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3 **Are Bikeshare Users Different from Regular Cyclists? A First Look at Short-Term Users,**
4 **Annual Members, and Area Cyclists in the Washington, DC Region**

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ABSTRACT

In recent years, bikeshare systems have spread throughout the U.S. Despite the increase in systems and users, little is known about how bikeshare member demographics and travel patterns compare to characteristics of traditional bicyclists. To bridge the gap, this paper investigates bikeshare system users' travel behavior and develops a profile of user demographics comparing short-term (one day) users and annual members of Capital Bikeshare (CaBi) in Washington, DC with profiles of area bicyclists. Data originate from the Washington, DC area regional household travel survey of 2007-2008, an intercept survey of short-term CaBi users, and an online survey of annual CaBi members. The analysis compares gender, race/ethnicity, age, and student status, as well as socio-economic status across the surveys. Moreover, the comparison includes trip purpose, helmet usage, and travel modes for trips that were replaced by bikesharing. Profiles of CaBi and area cyclists differ on many demographic and socioeconomic characteristics. Compared to area cyclists, CaBi short-term users and annual members are more likely female, younger, have lower household incomes, own fewer cars and fewer bicycles, and are more likely to cycle for utilitarian trip purposes. Furthermore, CaBi trips mainly replace public transport and walk trips. CaBi short-term users and members show similar characteristics, but short-term users are more likely to ride for recreational trip purposes and less likely to wear a helmet. The study results indicate that bikesharing can encourage new segments of society to cycle and can help increase overall bicycling mode share.

INTRODUCTION

Over the last five years, U.S. cities such as Minneapolis, Denver, Boston, and Washington, DC have implemented third generation bikesharing systems. These new bikeshare systems overcome many of the problems associated with older bikeshare programs that relied on free or coin deposit bicycles. Third generation bikesharing systems have docking stations, electronic kiosks to rent and return bicycles, use key cards for system access, and have a fleet of specially designed, colored, and branded bicycles (1,2).

Most of the research on bikesharing in the U.S. focuses on the evolution of bikeshare systems over time, ridership trends, successful implementation strategies for new systems, and potential benefits of bikesharing (3,4,5,6). Little is known about bikeshare user demographics, rider motivations, their travel behavior, and similarities and differences between annual bikeshare members, short-term (one day) users, and regular cyclists. This paper provides a case study of short-term and annual bikeshare users of Capital Bikeshare (CaBi) in Washington, DC and Arlington County, VA. At the time of this writing, CaBi is the largest bikesharing program in the U.S., with 1,300 bikes and 144 stations in Washington, DC and Arlington County (7). The system will expand to the City of Alexandria, VA, and Montgomery County, MD by the end of 2012.

The goal of this paper is to provide a profile of short-term and annual CaBi users and their travel behavior as compared to traditional Washington, DC area cyclists. Data for the comparison of short-term CaBi users and annual CaBi members originate from our own 2011 intercept survey of short-term CaBi users (8) and original analysis of CaBi's 2011 online survey of annual members (9). We compare demographics of short-term and annual CaBi users to Washington, DC area cyclists, analyzing data from the Metropolitan Washington Council of Governments (MWCOC) 2007/08 regional travel survey (10).

The next sections briefly introduce the concept of bikesharing, provide a short history and ridership trends for CaBi, and an overview of the existing literature on characteristics of bikeshare users. After a short description of the three datasets, we present our analysis comparing Washington, DC area cyclists to short-term and annual CaBi users.

BACKGROUND

This section highlights the history and reported benefits of bikesharing in the U.S. Readers looking for more background information can find detailed overviews about the history of bikesharing worldwide by Shaheen et al. (1,6) and DeMaio (2). We also briefly summarize results from some exploratory studies, including Shaheen et al (1,6) and DeMaio (2), that evaluate the alleged benefits of bikesharing. Finally, we briefly summarize the only published academic report (6) about demographics of annual bikeshare members in the U.S. No study about bikesharing in the U.S. has distinguished between short-term users and annual members, and no study compared those two groups of bikeshare users to regular cyclists.

Bikesharing originated in Amsterdam in the Netherlands with the White Bikes program in 1965 (1). This first generation bikesharing system consisted of brightly colored bicycles left unlocked in Amsterdam free of charge for anyone to use. Damage and theft of bicycles led to the decline of first generation bikeshare programs. Coin-deposit operated systems are considered to be the 2nd generation of bikesharing. The second and subsequent generations continue the uniform color scheme pioneered by first generation systems. Second generation systems additionally feature docking stations with a locking mechanism requiring a refundable deposit to unlock the bicycles. However, anonymity of system users and inexpensive deposits failed to prevent bicycle theft (1,2,6).

Third generation bikeshare systems attempt to overcome many of the problems associated with older systems. Technological advances allow bikesharing providers to utilize telecommunication systems. Smartcards and key fobs allow users to electronically lock or unlock bicycles from kiosks (docking stations). Smartcards and fobs include identifiable links to users, eliminating the anonymity of bikeshare users. System operators use telecommunications to collect data on usage, such as duration of checkout and availability of bicycles at docking stations. Users can make reservations and check for bicycle availability through mobile phone applications (1,2,6). In Europe, the deployment and expansion of third

1 generation bikesharing schemes in recent years has been rapid, and is now approaching market saturation.
2 (11).

3 Reported benefits of bikesharing include a reduction in greenhouse gas emissions through mode
4 shift from automobiles to bicycles and reduced fuel consumption; lower household transportation
5 expenditures; increasing accessibility to of public transport by addressing the first mile/last mile problem;
6 and increasing overall physical activity (1,2,6). Much of the existing bikesharing research focuses on
7 determinants of ridership, such as infrastructure and the built environment (3,4,5,12).

8 Several other studies of bikeshare systems outside the U.S. have provided information about
9 annual members. For example, Bachand-Marleau et al (13) collected basic demographic information and
10 attitudes of riders of Montreal's Bixi bikeshare system, and Tang et al (14) collected information on
11 bikeshare users in three cities in China.

12 Only one published academic study (6) provides demographic and socioeconomic details about
13 bikeshare users in the U.S. No study to date distinguishes between short-term and annual members.
14 Shaheen and colleagues conducted a survey of annual members of bikeshare systems in Minneapolis,
15 Montreal, Denver, and Washington, DC. Aggregate statistics for all 4 systems combined indicate that the
16 majority of bikeshare users were younger than 34 (60%), white (approximately 80%), and highly
17 educated (85% had a Bachelor's degree or higher). Results about trip purpose are not entirely comparable
18 across the cities surveyed, but going to work or school was the number one trip purpose for all systems.
19

20 **Overview of Bikesharing in Washington, DC**

21 Third generation bikesharing in the U.S. was pioneered in Washington, DC. The District of
22 Columbia initiated a public-private partnership program called SmartBike DC, operated by Clear Channel
23 Outdoor. The system operated from 2008 to early 2011 and consisted of 10 stations and 120 bicycles at
24 implementation (1). However, the program ended due to financial and technological constraints including
25 low ridership, an inability to expand the system, and the need for electrical connections at stations.
26 Lessons learned from SmartBike DC paved the way for CaBi (15).

27 CaBi began operations September 20, 2010, with 1,100 bikes and 114 stations throughout the
28 District of Columbia and Arlington County (16). By February 2012 the system had expanded to 1,300
29 bikes and 144 stations (7). Plans to expand the system to the City of Alexandria, VA, and Montgomery
30 County, MD by the end of 2012 could increase the system to 2,800 bikes and 288 stations (17).

31 Users can join CaBi in two primary ways: as an annual or monthly member, or as a short-term
32 member. Annual or monthly members pay an up-front fee (\$75 per year, \$25 for one month, or \$7 per
33 month for one year) and register their name, address, and credit card online with CaBi. Fees for each
34 bicycle check-out are billed to the credit card on file every month, with no charge for rides under 30
35 minutes. Short-term members join by purchasing 24-hour (\$7) or 3-day (\$15) passes via credit card at the
36 bikesharing kiosks.

37 Both annual and short-term memberships have experienced strong increases. For example, there
38 were over 15,000 annual CaBi members in June 2011. One year later, by June 2012, annual membership
39 had increased by 57.6 percent to more than 24,000. Additionally, short-term memberships almost tripled
40 from 55,717 short-term passes in June 2011 to 169,635 short-term passes in June 2012 (15).

41 Total system-wide trips in June 2012 of 202,822 represented an increase of 59,000 check-outs, or
42 41%, compared to 143,511 check-outs in June 2011. Even after an expected weather-related decrease in
43 trips during the 2011/2012 winter months, March 2012 experienced 21,000 (or 15%) more check-outs
44 than the highest recorded monthly trip count in 2011 - 143,511 trips in June 2011 (15).
45

46 **DATA SOURCES AND METHODS**

47 Based on three different travel surveys this analysis compares demographic, socio-economic, and travel
48 characteristics of area cyclists, short term CaBi users, and annual CaBi members. Data for the analysis
49 originate from the MWCOG 2007/2008 regional household travel survey of area cyclists, the 2011
50 Capital Bikeshare Casual User Survey, and the 2011 Capital Bikeshare Member Survey. The surveys vary
51 in objectives, methodology, and numbers of participants.

1 The Capital Bikeshare 2011 Member Survey was administered online to registered (i.e., annual
2 and monthly) CaBi members over a one-month period during November and December of 2011. The
3 objectives of the survey were to ascertain demographic and use characteristics of CaBi members,
4 satisfaction with the system, and changes in travel patterns based on bikeshare availability. All registered
5 CaBi members were notified of the survey by email. The survey was completed by 5,464 members,
6 representing 31% of total CaBi membership at that time. While the survey was sent to both annual and
7 30-day members, 30-day members only represented approximately 10% of all CaBi members at the time
8 (15). Unfortunately, for purposes of this analysis, the dataset did not allow for differentiation between
9 responses from the two different membership groups. Therefore, we refer to the respondents to this
10 survey as annual members in this paper for the sake of brevity.

11 The 2011 Capital Bikeshare Casual User Survey was designed to understand the demographic
12 profile of cyclists who had purchased short-term CaBi memberships. The term “short-term members”
13 refers to users who purchase a 24-hour or five day membership (5-day memberships have been
14 discontinued), rather than an annual or monthly membership that requires a key fob to access the system.
15 The intercept survey was designed and conducted by a Virginia Tech graduate studio class in
16 collaboration with Capital Bikeshare. The survey consisted of 23 questions. Surveys were conducted by
17 graduate students over two weekends in September and October 2011 at five CaBi stations selected for
18 high levels of use by short-term users. Short-term users who did not have time to complete the verbal
19 survey were provided with instructions for completing the survey online. Surveys were completed by 340
20 short-term users, of whom 66% identified themselves as visitors from outside the Washington DC
21 Metropolitan Statistical Area. The intercept survey only included responses from one person if cyclists
22 traveled in groups. Thus results from this survey must be qualified by noting that data were not collected
23 for other bicyclists accompanying the CaBi survey respondent.

24 The MWCOC regional household travel survey of 2007/2008 included 25,197 respondents,
25 comprising 832 cyclists who reported that they rode at least once per week. The objective of the survey
26 was to evaluate the metropolitan Washington area transportation system's effectiveness in meeting local
27 household transportation needs. Survey participants were selected by geographically stratified household
28 random sampling. Randomly selected participating households kept a one-day travel diary between
29 February 2007 and May 2008. Each participating household member recorded their travel for one
30 weekday, and transmitted it to the survey team through a computer-aided telephone interview. Data
31 collected included trip purpose, mode of transport, distance, and trip duration. The MWCOC survey was
32 conducted prior to the implementation of CaBi and provides a profile of area cyclists prior to the launch
33 of bikesharing.

34 In order to mirror the main geographic area of CaBi use, this analysis only uses responses of 285
35 DC area cyclists living in the urban core of the region including Washington, DC, Arlington County, and
36 Alexandria City. The term “DC area cyclists” refers to respondents in these three jurisdictions who
37 reported cycling at least once per week. Because sample size is small, we also conducted separate analysis
38 of cyclists for the entire region (with 832 cyclists) and for Washington, DC and the adjacent inner ring
39 suburban jurisdictions of Arlington County, Alexandria, Fairfax County, Montgomery County, and Prince
40 George’s County (632 cyclists). Comparisons of regular cyclists and CaBi users yielded consistent results
41 for cyclists of the entire region; cyclists in Washington, DC and inner suburbs; and Washington, DC,
42 Arlington, and Alexandria only. Below we present results for Washington, DC, Arlington, and Alexandria
43 only, because this is the most appropriate geographic scope for a comparison with CaBi users.

44 The next section presents estimates of demographics, socio-economics, and trip purpose
45 characteristics of area cyclists, short-term CaBi users, and annual CaBi members. Information about
46 statistical significance of differences between groups of cyclists is provided in appendix Table A.

47 **ANALYSIS AND DISCUSSION**

48 **Demographics of Area Cyclists, Short-Term Users, and Annual Members**

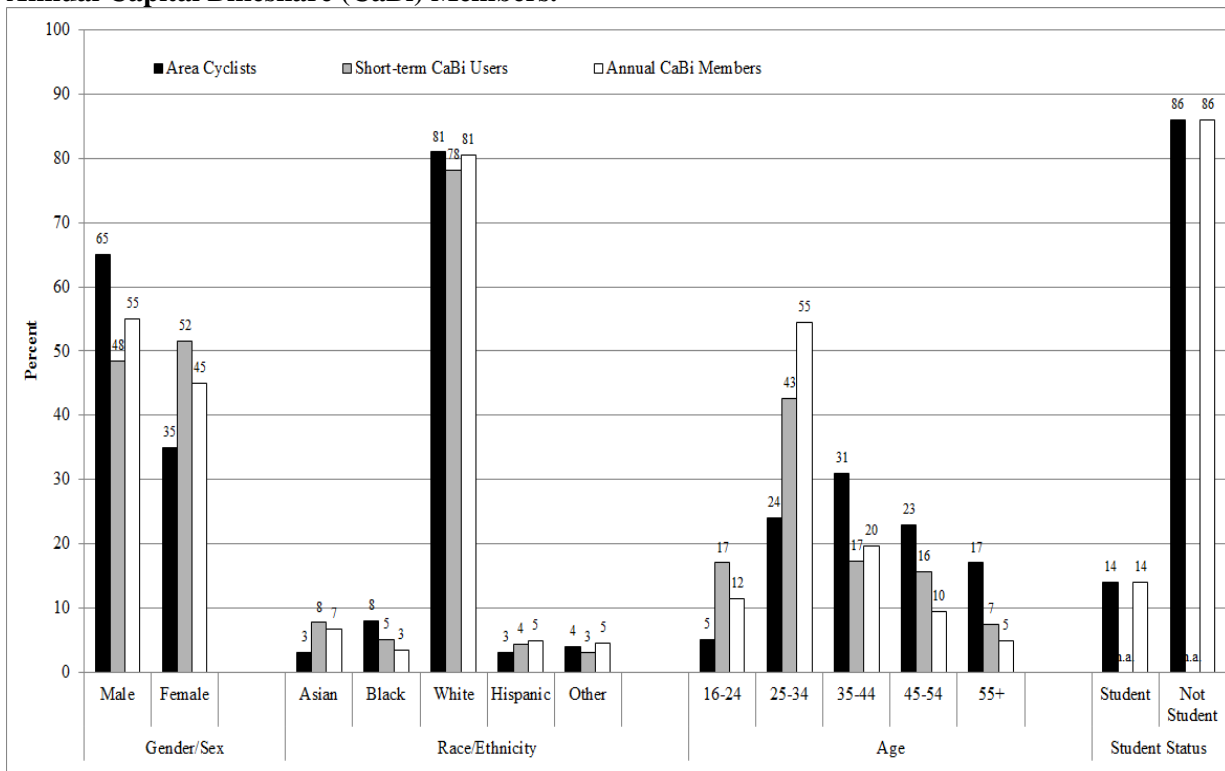
1 The demographics of CaBi members, CaBi short-term users, and DC area bicyclists are shown in Figure
2 1, and tests of significance are shown in appendix Table A. The reported gender of DC area bicyclists is
3 split 65% male and 35% female, reflecting the general percentage distribution in bicycling in the U.S. The
4 CaBi intercept survey of short-term users observed that 48% of riders were male, and 52% female. The
5 high share of females among short-term users may be explained by the interview method. Interviewers,
6 for the most part, only interviewed one respondent if short-term users traveled in groups. Thus, it may be
7 that women were more likely than men to act as respondents.

8 However, a higher share of women among short-term CaBi users is confirmed by the annual
9 member survey. Respondents to the annual CaBi member survey were 55% male and 45% female. The
10 data on gender only report on membership and do not consider actual rides taken by respondents. More
11 detailed analysis of the annual membership data indicates that women are more likely to make no or few
12 trips per month: 21% of women reported making no CaBi trip in a typical month and another 59% of
13 women reported making between 1 and 10 trips per month. Only 20% of women made more than 10 CaBi
14 trips per month. By contrast, only 13% of men reported making no CaBi trip per month and 35% reported
15 making 10 or more trips a month.

16 About 80% of DC area cyclists and CaBi users were White. Hispanics accounted for 3-5% of DC
17 area cyclists and CaBi users. The most significant variations between DC area bicyclists and CaBi users
18 were among Asians and African Americans. Asians accounted for only 3% of area cyclists, but 7% of
19 CaBi members and 8% of CaBi short-term users. African Americans accounted for almost 8% of area
20 cyclists, but only 3% of CaBi members and 5% of CaBi short-term users.

21 Our comparison shows that DC area cyclists are older than CaBi users. The reported age of DC
22 area bicyclists shows a plurality of 31% in the 35 to 45 year old range. In fact, 71% of DC area cyclists
23 were older than 35. By contrast, a plurality of both CaBi short-term users (43%) and CaBi annual
24 members (55%) fall within the 25 to 34 year old range. Self-reported average age for area cyclists was 42,
25 compared to 34 for CaBi members and 35 for short-term CaBi users. No significant differences were
26 noted between DC area bicyclists and CaBi annual members in their student status. Data about the student
27 status of short-term CaBi users was not available.
28

FIGURE 1 Comparison of Demographics of Washington, DC Area Cyclists and Short-Term and Annual Capital Bikeshare (CaBi) Members.



Sources: Author's analysis of Cabi Membership Survey 2011, CaBi Casual User Survey 2011, and MWCOG Travel Survey 2007/2008. (Notes: Data on student status not available for short-term CaBi members; detailed point estimates, 95% confidence intervals, and statistical tests of significance are presented in Table A in the Appendix)

Income, Car Ownership, and Access to a Bicycle

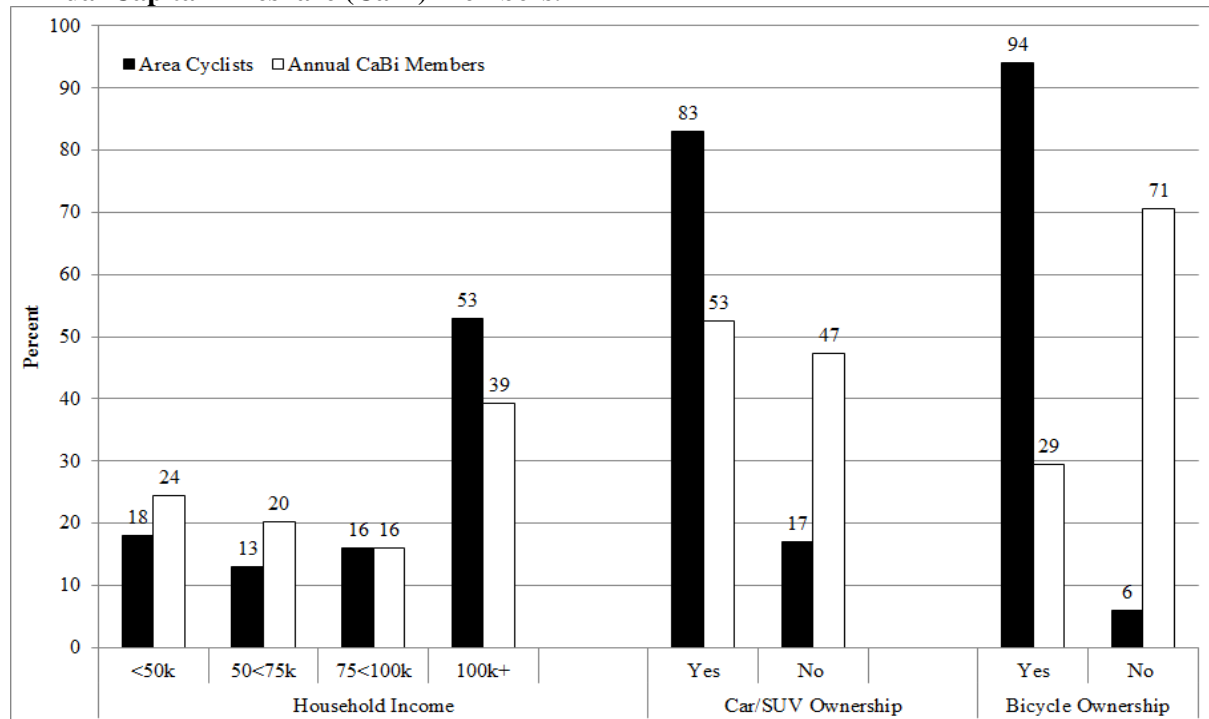
As shown in Figure 2, our data suggest that DC area cyclists have higher incomes than annual CaBi members. Significant differences, as shown in appendix Table A, were noted at the lower and upper ends of the income categories reported by DC area bicyclists and CaBi annual members: 45% of CaBi annual members reported an annual household income below \$75,000, versus only 31% of DC area bicyclists. At the upper range of household income, 53% of DC area bicyclists reported household incomes above \$100,000, compared to only 39% for CaBi members. Mean household income for area cyclists was 14% higher than for annual CaBi members: \$93,180 compared to \$81,920. The difference in age between area cyclists and CaBi members, reported above, may help explain dissimilarities in income levels: most CaBi members are below 35 years old and have not reached their peak earning years, whereas most area cyclists are above 35 years old—an age group with comparatively higher incomes.

Area cyclists are more likely to own an automobile than annual CaBi members. Among DC area bicyclists, 83% report ownership of an automobile, and 17% do not. A significantly lower rate is observed for CaBi members, with only 53% reporting ownership of an automobile. Lower car ownership levels among CaBi users may correlate with their lower incomes and younger ages. Moreover, CaBi users are more likely to live in areas where CaBi stations are clustered—in the center of Washington, DC and along the Rosslyn-Ballston corridor in Arlington County, which have lower automobile ownership rates than outlying areas of Washington, DC, Arlington, and Alexandria.

Similarly, area cyclists are more likely to own a bicycle: 94% report ownership of a bicycle. The remaining cyclists are assumed to have used a bicycle rental, or borrowed bicycle from a friend or family

member. By contrast, only 29% of CaBi members report ownership of a bicycle, while 71% do not. The membership survey found that CaBi members over 35 years in age and with incomes over \$100,000 were significantly more likely to own both cars and bicycles.

FIGURE 2 Comparison of Socio-Economic Characteristics of Washington, DC Area Cyclists and Annual Capital Bikeshare (CaBi) Members.



Sources: Author's analysis of Cabi Membership Survey 2011 and MWCOG Travel Survey 2007/2008. (Notes: Data not available for short-term CaBi members; detailed point estimates, 95% confidence intervals, and statistical tests of significance are presented in Table A in the Appendix)

Trip Purpose, Mode Shift, and Helmet Use

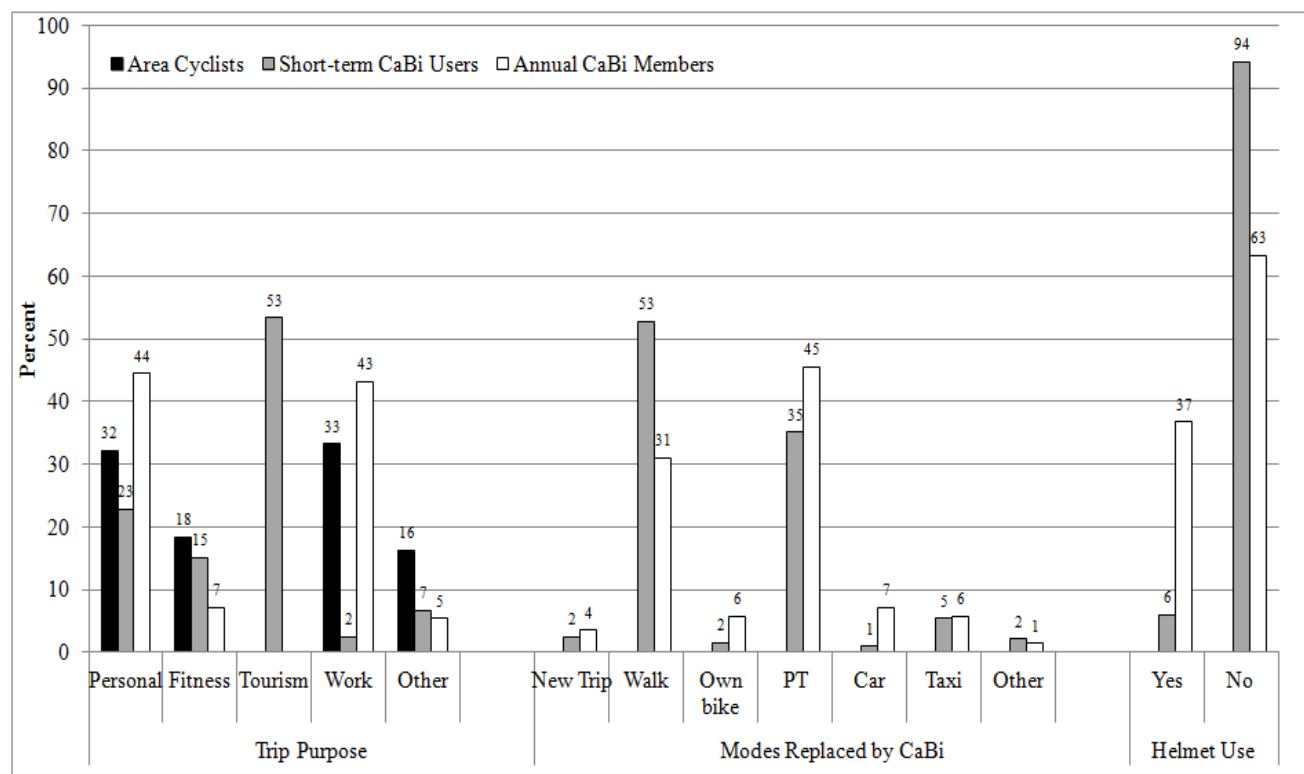
A majority of CaBi short-term users (53%) reported "tourism" as the reason for their trip (Figure 3). This option was not given as a trip purpose on either the DC area bicyclists' nor CaBi member survey. "Personal" trips (44%) and "work" (43%) were given as the most common trip purposes for CaBi members. DC area bicyclists also reported these two purposes as the most common reasons for making a trip by bicycle—however at lower rates than CaBi members. Reported shares for utilitarian trip purposes are consistent with prior findings that bicyclists in the Washington DC area ride for utilitarian purposes at high rates. The 77% share of trips by CaBi annual members for utilitarian purposes significantly exceeds the 66% of trips by DC area bicyclists for utilitarian purposes, the 58% of utilitarian trips reported by bicyclists in the full metropolitan Washington DC area, and the 35% of utilitarian trips reported by bicyclists in all U.S. urbanized areas (18). The CaBi annual member survey results noted that trip purposes were one of the only variables that changed over time, with reported trips becoming less utilitarian with later membership start dates. This was one of the few variables in the survey to show significant differences between early and late joining members (9).

The mode of transportation replaced by the bicycle trip was not collected by the DC area bicyclist survey. Among CaBi users, both short-term users and annual members reported mainly replacing public transport trips (35% and 45% respectively) and walk trips (53% and 31% respectively). Short-term users reported significantly lower rates of replacing automobile and personal bicycle trips than annual members. This difference may be explained in part by the majority of short-term users being tourists who

may not have access to a personal automobile or bicycle in Washington, DC. Only very few short-term users (2%) and CaBi members (4%) report induced (newly generated) trips, which they would not have made without CaBi.

Finally, data on helmet use was not collected for DC area bicyclists. Among CaBi users, 6% of short-term users surveyed were observed to use a helmet, while 37% of annual members reported using a helmet. The lack of availability of a helmet for short-term users may contribute to this difference as might the difference in survey methodology (observed versus self-reported). More detailed analysis of the annual member survey shows an important difference in helmet use by gender: 48% of male CaBi members report never wearing a helmet compared to only 36% of women. By contrast, 42% of women report to always or almost always wear a helmet—compared to 31% of men.

FIGURE 3 Comparison of Trip Purpose, Transport Modes Replaced by Capital Bikeshare, and Helmet Usage



Sources: Author's analysis of CaBi Membership Survey 2011, CaBi Casual User Survey 2011, and MWCOG Travel Survey 2007/2008. (Notes: Data on modes replaced and helmet use not available for DC area cyclists; detailed point estimates, 95% confidence intervals, and statistical tests of significance are presented in Table A in the Appendix)

Suggestions for Further Research

This analysis relies on a bivariate comparison of independent variables and bicycling levels without controlling for other variables. Further analysis could help determine whether or not there are significant differences between CaBi users and DC area bicyclists when controlling for other factors. For example, the lower rate of car ownership and lower age for CaBi riders may be correlated with the lower reported household income of CaBi members.

Additionally, this analysis cannot fully consider the spatial restrictions of the two CaBi surveys. While CaBi covers a substantial portion of the geographic area covered by the DC area bicyclist survey, it does not serve some outlying areas of Washington, DC, Arlington County, and Alexandria. Moreover, the

1 CaBi short-term user survey sampled from an even narrower geographic area focusing only on docking
2 stations that experienced a high frequency of short-term rentals—all of which were located within
3 downtown Washington DC. Further research should attempt to more precisely control for geography to
4 determine if significant differences persist.

5 CaBi annual member survey respondents self-selected from email and online solicitations, and
6 responded over the internet. With such potential biases in this sample, further research using a more
7 randomized sample might yield differing and statistically more representative results, and may be more
8 comparable to the sampling method used for the MWCOG survey.

9 As noted earlier, the number of short-term CaBi members has dramatically increased in 2012.
10 This may be explained in part with the placement of new stations within the National Mall, a popular
11 destination for tourists. A repeat of the CaBi short-term user survey at these sites might yield more
12 insights into the demographics and behaviors of CaBi short-term users.

13 The MWCOG 2007/2008 travel survey provides the latest available data on bicycle use for all
14 trip purposes in metropolitan Washington. The survey provides a snapshot of area cyclists in 2007/2008.
15 However, the survey cannot provide a comprehensive profile of demographics of area bicyclists since
16 CaBi began operations in 2010. Thus, a more recent survey of regular bicyclists may yield insight into
17 how demographics of regular bicyclists have changed since CaBi began operations.

18 Finally, results from the Washington, DC area cannot be easily transferred to other cities in the
19 U.S. Washington is home to the Federal government and related industries (e.g. federal contractors,
20 lobbyists, etc.), and the area's demographics differ substantially from national averages. The DC area also
21 attracts many tourists from both the U.S. and abroad. Future studies should compare area bicyclists and
22 bikeshare users in other cities in the U.S. to test if the differences observed in this study are also found in
23 other places.

24 **CONCLUSION**

25 This study suggests that CaBi short-term users and members are different from Washington, DC
26 area cyclists. Compared to DC area cyclists, CaBi short-term users and annual members are more likely
27 women, younger, have lower incomes, and less likely to own bicycles or automobiles. CaBi users are also
28 more likely to make utilitarian trips than other cyclists. The study indicates that by implementing
29 bikesharing programs municipalities could encourage new segments of society to cycle and potentially
30 increase overall bicycling mode share. With its younger demographic, bikesharing systems could serve as
31 a gateway to future growth of overall bicycling transportation. However, decision makers using
32 bikesharing as a policy to shift transportation mode choice should be cognizant of also implementing
33 other bike-friendly transport policies, such as networks of bike lanes and bike paths.

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11

APPENDIX

TABLE A Point Estimates, 95% Confidence Intervals, and Significance Test

	Area Cyclists		Short Term CaBi		CaBi Members		Differences Significant at P<.05 (test)	
	%	95% Interval	%	95% Interval	%	95% Interval	Area Cyclists vs Both Groups of Cabi Users	CaBi Short-Term Users vs. Members
Gender/Sex							Yes (Chi-Square)	No (Chi-Square)
Male	65.4	58.8-71.4	48.4	48.0-48.7	55.0	53.6-56.3		
Female	34.6	28.6-41.2	51.6	46.3-57.0	45.0	43.7-46.4		
Race/Ethnicity							Yes (Chi-Square)	No (Chi-Square)
Asian	3.4	1.8-6.5	7.7	5.3-11.0	6.7	6.0-7.4		
AA/Black	7.8	4.9-12.3	5.0	3.1-7.9	3.4	2.9-3.9		
White	81.4	75.7-86.1	78.2	73.4-82.3	80.6	79.4-81.6		
Hispanic	3.4	1.5-7.6	4.4	2.7-7.2	4.9	4.4-5.6		
Other	4.4	4.0-5.1	3.0	1.4-5.0	4.5	4.0-5.1		
Age							Yes (ANOVA and Sheffe Post Test)	No (T-test)
Mean	42.0	40.5-43.45	34.8	33.5-36.0	34.1	33.8-34.4		
16-24	5.1	2.8-8.9	17.0	13.3-21.5	11.5	10.7-12.4	Yes (Chi-Square)	Yes (Chi-Square)
25-34	24.1	18.9-30.1	42.6	37.3-48.1	54.5	53.1-55.9		
35-44	31.2	25.2-37.9	17.3	13.5-21.8	19.6	18.6-20.7		
45-54	22.9	17.7-29.2	15.7	12.2-20.2	9.5	8.7-10.3		
55+	16.7	13.0-21.3	7.4	5.0-10.8	4.9	4.3-5.5		
Student Status							No (Chi-Square)	n.a.
Student	14.0	11.3-17.2	n.a.		14.0	13.1-15.0		
Not Student	86.0	83.1-89.6	n.a.		86.0	85.0-86.9		
Household Income								
Mean	93,175	88,660-97,689	n.a.		81,923	80,813-83,033	Yes (T-test)	n.a.
<50k	17.9	13.5-23.5	n.a.		24.4	23.3-25.6	Yes (Chi-Square)	n.a.
50<75k	12.5	9.0-17.1	n.a.		20.3	19.2-21.4		
75<100k	16.1	12.1-21.2	n.a.		16.1	15.1-17.1		
100k+	53.4	46.8-59.9	n.a.		39.3	37.9-40.6		
Car/SUV Ownership							Yes (Chi-Square)	n.a.
Yes	82.9	77.3-87.3	n.a.		52.6	46.0-48.7		
No	17.1	12.7-22.7	n.a.		47.4	51.3-54.0		
Bicycle Ownership							Yes (Chi-Square)	n.a.
Yes	94.2	93.0-97.9	n.a.		29.4	28.2-30.6		
No	5.8	3.1-9.0	n.a.		70.6	69.4-71.8		
Trip Purpose								
Social/personal	32.2	26.6-38.4	22.8	18.6-27.6	44.4	43.0-45.7	Yes, Area cyclists vs. CaBi members only (Chi-Square)	n.a.
recreational/fitness	18.3	14.1-23.5	15.0	11.5-19.2	7.1	6.4-7.8		
tourism	n.a.	n.a.	53.3	47.9-58.6	n.a.	n.a.		
work/meeting	33.2	27.8-39.2	2.4	1.2-4.7	43.2	41.8-44.6		
other	16.2	12.2-21.7	6.6	4.4-9.8	5.4	4.8-6.0		
Alternative mode (if not CaBi)								
Induced	n.a.		2.4	1.2-4.7	3.5	3.0-4.0	n.a.	Yes (Chi-Square)
Walk	n.a.		52.7	47.3-58.0	30.9	29.7-32.8		
Own bike	n.a.		1.5	0.6-3.5	5.8	5.2-6.5		
PT	n.a.		35.1	30.1-40.4	45.4	44.1-46.8		
Car	n.a.		0.9	0.3-2.8	7.2	6.5-7.9		
Taxi	n.a.		5.4	3.4-8.4	5.8	5.2-6.4		
Other	n.a.		2.1	1.0-4.3	1.4	1.1-1.7		
Helmet Use								
Yes	n.a.		6.0	3.9-9.1	36.7	35.4-38.0		
No	n.a.		94.1	90.9-96.1	63.3	62.0-64.6		

Note: An alternative approach for significance tests of binary data (other than chi-square) would use t-tests comparing population proportions for each subcategory (e.g. proportion of women). We also conducted those tests. Chi-square tests for binary data presented here and t-tests of population proportions provide consistent results. Results of population proportion t-tests are available upon request.