

From Parking to Park

Transportation Impacts & Value of Parklets

Abstract

Parklets are a strategy to convert curb-side parking spaces into public spaces. The reclaiming of valuable parking has garnered considerable attention, and more research is needed. Do parklets impact pedestrian and vehicular travel? What is the value of parklets compared to parking spaces?

This paper examines the impact of parklets on transportation through a case study of the Mission neighborhood in San Francisco. Additionally, the paper values parking and parklets using an Analytic Hierarchy Process approach, highlighting the benefits of parklets beyond the public space component. The emergence of parklets provides a forum to rethink the true costs of parking.

Introduction

Subsidies mask the true cost of parking. As Donald Shoup and others have shown, the oversupply of parking encourages solo driving, increases energy consumption, and creates an auto-oriented urban form. A paradigm shift is needed.

The emergence of parklets provides a forum to rethink the costs of parking. Parklets are a strategy to “convert curb-side parking spaces into new spaces for seating, greenery, and places to gather and stop” (SF Pavement to Parks 2012). The reclaiming of valuable parking spaces to public space has garnered considerable attention.

Current literature on parklets focuses on design and impacts on public space. More research on parklets is needed in terms of their other effects, particularly on transportation. Do parklets impact pedestrian and vehicular travel? What is the value of parklets compared to parking spaces?

This paper tests the hypothesis that parklets, by taking away parking spaces, impacts pedestrian and vehicular travel. The first half of the paper presents a case study of the 900 block of Valencia Street in the Mission neighborhood of San Francisco. The second half values parking and parklets using an Analytic Hierarchy Process approach. This paper highlights the value of parklets beyond the public space component, particularly on transportation effects.

Parklets Case Study: 900 block of Valencia Street, Mission

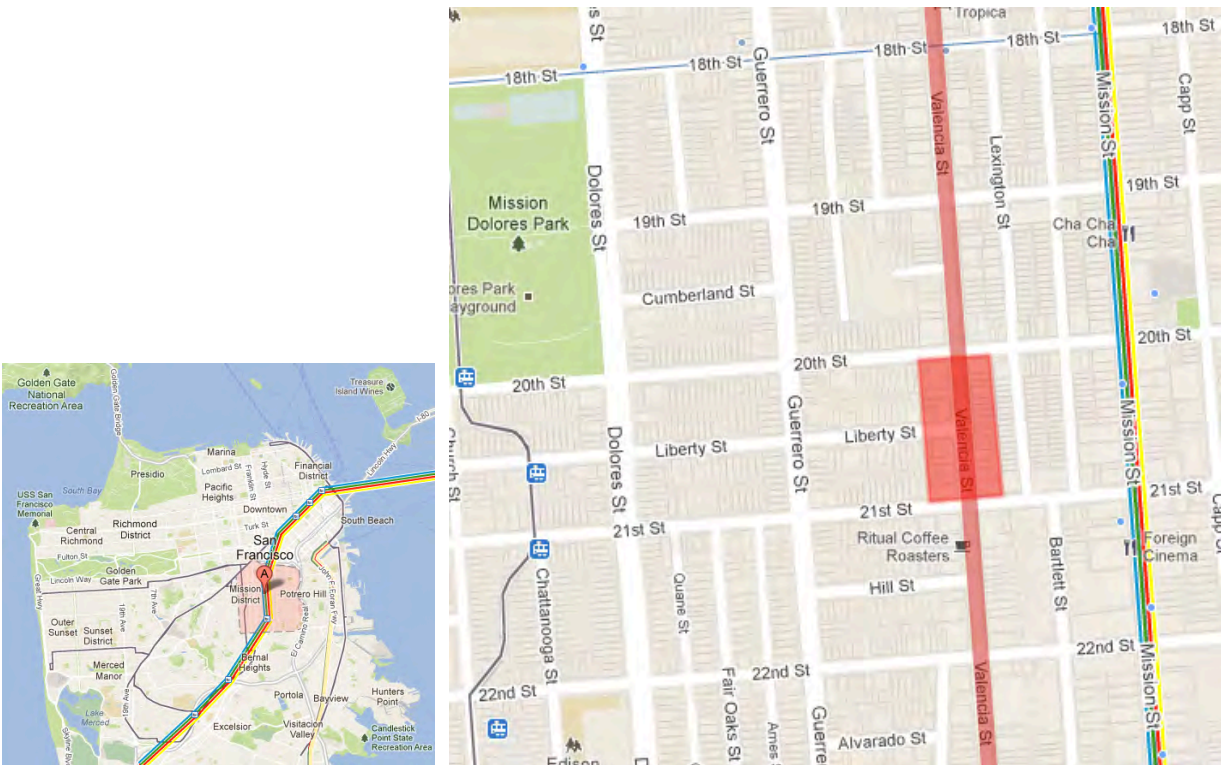
Do parklets impact pedestrian and vehicular travel? A case study of the 900 block of Valencia Street in the Mission neighborhood of San Francisco, provides insight to this question.

Parklets originated in San Francisco in 2005.¹ As of 2012, there are 35 parklets and 6 mobile parklets in the city (SF Pavement to Parks 2012). Valencia Street was chosen as a study area for the availability of parking data through SFPark², and the number of parklets in the community. The paper focuses on the 900 block, between 20th and 21st Streets, which contains three diverse parklets.

¹ On November 16, 2005, San Francisco art and urban design firm Rebar Group installed a small, temporary park between the hours of noon and 2pm in an area of downtown San Francisco that was underserved by public outdoor space. The goal was to “transform a parking spot into a PARK(ing) space, thereby expanding the public

² SFPark is an on-street parking management system that delivers real-time information to drivers on parking choices. SFPark uses dynamic pricing to control for parking, with the goal of providing 15% vacancy per block. The project was piloted in 2010, and in April 2011, real-time parking data was made publicly available. More information is available at www.sfpark.org.

The 900 block of Valencia Street is representative of the area overall. The Mission neighborhood in San Francisco is a destination center for retail, restaurants, and nightlife. Attractions include colorful murals on 18th street, well-regarded establishments like Tartine Bakery, and 826 Valencia, author Dave Egger's nonprofit writing project. The block has a mix of uses: quaint housing, bookstores, vintage clothing shops, three cafes, a few restaurants, specialty shops, and nonprofits including Artists' Television Access and Dolores Street Community Services. Overall, Valencia Street is bustling at all hours, attracting a diversity of people.



Source: Google Maps

Valencia Street is zoned as a “Neighborhood Commercial Transit” (NCT) district, a special zoning designation with relaxed density and parking requirements.³ Valencia Street has narrow sidewalks, as well as bike lanes. The area has good access to transit, with BART on Mission Street and MUNI near Church Street.

³ Density limits and parking minimum requirements are lifted in this corridor to acknowledge the good transit service. The San Francisco Planning Department is looking to eliminate density limits and limited parking controls in some residential areas of the Mission near Mission Street transit.

Pedestrian Travel Effects of Parklets: Observations of Pedestrian Activity

By creating new public space for gathering, parklets may generate additional foot traffic or improve pedestrian flows by providing an extension of the sidewalk. Given time and resource constraints, analysis of the pedestrian travel impacts of parklets was limited to qualitative observations of pedestrian activity. Observations were made on a sunny Monday afternoon (summarized in Table 2).

Qualitative observations revealed that the parklet with seating and table space saw the most use, with bustling pedestrian activity and nearby traffic as people enjoyed street life. The parklet with seating but no tables saw less use, and the parklet with no seating or tables had the least use. These observations reveal a key point: parklets are diverse, and a parklet's location and design affect its pedestrian activity levels. The parklet with seating and table space was most actively used, with bustling pedestrian activity and people stopping to enjoy street life.

San Francisco Great Streets Project's impact study of three parklets provides more insight on pedestrian travel impacts of parklets, with data from pedestrian counts, station activity counts, and pedestrian surveys (San Francisco Great Streets Project 2011). The study found that the number of people engaging in stationary activities (e.g. talking, window-shopping, or eating) significantly increased in all locations, especially on weekdays.

Vehicular Travel Impacts of Parklets: Analysis of Parking Activity

Do parklets, by reducing the number of parking spaces available, affect vehicular travel patterns such as more circling or parking spillover? SFPark occupancy data was used to analyze this question (See Appendix A). For example, one may expect higher occupancy rates on blocks without parklets to account for spillover from blocks with parklets.

Figures 1 and 2 show that no significant difference was found between the two blocks with parklets, and the other Valencia Street blocks without parklets. This may suggest that parklets do not have a significant impact on parking in terms of spillover effects. This result may also be explained by the premise of SFPark, which dynamically prices parking spaces and aims for a 15% vacancy rate per block.

Table 1. Street life & Parklets on 900 Block of Valencia Street, Mission SF



914 Valencia Street



**937 Valencia Street ('Deeplet')
Deepistan National Parklet**



990 Valencia Street

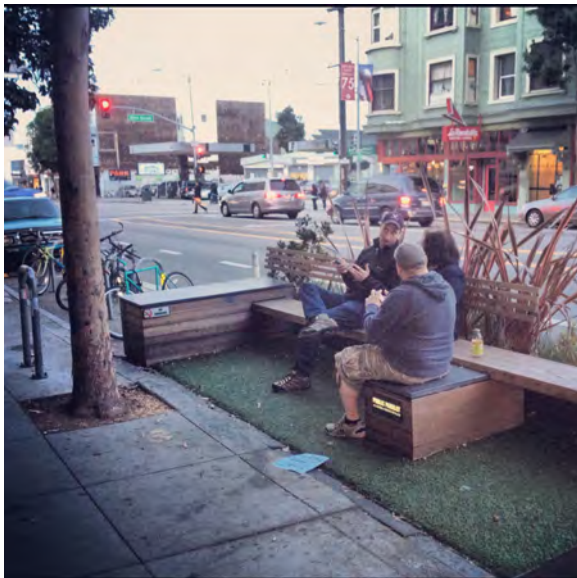


Table 2. Observations of Parklets on 900 Block of Valencia Street, Mission SF


				
914 Valencia Street		937 Valencia Street ('Deeplet') Deepistan National Parklet		990 Valencia Street
Host	Freewheel Bike Shop	Resident Amandeep ('Deep') Jawa		Blue Fig
Opening	March 2011	June 2011		August 2012
Features	Occupies two parking spots: a bike corral with 6 rings, pedestrian seating (wooden benches), plant boxes & grassy turf	Occupies two parking spots. Parklet has lush plant boxes, with a dinosaur plant named "Trixie." No seating available.		Occupies two parking spots. Consists of several plant boxes, raised wooden bar table, makeshift bench, and outdoor patio seating (5 circular tables & 10 chairs)
Usage	Limited to moderate use	Limited use		Moderate to high use
Observations	One person sat for a few minutes to smoke a cigarette. Group of three friends sat down to make dinner plans on their smart phones before wandering further. 5 of 6 racks occupied in bike corral.	Little to no use; mostly for aesthetics. However, the Deeplet has an active Facebook page and has played host to neighborhood events like Election Night viewing and Shakespeare in the Parklet.		Most active parklet with many uses. [1] As spaces for lingering and waiting: one young man reading smart phone, waiting for friend shopping at After Life; one elderly man smoked a cigarette. [2] As places to gather or work: one man in business attire with bike, working on laptop for 1+ hour; group of friends engaged in deep conversation, one with a coffee from Ritual. [3] For pleasure: Two ladies enjoying meals. Two men chatted over coffee.
Additional	Freewheel: "Maybe we have a bias but it seems that the parklet is doing more for the community as a whole than a parking space ever did" (Freewheel 2011).	From Amandeep's website: Parklet is "presented as a small gift to the community and a modest contribution to environmentally-friendly urban design" (Jawa 2011).		It is worth noting that Blue Fig, in addition to its indoor space, has two sidewalk tables outside and large backyard patio. These were not used, suggesting people wanted to be in the parklet. The owner spoke positively of the parklet.

Figure 1. Weekday Parking Occupancy on Valencia Street by Block

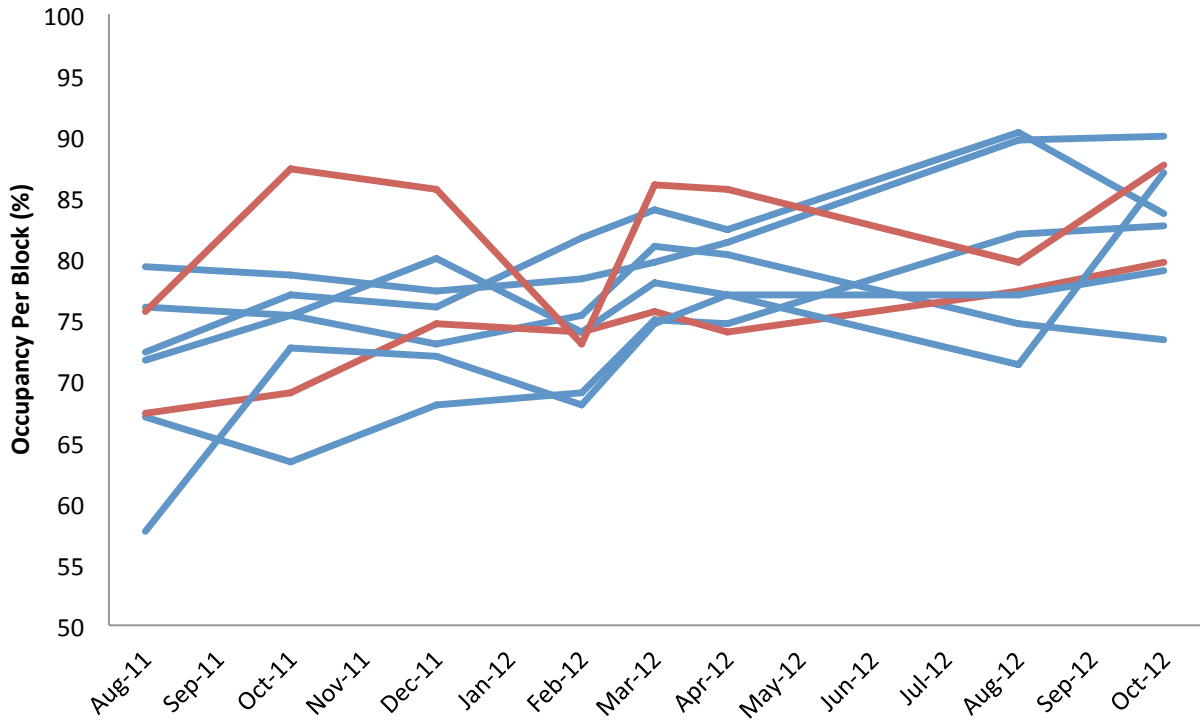
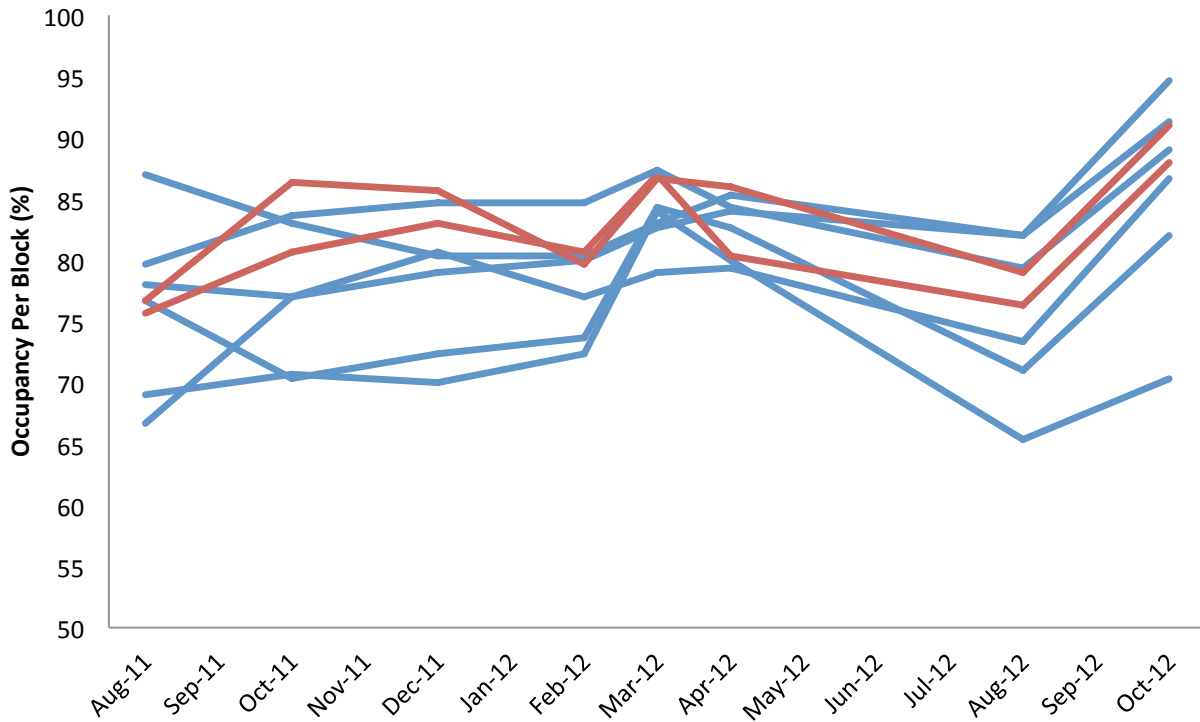


Figure 2. Saturday Parking Occupancy on Valencia Street by Block



Note: Red indicates 900 and 1100 blocks of Valencia Street, with parklets;
Blue indicates other Valencia Street blocks without parklets. See Appendix A.

Value of Parklets & Parking: Analytic Hierarchy Process Approach

What is the value of a parklet compared to a parking space? Using SFPark, SFCTA, and SFMTA data, the value of two parking spaces in the Mission has an estimated value of \$9,327.82 (See Appendix A).

Table 3. Value of Parking Spaces in the Mission

Description	Estimate (in annual \$, per parking space)
Parking meter revenue	6,273.28
Parking citation revenue	288.63
Total revenue	6,561.91
Operations & maintenance	494
Environmental & indirect	1,404
Total costs	1,898
Net benefit	4,663.91
Total benefit for 2 spaces	9,327.82

The city collects \$1,632.50 from a parklet application occupying two spaces, and those proposing a parklet spend approximately \$25,000 in design and installation.⁴

Table 4. Parklet Application Costs⁵

Description	Fees \$
Base fee for application	791
Parking meter removal (up to two)	650
Inspection before and after installation	191.50
Total cost of parklet (2 parking spaces)	1,632.50
Yearly renewal	221
Additional base fee for each parking stall beyond first two	285
Additional fee for each additional meter removal beyond first two	325

This suggests that the city is willing to forgo approximately \$7,500 annually for the parking space in favor of a parklet. The question remains: do other factors, like social and environmental benefits of parklets, meet or exceed this \$7,500 value? These factors are difficult to quantify, but an analytic hierarchy process (AHP) approach provides insight to other values of parklets. AHP is a structured

⁴ The diversity of parklets contributes to the range of costs in providing parklets. A parklet in Philadelphia cost \$11,000, while a parklet in Long Beach cost \$25,000. The \$25,000 figure is a conservative estimate from UCLA's Complete Streets Initiative. The authors acknowledge that the price tag can be intimidating at first, but previous examples show that costs can be lowered through in-kind donations, pro-bono hours from designers, and volunteers for the installation phase. Additionally, some businesses have gained support from private foundations and online fundraising sites like Kickstarter. (UCLA Complete Streets Initiative 2012)

⁵ Parking application costs taking from San Francisco Planning Department's 2011 Call for Proposals. At the time of writing, 2012 figures were not available.

decision-making technique using ratio scales from paired comparisons. Developed by Saaty in the 1970s, AHP can be used to compare the relative costs and benefits of transportation alternatives.⁶

The following is a modified, hypothetical AHP model, applied to four alternatives: (1) no parklet (2) parklet primarily as green space, such as the Deeplet (3) parklet with seating, like the Freewheel Parklet and (4) parklet as gathering space with seating and tables, like the Blue Fig Parklet. The benefits and costs were identified from existing literature of parklets.

Table 5. AHP Sample Survey of Relative Benefits

Benefits	Alt. 1: No Parklet	Alt. 2: Parklet as Green Space	Alt. 3: Parklet with Seating	Alt. 4: Parklet as Gathering Space	Weighted Score (1-5)
Economic					
Property Values	4	3	3	4	4
Business Patronage & Tourism	2	2	3	4	3
Social					
Attractive space & community character	1	4	4	5	4
Pedestrian activity and neighborhood interaction	2	2	4	5	3
Enhanced streetscape	1	5	5	5	4
Environmental, Health & Transportation					
Reduce urban stormwater	1	3	2	2	3
Encourage walkability	2	3	3	3	3
Traffic calming & increases safety	1	3	3	3	4
Improve pedestrian flow	1	3	4	4	3
Other					
Cleanliness	2	3	3	3	2
Open Space (extra sidewalk space)	1	3	3	3	2
Composite Benefits Score	58	111	120	134	

⁶ AHP approach adapted from Carrie Makarewicz's unpublished paper "An Alternative Prioritization Tool for Transportation related Environmental Impact Statements: Analytic Hierarchy Process" (Spring 2007).

Table 6. AHP Sample Survey of Relative Costs

Costs	Alt. 1: No Parklet	Alt. 2: Parklet as Green Space	Alt. 3: Parklet with Seating	Alt. 4: Parklet as Gathering Space	Weighted Score (1-5)
Economic					
Revenue from parking	1	5	5	5	5
Parking/unloading spaces for visitors & businesses	1	5	5	5	3
Social					
Noise	2	3	3	4	2
Trash	2	2	2	2	2
Attract incivilities	2	3	3	4	2
Environmental, Health & Transportation					
Sidewalk crowding	2	2	2	2	2
GHG emissions	4	2	2	2	4
Air quality & other environmental	4	2	2	2	4
Health & obesity	4	2	2	2	3
Composite Costs Score	68	82	82	86	

Table 7. Comparison of AHP Ranks to Benefit-Cost Scores

	Alt. 1: No Parklet	Alt. 2: Parklet as Green Space	Alt. 3: Parklet with Seating	Alt. 4: Parklet as Gathering Space
Benefits	58	111	120	134
Costs	68	82	82	86
Benefits:Costs	0.85	1.35	1.46	1.56

These results suggest that the benefits of building a parklet is higher than not building a parklet, and that a parklet as a gathering space may have more benefits than the other types of parklets. Ideally, key stakeholders like community members, pedestrians, drivers, and others would be surveyed to provide average weights and values; the following weights and values assigned may be subject to some bias. Additionally, parklets may confer more benefits than others depending on location and design; there may also be a saturation point for the number of parklets per block. Nonetheless, the AHP framework provides a good starting point for the valuation of parklets.

Conclusion

Underpricing a resource leads to its exploitation (Moore, Thorsnes and Appleyard 2007). With abundant free parking, automobile use is encouraged and consumes more energy and increases traffic congestion (Wilson 1995). Chester, Horvath and Madanat suggest that the environmental cost of parking infrastructure sometimes equals or exceeds the environmental costs of the vehicles themselves (Chester, Horvath and Madanat 2011). Donald Shoup's *High Cost of Free Parking* details the significant costs of parking.

This paper studied parklets as a phenomena taking away parking spaces. The case study highlighted transportation impacts of parklets. Parklets were found not to have significant impact on vehicular travel, further supporting that parking is abundant. The design and location of parklets will affect pedestrian travel; parklets with seating and tables are more likely to see increased foot traffic or stationary activities than those without. The AHP method shows that a parklet can confer significantly more societal benefits than two parking spaces – especially the parklets as gathering space.

Parklets are a new phenomena and more research is needed, especially on its long-term transportation impacts. The emergence of parklets provide a forum to rethink the true costs of parking.

References

- Chester, Mikhail, Arpad Horvath, and Samer Madanat. "Parking infrastructure and the environment." *Access*, no. 39 (2011): 28-37.
- Dumbaugh, Eric, and W. Li. "Designing for the safety of pedestrians, cyclists, and motorists in urban environments." *Journal of the American Planning Association* 77, no. 1 (2010): 69-88.
- Freewheel. *Parklet*. San Francisco, 2011. <http://www.thefreewheel.com/?p=108> (accessed 11 2012).
- Iseki, Hiroyuki, Michael Smart, Brian D. Taylor, and Allison Yoh. "Thinking outside the bus." *Access* 40 (2012): 9-15.
- Jawa, Amandeep. *Deepistan National Parklet*. San Francisco, 2011. <http://www.deeplet.org> (accessed 11 2012).
- Litman, Todd Alexander, and Eric Doherty. *Transportation Cost and Benefit Analysis: Techniques, Estimates and Implications*. Policy Guidebook, Victoria Transport Policy Institute, 2011.
- Manville, Michael, and Donald C. Shoup. "People, parking and cities." *Access*, no. 25 (2004): 2-8.
- Moore, Terry, Paul Thorsnes, and Bruce Appleyard. "Efficient pricing of highway transportation; Pricing parking; and Pricing auto emissions." In *The Transportation/Land Use Connection*, by Terry Moore, Paul Thorsnes and Bruce Appleyard, 92-109. Chicago: American Planning Association, 2007.
- Ocubillo, Robin Abad. "Experimenting with the Margin: Parklets and Plazas as Catalysts in Community and Government." Masters Thesis, University of Southern California, Los Angeles, 2012.
- Rebar Group. *Portfolio: Parking*. 2012. <http://rebargroup.org/parking/> (accessed 11 2012).
- San Francisco County Transportation Authority. "On-Street Parking Management and Pricing Study." Final Report, San Francisco, 2009.
- San Francisco Great Streets Project. "Parklet Impact Study." Study, San Francisco, 2011. http://sfgreatstreets.org/wp-content/uploads/2012/01/Parklet_Impact_Study.pdf (accessed 11 2012).
- San Francisco Municipal Transportation Agency. "FY 2013 and FY 2014 Adopted Operating Budget." Budget Report, San Francisco, 2012.
- SF Pavement to Parks. *Pavement to Parks*. 2012. <http://sfpavementtoparks.sfplanning.org/> (accessed 11 2012).
- Shoup, Donald C. "The trouble with minimum parking requirements." *Transportation Research Part A: Policy and Practice* 33, no. 7-8 (1999): 549-74.
- Shoup, Donald. *The High Cost of Free Parking*. Chicago, IL: American Planning Association, 2011.
- UCLA Complete Streets Initiative. *Reclaiming the Right of Way: A Toolkit for Creating and Implementing Parklets*. LA: Luskin School of Public Affairs, 2012.
- Wilson, Richard W. "Suburban parking requirements: A tacit policy for automobile use and sprawl." *Journal of the American Planning Association* 61, no. 1 (1995): 29-42.

Appendix A: Analysis of SFPark Data

The 500 to 1200 blocks (8 blocks) were included in the SFPark data analysis. The 900 block contains three parklets, and the 1100 block contains one parklet. The other blocks do not contain parklets.

Blocks	# of Parking Spaces	Parklet?
Valencia St 500	36	No
Valencia St 600	25	No
Valencia St 700	31	No
Valencia St 800	30	No
Valencia St 900	27	Yes - 3
Valencia St 1000	30	1 TBA
Valencia St 1100	23	Yes - 1
Valencia St 1200	40	No

Average occupancy was calculated by taking the average occupancy for weekdays and weekends, multiplied by the number of parking spaces.

Appendix B: Cost of a Parking Space

What is the cost of a parking space? This question has no easy answer since the cost of parking depends on land values, which varies greatly among sites (D. C. Shoup 1999).

The cost of a parking space was estimated in the Mission neighborhood of San Francisco by finding the revenue (from meters and citations) and costs (operations, maintenance, environmental, and other).

Estimated Value of a Parking Space in the Mission, San Francisco

Description	Estimate (in annual \$)
Parking meter revenue	6,273.28
Parking citation revenue	288.63
Total revenue	6,561.91
Operations & maintenance	494
Environmental & indirect	1,404
Total costs	1,898
Net revenue	4,663.91

SFPark data was used to calculate the parking revenue generated by the meter. For the 900 Valencia Street block, parking meter rates range from \$1.50/hr to \$4.00/hr as of October 2012. Rates apply 9am to 6pm Monday through Saturday. The following calculations were made:

$$\frac{\text{Average weekday price/hour} * \text{Hours charged per day} * \# \text{ of parking spaces} * \text{Occupancy rate}}{\# \text{ of parking spaces}}$$

$$= \frac{2.67 * 9 * 33 * .7967}{33}$$

= \$18.98 per parking space per weekday

$$\frac{\text{Average weekend price/hour} * \text{Hours charged per day} * \text{\# of parking spaces} * \text{Occupancy rate}}{\text{\# of parking spaces}}$$

$$= \frac{3.25 * 9 * 33 * .88}{33}$$

= \$25.74 per parking space on Saturdays

So, multiplying by 6 days per week and 52 weeks per year, each parking space on the 900 Valencia Street block generates approximately **\$6,273.28 annually** in parking meter revenue.

Revenue from parking does not solely come from parking meters. A substantial sum comes from parking violations and citations. Using data from SFMTA's FY 2013 and FY2014 Adopted Operating Budget, and SFCTA's 2009 On-Street Parking Management and Pricing Study, the following estimate was made for parking citation revenue per parking space. It is worth noting that some parking spaces may be more subject to violations than others.

$$\frac{\text{Parking citation revenue} + \text{boot program revenue}}{\text{On-street spaces} + \text{parking garage spaces} + \text{metered lots}}$$

$$= \frac{95,772,024 + 966,000}{320,000 + 14,575 + 591}$$

= \$288.63 annual citation revenue per parking space

Total revenue generated per parking space from meters and citations is \$6,561.91 annually.

Parking spaces also cost money to maintain and operate, from cleaning the spaces to collecting and enforcing the fees. They may also require resurfacing and repaving every 5-10 years. A 1996 survey of commercial operating expenses from the Institute of Transportation Engineers estimates approximately **\$494 in operations and maintenance fees** annually per parking space (Litman and Doherty 2011).

As Donald Shoup and others have suggested, parking should include other costs such as congestion and pollution costs. Shoup estimates approximately **\$1,404 in environmental and indirect costs** annually per parking space. He assumes 83 one-way trips per month per space, totaling 727 vehicle miles (D. Shoup 2011).

Total costs of providing a parking space can be thought in terms of its operations, maintenance, environmental, and other indirect costs. It is worth noting that this is a conservative estimate and subject to the variability in maintenance, environmental, and other costs. Using the above estimates, **total cost of providing a parking space is approximately \$1,898 annually.**

The total net benefits generated for a parking space is approximately \$4,663.91. The typical parklet takes up two parking spaces, so the net benefit forgone is approximately \$9,327.82.