

Understanding a New Bike Share Program in Vancouver

2017 INTERCEPT SURVEY FINDINGS

Report Prepared for the City of Vancouver & Mobi by Shaw Go Partners

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Dr. Meghan Winters' Bicycling Research Team
Simon Fraser University

Field Work: Moreno Zanotto, Danielle DeVries, Kate Hosford, Caitlin Pugh, and Amanda Rowlands
Data Analysis & Report Preparation: Suzanne Therrien and Moreno Zanotto

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Executive Summary

The cycling research team at Simon Fraser University conducted an intercept survey with Vancouver public bike share (Mobi by Shaw Go) system users to gain insights into group demographics, travel behaviour and user perspectives. This investigation allowed us to develop a profile of casual riders and members and to compare these groups on their use of bike share, knowledge and perceptions of the system, motivators and deterrents to system use, and trip characteristics. The survey was designed to focus on the current bike share trip and included 32 questions on various topics. Between August 24 and September 24, 2017, five trained surveyors interviewed users at 45 randomly selected bike share docking stations (3 hours per station; 135 hours total). System users who were starting or ending their trip were invited to participate.

Description of System Users Observed & Surveyed

The survey was completed by 214 system users (71% participation rate). We classified those travelling with a 24-hour pass as “casual riders” (34%), while participants with a 90-day or 365-day pass were classified as “members” (66%). Overall, participants were 64% male and predominantly younger adults (63% aged 19-39). About a third of system users (31%) travelled in a group of two or more although such social cycling was notably higher amongst casual riders (74%) than members (10%). We also report select observational data (gender, helmet use etc.) on 109 system users who refused or were ineligible to participate (younger than 19 or had already taken the survey).

City of Residence

About two-thirds of participants lived either in Vancouver (62%) or another Metro Vancouver municipality (6%). Almost one in three (30%) were visitors from outside the region. Most members (89%) reported living in the City of Vancouver and in contrast, most casual riders (85%) reported their home location being somewhere outside of Metro Vancouver (elsewhere in Canada, US or abroad).

Visitor Profile

A majority (86%) of visitors indicated they were tourists on a leisure-related trip (compared to 14% work-related trip). Nearly all visitor were casual riders with a 24-hour pass (95%) and 85% had purchased this day-pass for the first time. Those residing outside the region were a mix of domestic (34%) and international (66%) visitors. Just over half (57%) indicated they were visiting Vancouver for the first time, and three quarters (77%) were planning to stay seven days or less. A majority (77%) indicated that they had not planned to hire a bicycle from a private bicycle rental shop on this trip, and half (49%) said they only planned to use Mobi for one day.

Access to Pass and System Information

The Mobi website was the top place where participants received information on how to use Mobi (66% of members and 42% casual riders), followed by a docking station tower for casual riders (44%) and friends and family amongst members (22%). For members, two-thirds (64%) had purchased their pass on a desktop computer and almost a third (30%) used a mobile device or the Mobi app. Members’ preference was for a shift away from desktop computers to more mobile and app based pass purchases (40%). For casual riders, nearly all had purchased a pass with their mobile device (86%), either through a browser on their mobile (44%) or using the Mobi app (42%). Casual riders’ preference was for purchasing passes at an “on street kiosk at the station” (30%), not currently available for the Mobi

system. Although three-quarters (77%) of all participants surveyed had the Mobi app, only 18% had purchased their pass via the app; casual riders being almost nine times more likely to do so compared to members.

Ease of Finding Stations & Navigating Vancouver's Cycling Network

Overall, participants found it easy (very or somewhat) to both find Mobi bike share stations and to navigate Vancouver's cycling network (95% and 80%, respectively).

Trip Details

Two-thirds (67%) of casual rider trips were for the purposes of exercise or recreational pursuits. Nearly half (48%) of member trips were for commuting to work or school or were daytime work-related trips. In response to the question "how much [money] did you or do you expect to spend in the area today", there was a clear trend towards casual riders spending more than members (58% of casual riders spent \$50 or more compared to just 10% of members).

Mode Replacement & Integration

Most participants integrated walking with their Mobi trip (91%). More than twice the proportion of casual riders integrated transit with Mobi (26%) compared to members (12%). Participants primarily replaced transit and active modes with Mobi (87%). Only about one in five (22%) casual rider trips were reported as replacing a trip that would have been on a rental bicycle.

Helmet Use

Overall, 63% of system users were observed wearing a helmet (58% Mobi helmet, 6% personal helmet). Members were more likely than casual users to be wearing a helmet (72% vs. 61%). Of those wearing a Mobi helmet, 24% used a barrier (helmet liner or hat). The top reason reported for not wearing a helmet was "I don't need a helmet" (28%). Problems with shared helmets, including "no helmet with bike", "sanitary concerns", and "poor fit", were reported by 40% of non-helmet wearing participants.

Motivators & Deterrents

The top reason motivating participants to make their trip by Mobi was that it was "faster and easier than other modes" (57%). This was followed by "I have fun riding Mobi bicycles", cited by three times as many casual riders as members (33% vs. 11%). One-third (35%) of members reported "no stations near destinations" as a barrier to using Mobi more, but only 4% of members indicated there were "no stations near home", suggesting that proximity to a station near one's home is important to system membership. Overall, 1 in 4 (24%) participants said they had no barriers to using Mobi more often and that they were happy with how much they used the system.

Compared to Public Bike Share in Other Cities

About half (54%) of those surveyed had used a public bike share system in another city. When asked to rate their experience, about half (47%) rated their experience in Vancouver to be "about the same" compared to other cities, a third (32%) as "better", and 15% as "worse".

Suggestions for System Improvements

Top suggestions for system improvements included "expanding the public bike share zone and increasing station density" (27%), "improving the Mobi app" (17%), and "increasing maintenance on the bikes and docking stations" (16%).

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Background

The Vancouver public bike share intercept survey was initiated and developed in the following manner:

Survey Initiation

Spring 2016: The SFU research team's partners at the City of Vancouver and Mobi by Shaw Go expressed interest in better understanding the demographic and travel characteristics of casual riders (24-hour pass holders).

Summer 2017: With approved funding from the City of Vancouver (SFU fund R599248) and ethical approval (SFU Office of Research Ethics study #2012s0286) the SFU research team conducted an on-street, face-to-face intercept survey with Vancouver public bike share users.

Survey Development

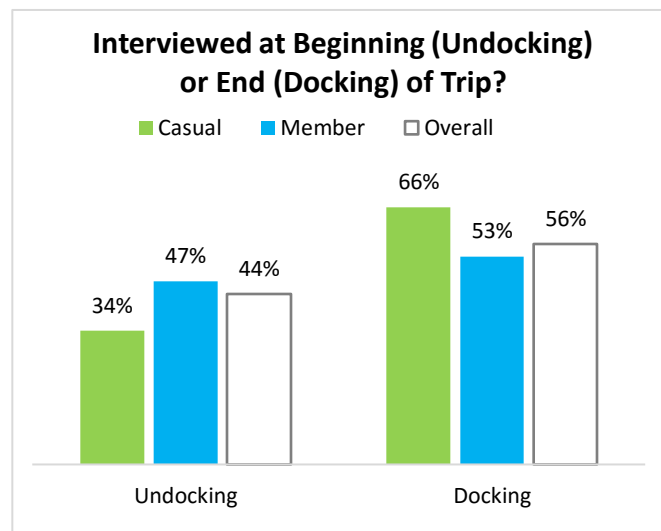
August 2017: The survey instrument was designed collaboratively by the SFU research team with input from the City of Vancouver and Mobi partners and pilot tested with university students and staff. It was designed to take 5 minutes or less to complete, and included 32 questions and 6 observations on the topics of: pass and current trip info, knowledge and perceptions of Mobi, use of PBS in other cities, demographics, and visitor information (Refer to Appendix A). The survey was programmed into the REDCap online portal to allow for the survey to be administered electronically.

Training, Timing & Survey Rollout

Five trained surveyors conducted intercept surveys on fair-weather days between **August 24 – September 24, 2017** (31 days when excluding Labour Day). Each of the 45 randomly selected docking stations was attended for 3 hours (135 hours total), one hour each during three time periods:

- weekday midday, 11:30-14:00
- weekday afternoon, 16:00-18:30
- weekend midday, 11:00-15:30

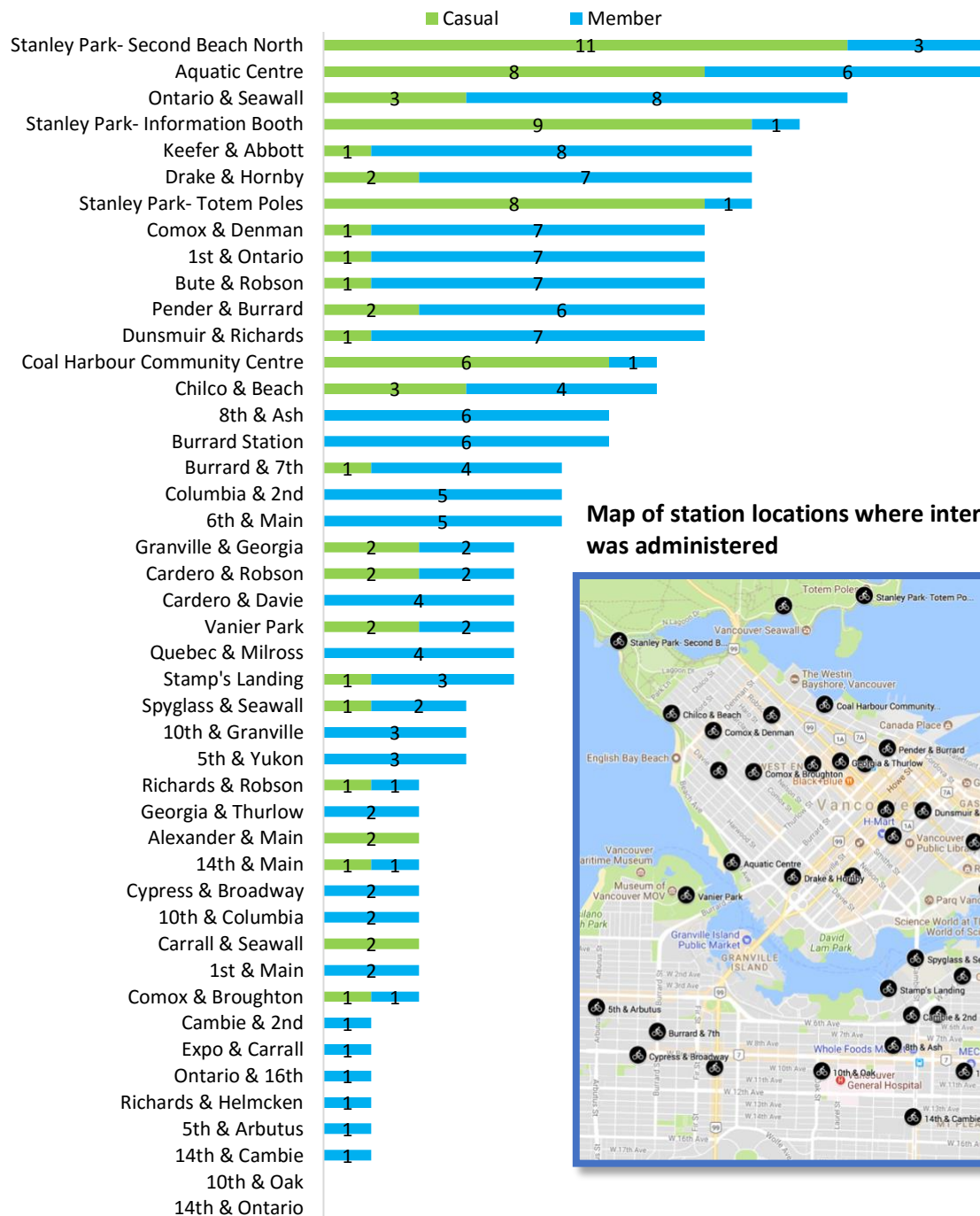
All system users who agreed to participate were offered a letter of information and consent (Appendix B) and then asked the survey questions (Appendix A), with responses entered electronically into tablets. System users who were beginning or ending their trip were invited to participate and a fairly even split of those who were undocking (44%) and docking (56%) agreed to complete the survey (although more casual riders were intercepted when docking). This finding is consistent with a pattern we observed where users would dock at stations during their trip to reset their riding time and avoid usage fees.



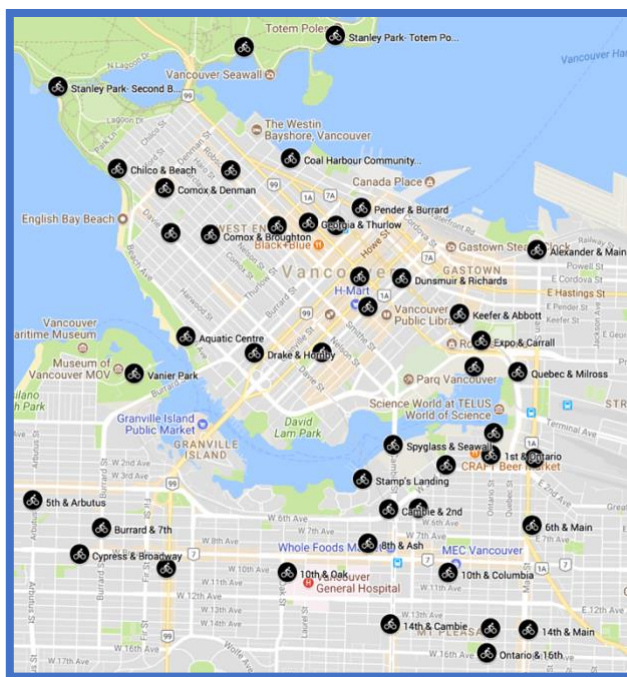
Station selection

A total of 45 randomly selected bike share docking stations (15 each of low, medium and high activity stations based on trip data provided by Mobi) were selected as sites for data collection. Surveyors completed an average of 4.8 surveys per station with a maximum of 14 (of 214) surveys completed at each Stanley Park- Second Beach North and the Aquatic Centre stations, and a minimum of zero at 10th & Oak and 14th & Ontario stations. Refer to figures below and Appendix C for more details.

Number of Surveys Completed by Docking Station (most to least)



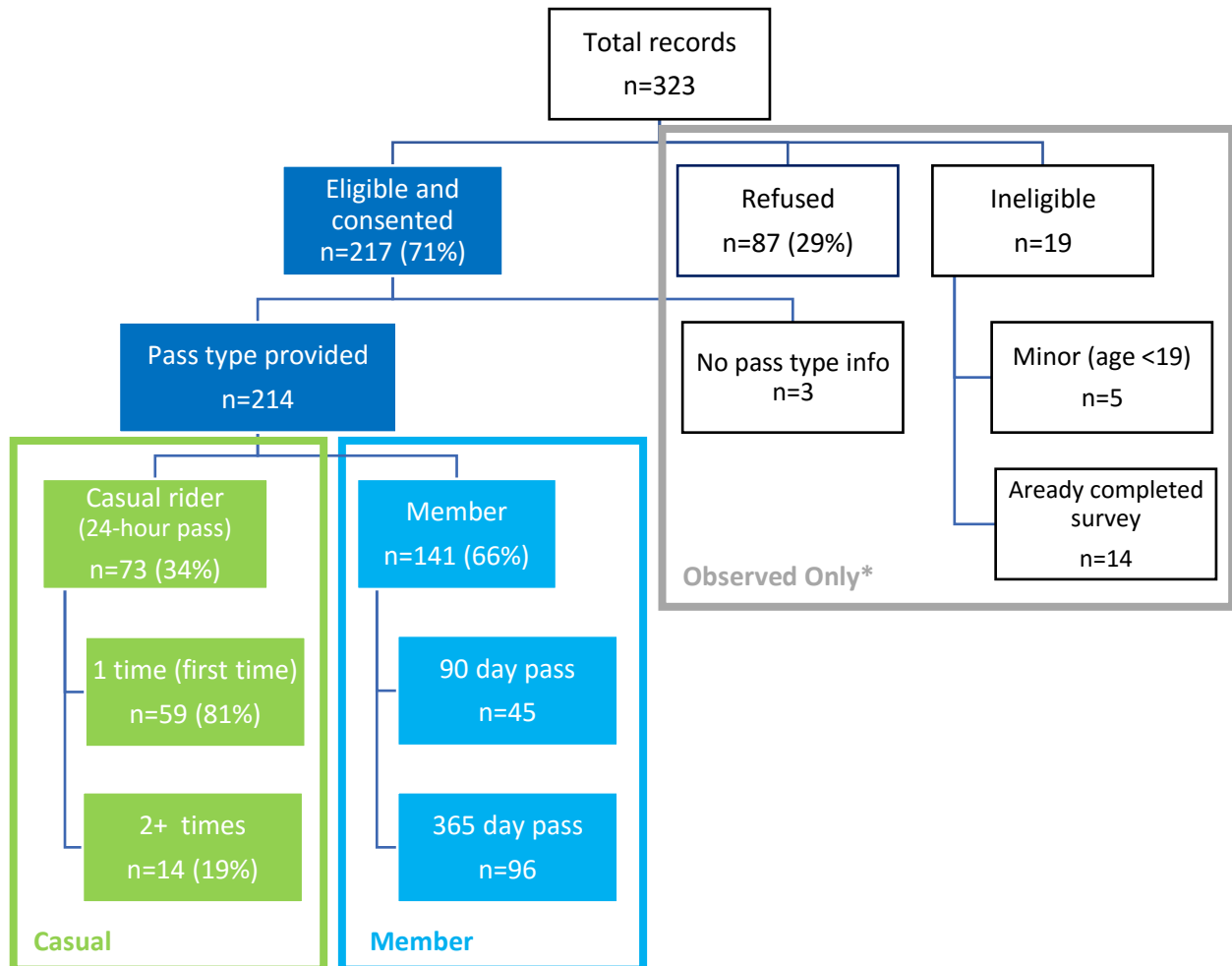
Map of station locations where intercept survey was administered



Response

The survey took between 4 and 5.5 minutes to complete and we achieved a 71% participation rate, although we found that women were more likely to refuse participation than men. The final sample was 214—and was comprised of two-thirds members (66%, n=141/214) and one-third casual riders (34%, n=73/214). Additional observations (gender, estimated age, helmet use, and riding in groups) on 109 “observed only” users are also included. A detailed breakdown of system users by eligibility and participation criteria is provided in the flowchart below. The results from this sample’s responses are included in this report.

**Vancouver Bike Share Intercept Survey
Participation Flow Chart**

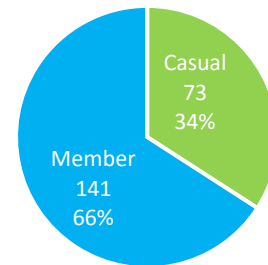


Results

Describing Casual Riders & Members

As already mentioned, a total of 214 system users completed the survey—about two-thirds members (66%, n=141/214) and one-third casual riders (34%, n=73/214). Results by each of these groups will be presented for comparison throughout this report. The boxes below provide a profile overview describing the typical member and typical casual rider to paint a more qualitative and descriptive picture of who these groups are.

Sample Composition by Rider Type



A Typical Casual Rider

- Visiting Vancouver
- Uses Mobi for recreation
- Riding in a group
- Wants more stations in Stanley Park, increased time limit, improved app map, option to purchase passes at point-of-use

A typical casual rider is a young man on his first holiday to Vancouver. This is his first time using Mobi and is cycling helmeted in a group for recreation because it is fun, faster, and easier than walking. While he won't rent a bike from a shop, he would like to see Mobi add stations in Stanley Park, increase the free time limit, improve the app's map, and add an option to purchase passes from point-of-use station towers to save his mobile phone data. He is staying in Vancouver for a week before returning home to his full-time job.

A Typical Member

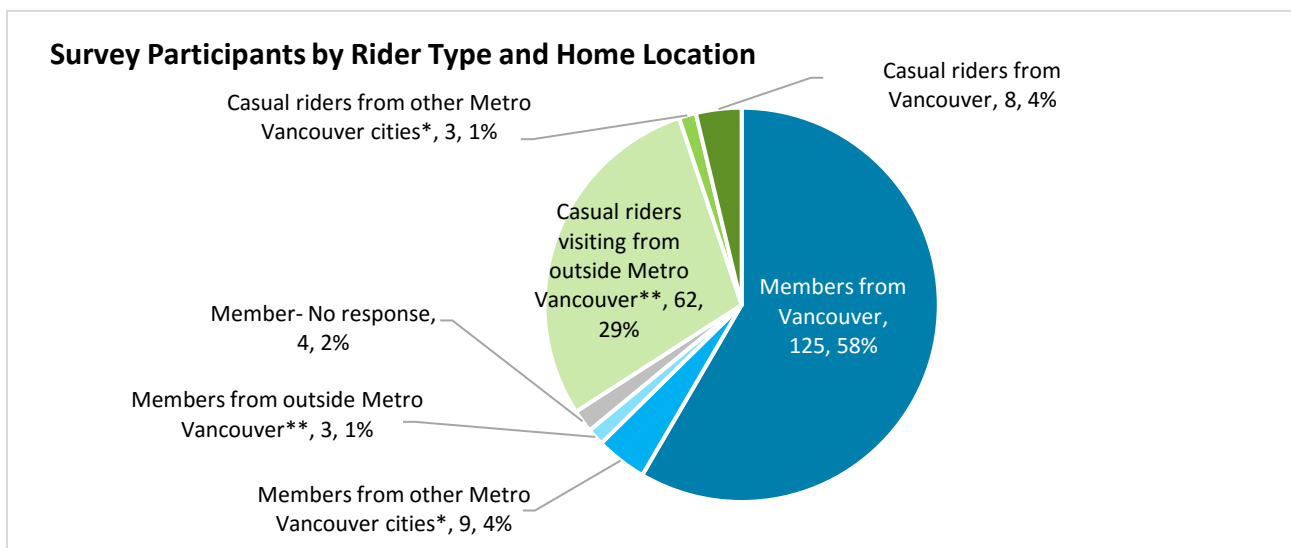
- Lives in Vancouver
- Uses Mobi for transportation to work
- Riding alone
- Wants the operating zone to expand

A typical member is a young man living in Vancouver. He is using Mobi by Shaw Go (and a shared helmet) to cycle to his full-time job, which is faster and easier than walking. He would use Mobi more if the bicycles were better maintained and if there were stations near more of his destinations. He would like to see the operating zone expanded into the west side of Vancouver and eastward to Commercial Drive.

City of Residence

About two-thirds of all participants lived either in Vancouver (62%, n=133/214) or another Metro Vancouver municipality (6%, n=12/214), while one-third (30%, n=65/214) were visitors from outside of Metro Vancouver. As could be expected, most members (89%, n=125/141) reported living in the City of Vancouver with an additional 6% (n=9/141) from another Metro Vancouver municipality. In contrast, a majority (85%, n=62/73) of casual riders indicated their home location was outside of Metro Vancouver—making the term “casual rider” nearly synonymous with “visitor”. Amongst visitors (n=65), one third (34%, n=22/65) were from another Canadian city and two thirds (66%, n=43/65) were international.

	Vancouver	Other Metro Vancouver Cities	Elsewhere (visitors)	No response	Overall
Member	125 (58%)	9 (4%)	3 (1%)	4 (2%)	141 (66%)
Casual Rider	8 (4%)	3 (1%)	62 (29%)	0 (0%)	73 (34%)
Subtotal	133 (62%)	12 (6%)	65 (30%)	4 (2%)	214 (100%)



*Other Metro Vancouver Cities (6%, n=12/214)

Members

- Surrey (2)
- Burnaby
- North Vancouver
- Coquitlam (2)
- Delta
- New Westminster
- Port Coquitlam

Casual Riders

- Surrey
- Burnaby
- North Vancouver

** Home Locations of Visitors from Outside Metro Vancouver (30%, n=65/214)

Canada (34%, n=22/65)

- Toronto (4), ON
- Edmonton (3), AB
- Calgary (2), AB
- Banff, AB
- Canmore, AB
- Victoria, BC
- Courtenay, BC
- Half Moon Bay, BC
- Vernon, BC
- Whistler, BC
- Winnipeg, MB
- Ontario
- Cambridge, ON
- Montreal, QB
- Quebec City, QB
- Joliette, QB

USA (28%, n=18/65)

- USA
- Bellingham, WA (2)
- Denver, CO (2)
- L.A., CA (2)
- Charlotte, NC
- California
- San Francisco, CA
- San Jose, CA
- Corona, CA
- Cleveland, OH
- Detroit, MI
- New York, NY
- St. Louis, MO
- Seattle, WA
- Washington, D.C.

Europe (17%, n=11/65)

- Germany (4)
- England (2)
- Belgium
- Switzerland
- Finland
- Scotland
- Netherlands

Latin America (17%, n=11/65)

- Mexico (5)
- Brazil (4)
- Peru
- Dominican Republic

Oceania (3%, n=2/65)

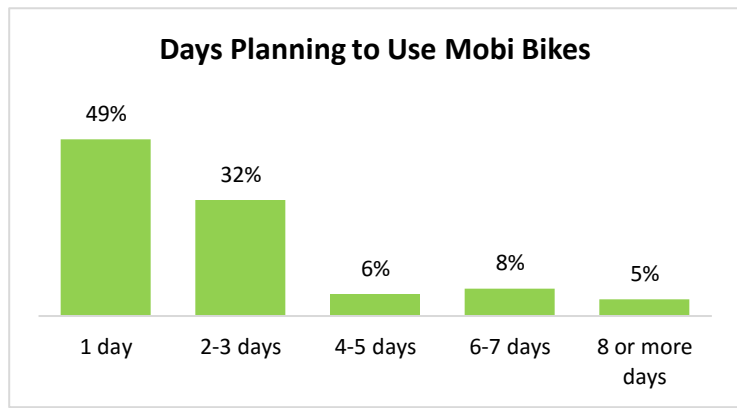
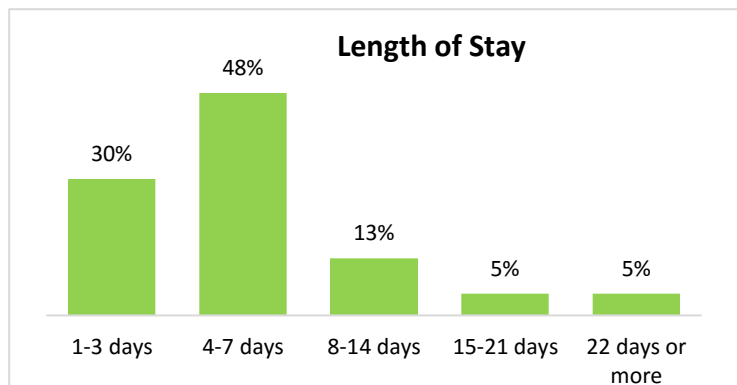
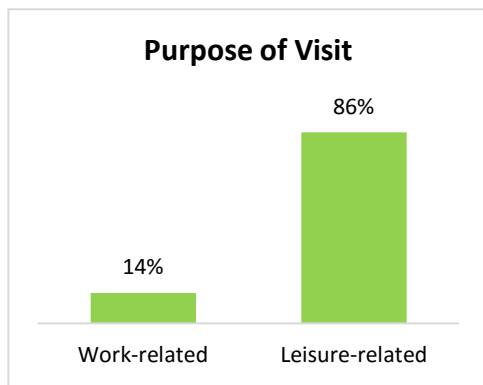
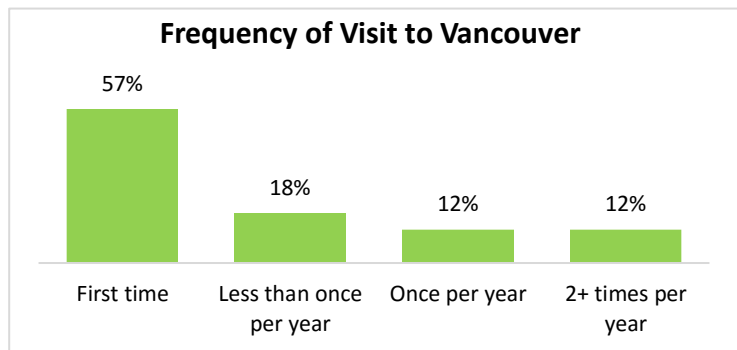
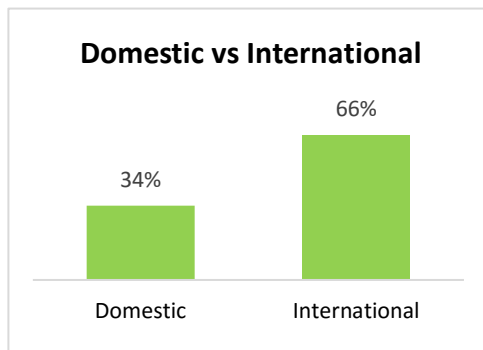
- Australia
- New Zealand

Middle East (2%, n=1/65)

- Iran

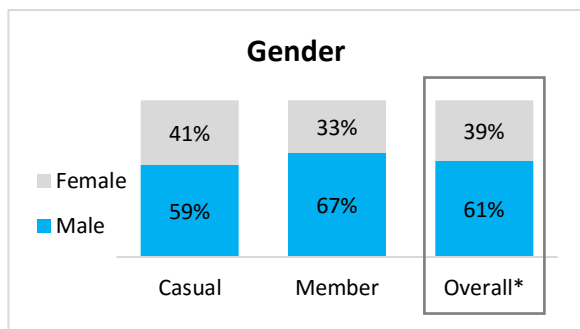
Detailed Visitor Profile

Nearly all visitors were casual riders (95%, n=62/65) and most had purchased their day-pass for the first time (85%, n=53/62). One-third (34%) of visitors were from a Canadian city outside Metro Vancouver and two-thirds (66%) from international origins. A majority (86%) indicated they were on a leisure-related trip (14% being on a work trip). Just over half (57%) indicated they were visiting Vancouver for the first time and three-quarters (77%) were planning to stay for a week or less. A majority (77%) indicated that they had not planned to hire a bicycle from a private bicycle rental shop on this trip, and half (49%) said they only planned to use Mobi for one day.

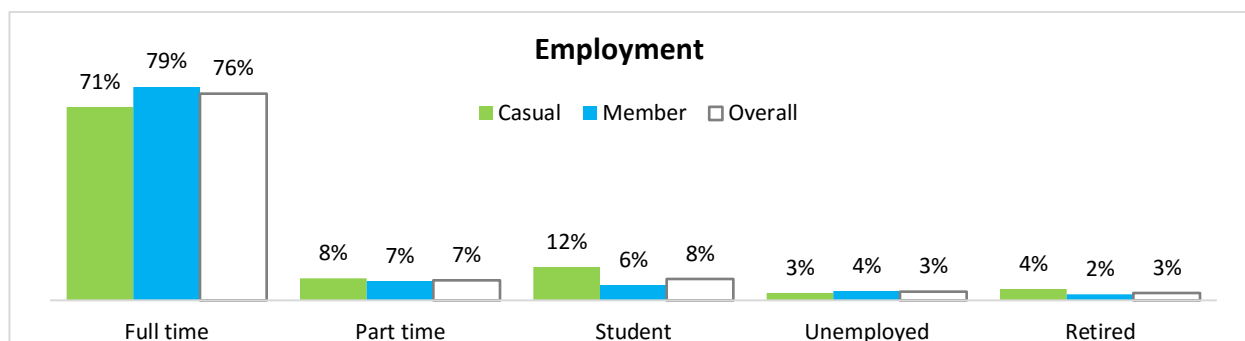
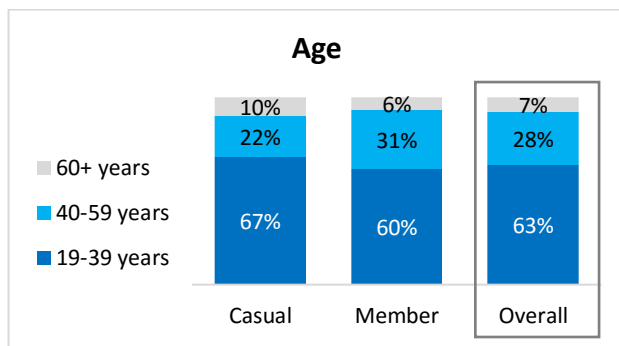


Demographics

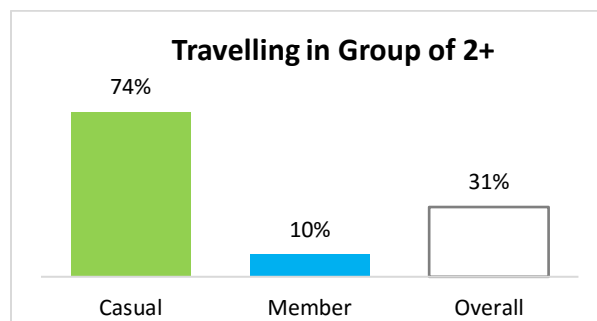
The participant sample was 64% male (n=137/214) and 36% female (n=77/214) and gender differences between members and casual riders were not statistically significant. Overall, the gender distribution of all system users (including those 109 observed) was 61% male (n=198/323) and 39% female (n=125/323). About two-thirds (63%, n=134/214) of participants reported being under the age of 40. Casual riders and members were predominately employed full-time (76%), and casual riders were twice as likely to identify as a student (12% vs 6%).



*Overall includes n=109 "observed only" system users.



About a third of system users (31%, n=101/323) travelled in a group of two or more—a circumstance commonly referred to as "social cycling". Social cycling was notably higher amongst casual riders, of which nearly 3 out of 4 (74%, n=54/73) cycled in a group or pair. This compared to only 1 in 10 members who cycled in a group (10%, n=14/141). From observational field notes, the majority of groups observed were male and female couples. It should be noted that when travelling in pairs or groups, responses from only one member of the group were recorded.

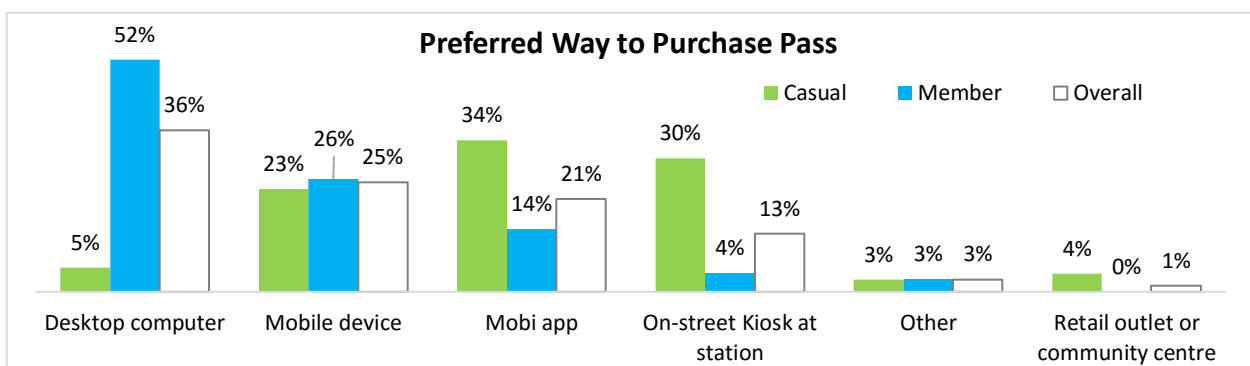
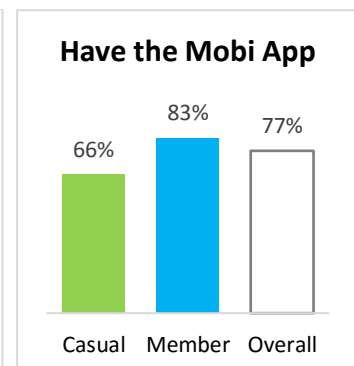
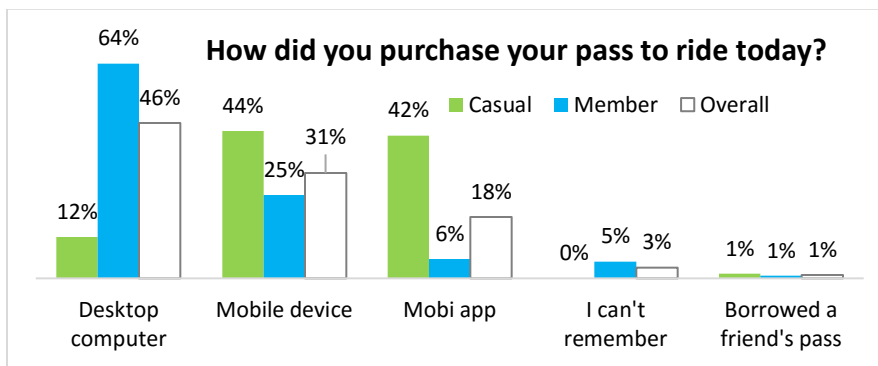
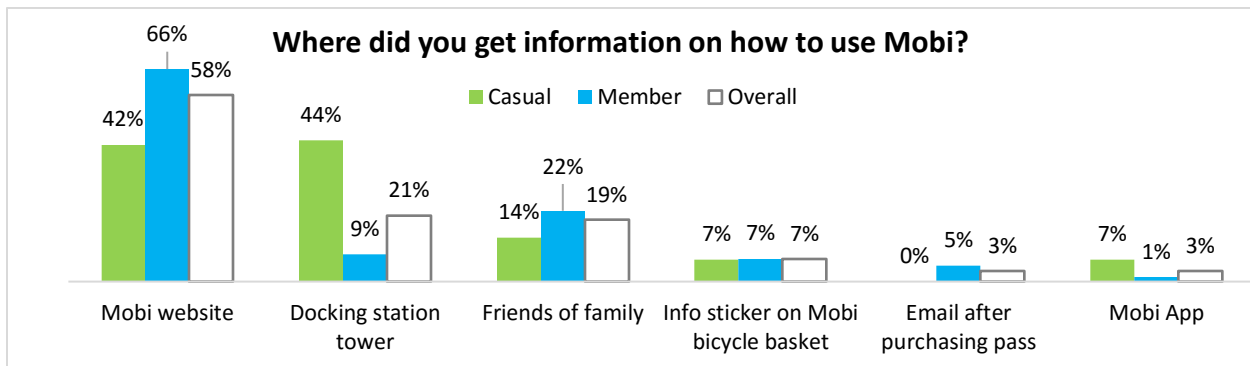


Access to Pass and System Information

The Mobi website was the top place where participants received information on how to use Mobi (66% of members and 42% casual riders), followed by a docking station tower (44% of casual riders) and friends and family (22% of members). Few reported learning about Mobi from the info sticker on the bicycle baskets, the email sent prior to purchasing a pass, or from the Mobi app (14% total).

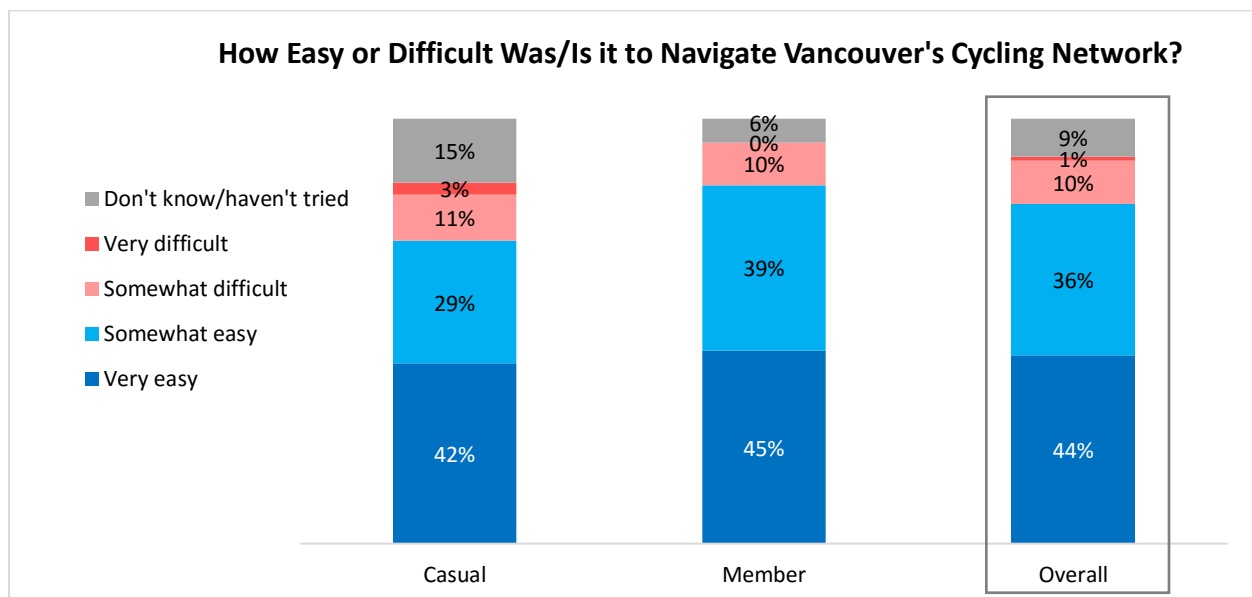
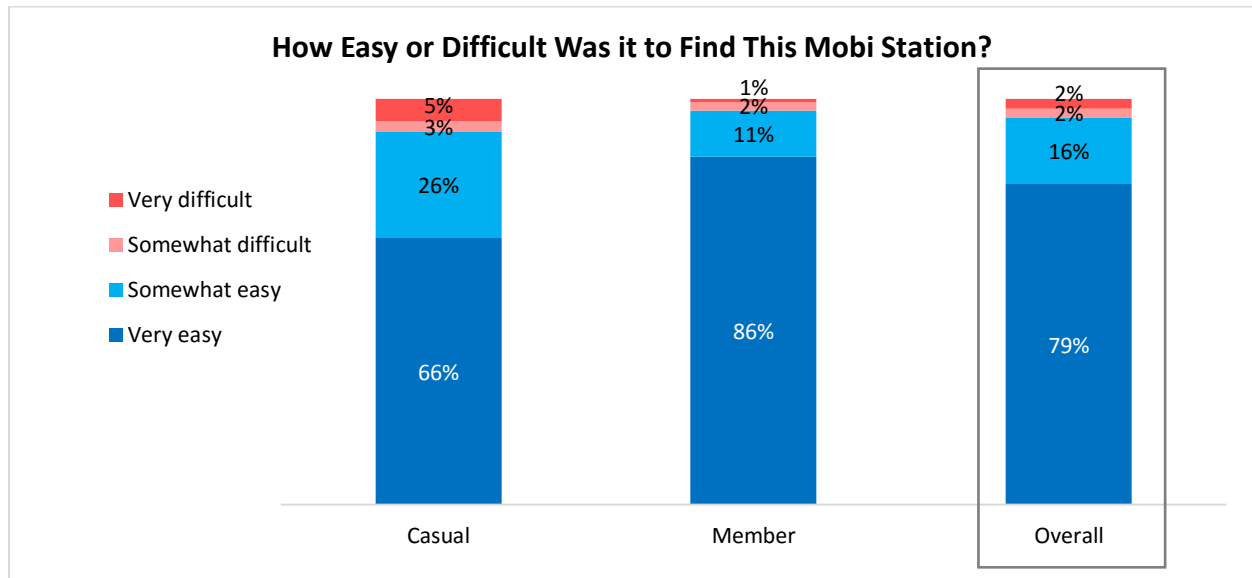
For members, two-thirds (64%) had purchased their pass on a desktop computer and almost a third on their mobile device (25%) or the Mobi app (6%). Members' preference was for a shift away from desktop computers to mobile and app based purchases (40%). For casual riders, nearly all had purchased a pass using their mobile device (44%) or the Mobi app (42%). Casual riders indicated a strong preference for purchasing a pass at an "on street kiosk at the station" (30%), not currently available.

Although three-quarters (77%) of all participants surveyed had the Mobi app, only 18% had purchased their pass via the app; casual riders being almost nine times more likely to do so compared to members.



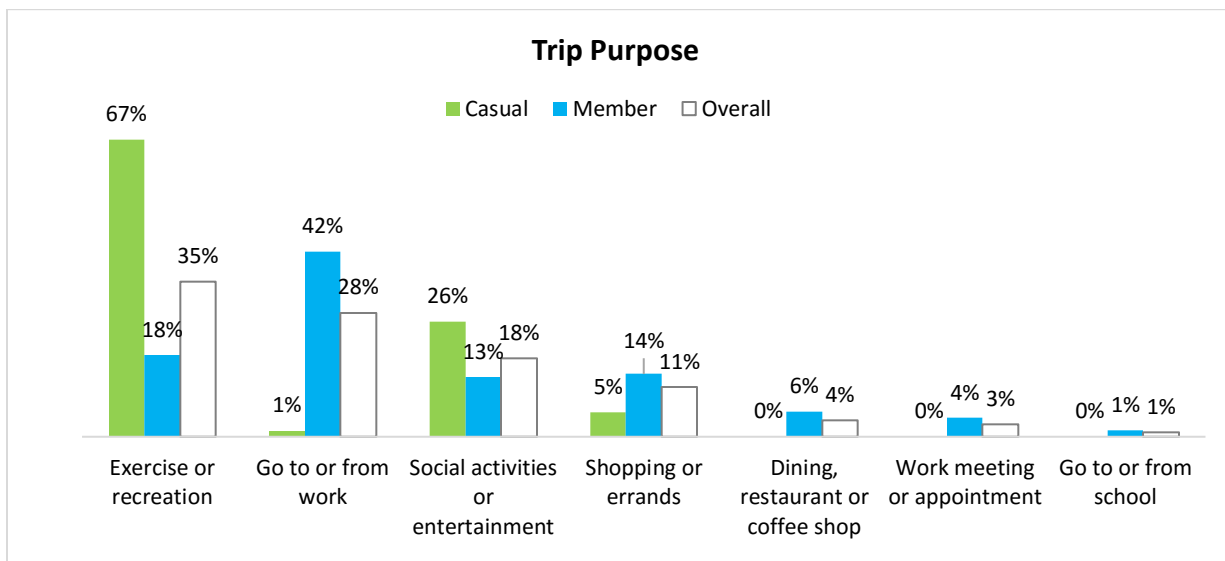
Ease of Finding Stations & Navigating Vancouver's Cycling Network

Overall, both casual riders and members alike found it easy (very or somewhat) to find Mobi bike share stations and to navigate Vancouver's cycling network (95% and 80%, respectively).

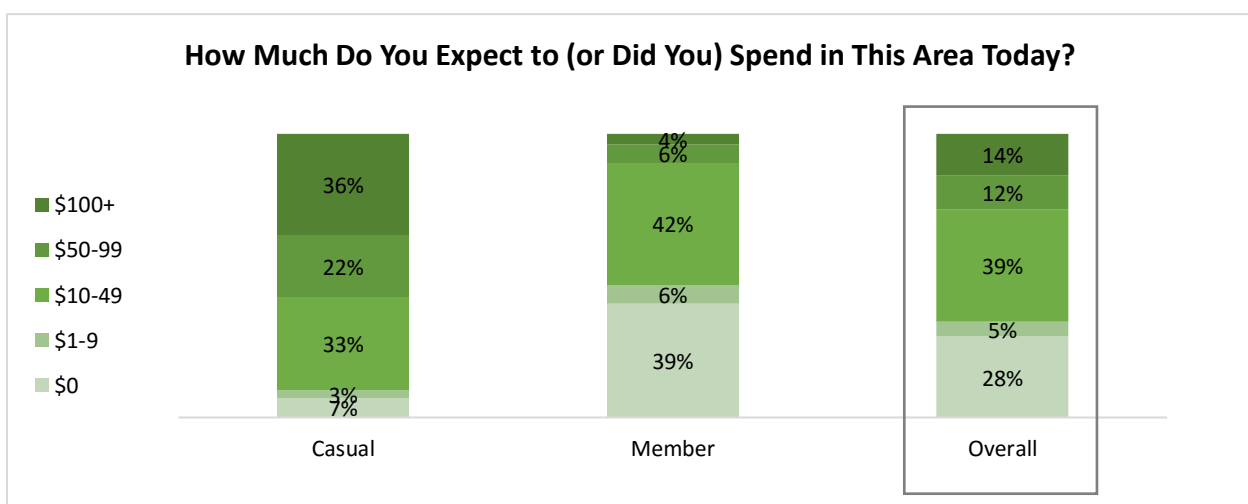


Trip Details

Two-thirds (67%) of casual rider trips were for the purpose of exercise or recreational pursuits. Almost no trips (1%) were for commuting or work related. Casual riders made twice as many trips for social activities and entertainment (26% vs 13%) and about a third as many trips for shopping or performing errands (5% vs 14%) as members. Members' trip purposes were more diverse compared to casual riders and included trips for dining, work appointments, and school that were not reported by casual riders. Nearly half (48%) of member trips were for commuting to work or school or were daytime work-related trips.

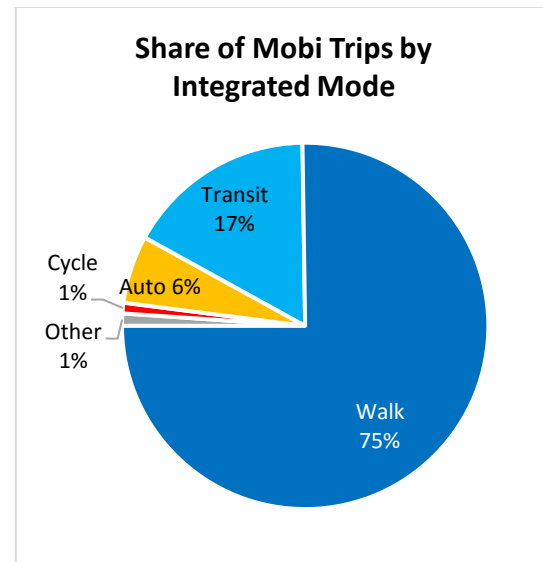
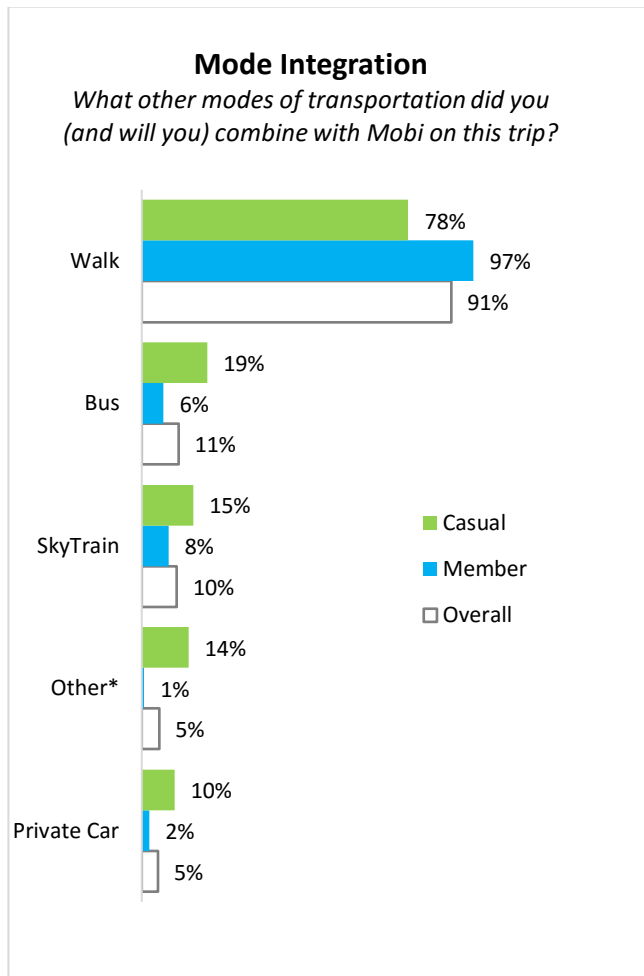


When participants were asked “how much [money] did you or do you expect to spend in the area today”, there was an obvious trend towards casual riders spending more than members (58% of casual riders spent \$50 or more compared to just 10% of members).



Mode Integration

Most participants reported integrating walking with their Mobi trip (91%), and a full three-quarters (75%) of trips (56% of casual riders' trips and 85% of members' trips) incorporated only walking. More than twice the proportion of casual riders integrated transit (any combination of bus, SeaBus, or SkyTrain) with Mobi as compared to members (26% vs 12%), and casual riders incorporated autos (private car, taxis, car rental, and carshare) six times more than members (13% vs 2%). The trips made by casual riders were also more complex than members as a larger proportion integrated two or more modes with Mobi (11% vs 2%; not shown).



**Other: n=2 trips combined with Aquabus.
Note: We did not include partial walking trips (such as to a bus stop, taxi, or transfers between transit modes) when calculating the share of trips by mode. Walking was included when it was the only mode combined with Mobi. For this reason, the mode-split for walking is lower than the proportion of participants that reported combining walking with their Mobi trip.*

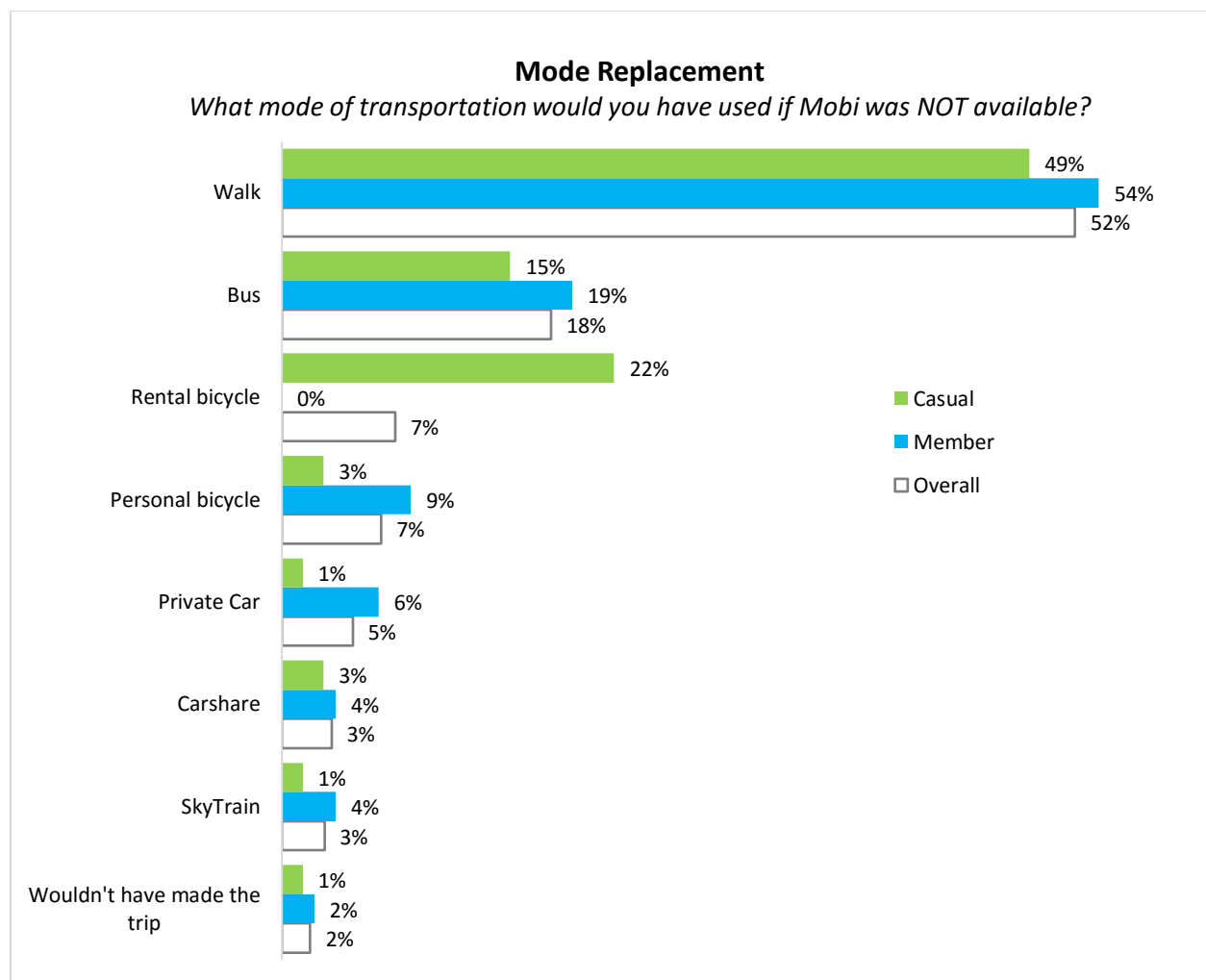
**Other (n=11): Seabus (n=2), Taxi (n=2), Aquabus (n=2), BC Ferries (n=1), personal bicycle (n=1), rental bicycle (n=1), carshare (n=1) and car rental (n=1)*

Mode Replacement

Participants primarily replaced transit and active modes with Mobi (87%). More than one in five (22%) casual rider trips replaced a rental bicycle; aligning with the results from a later question which asked visitors “On this visit, did you (do you plan to) hire a bicycle from a rental shop?” (23% indicated ‘Yes’, refer to page 10).

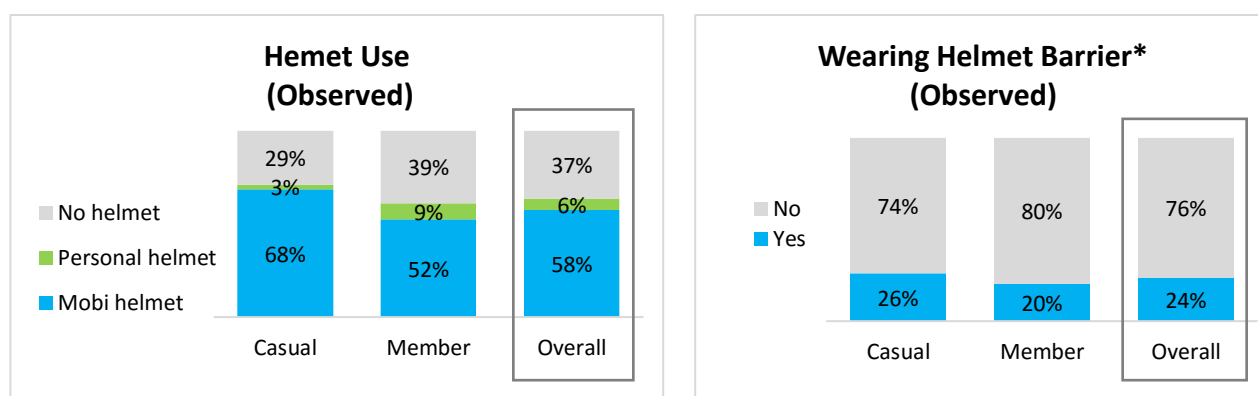
Overall, 10% of respondents reported they replaced an auto trip (private car, carshare, taxi, car rental, or motorcycle) with Mobi. For casual riders, 7% of trips replaced auto trips; a replacement rate lower than members (12% auto trips) primarily due to substituting fewer private car trips than members.

Induced trips (“Wouldn’t have made trip if Mobi was not available”) account for 2% of trips made.

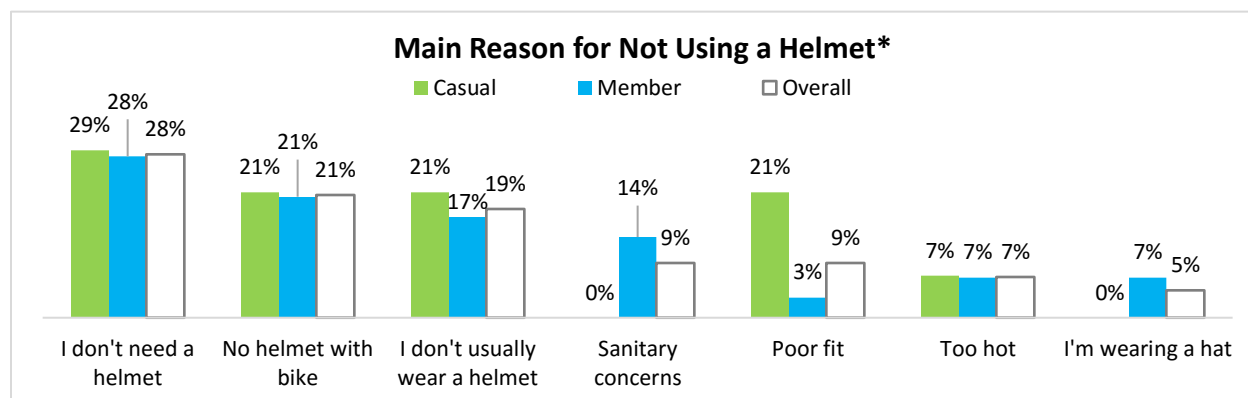


Helmet Use

Our surveyors observed whether system users were wearing a helmet, the type of helmet, and whether a barrier between the helmet and head was used. Overall, 63% (n=205/323) of users were observed wearing a helmet (58% Mobi helmet, 6% personal helmet). Twenty-four per cent of Mobi helmet wearers used a barrier (helmet liner or hat). Top reasons reported by participants for not wearing a helmet included “I don’t need a helmet” (28%, n=12/43), “no helmet with bike” (21%, n=9/43), and “I don’t usually wear a helmet” (19%, n=8/43). Problems with shared helmets, including “no helmet with bike”, “poor fit”, and “sanitary concerns” were cited by 40% of non-helmet wearing participants. While “no helmet with bike” was equally reported, casual riders reported more instances of “poor fit” than members (21% vs 3%), while members cited “sanitary concerns” more than casual riders (14% vs. 0%).



*Note: includes a helmet liner, hat, or hood.



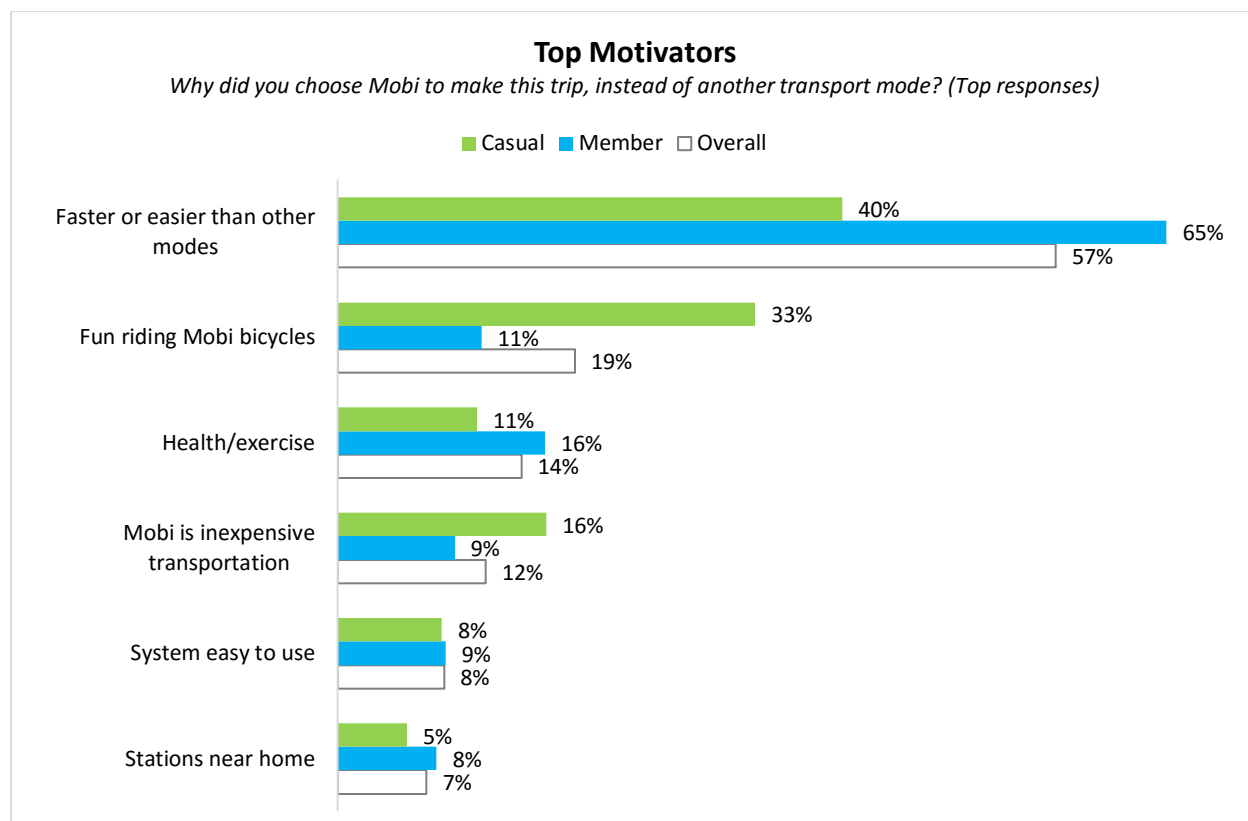
*Note low count numbers: n=14 casual riders and n=29 members.

Reason for Not Using a Helmet

	Casual (n=14)	Member (n=29)	Overall (n=43)
I don't need a helmet	4 (29%)	8 (28%)	12 (28%)
No helmet with bike	3 (21%)	6 (21%)	9 (21%)
I don't usually wear a helmet	3 (21%)	5 (17%)	8 (19%)
Sanitary concerns	0 (0%)	4 (14%)	4 (9%)
Poor fit	3 (21%)	1 (3%)	4 (9%)
Too hot	1 (7%)	2 (7%)	3 (7%)
I'm wearing a hat	0 (0%)	2 (7%)	2 (5%)
I don't want to mess up my hair	0 (0%)	1 (3%)	1 (2%)

Motivators

The top reason motivating participants to make their trip by Mobi was that it was “faster and easier than other modes” (57%, n=121/214). “I have Fun riding Mobi bicycles” was cited by three times as many casual riders as members (33% vs 11%), consistent with their typical trip purposes.



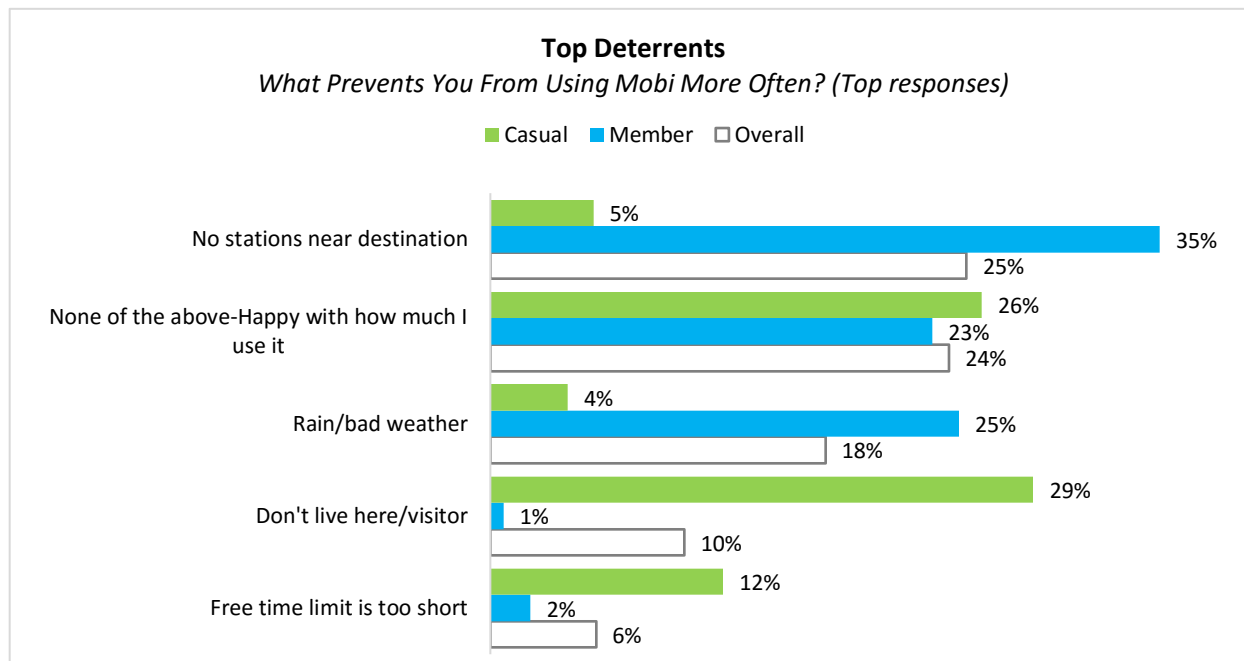
	Casual Rider	Member	Overall
Faster or easier than other modes	40%	65%	57%
I have fun riding Mobi bicycles	33%	11%	19%
Health/exercise	11%	16%	14%
Mobi is inexpensive transportation	16%	9%	12%
System easy to use	8%	9%	8%
Other*	12%	6%	8%
Stations near home	5%	8%	7%
Can ride one-way	8%	5%	6%
No bike theft	1%	9%	6%
Stations near destination	3%	6%	5%
Environment	1%	5%	4%
No personal bike	1%	5%	4%
Don't know/not sure	7%	1%	3%
Free ride time	1%	3%	2%
Auto parking is difficult/expensive	0%	3%	2%
Discounted/free Mobi membership	1%	1%	1%

*Other responses (n=18):

- saw the stations and want to try it (n=6)
- it's a nice day (n=5)
- want to support bike share (n=3)
- can see more things (n=1)
- had bikeway for entire trip (n=1)
- see environment (n=1)
- have 3-month pass and want to use it more (n=1)

Deterrents

Overall, 1 in 4 (24%, n=52/214) participants indicated that they did not have anything preventing them from using the system more often and that they were “happy with how much [they] used Mobi”. Over one-third (35%, n=50/141) of members cited “no stations near destinations” as a barrier to using Mobi more, while just 4% (n=6/141) indicated that there were “no stations near home”, suggesting that proximity to a station near one’s home is important to system membership. Casual riders indicated that not living in Vancouver means they (unsurprisingly) use Mobi less (29%, n=21/73).



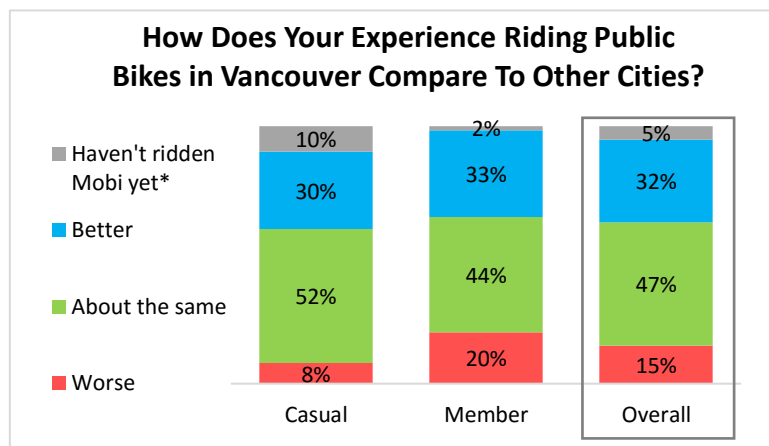
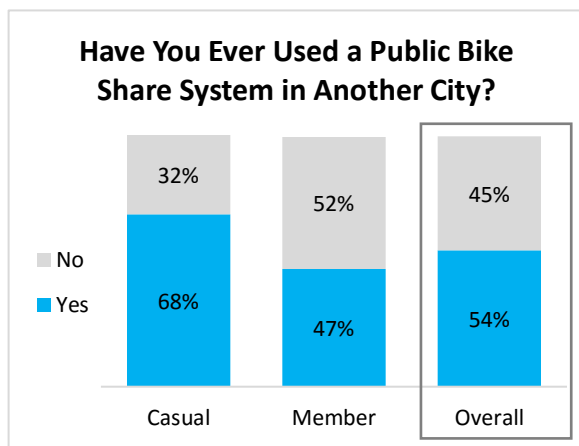
	Casual Rider	Member	Overall
No stations near destination	5%	35%	25%
None of the above-Happy with how much I use it	26%	23%	24%
Rain/bad weather	4%	25%	18%
Don't live here/visitor	29%	1%	10%
Free time limit is too short	12%	2%	6%
Other*	8%	4%	5%
No station near home	5%	4%	5%
Don't feel safe (traffic)	0%	6%	4%
Hills	1%	4%	3%
Bikes too heavy	0%	5%	3%
Not enough bikes/free docks at docking stations	1%	4%	3%
Too expensive (passes and usage fees)	7%	0%	2%
Don't know/not sure	7%	0%	2%
Other modes more convenient	1%	2%	2%
Too far to cycle	1%	2%	2%
Prefer my personal bicycle	3%	1%	2%
Maintenance problems	0%	3%	2%
Helmet requirement	1%	1%	1%

*Other responses (n=11):

- Want to wear nice clothes
- Without data on phone/ difficult to navigate stations
- I have my hair all ready for work...don't want to get sweaty
- Don't have mobile data need wifi
- Need more holidays
- Not having a week/3 day pass
- No 3-day option like Montreal
- Uncertain where stations are
- Saddle needs to be higher
- if I forget my member card, pin doesn't seem to work
- being comfortable with the Mobi stations

Comparing Mobi with Public Bike Share in Other Cities

Just over half (54%, n=116/214) of all participants had used a public bike share system in another city (the 43 locations listed below). A larger proportion of casual riders had ridden a public bike share system in another system—logical given these users are primarily visitors. When asked to rate their experience riding public bikes in Vancouver compared to other cities, about half (47%, n=55/116) rated their experience to be “about the same”, about a third (32%) as “better” and 15% as “worse” (a positive to negative ratio of 2.1). Compared to casual riders, members were about 2.5 times more likely to rate the experience of using Mobi as “worse” than other systems (20% vs. 8%).

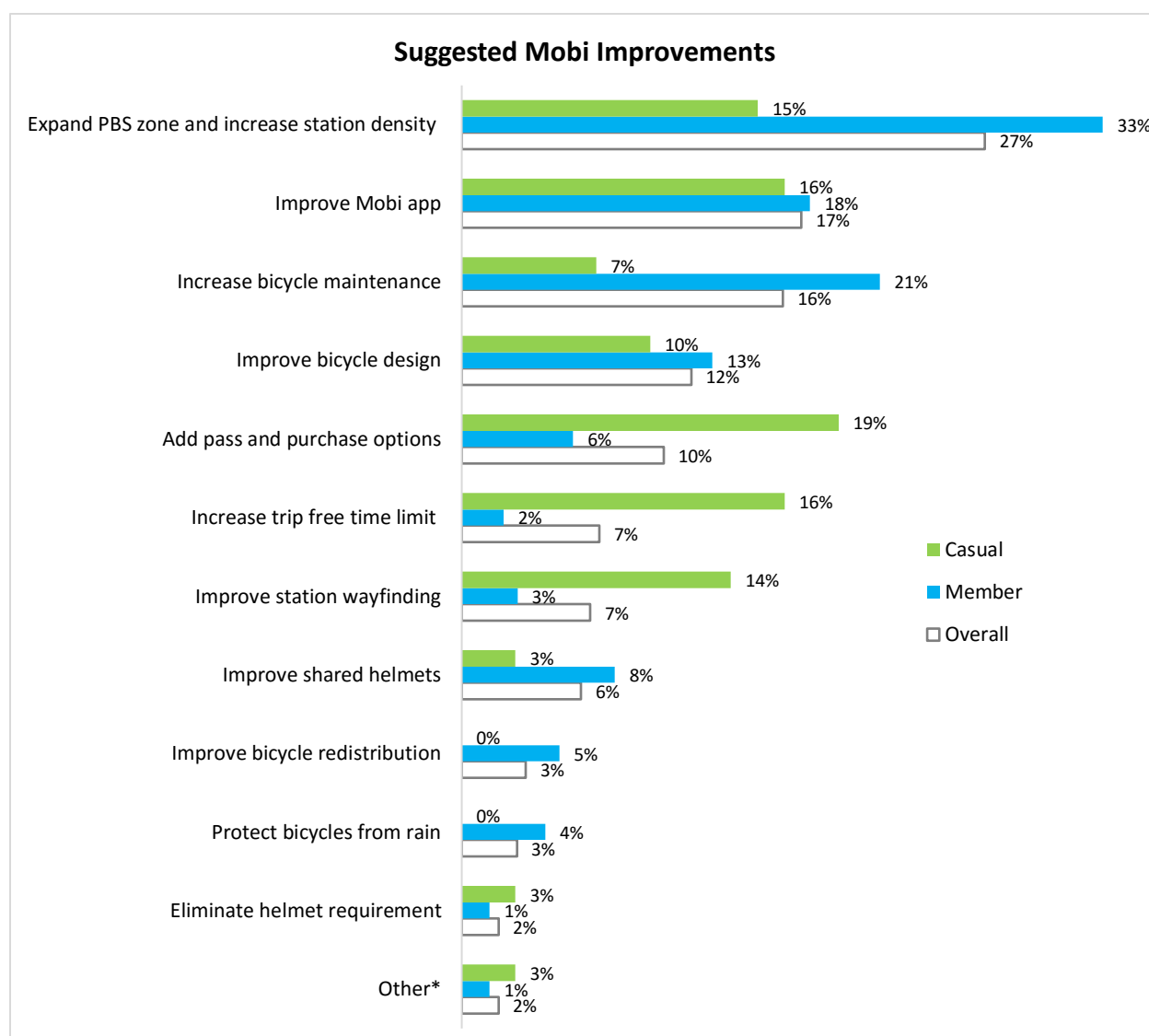


*Intercepted before first departure

Location	Casual	Member	Overall	Location	Casual	Member	Overall
Canada (28%, n=33/116)				Dublin	0	3	3
Montreal	8	15	23	Amsterdam	1	1	2
Toronto	2	7	9	Hamburg	1	1	2
Calgary	0	1	1	Copenhagen	1	0	1
USA (32%, n=37/116)				Glasgow	1	0	1
New York	4	5	9	Munich	0	1	1
Washington, D.C.	2	3	5	Nice, France	0	1	1
Chicago	4	0	4	Rome	1	0	1
San Francisco	3	1	4	Luxemburg	0	1	1
Seattle	0	3	3	Lyon	0	1	1
Los Angeles	0	2	2	Manchester	1	0	1
Portland	1	1	2	Latin America (3%, n=4/116)			
Austin	1	0	1	Brasilia	1	0	1
Cambridge	0	1	1	Brazil	1	0	1
Cleveland	1	0	1	Rio	0	1	1
Denver	1	0	1	San Paulo	0	1	1
Detroit	1	0	1	Asia (4%, n=5/116)			
Houston	0	1	1	Kyoto	0	1	1
Minneapolis	1	0	1	Seoul	0	1	1
San Diego	0	1	1	Shenzhen	1	0	1
Europe (31%, n=36/116)				Taipei	0	1	1
London, U.K.	5	4	9	Malaysia	0	1	1
Paris	4	2	6	Africa (1%, n=1/116)			
Barcelona	2	1	3	South Africa	0	1	1
Berlin	1	2	3				

Suggestions for System Improvements

Participants were asked if they had “any suggestions to improve Mobi?” This question was asked to 214 users (73 casual riders, 141 members). Fifty-three (25%) participants had no suggestions for system improvements. Below is a list of topic categories based on a review of all feedback received (161 comments). Participant suggestions were categorised into 11 topics, plus ‘other’. The number and proportion of participants making each recommendation is presented next to each topic category. When participants provided specific suggestions for improvements, we included their suggestions in the accompanying paragraph. Top suggestions for improvements included “expanding the public bike share zone and increasing station density” (27%, n=57/214), “improve the Mobi app” (17%, n=37/214) and “increase bicycle and station maintenance” (16%, n=35/214).



*Other responses (n=4): "Make more bike lanes less cars" (casual rider); "Make it more clear for visitors" (casual rider); "better advertising to tourists, locals and commuters too" (member); "Lock them anywhere (not at a docking station)" (member).

Expand PBS Zone and Increase Station Density	Overall	Casual Riders	Members
	57 (27%)	11 (15%)	46 (33%)

Over twice as many members recommended an increase to the public bike share (PBS) operating zone or an increase in station density compared to casual riders. Specific recommendations included:

- Expand the system zone east toward Commercial drive, and west to Kitsilano and UBC.
- Expand the system operating zone south (e.g., to Cambie Village).
- Increase the capacity of the Comox & Denman station (#0032).
- Increase station density by adding stations at:
 - Major train stations
 - Science World
 - Within Downtown
 - Stanley Park
 - Oak and 7th

Improve Mobi App	Overall	Casual Riders	Members
	37 (17%)	12 (16 %)	25 (18%)

Wherever possible, provide these features for off-line viewing as an accommodation to visitors who have limited access to cellular data on their mobile devices. Specific recommendations included:

- Geocoding of users when using the app map (i.e., map display defaults to user location).
- Map of stations should display bikes available and free docks (similar to website station map).
- Add a trip planner capable of guiding users to destinations and the nearest docking station.
- Add a Vancouver bikeways layer to app map.
- Add push notifications informing users of station closures or other important information.
- Add the ability to unlock bicycles using the app (similar to car2go).
- Use local servers instead of the Google server.
- Allow users to report issues to Mobi via the app, including:
 - bicycle maintenance issues
 - non-working bicycles
 - empty or full docking stations (and receive extra free time and directions to find the nearest station with a free dock)

Increase Bicycle & Station Maintenance	Overall	Casual Riders	Members
	35 (16%)	5 (7%)	30 (21%)

Members were much more likely to request improvements to bicycle and station maintenance than casual riders. Specific recommendations included:

- Improve bicycle maintenance, focusing on bicycle tire pressure, breaks, bell, and gears.
- Improve bicycle cleaning, focusing on the saddle, handlebars, and display.
- Add a mechanism at docking stations to report bicycle maintenance issues, similar to Montreal's Bixi system.
- Fix offline stations and provide notification to users when shut downs occur.
- Address technical problems with stations that result in bicycle docking failures.

Improve Bicycle Design	Overall	Casual Riders	Members
	25 (12%)	7 (10%)	18 (13%)

The following recommendations were specific to the design of the bicycle and associated technology:

- Provide bicycles with a lower minimum saddle height for shorter people.
- Provide bicycles with a higher maximum saddle height for taller people.
- Use more stylish and lighter bicycles.
- Add side-view mirrors.
- Offer electric (pedal assist) bicycles.
- Increase the number of gears.
- Improve sensitivity of breaks.
- Add a mount for mobile phones to assist users with navigation.
- Add a scanner to bicycle so emailed passes can be read for undocking bicycles (in lieu of PIN).
- Add GPS on bicycles and a screen display to aid station wayfinding.
- Improve grip on bike handles and pedals which currently slip when wet.
- Increase the allotted time to enter the PIN using the keypad.
- Better communicate cable lock uses and proper storage when cycling.

Add Pass and Purchase Options	Overall	Casual Riders	Members
	22 (10%)	14 (19%)	8 (6%)

Casual riders were over three times more likely to recommend new pass and purchasing options than members. Specific recommendations included:

- Add a 24-hour pass with unlimited 60 minute rides (i.e., 24-hour pass plus).
- Add new short-term (3, 5, and 7-day) and monthly pass options.
- Offer a pay-per-ride (pay as you go) pass option.
- Offer pass purchases from station towers [many casual riders cited the lack of cellular data as a barrier to making pass purchases via their mobile device].
- Do not auto renew passes.
- 24-hour pass should start from first undocking, not time of pass purchase.
- Improve simplicity and ease of purchasing passes, especially 24-hour passes.
- Reduce pass prices.

Increase Trip Free Time Limit	Overall	Casual Riders	Members
	15 (7%)	12 (16%)	3 (2%)

Casual members were eight times more likely to recommend an increase to the trip free time limit than members. Specific recommendations included:

- Increasing the free time limit per trip to at least 45 minutes.
- Better communicate the per trip free time limit to users.

Improve Station Wayfinding	Overall	Casual Riders	Members
	14 (7%)	10 (14%)	4 (3%)

Casual riders were almost five times more likely to recommend improvements to station wayfinding than members. Specific recommendations included:

- Use road markings to direct users to nearby stations.
- Add docking station locations to maps currently posted at docking station towers.
- Provide printed brochures or Z-cards of the PBS zone map at all docking stations. The map should include the cycle network and Mobi station locations.

Improve Shared Helmets	Overall	Casual Riders	Members
	13 (6%)	2 (3%)	11 (8%)

Members were about three time more likely to request improvements to the shared helmet system than casual riders. Specific recommendations included:

- Reconsider the way helmets are attached to bicycles as they often fall when undocking.
- Provide additional helmet size options, including larger helmets.
- Increase the proportion of bicycles with shared helmets, however, other participants call for keeping some bikes without shared helmets as an option when using a personal helmet and needing the front basket free for cargo.
- Increase the proportion of stations with helmet liners and ensure helmet liners are kept stocked.
- Provide a trash can at stations for the disposal of used helmet liners.
- Mark helmets for cord to improve proper locking procedure and avoid instances where helmets are left in baskets or the helmet is secured by the straps.
- One participant suggested adding helmet sanitizer machines in lieu of providing helmet liners.

Improve Bicycle Redistribution	Overall	Casual Riders	Members
	7 (3%)	0 (0%)	7 (5%)

Specific suggestions included:

- Ensure each docking station has at least two bicycles and two free docks to better accommodate groups.
- In addition to improved redistribution of bicycles, provide users impacted by full stations extra time (e.g., 10-15 minutes) and directions to a nearby station with free docks.
- Allow users to report a station as 'full' (no free docks) at any docking station or with an improved mobile app.

Protect Bicycles from Rain	Overall	Casual Riders	Members
	6 (3%)	0 (0%)	6 (4%)

Specific suggestions included:

- Protect bicycles from rain with station shelters.
- Provide members with bicycle saddle covers.
- Protect helmets from getting wet.

Eliminate Helmet Requirement	Overall	Casual Riders	Members
	4 (2%)	2 (3%)	2 (1%)

No specific suggestions were offered.

Other Suggestions	Overall
• Better advertising to tourists, locals, and commuters, too.	1 (0.5%)
• Make more bike lanes less cars.	1 (0.5%)
• Make it clearer for visitors.	1 (0.5%)
• Lock them [bikes] anywhere (not at a docking station).	1 (0.5%)

APPENDIX A: Vancouver Public Bike Share Intercept Survey Questions

PURPOSE: To better understand who is using bike share, opinions of the system, and travel behaviour.

OBSERVATION/QUESTION	RESPONSE OPTIONS
Surveyor:	[Open text]
Date and time:	[Open text]
Docking station:	1st & Main 1st & Ontario 5th & Arbutus 5th & Yukon 6th & Main 8th & Ash 10th & Columbia 10th & Granville 10th & Oak 14th & Cambie 14th & Main 14th & Ontario Alexander & Main Aquatic Centre Burrard & 7th Burrard Station Bute & Robson Cambie & 2nd Cardero & Davie Cardero & Robson Carrall & Seawall Chilco & Beach Coal Harbour Community Centre Columbia & 2nd Comox & Broughton Comox & Denman Cypress & Broadway Drake & Hornby Dunsmuir & Richards Expo & Carrall Georgia & Thurlow Granville & Georgia Keefer & Abbott Ontario & 16th Ontario & Seawall Pender & Burrard Quebec & Milross Richards & Helmcken Richards & Robson Spyglass & Seawall Stamp's Landing Stanley Park- Information Booth Stanley Park- Second Beach North Stanley Park- Totem Poles Vanier Park
Participant status:	1, Eligible and consent provided 2, Refused 3, Ineligible
Reason:	1, Minor (age < 19) 2, Lack English comprehension 3, Already completed survey
Arriving or departing station?	1, Docking 2, Undocking
Helmet Use?	1, Mobi Helmet 2, Personal Helmet 3, No Helmet
Barrier used?	1, Yes 0, No
Gender:	1, Male 2, Female
Estimated age?	1, Young adult (19-39) 2, Adult (40-59) 3, Older adult (60 and over)
Travelling in a group?	1, Yes 0, No
Refused and ineligible: STOP HERE! Save and leave record.	
What kind of Mobi pass do you have?	1, 24-hour 2, 90 day 3, 365 day 4, I don't know
How many times have you purchased a 24-hour pass?	1, Just this once 2, 2-3 times 3, 4-5 times 4, 6-7 times 5, 8 or more times
How did you purchase your pass to ride today?	1, Desktop computer 2, Mobile device (online) 3, Mobi app 4, Borrowed a friend's pass 5, I don't know/Can't remember
What would be your preferred way to purchase a pass?	1, Desktop computer 2, Mobile device (online) 3, On-street kiosk at station 4, Mobi app 5, Retail outlet or community centre 6, Other
Name purchase preference:	[Open text]
Where did you get information on how to use Mobi?	1, Mobi website 2, Email after purchasing pass 3, Docking station tower 4, Info sticker on Mobi bicycle basket 5, Mobi app 6, Friends or family
Do you have the Mobi app on your mobile device?	1, Yes 0, No
How easy or difficult was it to find this Mobi station?	1, Very easy 2, Somewhat easy 3, Somewhat difficult 4, Very difficult 5, Don't know/haven't tried

OBSERVATION/QUESTION	RESPONSE OPTIONS
How easy or difficult was/is it to navigate Vancouver's cycling network?	1, Very easy 2, Somewhat easy 3, Somewhat difficult 4, Very difficult 5, Don't know/haven't tried
What's the main purpose of your trip today?	1, Go to/from work 2, Work meeting/appointment 3, Go to/from school 4, Shopping/errands 5, Dining/restaurant/coffee shop 6, Social activities/entertainment 7, Exercise/recreation
What mode of transportation would you have used if Mobi was NOT available?	1, Walk 2, Personal bicycle 3, Rental bicycle 4, Bus 5, SkyTrain 6, SeaBus 7, Private car 8, Carshare 9, Car rental 10, Motorcycle 11, Taxi 12, Wouldn't have made trip 13, Don't know
What other modes of transportation did you (and will you) combine with Mobi on this trip?	1, Walk 2, Personal bicycle 3, Rental bicycle 4, Bus 5, SkyTrain 6, SeaBus 7, Private car 8, Carshare 9, Car rental 10, Motorcycle 11, Taxi 12, Other
List mode:	[Open text]
Why did you choose Mobi to make this trip, instead of another transport mode?	1, Can ride one-way 2, No bike theft 3, Faster or easier than other modes 4, Stations near destination 5, Stations near home 6, System easy to use 7, Free ride time 8, Fun riding Mobi bicycles 9, Health/exercise 10, Mobi is inexpensive transportation 11, Environment 12, No personal bike 13, Auto parking is difficult/expensive 14, Discounted/free Mobi membership 15, Don't know/not sure 16, Other
Other reason:	[Open text]
What prevents you from using Mobi more often?	1, Rain/bad weather 2, No stations near destination 3, Hills 4, Don't feel safe (traffic) 5, Other modes more convenient 6, No stations near home 7, Too far to cycle 8, Bikes too heavy 9, Helmet requirement 10, Prefer my personal bicycle 11, Free time limit is too short 12, Not enough bikes/free docks at docking stations 13, Maintenance problems 14, Too expensive (passes and usage fees) 15, None of the above - Happy with how much I use it 16, Don't know/not sure 17, Other 18, Don't live here/visitor
Other reason:	[Open text]
What is your MAIN reason for not using a helmet on this trip?	1, Sanitary concerns 2, I don't usually wear a helmet 3, I don't need a helmet 4, Poor fit 5, Helmet was wet 6, Discomfort 7, I'm wearing a hat 8, Helmets are unattractive 9, Too hot 10, Helmet was damaged 11, Other 12, I prefer to not answer 13, No helmet with bike
Other reason:	[Open text]
How much do you expect to (or did you) spend in this area today?	1, \$0 (Nothing) 2, \$1-9 3, \$10-49 4, \$50-99 5, \$100 or more
Have you ever used a public bike share system in another city?	1, Yes 0, No
Which city?	[Open text]
How does your experience riding public bikes in Vancouver compare to [pbs_city_other]?	1, Worse than [pbs_city_other] 2, About the same as [pbs_city_other] 3, Better than [pbs_city_other] 4, Haven't ridden Mobi yet

OBSERVATION/QUESTION	RESPONSE OPTIONS
Do you have any suggestions to improve Mobi?	1, Improve shared helmets 2, Improve Mobi app 3, Improve station wayfinding 4, Increase bicycle maintenance 5, Improve bicycle design 6, Expand PBS zone and increase station density 7, Improve bicycle redistribution 8, Add pass and purchase options 9, Increase trip free time limit 10, Other 11, Protect bicycles from rain 12, Eliminate helmet requirement
What is your age?	1, Young adult (19-39) 2, Adult (40-59) 3, Older adult (60 and over) 4, Refused
What is your employment status?	1, Full time 2, Part time 3, Homemaker 4, Student 6, Unemployed 7, Retired 8, Refused
In which city do you live?	1, Vancouver 2, Burnaby 3, West Vancouver 4, Village of Lions Bay 5, North Vancouver 6, UBC/Electoral Area A 7, Richmond 8, Delta 9, New Westminster 10, Port Moody 11, Coquitlam 12, Port Coquitlam 13, Surrey 14, White Rock 15, Langley 16, Pitt Meadows 17, Maple Ridge 18, Village of Anmore 19, Village of Belcarra 20, Bowen Island 21, Tsawwassen First Nation 22, Visitor
What is your postal code?	[Open text]
Reason postal code not provided:	1, Refused 2, Don't know/Can't remember
City name:	[Open text]
Ask of Visitors only:	
What is the PURPOSE of your visit in Vancouver?	1, Work-related 2, Leisure-related
How LONG is your visit in Vancouver?	1, 1-3 days 2, 4-7 days 3, 8-14 days 4, 15-21 days 5, 22 days or more
How OFTEN do you visit Vancouver?	1, first time 2, less than once per year 3, once per year 4, 2 or more times per year
On this visit to Vancouver, how many days did you (or do you plan to) use Mobi bikes?	1, Just this once 2, 2-3 days 3, 4-5 days 4, 6-7 days 5, 8 or more days
On this visit to Vancouver, did you (or do you plan to) hire a bicycle from a bike rental shop?	1, Yes 0, No

APPENDIX B: Bike Share Intercept Survey: Letter of Information and Consent

Study overview and invitation to participate.

We are inviting people who have chosen to ride a Mobi bike today to understand your thoughts, perspectives and use of the Vancouver bike share system. This study is being conducted by Dr. Meghan Winters at Simon Fraser University (SFU) (Faculty of Health Sciences, 778-782-9325) and her research team, as a third-party contracted by the City of Vancouver to collect these data.

You are being invited to participate because you have or will make use of a Mobi bike today.

Who can participate in this study?

You can participate if 1) you are age 19 years or older, and 2) you can read English well enough to understand this consent form or have a translator present to interpret, and 3) you have, or immediately plan to, ride a Mobi bike today.

What will your participation involve?

Should you choose to participate, you will be asked to provide responses to a questionnaire that will take less than 5 minutes to complete. You may skip any question that you are not comfortable answering. To thank you for your participation, you may choose to enter a draw for a chance to win one of ten, \$50 Visa gift cards. The draw date will be no later than the end of September 2017.

What are the risks of participation?

We do not think there are any risks to you by participating in this survey. If a question makes you feel uncomfortable, you may skip the question. *By agreeing to proceed with the survey, you give consent to participate and for us to use your data for future analysis.*

How will we protect your identity?

Your confidentiality will be respected and the information we collect from you is unidentifiable, unless you provide your personal contact details for the prize draw. Your personal information will be deleted after the prize draw and will no longer be linked to your survey responses.

How will the results be used?

The results from the intercept survey will be reported in scientific meetings, journal articles, and a graduate thesis. Your personal information will never be revealed in these reports.

Your participation is voluntary. You can stop at any time without reason.

Who to contact if you have questions or complaints?

If you have any questions, or would like to receive copies of the end results, you may contact Dr. Meghan Winters (778-782-9325). If you have any concerns about your rights or experiences as a research participant in this study, you may contact Dr. Jeffrey Toward, at the SFU Office of Research Ethics (jtoward@sfu.ca, 778-782-6593).

APPENDIX C: Station and Session Assignments

Consultation with the extended research team emphasised the importance of not biasing the sample to high activity stations, as users may be systematically different than those from lower activity stations. In response, we ensured our sampling protocol used a stratified random sample. Using historical system activity data provided by Mobi for a 64-day period (May 29 to July 31, 2017) we developed three strata (high, medium, and low activity) based on mean daily trip data per station. We divided the sample of 123 stations into 3 groups of 41 stations using these cut-offs:

- High= 11.8-145.1 trips/day
- Med= 4.1-11.7 trips/day
- Low= 0-4.0 trips/day

We used randomizer.org to draw samples. Initially we drew 8 stations from each stratum (Wave 1). We interviewed at these stations for 72 hours. When it became clear we would need to spend more hours in the field to reach sample targets, we randomly drew an additional 7 stations from each stratum (totalling 21 of the remaining 99 stations) and interviewed for an additional 63 hours at these sites—for a total of 135 hour of interviewing at the following 45 docking stations (3 hours each station):

Wave 1:

	High Activity	Trips/h	Medium Activity	Trips/h	Low Activity	Trips/h
1	Stanley Park- Second Beach North	8.16	Quebec & Milross	0.60	Georgia & Thurlow	0.22
2	Stanley Park- Totem Poles	6.82	Granville & Georgia	0.58	Richards & Robson	0.20
3	Aquatic Centre	4.87	Dunsmuir & Richards	0.52	8 th & Ash	0.17
4	Stamp's Landing	1.33	Alexander & Main	0.50	Comox & Broughton	0.15
5	Drake & Hornby	1.09	Pender & Burrard	0.49	Burrard & 7th	0.14
6	Chilco & Beach	1.07	Vanier Park	0.44	10 th & Columbia	0.13
7	Keefer & Abbott	0.94	Expo & Carrall	0.31	Cypress & Broadway	0.10
8	1 st & Ontario	0.82	Richards & Helmcken	0.24	14 th & Cambie	0.08
	Mean trips per hour	3.1	Mean trips per hour	0.46	Mean trips per hour	0.15

*Trips per hour are by casual riders. Mean trips per hour for this selection of 24 docking stations is 1.2
Trips/h = trips/day*0.9/16 h since nearly all trips (90%) are made in the 16 h period between 07-23:00*

Wave 2:

	High Activity	Trips/h	Medium Activity	Trips/h	Low Activity	Trips/h
1	Stanley Park – Information Booth	8.10	Comox & Denman	0.52	5 th & Arbutus	0.21
2	Coal Harbour Community Centre	4.96	Cambie & 2 nd	0.46	Ontario & 16 th	0.21
3	Ontario & Seawall	2.40	1 st & Main	0.33	Burrard Station	0.20
4	Spyglass & Seawall	1.00	14 th & Main	0.32	5 th & Yukon	0.16
5	Bute & Robson	0.89	Cardero & Davie	0.28	10 th & Granville	0.15
6	Carrall & Seawall	0.76	6 th & Main	0.25	14 th & Ontario	0.15
7	Cardero & Robson	0.74	Columbia & 2 nd	0.23	10 th & Oak	0.12
	Mean trips per hour	2.7	Mean trips per hour	0.34	Mean trips per hour	0.17

*Trips per hour are by casual riders. Mean trips per hour for this selection of 21 docking stations is 1.1
Trips/h = trips/day*0.9/16 h since nearly all trips (90%) are made in the 16 h period between 07-23:00*