

AIMS

Goal

Examine the impact of Vancouver's public bike share program (PBS) on travel and health outcomes in the general population, in users of the program, and within key population segments.

Objectives

1 > Estimate the impact of public bikes hare on changes in physical activity & transportation outcomes at a population-level.

2 > Determine who uses public bike share and its impact on their individual health and transportation outcomes.

3 > Characterize barriers to the adoption of public bike share across socio-demographic groups.

ACTIVITIES & METHODS

10,000+ SURVEYS

Surveys covered the collective topics of: travel behaviour & physical activity, cycling patterns, safety & cycling incidents, bike share knowledge & perceptions, bike share use, helmet use, motivators & deterrents of use, Mobi customer service, and demographics.

1> Vancouver Population

- Online panel (LegerWeb).
- Age-sex population representation.
- 5 timepoints: 2 weeks in Oct 2012, 2015, 2016, 2017, 2018.
- ~1000 completes each timepoint (~4500 total).

2> Bike Share Members

- Online (FluidSurvey, REDcap).
- All 3-month & annual pass holders invited by email.
- 3 timepoints: 2 weeks in Nov 2016, and in Sept in 2017 & 2018.
- ~1500 each timepoint (~5000 completes total).
- Response rates: 36%-2016, 39%-2017, 33%-2018.

3> Casual Riders/ 24-hr Pass

- Aim to capture info on "casual" or "tourist" use to contrast with regular local members.
- In person at point of use, 45 randomly assigned stations (including low to high traffic stations).
- 2 timepoints: 4 weeks in Aug-Sept 2017, 2018.
- 7 surveys, 279 field hours.
- 162 surveys in 2017, 214 in 2018.
- 1/3 were casual users.

INPUTS

"The Intervention"

The Vancouver Public Bike Share Program (aka. Mobi by Shaw Go™) launched July 2016 with 250 bicycles and 23 stations. As of June 2019, the bike share consisted of 1740 bicycles and 185 stations.

\$354,000 Funding

- Canadian Institutes for Health Research \$200K (2013-2017)
- City of Vancouver \$50 K (2013-2017) + \$59 K (2017-2018)
- Mitacs & CycleHop \$45 K (2018-2019)

7 years of study 2012-2019

7 Co-Investigators

M Winters (PI), M Brauer, L Frank, D Fuller, L Gauvin, Y Kestens, K Teschke

7 Student Trainees

S Vander Wekken (2013-MPH), M Zanotto (2014-MSc), N Buglioni (2017-BSc), S Javaheri (2018-BSc), K Hosford (2018-MSc) J McKeen (2019-MPH), M Branon-Calles (In progress, PhD)

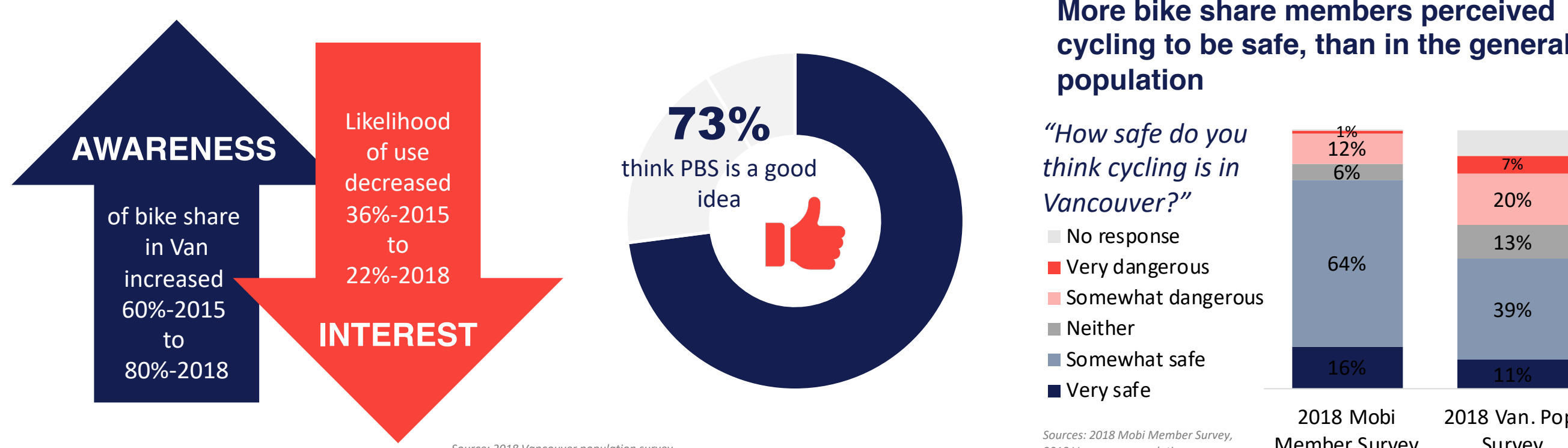
Research Personnel

4 Part-time Coordinators: Therrien (nee Vander Wekken), Zanotto, Hosford, McKeen
9 Intercept Surveys: Zanotto, Pugh, Hosford, DeVries, Rowlands, McKeen, Do, Chang, Mah
Contractors: LegerWeb (Pop. Survey), Context Research (Focus Group Facilitation)

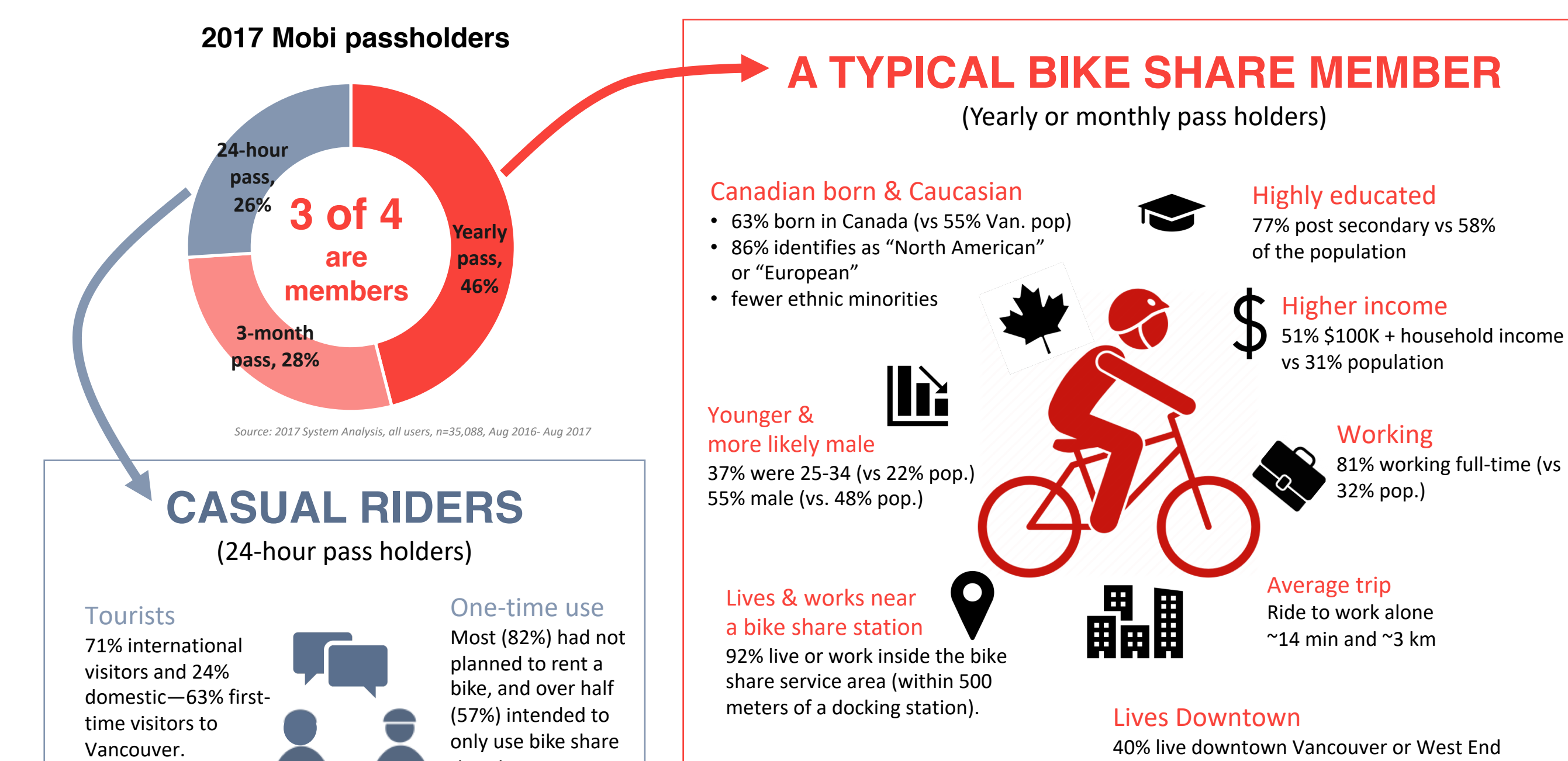
KEY FINDINGS

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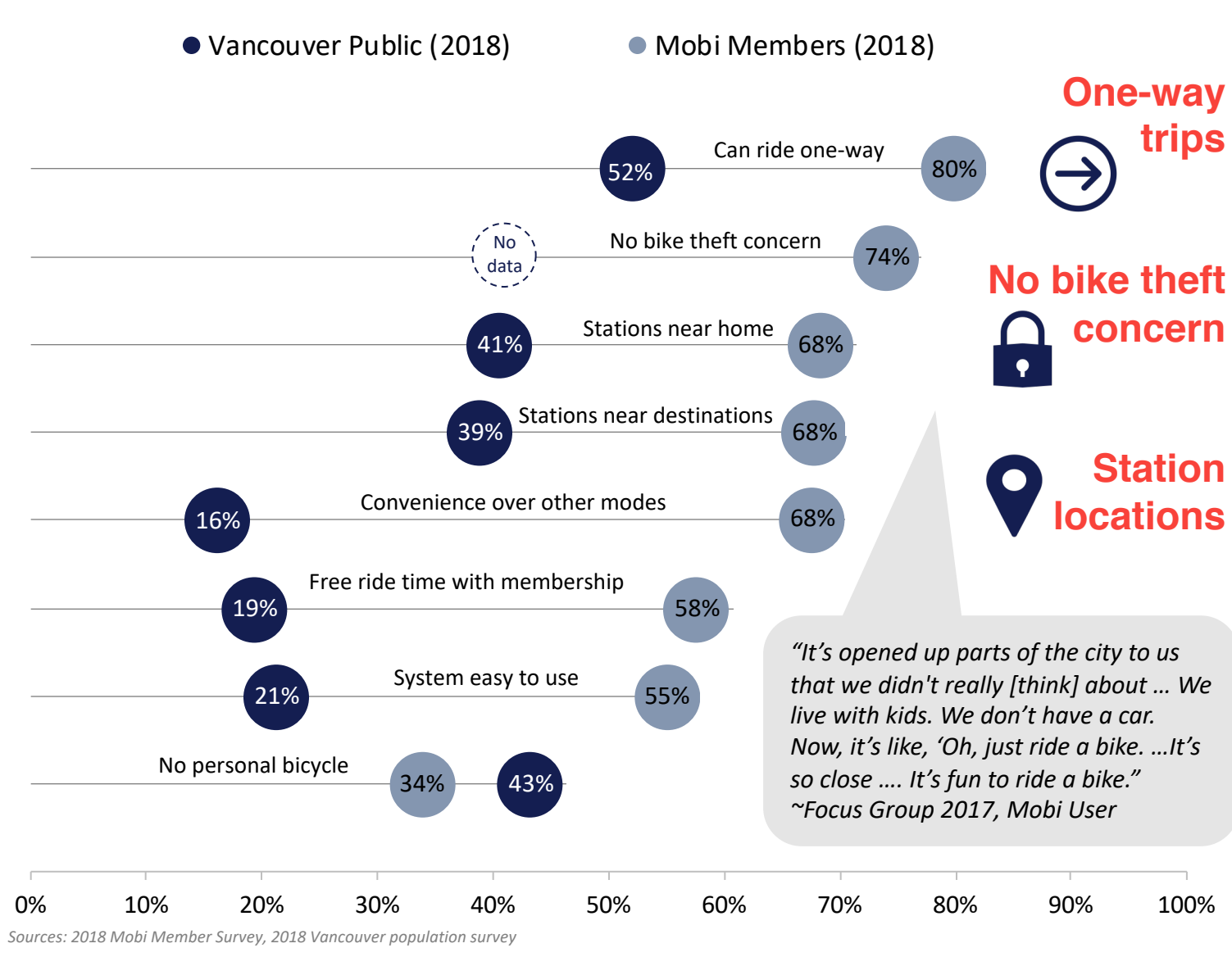
PERCEPTIONS



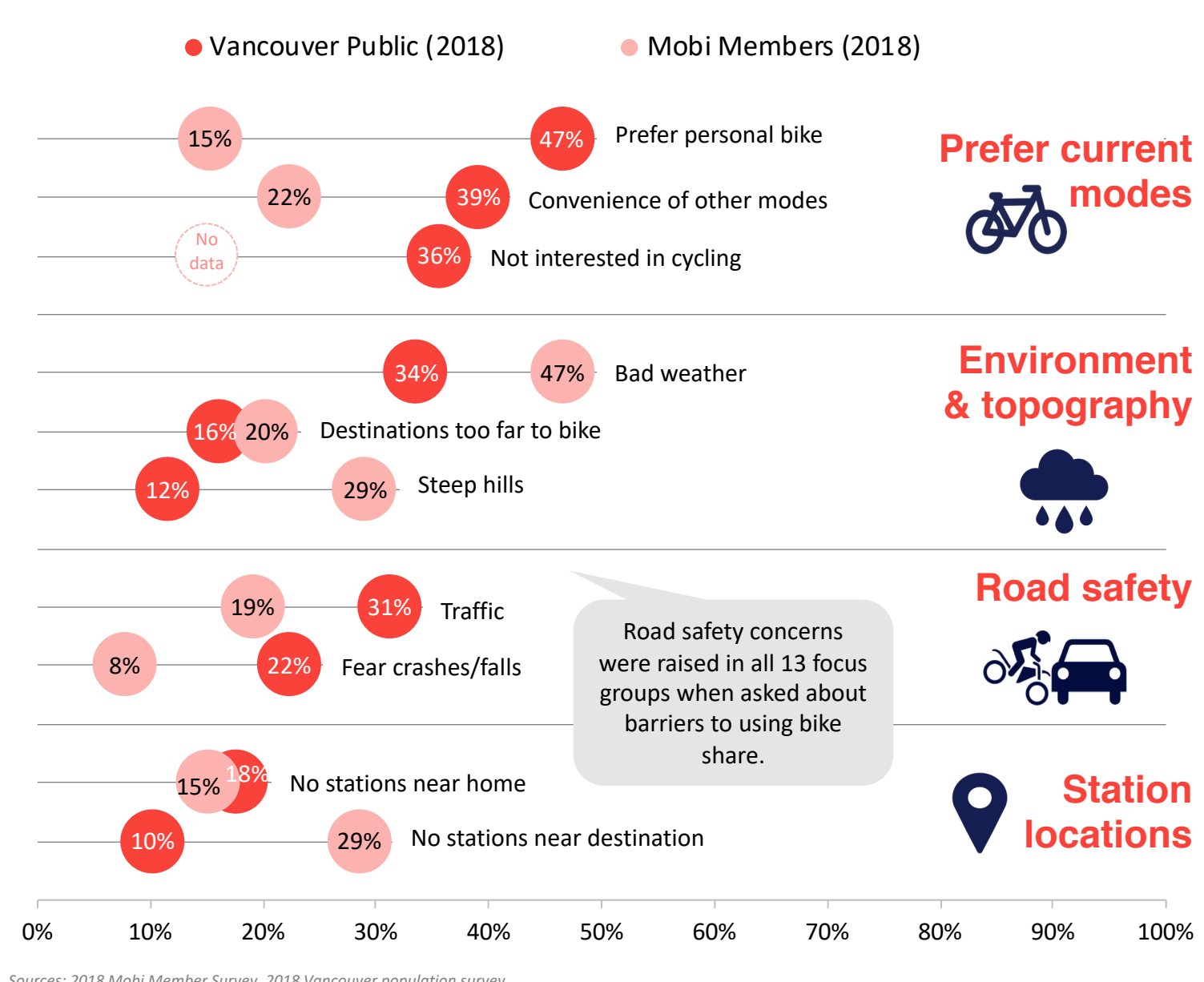
WHO USES VANCOUVER BIKE SHARE?



TOP MOTIVATORS



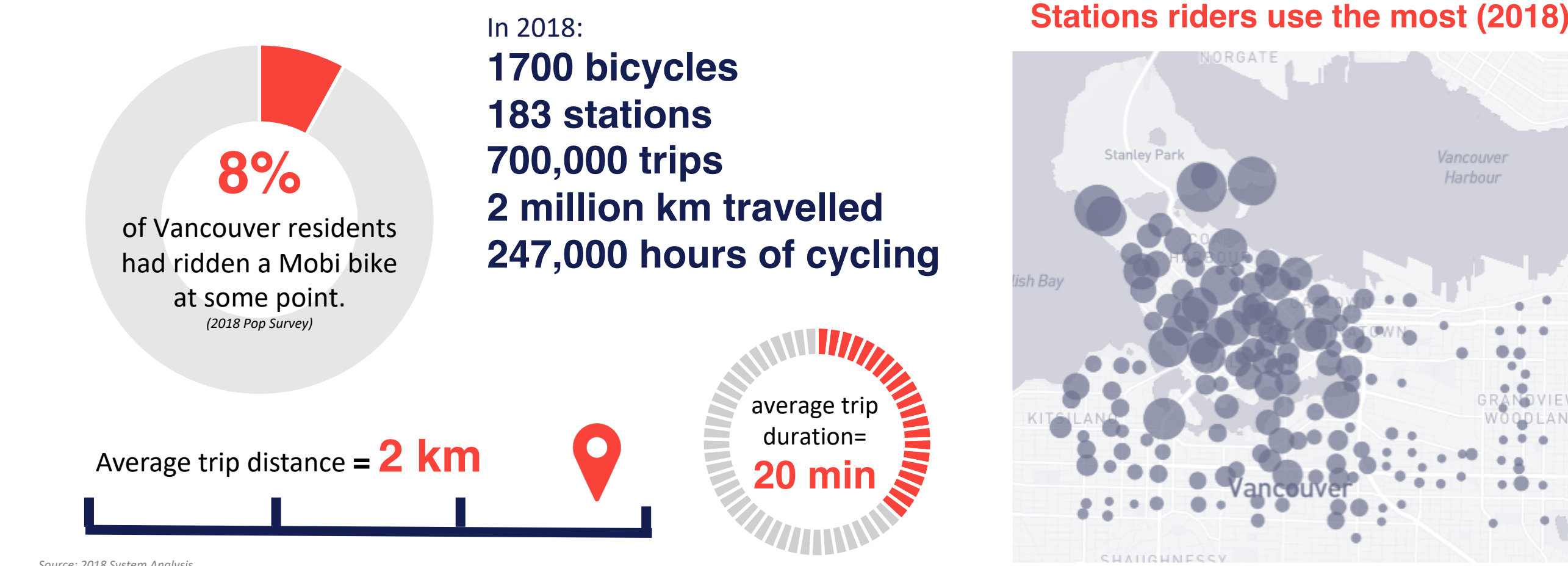
TOP BARRIERS



OTHER ANALYSIS

- Media Analysis (MZ):** Content analysis of 62 articles on PBS from 2012-2014, assessing 7 topics (barriers, facilitators, tone etc.) to understand media & public perceptions.
- PBS System Usage (SJ):** Used Tableau to explore system data visually and present trends in use including membership, trip usage per bike/member, seasonality, and comparison with other city systems.
- Spatial Equity Analysis (KH):** Mapped spatial access to stations by neighbourhood deprivation (income, employment, education) in Vancouver, Toronto, Hamilton, Ottawa-Gatineau, and Montréal.

SYSTEM TRENDS

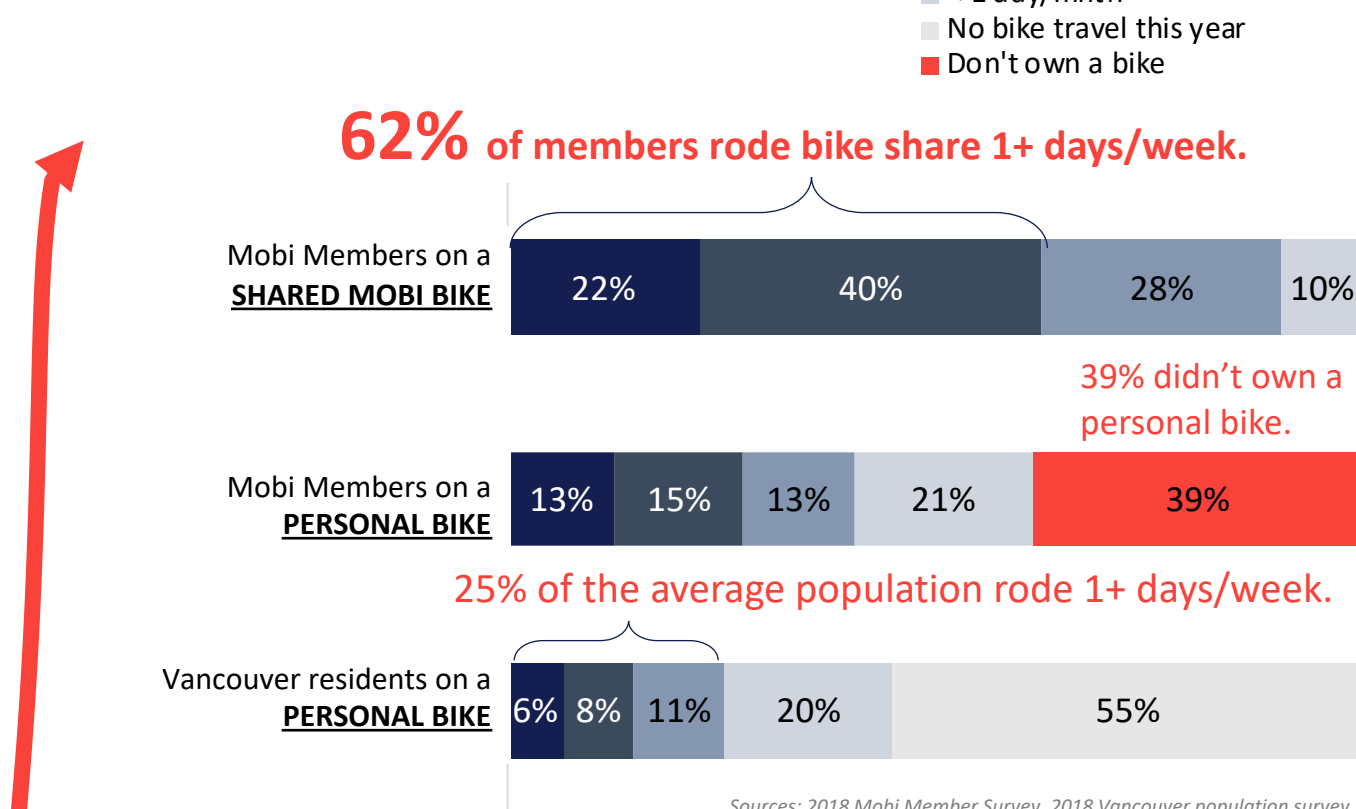


TRANSPORTATION TRENDS & IMPACTS

The ~436,000 trips made using PBS in its inaugural year represented less than 1% of all bicycling trips in Vancouver. (2018 APHA Abstract)

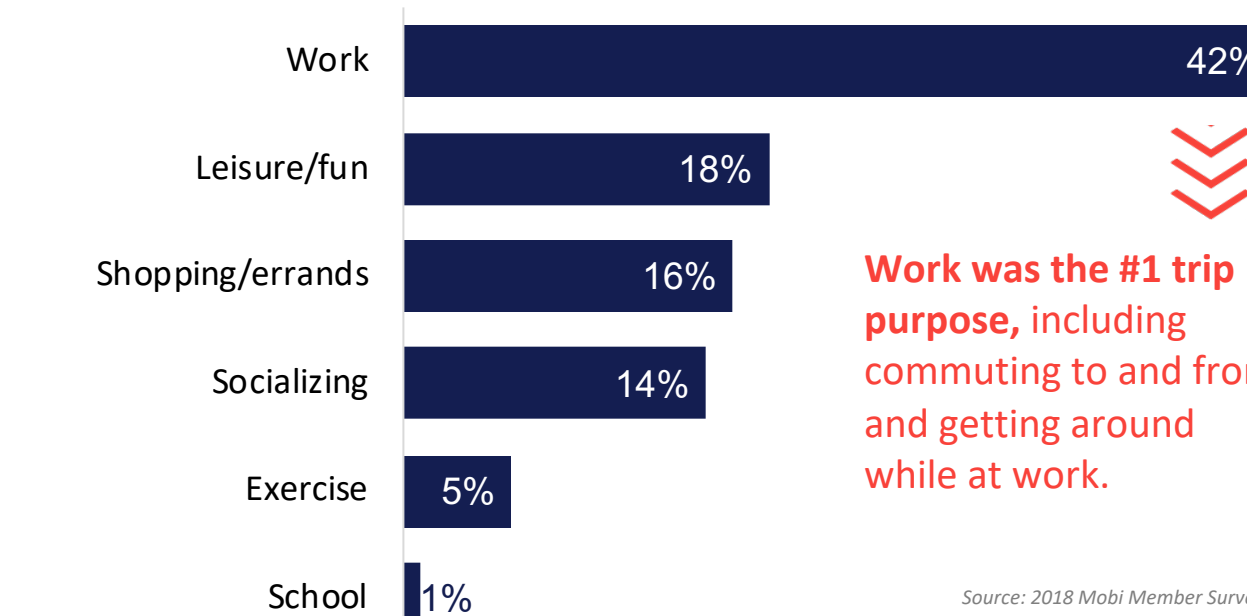
CYCLING FREQUENCY

"How often do you typically travel by bicycle?"



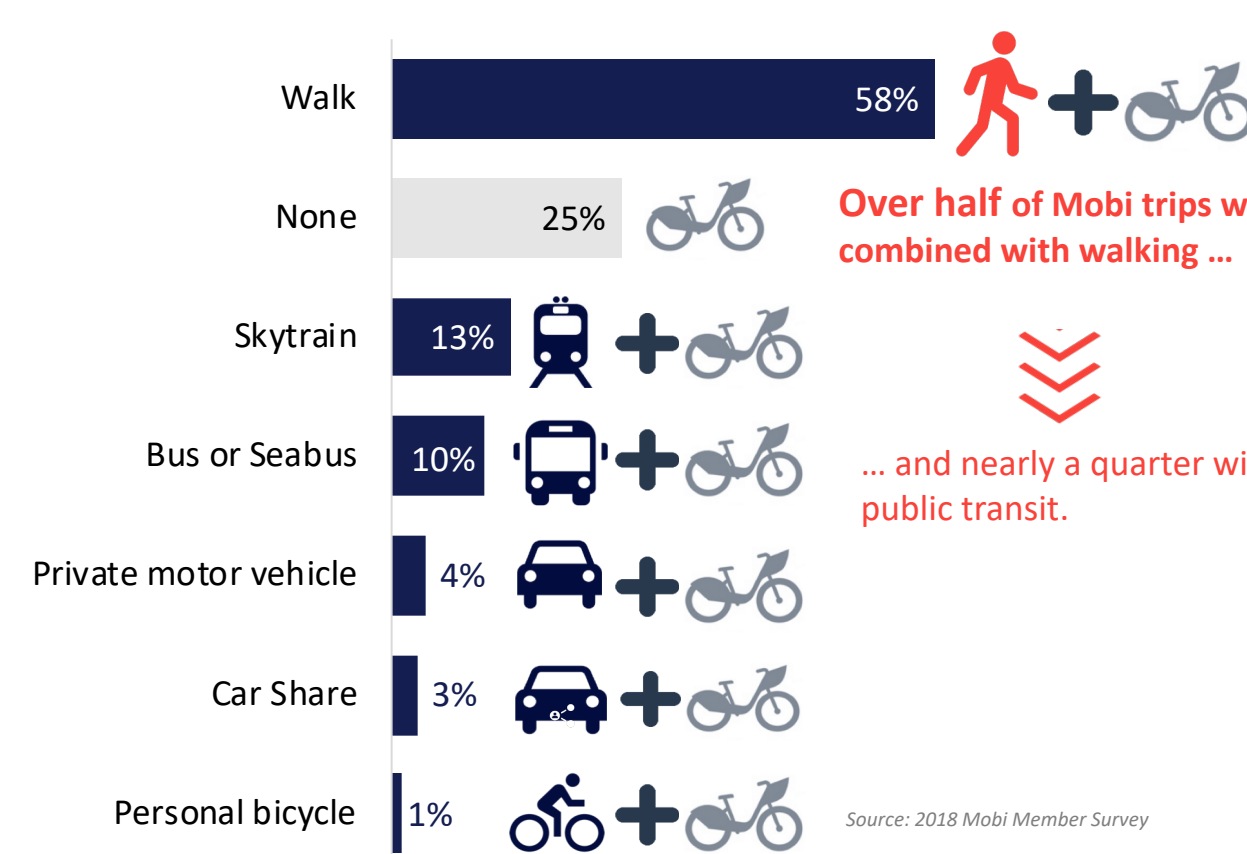
TRIP PURPOSE

% of all bike share trips (N=5020 trips, 2018)



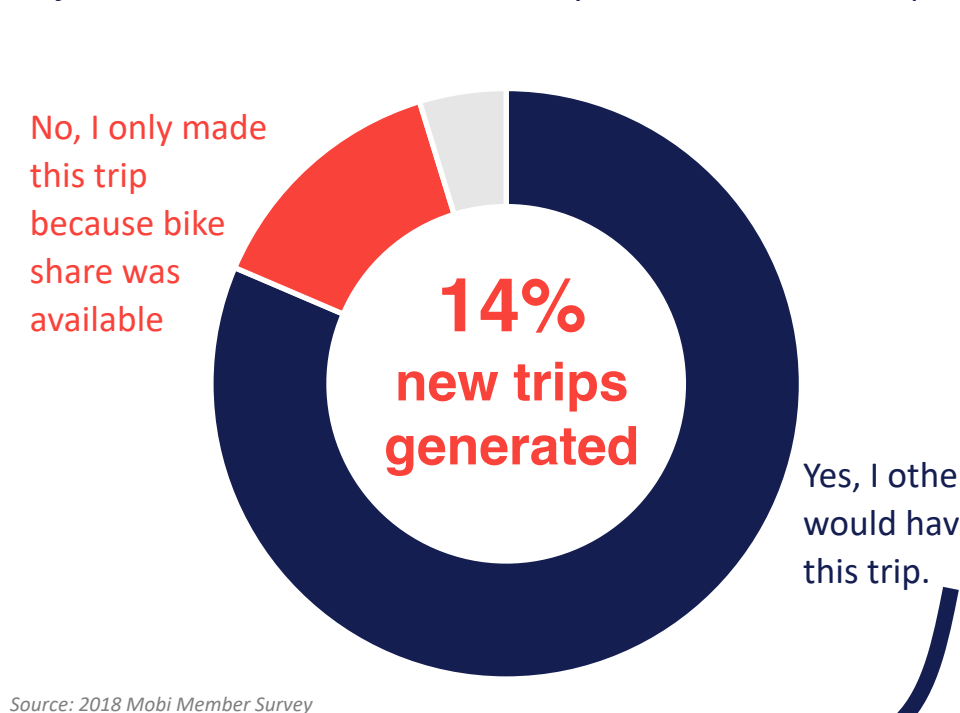
MODE INTEGRATION

"What other modes of transportation did you combine with Mobi on this trip? (Select all that apply.)"



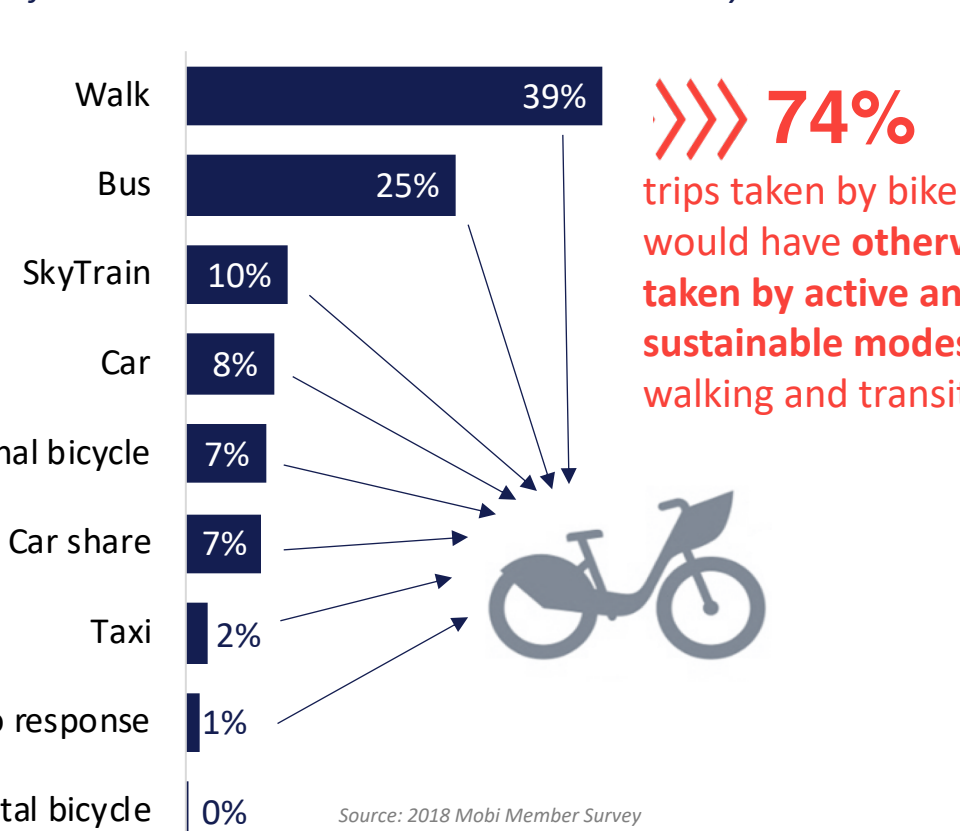
GENERATING NEW TRIPS

"If Mobi was not available ... would you have made this trip?"



MODE REPLACEMENT

"If Mobi was not available ... what mode would you have used?"



RECOMMENDATIONS TO INCREASE EQUITY & UPTAKE

Six key themes emerged in the focus group discussions:

- Potential users have a lack of knowledge and self-efficacy in using program.
- Bike share equipment does not suit specific needs.
- Bike share program does not suit needs: station locations, time limits, recreational use, and liability.
- Potential users want different pass features: access method, type, price and payment method.
- People that use bike share are active and care about their city.
- There are general barriers to bicycling in Vancouver.

Recommendations to increase equity in uptake...

- Provide ways to register that don't require technology, smart phones, or credit cards.
- Provide subsidy programs for low-income, students and seniors.
- Provide instructions in multiple languages.
- Expand the service area further east and west to more socio-economically diverse neighbourhoods, and to university campuses.

Recommendations to increase number of users and number of trips ...

- Create a more user-friendly day pass (i.e. sign up on site, no 30-minute restriction).
- Integrate with current transportation systems.
- Market the program on campuses, and particularly near ESL schools.
- Offer trial passes, "how-to" online videos, and in-person training opportunities.
- Make bicycles trendier and remove corporate branding.
- Improve the utility of the bicycles.

7 PUBLICATIONS

- Therrien, S., Brauer, M., Fuller, D., Gauvin, L., Teschke, K., & Winters, M. (2014). Identifying the Leaders: Applying Diffusion of Innovation Theory to Use of a Public bike share System in Vancouver, Canada. Transportation Research Record: *Journal of the Transportation Research Board*
- Winters, M., & Branon-Calles, M. (2017). Cycling safety: Quantifying the under reporting of cycling incidents in Vancouver, British Columbia. *Journal of Transport & Health*.
- Winters, M., & Zanotto, M. (2017). Helmet Use Among Personal Bicycle Riders and Bike Share Users in Vancouver, BC. *American Journal of Preventative Medicine*.
- Hosford K, Winters M. (2018). Who are public bike share programs serving? An evaluation of the equity of spatial access to bike share service areas in Canadian cities. *Transportation Research Record*.
- Hosford K, Fuller D, Lear S, Teschke K, Gauvin L, Brauer M, Winters M. (2018). Evaluation of the impact of a public bicycle share program on population bicycling in Vancouver, BC. *Preventive Medicine Reports*.
- Hosford K, Lear S, Fuller D, Teschke K, Therrien S, Winters M. (2018). Who is in the near market for bicycle sharing? Identifying current, potential, and unlikely users of a public bicycle share program in Vancouver, Canada. *BMC Public Health*.
- Winters M, Hosford K, Javaheri S. (2019). Who are the 'super-users' of public bike share? An analysis of public bike share members in Vancouver, BC. *Preventive Medicine Reports*.

4 GRADUATE PROJECTS

- Who will use the Vancouver Bike Share Program? (Vander Wekken, 2013).
- Facilitators and Barriers to Public Bike Share Adoption and Success in a City with Compulsory Helmet Legislation: A Mixed-Methods Approach (Zanotto, 2014).
- Understanding a Public Bicycle Share Program in Vancouver, Canada: Program Uptake and Impacts on Bicycling (Hosford, 2018).
- Understanding the Characteristics of New Public Bike Share Members in Vancouver over 2016-2018 (McKeen, 2019).

CONFERENCES

- 2013 Bicycle Urbanism, Seattle, USA.
- 2016 International Conference on Transport & Health, San José, USA.
- 2016 International Society of Behavioural Nutrition & Physical Activity, Victoria, CANADA.
- 2017 VeloCity, Nijmegen, NETHERLANDS.
- 2017 International Conference on Transport & Health, Barcelona, SPAIN.
- 2018 Transportation Research Board Annual Meeting, Washington DC, USA.
- 2018 Canadian Public Health Association, Montreal, CANADA.
- 2018 American Public Health Association, San Diego, USA.

PARTNER REPORTS

- 2016 Mobi Members Online Survey Results (April 2017). 2018 Mobi Member Survey Results (June 2019).
- 2017 Mobi Member Recommendations for Improvement (shared April 2017) A thematic summary with key quotes of the total of 1172 open-ended responses on recommendations to improve Mobi.
- 2017 Focus Groups Findings (shared June 2017).
- Mobi System Use Infographics Short Report (Presented to partners in person October 2017).
- 2017 Mobi Intercept Survey Results (November 2017).
- 2017 Mobi Member Survey Results (January 2018).
- Presentation to City of Vancouver & Mobi Teams- Trending Findings over years and across surveys (February 2018).
- 2017 Vancouver Population Survey Results (April 2018).
- 2018 Focus Group Findings (June 2018).
- 2018 Mobi Intercept Survey Results (February 21, 2019).
- 2018 Vancouver Population Survey Results (March 2019).

MEDIA

- Winters M. Interview with CBC Radio. July 24th, 2018.
- Hosford K, Winters M. Bike sharing isn't just for rich hipsters – 'super users' have lower incomes. Article published in the Conversation. July 24th, 2019.

IMPACT

In the 7 years of conversations with stakeholders (City of Vancouver and Mobi by Shaw Go) we informed policy, program and rollout of input into local policy-makers decisions including:

- Equity considerations.
- Informing new station locations based on member needs.
- Providing evidence of who uses the system, how and why.
- Providing more evidence for the need to make the system more financially accessible (e.g. VanCity pass).