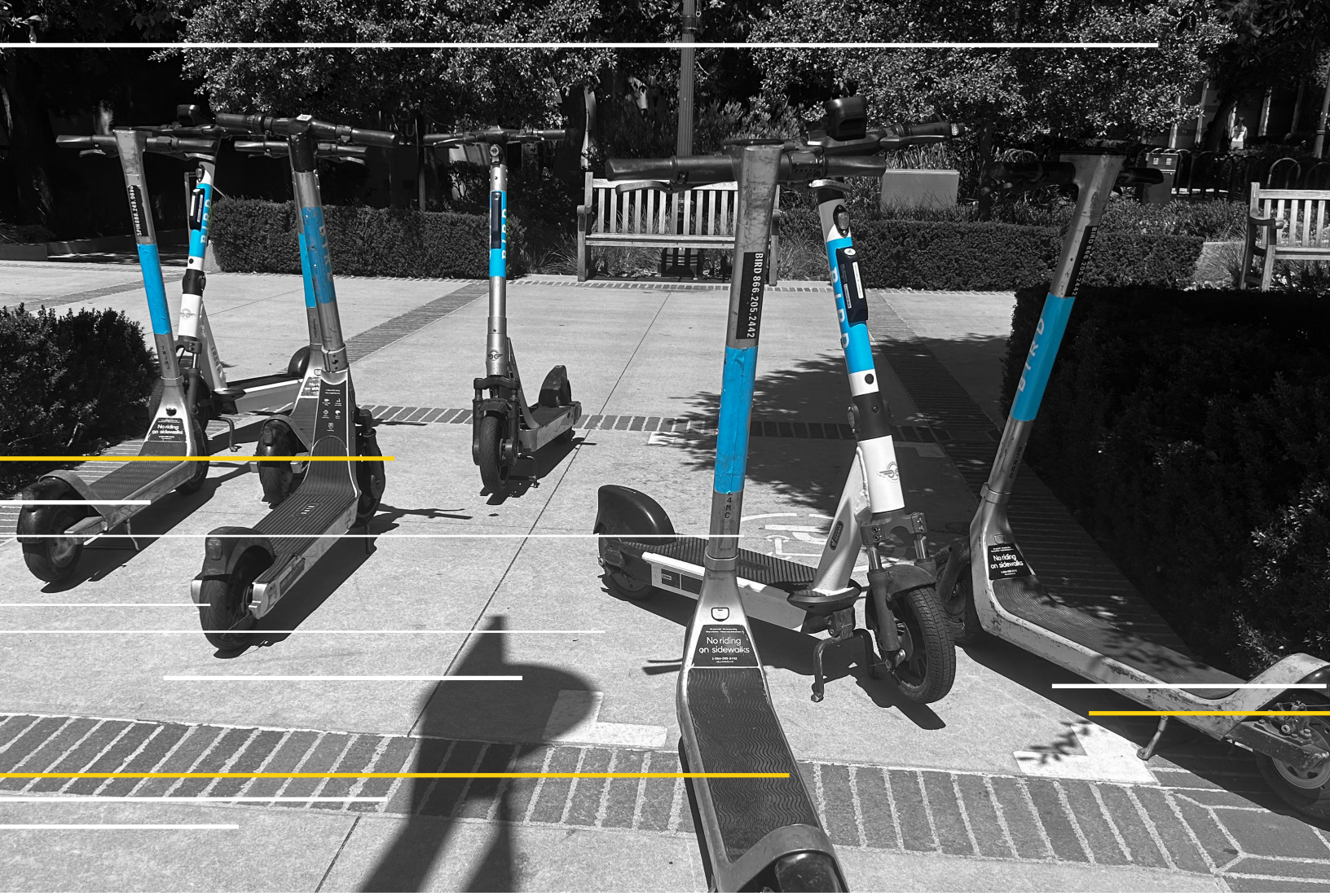

RESEARCH REPORT

Connecting the First and Last Mile

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UCLA Institute of Transportation Studies

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16. Abstract

Students on university campuses have several available options for travel, including cars, buses, and micromobility, the latter of which encompasses bicycles and more recently, shared e-scooters (e-scooters). E-scooters are lightweight, electric vehicles which can be rented or purchased easily. They offer an ideal option to close the first/last-mile gap between a public transit stop or station and someone's origin or destination, a niche use for students that has not been well studied. To address this gap in the literature, this paper offers a systematic review of literature from 2017 to 2025, focusing on the characteristics of students who rent e-scooters specifically for first/last-mile transportation. It also examines how these students differ from the broader population of e-scooter users. Limited yet growing evidence suggests that although students are not at present a key user base for e-scooters for first/last-mile connections, those currently using micromobility express interest in this use. Barriers like safety concerns and perceptions that other modes are quicker may hinder widespread adoption, but strategic interventions—such as enhanced safety infrastructure and rising parking prices—could effectively motivate policymakers to promote greater use of e-scooters among students.

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The UCLA Institute of Transportation Studies acknowledges the Gabrielino/Tongva peoples as the traditional land caretakers of Tovaangar (the Los Angeles basin and So. Channel Islands). As a land grant institution, we pay our respects to the Honuukvetam (Ancestors), ‘Ahiihirom (Elders) and ‘Eyoohiinkem (our relatives/relations) past, present and emerging.

Disclaimer

Connecting the First and Last Mile:

A Systematic Review of Student Use of E-scooters for First/ Last-mile Connections to Public Transit

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Introduction

In 2017 in Santa Monica, California, a start-up firm called Bird introduced shared e-scooters, electric motor-powered scooters that members of the public can rent and generally park anywhere (I will refer to shared e-scooters as e-scooters throughout the paper.). Since then, e-scooters have been introduced worldwide and continue to be the focus of extensive international research, encompassing a diverse range of topics and perspectives. One specific area of scholarship that emerged focused on understanding who uses e-scooters, for what types of trips, and where they are being used. These studies have engaged with and contributed to the general idea that shared e-scooter users are likely to be younger, more-educated, higher-earners, and typically men (Laa and Leth, 2020; Christoforou et al., 2021; and Aguilera-García et al., 2024). Another area of scholarship focuses on spatial analysis of e-scooter trip data. One such study is Caspi, Smart, and Noland (2020), which concludes that University of Texas at Austin students are a key user base and that “e-scooter sharing services can work well in college towns or on campuses” (Caspi, Smart, and Noland, 2020, p. 13). Hawa et al. (2021) highlight an additional factor. They found that the presence of bicycle lanes contributed to the presence of e-scooters parked nearby. Other scholarship on e-scooters includes engineering-focused research on shared e-scooter systems and trip demand, as well as public health-focused papers concerning injuries associated with e-scooter use.

This paper reviews current literature at the intersection of two key areas of scholarship: student e-scooter users and the use of e-scooters for first/last-mile connections to public transit. College campuses have been identified as prominent areas where shared e-scooters are available and utilized (Caspi, Smart, and Noland, 2020 and Tokey, Shioma, and Jamal, 2022). Bagdatli and Godebey (2025) and Dias, Ribeiro, and Arsenio (2024) have surveyed student attitudes and travel behavior, finding that male students, as with the general population, are more likely to use e-scooters. The first/last-mile issue refers to the gap between a public transit stop or station and someone’s origin or destination (Yin et al., 2024). Some authors propose e-scooters as a potential solution to this problem due to their power source and/or form factor (Kim, Zo, and Chiravuri, 2025 and Yin et al., 2024). Yet despite a utilitarian role for e-scooters to fill a key transit gap and the presence of students on university campuses as a potential key user base, little scholarship exists at this intersection of student e-scooter users and first/last-mile travel behavior. This paper reviews an emerging body of literature on student e-scooter travel behavior, focusing on aspects such as trip frequency, intended purpose, and time of day/week. It also examines how students perceive e-scooters as a convenient first/last-mile transportation option and explores differences in trip patterns and characteristics between student subgroups, the broader public, and students who do or do not use e-scooters overall.

Methodology

I conducted a systematic literature review using the PRISMA checklist (Page et al., 2021) to explore student use of e-scooters as a first/last-mile mode for connecting to public transit. My literature review includes work published in the late 2010s following e-scooters' introduction up to 2025. I utilized Google Scholar's Advanced Search Tool, ScienceDirect, Transportation Research International Documentation (TRID), UCLA Library, and Web of Science, using their respective search tools. I also performed a heuristic review to ensure comprehensive coverage. Selection criteria focused on articles related to student e-scooter use for first/last-mile trips, overall student travel behavior, and general first/last-mile transportation patterns. I identified 25 studies directly focusing on e-scooter use for first/last-mile travel behavior among students.

I received 95 results in ScienceDirect, 288 results in UCLA Library, and 649 results in Google Scholar using the keywords "e-scooter," "electric scooter," "student," "travel behavior," and "last-mile." In ScienceDirect, I also specified that my search should only include articles with the word "e-scooter" in the abstract. I received approximately 200 articles from Google Scholar using the exact phrases "e-scooter" and "last mile travel behavior," as well as articles containing at least one of the words "college," "campus," or "university" anywhere in the text. To focus on travel behavior rather than safety concerns, I excluded articles that included the words "injuries," "injury," "safety," or "crash." I complemented this algorithmic review with a heuristic literature review, which involved examining the bibliographies of the three articles identified through Google Scholar. Using this approach, I identified five additional relevant studies: Nikiforiadis et al. (2023), which directly investigates student first/last-mile travel behavior and whom Gödde and Schneiner (2025) cite in their references; McQueen and Clifton (2022), a study of students in Portland that Nikiforiadis et al. (2023) discuss; Bagdatli and Godebey (2025), an article citing Nikiforiadis et al (2023); and Huang et al.(2024), who cite McQueen and Clifton (2022).

In the Web of Science database, the keywords "e-scooters" and "college students," and "last-mile" returned zero search results. When I dropped "last-mile" from the search, the keywords "e-scooters" and "college students" returned five results. In the TRID database, primary keyword "e-scooters," along with global free-text index term "college students," yielded seven articles, including Nikiforiadis et al. (2023) and Bagdatli and Godebey (2025) which I also identified in my heuristic search. The keywords "e-scooter," "electric scooter," "student," "travel behavior," and "last-mile" returned no results in either TRID or Web of Science. In total, I obtained 25 articles relating to student use of e-scooters for first/last-mile connections to transit or to cars/parking.

Results

Evidence from Studies

My literature review yielded 25 articles focusing on the subject of student use of e-scooters for first/last-mile travel. Thirteen are from the United States, seven are from Europe, and five are from Asia, including one study published in Turkey (Bagdatli and Godebey, 2025). All studies were published between 2021 and 2025. All but five studies rely on data collected between 2019 and 2022 (Schoenn-Anchling and Varotto (2024) and Coppola, Silvestri, and Pastorelli (2025) collected data in 2023 and Teng (2025) collected data in 2024). Bagdatli and Godebey (2025) note that their survey's ethics approval code is "2022/5-35" but do not confirm if their survey took place in 2022. Prayitno et al. (2024) and Sorkou et al. (2022) do not state when they collected their data.

The studies I analyzed fall into three distinct categories based upon study goals:

1. Analysis of e-scooter trip location (Hasan and Sisiopiku, 2024) or motivation (e.g., first-/last-mile (Gödde and Scheiner, 2025) or "last-minute" to get to exams on time (Berg Wincent, Jenelius, and Burghout, 2024))
2. Rider-based criteria (e.g., demographics, travel behavior, and/or perceptions of e-scooters) (10 studies)
3. Stated-preference studies designed to elicit preferences for transportation choice based upon economic, environmental, and personal variables (12 studies)

I analyze each of these below (See **Table 1**):

Table 1. Evidence from Studies

Category	Study	Time of Data Collection	Region	Summary
Trip Motivation Studies	Gödde and Scheiner (2025)	2022	United States	Study analyzed e-scooter trip data from Hanover, Germany, finding that e-scooter first- and last-mile trip start and endpoints, respectively, are strongly related to percentage of individuals aged 15-30 in Hanover's spatial aggregation units.
	Hasan and Sisiopiku (2024)	2021	United States	Study evaluated e-scooter pilot trip data from Birmingham, Alabama and concluded that although usage was concentrated around the University of Alabama at Birmingham, e-scooters were underutilized citywide.
	Berg Wincent, Jenelius, and Burghout (2024)	2021-2022	Europe	Study conducted in Stockholm analyzed e-scooter trip data to assess how student travel behavior changed during exams at a university. They concluded that students used e-scooters to connect from a nearby rail station to campus more often during exams than they did outside exams.
Rider Behavior Studies	Askari et al. (2025)	2022	United States	Study surveyed Chicago and concluded students were using e-scooters for first/last-mile travel. They observed strong relationships between e-scooter usage being aged 18-24 as well as between e-scooter usage and possessing discounted transit passes, a group they note includes students with university transit passes, leading them to make their conclusion.
	Bagdatli and Godebey (2025)	not stated*	Asia (Turkey)	Study surveyed students across Turkey, finding that there was no strong relationship between first- or-last mile trips and student use of e-scooters or intention to use e-scooters.
	Buehler et al. (2021)	2019	United States	Study surveyed Virginia Tech students and staff before and after e-scooters were introduced to campus. They found that 3 in 10 of their respondents use e-scooters to connect to buses (7%) or to parking lots (24%).
	de Carvalho and Lopes (2021)	September 2020	Europe	Study surveyed respondents in two Swedish cities and concluded that more e-scooter users connect to rail transit than to bus transit.

Category	Study	Time of Data Collection	Region	Summary
Rider Behavior Studies	Huang et al. (2024)	2021-2022	United States	Study surveyed Washington, D.C. and Los Angeles. They found that e-scooters users making first/last-mile trips were likely to not have a college degree and be non-white. Study also concluded that intent to use e-scooter this way was not split by income, race, nor education.
	Jafarzadehfadaki and Sisiopiku (2024)	2021-2022	United States	Study surveyed Los Angeles, Miami, and Washington, D.C., dividing respondents into five groups by use frequency across all three cities. Use of e-scooters for first/last-mile connections was not the primary use for any group.
	Lee et al. (2021)	2019	Asia	Study surveyed Seoul residents and identified the majority of respondents as lower-income individuals whose intent to use e-scooters for first/last-mile travel in the university district did not match their travel behavior. They recommend lowering scooter prices by bundling them with transit.
	Teng (2025)	2024	United States	Study surveyed Purdue University students and staff, finding that 4 in 10 respondents use e-scooters for first/last-mile connections to cars or buses.
	Yang et al. (2024)	2021	United States	Study surveyed Los Angeles, Miami, Washington, D.C., and Birmingham, Alabama. They found no relationship between student status and e-scooter use, and they observed that first/last-mile trips comprised ~10% of trip purposes among respondents in each city.
	Zuniga-Garcia et al. (2022)	2019	United States	Study surveyed students at the University of Texas at Austin and collected transit and e-scooter trip data. They found 12% of their respondents used e-scooters for first/last-mile connections to transit.
Stated-preference Studies	Coppola et al. (2025)	2023	Europe	Study conducted a stated preference experiment assessing what kind of mobility options students and staff at a university in Milan, Italy would like to have access to through a single travel service platform. They found respondents from Milan (versus the metropolitan area outside the city) had higher interest in combining e-scooters/bikes with public transit, as did respondents with transit passes, although interest in it and the other mobility options was low overall.

Category	Study	Time of Data Collection	Region	Summary
Stated-preference Studies	Eom, Lee, and Lee (2023)	2021	Asia	Study conducted a stated preference experiment in South Korea comparing cycling and e-scooters to walking as options to get home from a subway station. Study found that younger people were more likely to choose e-scooters and that women were less likely to choose e-scooters.
	Frolich, Sarker, and Jin (2024)	2021	United States	Study conducted a stated preference experiment to assess willingness to use e-scooters in South Florida. They concluded that students expressed interest in using e-scooters for first/last-mile transit, and they suggest increasing student access to e-scooters, improving e-scooter safety, and constructing additional e-scooter infrastructure.
	Hermawan and Le (2022)	April 2020	Asia	Study conducted a stated preference experiment assessing how Singapore students and staff traveled from train station to a university campus. They found that few respondents chose to use e-scooters and that those who did likely used public transit as their primary travel mode.
	McQueen and Clifton (2022)	February-March 2020†	United States	Study conducted a stated preference experiment of Portland State University (PSU) students. They found that at current prices and travel times, the model they create predict a 0% chance that people would use e-scooters to connect to public transit to get to PSU, although that probability grows if they raise car parking prices, make e-scooter trips free, and advertise the benefits of first/last-mile e-scooter trips to improve student perceptions of the travel behavior.
	Nikiforiadis et al. (2023)	2021	Europe	Study conducted a stated preference experiment among students at university in Thessaloniki, Greece. They conclude that students use e-scooters for first/last-mile connections to buses or cars if it saves them lots of time, and that the low interest they observe in first/last-mile travel indicates that e-scooters are not time or cost-effective compared to alternative modes.
	Prayitno et al. (2024)	not stated	Asia	Study conducted a stated preference experiment at a university in Indonesia assessing students' willingness to use e-scooters. Of respondents, 74% said they would use e-scooters for first/last-mile connections to transit, and they found a strong relationship between this travel behavior and users having previously ridden e-scooters.

Category	Study	Time of Data Collection	Region	Summary
Stated-preference Studies	Schoenn-Anchling and Varotto (2024)	2023	Europe	Study conducted a stated-preference experiment at a university outside Lyon, France. They found that individuals with e-scooter passes were more likely to signal intent to use e-scooters for first/last-mile travel to get to campus and that respondents were generally less likely to choose e-scooters for first/last-mile travel than to drive.
	Sorkou et al. (2022)	not stated	Europe	Study conducted a stated preference experiment with students and staff at an Athens, Greece university to assess how road and price circumstances would influence travel behavior. They found that being within a 2-kilometer radius of a metro station had a strong relationship with reducing respondents' willingness to use e-scooters but found no such relationship for buses. They conclude that e-scooters are not being used as a first/last-mile travel mode.
	Torabi Kachousangi et al. (2022)	2019	Europe	Study conducted a stated preference experiment to identify how residents near the Delft University of Technology would want to access the Delft Campus rail station. They found that just under 10% of their respondents would choose e-scooters. They also found that women were more likely and respondents age ≤ 26 less likely to select e-scooters.
	Yan et al. (2023)	2021-2022	United States	Study conducted a stated preference experiment in Washington, D.C. and Los Angeles, finding a strong relationship between interest in using e-scooters for first/last-mile connections to transit and existing transit users, e-scooter users, and those who perceive e-scooters as safe.
	Zhang et al. (2021)	2019	United States	Study conducted a stated preference experiment and collected trip data on e-scooter trips at Virginia Tech. They concluded that 1 in 10 students used e-scooters to connect with parking and that students would extend their trips to use bike lanes and shared use pathways.

** Bagdatli and Godebey* (2025) *note that their survey's ethics approval code is "2022/5-35" but do not confirm if their survey took place in 2022.*

† McQueen and Clifton (2022) *state that they received all responses by March 13 and most responses March 4-5, preceding Oregon's at home order on March 23 and coinciding with Oregon's Coronavirus Disease 2019 (COVID-19) state of emergency declaration (March 8), leading them to classify the travel behavior as pre-pandemic.*

Trip Motivation Studies

Gödde and Scheiner (2025) sought to understand the relationship between recorded Lime e-scooter trips in Hanover, Germany in 2022. They classified trips as either first-mile, last-mile, or origin-destination trips and included different spatial attributes surrounding trip start and endpoints. Berg Wincent, Jenelius, and Burghout (2024) analyzed e-scooter trip data in Stockholm to assess if the KTH Royal University of Technology's exam influenced students' travel behavior. Hasan and Sisiopiku (2024) assessed the trip data from an e-scooter pilot in Birmingham, Alabama.

Rider-based Criteria Studies

These ten studies sought to understand the relationship between e-scooter usage demographics, stated travel behavior, and perceptions of e-scooters. Many studies address the subject of e-scooter usage for first/last-mile connection to transit indirectly, asking students if they use e-scooter for first/last-mile trips as one of many questions (Bagdatli and Godebey, 2025; Buehler et al., 2021; and de Carvalho and Lopes, 2021) or including student as a demographic variable in studies of first/last-mile trips using e-scooters (Yan et al., 2023 and Huang et al., 2024, who appear to share a dataset). Other studies include both variables among other variables (Jafarzadehfadaki and Sisiopiku, 2024 and Yang et al., 2024). Only one (Zuniga-Garcia et al., 2022) directly addresses the question of student use of e-scooters for first/last-mile trips to connect with transit.

Stated-preference Studies

The remaining 12 studies administered stated-preference experiments to understand how different factors, in addition to demographics, current travel behavior, and perceptions about e-scooters, influence students' decisions to adopt e-scooters as a first/last-mile mode to connect to public transit. Among common variables in the stated price experiments were price (McQueen and Clifton, 2022; Sorkou et al., 2022; Nikiforiadis et al., 2023; Schoenn-Anchling and Varotto, 2024; and Eom, Lee, and Lee, 2023) and travel times (McQueen and Clifton, 2022; Nikiforiadis et al., 2023; and Schoenn-Anchling and Varotto, 2024). Coppola et al. (2025) had a slightly different focus; they surveyed students and staff in Milan, Italy to assess interest in a program where they offered respondents one of three proposed bundles for a program known as Mobility as a Service (MaaS), pairing public transit with bike/e-scooter sharing services.

Methodological Comparisons

All but three studies (Gödde and Scheiner, 2025; Hasan and Sisiopiku, 2024; and Berg Wincent, Jenelius, and Burghout, 2024) administered surveys where they asked questions about demographics, current travel behavior, and/or perception of e-scooters, with the stated-preference surveys collecting this information along with respondents' preferences. Gödde and Scheiner (2025) and Berg Wincent, Jenelius, and Burghout (2024) relied on e-scooter data collected by e-scooter providers in Hanover, Germany and Stockholm, Sweden, respectively. Most of the studies used different models based on regression analysis to assess how students' e-scooter usage (or choice, for the stated-preference experiments) related to attitudes, demographics, current travel behavior, and/or perception. Gödde and Scheiner (2025) and Berg Wincent, Jenelius, and Burghout (2024) focus their analyses on relating observed trip behavior to the built environment (Gödde and Scheiner, 2025) and to the occurrence of exams (Gödde and Scheiner, 2025 and Berg Wincent, Jenelius, and Burghout, 2024; although Berg Wincent, Jenelius, and Burghout (2024) used only Mann-Whitney U tests instead of regression). Other studies that did not use regression used chi-square and t-tests (Buehler et al., 2021), just t-tests (Zhang et al.,

2021), or descriptive analysis (de Carvalho and Lopes, 2021 and Teng, 2025). McQueen and Clifton (2022) added an additional dimension to their analysis by analyzing and modeling respondents' sensitivity to the travel time and price changes of the three modes in their study: cars, bicycles, and e-scooters, combined with Portland's MAX light rail. They used this data to map areas across Portland where, based on their analysis, the probability of students choosing to get to Portland State University using shared e-scooters as a first/last-mile mode to connect with MAX changes when they vary prices of e-scooters and car parking from summer 2020 levels.

Findings

Trip Motivation Studies

Gödde and Scheiner (2025) found that one fourth of the 322,309 e-scooter trips they analyzed were for first/last-mile travel and demonstrated a strong positive relationship between the proportion of 15- to 30-year-olds in one of Hanover's spatial units and both first- and last-mile trips starting or ending in a unit. Berg Wincent, Jenelius, and Burghout (2024) concluded that students were changing their behavior to use e-scooters to get to exams on time, making last-mile trips from Stockholm's Östra Station that they would not normally make. Hasan and Sisiopiku (2024) connected the high level of e-scooter trip starts and conclusions around the University of Alabama at Birmingham to student usage, observing that e-scooters were underutilized citywide throughout the study.

Rider-based Criteria Studies

Authors of several studies found that use of e-scooters for first-last mile connection to transit (and to parking lots (Buehler et al., 2021 and Zhang et al., 2021)) is an uncommon behavior (Jafarzadehfadaki and Sisiopiku, 2024 and Yang et al., 2024), with few students using e-scooters this way (Zuniga-Garcia et al., 2022; Buehler et al., 2021; Yang et al., 2024; and Hermawan and Le, 2022). Moreover, they found that a strong relationship does not exist between student status and using e-scooters this way (Yan et al., 2023; Huang et al., 2024; and Bagdatli and Godebey, 2025). Two studies challenge this finding. Askari et al. (2025) suggest that students are first/last-mile users because they found strong relationships between e-scooter use and recipients of transit passes, such as student transit discounts, and between e-scooter use and the population density of 18- to 24-year-olds. In his survey of Purdue University students and staff, Teng (2025) found that four in ten respondents use e-scooters for first/last-mile connections to cars or buses. De Carvalho and Lopes (2021) identify that more of their respondents, particularly in Lund, Sweden, use e-scooters to connect to rail transit than buses.

Demographically, the majority of studies identified that e-scooter users were primarily 40 and under (Jafarzadehfadaki and Sisiopiku, 2024; de Carvalho and Lopes, 2021; and Askari et al., 2025). Studies focused specifically on students saw the highest usage among people in their 20s (Buehler et al., 2021; de Carvalho and Lopes, 2021; and Zuniga-Garcia et al., 2022). Most found a gender gap among both e-scooter users and those who indicated intent to use e-scooters in the future (Bagdatli and Godebey, 2025; Yan et al., 2023; and Yang et al., 2024), where more e-scooter users or individuals who expressed intent were men than women (Jafarzadehfadaki and Sisiopiku, 2024). Yang et al. (2024) challenges both consensuses, identifying 30- to 49-year-old users as a sizable user group in Los Angeles, Miami, and D.C., while also reporting that women made up 35%-57% of e-scooter users across those cities and Birmingham. U.S.-based studies did not reach consensus on the race/ethnicity of e-scooter users.

Many studies indicated that higher-income individuals use or have intent to use e-scooters (Jafarzadehfadaki and Sisiopiku, 2024 and Yang et al., 2024). Four studies indicated that lower-income respondents use or had intent to

use e-scooters (Yan et al., 2023; Huang et al., 2024; Lee et al., 2021; and Askari et al., 2025). Askari et al. (2025) attributed use to subsidized price programs for e-scooters.

Stated-preference Studies

Studies that administered stated-preference experiments also found that using e-scooters to travel the first or last mile to transit is an uncommon travel behavior. The two exceptions to this finding are first a study in Indonesia, where nearly three quarters of respondents in a survey at a university said they would use e-scooters "to complete transit-based trips" (Prayitno et al., 2024, p. 6), a finding that the authors found had a strong relationship with previously having used e-scooters (Prayitno et al., 2024). The second exception is Frolich, Sarker, and Jin (2024), which identifies students as a group showing "strong preferences" for using e-scooters for first/last-mile connections to transit (Frolich, Sarker, and Jin, 2024, p. 13). Students would only select e-scooters as a first/last-mile mode if they perceived them to be more convenient (e.g., affordable and/or faster) than other travel options (McQueen and Clifton, 2022; Nikiforiadis et al., 2023; and Sorkou et al., 2022). Perceived safety (Yan et al., 2023) and familiarity with micromobility (Hermawan and Le, 2022 and Prayitno et al., 2024) also played a role in influencing student interest in e-scooters as a first/last-mile mode. Related to safety, Zhang et al. (2021) found that students would lengthen their e-scooter trips to utilize bikeways and multiple-use paths, which they observe demonstrates a desire to avoid cars. Compared to shared bicycles, Torabi Kachousangi et al. (2022) found a strong positive relationship between women and e-scooters, a finding that stands out among many studies that find that more men use or are interested in using e-scooters than women. Additionally, Frolich, Sarker, and Jin (2024) described its finding that gender did not have a strong relationship with interest in e-scooters as surprising.

McQueen and Clifton (2022) found strong relationships between women's lack of interest in using e-scooters for first/last-mile travel and safety and knowledge. Torabi Kachousangi et al. (2022) also reported that respondents under 26 were less likely to use e-scooters. Scholars did not reach a consensus on the role of race or income in influencing respondents' choice to use e-scooters for first/last-mile travel in stated-preference experiments. In an inverse finding from de Carvalho and Lopes (2021), Sorkou et al. (2022) found that being within a two-kilometer radius of a metro station reduced people's willingness to use e-scooters, making no such finding for bus lines.

McQueen and Clifton (2022) model hypothetical conditions that predict higher probabilities that students would decide to use e-scooters with MAX to travel to PSU (then-current conditions show 0% probability across their study area). They showcase the impact of raising parking prices alone or raising them while making e-scooter use free (alongside a "successful marketing campaign to increase students' attitudes towards e-scooters and MAX" (McQueen and Clifton, 2022, p. 410)). Both interventions considerably increase predicted probability of e-scooter-plus-MAX selection in areas surrounding MAX stations (McQueen and Clifton, 2022).

Recommendations to Increase E-scooter Usage in the Literature

Many of the studies across the Rider Behavior and Stated-preference studies proposed interventions to increase student use of e-scooters. Solutions studies propose include creating more bicycle lanes (McQueen and Clifton, 2022; Nikiforiadis et al., 2023; Buehler et al., 2021; Huang et al., 2024; Zhang et al., 2021; Frolich, Sarker, and Jin, 2024; and Hermawan and Le, 2022), changing prices of e-scooters (Lee et al., 2021; Eom, Lee, and Lee, 2023; Yan et al., 2023; Huang et al., 2024; Frolich, Sarker, and Jin, 2024; and Bagdatli and Godebey, 2025) and car parking (McQueen and Clifton, 2022; Nikiforiadis et al., 2023; and Yan et al., 2023), and improving spatial access (Eom, Lee, and Lee, 2023; Huang et al., 2024; Nikiforiadis et al., 2023; Frolich, Sarker, and Jin, 2024; and

Bagdatli and Godebey, 2025). McQueen and Clifton (2022), alongside their recommendation about increasing parking costs, warn of unintended harm stemming from raising people's costs.

Discussion

The trip motivation studies demonstrated that, while students and young people use e-scooters for first/last-mile trips, this is not a frequent trip type, a finding emphasized by the rider-based criteria studies. The stated-preference experiments found that students who had used e-scooters would use them for first/last-mile travel behavior, or if e-scooters offered travel times and/or prices that were better than alternatives. Collectively, the studies I review here do not find that use of e-scooters for first/last-mile travel behavior is common practice among students. However, that many of these studies make suggestions to increase usage indicates that scholars believe interventions can increase student e-scooter usage for first/last-mile trips and influence other e-scooter travel behavior.

Parallels exist between factors that influence student use of e-scooters for first/last-mile travels and those influencing general population and student usage of e-scooters in terms of gender and income. This suggests that interventions like bicycle infrastructure, pricing changes, and means of increasing trip speed and convenience, such as traffic signal priority (suggestions from Frolich, Sarker, and Jin (2024)) could increase e-scooter usage among students for first/last-mile connections to transit as well as broader e-scooter usage. These parallels suggest that further study is needed to identify how different demographics respond to interventions such as price changes and/or safety infrastructure. The findings of de Carvalho and Lopes (2021) and Sorkou et al. (2022) portray first/last-mile travel in an interesting light because of varying findings about the relationship with rail versus buses. It introduces questions about how transit modes' coverage, speed, and reliability, for example, influence a decision to use first/last-mile modes like e-scooters.

Limitations

While each of the reviewed papers offers interesting findings, overall the amount of research on first/last-mile scooter use by university students is comparatively modest. That many of them present the results of stated preference experiments rather than actual travel behavior data should be understood as a limitation, particularly given that Buehler et al. (2021) and Yan et al. (2023) highlight how intent can differ from real behavior. Other studies are limited by having the student category or trip type be one dimension of a broader analysis. It is worth noting that almost all the studies rely on data collected before the pandemic or in the early 2020s. It remains to be seen if preferences and travel behavior will shift as scholars collect post-pandemic data.

Future Directions

Finally, current literature is also distinguished by its omission of privately owned e-scooters. This omission makes little sense from an analytical standpoint, particularly given general travel behavior studies like Laa and Leth (2020), Christoforou et al. (2021), and Aguilera-García et al. (2024) all include private e-scooter use in their studies. Moreover, it deprives scholars, planners, and other potential readers of information about a distinct mode choice. Future areas of study include additional comparisons of intended use versus actual use among students for first/last-mile travel behavior and the difference between first/last-mile behavior between students served by rail and those served by buses. Additionally, future studies should compare students' travel behavior changes in response to different interventions to those of other population groups.

Conclusion

Current literature focusing on student use of e-scooters for first/last-mile connections to public transit shows that this e-scooter travel behavior is relatively uncommon. However, the literature provides a guide to scholars and planners seeking to understand how to increase e-scooter usage, primarily by raising car parking prices, increasing personal familiarity with e-scooters, and creating more street and pathway infrastructure to facilitate safe e-scooter travel. Although current literature offers a somewhat incomplete picture of student use of e-scooters for first/last-mile travel, it does offer findings and questions that can inform the next wave of scholarship on this topic.

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