

1 **BIKESHARE AND EQUITY IN BERKELEY, CA**

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1 ABSTRACT

2 Bikeshare programs are becoming increasingly popular in cities around the United States.
3 However, there are concerns that they do not provide equitable access across socioeconomic or
4 racial/ethnic groups. Even though equity concerns are widely acknowledged in the literature and
5 among practitioners, there is a gap in data on how low-income communities use (or don't use)
6 bikeshare and on the seemingly conventional metrics that deprioritize access for lower-income
7 neighborhoods. Given that Berkeley, Oakland, and Emeryville are launching bikeshare programs
8 in 2016 as an expansion of Bay Area Bike Share, this research sought to better understand
9 Berkeley residents' attitudes about bicycling and bikeshare; to identify location and financial
10 barriers to a future system; and to analyze these data across different sociodemographic groups.
11 An intercept survey was conducted at a rapid transit station near lower-income neighborhoods of
12 Berkeley. Results indicated that low-income and high-income respondents have a similar level of
13 interest in using Berkeley bikeshare and having a bikeshare station located in their neighborhood
14 or near their home. Station location is the factor that respondents report being most important in
15 making it more or less likely that they will use bikeshare in the future. Cost and the ability to use
16 a credit card are the next most important factors. The results also indicated that access to a credit
17 card and the internet are not significant barriers to utilizing bikeshare. Finally, the study found
18 that White Alone, non-Hispanic respondents are far more likely to have heard of bikeshare
19 before the survey than non-White respondents.

1 INTRODUCTION

2 Bikeshare programs have become increasingly common in the U.S., with 22 systems claiming
3 over 884,000 users around the country as of 2012 (1). The number of systems more than doubled
4 since then, according to a count by the Pedestrian and Bicycle Information Center, and include
5 large systems like Boston Hubway, New York Citibikes, Seattle Pronto, and Bay Area Bike
6 Share (2). While these bikeshare programs have proven popular, some have argued that they do
7 not provide equitable access across socioeconomic or racial/ethnic groups.

8 Bikeshare programs around the country are aware of this critique and seem to be
9 concerned about equity, yet there is a gap in data on how low-income communities use (or don't
10 use) bikeshare and on the seemingly conventional metrics that deprioritize access for lower-
11 income neighborhoods. It is important to try to fill this gap in order to better serve low-income
12 populations.

13 Berkeley, Oakland, and Emeryville are launching bikeshare programs next year as an
14 expansion of Bay Area Bike Share. These cities are just beginning the strategic planning process
15 to determine key details of the programs, including where and how far apart to place stations and
16 how to implement payment. Equity, along with economic and environmental considerations, is a
17 key concern for those making these decisions.

18 RESEARCH QUESTION AND HYPOTHESES

19 The fact that Berkeley is beginning its strategic planning process presented a unique opportunity
20 to help fill the equity data gap. Therefore, through this research, we sought to better understand
21 Berkeley residents' attitudes and perceptions about bicycling and bikeshare; to identify location
22 and financial barriers to a future system; and to analyze these data across different
23 sociodemographic groups.

24 We hypothesized that in Berkeley, the lower-income neighborhoods that are similar to
25 those typically underserved by bikeshare systems are indeed suitable for bikeshare, and that
26 residents of these neighborhoods would take bikesharing trips for utilitarian purposes, including
27 commuting to work/school and running errands. We also hypothesized that common verification
28 steps, including the use of a credit card and signing up for an online membership, may be
29 especially large barriers to using bikeshare for lower-income individuals.

30 LITERATURE REVIEW

31 Bikesharing systems provide short-term bicycle access to individuals on an "as-needed" basis,
32 usually for less than an hour at a time, as a point-to-point transit option (1, 3). Each bikeshare
33 system has slightly different rules for accessing a bike, but many cities require signing up for a
34 yearly membership online or paying by credit/debit card. A few systems, such as Capital
35 Bikeshare in D.C., let you pay by cash, and others enable payments in monthly installments, such
36 as Capital Bikeshare and Boston Hubway, though these options are not common.

37 While some perceive bikeshare systems as being catered mainly to tourists, the data
38 suggest that users are taking trips on bikeshare for largely utilitarian purposes. A 2012 survey of
39 users of four North American systems found that the most common purpose for bikeshare trips
40 was for travel to work or school; social/entertainment and running errands are two other common
41 purposes (1). Therefore, there could be a market within bikeshare programs for low-income
42 individuals.

43 The demographic profile of bikeshare users is skewed on multiple accounts—by income,
44 race, and educational attainment. In the same survey of users in four North American cities,

1 Shaheen et al. found that nearly 80% are Caucasian and that 85% are college-educated (1).
2 Another study found that only 2% of Capital Bikeshare members are Black/African-American,
3 compared to 50% of the population of Washington, D.C. (4). Additionally, a 2014 study of user
4 impacts of bikeshare programs found that low-income bikeshare members are under-represented
5 in the population, while high-income members are over-represented (5). A CityLab analysis of
6 this study found that “bikeshare membership has a tipping point of roughly \$50,000 in household
7 income” (6). Further, a London study found that bikeshare members were more likely to live in
8 affluent areas, but that when controlling for greater bikeshare station density in these areas, those
9 in less affluent areas use bikeshare more often (4).

10 Early spatial analysis of station location suitability by the City of Berkeley and City of
11 Oakland has focused on current bike commute share, distance from BART, retail/employment
12 density, and distance from the existing bicycle network; this analysis concludes that West
13 Oakland, West Berkeley, and large areas of East Oakland are relatively unsuitable for bikeshare
14 stations. A similar study, which generated a model to determine spatial suitability for expansion
15 of Capital Bikeshare using data from existing ridership, found that non-White population
16 prevalence was negatively correlated to suitability (7). Both data-driven attempts to determine
17 where to place new stations suggest that low-income, non-White neighborhoods are less suitable
18 locations for bikeshare.

19 There seems to be general agreement that bikeshare systems should make a greater effort
20 to promote equity. Systems across the country are implementing or planning to implement a
21 wide range of measures to promote equity, including station siting in low-income communities
22 and providing assistance in overcoming financial barriers (8). For example, Philadelphia has
23 made equity a primary focus of its recently launched bikeshare system. The City’s bikeshare
24 business plan has an explicit Social Equity Strategy, which includes strategies for overcoming
25 key barriers to lower-income people using bikeshare, such as station location, system access and
26 verification, cultural barriers, and cost barrier to entry (9). As of May 2015, Philadelphia placed
27 20 out of its 70 initial bike share stations in low-income neighborhoods (10). The City also
28 partnered with the Temple University Institute for Survey Research to organize a focus group of
29 nearly 60 residents from low-income neighborhoods to discuss how to make bikeshare accessible
30 to all residents (10).

31 Chicago is also taking steps to incorporate equity into its bikeshare system. The City is
32 launching the “Divvy for Everyone” program, which will offer a one-time annual membership to
33 low-income residents for \$5 rather than the standard \$75 fee (11). Applicants must sign up in
34 person, which is intended to minimize confusion associated with signing up online. Boston also
35 has a program offering \$5 subsidized memberships and has been conducting outreach to low-
36 income communities since its program’s inception. Conversely, Minneapolis’ attempt to expand
37 to low-income areas yielded limited success despite prior evidence that community members had
38 positive views on bikesharing, and found that “simply installing kiosks in a low-income area is
39 not sufficient to increase residents’ use of bike share” (12). However, there is little literature on
40 the effectiveness of expanding bikeshare in low-income neighborhoods, as bikeshare equity has
41 only recently come to the forefront.

42 The Institute for Transportation and Development Policy report lists several barriers to
43 shared-ride mobility for low-income households, including structural issues (physical and
44 logistical access), financial issues (user costs and bank account access), and informational and
45 cultural barriers (3). A report from the National Association of City Transportation Officials
46 notes that no matter the sociodemographic composition of a neighborhood, station density is key:

1 “systems that have lower station density in low-income neighborhoods often exacerbate equity
2 issues, as stations are too far apart to provide a real transportation option for low-income riders”
3 (13).

4 5 **RESEARCH APPROACH AND METHODOLOGY**

6 In order to address our research questions, we conducted 3 interviews with bikeshare
7 professionals—Kara Oberg, City of Berkeley Bikeshare Coordinator; Darren Buck, Bicycle
8 Program Specialist at D.C. Department of Transportation; and Heath Maddox, Transportation
9 Planner at San Francisco Municipal Transportation Agency. The interviews addressed perceived
10 barriers to low-income people using bikeshare, challenges to providing bikeshare to low-income
11 communities, and potential solutions to these barriers and challenges. Additionally, we
12 developed and administered a pilot intercept survey to 86 individuals at the Ashby BART station
13 and adjacent flea market. It addressed current bicycling behavior and perceptions, attitudes
14 towards use of bikeshare in the future, possible barriers to bikeshare, and basic demographic
15 information, such as income, race/ethnicity, age, and residential location.

16 There is no comparable data collection being done by the City of Berkeley on bikeshare.
17 While an upcoming street design survey commissioned by the City of Berkeley plans to ask one
18 question about potential bikeshare use, we felt this was inadequate. Therefore, we coordinated
19 with the City of Berkeley’s bikeshare coordinator in designing the pilot intercept survey. The
20 City would like to use our findings to inform its planning efforts and to serve as a foundation for
21 additional research.

22 We decided to survey at the Ashby BART station for several reasons. Firstly, since we
23 were working with the City of Berkeley, we wanted to survey within Berkeley (as opposed to
24 Oakland or Emeryville). Secondly, this BART station serves South and West Berkeley, which
25 are both Metropolitan Transportation Commission (MTC) “Communities of Concern” and have
26 higher proportions of African Americans and Hispanic/Latinos than Berkeley overall. Finally,
27 this is an area that the City of Berkeley’s early spatial analysis for station suitability found to be
28 less suitable.

29 Our approach to sampling was to stop everyone possible in the flea market and at Ashby
30 BART, though we only targeted people leaving the BART station; we did not think people
31 rushing to catch a BART train would be as willing to speak with us. We decided not to screen
32 people based on their income or race because we thought collecting a broad range of responses
33 would be helpful for comparison and for future analysis by the City. That said, when a BART
34 train arrived and there was a large influx of people, we targeted non-Whites. Also, towards the
35 end of our data collection, we targeted women, as our respondents to date were predominantly
36 male.

37 Survey data were primarily analyzed using chi-square tests. In order to compare Likert-
38 scale variables (i.e. questions asked on a 1-5 scale) across groups, we created binary variables
39 between respondents that answered “4” or “5” versus those that responded “1”, “2”, or “3”. To
40 compare results by income, we use a binary variable with \$50,000 annual household income as a
41 cut-off. This was an appropriate cutoff for our data because it is relatively close to median
42 household incomes in census tracts near our survey location, and other studies identify \$50,000
43 annual household income as the “tipping point” below which bikeshare use tends to be less
44 common (6).

1 INTERVIEW FINDINGS

2 This section describes themes that emerged from the three interviews with bikeshare
3 professionals, and it summarizes interviewees' views on barriers to bikeshare in low-income
4 neighborhoods and potential solutions.

6 **Barriers to Low-Income Individuals Using Bikeshare**

7 Interviewees identified station location as a key barrier to low-income individuals using
8 bikeshare. They agreed that bikeshare is not typically placed in low-income neighborhoods for a
9 variety of reasons that vary across cities. Some reasons mentioned include the low density of
10 low-income neighborhoods in some cities, a lack of existing bicycle infrastructure, a perceived
11 lack of interest in bikeshare in low-income neighborhoods, and a perception that bikeshare in
12 those neighborhoods may not be financially sustainable. Darren Buck mentioned that in D.C.,
13 bikeshare is usually placed in high-density, mixed use locations to ensure high ridership, and
14 low-income communities are often in outlying areas with lower population density that is
15 residential-only. Thus, "it becomes a self-fulfilling prophecy because the demand for station
16 hardware is in busier areas" (Darren Buck, personal communication, 2015, unpublished data).
17 Also, public transit networks are already established and have an existing customer-base, so
18 transit is somewhat of a competitor. Heath Maddox noted that "bikesharing has an equity
19 problem. I think to a certain extent, it's exacerbated by station placement, but it's not a simple
20 nut to crack. Station placement [alone] won't fix it" (Heath Maddox, personal communication,
21 2015, unpublished data); many other barriers are contributing to unequal access to bikeshare,
22 which are outlined below. Maddox's statement echoes the findings of Stewart et al. that
23 expanding bikeshare stations to low-income neighborhoods in Minneapolis was not a sufficient
24 intervention for increasing use.

25 The cost and payment options are other potential barriers to low-income individuals using
26 bikeshare. There was no consensus among our interviewees about the extent to which price is a
27 barrier. Some felt this was a significant barrier, and others felt price is often overstated and that
28 there are larger barriers to access. Similarly, there were mixed opinions on the extent to which
29 requiring payment via credit card is a significant barrier. All three interviewees mentioned credit
30 card access as a potential barrier, as low-income individuals may not have credit cards, but
31 Maddox and Buck both mentioned that this has not proven to be as large of a barrier as expected.
32 However, all interviewees mentioned that paying for a full year membership up front (typically
33 \$75-100) may be a big request for lower-income households, especially if they are not
34 predisposed to ride a bike. Many people budget on a monthly instead of annual basis. All
35 interviewees mentioned that monthly installments or waived fees are options to consider. Oberg
36 mentioned studies that have shown that people are actually willing to pay more annually if
37 charged on a month-to-month basis (Kara Oberg, personal communication, 2015, unpublished
38 data).

39 Additionally, resistance to change is another potential barrier. Change tends to have a
40 negative connotation in low-income, minority communities, as change has not historically
41 benefitted the community. Buck mentioned that it is a perception issue. "[Bikeshare has] plopped
42 down stations in neighborhoods without much notice. There could be a perception that bikeshare
43 is a system that goes along with other changes not beneficial to low-income communities" (Buck
44 2015).

45 Finally, cultural prejudices are a potential barrier to low-income bikeshare use. While this
46 can vary a lot from neighborhood to neighborhood, interviewees noted a stigma against biking.

1 The car is often seen as a status symbol, so bicycles are not viewed as a legitimate mode of
2 transportation. People that use bikeshare tend to be people who have a car and just choose to use
3 bikeshare. Many people that could benefit more from bikeshare and don't have a car are saving
4 to get a car. As Maddox pointed out, "yes, we need to address equity in cycling, but we also need
5 to build bicycling culture outside the realm of bike coalition members. That's something that's
6 beyond the scope of any bikesharing program" (2015).

7 8 **Challenges to Providing Bikeshare in Low-Income Communities**

9 All three interviewees raised outreach and marketing as a fundamental challenge. It is essential
10 to get the word out about bikeshare, but there are many challenges associated with this. First and
11 foremost, "it is time intensive, and time comes down to money." And oftentimes, there is little to
12 no budget for marketing. Also, to be effective, outreach should be done in multiple languages,
13 which takes more time and money. The default approach tends to be social media, but not
14 everyone uses social media. Maddox pointed out, "The kind of marketing you'd do in lower
15 income communities is more like community organizing...[This requires a certain] skill set.
16 People in public health are better about developing those ties" (Maddox 2015).

17 Another key challenge is that there is no universal definition for equity. 20% of stations
18 in Berkeley are supposed to be placed in "Communities of Concern," according to MTC's
19 definition, but Kara Oberg argued that this definition allows for some ambiguity. UC Berkeley
20 technically qualifies as a community of concern, so Oberg pointed out that this requirement
21 could be fulfilled by only providing stations there.

22 One difficulty is that bikeshare systems have competing goals. If the goal of a bikeshare
23 system is to make money, providing bikeshare in low-income communities may not be
24 economically feasible. If equity is a goal, it makes more sense to provide bikeshare in these
25 communities. In general, the expectation is that bikeshare stations located in low-income areas
26 will generate less money due to less use, requiring fundraising to pay for them, but it is not a
27 given that low-income stations are going to see less use (Maddox 2015).

28 Further, many bikeshare systems are expected to be self-sufficient, which can be
29 problematic from an equity perspective. Maddox pointed out that bikeshare is currently expected
30 to pay for itself, which factors into the decision-making process about station location. Buck
31 argued that bikeshare programs "need to figure out how to adapt the existing model to suit the
32 particular needs of low-income communities" (Buck 2015).

33 Finally, the technology for administering bikeshare is complex, so changing the system is
34 challenging. Several bikeshare programs have considered or are considering a "smart card"
35 payment option, including D.C. and Berkeley, but there are many complications. Buck noted that
36 the technology for getting the bikeshare key fob and smart card to talk to each other is
37 complicated, which is why D.C. is moving toward an "open pay" system where users can tap
38 their smartphone or chip credit card for payment.

39 40 **Potential Solutions**

41 Bikeshare's marketing strategy needs to be revamped, according to interviewees. A more robust
42 outreach approach that goes beyond social media is essential. Buck argued that bikeshare
43 programs need to get away from traditional messages targeting "young, hip white people aged
44 25-34." In that regard, all three interviewees emphasized the importance of partnering with local
45 organizations. Local nonprofits, social service agencies, and low-income housing providers have
46 existing relationships with communities, so getting the word out about bikeshare and learning

1 about the community's perception about bicycling through a trusted member of the community is
2 advantageous. It has been successful in the past.

3 To address the financial barriers, bikeshare systems could offer various payment options.
4 Allowing monthly payments and the ability to pay in cash or via a pass purchased at stores like
5 Walgreens could reduce financial barriers. Maddox mentioned that instead of trying to get
6 around the requirement of having a credit card, one strategy is to help unbanked individuals get a
7 credit card. Another potential solution is providing membership discounts. In many cases, lower-
8 income individuals have good credit and access to a credit card, but are simply more price-
9 sensitive. Interviewees agreed that providing a deeply discounted membership would help
10 increase access to bikeshare. Maddox mentioned the idea of providing a reduced-rate corporate
11 membership for residents of low-income housing.

12 On the administrative side, Oberg mentioned that one way to ensure that resources are
13 directed toward lower-income communities is to explicitly write an equity clause into the
14 contract with the bikeshare vendor that cannot be manipulated. Finally, interviewees agreed that
15 there is a lack of rigorous program evaluation of bikeshare; it is essential to track and analyze
16 usage moving forward.

17

18 **SURVEY FINDINGS**

19 This section describes key intercept survey findings, and it compares respondents' bicycle use,
20 interest in bikeshare, anticipated future use, and potential barriers to access.

21

22 **Characteristics of Survey Respondents**

23 Personal characteristics of survey respondents are listed in Table 1. Of 86 respondents, there was
24 an even mix of male and female respondents and a wide range of racial/ethnic backgrounds. 35%
25 of respondents were non-Hispanic White, 28% were non-Hispanic Black, and 20% reported
26 being Hispanic/Latino of any race. Blacks and Hispanics/Latinos were over-represented in our
27 survey sample compared to the City of Berkeley's population, and our sample mix more closely
28 resembles the racial/ethnic mix of the City of Oakland's population. About 60% of the survey
29 sample reported an annual household income of \$50,000 or less, which is larger than the
30 equivalent proportion for either City, according to 2008-2012 ACS 5-year estimates. 31% of the
31 survey sample reported living in a zip code that is fully or partly in the City of Berkeley.

1 **TABLE 1 Characteristics of Respondents**

Category	Count of Respondents	Proportion of Respondents
Gender		
Male	45	52%
Female	40	47%
Did not respond	1	1%
Race/Ethnicity		
All Hispanic/Latino	17	20%
White Alone, Not Hispanic	30	35%
Black/African-American Alone, Not Hispanic	24	28%
Asian Alone, Not Hispanic	5	6%
Other Alone, Not Hispanic	4	5%
Multiracial, Not Hispanic	3	3%
Did not respond	3	3%
Annual Household Income		
Low Income (<\$50,000)	51	59%
High Income (>=\$50,000)	28	33%
Did not respond	7	8%
Other Characteristics		
Age (mean years)	33.6	12.0 (S.D.)
Has a credit card	75	89%
Has regular access to internet	80	95%
Resident of Berkeley	26	31%

2

3

4 **Comparison of Bicycle Use by Income**

5 A large majority of survey respondents agreed that biking is a good way to make short trips and
6 that they like riding a bike, and 65% reported having access to a bike for their personal use.
7 Respondents were most likely to report biking at least once a week for shopping/errands (63% of
8 those that have access to a bicycle for personal use), followed by social activities (59%).

9 There were substantial differences by income levels on bike use. Although a smaller
10 proportion of low-income respondents reported having regular access to a bike, those that do
11 reported more frequent use for every trip purpose we listed in the survey. While commuting is
12 the trip purpose that the smallest proportion of overall respondents reported biking for on a
13 weekly basis, it has the biggest difference between income levels: 68% of low-income
14 respondents reported commuting by bike weekly or more often, compared to 32% of high-
15 income respondents.

16

17 **Interest in Bikeshare and Potential Barriers for Low-Income Users**

18 Responses to key survey questions by income are displayed in Table 2. There was high overall
19 interest in the Bay Area Bike Share expansion to the East Bay. 80% of respondents responded
20 “yes” when asked if they would consider using the bikeshare program in Berkeley next year. A
21 similar proportion (81%) indicated being interested in seeing a bikeshare kiosk in their
22 neighborhood or near their home. There was no significant variation in these measures by

1 income groups; low-income respondents were not in fact any less interested in bikeshare, and our
2 data did not support a cultural explanation (e.g. there is a stigma against biking in low-income
3 communities) for a gap in usage. We did not see differences along income lines at the
4 neighborhood level, either; respondents living in census tracts with lower median income than
5 the typical neighborhood in our dataset had a similar level of interest in bikeshare as those in
6 higher-income census tracts.

7 Station location was the factor that respondents reported being most important in making
8 it more or less likely that they will use bikeshare in the future. Cost and the ability to use a credit
9 card were the next most important factors. There were no significant differences between low-
10 and high-income respondents on these factors, including the use of a credit card to access
11 bikeshare. While it is not surprising that cost was an important consideration for all households,
12 the lack of difference placed on credit card access between income groups was unexpected,
13 given the focus that our interviewees and past studies have placed on credit card access as an
14 important barrier to using bikeshare. Our data suggested that requiring a credit card to sign up for
15 bikeshare is not necessarily an important barrier, at least for our survey sample. This finding was
16 further explained by the fact that 86% of low-income respondents reported having credit cards,
17 which is not significantly different than 93% for high-income respondents.

18 Ability to pay using cash, ability to subscribe to the bikeshare service on a monthly basis,
19 and the inconvenience of signing up online were all less important factors. While online sign-ups
20 were the factor that respondents find least important overall, it was another area in which we saw
21 significant differences by income; more than half of low-income respondents reported this as an
22 important factor, compared to only 27% of high-income respondents. Access to the internet itself
23 was not a factor; 94% of low-income respondents had internet access. Still, the data suggested
24 that while credit card access is not necessarily a barrier, potential low-income users may see
25 online sign-ups as inconvenient. Therefore, it may be important to explore other ways of signing
26 people up for Bay Area Bike Share. Boston, Chicago, and Philadelphia could be useful models in
27 this regard.

28

29 **Use of the Future Bikeshare System**

30 When asked what they would use the future bikeshare system for, respondents most often said
31 they would use it for social activities, followed by recreation and exercise. Fewer than half of
32 respondents said they intend to use the system for commuting or for shopping and errands. This
33 varied substantially from current biking patterns for respondents that have access to a bicycle, for
34 whom shopping was the most common trip purpose taken weekly or more often. This also differs
35 from trip purposes reported in the literature about bikeshare; Shaheen et al. found that existing
36 bikeshare users in North America were most likely to use bikeshare for commuting, then social
37 activities and running errands (14).

1 **TABLE 2 Survey Results by Income Level**

Respondent Characteristics	Low Income (<\$50,000)	High Income (≥\$50,000)	All
<i>Agreement with statements about biking (% responded "4" or "5", 1 = Strongly Disagree, 5 = Strongly Agree)</i>			
"I like riding a bike"	82%	86%	84%
"Bicycling in Berkeley is safe."	51%	54%	52%
"Bicycling is a good way to make short trips."	92%	88%	89%
Has access to bicycle for personal use	65%	76%	68%
<i>Bike weekly or more often for: (% of those that have access to a bicycle for personal use)</i>			
Recreation/exercise	65%	42%	56%
Commute to work or school*	68%	32%	54%
Social activities (e.g. to go to a movie, restaurant, bar, friend's house)	70%	42%	59%
Shopping/errands	70%	53%	63%
Have heard of bikeshare	66%	63%	65%
Have used bikeshare in another city	22%	19%	21%
Would consider using a bicycle through the Berkeley bikeshare program	86%	70%	80%
Interested in seeing a bikeshare kiosk in their neighborhood or near their home (Rated "4" or "5", 1 = Not at all interested, 5 = Very interested)	82%	78%	81%
<i>Would consider using Berkeley bikeshare for:</i>			
Recreation/exercise	60%	68%	62%
Commute to work or school	50%	37%	46%
Social activities (e.g. to go to a movie, restaurant, bar, friend's house)	71%	74%	72%
Shopping/errands	52%	42%	49%
<i>Importance of factors in using bikeshare in the future (% responded "4" or "5", 1 = Not at all important, 5 = Very important)</i>			
Cost	84%	71%	80%
Location of bike kiosks	88%	83%	86%
Ability to pay using cash	56%	48%	53%
Ability to pay using a credit card	78%	78%	78%
Ability to subscribe to the service (monthly fee)	49%	50%	49%
Inconvenience of signing up online*	53%	27%	45%
<i>Other Characteristics</i>			
Has a credit card	86%	93%	89%
Has regular access to internet	94%	96%	95%
Resident of Berkeley	64%	79%	69%

*Difference between low-income and high-income proportion is significant at 95% confidence level.

We also collected data on respondents' likely destinations, as the survey asked for three specific places respondents were likely to go to using bikeshare. Table 3 shows the proportion of respondents that mentioned different places or types of places. Of the seventy respondents that answered this question, nearly 70% mentioned that they would use bikeshare to reach a BART station. This is by far the most popular type of destination; shopping destinations, the next most frequently mentioned category, were only mentioned by 36% of respondents. The UC Berkeley campus, downtown Berkeley, parks in the Berkeley/Oakland area, and other neighborhoods and corridors (such as "Telegraph Ave. near campus") were also mentioned by at least 10% of respondents.

Previous work has noted the potential for bikeshare to augment existing multimodal transportation systems as a "first-and-last mile" solution, as well as a "many-mile" solution (1). The fact that BART was a dominant response indicates that there is demand for Bay Area Bike Share in the East Bay as a last-mile connection to regional rapid transit.

TABLE 3 Types of Bikeshare Destinations Mentioned by Survey Respondents

Location	Low Income (<\$50,000)	High Income (>=\$50,000)	All
BART Station	68%	70%	69%
Shopping (including grocery)	41%	30%	36%
UC Berkeley	32%	10%	27%
Downtown Berkeley	18%	25%	21%
Park	18%	15%	16%
Non-downtown neighborhood/corridor	14%	10%	13%
Other cities (outside Berkeley, Oakland, and Emeryville)	7%	15%	9%
Other utilitarian trip (haircut, gym, insurance office)	11%	0%	9%
Restaurant or bar	9%	10%	9%
School or work	7%	5%	7%
Other social	7%	0%	4%
Downtown Oakland	2%	5%	3%

Racial Differences in Knowledge and Previous Experience of Bikeshare

A majority of respondents (65%) had heard of bikeshare before the survey, and about a fifth of respondents had actually used bikeshare in another city, including San Francisco. There was no difference on these measures by income, though this is one area where we observed significant differences by race. More than 80% of White Alone, non-Hispanic respondents said they had heard of bikeshare before the survey, compared to only 54% of non-White respondents—a significant difference at a 95% confidence level. Both groups were equally likely to be interested in using bikeshare in Berkeley and seeing a kiosk in their neighborhood.

Other Differences between Respondent Groups

Women were significantly more likely to be interested in using bikeshare in Berkeley; 93% of female respondents said they would consider using bikeshare in Berkeley, as opposed to only

1 68% of male respondents (Table 4), which is surprising given that men are more likely to bike
 2 than women in the United States (15). Interest in using bikeshare did not vary by age, although
 3 respondents under 35 years old were more likely to think that biking is a good way to make short
 4 trips and were more likely to consider using bikeshare for commuting.

5
 6 **TABLE 4 Survey Responses by Race, Gender, and Age**

Respondent Characteristics	White, Non- Hispanic	Non- White	Male	Female	Younger than 35	35 or Older	All
Have heard of bikeshare ¹	83%	54%	64%	63%	65%	60%	64%
Have used bikeshare in another city	28%	15%	21%	18%	22%	13%	20%
Would consider using a bicycle through the Berkeley bikeshare program ²	79%	83%	68%	93%	83%	77%	81%
Interested in seeing a bikeshare kiosk in their neighborhood or near their home (Rated "4" or "5", 1 = Not at all interested, 5 = Very interested)	76%	83%	72%	85%	80%	73%	80%

1: Difference between white and non-white respondents is significant at 95% confidence level

2: Difference between male and female respondents is significant at 95% confidence level

7 LIMITATIONS AND FUTURE WORK

8 This study had a number of limitations due to time constraints of our class. We only
 9 administered surveys at the Ashby Bart Station and adjacent flea market. In order to get a more
 10 representative sample of Berkeley's population, it would be helpful to conduct additional
 11 intercept surveys in other low-income communities, such as West Berkeley, other areas of South
 12 Berkeley, and student neighborhoods. While we administered some surveys on a Thursday
 13 afternoon and Friday evening, the majority were administered on the weekend, so it would be
 14 useful to survey on the weekdays as well.

15 It would be helpful to conduct additional in-depth interviews with bikeshare experts.
 16 Boston and Philadelphia have both prioritized equity in their bikeshare models and would likely
 17 have useful insight and lessons learned, which could be applicable to Berkeley and other cities.

18 Finally, we were unable to get a sense for residents' perceptions beyond the results of the
 19 intercept surveys. Interviews are a great tool for getting a detailed understanding of contextual
 20 factors, meanings, and experiences. They can also help build the trust necessary to make
 21 individuals comfortable sharing sensitive information. Therefore, we recommend conducting in-
 22 depth interviews with low-income Berkeley residents. Given these three limitations, additional
 23 research is recommended as the City of Berkeley moves forward with planning its bikeshare
 24 launch next year.

1 CONCLUSIONS AND DISCUSSION

2 The findings of this research showed that low-income and high-income respondents have a
3 similar level of interest in using Berkeley bikeshare, which supports our hypothesis that many
4 lower-income neighborhoods are suitable for bikeshare. While we anticipated that credit cards
5 would be a significant barrier to using bikeshare, given the focus on this topic in the literature
6 and in our interviews, this was not supported by our survey results. We found instead that low-
7 income respondents generally do have credit cards and do not see them as a particularly
8 important factor in using bikeshare. Additionally, we anticipated that bikeshare trips would
9 primarily be for utilitarian purposes, such as commuting to work/school and running errands, as
10 past studies have found. Our research revealed the opposite pattern. Fewer than half of
11 respondents say they intend to use the system for commuting or for shopping and errands.
12 However, our findings support our hypothesis that signing up for an online membership would
13 be a barrier to using bikeshare for low-income populations.

14 The key recommendations to the City of Berkeley in light of this research are to utilize
15 innovative outreach strategies and to focus planning efforts on station siting. Our research
16 revealed that far more White Alone, non-Hispanic respondents had heard of bikeshare before
17 taking the survey than non-White respondents. This finding, in conjunction with the finding that
18 low-income respondents are interested in using bikeshare, leads us to recommend that marketing
19 efforts target non-White, low-income communities. Buck argued that bikeshare programs need to
20 get away from traditional messages targeting “young, hip white people aged 25-34,” and our
21 research supports this argument. It is essential that enough money be allotted to outreach and
22 marketing to enable strategies beyond social media, which is inadequate and only reaches a
23 fraction of the population. For example, we recommend partnering with existing community
24 groups to get the word out about bikeshare in Berkeley, as they will have existing relationships
25 with the community and are a known, trusted entity. Low-income respondents also reported
26 being more averse to signing up for bikeshare online, revealing a need for the City to explore
27 ways to allow people to sign up in person; this is another potential way for community groups to
28 be involved in promoting bikeshare.

29 Finally, respondents across income groups reported that station location would be the
30 most important factor in deciding whether or not to use bikeshare in Berkeley, which supports
31 what we heard in the interviews. Low-income respondents are just as interested as high-income
32 respondents in seeing a bikeshare kiosk in their neighborhood or near their home. Therefore,
33 station location in low-income neighborhoods should continue to be a priority in Berkeley’s
34 bikeshare planning process. A majority of respondents anticipated using bikeshare to get to
35 BART stations, so planning the network around these first-and-last mile trips is an important
36 consideration. Given that respondents anticipate most frequently using bikeshare for social
37 purposes, which is contrary to the literature, the City should be wary of siting stations solely near
38 key employment centers. It would be helpful to conduct additional outreach to refine the list of
39 desired station locations.

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