



## COULD E-BIKES SPUR A NEW WAVE OF BIKING IN AMERICA?

*In this NITC study, researchers provided participants with electric bicycles to use for a ten-week trial period and surveyed them about the experience.*

### The Issue

Cities and states across the United States are taking serious measures to reduce the number of people driving single-occupancy vehicles. These efforts are largely due to concerns about traffic congestion, climate change and public health. One strategy to address these problems has been to get more people on bicycles. Researchers have put a lot of thought into ways to get more people riding bicycles; making improvements to bicycle infrastructure, land use and public engagement. Comparatively little research, however, has focused on the bicycle itself.

John MacArthur of TREC has released a NITC study which suggests that electric assist bicycles, or e-bikes, could provide the answer to a specific problem. Despite efforts to get more people biking, North America still has low ridership. Many people surveyed say that having to pedal up hills and arriving at their destination sweaty are major deterrents to commuting by bike, even in areas where bike lanes and other facilities are available.

### The Research

MacArthur and co-investigator Jennifer Dill teamed up with Drive Oregon, Metro and Kaiser Permanente Northwest to provide Kaiser employees with e-bikes to use for a trial period of ten weeks. The goal was to see if e-bikes might help overcome some of the commonly cited barriers to cycling. The study took place in Portland, Oregon from April 2014 to September 2015. A total of 150 Kaiser employees participated in the study. Fewer than 10 percent of them had ever ridden an e-bike before, and 50 percent of them said that they normally never rode a bike at all.



Web: <http://nitc.trec.pdx.edu>

### THE ISSUE

Encouraging more people to bicycle for transportation offers many benefits, but North America struggles behind other countries in bicycle ridership.

### THE RESEARCH

The research showed that e-bikes can help cyclists:

- Ride uphill more easily;
- Spend less energy riding and arrive less sweaty at their destination;
- Feel more confident cycling.

### IMPLICATIONS

Mainstream adoption of e-bikes in North America could have a significant, positive impact on bicycle mode share, making people healthier and getting more cars off the roads.

*Photo: Currie iZip E3—one of the hybrid folding electric bicycles used in the study*

For certain segments of the population there is lower participation in cycling, particularly among women, older adults and people with physical limitations. Researchers sought to find out if having the e-bikes would encourage the research participants to cycle more. Each participant was given an e-bike to take home: A 42-pound folding bicycle with a rear rack-mounted battery pack, capable of doing 18 miles (29 kilometers) per hour under motor assist. They could use it however they wanted during the ten week period.

The Kaiser volunteers in this study—over half of whom were women—were asked to take online surveys before, during and after the study. Half the participants fit into the “interested but concerned” category in Roger Geller’s typology of bicyclists—the category seen as key to increasing cycling rates. The pre-use survey collected data on their demographics, their attitudes toward biking and their typical travel habits. During the study, they were asked questions about how they were using the e-bikes and their impressions of the experience. The post-use survey asked questions about attitudes and travel habits similar to the first survey, now that the participants had used the e-bikes.

## Implications

Before beginning the program, 38 percent of the survey respondents were categorized as “strong and fearless” or “enthused and confident” cyclists in Geller’s typology. After using an e-bike, 52 percent were categorized as such. Researchers compared the barriers participants faced before and after the program and found some notable shifts in attitudes and behaviors.

About 85 percent of respondents had access to a functional bicycle before the program, yet only 23 percent reported using a bicycle once per week or more. During the program, this rate became 53 percent, in part because the e-bikes made people feel more confident riding. The number of people commuting

to work by bicycle at least once a week more than doubled during the study. The second most common use of the e-bikes was for personal trips. The number of people biking at least once a month for shopping or other errands doubled when they had access to the e-bikes, and those biking to visit friends or family at least once a week more than quadrupled. 64 percent of the respondents said they were likely to ride the e-bike purely for exercise or for fun. This analysis shows that people will use a bicycle more if it is electric assist.

### Bike usage by trip purpose, before and during trial program

Overall, the number of people commuting to work by bicycle at least once per week more than doubled (28% to 59%) during the study and the same increase was seen for all trips.

MacArthur’s team also conducted a review of the regulations of e-bikes in North America; a useful resource which is available on the project web page for anyone interested in adopting or advocating for e-bikes.

## PROJECT INFORMATION

**TITLE:** Evaluation of Electric Bike Use at Three Kaiser Permanente NW Employment Centers in Portland Metro Region

**LEAD INVESTIGATOR:** John MacArthur, Ph.D., Portland State University

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