

# Assessing the Modal Impacts of Public Bike Share Systems: A Comparison of Survey Tools

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## BACKGROUND

Public bike share systems are quickly growing in popularity with over 1200 programs operating in cities worldwide. These programs have the potential to increase physical activity levels and decrease greenhouse gas emissions by shifting trips from motorized transportation towards active travel (e.g., cycling and walking).

**Quantifying mode shifts is one way to assess the health and environmental impacts of public bike share programs.**

Many studies use the following general transportation question to assess mode shifts from bike share use: “Do you drive your car more or less often because of your use of the public bike share program?” However, the magnitude and extent of mode shifts cannot be quantified by this question, as it includes no measure of the number of trips. **In our study of Vancouver’s public bike share program, we evaluated mode shifts from bike sharing, comparing results from the general transportation question with a series of trip-specific questions.**



## OBJECTIVES

- To assess mode shifts resulting from the Vancouver Public Bike Share Program (Mobi)
- To evaluate the general transportation question as a tool for assessing mode shifts by comparing the results from the general question with a series of trip specific questions

## METHODS

### Mobi User Survey

- Cross-sectional survey of annual and monthly Mobi members, November 2016

### Assessing Mode Shifts

#### 1. General Transportation Question:

“As a result of your use of Mobi, do you use each of the following types of travel options\* more often, less often, or about the same as before you joined Mobi?”

\*options: walk, bus, sky train, private motor vehicle, personal bicycle, car share, and taxi

#### 2. Trip Specific Questions:

We asked respondents to provide details for their past three bike share trips. For each trip, respondents were asked:

- “Would you have made this trip if Mobi was not available?”
- “If yes, what mode would you have used?”

### Analysis

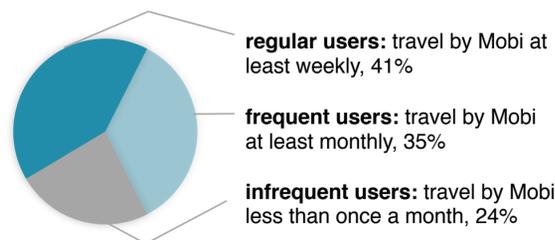
- For the general question**, we calculated the proportion of respondents reporting using each mode less often, more often, or about the same.
- For the trip specific question**, we calculated the proportion of bike share trips that replaced each mode, and the proportion that were new (i.e., would not have been made if Mobi was not available).
- We compared results for the two question types**, to assess how mode shift results may be affected by question types.

## RESULTS

### Survey Sample

- n=1759 completed responses, (response rate 36.2%)
- A majority had a post-secondary education (77%), were employed full time (78%), and had a household income above \$75,000 (59%)
- 41% of respondents were regular Mobi users (travel by Mobi  $\geq$  1 time per week)

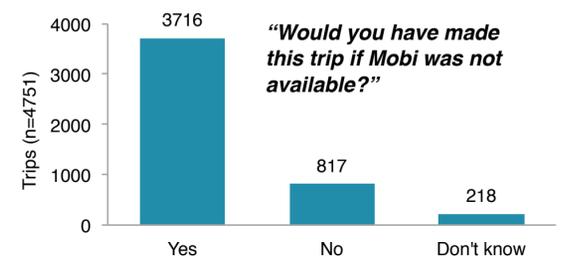
### Respondent’s bike share usage



### Trip Data

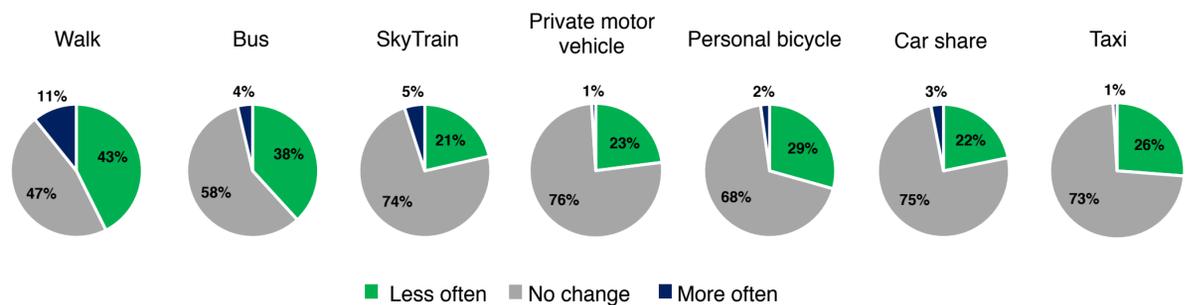
- Respondents provided information about **4751 trips**
- Of these trips, **3716 (78.2%)** were trips that would have been made previously and **817 (17.2%)** were new trips that would not have been made if Mobi was not available
- 73.7%** of trips were integrated with another mode

### Bike share is generating new trips...

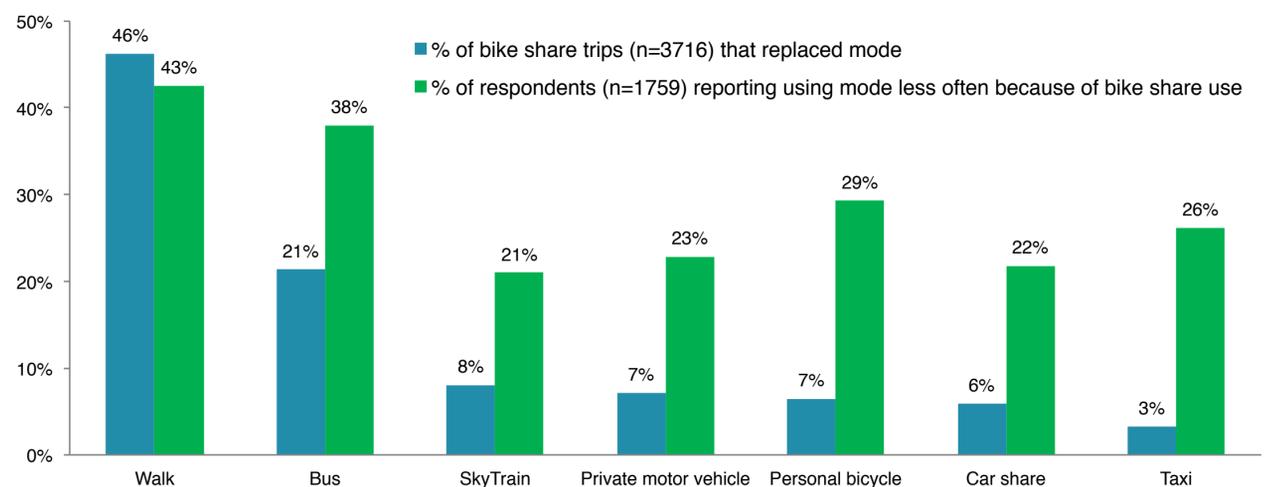


## Mode Shifts From Bike Sharing

### General Transportation Question: Self-reported changes in travel due to bike share (n=1759 respondents)



### Comparing Results from Trip Specific Prompts with the General Transportation Question



## CONCLUSION

**Bike share trips are primarily replacing active and sustainable modes of transportation.** 82% of bike share trips replaced trips made by walking, cycling, and public transit, while only 16% of trips replaced motor vehicle use (private motor vehicle, car share, or taxi).

**Importantly, the general transportation questions commonly used in bike share surveys may overestimate mode shifts away from motorized travel and personal bike use.** Using trip specific questions can provide detailed information about newly generated trips and the frequency that modes are replaced. To better quantify the modal impacts of public bike share systems, bike share user surveys should include trip-specific questions.