

EVS29 Symposium
Montréal, Québec, Canada, June 19-22, 2016

Electric Bikes: Power Your Commute

Zach Henkin¹

Dahlia Grossman-Heinze²

¹*Program Director at Drive Oregon, 1600 SW 4th Ave Suite 620 Portland Oregon 97201, zach@driveoregon.org*

²*Account Associate at Brink Communications, 1300 SE Stark St Portland Oregon 97212, dahlia@brinkcomm.com*

Summary

Drive Oregon—in conjunction with project partners the Transportation Research and Education Consortium at Portland State University, Kaiser Permanente Northwest, and Metro—conducted a commuting pilot using 30 folding electric-assist bicycles. Based on the barriers learned during the study and from additional research, Drive Oregon designed an infographic and social media campaign to increase electric bicycle use and awareness in the region.

Keywords: biking, communication, marketing, public transport, city traffic

1 Introduction

The concept of the “smart city” is quickly reaching a tipping point in the United States. More Americans are moving to and working in dense areas that require innovative, viable, and sustainable transportation options and solutions. Smart cities are working to integrate information, communications, and technology to improve urban experiences, quality of life, and transportation, creating more functional and connected cities. As these moves happen, smart cities are making urban areas more connected; they are preparing for growth while remaining committed to long-term sustainability.

The City of Portland currently has claim to the largest percentage of bicycle commuters for a large city within the United States. These commuters make use of the bike lanes, trails, and other city infrastructure and contribute to a less congested transportation systems and cleaner air by lowering the amount of vehicle-miles-travelled. These active-transportation commuters also enjoy further public health and quality of life benefits. However, until now, converting individuals to bike commuting has focused on road infrastructure and safety, and not other barriers, such as ease of ride itself and eliminating the concern of hills and distance.

Electric bicycles, already an overwhelming success in Asia and Europe, have received a limited reception in American markets. While bicyclists in Asia and Europe are already thinking of and seeing bicycling as an inherent part of urban transportation, many in the United States still see it as purely, or mainly, recreational.

As cities become more congested, they will need to plan for an support smart infrastructure. Multi-modal transportation will become a necessity for cities that are absorbing population gains while also trying to achieve sustainability goals. Two-wheeled mobility solutions such as bike shares and electric bicycles will become an increasingly important piece of the urban transportation puzzle, especially as they relate to first-

/last-mile transportation solutions. With these exciting changes, the electric bicycle is poised to become the next big thing in urban transportation in the United States.

Drive Oregon conducted an electric bicycle pilot project to identify how attitudes and perceptions toward electric bicycles changed after usage and a social media campaign to increase interest and exposure to electric bicycles and their benefits in Oregon.

1.1 Behavior Change Communications

The most effective behavior change programs integrate communications and program design from the very beginning. Further, with the rise of social media, the traditional approach of one-way, mass media campaigns are losing relevancy in favor of integrated, targeted efforts that leverage peer-to-peer influence and the latest knowledge about how to change citizen behavior for the long-term.

Communications campaigns grounded in behavior-change psychology start with identification of the barriers that stand in the way of the desired action by the target audience. For this campaign, the first step assessed the barriers that currently keep people from seeing and using electric bicycles as a viable commuting and transportation solution. Drive Oregon partnered with Portland-based Brink Communications, a firm specializing in behavior-change communications, to conduct interviews with stakeholders and local Drive Oregon partners to identify the barriers to e-biking and to narrow the focus to the messages most likely to motivate the target audience to adopt electric bicycles as part of their transportation behavior—and the audience segments most likely to take action

Focusing on professional daily commuters as the target audience, Brink's research uncovered that the primary barrier to bicycle usage as a commuting option is the concern that the rider will arrive at their destination sweaty and need to change clothes in order to continue with their professional day. This finding pointed to electric bicycles' ability to make commuting "sweat-free" as a critical asset. Further benefits to commuting on an electric bicycle were identified, including saving money, getting to the destination faster, and contributing to clean air.

The interview findings made it clear that electric bicycles are seen as part of the region's long-term transportation solutions, but while the benefits of electric bicycles are clear, the specific demographics within the broad audience is hazy. The challenges before Drive Oregon was to define and prioritize the audience for the campaign, frame the challenges that electric bicycles help solve, and emphasize the value that electric bicycles deliver—all while keeping the content brief and easy to digest.

2 Electric Bicycle Transit Connection Pilot Project

Drive Oregon partnered with the Transportation Research and Education Center of Portland State University and Kaiser Permanente Northwest to administer an electric bicycle pilot project. This electric bicycle study, funded through a Metro Regional Travel Options grant, sought to make findings on how electric bicycles were perceived by study participants, and to test whether a folding electric bicycle could be a reliable transportation option when paired with public transportation.

The electric bicycle chosen for the study through a public request for proposals process was a Currie iZip E3 Compact. The primary criteria for the bicycle selected were that it fold and have a peddle-assist cadence electric assist function.

The pilot project took place between April 2014 and September 2015 in the Portland region on three Kaiser Permanent Northwest campuses. Employees were issued an electric bicycle for 10 weeks to use for a variety of transportation needs, but especially focusing on first-/last-mile commuting. Participants were asked to complete surveys before, during, and after use of the electric bicycle.

The program consisted of six cohorts of participants of about 30 employees each at the three regional campuses each in a different part of the Portland metropolitan. Cohorts participated in the study for 10 weeks. Before the study, about 45% of participants had biked in the past month and cited as barriers to biking more often being: bad weather (50%), logistics (41%), need to carry more than bike could handle

(36%), sweat (32%) and hills (29%). Electric bicycles are particularly well suited to address the last two concerns: sweat and hills.

What's more, the pilot inversed normal gender distribution in biking: 59% of the participants were women, compared to 2-to-1 break down of men to women for standard bike commuters in Portland and nationally [1]. More than 20% also indicated some physical limitations that might discourage more traditional bike commutes, like "obesity, asthma, and chronic pain."

Kaiser Permanente Northwest proved to be an ideal project partner for the electric bicycle study for several reasons. The mobility emphasis aligned with their Thrive brand campaign and contribution toward employee health. Having multiple campuses in the Portland region encompassing three counties, a multitude of stakeholders, and different commuting habits provided an excellent opportunity to sample a diverse mix of commuters in a variety of circumstances.

2.1 Results

Results from the participant surveys were analyzed using statistical software and GIS. Results showed that participants biked farther, were more confident, and generally perceived fewer barriers to making trips due to the ease in overcoming hills and reducing sweat. The study found that "over half of the respondents (56%) reported using the electric bicycle to commute to work at least once a week, and over a fifth (22%) used the bike three or more times per week." Even better, "overall, the number of people commuting to work by bicycle at least once per week more than doubled during the study."

Overall, bike confidence increased throughout the pilot with 28% showing a greater confidence while only 13% indicated a decreasing confidence at the end of the 10 weeks. Participants felt that the electric bicycles "were comfortable (89%), fun (92%) and easy to use overall (93%)." They also felt safe (92%) and more comfortable in traffic (67%) compared to standard bikes and had an overall positive experience (75% rated the experience as good or very good, versus only 4% reporting poor or very poor).

Conversion rates were also very positive: "Over a third of respondents (37%) said they would consider purchasing their own electric bicycle." Reasons for why included that it is "fun" (24%), good exercise (21%) and "a cost-effective form of transportation (21%)." Even before the pilot program, most (58%) felt \$2,000 for an electric bicycle was "about right," a number that increased after the conclusion of the pilot.

The study suggests that electric bicycles do enable users to bike more often, and increase the frequency of biking even for people who previously rode a conventional bicycle as part of their commute. Electric bicycles are also enabling those who might otherwise not bike because of physical limitations or proximity to their destinations to use a bicycle for their transportation needs [2].

3 Electric Bicycle Marketing Campaign

Building upon what was learned in the electric bicycle transit connection pilot project, Brink designed an infographic with the goal of mitigating the identified barriers to using electric bicycles, highlighting motivators for use, and increasing electric bicycle awareness in the Portland region. The target for this campaign was young and mid-level urban professionals who use public transit or a personal vehicle and who are not regularly bike commuting due to some perceived barrier. An older commuting demographic and commuters who may be encumbered with an injury or disability was also identified as a secondary market but was not targeted in this campaign.

The infographic and supporting social media campaign focused on the following aspects of electric bicycle use: saving money, "fast-tracking" commuting, contributing to clean air, and controlling the amount of effort needed during a commute. This infographic was hosted on the Drive Oregon website. Graphics and citation from the infographic can be found at driveoregon.org/ebikes.

Based on the created infographic, Drive Oregon and Brink designed an electric bicycle social media campaign that featured each of the already-identified focuses individually. The campaign ran for a month and directed users to take an action—clicking through to the Drive Oregon electric bicycle website or engaging with one of the posts. Drive Oregon also engaged regional transportation stakeholders to help raise awareness for the new collateral culminating with a drawing where a random Facebook entry was selected to win an electric bicycle from the pilot project.



Figure 1: No-pollute commute social media post

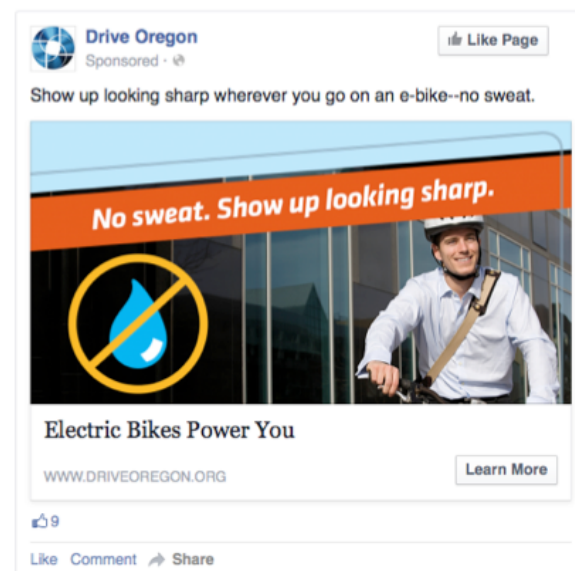


Figure 2: No sweat social media post



Figure 3: Fast-track commuting social media post

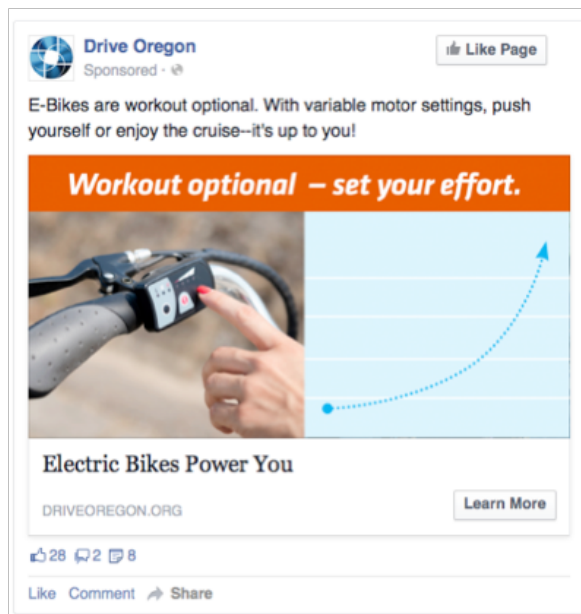


Figure 4: Workout optional social media post

3.1 Audience

Based on strategic assumptions about the target audiences who are most open and interested in learning about electric bicycles online, Brink Communications identified two groups that were most likely to take online action around electric bicycles. Creating a targeted electric bicycle social media campaign, they focused on the two, which will be referred to as: a “Politicals” group and a “Sharing Economy” group.

The “Politicals” group was comprised of Facebook users who lived in Oregon and expressed an interest in progressive political figures like Bernie Sanders, Barack Obama, Jon Stewart, Stephen Colbert, Al Franken, and Hillary Clinton. Because this group is likely to be politically progressive people, they are assumed to likely to care more about climate change and pollution, which would prime them for interest in an electric bicycle.

The “Sharing Economy” group was comprised of Facebook users who lived in Oregon and had expressed an interest in organizations like Trimet and the MAX (Portland metro’s public transportation systems),

Uber, Airbnb, and Lyft. This is a group of Facebook users who are already primed to approach many of the transportation and technical structures in their lives in a different or innovative way because of their interest in the sharing economy, and would therefore be more likely to be open to an electric bicycle.

3.2 Results

The Drive Oregon electric bicycle social media campaign was extremely successful by several metrics. The campaign was able to bridge some of the divide between genders and break down barriers to EV-entry for women. During the duration of the electric bicycle social media campaign, the gender breakdown of visitors to the website was 42% female and 58% male—while before the launch of the electric bicycle campaign, the Drive Oregon website’s gender breakdown was 31% female and 69% male.

The modest electric bicycle social media campaign generated 116 Drive Oregon page likes (almost a third of the current page audience), 962 post engagements, and 3,805 clicks to the Drive Oregon electric bicycle campaign page.

The campaign yielded more engagement by directing Facebook users through to the Drive Oregon electric bicycle page or sweepstakes page, especially when targeting the “Sharing Economy” group. When Facebook users are “inside” Facebook, they are very unlikely to take an action that directs them to a website outside of Facebook—they are more likely to take an action “within” Facebook like liking or sharing a post. Because so many members of the “Sharing Economy” left Facebook to learn more about electric bicycles, it is clear that the “Sharing Economy” group was perfectly primed and reached at the right moment to take action on a subject that was of interest and relevant to them.

4 Similar Initiatives

Other regions and cities across the country are examining other aspects of two-wheeled urban transportation such as mobile electric bicycle sharing. Solar Oakland, a community partnership to bring sustainable urban transportation via solar-powered electric bicycles and scooters to Oakland, California, launched a pilot program in January 2016. The pilot program brought eight solar-powered bicycles to Jack London Square in south Oakland. The electric bicycles were provided by Mahindra GenZe and housed in a custom-built solar-powered charging station from DC Solar. The pilot program allows commercial residents daily use of the electric bicycles so that they can experience and explore Oakland in a new way. Bike Solar Oakland is collecting data on the bicycles, the solar panel power, and how the station is being utilized, and hopes to expand the pilot project growing to ultimately serve larger transportation needs of Oakland [3].

Because solar-powered and electric bicycles can be an important part of existing sustainable transit models, providing residents with alternative, efficient, and sustainable transportation options, innovative transportation projects like Bike Solar Oakland’s pilot program and the Portland electric bicycle pilot project serve both smart cities—connected, urban, and thriving. Taken together, pilot projects like these pave the way for comprehensive campaigns to increase adoption of electric bicycles across the country—and to move them out of the realm of early adopters into an essential part of the urban transportation fabric.

5 Conclusion

As cities become more urban and denser, they will need to create innovative and usable transportation solutions—and electric bicycles are primed to become a large piece of that puzzle. Electric bicycles can reduce barriers to participation in cycling. While barriers like hills and sweat stand in the way for many commuters to adopt bicycling as their primary transportation, an electric-assist bicycle can mitigate those barriers. Electric bicycles can also make people more comfortable on and with a bicycle, as well as encouraging more trips by bicycle.

The pilot program and social media campaign show that there is an inherent interest in electric bikes and we encourage other communities to consider similar programs. Electric bicycles can increase biking in urban areas because they provide electric power assistance, which can address the limits of trip distance, physical ability, and terrain. Because of this, electric bicycles and bike sharing programs are a great solution to the growing demands of urban and smart cities.

As a next step, Drive Oregon plans on seeing how electric bicycles, particularly electric bicycle share programs, can increase EV adoption in low-income communities. Our own pilot was limited by the demographics making up Kaiser's employees. As a result, 88% had a household income over \$50,000 (and 48% over \$100,000). While we expect the barriers for low-income communities to be similar to those found in the Kaiser study, an additional pilot may uncover additional concerns, such as electric bicycle cost, safe electric bicycle storage and overall community safety.

Acknowledgments

This research was supported by a Metro (Oregon regional government) Regional Travel Options grant. We thank our colleagues John MacArthur, Caleb Winter, Lauren Whyte, and Marian Hammond for their support throughout the project.

References

- [1] O. Poblacion, *Oregon Public Radio*, <http://www.opb.org/news/article/closing-the-gender-gap-for-bicycling-women>, accessed on 2016-03-22; and B. McKenzie, *Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008-2012*, United States Census Bureau, 2014
- [2] MacArthur, John et., *Evaluation of an Electric Bike Pilot Project at Three Employment Campuses in Portland, Oregon*, 95th Annual Meeting of the Transportation Research Board, January 10-14, 2016
- [3] *Bike Solar Oakland*, <http://www.bikesolaroakland.com>, accessed on 2016-03-10

Authors



Zach Henkin is a Program Director for Drive Oregon, a non-profit economic development organization with a mission to grow the electric vehicle industry in Oregon. Zach coordinates the Energize Oregon Coalition in partnership with the Oregon Governors office and specializes in charging infrastructure and electric vehicle implementation. Zach has an MBA from Marylhurst University and volunteers his time on the board of Solar Oregon, the Oregon City Planning Commission, and the Clackamas County Economic Development Commission.



Dahlia Grossman-Heinze is an Account Associate for Brink Communications, a communications firm that specializes in behavior-change communications and turns profit-based resources into civic-minded initiatives around issues like sustainable energy, social equity, and alternative transportation. Dahlia coordinates social media strategy and enjoys working on messages that get people to take action.