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Examining the Effects of a Bike and E-Bike Lending Program on Commuting Behavior

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Introduction

The role of e-bike and bike lending as a transportation demand management program is largely untested in the US. How effective are bike and e-bike lending at increasing bike commuting, and what are the factors that influence success?

Study Method

To analyze the effectiveness of the program, researchers used self-reported and Strava app-integrated trip reporting along with survey data. In cooperation with Google, the research team synthesized anonymized survey and trip data collected as a part of the program operations and compliance. Using multi-level statistical models, the researchers estimated the program effects and evaluated which factors influenced bike commuting during the program.

Findings

Results indicate the program led to average bike commute increases of approximately 1.7–2.3 days per week, roughly a tripling of prior bike commute rates. After the program, bike rates of participants diminished slightly, but were still greatly elevated compared to the baseline (increase of 1.3–1.9 days per week). This increase in bike commuting led to 8.4–10.5 additional bike miles ridden per person per week on average during the program.

Nearly all the increases in bicycling are likely attributed to decreases in single occupancy vehicle (SOV) commuting. Although only a subset of participants reported all travel mode commuting (it was not a requirement to report other modes of travel besides bicycling), results suggest that SOV commuting dropped 2.4 days per week on average. This drop exceeds the increase in bike commuting which could be attributed to participants doing other changes in their commutes because of the availability of a bike or e-bike, or it could indicate measurement error in reporting of either bike or SOV commute rates. When examining

the cumulative effects of the program from mid-2015 through 2019, the results suggest the program reduced approximately 400,000 SOV commute miles.

Other important findings include:

- Conventional bikes were even more successful than e-bikes. However, e-bikes may still have been necessary given that many employees may not have participated had it not been for the availability of an e-bike
- Multimodal trip-makers biked more frequently. The sample of multimodal bike-transit or bike-GBus commuters was small, but they were more likely to bike compared to bike-only commuters.
- Longer commute distances resulted in less bike commuting. However, even participants with long commutes (> 10 miles) biked more than 40% on average, suggesting that a bike lending program should consider allowing longer distance commuters to participate.
- Self-reported bicycling skill was positively associated with bike commuting. This result is consistent with the general literature on bicycling.
- Results from participants with app integrated reporting (Strava) suggest either over-reporting of bike commutes by non-app participants, or app users biked less than non-app users. More research is needed to determine the validity of each of these potential explanations.

Google's bike and e-bike lending program triples bike commuting for participating employees.

Policy/Practice Recommendations

The success of the Google bike lending program should help other employers build their own programs. Although this analysis only includes behavioral modeling, with these results, benefit/cost ratios can be calculated to determine the effectiveness of the program in comparison to alternatives. Like all transportation demand management programs, Google's lending program can be improved. In the case of bike lending at Google, the results suggest that (a) permanent lending may be more efficacious than a fixed duration intervention, (b) a wider variety of bike/scooter form factors may be needed to attract more participants, and (c) targeting short SOV commuters could be accompanied with longer SOV commuters with a multimodal option available.

About the Authors

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Lucy Noble is the Transportation Demand Management Program Manager at Google. Her efforts are focused on reducing traffic and parking demand at their headquarters in Silicon Valley by designing and implementing innovative commute options for commuters. She uses findings from behavioral science research to nudge commuters to shift to, or sustain, non-driving commutes.

Terry Mac is the Senior Manager of Operations for Hallcon managing Google's Bike Programs. He executes the strategy for commuter and bikeshare programs, including implementing and marketing effective communication and program management to reduce vehicle trips to support Google's sustainability goals.

To Learn More

For more details about the study, download the full report at **transweb.sjsu.edu/research/2051**

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