Measuring the significance of facility availability and policy on bicycle commuting in the 50 most populous U.S. cities

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INTRODUCTION

Broad Goal: To provide city planners and transportation coordinators with quantitative evidence on infrastructure and policy measures that positively impact the number of bicycle commuters.

Over the past twenty years, a series of regression models have helped predict bicycle commuting levels across U.S. cities. Variables previously included were:

- Bike lane supply
- Bike path supply
- Bike network (i.e., density, directness
- Number and type of bike riders
- Bike lane quality
- Complete streets policy score
- Transits for cyclists
- Annual precipitation
- Average temperature
- Gasoline price
- Active transport budget
- College student population
- College graduates
- Household income
- Vehicle ownership
- Pedestrian spending
- Bike commuters per capita

Research Gap: Variables representative of bicycle-related policy are underexplored in aggregate models of bicycle commuting in the U.S.

Research Objective: To include measures of policy in a regression model of bicycle commuting.

METHODS

Study Approach: Associations between bicycle commuting, infrastructure, and policy.

Study Type: Ecologic study at the city level

Methods: Multiple linear regression models with log-log transforms and mediation testing by causal steps and the Sobel Test

Data Sample: The 50 most populous U.S. cities

CONCLUSIONS

Takeaway 1: Improving linkages to public transit hubs on the bicycle network may encourage more commuters to use a bike.

Maps of the Bicycle Network and Access to Transit

- RQ1: Accessibility to public transit and number of employees working on bike issues have the most significant associations with bicycle commuting.
- RQ2: Up to 76% of the variation in bicycle commuting across 50 U.S. cities can be accounted for by the variables in our study.
- RQ3: The number of full-time employees working on bike issues increases accessibility to transit and decreases bicycle fatalities which are both associated with an increase in bike commuters.

Takeaway 2: Hiring full-time staff to work on bike and pedestrian issues is vital for the protection of cyclists’ safety and can help improve the bike network.