

Changes in Travel Behavior, Attitudes, and Preferences among E-Scooter Riders and Non-Riders: Results from Pre and Post E-Scooter System Launch Surveys at Virginia Tech

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Abstract

Background and Methods: Shared micromobility such as electric scooters (e-scooters) has potential to enhance the sustainability of urban transport by displacing car trips, providing more mobility options, and improving access to public transit. Most published studies on e-scooter ridership focus on cities and only capture data at one point in time. This study reports results from a survey deployed before (n=462) and after (n=428) the launch of a fleet of shared e-scooters on Virginia Tech's campus in Blacksburg, VA. This allowed for a pre-post comparison of attitudes and preferences of e-scooter riders and non-users.

Results: E-scooter ridership on campus follows patterns identified in other studies, with a greater share of younger riders—in particular undergraduate students. Stated intention to ride prior to system launch was greater than actual ridership after system launch. The drop-off between pre-launch intention to ride and actual riding was strongest for older individuals, women, and university staff. As in city surveys, the main reasons for riding e-scooters on campus were travel speed and fun of riding. About 30% indicated using e-scooters to ride to parking lots or to access public transport service—indicating e-scooters' potential as connector to other modes of transport. Perceptions about the convenience, cost, safety, parking, rider behavior, and usefulness of the e-scooter systems improved among non-riders after system launch—indicating that pilot projects may improve public perception of e-scooters. Building more bike lanes or separate spaces for e-scooters to ride could help move riders off sidewalks—a desire expressed by both pedestrians and e-scooter users.

Literature

- Did not find any e-scooter evaluation studies in University campus context
- Selected city pilot evaluations with over 1,000 respondents, including at least 35% of respondents who were e-scooter users
- Trips average 1 mile and 5-20 minutes
- Users are predominantly male and under 40 years of age
- Users span a range of income groups
- Majority have income >\$75k
- Programs effective at attracting larger shares of low-income users
- Used for commuting, socializing, connecting to transit, and just for fun

Study area	Driving	Taxi or TNC	Public transit	Walk	Bicycle	Would not have traveled
Atlanta, GA [2]		42%	2%	48%	4%	n.a.
Arlington, VA [10]	15%	20%	5%	37%	4%	4%
Chicago, IL [4]	11%	32%	14%	30%	8%	3%
Hoboken, NJ [6]	11%	37%	13%	51%	13%	8%
Portland, OR [7]	19%	15%	10%	37%	5%	n.a.
San Francisco, CA [9]	5%	36%	11%	31%	9%	8%
Tucson, AZ [8]	27%	14%	3%	36%	8%	13%
Average	15%	26%	8%	39%	7%	7%

Figure 1. Rider mode choice if an e-scooter had not been available for last trip

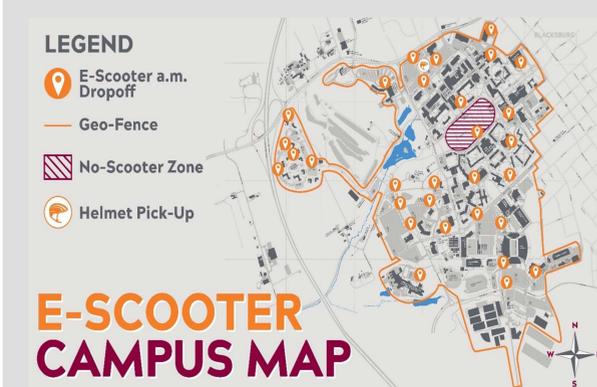


Figure 2. Study location—Virginia Tech's Campus in Blacksburg, VA
Source: Mary Beth Kegley (VTTI)

Methods

- Online survey of attitude & preference data from community, usage patterns of e-scooter users
- Respondents included students, faculty, & staff recruited online and by pedestrian intercept
- Chance to win \$50 was offered as an incentive
- Data was collected in two cross-sectional surveys, pre and post e-scooter deployment in late August (428 respondents) and October 2019 (462 respondents)
- 129 respondents (28%) of post-launch survey had used an e-scooter on campus
- T-tests for population proportions between cross-sections

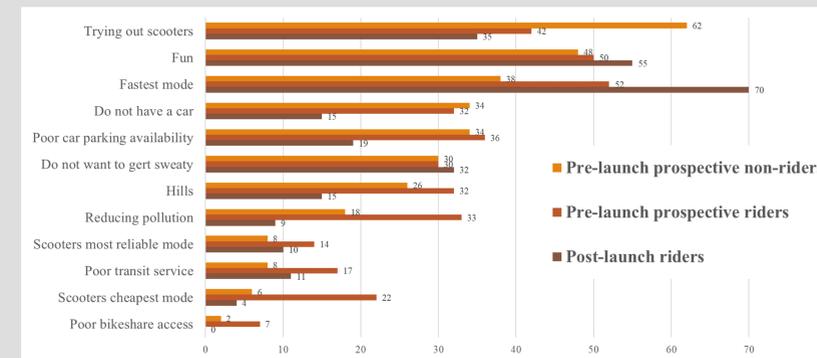


Figure 3. Reasons for choosing e-scooters among riders and non-riders before and after system launch

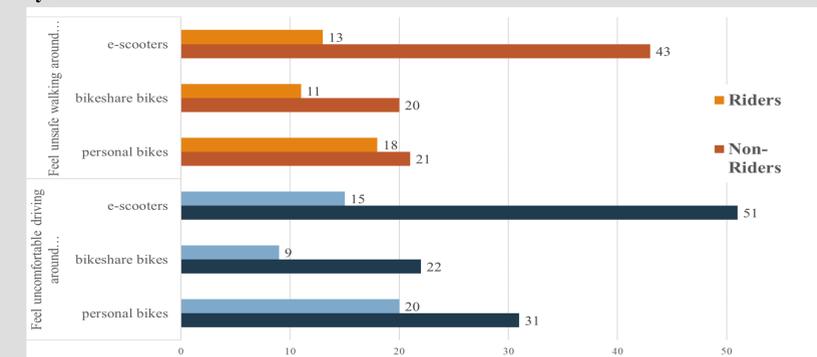


Figure 4 Perceived comfort driving and perceived safety walking around e-scooters for riders & non-riders

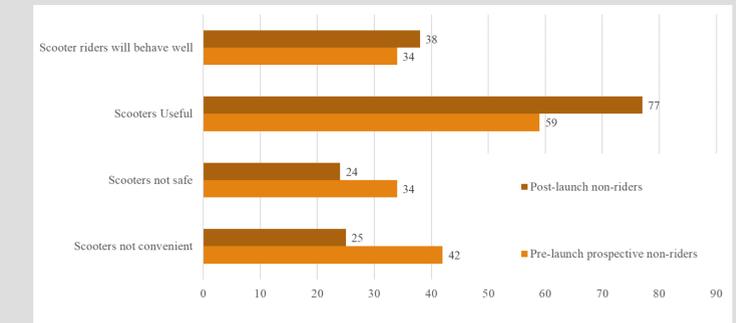


Figure 5. Changes in Perceptions by Non-Riders

Key Results

- Main reasons for riding e-scooters were travel speed and the fun of riding
- Perceptions about the convenience, safety, and usefulness of the e-scooter system improved among non-riders after system launch
- Current non-riders preferred more separate infrastructure, such as bike lanes, to ride scooters
- E-scooters mainly replaced walking trips (81%) and did not replace many automobile trips (only 2% in the online survey and 6% in the post-trip in-app survey)—likely related to low levels of driving on campus.
- Scooters geofenced at edge of campus limited trip replacement
- Overall reduction in driving reported by riders (30% say they drive less)
- More marketing and outreach specifically tailored to older individuals, women, and university staff could help attract those who are potentially interested to ride e-scooters
- Providing more bike lanes or separate spaces for e-scooters to ride could help move riders off of sidewalks.
- This may increase satisfaction among riders, attract more riders, and also improve perceptions by non-rider pedestrians—of whom 43% reported feeling unsafe walking around scooters.
- E-scooter companies, university administration, and local governments should design incentives and supportive infrastructure such as racks, marked parking areas, and charging stations to increase proper parking to help promote the general positive trend in community perceptions about e-scooters.