between the pre and the post-data collection (more in repeated events, not so much in single events) but that is why we aggregated pre and post as baseline for all businesses from whom we got event data to avoid any systematic attrition bias. Our study could not break down perceived impacts on customer activity and sales separately as the questionnaire did not ask this question separately. However, we could use the question broadly to represent perceived impact on business activity. We do not have data from merchants along non-SS routes but we overcame that by collecting baseline and event data from at least 2 neighborhoods on same dates to create comparison and treatment groups. If we had collected data from a matched non-SS route as well as from streets just off the SS routes, we could have done a stronger difference-in-difference study to show the true impact of SS as well as spillover impacts. Nevertheless, our study is the first rigorous attempt at estimating the impact of an open streets event on the businesses located on the event routes.

5. Conclusion

Overall, our findings show that SS has a modestly positive impact on businesses along the routes that were studied. These results were strong and robust for all the routes combined. However, results from individual events were varied, perhaps because all the routes were so different in terms of the nature of businesses along each route. The reasons for such variation in impacts across routes would be an interesting topic for further study. Increased pedestrian traffic on these routes and lower vehicular traffic have competing impacts on businesses and may be a cause of the route-level variation in impacts found in this study.

There are also potentially positive spillover impacts, for example, greater public safety, more transportation choices, higher property values, and enhanced community connection, from a program originally intended for improving health behaviors and fostering active lifestyles, that need further investigation. A future study could expand to also estimate the broader, indirect health impacts on the community generated by these events. Additional investigations could explore the long-term impact of customer exposure to local businesses because of SS. Finally, “walkability” of neighborhoods also benefits merchants located near open streets routes generating another kind of spillover benefit that would require additional study.

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Appendix A

Sunday Streets SF Routes, 2012 See Fig. A1.

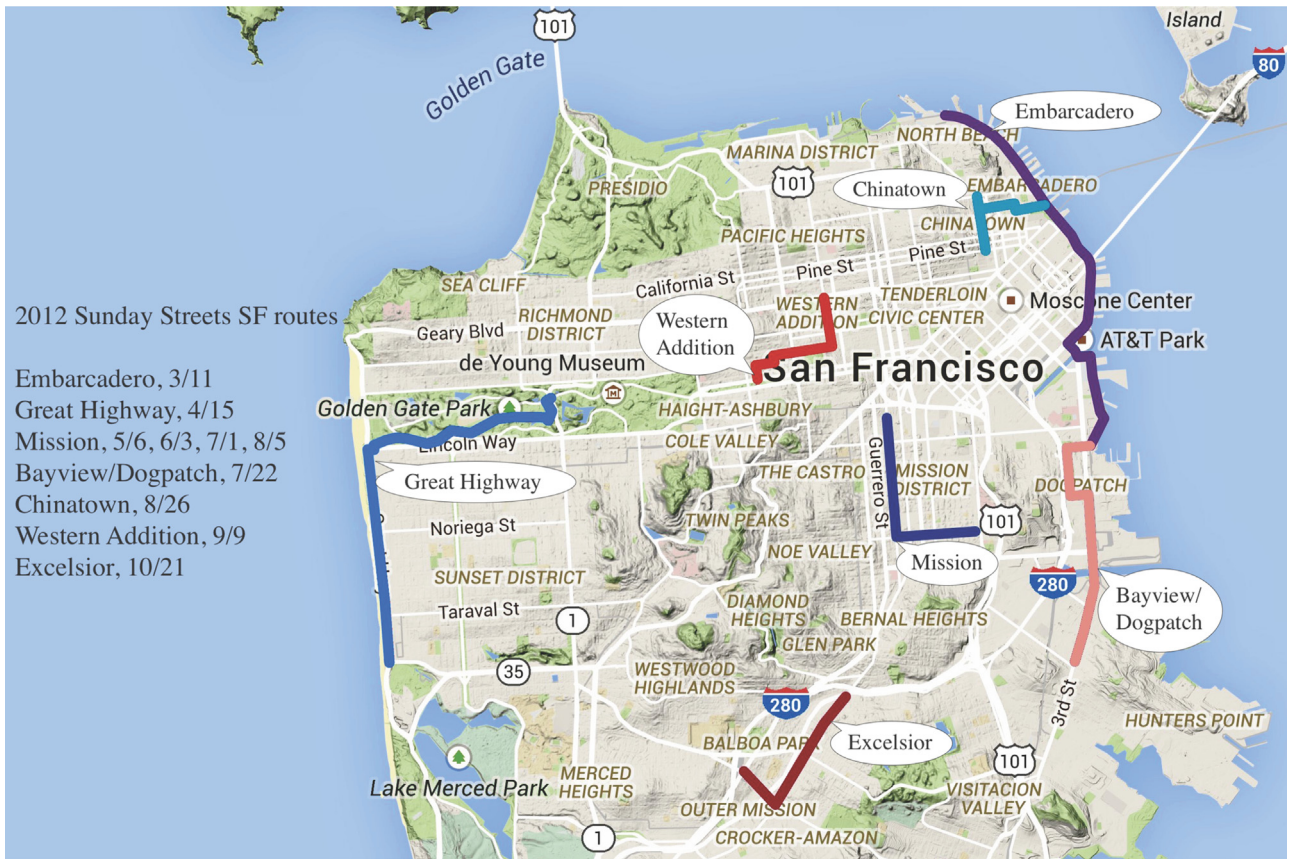


Fig. A1.

Appendix B

Short form survey
Merchant experiences with Sunday Streets

- | | |
|---|--|
| 1. What type of business is this? | 0 Restaurant/cafe
1 Grocery, liquor store
2 Gifts, small household items
3 Housewares (appliances, hardware)
4 Service (e.g. Laundromat, mortuary)
5 Clothing
6 Sporting goods
7 Specialty goods. Please describe:
8 Other. Please describe: _____ |
| 2. How many people came into your store this past Sunday? Date: | 0 0–10
1 11–20
2 21–35
3 36–50
4 More than 50 |
| 3. How many people bought something? | 0 0–10
1 11–20
2 21–35
3 36–50
4 More than 50 |

4. What was your total revenue for this past Sunday? (date) \$ _____

5. How many employees worked this past Sunday? Number: _____

Long form survey

1. What type of business is this? Please circle.

- | | | |
|--|---|-------------------------------------|
| 0 – Restaurant | 4 | Service (e.g. Laundromat, mortuary) |
| 1—Grocery, liquor store | 5 | Clothing |
| 2 – Gifts, small household items | 6 | Sporting goods |
| 3 – Housewares (appliances, hardware) | 7 | Specialty goods. Describe: _____ |
| | 8 | Other. Please describe: _____ |
| 2. How many people came into your store this past Sunday? | 0 | 0–10 |

- | | |
|---|--------------|
| 1 | 11–20 |
| 2 | 21–35 |
| 3 | 36–50 |
| 4 | More than 50 |

3. How many people bought something?

- | | |
|---|--------------|
| 0 | 0–10 |
| 1 | 11–20 |
| 2 | 21–35 |
| 3 | 36–50 |
| 4 | More than 50 |

4. What was your total revenue this past Sunday? (date) \$: _____

5. How would you describe your business's involvement with the Sunday Streets participants and event?

- | | |
|---|--|
| 2 | Active involvement with the participants and the event (e.g. sidewalk sales). Please describe: _____ |
| 1 | Occasional involvement (e.g. use Sunday Streets to promote my business). Please describe: _____ |
| 0 | Limited or no involvement |

6. Did Sunday Streets have an impact on your business?

- | | |
|---|---------------|
| 2 | Yes |
| 1 | No |
| 0 | I do not know |

7. How would you rate the impact of Sunday Streets on your business?

- | | |
|---|---|
| 2 | Increase in customer activity and sales |
| 1 | No change |
| 0 | Decrease in customer activity and sales |

8. How many total employees work here?

Number: _____

9. How many employees typically work on Sunday?

Number: _____

10. How many employees worked during Sunday Streets?

Number: _____

Appendix C

Sunday Streets data collection schedule

	Baseline	Sunday Streets event	Post-event
1. Mission 1, 6/3	May 21	June 4	June 18
2: Bayview/Dogpatch, 7/22	July 10	July 24	August 7
3: Mission 2, 8/5	July 24	August 7	August 20
4: Chinatown, 8/26	August 14	August 28	September 11

5: Western Addition, 9/9	August 28	September 11	September 25
6: Excelsior, 10/21	October 9	October 23	October 30

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