Equity on Two Wheels: Assessing Capital Bikeshare and E-Scooter Access in Montgomery County

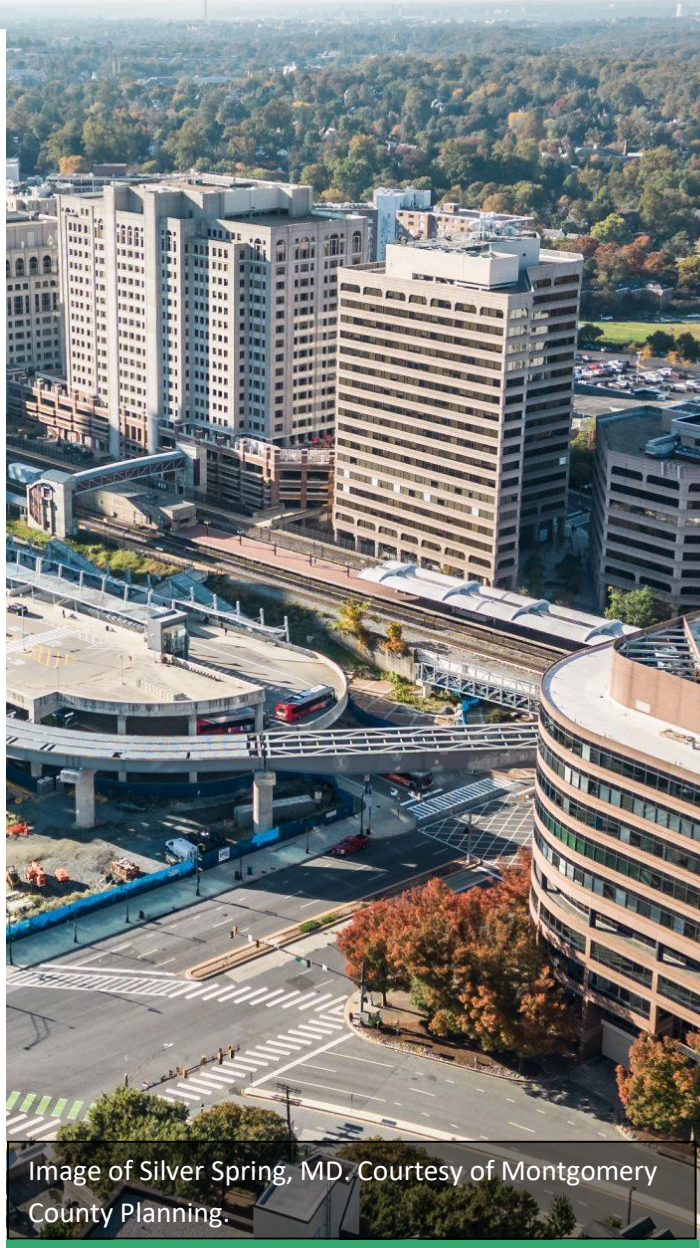


Image of Silver Spring, MD. Courtesy of Montgomery County Planning.

AUGUST 2025

Chloe Dorf
Montgomery County Council
2025 Summer Fellow
cd7014a@student.american.edu

Table of Contents

About the Fellow

Chloe Dorf is a Master of Public Administration candidate at the American University School of Public Affairs. Her studies are focused on State and Local Administration. Chloe graduated with her bachelor's degree in political science from American University in 2024. Her interests center around urban, infrastructure, and transportation policy. She previously worked as a legislative intern in the United States Senate and United States House of Representatives. In entering the world of public service, she hopes to examine issues of equity, transportation access, and transit system improvement, and assist places like her own hometown of Merrimack, New Hampshire, in finding fitting, equitable transit alternatives.

Acknowledgements

Thank you Montgomery County Council for having me this summer, and to Pam Dunn, Naeem Mia, Nicole Rodriguez-Hernandez, and Logan Anbinder for your consistent feedback, guidance, and support. A special and strong thank you to the MCDOT for making me feel welcome and included, and to the many MCDOT staff who lent their time and expertise to helping me shape this research, including Sandra Brecher, Stacy Leach, and Michelle Golden. Thank you to Chris Van Alstyne for your encouragement and willingness to help at every turn, and to Cameron McAllister and Eliot Mueting for your support in understanding and accessing critical data. A special shout-out to my boyfriend, Colde, for your love and constant support throughout this process.

Executive Summary

Montgomery County's Capital Bikeshare and e-scooter programs have faced significant developments in capacity and ridership over the last decade. As Capital Bikeshare's popularity has expanded in the D.C. Metro region, yielding record breaking ridership numbers month by month, budgetary shortfalls and debates over station expansion, transit connectivity, and bike coverage have led to a decrease in stations and available bikes in Montgomery County. At the same time, e-scooter usage through the County's area-limited e-scooter pilot program has seen continually increasing levels of ridership and concentrations in southeastern areas of the County, primarily Silver Spring. This analysis addresses the role of e-scooters as an additional form of micromobility in the County in a time of Capital Bikeshare considerations, and the part e-scooter vendors can play in addressing coverage gaps and helping Capital Bikeshare to increase equitable transportation access for disadvantaged communities. Focusing on Silver Spring and its large equity focus area, the author asks the following:

- How does Capital Bikeshare coverage in Silver Spring compare to the area's concentration of e-scooters and e-bikes?
- What is the relationship between usage patterns and equity?
- What steps can the Montgomery County Council take to address potential equity shortcomings in Capital Bikeshare and e-scooter programs?

Data gathered over four-days of observation in Silver Spring, comparing Lime e-scooter concentrations and locations to Capital Bikeshare bike availability, finding a high concentration of e-scooters in major areas of Silver Spring and a limited number of bikes across the 12 Silver Spring stations. Capital Bikeshare had many stations but few bikes in the Silver Spring EFA, while e-scooter concentrations in the same area were abundant and often functioned to fill in places where Capital Bikeshare left accessibility gaps. Additional factors such as cost difference, transparency, public perception, and concentrations in other EFAs point to e-scooters being more abundant but less equitable compared to Capital Bikeshare. With these findings in mind, this study recommends the following to the Council:

- Amending the current Memorandum of Understanding to include more explicit equity requirements, utilizing permitting elements present in other jurisdictions.

- Opening discussions with Capital Bikeshare over equity and rebalancing strategies, providing funding for CaBi bikes and e-bikes, and introducing new stations into the Silver Spring area.
- Considering infrastructure, survey, and partnership alternatives.

Racial Equity and Social Justice Impact

The cost and availability of micromobility vehicles have significant ties to racial equity and social justice. Cost and access have had a disproportionate impact on low-income individuals and communities of color, prompting greater barriers to use and connectivity between individuals and their homes, places of work, and available transit. This analysis advocates for the introduction of new provisions to address disparities and promote racial equity in Montgomery County's micromobility services. It addresses micromobility inequity on academic and case-based levels and recommends that the Council take action to address micromobility disparities and promote more equitable practices among micromobility vendors within the County.

Key Definitions and Acronyms

- **Thrive Montgomery 2050**: Montgomery County's General Plan, envisioning the future of the County and serving as a long-range guide for development.
- **Equity Focus Areas**: Areas of Montgomery County characterized by high concentrations of lower-income people of color. Measured based on access to resources and opportunities for employment, transportation, education, health, and government services.
    - **EFA:** Equity Focus Areas.
- **Micromobility**: Small, low-speed vehicles intended for personal use. These include station-based bikeshare systems, dockless bikeshare systems, electric-assist bikeshare, and electric scooters.
    - **Bikeshare**: Services that provide bicycles for public use, typically on a short-term rental basis.
    - **Capital Bikeshare**: Metro D.C.'s bikeshare system. Coverage includes the D.C. metropolitan area and surrounding Virginia and Maryland counties.
        - **CaBi**: Capital Bikeshare.
        - **Classic Bike/Classic**: Capital Bikeshare's standard, pedal-powered bike.
        - **E-Bike**: Capital Bikeshare or other vendor bikes powered by an electric motor or human power.
    - **Dockless Vehicles**: Shared-mobility vehicles that are available to the public to rent in public spaces, do not require any additional equipment, and can be located and unlocked using a smartphone application or account number. Vehicles may include manual pedal bicycles, electric pedal-assist bicycles ("e-bike") or electric scooters ("e-scooters").
    - **Dockless E-Scooters**: Dockless vehicles that weigh less than 100 pounds, with two or three wheels, handlebars, and a floorboard. Must be solely powered by an electric motor or human power, and not exceed a speed of 20 MPH.
    - **Starting Ride**: The location at which a user begins an e-scooter, e-bike, or classic bikeshare ride. Generally measured in terms of origin station for

docked micromobility options and origin region for dockless micromobility options.
    - **Ending Ride**: The location at which a user ends and parks an e-scooter, e-bike, or classic bikeshare ride. Generally measured in terms of ending station for docked micromobility options and ending region for dockless micromobility options.
- **Rebalancing**: The process of moving bikeshare or e-scooter fleet vehicles within a service area from one location to another to better balance their distribution. Often done once per day, through loading devices such as a van, truck, or cargo bike.
- **First-Mile/Last-Mile Linkage**: Transportation policy efforts to sustainably and effectively connect transit centers to an individual's first and last commute miles without the use of single occupancy vehicles.
    - **Single Occupancy Vehicles (SOV)**: a motor vehicle, typically a car, that is being driven with only one occupant, the driver.
- **JARC**: Job Access Reverse Commute program.
- **FTA**: Federal Transit Administration.
- **MCDOT**: Montgomery County Department of Transportation.
- **FY**: Fiscal Year.
- **M-NCPPC**: The Maryland National Capital Park and Planning Commission.
- **MOU**: Memorandum of Understanding.

Micromobility in Montgomery County

Capital Bikeshare: History and Overview

The Development of Capital Bikeshare

Inspired by bike sharing concepts invented in the late 1960s in Europe, Capital Bikeshare grew from Washington, D.C.'s desire to introduce new iterations of accessible, community-based transportation to the United States. Following operating plans much like Copenhagen's "Bycyklen" program, D.C. initially introduced the Smart Bikes program with a fleet of 10 stations and 100 bikes funded by outdoor advertisement.[1] While demand was high when the program went public, D.C. encountered issues with operation almost immediately. Smart Bike equipment was difficult to use, and the installation of docks was time consuming, taking approximately 9 months and requiring D.C. to dig street trenches and coordinate with power companies to hardwire stations into the electrical grid.[2] Against high demand, the program was too small, had too few destinations, and was not fit to expand.

Upon Smart Bikes' discontinuation in 2008, D.C. began to seek other, more efficient ways to operate their bikeshare program. Drawing heavily from Montreal's BIXI system, which used solar paneled stations, D.C. joined a bikeshare bid with Arlington County, who shared a mutual interest in streamlined bikeshare. In September 2010, the two jurisdictions launched Capital Bikeshare with 49 stations, marking one of the first large-scale bikeshare systems in North America.[3] Over the last 15 years, Capital Bikeshare's partnership has expanded to include over 700 stations and seven jurisdictions in Maryland and Virginia.

Capital Bikeshare and Montgomery County

Montgomery County joined Capital Bikeshare in 2013, becoming the first suburb in the D.C. region to adopt the system. Bikeshare in Montgomery County was one of 8 regional projects to win funding under the FTA's JARC program, requiring all fees to move toward the improvement of mobility options for low-income commuters. The program ensured annual membership and usage fees would be waived for low-income workers who met program guidelines.[4] The program opened in September with plans to implement 50 stations and over 450 bikes across the County, focusing primarily on

portions of Greater Shady Grove, unincorporated areas, and the City of Rockville Town Center. Operations were funded by the FTA and other local sources, including the City of Rockville and the County itself.

Today, Montgomery County's bikeshare system has grown significantly, with large and consistently increasing degrees of ridership. For example, since FY22 Montgomery County's ridership has grown by 50%, representing an increase from 96,000 rides to over 144,000.[5] The program has introduced numerous economic and environmental benefits, including air quality improvements, reductions in carbon emissions, increased transport resilience and convenience, and affordable rates for low-income riders. Surveys conducted in the D.C. region found that 73% of Capital Bikeshare riders were motivated to use the system to save travel time and 25% of users were compelled to use it to save on costs.[6] Support has been strong among businesses to replace car parking with bikeshare stations due to positive associations between bikeshare riders and increased sales. Young, low-income residents in high-density areas rely most heavily on bikeshare options and the benefits Capital Bikeshare provides. So far in 2025, Montgomery County has seen 147 new members join its Capital Bikeshare for All program, indicating the program continues to appeal to low-income individuals, who use bikeshare as a cheaper, more efficient way to travel.[7]

The County system encompasses 80 Capital Bikeshare stations and a variety of programs to promote ridership, including adult biking classes through the Washington Bicyclist Association and low-income support programs like Capital Bikeshare for All. Through its bikeshare program, the County seeks to fulfill the following objectives:

- Link low-income and reverse commute employees with jobs, addressing first-mile/last-mile linkages to transit.
- Provide environmentally-friendly and highly time- and cost-efficient connections between transit and jobs, retail, local businesses, recreation, and other destinations.
- Emphasize biking, walking, and transit (Thrive Montgomery 2050).
- Reduce car traffic, usage, and emissions (Thrive Montgomery 2050).
- Promote public health (Thrive Montgomery 2050).

- Improve access to transportation to increase racial equity and social justice (Thrive Montgomery 2050).

County E-Scooter Usage: History and Overview

E-Scooters and Montgomery County

In Spring 2019, MCDOT introduced the County's first formal dockless e-scooter pilot program after a series of dockless bikeshare and e-bike pilot programs showed signs of success in Silver Spring, Takoma Park, and North Bethesda demonstration areas. Initially intended to run for only 6 months, the pilot was conducted with three selected private companies who provided a distribution of e-scooters to the pilot area. In conjunction with the goals of the CaBi program, the MCDOT sought to:

- Improve personal mobility choices.
- Provide broader access to transit for people of color and other underserved communities.
- Emphasize biking, walking, and transit (Thrive Montgomery 2050).
- Reduce car traffic, usage, and emissions (Thrive 2050).
- Improve access to transportation to increase racial equity and social justice (Thrive Montgomery 2050).

The pilot saw immediate popularity, with more than 84,000 total rides in the summer of 2019.[8] As a result, in January 2020, the program was extended. The following year, recreational e-scooter usage expanded, with permitting that allowed riders to use hard surface trails in County-owned M-NCPPC parks, and the Council passed new riding regulations to address safety and parking concerns across County pilot areas. Mirroring national usage trends, e-scooter ridership in the County has continued to increase. In 2024, 242,749 trips were taken in the e-scooter pilot area, a majority of which operated through the County's primary e-scooter provider, Lime.[9]

Agreements made between private e-scooter vendors and the County currently function under a Memorandum of Understanding. MOUs permit vendors to launch their programs in the pilot project area and operate on public right-of-way. They set guidelines to ensure proper vendor and e-scooter conduct, response and data requirements, and parking standards, and give the MCDOT primary enforcement

power of conditions set forth.[10] Critical to this analysis, while the current MOU does require vendors distribute discounts based on users' enrollment in County public assistance programs such as MCDOT's MCLiberty program, it does *not* include any distribution or rebalancing criteria related to equity or the County's EFAs.

Report Scope

As Capital Bikeshare's popularity has continued to grow, yielding record-breaking ridership numbers month by month in the D.C. region, D.C. and surrounding jurisdictions have increased investment in the expansion of CaBi stations and bikes. However, in Montgomery County, budgetary shortfalls have led to a decrease in station numbers despite the program's continued growth. As debate continues over expanding station and bike coverage and using new and existing stations to forward Thrive Montgomery goals, so have conversations arisen regarding the criticality of coverage for low-income individuals and communities of color. In a time of CaBi considerations, it is vital to address more deeply the role of e-scooters as an additional form of micromobility in the County, and the part e-scooter vendors can play in addressing coverage gaps and helping Capital Bikeshare to increase equitable transportation access for disadvantaged communities.

This report will focus on the equitability of Montgomery County's Capital Bikeshare and e-scooter vehicle distributions and analyze distributive patterns of both programs in Silver Spring, Maryland. In doing so, the author aims to answer the following questions:

- How does Capital Bikeshare coverage in Silver Spring compare to the area's concentration of e-scooters and e-bikes?
- What is the relationship between usage patterns and equity?
- What steps can the Montgomery County Council and MCDOT take to address potential equity shortcomings in Capital Bikeshare and e-scooter programs?

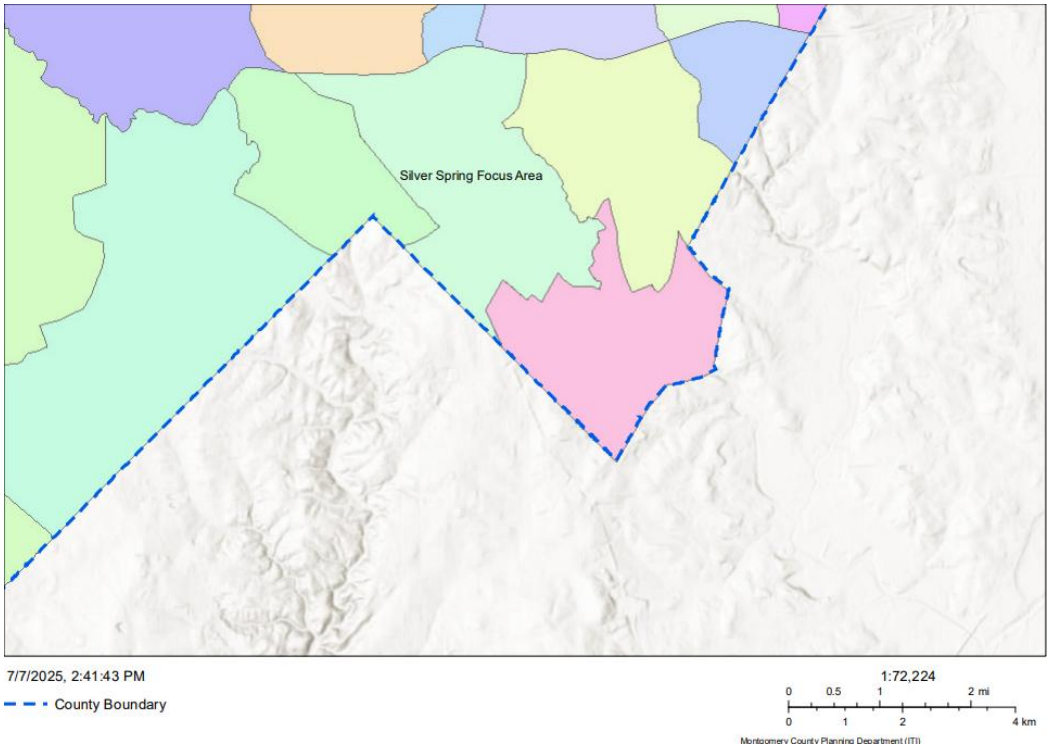
Methodology

Due to the transient nature of bikeshare and e-scooter usage, this analysis will observe the Silver Spring coverage area via Populus and Capital Bikeshare mapping systems once a day over a four-day period to produce consistent and generalized findings

within a limited project timeframe. Each day, observations will alternate between morning (9 AM – 10:30 AM) and afternoon (1:30 PM – 3:00 PM) observation periods. Findings will be compiled and summarized to identify key trends. Analysis will include coverage of pricing, equity action for micromobility in other jurisdictions, and scholarly literature regarding bikeshare and e-scooter equity. Findings will be summarized and matched against general trends in Silver Spring.

Clarifying Rationale

The Silver Spring area was chosen as the primary focus of this analysis due to its status as a primary member of the e-scooter pilot project and heavy concentration of e-scooters compared to the rest of the County pilot area. Silver Spring also maintains a high number of Capital Bikeshare stations (approximately 12). In terms of equity, Silver Spring remains one of the most diverse cities in the United States, with a significant mix of racial and ethnic groups, linguistic diversity, and income-levels. The downtown Silver Spring coverage area is comprised of, in large part, an EFA. Taken together, these elements create a critical environment for the examination of equitable micromobility distribution and access.



Study Coverage Area.[11]

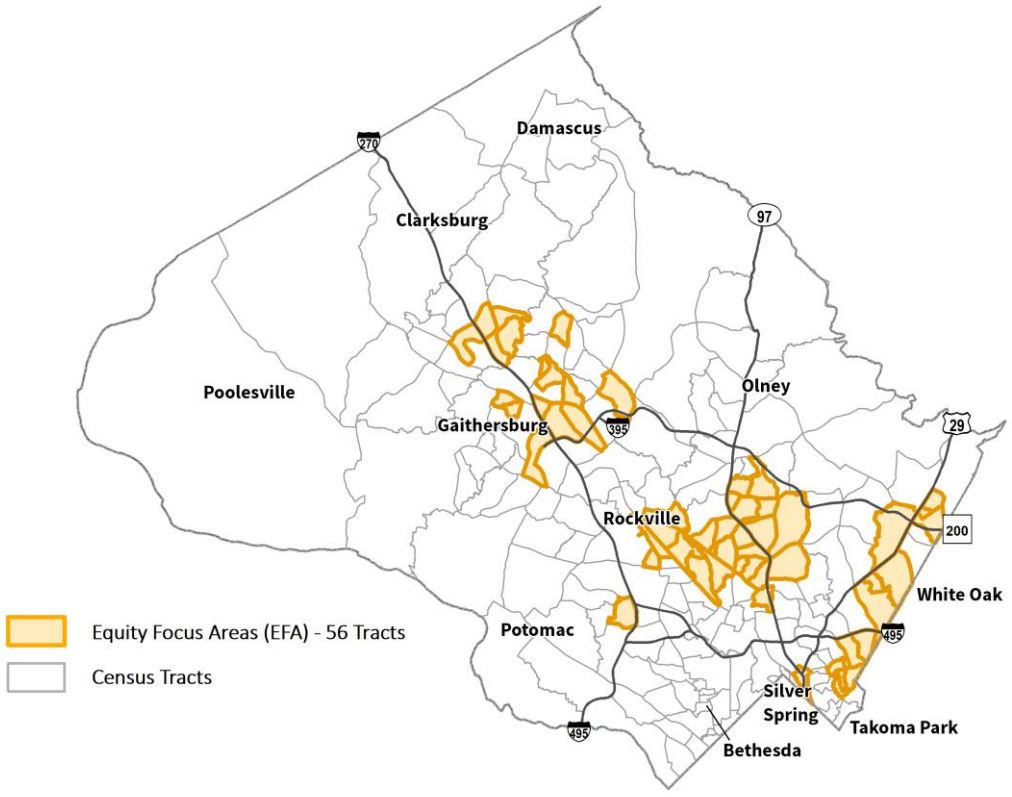
While both Capital Bikeshare and e-scooter services are utilized frequently for recreational purposes within the region, this analysis presumes the use of these services primarily for commuting or urban resource access. Due to a decline in fleet size and activity from e-scooter vendors Spin and Bird, focus will center on the County's largest active e-scooter provider, Lime.

EFAs and Silver Spring

EFA Overview

What are EFAs?

Equity Focus Areas are identified and mapped as a means for the County to assess and address racial and social inequities. Montgomery County has identified 56 of 215 census tracts as EFAs. These tracts are found along the I-270 Corridor (Germantown, Gaithersburg), the Route 29 Corridor (Aspen Hill, Wheaton), and the eastern portion of down-county (Silver Spring, Rockville). EFA determinations are made on a basis of income, race and origin, and the ability to speak English.



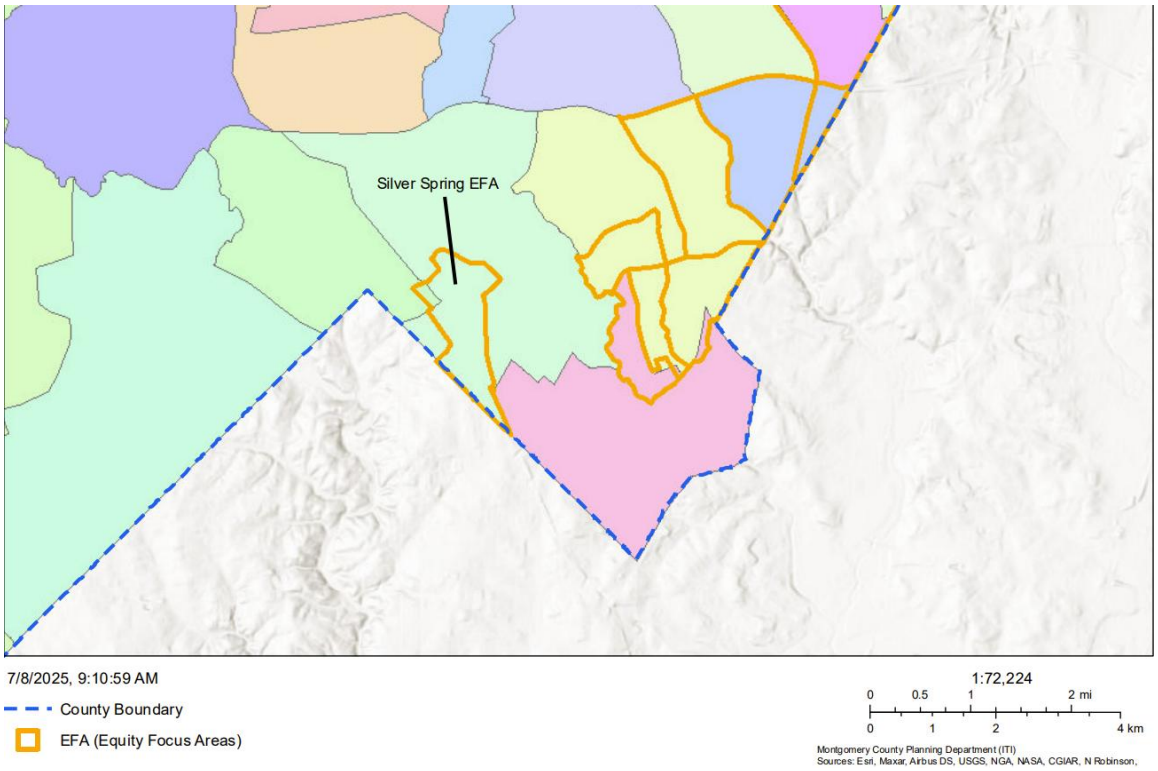
Montgomery County EFAs.[12]

Approximately 26% of the County population, or 275,875 people, live in EFAs.[13] EFA populations are generally younger, have lower educational attainment levels, and are more likely to be of Hispanic origin. The annual income of one-third of households in these areas is typically under $50,000, and residents are more likely to pay 35% or more of their income on housing costs. Critical to this analysis, while only 27% of employed residents in the County reside in EFAs, they account for 33% of all public

transit commuter residents in the County.[14] 11.3% of households in EFAs have no vehicles available compared to 6.4% of areas outside of EFAs, and 39.4% have access to only one vehicle compared to 31.7% of areas outside of EFAs.[15] This is a significant portion of those who would benefit the most from bikeshare and e-scooter programs as first- and last-mile transit linkage alternatives.

The Silver Spring EFA

The Silver Spring EFA encompasses a large portion of downtown Silver Spring, a prominent center of recreation, work, and transit. It includes a section of Georgia Avenue, the Silver Spring Metro, Colesville Road, Thayer Avenue, Bonifant Street, Wayne Avenue, and Fenton Street. The EFA maintains a total population of 7,478 people, with 4,863 total households.[16]



Silver Spring Equity Focus Area.[17]

43.3% of households within the Silver Spring EFA are low-income, with 38.2% earning less than $50,000.[18] The median household income is $75,889. 62.8% of the EFA is composed of people of color, with Black (42.4%), White (37.2%), and Asian (8.7%) populations composing much of the area. 4.8% of individuals speak English less than very well.[19] Car ownership in the area is lower than the national average, with 1 vehicle

per the largest share of households in Silver Spring. As with most EFAs, the Silver Spring EFA is in an area with no dominant racial majority.

Micromobility & Equity

Literature Review

Examinations of e-scooter and bikeshare equitability have yielded a variety of conclusions from across the country. Similar among all analyses is the identification of a need for more low-income discount programs for e-scooters and bikeshares to promote usage. In addition, scholars have recognized slower response rates and rebalancing in low-income areas, and too strong of a focus from bikeshare and e-scooter vendors on usage rates to rebalance, rather than equitable access.

Washington, D.C.

In an equity performance study of e-scooters and Capital Bikeshare in Washington, D.C., Sun, Yan, & Zhao (2024) reveal dockless e-scooter services "increase accessibility to shared micromobility options in disadvantaged neighborhoods but widen access gaps across neighborhoods."[20] Compared to bikeshare, e-scooters provide a higher level of spatial accessibility overall due to greater supplies, but that supply tends to lead to longer average idle times rather than a greater number of trips. Capital Bikeshare's equity program, in addition, is more effective than equity programs provided by e-scooter operators in promoting usage in low-income neighborhoods. Findings suggest that increasing vehicle supply alone does not lead to higher usage in disadvantaged neighborhoods.

Austin, TX

In Austin, Texas, Bai et al. (2021) and Aman et al. (2021) find that e-scooters leave inequitable societal impacts on disadvantaged populations when the equitable distribution of resources are not prioritized. Bai et al. determine that minority and disabled populations in the region experience fewer e-scooter use opportunities and slower response rates from the municipality and private e-scooter companies. Aman et al. reveals that while areas with higher proportions of African American residents were less likely to have access to bikeshare or e-scooters, positive associations could be identified for both bikeshare and e-scooter accessibility and low-income populations. They determine that increased understandings of spatial access can support ongoing

efforts to deliver equitable transportation systems, improve alternatives for disadvantaged populations, and support future action related to bikes and scooters.

Louisville, KY

Karimi & Kluger (2025) find greater e-scooter availability in low-income, low car-owning neighborhoods, potentially supporting equitable micromobility access, while racial minority-dominant neighborhoods experience more rapid rebalancing that reduces their windows of use. Noting that rebalancing activities show trends of redistributing scooters away from minority-concentrated regions, they emphasize the necessity of equity frameworks within micromobility operations.

Seattle, WA & New York City, NY

Mooney et al. (2009) identify the tendency of e-scooter and bikeshare services to be concentrated in wealthier, central areas, creating significant special barriers for disadvantaged users. In Seattle, they find that bike availability is disproportionately high in higher educated, higher income neighborhoods. This distribution is primarily driven by high demand bike rebalancing, which focuses on locations with the most usage rather than addressing equity concerns such as racial and ethnic composition or risks of displacement. Babagoli et al. (2019) find similar trends with Citi Bike station distributions in New York City, noting dominant placements in low-poverty, affluent neighborhoods.

Jurisdictional Approaches to Equity in Micromobility

Jurisdictions in and around the region have embraced a range of equity requirements within their micromobility permitting systems. Common among all systems is the requirement that micromobility providers provide some form of low-income discount program, and a fleet distribution requirement that favors identified equity areas or zones.

Washington, D.C.

Washington, D.C. requires all shared fleet device companies that operate e-scooters and bikes in public spaces to provide a low-income customer program. This program must make available services to those with income levels at or below 200% of the

federal poverty guidelines and cannot impose any device deposit requirement. It must also offer affordable cash payment options and unlimited trips under 30 minutes. D.C. permitting also requires each shared fleet device operating company to deploy a minimum of 3% of its fleet in each ward daily, and to always maintain a limit of no more than 35% of its permitted fleet within each ward.[21]

Arlington County, VA

Arlington County's permit program for e-scooters requires micromobility vendors to place at least 0.75% of each of their device fleets within each of its nine Equity Emphasis Areas in the mornings. In addition, permit program ordinances establish equity expectations for providers that include at least 15% of vehicles in service to be deployed every morning outside of Rosslyn-Ballston and Richmond Highway metro corridors.[22] The County also requires low-income discount programs to encourage use from other community members and provides incentives to include accessible vehicles for persons with differing physical abilities.

Baltimore City, MD

Baltimore City maintains equitable deployment requirements for its Lime and Spin e-scooter fleets. Permit holders are obligated to deploy "a minimum of three dockless vehicles per day" to each identified equity zone, and a minimum of four dockless vehicles per day for permit holders with two or more types of dockless vehicles.[23] E-scooter compliance scores must remain within 85% in equity zones, and to expand fleet sizes, a permit holder needs to score a minimum of 90% compliance for each reporting period within an equity zone.

City of Alexandria, VA

Permit holders in Alexandria are required to implement an approved Equity Plan with mandatory elements agreed upon by the City Manager. Vendors must develop and offer a cash-based payment program and a low-income discount program to expand access to more users. For devices, vendors must also deploy a specific percentage of their fleets to Equity Emphasis Areas, with minimum deployments between 5% and 15% of the fleet. Metric scores and evaluation methods used by the city to determine if vendors can continue permitting heavily weigh equity zone deployments in the scoring.

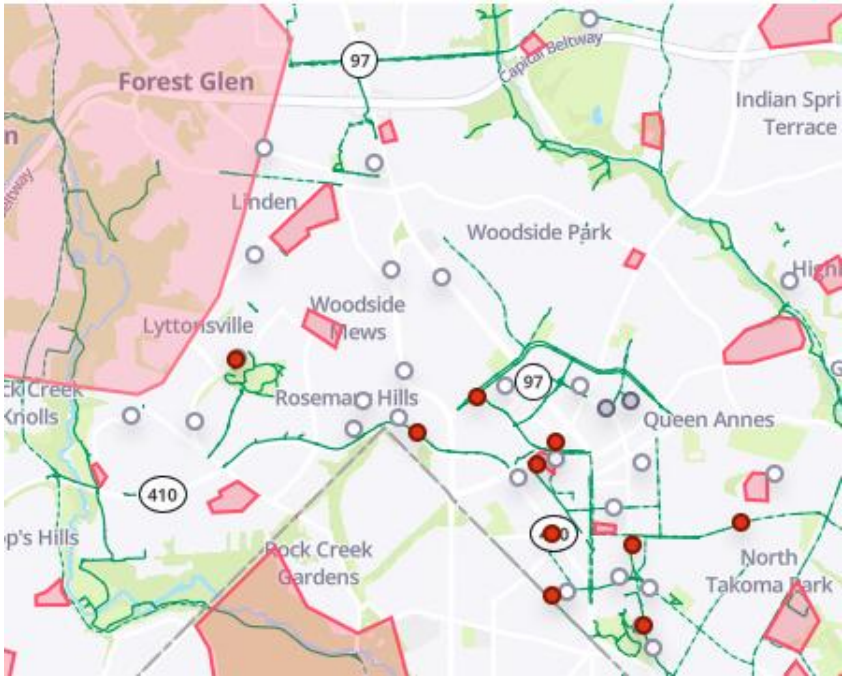
Silver Spring Coverage Analysis

Data collection for Capital Bikeshare and Lime e-scooter fleet numbers in Silver Spring was conducted over the course of four weekdays, from June 25, 2025, to June 30, 2025. All additional data represents a 3-month period from March 30, 2025, to June 30, 2025.

Summary of Findings

Capital Bikeshare

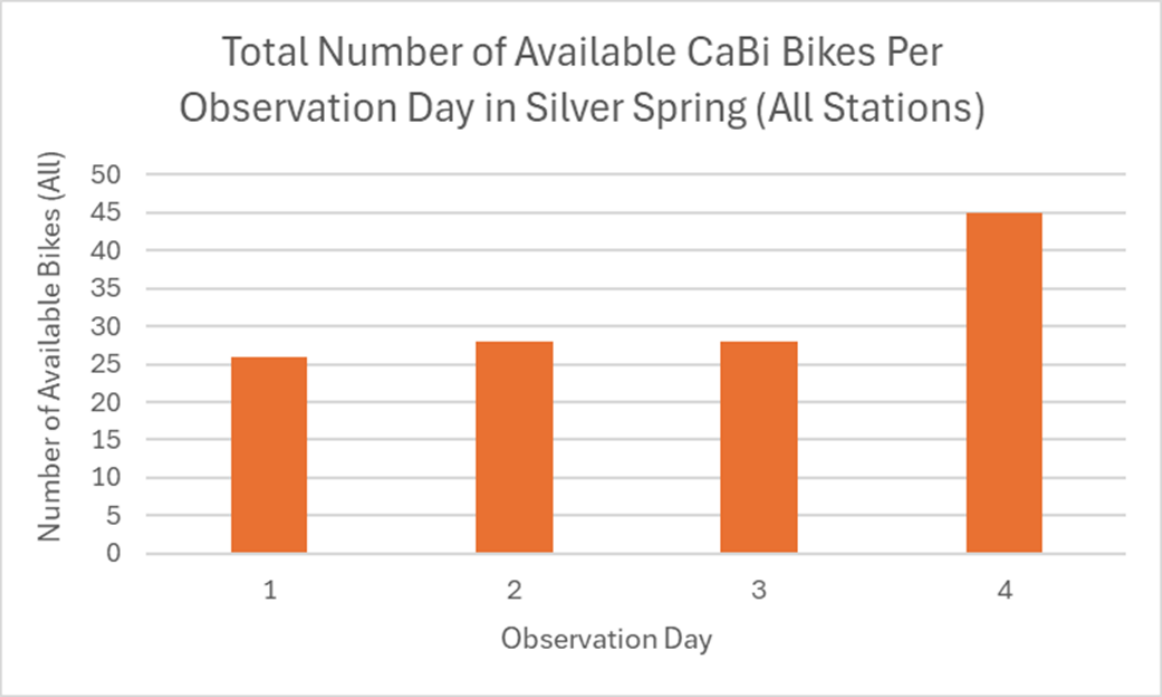
Capital Bikeshare's twelve stations in Silver Spring maintain a range of 11 to 19 total bike docks, with an average of 15 docks overall. Full breakdowns of Capital Bikeshare station locations, dock numbers, and collected data can be found in Appendix A. Summaries here reference trends from Tables A.2 and A.3.



Silver Spring CaBi Stations (Red and Gray).[24]

Day 1. Data collected on the afternoon of June 25 saw an average of 3 available bikes per station in the Silver Spring area. Notable outliers included Fenton St. & New York Ave. and East-West Highway & 16th St. CaBi stations, where no classic or e-bike options were available. Lyttonsville Pl. & Lyttonsville Rd., Fairland Ave. & Walden Rd., and Silver Spring Metro stations held available bike numbers above the daily average, with 5-9 classic bikes present at each station.

Day 2. Data collected on the morning of June 26 saw an average of 4 available bikes per station in the Silver Spring area. Notable outliers included East-West Highway & 16th St. and Spring St. & 2nd Ave. stations, where no classic or e-bike options were available. Lyttonsville Pl. & Lyttonsville Rd., Fenton St. & Gist Ave., and Silver Spring Metro stations maintained bike numbers above the daily average, with 7-10 e-bikes and classic bikes present at each station.



A bar graph detailing the number of available Capital Bikeshare bikes per observation day.[25]

Day 3. Data collected on the afternoon of June 27 saw an average of 3 available bikes per station in the Silver Spring area. Notable on this day was the prevalence of stations where no classic or e-bike options were available. 5 of 12 monitored stations had no available bikes by 1:30 PM, and only two stations (Lyttonsville Pl. & Lyttonsville Rd. and Garland Ave. & Walden Rd.) held bike numbers above the daily average, with 6-11 classic bikes at each station.

Day 4. Data collected on the morning of June 30 saw an average of 5 available bikes per station in the Silver Spring area. Notable outliers included East-West Highway & 16th St., Fenton St. & Ellsworth Dr., and Fenton St. & Gist Ave. where no classic or e-bike options were available, or limited bike options were available (1-2). Lyttonsville Pl.

& Lyttonsville Rd. and Spring St. & 2nd Ave. maintained bike numbers above the daily average, with 11 classic bikes in Lyttonsville docks and 14 e-bikes in Spring St. docks.

Overall findings yielded an average of 4 available bikes per station over the four day observation period. Fenton St. & Ellsworth Dr. and East-West Highway & 16th St. remained, on average, the stations with the least number of available bikes (0-1), while Lyttonsville Pl. & Lyttonsville Rd. maintained the most available bikes, likely a result of less traffic to the area (10).

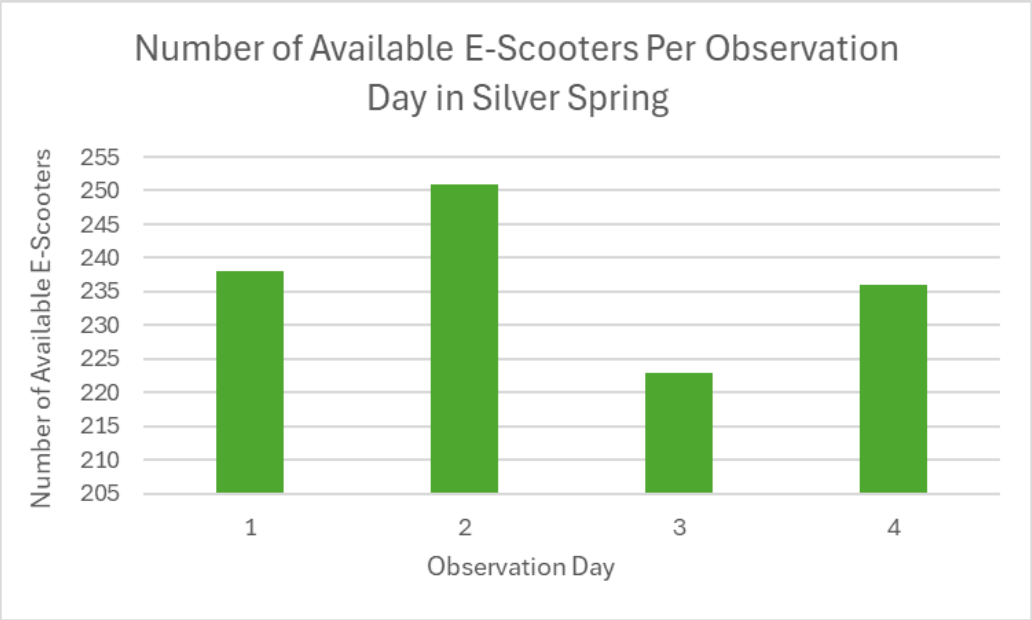
Lime E-Scooters

Collected data for Lime e-scooter coverage can be found in Appendix B. Unlike Capital Bikeshare, Lime operates on a dockless system. Thus, data collection and analysis are based on concentrations of e-scooters rather than bikes in docks, and summarized data highlights the locations of major e-scooter concentrations in the Silver Spring pilot region.

Day 1. Data collected on the afternoon of June 25 saw a total of 238 Lime e-scooters in the Silver Spring area. Approximately 40 e-scooters were situated in proximity of the Silver Spring Metro station, including areas around Colesville Rd., East-West Highway, and Wayne Ave. Approximately 60 e-scooters ran the length of Georgia Ave., remaining near the main road even when parked on adjacent streets like Fenton St. and Colesville Rd. E-scooters parked on off shoot roads primarily surrounded residential high-rise apartment buildings, parking garages, and central shopping and business centers.

Day 2. Data collected on the morning of June 26 saw a total of 251 Lime e-scooters in the Silver Spring area. Approximately 80 were located on and around Georgia Ave., with high concentrations on Colesville Rd. and around major recreational and commercial locations, such as Silver Theatre and Cultural Center and Ellsworth Place. Approximately 30 e-scooters were situated in proximity of the Silver Spring Metro station, including areas of East-West Highway and Ripley St., and another 20 were

located on Wayne Ave. and Ellsworth Dr., close to grocery centers like Whole Foods, CVS, the library, and the Silver Spring Civic Building.



A bar graph detailing the number of available e-scooters per observation day.[26]

Day 3. Data collected on the afternoon of June 27 saw a total of 223 Lime e-scooters in the Silver Spring area. Approximately 50 of these were located on and around Georgia Ave., north of Wayne Ave., with the largest concentration once more centered around Colesville Rd. and adjacent shopping centers. Approximately 47 e-scooters were located south of Wayne Ave. on Georgia Ave., focused primarily on Thayer Ave. and nearby grocery and residential apartment areas. Another 42 e-scooters were concentrated around the Silver Spring Metro station, including areas of Blair Mill Rd. and Colesville Rd.

Day 4. Data collected on the morning of June 30 saw a total of 236 Lime e-scooters in the Silver Spring area. Approximately 40 of these were concentrated around Silver Spring Metro station, along Colesville Rd. Another 40 populated major streets directly off Georgia Ave., including Fenton St. and Wayne Ave. commercial, dining, and parking areas. 25 e-scooters centered around Thayer Ave. and a variety of commercial and residential buildings, and approximately 20 e-scooters were found on Blair Mill Rd. and East-West Highway, near major government buildings such as the National Oceanic and Atmospheric Administration, grocery centers, and residential buildings.

Overall findings indicate an average of 237 Lime e-scooters in the Silver Spring pilot area over the four day observation period. Georgia Ave. and major adjacent streets of Colesville Rd. and Wayne Ave., alongside Silver Spring Metro station, remained the largest areas of concentration.

Analysis of Findings

Comparative Concentrations

While findings indicate a greater concentration of Lime e-scooters in the Silver Spring region than available Capital Bikeshare bikes, the nature of the CaBi system as docked and the Lime system as dockless allows e-scooters a greater degree parking mobility and movement. To best compare concentration, this analysis focuses on the availability of e-scooters and bikes according to location and time of day.

Lime E-Scooters Outside of Silver Spring Metro. Photographed by Author.

Critical to micromobility's role as an instrument for first- and last-mile transit linkage, accessibility, and the reduction of SOV usage are considerations of metro station proximity and availability. On average, over the 4-day period, Capital Bikeshare

maintained an availability of approximately 8 bikes per day between its Silver Spring Metro and Silver Spring Transit Center stations. Comparatively, there were approximately 38 Lime e-scooters per day in the same general proximity. On their own, these numbers indicate a greater proportion of available e-scooters in a core transit area in Silver Spring. However, breaking these numbers down by time of day yields a more detailed pattern of availability:

Time of Day	Capital Bikeshare	Lime E-Scooter
AM	11 bikes	35 scooters
PM	5 bikes	41 scooters

Capital Bikeshare Versus E-Scooter Numbers, Silver Spring Metro-Transit Center.[27]

Between the morning and the afternoon, Capital Bikeshare availability dropped by an average of 6 bikes, indicating a decrease in coverage around the Silver Spring Metro station as the day went on. In the same timeframe, Lime e-scooter numbers increased by an average of 6 scooters, illustrating an expansion in coverage in the same Metro proximity as the day went on. This phenomenon is likely a result of bikes that are taken from bikeshare stations not being returned to the same station (see Trip Origins and Distances), leading to increased e-scooter usage to fill those first- and last-mile gaps. This increased usage was likely enabled by the greater concentration of available e-scooters on major roads such as Georgia Ave., Wayne Ave., and Colesville Rd., and roads surrounding the Metro station, such as Colesville Rd. and East-West Highway.

Another central area where micromobility plays a role is that of downtown Silver Spring and its variety of recreational, commercial, and retail spaces. Capital Bikeshare's most central "downtown" stations, Fenton St. & Ellsworth Dr., Fenton St. & Gist Ave., and Veterans Pl. & Pershing Dr., maintained an average availability of 3 bikes per day between them. Lime e-scooter numbers, in comparison, for the downtown area remained around 57. While bike numbers were low, concentrations of e-scooters indicate a focus on demand in the downtown area from vendors, and a likelihood of

high demand among users. As with Metro station concentrations, time of day distinctions yield integral pattern identifications:

Time of Day	Capital Bikeshare	Lime E-Scooter
AM	5 bikes	60 scooters
PM	3 bikes	55 scooters

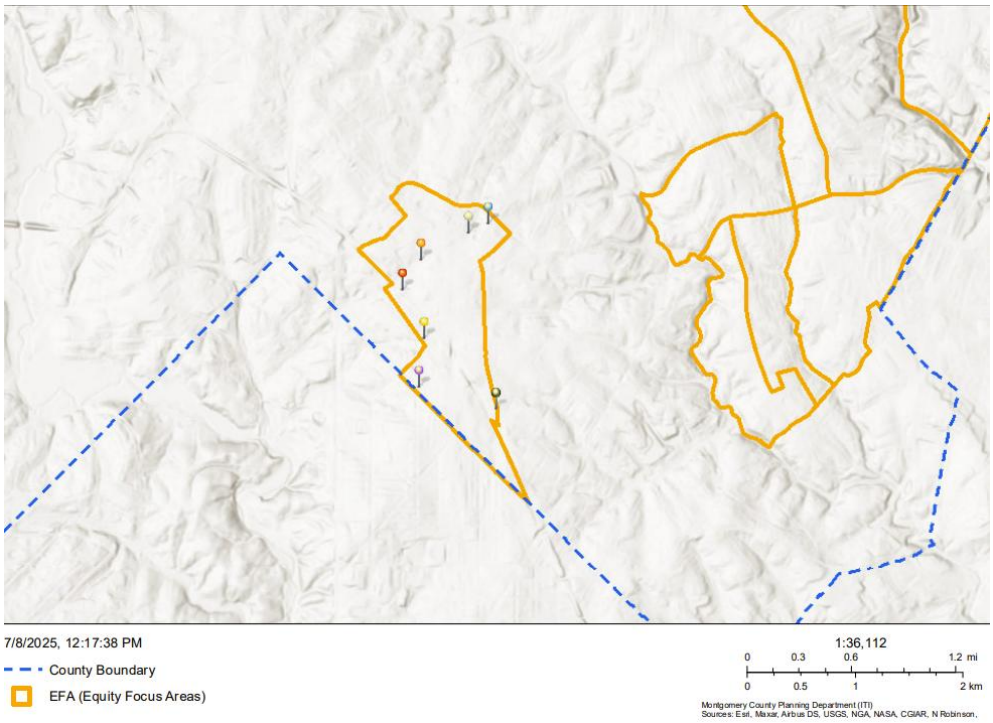
Capital Bikeshare Versus E-Scooter Numbers, Downtown Silver Spring.[28]

Between the morning and the afternoon, Capital Bikeshare availability decreased by an average of 2 bikes, while Lime e-scooter availability decreased by an average of 5 scooters. Similar decreases between times of day indicate a frequency of use for both systems, and proximity to downtown hints at usages for transit linkage, recreation, retail, and work commutes. Lime e-scooter counts were far higher, illustrating a level of coverage wider and more flexible than Capital Bikeshare, but here it is important to consider once more the work of Sun, Yan, & Zhao. While compared to bikeshare, e-scooters did provide a higher level of spatial accessibility for both metro and downtown usage overall due to greater supply, data does not reflect average scooter idle times, or the number of trips taken each day over this four day period. To better understand the quality of coverage, cross comparisons would need to be made between these factors, a limitation to this aspect of analysis.

Placements in Silver Spring EFA

In consideration of equity, the number of stations, bikes, and e-scooters within the Silver Spring EFA compared to the rest of the area is an important factor of this analysis. Mapping done via Populus and MC Atlas shows a majority distribution of Capital Bikeshare stations and Lime e-scooters in the Silver Spring EFA. However, bigger picture comparisons to distributions of e-scooters in other EFAs across the pilot area yield a mixture of proper coverage.

Capital Bikeshare. While bikeshare stations, overall, showed a very limited number of available docked bikes during each observation period, the distribution of these stations throughout the Silver Spring EFA is similar in proportion to other EFAs in Capital Bikeshare's coverage radius. Approximately 58% of CaBi's bikeshare stations in Silver Spring, 7 of 12 stations, were within the Silver Spring EFA.



Silver Spring CaBi Stations Within Silver Spring EFA.[29]

Where bikeshare struggled was in its ability to maintain a sufficient stock of bikes that could be available to residents throughout the day within both the Silver Spring EFA and greater Silver Spring in general. There are several general factors that could explain this shortage in bikeshare stock:

- Heavy usage of bikeshare bikes during morning rush hour periods.
- Insufficient numbers of bikes mandated in rebalancing.
- Sensitivity to distance.

Heavy usage in the morning implies that because more bikes are available in AM hours, a primary time for morning commutes to work, more bikes are used and taken out of the EFA in these hours. More bike usage in the morning due to more availability for commutes decreases the number of bikes that remain in the Silver Spring EFA in the afternoon. This morning availability is reflected in both higher average counts and

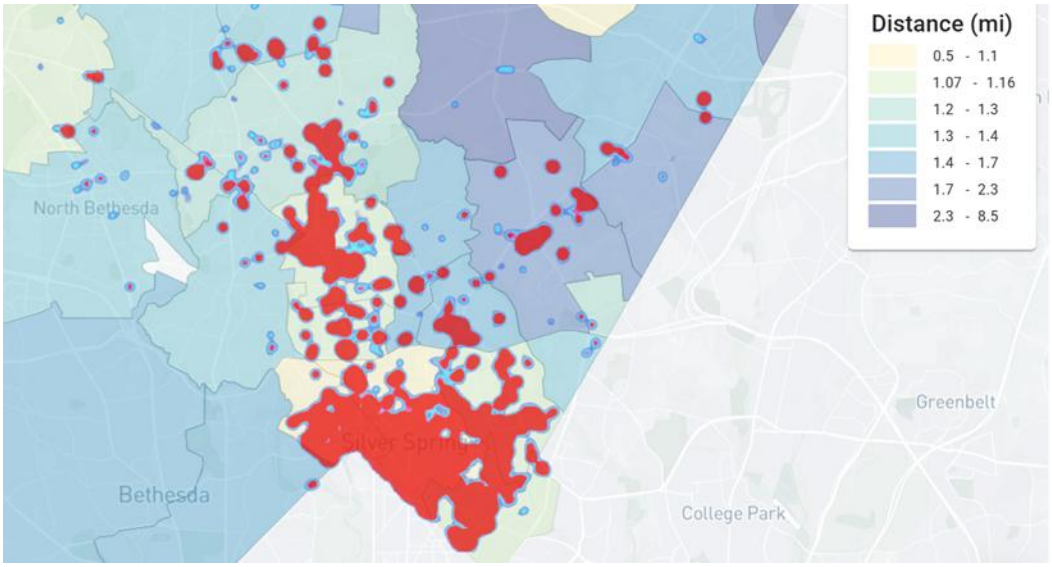
individual station counts on morning observation days. Related to higher morning demand, limited allocation due to flawed rebalancing formulas could yield distributions of Capital Bikeshare bikes insufficient to meet community needs or provide equitable access. This would likely be due to a focus on revenue accrual and usage forecasting that influences the variables present in CaBi rebalancing formulas.

Sensitivity to distance considers an awareness of distance that is present more in e-scooter trips than bikeshare trips. Users on e-scooter trips have been found to be more sensitive to distances traveled compared to those utilizing bikeshare bikes and e-bikes due to either cost, mobility, or parking availability at destinations.[30] As such, it is likely that bikeshare bikes leaving the Silver Spring service area are taking longer trips and not returning, while e-scooters continue to ride for shorter durations and remain within the confines of the region. This assumption is supported by both CaBi ridership data at each Silver Spring station, and Lime e-scooter trip distance and origin trends.

	Grand Total		3/1/2025		4/1/2025		5/1/2025		6/1/2025	
Station Name	Ending Rides #	Starting Rides #	Ending Rides #	Starting Rides #	Ending Rides #	Starting Rides #	Ending Rides #	Starting Rides #	Ending Rides #	Starting Rides #
Grand Total	3,687	5,348	73	1,069	1,085	1,221	1,255	1,486	1,274	1,572
Fenton St & Ellsworth Dr	586	760	14	155	181	180	189	201	202	224
Silver Spring Metro / Coles..	527	715	13	157	168	181	181	191	165	186
Fenton St & Gist Ave	392	565	7	118	108	118	131	157	146	172
East West Hwy & Blair Mill ..	379	560	5	96	108	131	137	170	129	163
Fenton St & New York Ave	327	523	6	147	126	143	89	104	106	129
East West Hwy & 16th St	326	507	7	73	78	97	111	148	130	189
Silver Spring Transit Cente..	301	540	6	111	88	116	105	160	102	153
13th St & Eastern Ave	277	408	4	81	83	86	108	121	82	120
Veterans Pl & Pershing Dr	200	252	7	48	51	63	72	70	70	71
Lyttonsville Rd & Lyttonsvil..	182	207	2	29	33	39	50	51	97	88
Spring St & 2nd Ave	97	192	1	24	29	38	42	73	25	57
Garland Ave & Walden Rd	93	119	1	30	32	29	40	40	20	20

Capital Bikeshare Ridership by Silver Spring Station.[31]

Trends depicted above indicate that the number of starting rides at almost every Silver Spring Capital Bikeshare station from March 30 to June 30, 2025, was greater than the number of ending rides at these same stations. This is also illustrated in monthly totals of starting and ending rides for all Silver Spring stations. More rides began than ended in Silver Spring each month by a margin of approximately 100 to 150 rides, depicting a proportionate gap in CaBi bike availability.

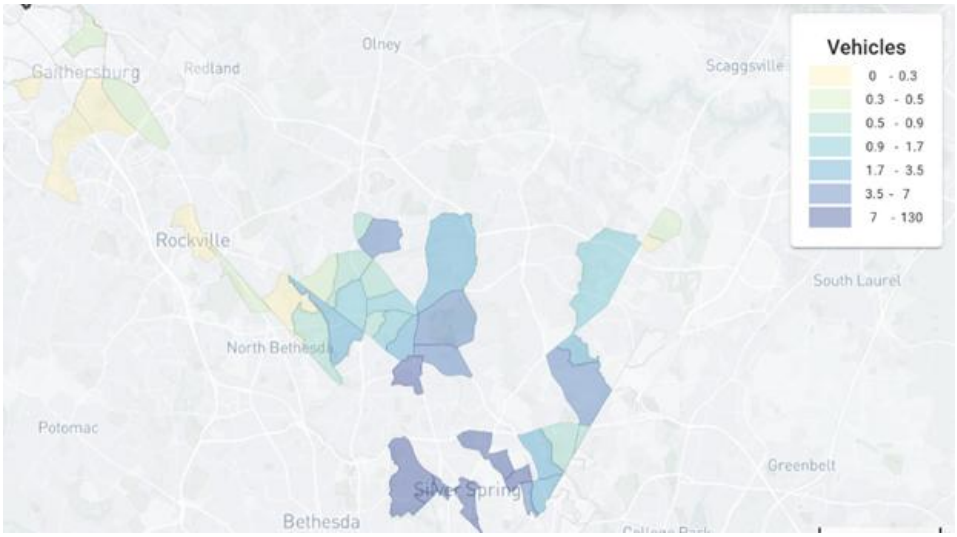


Lime E-Scooter Trip Origins and Distance Heatmap.[32]

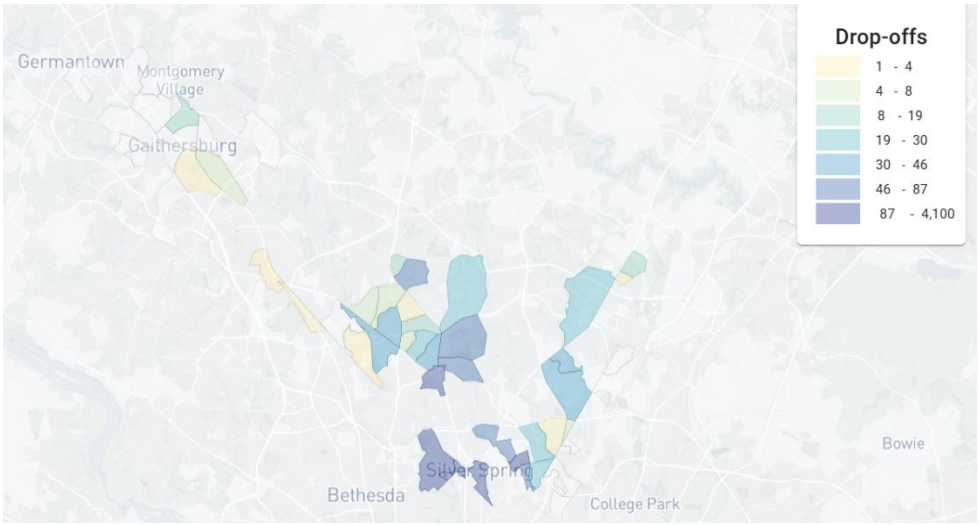
In contrast, origin and trip distance heatmaps from Lime show that over 80% of total trips that began in Silver Spring ended in Silver Spring, a sum of approximately 21,573 rides between March 30 and June 30. Rides in the area maintained an average start to end ride distance of approximately 0.92 miles, a shorter overall distance when compared to an average County-wide e-scooter trip length of 1.17 miles in the same period.

Both sets of data help to reinforce the theory of distance sensitivity, identifying a regional shortcoming for Capital Bikeshare that may require addressing to improve equitable access. While all three factors could, and likely do, contribute simultaneously to CaBi shortages, data most prominently supports distance as a key factor in limited bike counts, raising questions of how Capital Bikeshare approaches rebalancing and distribution throughout the region.

Lime E-Scooters. Many of the e-scooters found in Silver Spring were concentrated in Silver Spring's downtown, encompassing the primary Silver Spring EFA zone. According to mapping data, over the last three months, 55.3% of total Lime vehicles, or 133 e-scooters and e-bikes, have been used and distributed in the Silver Spring EFA. This represents a significant portion of all e-scooters in the County pilot area, and the greatest single e-scooter concentration of any pilot area EFA in the region. The data illustrated below implies Lime allocation focuses primarily on the Silver Spring EFA. The second most distributions to an EFA in the pilot area, the central Wheaton EFA, received only 6% of Lime vehicles in the same period, or 14 e-scooters and e-bikes.



Lime E-Scooter Distribution in Pilot Area EFAs.[33]



Lime E-Scooter Rebalancing in Pilot Areas.[34]

A similar phenomenon can be observed when looking at Lime e-scooter rebalancing rates in the pilot area. The Silver Spring area continues to be where the most e-scooters are dropped off, reflecting EFA distribution trends and representing 67.7% of operator drop-offs in the pilot area. The next largest drop-off percentage to an EFA in the pilot area is 8.8% in the central Wheaton EFA.

A large proportion of e-scooters are concentrated in the Silver Spring EFA, and compared to other EFAs in the pilot area, downtown Silver Spring receives the greatest number of e-scooter drop-offs from Lime. This is likely due to the amount of usage Silver Spring generates, with 3-month ridership numbers showing over 30,000 rides, or 56.4% of total pilot area rides. However, this rationale introduces a cycle of increased accessibility yielding increased usage due to increased attention from Lime. Whether Lime is motivated to rebalance by usage rates or revenue accrual, in EFA areas where accessibility is drastically limited, increased usage cannot occur, and considerations of increased distribution cannot take place.

Additional Challenges and Study Limitations

There are a variety of contextual factors that play a role in determining the equitability of micromobility access and viability of its usage throughout equity areas like the Silver Spring EFA. These include elements such as cost, informational transparency, and public perceptions of micromobility. Context also takes into consideration limitations within the study, and areas where more robust, community-oriented data is required to better shape future equity analyses.

Costs: Affordability, Transparency, and Accessibility

Cost Comparisons

The table below breaks down the average cost of Capital Bikeshare bikes and e-bikes compared to Lime e-scooters in Montgomery County by single trip, day passes, memberships, and low-income equity programs:

Ride Type	Capital Bikeshare	Lime E-Scooters
Single Day/Trip	$1.00 unlock, $0.05/minute (classic bike) $1.00 unlock, $0.15/minute (e-bike)	$1.00 unlock, $0.15/minute to $0.30/minute
Day Pass/Bundle	$8/day, unlocks free 45 minutes free, $0.05/minute (classic bike) $0.10/minute (e-bike)	30 minutes: $4.99/day, $0.17/minute 60 minutes: $8.99/day, $0.15/minute 280 minutes: $36.99/day, $0.13/minute 400 minutes: $49.99/day, $0.12/minute
Membership (Monthly)	-	$1.00 unlock, $5.99/month $2/ride up to 5 minutes $5/ride up to 20 minutes $0.23/min after 20 minutes
Membership (Annually)	$95/year, unlocks free 45 minutes free, $0.05/minute (classic bike) $0.10/minute (e-bike)	-
Discount/Low-Income Program	Bikeshare for All $0/year, unlimited 60-minute rides on classic bikes and e-bikes	Lime Access $0.50 unlock, $0.07/minute

Capital Bikeshare and Lime E-Scooter comparative costs.[35]

The cost of Capital Bikeshare is consistent across the DC Metro Area, with variations only occurring on jurisdictional levels related to Bikeshare for All. Price variations within Capital Bikeshare pricing occur based on whether a user selects a classic bike or an e-bike, and charges are based on ride duration. In the framework of day and

membership passes, the per minute cost of an e-bike is $0.05 more than the per minute cost of a classic bike. For single day trips, this per minute cost for an e-bike increases to $0.10 more than a classic bike. While these are the current prices, rates are set to increase for Capital Bikeshare on August 1.

Lime e-scooters operate on a local rate formula subject to variation based on local costs, permit fees, and surcharges. This might include additional fees to cover city permit costs or regulatory expenditures Lime must handle in order to operate within an area. Like Capital Bikeshare, pricing is based on ride time and is rounded up to the next full minute for billing.[36] Lime's low-income program, Lime Access, allows those enrolled in SNAP, Medicaid, reduced transit fare programs, Social Security, and more to ride at reduced rates.

On average, Lime e-scooters cost approximately $0.10 to $0.25 per minute more than a classic Capital Bikeshare bike, and up to $0.15 per minute more than a CaBi e-bike. Day pass options are an average of $0.07 to $0.12 per minute more than a classic bike, and $0.02 to $0.07 more than an e-bike. Common among both pricing frameworks is the $1.00 unlock fee on single trips. Capital Bikeshare and Lime waive these fees upon the purchase of a day pass (CaBi) or minute bundle (Lime). However, Lime's membership system and low-income program both reintroduce the unlock fee, with a 50% discount to Lime Access users, while Capital Bikeshare's membership and low-income program continue to waive unlock fees.

Transparency and Equity

Distinctions between micromobility pricing clarity illustrate well the nature of accessibility and transparency as they relate to equity. Capital Bikeshare costs maintain a static rate across the coverage area and are clearly listed on the home page of the website. Their relative uniformity in cost across the DC Metro area, a benefit of public ownership, means the accessibility of information and relative cost-measure for users is available ahead of a ride. This allows for financial preparation and the ability for users to gauge pricing suitability.

The nature of Lime's private system and pricing scheme offer a degree less transparency. A clear list of prices or precise costs is not available on the Lime website,

and it is difficult to clearly identify via a search engine. Pricing guidelines and formulas are vague, and estimations used in this analysis are the result of third-party information providers and approximations from other e-scooter vendors. Bundle and membership rates gathered for this comparison can only be accessed via the Lime mobile app, and risk inaccuracy due to locational differences in price. Directly contacting customer service does not yield more specified information, and users are urged to examine pricing in the process of unlocking a Lime e-scooter for use. Thus, comparatively, Capital Bikeshare offers a more transparent, direct, and accessible breakdown of pricing to consumers. This is likely an instance of variations in public and private obligations to transparency and expectations of accessibility and raises questions of the responsibility of e-scooter companies to present clear pricing information to the public.

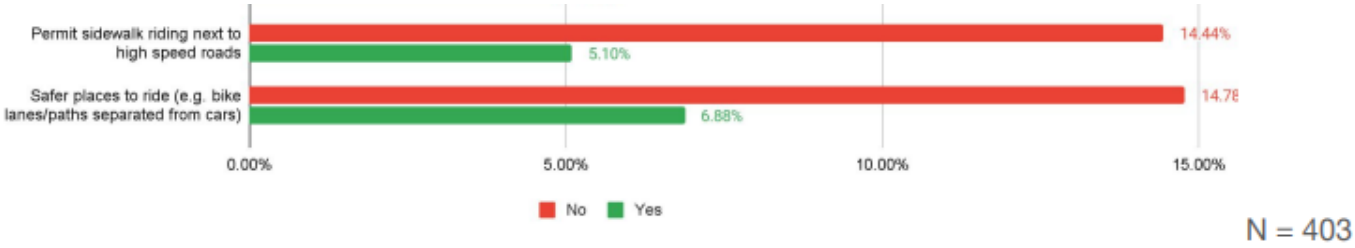
However, regardless of public or private status, from the standpoint of equity, price transparency is critical. Financial barriers in micromobility systems often include the challenges low-income individuals face due to associated costs, compounded by "a limited awareness of reduced-price options" and per minute rates.[37] Studies have recognized that transparency of pricing is a significant financial barrier that deters low-income users from utilizing systems. In Philadelphia, Hoe and Kaloustian (2014) found the cost of bikeshare memberships was a major concern among low-income users until they learned about the proposed $20 per month pass. Enthusiasm indicated affordable, transparent pricing could increase membership uptake. Additionally, Brown and Howell (2024) identified a lack of awareness about reduced-price membership options as a major barrier to e-scooter usage. Only 24% of low-income customers in 2024 were aware of the Lime Access program, and while many programs offered similar reduced fare rates to Lime, these were also not well known.[38] In most cases, these programs are often still considered inadequate due to multifaceted financial constraints faced by low-income individuals.

Public Perceptions of Micromobility

Public perceptions of micromobility, both positive and negative, have a significant impact on aspects of e-scooter accessibility in Silver Spring and other pilot areas, as well as regions of Montgomery County outside of the pilot's borders. Studies have

found that user and non-user perceptions on issues such as accidents and parking problems have raised concerns for use in urban and suburban regions.[39] These attitudes, in turn, have the potential to limit the use of e-scooters and other micromobility options in new areas with the potential for sustainable transit connectivity. Through internal surveys, news reports, and blog posts, this study has identified two interrelated concerns expressed frequently by County residents: safety and parking placement. These concerns have yielded considerable resistance to permitting more available e-scooters and e-bikes and allowing e-scooter and e-bike usage in additional areas. MCDOT internal surveys found 6.29% of 403 respondents were against additional e-scooter usage areas, and 8.33% of these same respondents were against increased availability of e-scooters and e-bikes in the County.

Regulations in the County barring the use of e-scooters on sidewalks have had a significant impact on both safety and parking placement concerns among users and non-users alike. For non-users, focus has been placed on the rate of scooter-related injuries to pedestrians and riders, annual accident counts, and high proportions of head injuries and collisions. For users, while a majority indicated using e-scooters in shared travel lanes used by cars (27.42%) or in bike lanes marked on the street (26.61%), 50% claimed they felt somewhat unsafe doing so, and 14.5% felt they were not at all safe. However, despite claims from both parties, internal surveys found that when faced with the option to improve the e-scooter program by permitting sidewalk riding next to high speed roads or increasing access to safer places to ride, most respondents marked “no.”



Internal Survey Responses: Sidewalk Riding and Safer Places to Ride.

Adjacent to safety concerns, non-users in the County have expressed additional concerns regarding improper and obstructive parking, including vehicles left for more than three days and vehicles blocking pedestrian access to sidewalks, side streets, and business centers. In response to these concerns, the MCDOT MOU has included County

parking policies and requirements for pick up and correction of idle or improperly parked vehicles. However, data gathered by Lime has shown a variety of noncompliance events related to improper parking and idle time limits, phenomena felt by residents in e-scooter pilot communities. This noncompliance has exacerbated resistance from residents within other areas of the County where e-scooter coverage could expand, limiting potential coverage in EFAs where there could be need, reducing public trust, and altering the sustainability of micromobility as an equity tool County-wide.

Study Limitations

Due to limitations on the timeframe available to gather observational data, this analysis recommends a longer, more sustained period of observation within the Silver Spring region. While four days of observation were beneficial in laying out base trends and illuminating broad equity considerations, this study would benefit from at least a month of consistent AM and PM data collection. In addition, survey work has been limited regarding micromobility in communities with both Capital Bikeshare and e-scooters. This has led to ambiguity in interpreting the needs and attitudes of individuals in places like the Silver Spring EFA and understanding the perspectives of those who would most rely on micromobility alternatives. Prioritizing surveys and community outreach for micromobility would work effectively to bridge findings to more significant and targeted equity considerations.

Key Takeaways

- E-scooter concentrations in Silver Spring are greater than available Capital Bikeshare bikes.
- E-scooters fill in accessibility vacuums in areas like the Silver Spring Metro, the Silver Spring Transit Center, and downtown Silver Spring.
- The majority of Capital Bikeshare stations and e-scooters in Silver Spring are within the Silver Spring EFA.
- Capital Bikeshare bike availability in the EFA is limited, despite significant station coverage. There are three likely reasons for this: morning usage, rebalancing formulas, and distance sensitivity.
- Compared to other EFAs in the pilot region, a significant portion of Lime's e-scooter fleet is located in the Silver Spring EFA. This simultaneously indicates *small scale* distribution equity in the Silver Spring area and *large scale* distribution inequity in the greater pilot region.
- Additional factors such as cost difference, transparency, and public perception play a role in micromobility equity.
- Lime is costlier and less transparent than Capital Bikeshare. When Capital Bikeshare access is reduced, so are affordable options for individuals within the Silver Spring EFA.
- Public perception can negatively affect receptibility to e-scooter expansion, limiting the spread of e-scooters to other areas in the County that may need micromobility alternatives.
- This study could benefit from a longer study window and more detailed, micromobility-specific survey data.

Recommendations

The continued pilot phase of the e-scooter demonstration project provides significant flexibility that the Council could utilize to revise and experiment with amendments to the Memorandum of Understanding between the County and Lime. In addition, the working relationship between Capital Bikeshare and the County sets a viable foundation for discussions regarding station rebalancing and equity criteria within EFAs. As such, this analysis recommends the following:

- Amending to the Memorandum of Understanding, inspired by permitting elements of other jurisdictions, to incorporate explicit equity requirements.
- Opening discussions with Capital Bikeshare over equity and rebalancing strategies, providing funding for CaBi bikes and e-bikes, and introducing new stations into the Silver Spring area.
- Considering infrastructure, survey, and partnership alternatives.

A variety of these changes could begin with a focus on Silver Spring as a more contained trial area and expand to include other areas of the pilot. They could also apply to a select portion of the pilot area, offering more comparative results.

Amending the County's Memorandum of Understanding

An amendment to the current Memorandum of Understanding could include a combination of three elements influenced by permitting requirements set in Baltimore City and the City of Alexandria. The first of these are **required equity focus area allocations**. Utilizing a similar method to Alexandria, the County could require percentage allocations for fleets in EFAs, ensuring that pilot area EFAs are not only getting sufficient amounts of e-scooter access, but also a considerable amount of attention from Lime to respond to complaints and rebalance. This not only addresses key equity problems found in literature, but overall findings between distributions in the Silver Spring EFA and other pilot EFAs. Percent allocations would be based on the size and density of each EFA, the number of fleet vehicles available, and expressed need determined through need assessments and community outreach efforts.

Compliance, the second element, would involve implementing compliance score metrics similar to those in Baltimore City. These scores would be based off of 1) an

equitable distribution of dockless vehicle fleets; and 2) the parking of the fleet. They would function to increase the accountability of e-scooter vendors in fulfilling their obligations and set thresholds for performance that can be consistently met within determined reporting periods. Like Baltimore City, the County could require vendors to maintain a certain compliance threshold in EFAs and with parking in order to continue to operate without penalty or termination. Baltimore City currently requires an 85% score in equity zones and that no more than 5% to 10% of vendor fleets remain parked for longer than 5 days in a location, depending on the season. Montgomery County could alter these thresholds to better meet Thrive Montgomery 2050 goals, address resident concerns, or maintain reasonable vendor obtainability. In addition, requiring higher compliance metrics to be met in order for fleets to expand could introduce additional incentive to perform well. This expansion metric could even apply when considering pilot area expansion, bringing with it measurable, consistent compliance reports for parking and equity that could work to address larger community concerns with the safety and viability of e-scooters in new regions.

Finally, **equity plans** could work well to include e-scooter vendors in equity processes and allow them to help define reasonable equity goals within their operating ability. This addition to the MOU would require vendors to implement approved equity plans in Montgomery County, with mandatory elements defined and upheld by the MCDOT. This move could expand networks of accountability, while also acting as a way to gauge areas where vendors might feel operationally strained or poised to withdraw from the pilot area. Inclusion and collaboration with e-scooter vendors that allow them to work *with* the County to fulfill long-term goals is a critical element to consider in the current micromobility climate. As of now, Lime is the only active e-scooter vendor in the County, and equity goals should be balanced with the capacity of Lime in mind.

An important limitation to address in the discussion of equity amendments to the County's MOU is the strength of the County's negotiating position. As of now, the County maintains low e-scooter usage rates compared to other jurisdictions in the region, and it is unclear how suitable other EFAs are for e-scooter use. The MCDOT has expressed concern in the past regarding Lime's withdrawal from the County in the face of added regulations, stressing the delicacy of the arrangement in a climate of

consistent industry upheaval. In consideration of these challenges, this study recommends the potential implementation of new MOU amendments following changes to infrastructure and Capital Bikeshare improvement, and begin with adjustments, such as equity plans, that most include Lime in the process. Following this path increases the likelihood the County can strengthen its capacity for micromobility use and move itself into a better position to negotiate changes to its e-scooter agreements.

Rebalancing, Funding, and New Capital Bikeshare Stations

Discussions with Capital Bikeshare over rebalancing strategies in the County could include considerations of the following:

- Bike availability thresholds in EFAs throughout the County.
- Formula altercations that more explicitly incorporate equitability.
- More frequent rebalancing, or better rebalancing enforcement.

This analysis recognizes that growing pains still exist within the Capital Bikeshare system. While CaBi is not sufficiently meeting rebalancing standards in Silver Spring that have been set internally, such as bike replenishments throughout the day and rebalancing within 2 hours of a station becoming full or empty, the system is still rapidly growing. As the number of bikes has more than doubled, so has the demand for Capital Bikeshare to effectively adjust and allocate staff to rebalance where need is most critical or shortages most severe. In consideration of this, it is possible that discussions with Capital Bikeshare about issues of rebalancing in the County could operate just to get Montgomery County on their radar. Changes in rebalancing attention will take consistent communication and time to see through.

Alongside discussing changes in Capital Bikeshare rebalancing strategies and ensuring proper attention is given to equity areas across the County, there is additional action the Council could take to address Capital Bikeshare bike shortages and the sizable gaps that still exist in CaBi coverage in downtown Silver Spring. The Council could consider increasing funding for Capital Bikeshare, its bikes, and the installation of more stations in major downtown areas like Silver Spring. This could involve allotting a total program budget that facilitates growth beyond sustaining the program's costs, giving Capital Bikeshare the opportunity to grow and invest in its expansion. It could also include

permitting revenue accrued from Capital Bikeshare ridership in the County to contribute directly to the program budget, rather than route back to the General Fund. This would allow Capital Bikeshare to self-fund to a degree that enhances performance standards and incentives to increase ridership and bike access.

Additional Infrastructure Changes

Finally, the Council could consider mandating additional action to support larger equity changes in the County. This might include instituting more detailed needs assessments to gauge demonstrated community desire for micromobility and input on expansion, shortages, and usage. It could also include the prioritization of funding for bike lanes and other bike-safe, scooter-safe infrastructure, such as the allowance of sidewalk riding on roads with speed limits over 35 miles-per-hour to increase ridership willingness and safety in high traffic areas. Finally, supporting community partnership programs in the Silver Spring area with Lime or other e-scooter vendors could help to reduce or cater costs to low-income user bases.

Appendix A: Silver Spring CaBi Data

Station	Number of Capital Bikeshare Docks
Fenton St. & New York Ave.	15
13th St. & Eastern Ave.	15
Fenton St. & Gist Ave.	11
Garland Ave. & Walden Rd.	15
East-West Hwy. & Blair Mill Rd.	15
Fenton St. & Ellsworth Dr.	15
Veterans Pl. & Pershing Dr.	11
Silver Spring Metro	17
Silver Spring Transit Center	14
Spring St. & 2nd Ave.	15
Lyttonsville Pl. & Lyttonsville Rd.	15
East-West Hwy. & 16th St.	19

Table A.1: Capital Bikeshare Station Locations and Dock Numbers.[40]

Station	Day 1 (PM): # of Available Bikes	Day 2 (AM): # of Available Bikes	Day 3 (PM): # of Available Bikes	Day 4 (AM): # of Available Bikes	Average # of Bikes Available/Station
Fenton St. & New York Ave.	0	1 e-bike available	3 classics	3 classics	**2**
13th St. & Eastern Ave.	2 classics	2 classics, 4 e-bikes	4 classics	2 classics	**4**
Fenton St. & Gist Ave.	1 classic, 2 e-bikes	6 classics, 1 e-bike	3 classics	1 classic	**4**
Garland Ave. & Walden Rd.	5 classics	5 classics	6 classics	7 classics	**6**
East-West Hwy. & Blair Mill Rd.	1 classic	1 classic	0	3 e-bikes	**2**
Fenton St. & Ellsworth Dr.	1 classic	1 classic	0	1 classic	**1**
Veterans Pl. & Pershing Dr.	1 classic	2 classics	1 classic, 1 e-bike	1 classic, 2 e-bikes	**2**
Silver Spring Metro	1 classic, 1 e-bike	8 e-bikes	1 e-bike	3 classics	**4**
Silver Spring Transit Center	5 classics	2 classics, 1 e-bike	0	5 classics, 1 e-bike	**4**
Spring St. & 2nd Ave.	2 classics	0	0	14 e-bikes	**4**
Lyttonsville Pl. & Lyttonsville Rd.	9 classics	10 classics	11 classics	11 classics	**10**
East-West Hwy. & 16th St.	0	0	0	0	**0**

Table A.2: Capital Bikeshare Bike Counts Per Day and 4-Day Averages.[41]

Station	Day 1 (PM): Number of Available Bikes	Day 2 (AM): Number of Available Bikes	Day 3 (PM): Number of Available Bikes	Day 4 (AM): Number of Available Bikes
Fenton St. & New York Ave.	0	1 e-bike available	3 classics	3 classics
13th St. & Eastern Ave.	2 classics	2 classics, 4 e-bikes	4 classics	2 classics
Fenton St. & Gist Ave.	1 classic, 2 e-bikes	6 classics, 1 e-bike	3 classics	1 classic
Garland Ave. & Walden Rd.	5 classics	5 classics	6 classics	7 classics
East-West Hwy. & Blair Mill Rd.	1 classic	1 classic	0	3 e-bikes
Fenton St. & Ellsworth Dr.	1 classic	1 classic	0	1 classic
Veterans Pl. & Pershing Dr.	1 classic	2 classics	1 classic, 1 e-bike	1 classic, 2 e-bikes
Silver Spring Metro	1 classic, 1 e-bike	8 e-bikes	1 e-bike	3 classics
Silver Spring Transit Center	5 classics	2 classics, 1 e-bike	0	5 classics, 1 e-bike
Spring St. & 2nd Ave.	2 classics	0	0	14 e-bikes
Lyttonsville Pl. & Lyttonsville Rd.	9 classics	10 classics	11 classics	11 classics
East-West Hwy. & 16th St.	0	0	0	0
Average Number of Bikes Available	**3 available bikes/station**	**4 available bikes/station**	**3 available bikes/station**	**5 available bikes/station**

Table A.3: Capital Bikeshare Bike Counts Per Day and Overall Station Averages.[42]

Appendix B: Silver Spring E-Scooter Data

Observation Day	Number of Scooters in Silver Spring	Major Scooter Concentration Areas
Day 1 (PM)	238 scooters	Silver Spring Metro Georgia Ave. & Colesville Rd. Georgia Ave. & Wayne Ave.
Day 2 (AM)	251 scooters	Silver Spring Metro Georgia Ave. & Colesville Rd. Ellsworth Dr. & Wayne Ave.
Day 3 (PM)	223 scooters	Silver Spring Metro Georgia Ave. & Thayer Ave. Georgia Ave. & Colesville Rd.
Day 4 (AM)	236 scooters	Silver Spring Metro Georgia Ave. & Colesville Rd. Georgia Ave. & Wayne Ave. Georgia Ave. & Thayer Ave.

Table B.1: Lime E-scooter Counts Per Day.[43]

Works Cited

Arlington Virginia. 2019. *County Board Votes to Regulate e-Scooters.* December 16. https://www.arlingtonva.us/About-Arlington/Newsroom/Articles/2019/County-Board-Votes-to-Regulate-e-Scooters.

BCDOT. 2025. *Dockless Vehicles General Provisions.* Baltimore, MD: Baltimore City.

Buehler, Ralph, and Andrea Hamre. 2019. "Business and Bikeshare User Perceptions of the Economic Benefits of Capital Bikeshare." *Transportation Research Record: Journal of the Transportation Research Board.* https://journals.sagepub.com/doi/abs/10.3141/2520-12?casa_token=Gj70cow-wugAAAAA:B7ZeFi0-xq4f5IMEiHUOBoCzvYh0pYElGS7Y6s2S6J-50rGFPLfyuQ7lFnfA-THOf4T9qW4GpAVm_H4.

DDOT. 2020. *Development Plan Update.* Washington, DC: District Department of Transportation.

DDOT. 2025. *Low-Income Customer Program.* https://sharedmobility.ddot.dc.gov/pages/equity.

Harnik, Peter. 2022. *Why the Washington Region's First Attempt at Bikeshare Failed.* September 26. https://ggwash.org/view/86646/why-the-washington-regions-first-attempt-at-bikeshare-failed.

Jin, Scarlett, and Daniel Sui. 2024. "A comparative analysis of the spatial determinants of e-bike and e-scooter sharing link flows." *Journal of Transport Geography* 119. https://www.sciencedirect.com/science/article/pii/S0966692324001686.

Lime. 2025. *Ride Costs and Rates.* June. https://help.li.me/hc/en-us/articles/115004914208-Ride-costs-and-rates.

MCDOT. 2019. "Memorandum of Understanding." Rockville, MD: Montgomery County. https://www.montgomerycountymd.gov/dot-dir/Resources/Files/commuter/Bikesharing/Sample-MOU-Dockless-Vehicle-Demonstration-Project-Spring-2019.pdf.

M-NCPPC. 2024. *Equity Focus Areas.* https://mcplanning.maps.arcgis.com/apps/Cascade/index.html?appid=05d437361e7a4e19a2ba3bbced117d10.

M-NCPPC. 2024. *Equity Focus Areas Analysis.* https://montgomeryplanning.org/planning/equity-agenda-for-planning/the-equity-focus-areas-analysis/.

M-NCPPC. 2025. *Silver Spring.* https://montgomeryplanning.org/planning/communities/east-county/silver-spring/.

Orlin, Glenn. 2011. "Memorandum: T&E Committee #1." Rockville, MD: Montgomery County Council, October 14.

Su, Lin, Xiang Yan, and Xilei Zhao. 2024. "Spatial equity of micromobility systems: A comparison of shared E-scooters and docked bikeshare in Washington DC." *Transport Policy* 25-36. https://www.sciencedirect.com/science/article/abs/pii/S0967070X23002767.

Tuli, Farzana, and Suman Mitra. 2025. "Roadblocks to Ride: Unraveling Barriers to Access Shared Micromobility Systems in the United States." *Journal of Cycling and Micromobility Research* 3. https://www.sciencedirect.com/science/article/pii/S2950105924000469.

Wester, Abby. 2021. *How Montgomery County embraced electric scooters and the future of shared micromobility.* July 27. https://ggwash.org/view/82043/how-montgomery-county-moved-forward-with-e-scooters-and-micro-mobility.

Endnotes

[1] Harnik, Peter. 2022. Why the Washington Region's First Attempt at Bikeshare Failed. September 26. https://ggwash.org/view/86646/why-the-washington-regions-first-attempt-at-bikeshare-failed.
[2] Ibid.
[3] DDOT. 2020. Development Plan Update. Washington, DC: District Department of Transportation.
[4] Orlin, Glenn. 2011. "Memorandum: T&E Committee #1." Rockville, MD: Montgomery County Council, October 14.
[5] Data gathered from Tableau.
[6] Buehler, Ralph, and Andrea Hamre. 2019. "Business and Bikeshare User Perceptions of the Economic Benefits of Capital Bikeshare." Transportation Research Record: Journal of the Transportation Research Board. https://journals.sagepub.com/doi/abs/10.3141/2520-12?casa_token=Gj70cow-wugAAAAA:B7ZeFi0-xq4f5IMEiHUOBoCzvYh0pYElGS7Y6s2S6J-50rGFPLfyuQ7lFnfA-THOf4T9qW4GpAVm_H4.
[7] Tableau data.
[8] Wester, Abby. 2021. How Montgomery County embraced electric scooters and the future of shared micromobility. July 27. https://ggwash.org/view/82043/how-montgomery-county-moved-forward-with-e-scooters-and-micro-mobility.
[9] Data gathered from Populus.
[10] MCDOT. 2019. "Memorandum of Understanding." Rockville, MD: Montgomery County. https://www.montgomerycountymd.gov/dot-dir/Resources/Files/commuter/Bikesharing/Sample-MOU-Dockless-Vehicle-Demonstration-Project-Spring-2019.pdf.
[11] Done via MC Atlas Webmap.
[12] M-NCPPC. 2024. Equity Focus Areas Analysis. https://montgomeryplanning.org/planning/equity-agenda-for-planning/the-equity-focus-areas-analysis/.
[13] Ibid.
[14] Ibid.
[15] Ibid.
[16] M-NCPPC. 2024. Equity Focus Areas. https://mcplanning.maps.arcgis.com/apps/Cascade/index.html?appid=05d437361e7a4e19a2ba3bbced117d10.
[17] Done via MC Atlas Webmap.
[18] M-NCPPC. 2024. Equity Focus Areas. https://mcplanning.maps.arcgis.com/apps/Cascade/index.html?appid=05d437361e7a4e19a2ba3bbced117d10.
[19] Ibid.
[20] Su, Lin, Xiang Yan, and Xilei Zhao. 2024. "Spatial equity of micromobility systems: A comparison of shared E-scooters and docked bikeshare in Washington DC." Transport Policy 25-36.
[21] DDOT. 2025. Low-Income Customer Program. https://sharedmobility.ddot.dc.gov/pages/equity.

[22] Arlington Virginia. 2019. County Board Votes to Regulate e-Scooters. December 16. https://www.arlingtonva.us/About-Arlington/Newsroom/Articles/2019/County-Board-Votes-to-Regulate-e-Scooters.
[23] BCDOT. 2025. Dockless Vehicles General Provisions. Baltimore, MD: Baltimore City.
[24] Capital Bikeshare map data.
[25] Done via Microsoft Excel, utilizing gathered data.
[26] Ibid.
[27] Done via Microsoft Word, utilizing gathered data.
[28] Done via Microsoft Word, utilizing gathered data.
[29] Done via MC Atlas Webmap, utilizing Capital Bikeshare map data.
[30] Jin, Scarlett, and Daniel Sui. 2024. "A comparative analysis of the spatial determinants of e-bike and e-scooter sharing link flows." Journal of Transport Geography 119. https://www.sciencedirect.com/science/article/pii/S0966692324001686.
[31] Tableau data.
[32] Done via Populus map data.
[33] Ibid.
[34] Ibid.
[35] Done via Microsoft Word.
[36] Lime. 2025. Ride Costs and Rates. June. https://help.li.me/hc/en-us/articles/115004914208-Ride-costs-and-rates.
[37] Tuli, Farzana, and Suman Mitra. 2025. "Roadblocks to Ride: Unraveling Barriers to Access Shared Micromobility Systems in the United States." Journal of Cycling and Micromobility Research 3.
[38] Ibid.
[39] Dirsehan (2024); Wincent et al. (2025); Teixeira et al. (2023).
[40] Done via Microsoft Word, utilizing Capital Bikeshare map data.
[41] Ibid.
[42] Ibid.
[43] Done via Microsoft Word, utilizing Populus map data.