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Regulating Micromobility: Examining Transportation Equity and Access

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Festschrift I, a special edition of The Urban Lawyer commemorating Julian's 45 years of teaching law and numerous scholarly achievements, was titled "A 2020 View of Urban Infrastructure" and published in Fall 2010/Winter 2011. Although several articles addressed transportation, none predicted the worldwide reemergence of electric scooters by 2020 and the rapid impact they would have on mobility around cities and transportation infrastructure. It only seems fitting in Festschrift II to address the recent addition of micromobility to the urban environment. Thank you Julian for always supporting me in my research, and telling me to "go for it!" I will miss working with you. Karen Johnston

REGULATING MICROMOBILITY: EXAMINING TRANSPORTATION EQUITY AND ACCESS

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ABSTRACT

This paper evaluates the various ways cities have or are attempting to address e-scooter usage equity concerns, with a focus on Atlanta, Georgia as compared to Austin, Texas; Charlotte, North Carolina; Los Angeles, California; and Portland, Oregon. The cities were evaluated by the laws in effect at the time of coding, which occurred during the project period of October through December 2019. To explore how existing laws and regulations affect access to e-scooters, this research was guided by the following overarching questions: How equitable is access to e-scooters? How can equitable access to e-scooters be improved? How can a data-driven approach be used to craft inclusive and effective micromobility regulations for Atlanta, Georgia, and other cities nationwide?

KEY WORDS: Micromobility, E-scooters, Equity, Regulation, Atlanta, Policy Surveillance, Legal Epidemiology

I. INTRODUCTION

Smart technology has enabled the development of a broad range of micromobility options including docked and dockless electric bicycles, electric scooters (e-scooters), onewheels, electric skateboards, and others. Despite the growing list, none of the devices has received more attention than e-scooters. The attention is warranted: e-scooters offer an innovative opportunity to decrease traffic and make mass transit more accessible by addressing the "first/last mile problem" and

extending public transportation beyond what is easily walkable to or from a bus or light rail stop. Proponents also claim that the devices change how people move around the city, represent “green” transportation for their local carbon footprint, and help to reshape streets from automobile-centric to more open for other users.¹

The arrival of e-scooters has also come with many challenges, including injuries to both riders and pedestrians,² violations of the Americans with Disabilities Act for e-scooters blocking sidewalks,³ and issues of privacy protection for the data collected on riders.⁴ Additionally, disparate e-scooter distribution, costs, and a narrow range of payment options raise concerns of equitable access to the devices by a diverse ridership.⁵

Transportation policy has shifted in the last decade, from a policy focused on moving people and goods farther and faster, to one focused on serving all people, specifically focusing on communities in greatest need – predominately low-income and minority communities. Improved connectivity through new modes of transport, such as micromobility, have the potential to advance these transportation equity goals. Positive public perception of e-scooters by lower-income groups has

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¹ Benjamin Schneider, *There’s Something about Scooters*, SLATE, Apr. 27, 2020, <https://slate.com/technology/2020/04/dockless-scooters-cities-safer-better.html>.

² Nikan K. Namiri, Hansen Lui, and Thomas Tangney, *Electric Scooter Injuries and Hospital Admissions in the United States, 2014-2018*, 155 *JAMA SURGERY* 257 (2020), <https://jamanetwork.com/journals/jamasurgery/article-abstract/2758159>.

³ Andrew Bowen, *Disability Rights Group Sues San Diego Over Scooters On Sidewalks*, NPR, Mar. 4, 2019, <https://www.npr.org/2019/03/04/698768297/disability-rights-group-sues-san-diego-over-scooters-on-sidewalks>.

⁴ Preetika Rana and James Rundle, *Uber Sues Los Angeles Over Data-Sharing Rules; The Battle Could Set the Stage for How Cities Police Mobility Providers while Safeguarding Privacy*, WALL ST. J., Mar. 25, 2020, <https://www.wsj.com/articles/uber-sues-los-angeles-over-data-sharing-rules-11585104223>.

⁵ Emily Birnbaum, *Scooter Revolution Proves Challenging for Cities*, THE HILL, Sept. 26, 2019, <https://thehill.com/policy/transportation/463121-scooter-revolution-proves-challenging-for-cities>.

signaled interest in such mobility services.⁶ Despite the interest, deployment in such underserved neighborhoods has often been limited. Aware of equity concerns, some cities have created equity zones where a certain portion of e-scooters should be located, and some introduced other measures intended to increase access.

While other research has primarily focused on safety,⁷ this paper evaluates the various ways cities have or are attempting to address e-scooter equity concerns with a focus on Atlanta, Georgia as compared to Austin, Texas; Charlotte, North Carolina; Los Angeles, California; and Portland, Oregon. As further outlined in the research methodology, cities were evaluated by the laws in effect at the time of coding, which occurred during the study period of October through December 2019.⁸ To explore how existing laws and regulations affect access to e-scooters this research was guided by the following overarching questions: How equitable is access to e-scooters? How can equitable access to e-scooters be improved? How can a data-driven approach be used to craft inclusive and effective micromobility regulations for Atlanta, Georgia, and other cities nationwide?

II. E-SCOOTERS: A BRIEF OVERVIEW

A. Early History

The electric scooter, or e-scooter, is not a completely novel device. The famous suffragette Lady Florence Norman was known to ride her then-called “autoped” –

⁶ Populus, *The Micro-Mobility Revolution: The Introduction and Adoption of Electric Scooters in the United States* (2018), <https://medium.com/populus-ai/the-micro-mobility-revolution-95e396db3754>.

⁷ Ryan Felton, *E-Scooter Ride-Share Industry Leaves Injuries and Angered Cities in its Path*, CONSUMER REPORTS, Feb. 5, 2019, <https://www.consumerreports.org/product-safety/e-scooter-ride-share-industry-leaves-injuries-and-angered-cities-in-its-path/>; Austin Public Health, Epidemiology and Public Health Preparedness Division, Epidemiology and Disease Surveillance Unit, *Dockless Electric Scooter-Related Injuries Study 1* (2019), https://austintexas.gov/sites/default/files/files/Health/Web_Dockless_Electric_Scooter-Related_Injury_Study_final_version_EDSU_5.14.19.pdf; Matt Howerton, *E-scooter injuries have generated 1.4 million in hospital costs, Baylor Scott & White says*, WFAA, Apr. 22, 2019, <https://www.wfaa.com/article/news/e-scooter-injuries-have-generated-14-million-in-hospital-costs-baylor-scott-white-says/287-726df73f-8e35-4840-9789-cc96d69da8c8>; Tarak K. Trivedi, Charles Liu, C., Anna Liza M. Antonio, Natasha Wheaton, Vanessa Kreger, Anna Yap, David Schriger, & Joann G. Elmore, *Injuries Associated with Standing Electric Scooter Use*. 2 JAMA NETWORK OPEN 1 (2019), <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2722574>.

⁸ Laws related to micromobility are changing quickly. All citations are to the laws applicable during the study period, unless otherwise noted. Laws may have changed since the study was conducted.

the first mass-produced motorized scooter – in the early 1900s.⁹ In the mid-1910s, the New York Postal Service used the autoped to deliver mail.¹⁰ The autoped, however, was not commercially successful, and production stopped in the 1920s.¹¹

Figure 1: Lady Florence Norman riding the autoped in 1916

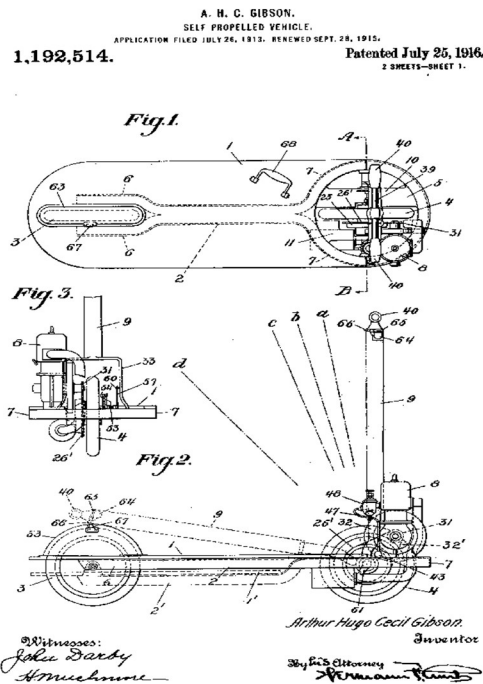


⁹ Jackie Mansky, *The Motorized Scooter Boom That Hit a Century Before Dockless Scooters*, SMITHSONIAN MAGAZINE, Apr. 18, 2019, <https://www.smithsonianmag.com/history/motorized-scooter-boom-hit-century-dockless-scooters-180971989/>.

¹⁰ *Id.*

¹¹ *Id.*

Figure 2: U.S. patent for the autoped, 1916



B. Recent Revival

Dockless electric scooters were reintroduced to the world in September 2017 in Santa Monica, California, by startup company Bird and quickly spread to other cities across the United States. Competitors such as Lime, Lyft, and Jump entered the marketplace soon thereafter. In 2018, e-scooters were dropped overnight into seventy-one U.S. cities in what became a standard policy of “ask for forgiveness, not permission,”¹² resulting in the “the fastest technological adoption in history,”¹³

¹² Nicole DuPuis, Jason Griess, and Conner Klein, *Micromobility in Cities, A History and Policy Overview*, NATIONAL LEAGUE OF CITIES, CENTER FOR CITY SOLUTIONS, (2019), https://www.nlc.org/sites/default/files/2019-04/CSAR_MicromobilityReport_FINAL.pdf.

¹³ Laura Bliss, *Ready or Not, Here Comes the Micromobility Revolution*, BLOOMBERG CITYLAB, Feb. 5, 2019, <https://www.bloomberg.com/news/articles/2019-02-05/behind-the-big-promises-of-the-micromobility-industry>, quoting the 2019 Micromobility Conference website; see also *The Micromobility Conference California*, Movmi Shared Transportation Services Inc., (Feb. 19, 2019), <https://movmi.net/micromobility-conference-2019/>.

much faster than others entering the ride-sharing economy, such as cars and bikes.¹⁴ The National Association of City Transportation Officials (NACTO) reported an astounding 38.5 million trips on e-scooters in 2018 alone.¹⁵

Around the world, Bird and Lime experienced explosive growth, each offering e-scooters in over a hundred cities. Growing three times faster than Airbnb, Bird hit a billion-dollar valuation in just over a year.¹⁶ In 2019, Bird was valued at \$2.5 billion,¹⁷ and Lime was valued at \$2.4 billion.¹⁸

The potential for micromobility to replace short car trips became the narrative. An INRIX study revealed 48% of car trips taken in October 2018 in the top twenty-five most congested U.S. metro areas were less than three miles and 20% were less than a mile – the average length of an e-scooter ride – lending credence to micromobility’s potential to replace some car trips.¹⁹ Additionally, in evaluating the environmental impact of e-scooters, Hollingsworth et. al. surveyed riders in Raleigh, North Carolina to understand the modes of transportation being replaced: 7% reported they would not have taken the trip; 49% would have biked or walked; 34% would have used a personal automobile or ride-share service; 11% would have taken a public bus.²⁰

¹⁴ Daniel Schellong, Philipp Sadek, Carsten Schaetzberger, and Tyler Barrack, *The Promise and Pitfalls of E-Scooter Sharing*, BOSTON CONSULTING GROUP, May 16, 2019, <https://www.bcg.com/publications/2019/promise-pitfalls-e-scooter-sharing>.

¹⁵ Nicole DuPuis, Jason Griess, and Conner Klein, *Micromobility in Cities, A History and Policy Overview*, NATIONAL LEAGUE OF CITIES, CENTER FOR CITY SOLUTIONS, (2019), https://www.nlc.org/sites/default/files/2019-04/CSAR_MicromobilityReport_FINAL.pdf.

¹⁶ Patrick Sisson, *Bird, The Electric Scooter Company, May Become a Billion-Dollar Startup*, CURBED, May 29, 2018, <https://www.curbed.com/2018/5/29/17407116/bird-scooters-billion-dollar-funding-unicorn-startup>.

¹⁷ Erin Griffith, *Bird is Said to Raise New Funding at \$2.5 Billion Valuation*, N.Y. TIMES, Jul. 22, 2019, <https://www.nytimes.com/2019/07/22/technology/bird-scooters-valuation.html>.

¹⁸ Graham Rapier, *Lime Confirms its Raising Another \$300 Million Round that Raises its Valuation to a Whopping \$2.4 Billion*, BUSINESS INSIDER, Feb. 6, 2019, <https://www.businessinsider.com/lime-raising-another-300-million-valuation-hits-24-billion-2019-2>.

¹⁹ Trevor Reed, *INRIX: Micromobility Potential in the US, UK and Germany*, INRIX (Sept. 2019), <http://www2.inrix.com/micromobility-study-2019>. The study found in Atlanta 18% of car trips were 0-1 mile, 15% were 1-2 miles, and 11% were 2-3 miles for a combined 45% of trips were 3 miles or less.

²⁰ Joseph Hollingsworth, Brenna Copeland, and Jeremiah X. Johnson, *Are E-Scooters Polluters? The Environmental Impacts of Shared Dockless Electric Scooters*, 14 ENVIRON. RES. LETT. 084031 (2019), <https://doi.org/10.1088/1748-9326/ab2da8/>

C. City Response

Some cities have expressed optimism regarding e-scooters: “As a major city, we believe there is potential in engineering the smart integration of this popular mode of transportation. The devices go a long way in providing last-mile connectivity and convenience to residents, students, businesses and visitors. But it is vital that we pause and assess how we move forward in a responsible way, with public safety always being the top priority,” said City of Atlanta Planning Commissioner Tim Keane in a media statement.²¹ Others, like Chattanooga, Tennessee,²² or Athens, Georgia,²³ responded by banning e-scooters. A number of cities initiated pilot programs, and many regulated the deployment and use of the devices, trying to address such issues as public safety and equitable access to devices. To help cities draft regulations associated with e-scooters, the National League of Cities (NLC) issued a report on micromobility in cities, providing seven key recommendations for cities to consider when drafting micromobility regulations:

- Get out in front of surprise deployments;
- Utilize pilot programs to consider right of way policy, cost structure, sustainability and opportunities to work with different companies;
- Consider safety;
- Develop a plan and agreement for trip data;
- Reevaluate bike infrastructure;
- Focus on equity;
- Reach out and connect with other cities.²⁴

²¹ Stephen Deere, *Atlanta Mayor: No More Riding Electric Scooters and Bikes after 9 pm*, ATLANTA J. CONST., Aug. 8, 2019, <https://www.ajc.com/news/breaking-news/atlanta-mayor-more-riding-electric-scooters-and-bikes-after/4mF1LUEi6lcLPu8DjaCoII/>.

²² Ken Nicholson and Jake Chapman, *Update: Chattanooga City Council Passes Ban Extension of Electric Scooters and Bicycles*, WRCBTV, Feb. 5, 2020, <https://www.wrcbtv.com/story/40736981/update-chattanooga-city-council-passes-ban-extension-of-electric-scooters-and-bicycles>

²³ Spencer Donovan, *Athens Commission Extends Scooter Ban to December*, THE RED & BLACK, May 27, 2020, https://www.redandblack.com/athensnews/athens-commission-extends-scooter-ban-to-december/article_66c44084-8f58-11ea-ba04-efbbce68599f.html

²⁴ Nicole DuPuis, Jason Griess, and Conner Klein, *Micromobility in Cities, A History and Policy Overview*, NATIONAL LEAGUE OF CITIES, CENTER FOR CITY SOLUTIONS, (2019), https://www.nlc.org/sites/default/files/2019-04/CSAR_MicromobilityReport_FINAL.pdf.

D. Understanding Rider Demographics

A number of surveys have been conducted in cities across the United States in an effort to understand who rides e-scooters. A survey of over 4,700 riders in Santa Monica between January and February 2019 found riders were young (66% under the age of 35), male (69%) and affluent (52% reporting income of \$75,000 and up).²⁵ While all four permitted operators worked with the city to conduct the survey, they distributed the survey only via email or in-app pop-ups, and all of the respondents were self-selected.

In a month-long, online e-scooter opinion survey conducted by the City of Chicago between September and October 2019, there were 12,446 respondents with 64% identifying as riders. Of these, 72% were white, 65% male, and 58% affluent (with income of \$75,000 and up).²⁶ The study reported, “Demographics of the survey respondents skewed older, whiter, higher income and more educated than the pilot geography as a whole, although rider respondents were more diverse than non-rider respondents.”²⁷ The report also noted that survey results may be affected by small sample size and the fact that survey respondents was not a representative sample of all of the pilot period e-scooter riders.²⁸

The City of Portland also conducted a survey of 3,444 respondents to find that 73% of e-scooter riders were under the age of 40, 62% were male, and 72% were white.²⁹ Diversity levels were higher than the Santa Monica and Chicago surveys showed; however, when income was considered, over 60% of the riders earned income of less than \$75,000 per year, of which 12% reported income under \$15,000.³⁰ Portland Bureau of Transportation developed the survey that three permitted companies then distributed to users via email; respondents were self-selected.

A five-minute online e-scooter survey in Atlanta in 2019 of 2,640 people seems to indicate greater diversity among riders than the aforementioned surveys: people of

²⁵ The City of Santa Monica, Dep’t of Plan. & Community Dev., *Shared Mobility Device Pilot Program User Survey Results Conducted 01-25-2019 to 02-15-2019*, (May 8, 2019), https://www.smgov.net/uploadedFiles/Departments/PCD/Transportation/SharedMobilityUserSurveyReports_Combined.pdf.

²⁶ Chi. Ill., E-SCOOTER PILOT EVALUATION (Jan. 2020), https://www.chicago.gov/content/dam/city/depts/cdot/Misc/EScooters/E-Scooter_Pilot_Evaluation_2.17.20.pdf.

²⁷ *Id.* at 52.

²⁸ *Id.* at 39.

²⁹ Portland Bureau of Transp., The City of Portland, Or., 2018 E-SCOOTER PILOT USER SURVEY RESULTS, <https://www.portlandoregon.gov/transportation/article/700916>.

³⁰ *Id.*

all ages are interested or have tried riding e-scooters; women are more likely to ride and be interested in riding; and higher income individuals are slightly less likely to ride.³¹

A 2019 report by Lime also showed diverse ridership with respect to income among 7,500 riders surveyed: about half of riders were living in households earning less than \$75,000 per year (average U.S. household income is \$81,000); it also found 33% female; 36% people of color; and 75% under age 37.³²

It is important to note that these online surveys are impacted by methodological challenges that likely affect the accuracy of the results. A survey sample's ability to represent the population depends on how the sample is selected. "For a study to be unbiased, every member of the population under study must have an equal chance of participating."³³ Online surveys are said to result in double bias: 1) bias resulting everyone in the population not having access to the internet and thus not having access to an online survey; and 2) bias resulting from who decided to take the online survey and why.³⁴ Additionally, design of the survey questions is one of the most critical components in the survey process.³⁵ Questions should be designed with relevance and accuracy. Relevant questions "accomplish the survey's objective."³⁶ Accuracy "means that the information gathered is reliable and valid" – "simple, understandable, unbiased, unambiguous, and nonirritating words" should be used.³⁷

While providing needed information on e-scooter rider demographics, the online e-scooter surveys risk only including those who are easier to reach and who express interest in participating. Online e-scooter surveys possibly underrepresent or leave out members of certain demographics, such as those without internet access or without smartphones. Further, questions may be worded differently when comparing one survey to another, such as individual versus household income, potentially resulting in variation between cities. As these surveys may also be used

³¹City of Atlanta Department of Transportation, *Atlanta E-Scooter Survey Results: 2019 Results* (Mar. 20, 2020), <https://www.atlantaga.gov/home/showdocument?id=45981>.

³²2nd Street Lime, *New Lime Report Highlights Diversity of Electric Scooter Riders*, LIME, Mar. 27, 2019, <https://www.li.me/second-street/new-lime-report-highlights-diversity-electric-scooter-riders>.

³³JOHN FOGLI AND LINDA HERKENHOFF, *CONDUCTING SURVEY RESEARCH: A PRACTICAL GUIDE*, 14 (Business Expert Press, 2017).

³⁴*Id.* at 15.

³⁵*Id.* at 69.

³⁶*Id.* at 75.

³⁷*Id.*

to elicit other important opinions and information beyond mere demographics, on which decisions may be made, it is critical that they include the responses of lower-income and diverse riders.

III. MICROMOBILITY REGULATION IN ATLANTA

Atlanta, Georgia, experienced the sudden arrival of Bird e-scooters in May 2018, and for months thereafter, more and more e-scooters appeared. Fearful of the problems created by e-scooters, some Georgia cities and counties, including Alpharetta, Norcross, Marietta, Lilburn, and Athens-Clarke County, which includes the University of Georgia, banned them.³⁸ The City of Atlanta, however, embraced the new technology and its potential to solve the first/last mile transportation problem, choosing to allow and regulate micromobility instead.³⁹

With soaring parking costs for Super Bowl LIII, e-scooters were seen as a cheaper option to get from Midtown to downtown for the game,⁴⁰ making the need for controlling e-scooters more critical. Just seven months after their debut and right before Super Bowl LIII, on January 7, 2019, the City of Atlanta passed Ordinance 18-O-1322, Shareable Dockless Mobility Devices, regulating both operators and riders. The ordinance defined Shareable Dockless Mobility Devices as:

[A]n electric/motorized or human-powered device that permits an individual to move or be moved freely, is available for rent to the general public for short-term one-way trips without installation of any infrastructure in the public right-of-way and shall include but not be limited to a bicycle/e-bicycle, scooter/e-scooter and shall exclude any motor vehicle required to be registered with the state, in accordance with state law.⁴¹

³⁸ Kristal Dixon, Ben Brasch, J.D. Capelouto, Stephen Deere, Raisa Habersham, Amanda C. Coyne, *Which Metro Atlanta Cities Have Banned E-Scooters*, ATLANTA J. CONST., Oct. 15, 2019, <https://www.ajc.com/news/local/which-metro-atlanta-cities-have-banned-scooters/ZEYqSswgM87c5EGb2os6aO/>.

³⁹ Thomas Wheatley, *Bird Invasion: Atlanta's Electric Scooters are Fun, Dangerous, Exciting, Annoying and Unstoppable*, ATLANTA MAGAZINE, Aug. 7, 2018, <https://www.atlantamagazine.com/news-culture-articles/bird-invasion-atlantas-electric-scooters-are-fun-dangerous-exciting-annoying-and-unstoppable/>.

⁴⁰ Kelly Yamanouchi, *Super Bowl in Atlanta: Scooters Seen as a Way to Get Downtown from Cheaper Parking in Midtown*, ATLANTA J. CONST., Feb. 2, 2019, <https://www.ajc.com/business/super-bowl-atlanta-scooters-seen-way-get-downtown-from-cheaper-parking-midtown/1LGcbZt1oQROgmKFsIH32N/>.

⁴¹ CITY OF ATLANTA, GA., CODE §150-400 (2019).

Section 150-401(a) of the ordinance states: “No Shareable Dockless Mobility Device may be operated or deployed in the City of Atlanta without a permit.”⁴² The permit requirements were set forth in the administrative regulations dated January 3, 2019 and included the permit fee structure, insurance and indemnification requirements, and the requirement for an equity plan. Permits were issued by the Department of City Planning in the Office of Zoning and Development, and were valid for one year from the issue date.⁴³ The City of Atlanta issued the first e-scooter permits in February 2019; by July 2019, there were nine operators in the City of Atlanta and a total of 12,700 permitted devices.⁴⁴

A series of tragic deaths of e-scooter riders between May and July 2019 significantly altered the regulatory landscape in the City of Atlanta. The city’s first death occurred on May 17 just after midnight when a 20-year old male riding an e-scooter on a street without a bike lane was struck by a Cadillac SUV.⁴⁵ Just two months later on the night of July 17, a 37-year old male riding an e-scooter in Midtown near the Arts Center MARTA station on a street with no bike lane was killed when he was pinned beneath a public transit bus.⁴⁶ His death and persistent frustration with the city’s infrastructure for non-motorists led to several protests across the city on July 24 including a human-protected bike lane along West Peachtree Street at rush hour, snarling traffic for hours and causing many slow rolls across the city.⁴⁷ That same night, Mayor Keisha Lance Bottoms issued Executive Order 2019-5, directing the Department of City Planning to no longer accept permit

⁴² CITY OF ATLANTA, GA., CODE §150-401(a) (2019).

⁴³ CITY OF ATLANTA, ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. III Shareable Dockless Mobility Device Permit (Jun. 24, 2019).

⁴⁴ See City of Atlanta, *Shareable Dockless Mobility Devices February – May 2019* (Jun. 26, 2019), <https://www.atlantaga.gov/home/showdocument?id=42488>. The City reported that e-scooter operators and permitted devices in Atlanta included Bird - 2000; Boaz - 200; Bolt - 1000; Gotcha - 500; Jump - 2000; Lime -2000; Lyft - 2000; Spin - 2000; and Wheels – 1000.

⁴⁵ Sean Richard Keenan, *Atlanta’s First E-Scooter Death Spotlights Need for Infrastructure Improvements, Could Bike Lanes Near a MARTA Station have made a Difference?*, CURBED ATLANTA, May 20, 2019, <https://atlanta.curbed.com/2019/5/20/18632353/e-scooter-death-infrastructure-improvements-complete-streets>; See also Chelsea Prince, *Victim ID’d in First Deadly E-Scooter Accident in Atlanta*, ATLANTA J. CONST., May 17, 2019, <https://www.ajc.com/news/breaking-news/just-man-moped-hit-killed-near-marta-station-atlanta/KLAKJ19gYh0QXGRERfuVIK/>.

⁴⁶ Sean Richard Keenan, *In Wake of Second E-Scooter Death, Atlanta Leaders Promise a Push for Safer Streets*, CURBED ATLANTA, Jul. 19, 2019, <https://atlanta.curbed.com/2019/7/19/20700005/e-scooter-death-atlanta-council-complete-streets>.

⁴⁷ Sean Richard Keenan, *A Human-Protected Bike Lane on West Peachtree Proved Protestors’ Point*, ATLANTA MAGAZINE, Jul. 25, 2019, <https://www.atlantamagazine.com/news-culture-articles/a-human-protected-bike-lane-on-west-peachtree-proved-protesters-point/>.

applications for shareable dockless mobility devices in order to provide the City Council time to consider its next steps.⁴⁸ Days later, on the night of July 27, a 34-year old female vacationing in the city became the victim of a hit and run, riding an e-scooter on a road with no bike lane.⁴⁹ On August 6 at 6:30 a.m., a fourth e-scooter death occurred outside of the city limits; a homeless man riding an e-scooter ran a red light and was struck by a commercial gas truck.⁵⁰ At this point, metro Atlanta reportedly led the nation in e-scooter deaths and community pressure to respond was intensifying.⁵¹ On August 9, the City of Atlanta added a nighttime riding ban to the regulations, prohibiting riding from 9 p.m. to 4 a.m.⁵² On August 19, the City of Atlanta passed Ordinance 19-O-1429, which amended Chapter 150 of the Atlanta Code of Ordinances to repeal the Department of City Planning's authority to issue new permits, but allowed current permit holders to continue operating until their permit expires.⁵³

IV. TRANSPORTATION INEQUITIES IN ATLANTA

A. *Structural Racism and Transportation Disparities*

Regulation of e-scooters in Atlanta has primarily been driven by a need for injury prevention. Improving equitable access to e-scooters has been a secondary goal. However, to develop an equitable deployment strategy for e-scooters in Atlanta, the City must first acknowledge its historically-based racialized road infrastructure and overall built environment. Nathaniel Smith, founder of the Partnership for Southern

⁴⁸ Exec. Order No. 2019-5, OFF. OF THE MAYOR, CITY OF ATLANTA, GA., <https://www.atlantaga.gov/Home/ShowDocument?id=42730>.

⁴⁹ Sean Richard Keenan, *Midtown Collision Marks Third E-Scooter Rider Killed in Atlanta this Year*, CURBED ATLANTA, Aug. 2, 2019, <https://atlanta.curbed.com/2019/8/2/20751175/atlanta-e-scooter-death-midtown-micromobility-bike-lanes>; See also Raisa Habersham and Stephen Deere, *Couple's Romantic Trip Turns Tragic as Woman on E-scooter Hit, Killed*, ATLANTA J. CONST., Aug. 4, 2019, <https://www.ajc.com/news/couple-romantic-trip-turns-tragic-woman-scooter-hit-car/DoWx02Z5aLk1m9xWOFDYXI/>.

⁵⁰ Ben Brasch and Stephen Deere, *4th E-Scooter Death in Metro Atlanta Comes to East Point*, ATLANTA J. CONST., Aug. 8, 2019, <https://www.ajc.com/news/local/4th-scooter-death-metro-atlanta-comes-east-point/GAVZUew94xvwRsDYTR7RfK/>.

⁵¹ Sean Keenan, *Atlanta Appears to Lead Nation in E-Scooter Related Fatalities*, CURBED ATLANTA, Aug. 9, 2019, <https://atlanta.curbed.com/2019/8/9/20797437/atlanta-e-scooter-deaths-dc-los-angeles-san-diego>.

⁵² CITY OF ATLANTA, GA., ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. VI, Device Specifications (Jun. 24, 2019).

⁵³ CITY OF ATLANTA, GA., CODE §150-401(c) (2019).

Equity, wrote in a 2017 report that the city’s transportation infrastructure has “been undeniably shaped by a history of structural racism and divisive policy decisions.”⁵⁴

Nearly fifty years before Rosa Parks, a Black woman, refused to give up her bus seat to a white man in Montgomery, Alabama,⁵⁵ Homer Plessy, who was one-eighth Black, was arrested for boarding a whites-only train car in Louisiana.⁵⁶ In the landmark 1896 case *Plessy v. Ferguson*, the U.S. Supreme Court ruled that racial segregation of public facilities was constitutional if such facilities were equal in quality.⁵⁷ This became known as the “separate but equal” doctrine.⁵⁸ This Court’s decision backed many southern state laws already on the books, which had re-established racial segregation post-Reconstruction in the late 1870s. Such laws became known as “Jim Crow” (after a Black character in a minstrel show) or *de jure* (by law) segregation.⁵⁹ The Jim Crow south lasted legally until the 1954 U.S. Supreme Court’s landmark ruling in *Brown v. Board of Education of Topeka*⁶⁰ that separate but equal was unconstitutional,⁶¹ but informally it remained in place until well into the 1960s.⁶²

Ultimately, the Jim Crow system was separate and very unequal. Public facilities for Blacks paled in comparison to those for whites. Race riots erupted in Atlanta

⁵⁴ Partnership for Southern Equity, *Opportunities Deferred: Race, Transportation, and the Future of Metropolitan Atlanta* 1 (2017), <https://psequity.org/uploads/2019/10/2017-PSE-Opportunity-Deferred.pdf>.

⁵⁵ History.com Editors, *This Day in History - December 1, 1955: Rosa Parks Ignites a Bus Boycott*, A&E TELEVISION NETWORKS (2019), <https://www.history.com/this-day-in-history/rosa-parks-ignites-bus-boycot>.

⁵⁶ History.com Editors, *Plessy v. Ferguson*, A&E TELEVISION NETWORKS (2020), <https://www.history.com/topics/black-history/plessy-v-ferguson>.

⁵⁷ *Plessy v. Ferguson*, 163 U.S. 537 (1896).

⁵⁸ Richard A. Maidment, *Plessy v. Ferguson Re-examined*, 7 J. OF AM. STUD. 125 (1973), <https://www.jstor.org/stable/pdf/27553046.pdf>.

⁵⁹ Edward A. Hatfield, *Segregation*, NEW GEORGIA ENCYCLOPEDIA (2007, edited by NGE Staff 2020), <https://www.georgiaencyclopedia.org/articles/history-archaeology/segregation>. See also John Logan, Deirdre Oakley and Jacob Stowell. *School Segregation in Metropolitan Regions, 1970-2000: The Impacts of Policy Choices on Public Education*. 113 AM. J. OF SOCIOLOGY 1611 (2008), <https://www.journals.uchicago.edu/doi/pdfplus/10.1086/587150>.

⁶⁰ *Brown v. Board of Education of Topeka*, 347 U.S. 483 (1954).

⁶¹ Edward A. Hatfield, *Segregation*, NEW GEORGIA ENCYCLOPEDIA (2007, edited by NGE Staff 2020), <https://www.georgiaencyclopedia.org/articles/history-archaeology/segregation>.

⁶² John Logan, Deirdre Oakley and Jacob Stowell. *School Segregation in Metropolitan Regions, 1970-2000: The Impacts of Policy Choices on Public Education*. 113 AM. J. OF SOCIOLOGY 1611 (2008), <https://www.journals.uchicago.edu/doi/pdfplus/10.1086/587150>.

during 1906, lasting for four days with many Black residents losing their lives.⁶³ This heralded in a period where the City's leadership enacted policies to spatially contain its Black residents.⁶⁴ Even today, Atlanta's geography and infrastructure reflects these past discriminatory policies with poorer quality roads, sidewalks, bus stops, and overall maintenance in Black neighborhoods.⁶⁵ In 1913, Atlanta passed its first residential segregation law with additional laws being implemented in the 1920s and early 1930s to further limit geographic movement of its Black residents.⁶⁶ Restrictive zoning laws and racial covenants would follow.

Housing, urban development and growth are intricately related to residential segregation and its disparate outcomes, including uneven built environments. Cities can be viewed as commodities where the local power elite seek development and redevelopment that will increase the exchange values of place.⁶⁷ In Atlanta, leadership only cared about containing Black neighborhoods, not developing them,⁶⁸ so exchange values were irrelevant for such places at the time. Then came the federal Housing Act of 1949. Title I focused on "slum" clearance and urban renewal. Title II authorized Federal Housing Administration (FHA) insured mortgages. Title III extended federal funding for the building of more than 800,000 public housing units.⁶⁹

Implementing the first three titles of the Housing Act of 1949 had contradictory effects. According to Logan and Molotch, the goal of Title I was to improve housing conditions, but "less than 20 percent of all urban renewal land went for housing; over 80 percent went for developing commercial, industrial, and

⁶³ Gregory Mixon and Clifford Kuhn, *Atlanta Race Riot of 1906*, NEW GEORGIA ENCYCLOPEDIA (2005, edited by NGE Staff 2020), <https://www.georgiaencyclopedia.org/articles/history-archaeology/atlanta-race-riot-1906>.

⁶⁴ RONALD H. BAYOR, *RACE AND THE SHAPING OF TWENTIETH-CENTURY ATLANTA* (U. of N.C. Press, 1st ed. 1996).

⁶⁵ LAWRENCE KEATING, *ATLANTA: RACE, CLASS AND URBAN EXPANSION*. (Temple University Press, 2010).

⁶⁶ RONALD H. BAYOR, *RACE AND THE SHAPING OF TWENTIETH-CENTURY ATLANTA* (U. of N.C. Press, 1st ed. 1996).

⁶⁷ JOHN R. LOGAN AND HARVEY MOLOTCH, *URBAN FORTUNES: THE POLITICAL ECONOMY OF PLACE* (U. of Cal. Press, 1st ed. 1987).

⁶⁸ Kevin M. Kruse, *What Does a Traffic Jam in Atlanta have to do with Segregation? Quite a lot*. N.Y. TIMES, Aug. 14, 2019, <https://www.nytimes.com/interactive/2019/08/14/magazine/traffic-atlanta-segregation.html>.

⁶⁹ Deirdre Oakley and Keri Burchfield, *Out of the Projects, Still in the Hood: The Spatial Constraints on Public Housing Residents' Relocation in Chicago*, 31 J. OF URB. AFF. 589 (2009), <https://doi.org/10.1111/j.1467-9906.2009.00454.x>.

infrastructure.”⁷⁰ By infrastructure, Logan and Molotch are referring mostly to commuting roads or highways in and out of the city, as well as parking lots in the city. In fact, the authors state: “There seems to be little disagreement about the devastating effects of urban renewal on the poor and minorities.”⁷¹ Some have called these urban renewal initiatives the “federal bulldozer” or “Negro removal.”⁷²

Several factors contributed to the hyper-segregation of inner-city poor Black households.⁷³ The FHA expanded mortgage-insurance program fueled white flight to the suburbs. “Redlining” and other discriminatory lending practices prevented Black and other minority city households from purchasing suburban homes.⁷⁴ Further public housing was concentrated on land cleared through urban-renewal efforts, often mere blocks from where displaced families originally lived.⁷⁵ In the 1960s, these public housing neighborhoods were referred to as “federal slums.”⁷⁶ Ironically, in Atlanta, public housing was more spread out and barrack-style, taking up to 85 acres for one development.⁷⁷ Within these developments were roads and sidewalks, but that did not mean that the surrounding neighborhood was integrated or that the city invested in it – or its public housing.⁷⁸

The overall impact of the 1949 Housing Act on inner-city Black neighborhoods was exacerbated by the Federal Aid Highway Act of 1956, which started the

⁷⁰ JOHN R. LOGAN AND HARVEY MOLOTCH, *URBAN FORTUNES: THE POLITICAL ECONOMY OF PLACE 168* (U. of Cal. Press, 1st ed. 1987). See also Deirdre A. Oakley and James C. Fraser, *Empowerment, Urban*, WILEY ONLINE LIBRARY, Apr. 15, 2019, <https://doi.org/10.1002/9781118568446.curs0088>.

⁷¹ *Id.*

⁷² R. ALLEN HAYS, *THE FEDERAL GOVERNMENT AND URBAN HOUSING: IDEOLOGY AND CHANGE IN PUBLIC POLICY* (St.U. of N.Y. Press, 1st ed. 1985).

⁷³ DOUGLAS S. MASSEY AND NANCY A. DENTON, *AMERICAN APARTHEID: SEGREGATION AND THE MAKING OF THE UNDERCLASS* (Harvard U. Press, 1993).

⁷⁴ DOUGLAS S. MASSEY AND NANCY A. DENTON, *AMERICAN APARTHEID: SEGREGATION AND THE MAKING OF THE UNDERCLASS* (Harvard U. Press, 1993).

⁷⁵ Adam Bickford and Douglas S. Massey, *Segregation in the Second Ghetto: Racial and Ethnic Segregation in American Public Housing*, 69 *SOCIAL FORCES* 1011 (1991), <http://www.jstor.com/stable/2579300>. See also Deidre A. Oakley and James C. Fraser, *U.S. Public-Housing Transformations and the Housing Publics Lost in Transition*, 15 *CITY & COMM.* 349 (2016), <https://onlinelibrary.wiley.com/doi/full/10.1111/cico.12210>.

⁷⁶ LEE RAINWATER, *BEHIND GHETTO WALLS: BLACK FAMILY LIFE IN A FEDERAL SLUM* (Aldine Publishing, 1970).

⁷⁷ LAWRENCE J. VALE, *PURGING THE POOREST: PUBLIC HOUSING AND THE DESIGN POLITICS OF TWICE CLEARED COMMUNITIES* (U. of Chicago Press, 2013).

⁷⁸ *Id.*

national interstate system.⁷⁹ City planners, however, saw this as another opportunity for “urban renewal” with highways slicing through Black neighborhoods in cities across the country. In Atlanta, Interstates 20 and 75/85 were constructed through central Atlanta. Many Black residential neighborhoods were destroyed including Vine City and the Old Fourth Ward.⁸⁰ Summer Hill, another vibrant Black community, was dissected by I-20, and Buttermilk Bottom was razed.⁸¹ Auburn Avenue – also known as Sweet Auburn, the commercial center of Black Atlanta, had gained national prominence as an epicenter of Black-owned businesses, wealth, culture, and churches only to fall victim to urban renewal.⁸²

The net impact was that many Black residents were displaced further south of the city. In city neighborhoods where they remained, the white elites encouraged further divestment in housing and the built environment. Today, the City of Atlanta, comprised mostly of Fulton County, is racially split, with North Fulton majority white and South Fulton majority Black. This division creates a lack of transit connectivity.⁸³ It also means that many Black neighborhoods in or near the city are surrounded by highways.⁸⁴ Figure 1 illustrates segregation in the city and how transit connectivity fades away in the Black neighborhoods.

⁷⁹ Federal Aid Highway Act of 1956, Pub. L. No. 84-627, 70 Stat. 374.

⁸⁰ LAWRENCE KEATING. *ATLANTA: RACE, CLASS AND URBAN EXPANSION* (Temple University Press, 2010).

⁸¹ John E. Williams, *Race, Place, and Politics: Urban Renewal, Redevelopment, and Stories of the Historic Buttermilk Bottom Neighborhood in Atlanta* (May 10, 2019) (unpublished M.S. thesis, Georgia State University) https://scholarworks.gsu.edu/geosciences_theses/126.

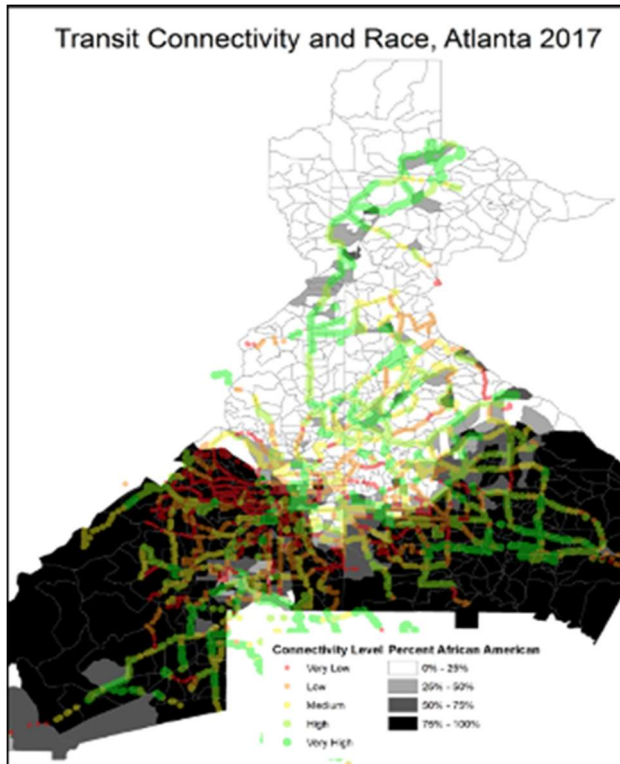
⁸² Edward A. Hatfield, *Auburn Avenue (Sweet Auburn)*, *NEW GEORGIA ENCYCLOPEDIA* (2006, edited by NGE Staff 2018), <https://www.georgiaencyclopedia.org/articles/counties-cities-neighborhoods/auburn-avenue-sweet-auburn>.

⁸³ Christopher K. Wyczalkowski, Timothy Welch, and Obed Pasha, *Inequities of Transit Access: The Case of Atlanta, GA*, 4 *J. OF COMP. URB. L. AND POL’Y* 654 (2020), <https://readingroom.law.gsu.edu/jculp/>

⁸⁴ LAWRENCE KEATING. *ATLANTA: RACE, CLASS AND URBAN EXPANSION*. (Temple University Press, 2010).

Figure 3: Transit Connectivity and Race, Atlanta 2017

Source: Christopher K. Wyczalkowski, Timothy Welch, and Obed Pasha, *Inequities of Transit Access: The Case of Atlanta, GA*



B. Establishing Equitable E-Scooter Distribution in Atlanta

Many of the city's Black neighborhoods today still have few or no sidewalks or bike lanes and lack adequate curb space. The neighborhoods suffer poor quality or narrow roads, numerous potholes, and poor drainage. All of this is embedded in Atlanta's racist past⁸⁵ and may impact where e-scooter companies are willing to

⁸⁵ Matt Leonard, *Highways, Urban Renewal, and Patterns in the Built Environment*, 33^on (2017), <https://33n.atlantaregional.com/special-features/special-feature-highways-urban-renewal-patterns-built-environment>.

disperse their fleets. In an effort to ensure equitable access to e-scooters, the city's regulations require distribution within Equity Zones established by the city.⁸⁶

Atlanta's Equity Zones are based on the Equitable Target Areas (ETAs) established by the Atlanta Regional Commission (ARC), urban neighborhood characteristics as defined by The Atlanta City Design,⁸⁷ and access to MARTA rail stations. The equity analysis methodology was updated by the ARC in June 2019 and follows federal guidance (Title VI of the Civil Rights Act and Executive Order on Environmental Justice) to identify communities with protected classes subject to disproportionately high health or environmental burdens and ensure fair treatment.⁸⁸ Two models are used by ARC for technical analysis – Protected Classes Model and Environmental Justice Model.⁸⁹

Protected Classes Model: The Protected Classes Model uses data from the most current American Community Survey to determine the percent of each of the nine protected populations in each census tract, and then evaluates how the composition of the census tract compares to the regional mean. Protected populations include: ethnic minority, female, foreign born, limited English proficiency, low-income, older adults, people with disabilities, racial minority, and youth. Each of the nine populations is then scored from zero to four (four - well above average, three - above average, two - average, one - below average, and zero- well below average) based on deviation from the regional mean; because there are nine populations and a maximum score of four, each census tract has a maximum possible score of thirty-six. The Protected Classes Model enables the ARC to identify at-risk communities for targeted interventions, called the Equitable Target Areas.⁹⁰

Environmental Justice Model: The Environmental Justice Model utilized by the ARC examines three criteria (ethnic minority, low-income, and racial minority) because they are the greatest indicators of inequality in the Atlanta region. The same calculation method is used as the Protected Classes Model; however, because only three criteria are used with a maximum score of four, the total possible score

⁸⁶ CITY OF ATLANTA, ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. VIII Equity Zones (Jun. 24, 2019).

⁸⁷ Email from Jordan Dowdy, Urban Planner II, City of Atlanta to Claire Bass (June 17, 2019) (on file with the authors). City of Atlanta Administrative Regulations, Shareable Dockless Mobility Devices were updated on April 6, 2020 changing the methodology for establishing equity zones to include access to the westside and southside Beltline Trails.

⁸⁸ Atlanta Regional Commission, *Equity Analyses Methodology* (June 2019), <https://atlantaregional.org/wp-content/uploads/arc-equity-methodology-june2019.pdf>.

⁸⁹ *Id.*

⁹⁰ *Id.*

is twelve. The Environmental Justice Model is used to guide regional transportation and land use planning investments.⁹¹

Balancing the results of the ARC technical analysis with community engagement, policy and program development, and qualitative knowledge, the City of Atlanta then established four equity zones and defined those zones in the Administrative Regulations for Sharable Dockless Mobility Device.⁹²

Even with equitable distribution plans in place, without addressing the infrastructure and built environment disparities, micromobility use as a first/last mile solution may be stifled. For example, a pilot study organized by the City of Chicago in June 2019 set up two priority zones in underserved low income Black neighborhoods. E-scooter companies were required to drop a quarter of their fleets in each of the two zones every morning. Despite the requirement to drop half their fleet in priority zones only 14.7% of rides started in these zones.⁹³ There may be many reasons for this, but insufficient infrastructure could very well be one of them. Micromobility users may be less likely to ride on pothole-ridden, narrow streets with crumbling pavement near busy highways.

Interestingly, despite the continued built environment disparities and serious infrastructure issues, with 12,700 permitted devices, Atlanta may have the highest ratio of permitted e-scooters to residents of any city in the country.⁹⁴ Also, the demand is evident: in a recent Atlanta survey, the most common change requested was building safer places to ride; improvements in equitable access were listed among the most critical regulations to making e-scooters successful.⁹⁵

Atlanta's rapid gentrification has complicated the realities of building equal and safe city-wide street infrastructure. Much of the city's gentrification has been fueled by large development projects, such as the Atlanta Beltline. The Beltline is a former twenty-two-mile railroad corridor surrounding the city that is being developed into

⁹¹ *Id.*

⁹² CITY OF ATLANTA, ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. VIII Equity Zones (Jun. 24, 2019). The equity zones were updated on Apr. 6, 2020 in the City of Atlanta Administrative Regulations, Shareable Dockless Mobility Devices. The geographic area of the equity zones was expanded but the zones were consolidated into three equity zones.

⁹³ Samuel Kling, *Vroom or Bust? Towards Chicago E-scooter Strategy in 2020 and Beyond* (The Chi. Council of Global Aff., Working Paper No. 2020-01, Mar. 2020), https://www.thechicagocouncil.org/sites/default/files/ccga_vroom_or_bust.pdf.

⁹⁴ PEDS, E-newsletter (June 2019), <https://www.peds.org/wp-content/uploads/2019/06/June-2019-e-newsletter.pdf>

⁹⁵ City of Atlanta Department of Transportation, *Atlanta E-Scooter Survey Results: 2019 Results* (Mar. 20, 2020), <https://www.atlantaga.gov/home/showdocument?id=45981>.

a multi-use trail and greenspaces across forty-five in-city neighborhoods of varying racial and socioeconomic composition.⁹⁶ Currently, several southwest and east Black neighborhoods in the city are experiencing emerging and full-blown gentrification as the Beltline is being completed in these areas. While the Beltline is leading to improved infrastructure, it is also displacing lower income residents.⁹⁷ Caution must be exercised to ensure that infrastructure improvements are also made in lower income or Black communities, not just gentrifying or higher income neighborhoods. The concern is legitimate - in fact, according to Flanagan et al., bias towards improved infrastructure for alternative vehicles such as bicycles and e-scooters typically happens in higher income neighborhoods or those of increasing privilege – such as gentrifying ones.⁹⁸

V. RESEARCH METHODS

Information on regulation from other U.S. cities has the potential to inform Atlanta's future efforts to increase equity. This study utilizes data from a larger, ongoing research project aimed at, among other things, conducting pilot policy surveillance using principles of legal epidemiology on micromobility laws across the United States and analyzing the collected data to identify barriers to the accessibility of micromobility in Atlanta, Georgia, and other cities nationwide. Legal epidemiology is “the scientific study and deployment of law as a factor in the cause, distribution, and prevention of disease and injury in a population.”⁹⁹ One component of legal epidemiology is policy surveillance. Policy surveillance is “the systematic, scientific collection and analysis of laws of public health significance. It is a form of legal mapping that creates data suitable for use in rigorous evaluation studies.”¹⁰⁰ Policy surveillance can be used to identify changes that need to be made or gaps in law.

For this study, the authors conducted policy surveillance on micromobility laws in Atlanta, Georgia, and four other U.S. cities (Austin, Texas; Charlotte, North

⁹⁶ Deirdre Oakley and George Greenidge Jr., *The Contradictory Logics of Public-Private Place-making and Spatial Justice: The Case of Atlanta's Beltline*, 16 CITY & COMMUNITY 353 (2017).

⁹⁷ *Id.*

⁹⁸ Elizabeth Flanagan, Ugo Lachapelle and Ahmed El-Genardy, *Riding Tandem: Does Cycling Infrastructure Investment Mirror Gentrification and Privilege in Portland, Or and Chicago, IL?*, 60 RES. IN TRANSP. ECON. 14 (2016), <https://www.sciencedirect.com/science/article/pii/S0739885915300287?via%3Dihub>.

⁹⁹ Scott Burris, Marice Ashe, Donna Levin, Matthew Penn, and Michelle Larkin, *A Transdisciplinary Approach to Public Health Law: The Emerging Practice of Legal Epidemiology*, 37 ANNU. REV. PUB. HEALTH 135, 139 (2016).

¹⁰⁰ Temple University, Center for Public Health Law Research, *Policy Surveillance Program* (2017), <http://publichealthlawresearch.org/content/policy-surveillance-program>.

Carolina; Los Angeles, California; and Portland, Oregon), following the framework set forth in *Public Health Law Research: Theory and Methods*.¹⁰¹ Preliminary legal research, including a literature review and coding of ordinances for a sample of U.S. cities, was conducted and yielded fifty-six variables reflecting requirements on the rider, operator, and city, that potentially affect health outcomes; from those fifty-six variables, twenty-four were identified as relevant to the specific topic of equity in micromobility regulation. Each variable was developed into a question able to be answered with discrete multiple choice responses (largely, “yes,” “no,” or “not addressed”) with the exception of five free response questions intended to gather additional data points.

The authors studied and coded local ordinances, regulations, and executive orders regulating the operation and use of e-scooters in the five cities and evaluated relevant state laws in effect during the study period of October through December 2019.¹⁰² The authors also consulted city officials to request access to documents like equity plans and to understand potential differences in implementation and enforcement. Each of the five cities included in this survey was double coded and reviewed by researchers for discrepancies.

VI. RESEARCH FINDINGS: E-SCOOTERS AND EQUITY STRATEGIES

A. *Equitable Distribution*

A large Harvard-based study of upward mobility concluded that commuting time is the single most important factor in the ladder out of poverty.¹⁰³ E-scooters have the potential to shorten commuting times, provide first/last mile connectivity to public transit, or serve as a single, stand-alone transportation option. However, because shared micromobility is dockless, regular and consistent access is not guaranteed nor can it be relied upon, leaving low-income and underserved communities vulnerable, potentially exacerbating transportation inequalities.¹⁰⁴

¹⁰¹ ALEXANDER C. WAGENAAR AND SCOTT C. BURRIS, *PUBLIC HEALTH LAW RESEARCH: THEORY AND METHODS* (Wiley, 2013).

¹⁰² As mentioned previously, laws related to micromobility are changing quickly. All citations are to the laws applicable during the study period, unless otherwise noted. Laws may have changed since the study was conducted.

¹⁰³ Mikayla Bouchard, *Transportation Emerges as Crucial to Escaping Poverty*, N.Y. TIMES, May 7, 2015, <https://www.nytimes.com/2015/05/07/upshot/transportation-emerges-as-crucial-to-escaping-poverty.html>.

¹⁰⁴ Nicole DuPuis, Jason Griess, and Conner Klein, *Micromobility in Cities, A History and Policy Overview*, NATIONAL LEAGUE OF CITIES, CENTER FOR CITY SOLUTIONS (2019), https://www.nlc.org/sites/default/files/2019-04/CSAR_MicromobilityReport_FINAL.pdf.

Equitable mobility device distribution is not a new issue. Much of the micromobility legislation began with docked and then dockless bike share implementation, and much of that legislation already included explicit equity requirements for underserved neighborhoods (e.g., dockless bike share regulation in St. Louis, Missouri; Portland, Oregon; Washington, DC; Seattle, Washington; San Francisco, California; etc.).¹⁰⁵ Piggybacking on the bike share regulations, e-scooter regulation often requires fleet management to provide access in underserved communities. However, as previously mentioned, the dockless nature of micromobility can lead to unequal distribution of the devices in cities.¹⁰⁶ The National League of Cities recommends fleet balancing to ensure equitable distribution.¹⁰⁷ Cities have responded differently to this recommendation.

In Atlanta, operators must comply with basic equity requirements set forth in the code¹⁰⁸ and administrative regulations.¹⁰⁹ Operators are required to submit an equity plan as part of the permit application, and suggested elements include discounted price options, cash-based payment systems, and non-smart phone reservation systems.¹¹⁰ Operators must also adhere to equitable distribution requirements set forth in the administrative regulations; however, the administrative regulations lack specificity, simply stating, “As part of the Equity Plan, Operators are required to commit to distributing a stated portion of their fleet in each Equity Zone.”¹¹¹ This allows each operator to determine what portion of their fleet they will dedicate to the equity zones.

¹⁰⁵ Brandon Bordenkircher, Riley L. O’Neil of Twelve Tone Consulting, *Dockless Bikes: Regulation Breakdown*, STREETS BLOG CHI., Mar. 18, 2018, <http://chi.streetsblog.org/wp-content/uploads/sites/4/2018/04/Dockless-Bike-Regulation-Breakdown.pdf>.

¹⁰⁶ Nicole DuPuis, Jason Griess, and Conner Klein, *Micromobility in Cities, A History and Policy Overview*, NATIONAL LEAGUE OF CITIES, CENTER FOR CITY SOLUTIONS (2019), https://www.nlc.org/sites/default/files/2019-04/CSAR_MicromobilityReport_FINAL.pdf.

¹⁰⁷ *Id.*

¹⁰⁸ CITY OF ATLANTA, GA., CODE §150-407 (2019).

¹⁰⁹ CITY OF ATLANTA, GA., ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. VIII, Equity Zones (June 24, 2019).

¹¹⁰ CITY OF ATLANTA, GA., CODE §150-407 (2019).

¹¹¹ CITY OF ATLANTA, GA., ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. VIII, Equity Zones (June 24, 2019).

A July 2019 review of the equity plans for eight operators in Atlanta revealed significant variation in their level of commitment to distribution in equity zones;¹¹² enforcement of the equity plans is unclear.

¹¹² Email correspondence from Gabrielle Ware, Public Information Officer, Department of City Planning, City of Atlanta to Karen Johnston (June 4, 2019) (on file with the authors).

Note: As e-scooter operators left Atlanta, variation in commitment to distribution in the equity zones converged. By Mar. 2020, the remaining e-scooter operators were Bird, Jump, Wheels and Boaz. See Sean Richard Keenan, *As Spring Draws Near, Atlanta's Crackdown on E-Scooter Providers is Intensifying*, CURBED ATLANTA, Mar. 4, 2020, <https://atlanta.curbed.com/2020/3/4/21163651/atlanta-escooter-transportation-bird-uber-jump-mobility>.

Furthermore, the Administrative Regulations, Shareable Dockless Mobility Device, were updated on Apr. 6, 2020 (see CITY OF ATLANTA, GA., ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. VI(d)(3) (Apr. 6, 2020)); the equity zone area was expanded but consolidated into three equity zones. The new regulations also required operators to deploy a minimum of 2% of their permitted fleet across each equity zone (6% total). Current regulations (see CITY OF ATLANTA, GA., ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, SEC. VI(d)(3)(May 14, 2020) retain this change.

Table 1: Percent of Fleet Committed to Equity Zones by Operator, July 2019

Operator	Total % Fleet to Equity Zones	% Fleet Committed to Each of Four Zones
Bird	10%	2.5%
Bolt	35%	No commitment
Gotcha	4%	1%
Jump	Minimum 10%	2.5%; however, up to 5% per zone may be committed if demand reaches 3 trips/vehicle/day on average over the month.
Lime	10%	No commitment
Lyft	10%	4% will be staged in zone 2 to support a partnership with Transformation Alliance and 2% in zones 1, 3 and 4 focusing on distribution near MARTA transit stops
Spin	10%	2.5%
Wheels	5%	1.25%

The inconsistency in commitment to equitable distribution of devices from Atlanta operators is distinct from other cities that require equity plans. For example, the city of Portland’s equity plan requires operators to commit a consistent 15% of their fleet to east Portland.¹¹³ East Portland is identified in the city’s comprehensive plan from 2018 as requiring assistance because it has a different land use and transportation structure (less transport, more spread out, less transportation investment) than does the rest of the city.¹¹⁴

Instead of specific percent distribution requirements in equity zones, Los Angeles has created permit fee and fleet number incentives for companies to deploy e-

¹¹³ PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., ADMIN. RULE TRN-15.01(8) (A) (3), NEW MOBILITY – SHARED ELECTRIC SCOOTERS (2019).

¹¹⁴ Telephone interview by Claire Bass with Love Johnson, Transportation Demand Specialist, Portland Bureau of Transportation (Feb. 24, 2020).

scooters in ‘disadvantaged communities (DAC),’ with a particular focus on San Fernando Valley.¹¹⁵ To define the DACs, the city relies on data from California’s Office of Environmental Health Hazard Assessment (OEHHA) that, on behalf of California Environmental Protection Agency (CalEPA), identifies communities by census tract that are “disproportionately burdened by, and vulnerable to, multiple sources of pollution.”¹¹⁶ Consequently, in 2019, the majority of Spin e-scooters (8,000 out of the permitted 10,500) operated in disadvantaged communities; at the same time, about 3,500 Lime and 2,500 Bird e-scooters were also deployed in DACs.¹¹⁷ Almost a third of all e-scooters citywide were deployed in San Fernando Valley.¹¹⁸

In Austin, operators are required to submit and implement a “marketing and outreach plan” to promote e-scooter use in underserved communities, defined as “less than 25 licensee units per square mile”.¹¹⁹ However, Austin’s rule does not list any specific percent requirements, and underserved communities are not clearly delineated.

Charlotte is distinct from the other cities included in this research. Unlike Atlanta, Portland, Austin, and Los Angeles, Charlotte does not have an equity plan requirement. While Charlotte may enforce equitable distribution requirements through other means, these methods were not identified by or included in this study. The impact of Charlotte’s approach is unclear as the city has not released data on rider diversity.

¹¹⁵ DEP’T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹¹⁶ Cal. Air Resources Board, *Priority Population Investments*, CAL. AIR RESOURCES BOARD, Oct. 1, 2018, <https://ww3.arb.ca.gov/cc/capandtrade/auctionproceeds/communityinvestments.htm>. See also, Cal. Env’tl. Protection Agency (CalEPA) and Off. of Env’tl. Health Hazard Assessment, *CalEnviroScreen 3.0* (last updated June 25, 2018), <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>; Ryan Fonseca, *Scooters, Scooters Everywhere. Here’s How LA’s Grand Experiment Is Going*, LAIST, May 28, 2019, https://laist.com/2019/05/28/las_big_scooter_experiment.php.

¹¹⁷ Ryan Fonseca, *Scooters, Scooters Everywhere. Here’s How LA’s Grand Experiment Is Going*, LAIST, May 28, 2019, https://laist.com/2019/05/28/las_big_scooter_experiment.php.

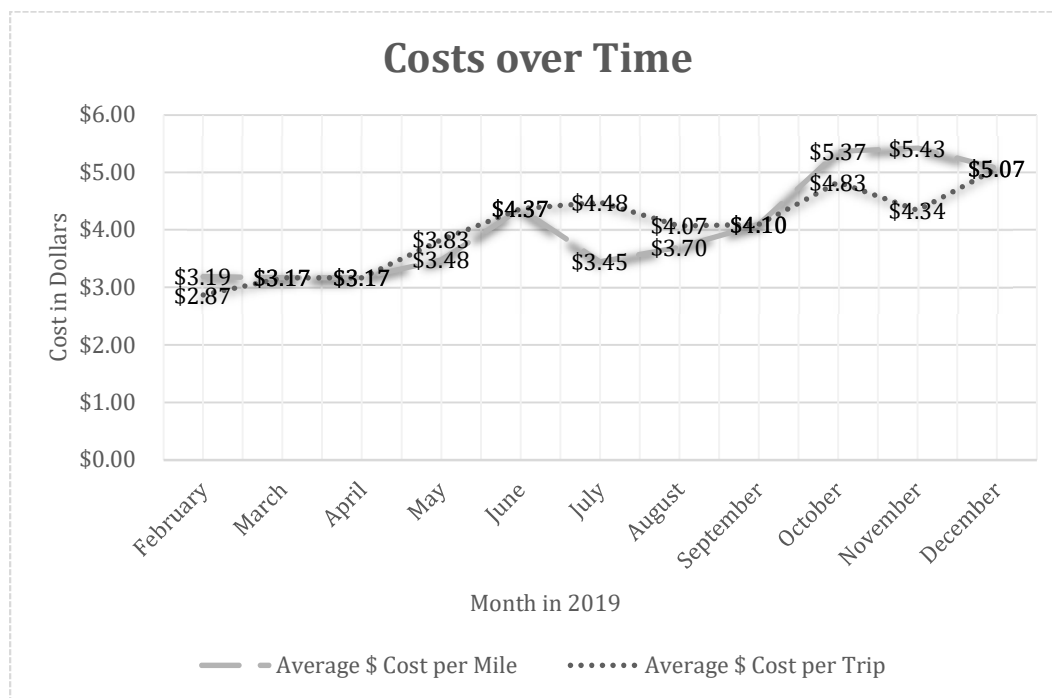
¹¹⁸ *Id.*

¹¹⁹ AUSTIN TRANSP. DEP’T, THE CITY OF AUSTIN, TEX., DIRECTOR RULES FOR DEPLOYMENT AND OPERATION OF SHARED SMALL VEHICLE MOBILITY SYSTEMS, SEC. 6(F) (Nov. 9, 2018), https://austintexas.gov/sites/default/files/files/Transportation/Final_Notice_of_Rule_Adoption.pdf.

B. Affordability and Discounted Pricing Plans

Affordability and the need for a range of payment options is another consideration. Initially, the cost of an e-scooter ride in Atlanta was \$1 for the first mile, and \$0.15 for each minute thereafter. A two-mile ride took about ten minutes and cost around \$3.00. Over the course of 2019, the average cost per trip nearly doubled from \$2.87 to \$5.07, even though the average distance traveled stayed consistently around one mile.¹²⁰ Figure 4 graphically depicts the rise in costs from February to December 2019, using City of Atlanta monthly data.¹²¹

Figure 4: Average Cost per Trip in City of Atlanta, February – December 2019



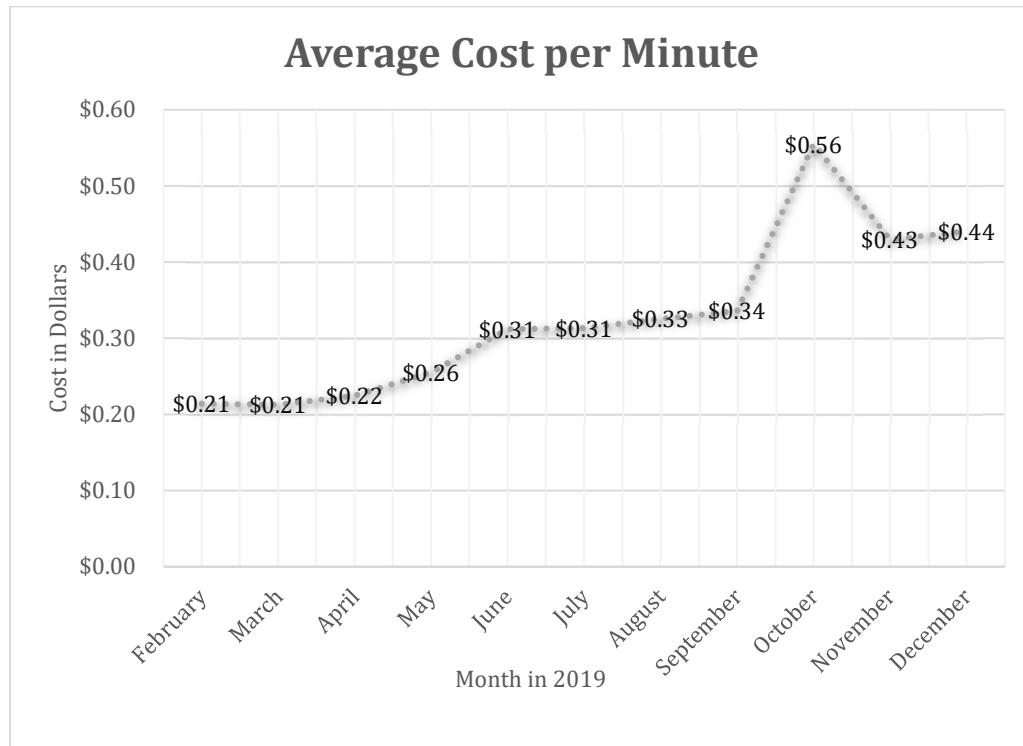
Further, the average cost per minute of riding more than doubled from \$0.21 in February 2019 to \$0.44 in December 2019, as depicted in Figure 5.¹²²

¹²⁰ Dep’t of Transp., City of Atlanta, Ga., *Micro-mobility Statistics Update: February to December 2019* (2020), <https://www.atlantaga.gov/home/showdocument?id=44818>.

¹²¹ *Id.*

¹²² *Id.*

Figure 5: Average Cost per Minute of Riding in City of Atlanta, February – December 2019



While an average trip cost of just over \$5 may sound affordable, in Atlanta, the regular fare for a one-way MARTA trip is \$2.50¹²³ – If riding an e-scooter is intended to be in addition to public transportation to address the first/last mile problem, riding an e-scooter could more than double an individual rider’s daily transportation budget.

Consequently, cities have required equity requirement strategies that lower the cost of ridership. For example, Los Angeles mandates equity plans include, “at a minimum,” a “plan for low-income customers that include waiving any hold deposits and unlimited free trips under 30 minutes in duration.”¹²⁴ Thus, Bird offers low-income residents in Los Angeles an annual subscription plan at \$5 per month,

¹²³ Metropolitan Atlanta Rapid Transit Authority (MARTA), *MARTA Fare Programs* (updated 2020), <https://www.itsmarta.com/fare-programs.aspx>.

¹²⁴ DEP’T OF TRANSP., L.A., CAL., *DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT*, <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

waiving hold deposits and covering unlimited 30-minute rides.¹²⁵ To qualify, residents need to have their income verified during an enrollment process that entails emailing Bird with a person's name, phone number, and a document showing they have qualified for a state or federal assistance program.¹²⁶ Similarly, Lyft's low-income discount program, Lyft Community Pass, costs \$5 per month and 5 cents per minute.¹²⁷ The program is available to Los Angeles residents 18 years old and up, who are currently enrolled in or are eligible for a state or federal assistance program, a discounted local transit program, or a discounted utility bill. Applications for qualifying participants are accepted via Lyft's website and reviewed by Lyft's Customer Experience Team.¹²⁸

Portland also requires discounted pricing plans to make e-scooters more affordable to low-income riders.¹²⁹ In most cases, e-scooter users must qualify for the low-income plans, generally by demonstrating enrollment in state or federal assistance programs. Some operators require that the applicant actually be enrolled in the assistance program, but others simply require that the applicant demonstrate eligibility for the programs or an income level less than twice the federal poverty level¹³⁰ for their household size. The low-income plans vary from a specified number of free rides, to discounted unlocking and riding fares.¹³¹

Atlanta, Austin, and Charlotte do not mandate discounted pricing; in Atlanta, it is only a suggested element of an equity plan.¹³² However, at least one operator has taken the initiative to financially assist underserved communities even without the

¹²⁵ Dep't of Neighborhood Empowerment, L.A. Cal., *Bird and Lime Offer Heavily Discounted Rider Rates on Scooters, E-bikes for Homeless or Low-Income Angelenos*, Nov. 1, 2019, <https://empowerla.org/bird-and-lime-offer-heavily-discounted-rider-rates-on-scooters-e-bikes-to-homeless-or-low-income-angelenos/>.

¹²⁶ *Id.*

¹²⁷ Lyft, *Mobility Matters: Transportation for All* (2020), <https://www.lyft.com/scooters/los-angeles-ca/community>.

¹²⁸ LYFT, LOS ANGELES, CA: DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT APPLICATION, supp. Doc. app. F (2019).

¹²⁹ PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., ADMIN. RULE TRN-15.01(4) (B) (14), NEW MOBILITY – SHARED ELECTRIC SCOOTERS (2019).

¹³⁰ Off. of the Assistant Secretary for Plan. and Evaluation, U.S. Dep't of Health and Hum. Serv., *Poverty Guidelines* (Jan. 8, 2020), <https://aspe.hhs.gov/poverty-guidelines>. The 2020 poverty guideline for a household of four is \$26,200.

¹³¹ Portland Bureau of Transp., City of Portland, Or., *Low-Income Pricing Plans*, <https://www.portlandoregon.gov/transportation/article/739482>.

¹³² CITY OF ATLANTA, GA., CODE §150-407(c) (2019). The Mar. 2, 2020 amendment added discounted pricing as a required component of operator's equity plans.

regulatory requirement. For example, Lime Access, Lime’s discount program, provides half-priced rides to those who qualify for city, state, or federal low-income programs nationwide.¹³³ Nevertheless, varied or no discount requirements across cities have resulted in a patchwork of available discounts. Stricter, more uniform municipal guidelines would ensure riders more equitable access to e-scooters nationwide and simplify compliance for operators.

C. *Alternative Payment Options*

E-scooter activation usually requires a credit card. Unfortunately, in the United States, 40% of adults earning below \$40,000 a year do not own a credit card; 15% do not have a bank account.¹³⁴ Among those without a credit card or a bank account, cash is a common form of payment, which complicates access to dockless mobility devices. To address this issue, many cities, including Atlanta, are incorporating an alternative payment option into their equity requirements. As a part of Atlanta’s equity plan, operators are required to provide methods of paying for devices that do not require a credit card.¹³⁵ In Atlanta, non-credit card options include using a multiple payment option platform such as PayNearMe,¹³⁶ prepaid debit cards, or mail in of checks or money orders.¹³⁷

Los Angeles requires that operators offer a cash, non-smart phone payment option.¹³⁸ Bird, for instance, offers prepaid debit cards that can be purchased across Los Angeles at CVS, Walgreens, and local grocery stores.¹³⁹ Lime Access allows members to pay in cash at a PayNearMe kiosk in any CVS.¹⁴⁰ Portland does not explicitly require cash payment options. However, the equity plan required in the

¹³³ Lime, *Lime Access* (last visited Aug. 8, 2020), <https://v1.li.me/en/community-impact>.

¹³⁴ Board of Governors of the Fed. Res. Sys., *Report of the Economic Well-Being of U.S. Households in 2016 – May 2017* (June 14, 2017), <https://www.federalreserve.gov/publications/2017-economic-well-being-of-us-households-in-2016-banking-credit.htm>.

¹³⁵ CITY OF ATLANTA, GA., CODE §150-407(a) (2019).

¹³⁶ PayNearMe, *PayNearMe* (2020), <https://home.paynearme.com/>.

¹³⁷ Sean Richard Keenan, *Atlanta Officials (Still) Striving to Make Dockless E-Scooters, Bikes Accessible for All*, CURBED ATLANTA, July 18, 2019, <https://atlanta.curbed.com/2019/7/18/20699095/atlanta-dockless-e-scooters-bikes-equity>.

¹³⁸ DEP’T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹³⁹ BIRD, DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, CITY OF LOS ANGELES ANNUAL PERMIT APPLICATION (Jan. 28, 2019).

¹⁴⁰ Lime, *Lime Access* (last visited Aug. 8, 2020), <https://v1.li.me/en/community-impact>.

Portland permit application mentions cash payments by directing vendors to, “[d]escribe any plans to offer a cash payment option.”¹⁴¹ Alternatives to credit card or smart phone payment that are in use in Portland include prepaid debit cards (Bird, Spin), cash payment order forms (Lime, Spin), and payment at a warehouse location (Razor).¹⁴²

Charlotte and Austin do not have any requirements in their regulations for operators to offer alternative payment methods to riders. With little data available from the aforementioned cities, it is unclear whether operators are offering alternative payment methods without regulations requiring this.

D. Alternative Methods of Activation

In the United States in 2019, nearly 30% of adults making less than \$30,000 per year did not own a smartphone, and 44% did not have broadband access;¹⁴³ by comparison, for those earning \$75,000 or more, a mere 5% did not carry a smartphone and only 8% did not subscribe to broadband.¹⁴⁴ Due to these disparities in access to the internet and digital devices, another key component of ensuring equitable access includes providing methods to engage e-scooters and initiate a ride without a smartphone.

Atlanta and Charlotte do not require operators to provide options for activating the devices without a smartphone. However, Atlanta’s equity plan suggests the inclusion of alternate activation options.¹⁴⁵ Austin, Los Angeles, and Portland have incorporated such measures. Austin’s rules require operators to offer an affordable option that does not require access through a smartphone for any customer with an income level at or below 200% of the federal poverty guidelines.¹⁴⁶ Lime, for

¹⁴¹ PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., SHARED ELECTRIC SCOOTERS PERMIT APPLICATION, SEC. IV(D) (C) (July 11, 2018).

¹⁴² Portland Bureau of Transp., The City of Portland, Or., *Cash Payment Options*, <https://www.portlandoregon.gov/transportation/article/740656>.

¹⁴³ Monica Anderson, *Mobile Technology and Home Broadband 2019*, PEW RESEARCH CENTER, June 13, 2019, <https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/>.

¹⁴⁴ *Id.*

¹⁴⁵ CITY OF ATLANTA, GA., CODE §150-407(c) (2019).

¹⁴⁶ AUSTIN TRANSP. DEP’T, THE CITY OF AUSTIN, TEX., DIRECTOR RULES FOR DEPLOYMENT AND OPERATION OF SHARED SMALL VEHICLE MOBILITY SYSTEMS, SEC. 6(F) (Nov. 9, 2018), https://austintexas.gov/sites/default/files/files/Transportation/Final_Notice_of_Rule_Adoption.pdf.

example, partners with PayNearMe for “text-to-unlock” features for riders participating in any local, state or federally-run assistance program.¹⁴⁷

In its permit application, the City of Los Angeles goes a step further by not only requiring operators to offer non-smartphone options for activation, but also mandating quarterly reports documenting “all outreach conducted to educate customers of these options.”¹⁴⁸ In Los Angeles, Bird offers a SMS messaging service to unlock an e-scooter.¹⁴⁹ To utilize this service, users must sign up either by email or text message. Once their account is approved, riders then set up their payment information (credit, debit, or prepaid card). Riders can locate devices on the street or by calling a phone number, and engage the devices by texting the number provided to them when they signed up for the account. Jump, Bolt, and Spin offer similar SMS text options, with Bolt also accepting payments via mailed checks or money orders.¹⁵⁰ Lime, through its discount Lime Access program, also offers a non-smartphone option. Similar to Bird, Bolt, or Jump, though, a qualifying rider still needs access to a computer and a cellphone to take advantage of the program. Riders first need to create an account by sending a request to a provided email address. To ride, users need to print a PayNearMe barcode that allows cash payment, after which Lime sends a text message with a code to unlock an e-scooter.¹⁵¹

Portland also requires that operators submit a user equity plan that includes non-smart phone access options.¹⁵² Some of Portland’s operators (Bird, Lime, and Spin)

¹⁴⁷ Smart Trips Austin, The City of Austin, Tex., *Reduced Cost Programs* (2020), <https://smartripsaustin.org/reduced-cost-programs/>.

¹⁴⁸ DEP’T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹⁴⁹ BIRD, DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, CITY OF LOS ANGELES ANNUAL PERMIT APPLICATION (Jan. 28, 2019).

¹⁵⁰ BOLT, DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, CITY OF LOS ANGELES ANNUAL PERMIT APPLICATION (Feb. 15, 2019); JUMP BY UBER, DOCKLESS ON-DEMAND PERSONAL MOBILITY, CITY OF LOS ANGELES ANNUAL PERMIT APPLICATION (Feb. 15, 2019); SPIN, DOCKLESS ON-DEMAND PERSONAL MOBILITY, CITY OF LOS ANGELES ANNUAL PERMIT APPLICATION (Feb. 11, 2019).

¹⁵¹ Stephen Edelstein, *Lime Will Let Customers Rent Electric Scooters and Bikes Without a Smartphone*, THE DRIVE, Aug. 9, 2018, <https://www.thedrive.com/tech/22754/lime-will-let-customers-rent-scooters-and-bikes-without-a-smartphone>.

¹⁵² PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., ADMIN. RULE TRN-15.01(4) (B) (14), NEW MOBILITY – SHARED ELECTRIC SCOOTERS (2019).

have addressed this by setting up SMS messaging services.¹⁵³ Portland's other operator, Razor, has taken a different approach. Rather than setting up a text message account, users can go to a Razor warehouse and rent a device for a specific period of time.¹⁵⁴ Spin also provides this option to users who are not approved for a text message plan.¹⁵⁵

E. Engaging the Community

While the e-scooter equity planning process generally seems to follow a more top-down decision-making approach, at least one city mandates operators engage with the community. The City of Los Angeles requires operators to conduct a quarterly city-provided customer survey. In an attempt to control for the aforementioned shortcomings of online surveys, Los Angeles provides for not only an in-app option to take the survey, but also distribution of printed copies or provision of tablets during outreach events to reach customers without smartphones. Completed printed copies must then be scanned and emailed to the city.¹⁵⁶ Determining the effectiveness of equity plans in reaching and meeting the needs of diverse populations, requires frequent, on-going surveys conducted through multiple channels to reduce methodologically created bias. Los Angeles quarterly surveys could serve as a model for other cities.

Another innovative effort of the City of Los Angeles is the requirement that operators conduct outreach to local communities to shape e-scooter program implementation strategies. In addition to the mandatory equity plans during the pilot period, the City of Los Angeles requires operators to submit and carry out community engagement plans. The plans must include:

- Description of key stakeholders and residents, including any existing neighborhood organizations or advisory councils serving the Project Area.
- Description of any meeting(s) held in neighborhoods within the Project Area, including dates, if already begun doing outreach.
- Description and timeline of proposed community engagement activities.
- Description of how Operator will engage underserved communities.¹⁵⁷

¹⁵³ Portland Bureau of Transp., The City of Portland, Or., *Non-Smartphone Options* (2020), <https://www.portlandoregon.gov/transportation/article/740657>.

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ DEP'T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹⁵⁷ *Id.* at 17.

Examples of city-recommended activities to ensure community engagement and participation in Los Angeles include public workshops, community-based participatory research, door-to-door canvassing, and “additional activities to provide community stakeholders an opportunity to influence pilot implementation process.”¹⁵⁸

Consequently, in their 2019 permit applications, all eight permitted operators in Los Angeles listed their completed community engagement initiatives, while pledging to continue such efforts in the future. Lime, for example, reached out to 99 Los Angeles neighborhood councils along with universities and colleges within the city limits, and over a six-month period, attended over 100 meetings with community stakeholders to share information about Lime’s operations, education, safety, and the various ways the company can improve their partnership with the communities.¹⁵⁹ Spin met with a number of community-based organizations to identify key areas of interest, to inform future outreach, and to seek opportunities for community engagement for e-scooter service.¹⁶⁰ Jump hosted a series of community input workshops to collect feedback and suggestions from both riders and non-riders on services areas, equity programs, and outreach strategies.¹⁶¹ Jump has also continued to hire and train local, low-income candidates through partnerships with such organizations like the Youth Policy Institute, an anti-poverty non-profit.¹⁶² Lyft expressed plans to meet with elected leaders and neighborhood members to learn about barriers to e-scooter use and how they can address these barriers to better serve low-income communities.¹⁶³

Mandating community engagement in e-scooter equity planning is not common. Nevertheless, it appears to have resulted in creative communication between operators and stakeholders. This type of engagement has the potential to address concerns and generate strategies beyond the traditional, top-down equity planning approaches that, while aimed at addressing the needs of the underrepresented, tend to underestimate the value of a direct and continuous feedback loop between the

¹⁵⁸ *Id.*

¹⁵⁹ LIME, LADOT DOCKLESS ON-DEMAND PERSONAL MOBILITY PILOT PROGRAM, 2019 PERMIT APPLICATION (2019).

¹⁶⁰ SPIN, DOCKLESS ON-DEMAND PERSONAL MOBILITY, CITY OF LOS ANGELES ANNUAL PERMIT APPLICATION, (Feb. 11, 2019).

¹⁶¹ JUMP BY UBER, DOCKLESS ON-DEMAND PERSONAL MOBILITY, CITY OF LOS ANGELES ANNUAL PERMIT APPLICATION (Feb. 15, 2019).

¹⁶² *Id.*

¹⁶³ LYFT, LOS ANGELES, CA DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT APPLICATION, supp. Doc. app. E (2019).

city, the operators, and local communities in ensuring equitable e-scooter service throughout.

VII. DISCUSSION

This research was guided by the following overarching questions: How equitable is access to e-scooters? How can equitable access to e-scooters be improved? How can a data-driven approach be used to craft inclusive and effective micromobility regulations for Atlanta, Georgia, and other cities nationwide?

How equitable is access to e-scooters? A review of available rider surveys revealed mixed results. Surveys conducted in Santa Monica¹⁶⁴ and City of Chicago¹⁶⁵ indicated riders were predominately young (Santa Monica), male (both), white (Chicago), and affluent (both). A survey in Portland¹⁶⁶ yielded similar results, but showed more diverse income levels, as did a survey by Lime¹⁶⁷. The Atlanta survey showed even more diverse riders in terms of race/ethnicity, age, income, and gender.¹⁶⁸ However, not only was each survey potentially biased based by the methodology used, each survey was simply a snapshot in time. In order to better understand who rides e-scooters and whether access is improving from equity measures, more frequent, on-going surveys are recommended. Additionally, surveys should be conducted through multiple channels to ensure representative population samples and accurate results. Los Angeles's quarterly surveys conducted through multiple channels (in app, printed, and on tablets at outreach events)¹⁶⁹ could be used as a guide for Atlanta and other cities.

¹⁶⁴ DEP'T OF PLAN. & COMMUNITY DEV., THE CITY OF SANTA MONICA, CAL., SHARED MOBILITY DEVICE PILOT PROGRAM USER SURVEY RESULTS CONDUCTED 01-25-2019 TO 02-15-2019 (May 8, 2019), https://www.smgov.net/uploadedFiles/Departments/PCD/Transportation/SharedMobilityUserSurveyReports_Combined.pdf.

¹⁶⁵ Chi. Ill., E-SCOOTER PILOT EVALUATION (Jan. 2020), https://www.chicago.gov/content/dam/city/depts/cdot/Misc/EScooters/E-Scooter_Pilot_Evaluation_2.17.20.pdf.

¹⁶⁶ Portland Bureau of Transp., The City of Portland, Or., 2018 E-SCOOTER PILOT USER SURVEY RESULTS, <https://www.portlandoregon.gov/transportation/article/700916>.

¹⁶⁷ 2nd Street Lime, *New Lime Report Highlights Diversity of Electric Scooter Riders*, LIME, Mar. 27, 2019, <https://www.li.me/second-street/new-lime-report-highlights-diversity-electric-scooter-riders>.

¹⁶⁸ City of Atlanta Department of Transportation, *Atlanta E-Scooter Survey Results: 2019 Results* (Mar. 20, 2020), <https://www.atlantaga.gov/home/showdocument?id=45981>.

¹⁶⁹ DEP'T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

How can equitable access to e-scooters be improved? The five city study revealed the following common equity provisions: equitable distribution requirements, discounted pricing, alternative payment options, and alternative methods of activation. However, significant variation exists between cities with respect to these provisions, as illustrated in Figure 6.

Figure 6: Micromobility Equity Provisions

Note: An icon that is in color indicates that the equity component is required as a part of the city’s permit process, whereas an icon that is only white indicates that the equity component is suggested but not required.

City	Equitable Distribution	Discounted Pricing Plans	Alternate Payment Options	Alternative Methods of Activation
Atlanta				
Austin				
Charlotte				
Los Angeles				
Portland				

Equitable Distribution: Portland required 15% of the fleet be allocated to East Portland.¹⁷⁰ In contrast, Atlanta does not require a certain percent distribution in the equity zones - operators were simply required to commit a portion of their fleet to the zones,¹⁷¹ resulting in great variation in operator commitments (ranging from 4-

¹⁷⁰ PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., ADMIN. RULE TRN-15.01(8) (A) (3), NEW MOBILITY – SHARED ELECTRIC SCOOTERS (2019).

¹⁷¹ CITY OF ATLANTA, GA., ADMIN. REG., SHARABLE DOCKLESS MOBILITY DEVICE, Section VIII Equity Zones (June 24, 2019) (updated May 14, 2020). As previously stated, the regulations were revised on April 6, 2020 to require a minimum of 2% of the fleet be distributed in 3 equity zones for a minimum of 6% total.

35%). Neither Charlotte, Austin nor Los Angeles require a certain percent of the fleet be allocated to low-income or underserved areas. Interestingly, Los Angeles provides incentives for operators to deploy in disadvantaged communities,¹⁷² leading to one-third of the city’s e-scooters being designated for deployment in the disadvantaged community of San Fernando Valley.¹⁷³ Spin deployed approximately 76% of their fleet in the DAC – two to three times more than Bird or Lime deployed in the DAC.¹⁷⁴

Ensuring e-scooters are available within low-income or underserved communities must be part of the solution; however, without truly understanding the needs of the community – where are e-scooters needed and when, whether they will be used in conjunction with public transit, how many are needed, and infrastructure challenges or needed investments to support their use – determining an equitable distribution requirement that is effective will be difficult. A “one size fits all” approach is not recommended with respect to equitable distribution requirements.

Discounted Pricing: Major e-scooter operators such as Bird, Lime and Lyft offer discounted pricing programs in many cities across the country.¹⁷⁵ Despite this, discounted pricing is not a regulatory requirement in Atlanta,¹⁷⁶ Austin or Charlotte, but is required in Los Angeles¹⁷⁷ and Portland¹⁷⁸. With operators already offering discounted pricing options nationwide, it is recommended that this component be included in all regulatory schemes adopted by cities. Uniform guidelines would simplify regulatory compliance for operators and promote equitable access to all, regardless of geographic location.

¹⁷² DEP’T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹⁷³ Ryan Fonseca, *Scooters, Scooters Everywhere. Here’s How LA’s Grand Experiment Is Going*, LAIST, May 28, 2019, https://laist.com/2019/05/28/las_big_scooter_experiment.php.

¹⁷⁴ *Id.*

¹⁷⁵ Bird, *Rides for All* (2020), <https://www.bird.co/bird-access/>; Lime, *Lime Access* (last visited Aug. 8, 2020), <https://v1.li.me/en/community-impact>; Lyft, *Mobility Matters: Transportation for All* (2020), <https://www.lyft.com/scooters/los-angeles-ca/community>.

¹⁷⁶ CITY OF ATLANTA, GA., CODE §150-407(c) (2019). The March 2, 2020 amendment added discounted pricing as a required component of operator’s equity plans.

¹⁷⁷ DEP’T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹⁷⁸ PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., ADMIN. RULE TRN-15.01(4) (B) (14), NEW MOBILITY – SHARED ELECTRIC SCOOTERS (2019).

Alternative Payment Options: Atlanta¹⁷⁹ and Los Angeles¹⁸⁰ require non-credit card payment options be available, whereas and Portland¹⁸¹ do not explicitly require it but include it as a component in the permit application; Austin and Charlotte do not require alternative payment options. Just as discounted pricing should be a required regulatory component, alternative payment options should be included; again, uniform guidelines would simplify regulatory compliance for operators and promote equitable access to all, regardless of geographic location.

Alternative Methods of Activation: Austin,¹⁸² Los Angeles,¹⁸³ and Portland¹⁸⁴ require non-smart phone, alternative methods of activation of devices. Los Angeles further requires operators to provide quarterly reports documenting outreach to educate customers on this option.¹⁸⁵ Charlotte and Atlanta do not require operators to provide non-smart phone methods to activate devices. Again, uniform guidelines would simplify regulatory compliance for operators and promote equitable access to all, regardless of geographic location.

How can a data-driven approach be used to craft inclusive and effective micromobility regulations for Atlanta, Georgia and other cities nationwide? Data on e-scooter usage is beginning to emerge from pilot studies conducted by cities, as well as academic and other studies. While some data may be useful nationwide, local level data collection will be critical to crafting inclusive and effective micromobility regulations.

Data specifically on low-income and minority riders such as distribution of fleet, number of rides and riders, geographic location of the rides, and use of equity programs such as discounted pricing plans, alternative payment options, and

¹⁷⁹ CITY OF ATLANTA, GA., CODE §150-407(a) (2019).

¹⁸⁰ DEP'T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹⁸¹ PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., SHARED ELECTRIC SCOOTERS PERMIT APPLICATION, SEC. IV(D) (c) (July 11, 2018).

¹⁸² AUSTIN TRANSP. DEP'T, THE CITY OF AUSTIN, TEX., DIRECTOR RULES FOR DEPLOYMENT AND OPERATION OF SHARED SMALL VEHICLE MOBILITY SYSTEMS, SEC. 6(F) (Nov. 9, 2018), https://austintexas.gov/sites/default/files/files/Transportation/Final_Notice_of_Rule_Adoption.pdf.

¹⁸³ DEP'T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹⁸⁴ PORTLAND BUREAU OF TRANSP., THE CITY OF PORTLAND, OR., ADMIN. RULE TRN-15.01(4) (B) (14), NEW MOBILITY – SHARED ELECTRIC SCOOTERS (2019).

¹⁸⁵ DEP'T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

alternative methods of activation are critical to understanding the effectiveness of common equity provisions. Are these programs being used in meaningful numbers? Are they helping the communities they are intended to benefit? If not, what other improvements could be made to meet the needs underserved low-income and minority communities – better communication, more access or access connected to transit, infrastructure improvements, better implementation of equity programs by vendors, or new ideas not yet contemplated?

Surveys will be a critical component to measuring equitable access, but caution must be exercised to ensure that surveys are designed and conducted to reach a representative sample population. Surveys must also be conducted on a frequent, on-going basis. As previously mentioned, Los Angeles’s quarterly surveys, distributed through multiple sources, may serve as a model.¹⁸⁶

Los Angeles’s community engagement requirement appears to have resulted in creative communication with stakeholders.¹⁸⁷ Requiring quarterly reports on community engagement provides a continuous feedback loop between the city, the operators, and local communities. It is recommended that all city’s require community engagement and reporting as part of their equity provisions.

Additional research is needed. Community led, participatory action research (PAR) must be part of the process. “Participatory action research (PAR) involves people with direct experience or interest in the topic under study in all or some of: research design, data collection, analysis, dissemination and implementation, with a view to creating social change.”¹⁸⁸ It is increasingly used to “address inequality by involving people experiencing marginalisation, whose voices are often silenced or unheard”¹⁸⁹ and is said to “keep the power of academics and service professionals in check” by requiring “conversations among participants to take place in order to examine how decisions are made and who get to make them.”¹⁹⁰ PAR can be used

¹⁸⁶ DEP’T OF TRANSP., L.A., CAL., DOCKLESS ON-DEMAND PERSONAL MOBILITY ONE-YEAR PERMIT, (last accessed Aug. 7, 2020), <https://ladot.lacity.org/sites/default/files/documents/final-one-year-dockless-permit.pdf>.

¹⁸⁷ *Id.*

¹⁸⁸ Sui Ting Kong, Sarah Banks, Toby Brandon, Stewart Chappell, Helen Charnley, Se Kwang Hwang, Danielle Rudd, Sue Shaw, Sam Slatcher & Nicki Ward, *Extending Voice and Autonomy through Participatory Action Research: Ethical and Practical Issues*, 14 ETHICS AND SOCIAL WELFARE 220, 221 (2020), <https://www.tandfonline.com/doi/full/10.1080/17496535.2020.1758413>.

¹⁸⁹ *Id.* at 222.

¹⁹⁰ *Id.* at 227.

to better understand the needs of underserved, low-income and minority communities.

VIII. CONCLUSION

Micromobility has the potential to address the first/last mile problem in transportation and should be considered as part of a comprehensive transportation plan by cities. In 2018, e-scooters were rapidly deployed in cities in what became a standard policy of “ask for forgiveness, not permission.” Cities responded quickly – some banning them outright, others allowing pilot programs, and some choosing to embrace but regulate the new technology. Bike share regulations were used as a model, but regulating e-scooters was uncharted territory. Regulations were quickly developed, but with little to no available data, they were largely created based on public opinion and in response to safety concerns, accidents and deaths. As Atlanta and other cities continue to address the transportation needs of their communities, recognizing historical transportation disparities rooted in racism, increasing equitable access should be a priority. Communication and collaboration with stakeholders in underserved communities are critical to developing and implementing regulations that increase access in low-income and minority communities.