NEW YORK CITY COMPTROLLER
BRAD LANDER

Riding Forward

Overhauling Citi Bike's Contract for More Reliable and Equitable Service

BUREAU OF POLICY AND ORGANIZING

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Executive Summary

Over the past decade, Citi Bike has become a vital part of New York City's transportation landscape. As the nation's largest bikeshare system, Citi Bike enables millions of trips each month and has a network of over 1,800 stations and 26,000 bikes.[1] Riders took 30 million trips on Citi Bike in 2022 – five times as many as when the system first launched in 2013. Preserving Citi Bike as a high-quality transportation service is a matter of public interest. The possible sale of Citi Bike from Lyft to a new operator, along with steep maintenance costs and patterns of poor system performance, pose challenges to the system's long-term stability. This report reviews Citi Bike's performance to-date and recommends a comprehensive contract overhaul to ensure more reliable and equitable service, with a strategic mix of performance standards, attention to equitable service, and incentives to enable Citi Bike to thrive as a key element of the transportation network – whether under Lyft or a new operator.

Key Findings

- **In many neighborhoods, Lyft has failed to ensure the availability of bikes.** As Citi Bike's fleet and network have grown, so have the system's operational needs. Rebalancing, or the relocation of bikes between stations, is an essential maintenance action and ensures bikes and docks are both available to riders. Despite contractual obligations to ensure the consistent availability of both bikes and docks throughout its service area, Lyft moves bikes around the system less frequently today than in the past. From 2014 to 2019, Citi Bike completed over 100 annual rebalancing moves per bike compared to just 26 in 2022 - an 80% drop. The rate of rebalancing moves in 2023 is even further below the pace from the past two years. This translates to a lack of available bikes and docks when and where riders need them.

- **Neighborhoods on the outer edges of the system experience far more unusable stations, disproportionately affecting Black, Latino, and low-income residents.** Real-time data in June and July of 2023 reveals that service was much less reliable at the edges of the system, where stations were left empty or without available docks more often and for longer durations. Unusable stations – defined as either a lack of docks or lack of bikes – were concentrated in areas with higher portions of Black and Latino residents and low-income residents than Citi Bike's service area overall. This trend was most noticeable in Brooklyn neighborhoods at the outer edges of the system, including Sunset Park, Flatbush, and Crown Heights.

- **Riders in the Bronx experienced higher rates of unusable stations compared to other boroughs.** Citi Bike users in the Bronx are 89% more likely to encounter an unusable station than they would in the other three boroughs where Citi Bike operates (see Figure 3). On average, stations remain empty more than twice as long in the Bronx than in Manhattan. Extended periods without docks or bikes were also much more common in the Bronx. More than half (52%) of stations in the Bronx had at least one outage exceeding

eight hours during June and July of 2023, while only 14% of stations in Manhattan below 59th St had an outage that long. The exceptionally poor service in the Bronx is partly attributable to the number of disabled or broken bikes at stations in the borough compared to the rest of the system. Citi Bike users would encounter twice as many disabled or broken bikes at a typical station in the Bronx than in other boroughs.

- **Though ridership is at an all-time high, system expansion has outpaced ridership growth.** While slowed ridership growth could be explained by several factors (including membership and day pass affordability and the lack of protected bike lane infrastructure), the lack of available bikes and docks, especially in the Bronx and upper Manhattan, render Citi Bike unusable for potential riders, thereby depressing ridership.

- **Despite numerous instances of service failures, the City does not enforce the performance standards in Lyft's contract.** The City does not exercise its authority to levy fines against Citi Bike's various operators for failing to meet basic service requirements. Analysis of real-time performance in June and July 2023 revealed 11,000 instances where stations remained completely empty or full for at least one hour. At one point in 2018, Citi Bike experienced a significant service decline with only 57% of bikes available to riders due to repair needs, though the contract requires 97% availability. These and other failures to adhere to contract requirements could have resulted in millions of dollars of fines against Lyft. The rebalancing violations from the summer of 2023 alone amount to over $812,000 in uncollected fines.

Summary of Recommendations

Ten years after its launch, Citi Bike has become an essential transportation service for New Yorkers. However, Lyft's failure to deliver reliable service raises serious alarm bells, especially as bike share networks in other cities decline and Lyft expresses interest in selling the system.

To secure Citi Bike's future as a vital and equitable component of New York City's transportation network, the City must overhaul its Citi Bike contract to include a more strategic mix of oversight and incentives as outlined in the following recommendations:

- **Update performance standards with neighborhood-level requirements** to ensure high-quality service throughout the system, not just in aggregate.

- **Strengthen enforcement of basic performance standards** by actually levying fines where Lyft fails to meet minimum performance requirements, especially around rebalancing and fleet availability.

- **Provide financial incentives for consistently achieving and exceeding performance standards**, to provide stronger incentives for reliable and equitable service, and to ensure the system's long-term viability.

- **Expand eligibility for Citi Bike's existing discounted membership program** to reach more low-income New Yorkers and increase ridership in lower-income neighborhoods.
- **Improve transparency through enhanced public reporting on Citi Bike's operations**, to provide more detail on performance and enable improved oversight.

Introduction

Over the past decade, bike share systems have become an integral part of city transportation systems, providing the public with reliable, low-cost mobility service. Since the launch of the first modern bikeshare system in 2010, the industry experienced rapid growth. Spurred by investments in the micro mobility industry as well as bicycle infrastructure, the number of active docked bikeshare systems in the U.S. peaked at 109 systems in 2019.[2]

New York City's Citi Bike system launched amidst this trend in 2013 and quickly became the nation's largest bikeshare service in terms of number of bikes, stations, and trips. Citi Bike bucked national trends, with ridership reaching new highs and sponsorships funding further expansion of the system over the past three years. In 2022, Citi Bike reported over 30 million total trips – almost double the number on the five next largest docked bikeshare systems combined.[3]

In recent years, Lyft, which currently operates Citi Bike, began to face mounting financial struggles. This trend reflects broader challenges among other national private bikeshare operators that led dozens of systems to close. The number of active docked systems declined to 67 in 2020, 56 of which are still operating as of 2023.[4] Lyft, the owner and operator of Citi Bike and multiple other systems around the country, reported declining ridership and increasing costs in many markets. Lyft abruptly shut down its bikeshare services in Minneapolis and Santa Monica and raised prices in other cities, with little to no input from the public or local governments.[5] Recent moves on Lyft's part to sell Citi Bike raise additional questions about its future as an essential transportation service.

These developments highlight the tensions inherent to privately-operated bikeshare systems. Lyft does not receive any subsidy from the City of New York, leaving it reliant on user fees and sponsorships to be profitable, and potentially in tension with the City's interest in providing reliable and equitable service across all neighborhoods. While strong growth and high ridership puts Citi Bike in a secure position relative to systems in other cities, a system of its size and utilization requires considerable resources to operate and maintain.

Citi Bike is now at a critical juncture. Ensuring Citi Bike's future as a stable, reliable mobility service requires analyzing the system's past performance and current operating environment. This report reviews the system's performance using monthly reports provided by Lyft and prior system operators, as well as real-time data collected over a two-month period during the summer of 2023 that provides more granular details about service quality. These data demonstrate concerning patterns of poor system performance that impacts the quality and equity of service for riders. To address performance issues and ensure equitable, efficient service in the future, this report puts forward concrete recommendations to preserve Citi Bike as a world-class bikeshare system and public good.

Background and History

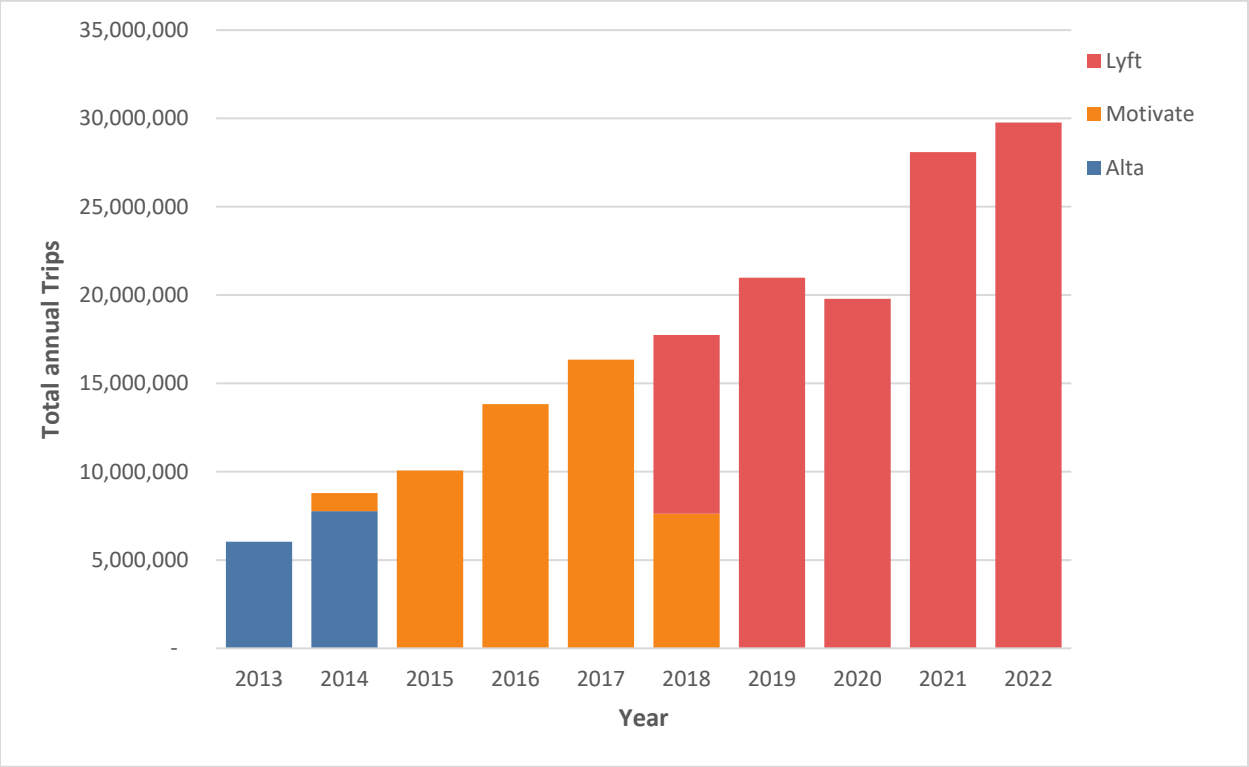
Citi Bike first launched in 2013 and has since become an important fixture of New York City's transportation landscape. Citi Bike is a docked bike share system, consisting of a fleet of traditional and electric bikes and a network of stations throughout the city. Multiple payment options available to riders include single-trip purchases, day passes, and annual memberships, with prices varying based on bike type, trip duration, and membership status. Citi Bike is available for use 24 hours per day, 365 days out of the year, with bikes and stations located throughout Manhattan, Brooklyn, Queens, the Bronx, and Jersey City.

Citi Bike emerged in New York City at a time of growing support for bicycle infrastructure and facilities. Bicycle usage and ridership were already on the rise, after the City added over 350 miles of bike facilities between 2007 and 2013 under Mayor Bloomberg and DOT Commissioner Janette Sadik-Khan.[6] The number of bicycle commuters doubled between 2007 and 2011, and for the first time, bicycling reached 1% mode share in 2013.[7]

Following a feasibility study by the Department of City Planning, the City issued a request for proposals for bikeshare in fall 2010. NYCDOT ultimately selected NYC Bike Share, a new subsidiary of Alta Bike Share, as the operator for Citi Bike. The system received its name following a sponsorship agreement with Citibank. NYC Bike Share, and all subsequent Citi Bike operators, are under contract with the City but have never received public subsidies for system operation, aside from providing street and sidewalk space for stations. Citi Bike has exclusively relied upon sponsorships, advertisements, and membership and fees to support its operations.

The contract includes financial penalties for not meeting a set of performance standards. These standards have to do with the level and quality of service, the operator's responsiveness to user complaints, and the availability of data and reports about the system. The City retains authority to levy fines in situations where the operator does not meet the standards defined in the contract, with penalties based on the number and duration of violations.

Figure 1: Citi Bike Ridership by year and system owner



Alta Bikeshare (2013-2015)

The first Citi Bike trips took place on May 27, 2013, with 6,050 total trips on the day of its launch.[8] The system consisted of 6,000 bikes and 330 stations distributed around lower Manhattan and northwest Brooklyn. NYC Bike Share, a subsidiary of Alta Bikeshare, made 5,000 founding annual memberships available for purchase starting in April 2013, all of which sold out within 30 hours.[9] Memberships started at $95 per year, and at a discounted rate of $60 per year for NYC Housing Authority (NYCHA) residents.[10] Citi Bike saw over 8 million rides during its first 12 months in operation (Figure 1).

In October 2014, Alta Bikeshare came under new ownership and the system received an increase in private funding following a $70.5 million sponsorship deal with Citibank.[11] These funds paid for the expansion of the system from 330 to 700 stations and from 6,000 to 12,000 bikes by the end of 2017 (Figure 2). Alta also announced plans to expand Citi Bike into more neighborhoods including Harlem, Astoria, Prospect Heights, and Crown Heights. The annual membership fee also increased to $145 in 2014, although the discounted rate for NYCHA residents remained in place. By the end of 2014, Citi Bike served at least 40,000 riders per day and had just under 90,000 annual members.[12]

Motivate (2015-2018)

Shortly after its acquisition of Citi Bike, Alta Bikeshare rebranded as Motivate in 2015 and deployed 140 new stations in Greenpoint, Long Island City, and the Upper East Side.[13] Citi Bike ridership continued to grow throughout this period. The system reached 100,000 active annual members as of May 2016 and averaged well over 1 million rides per month. By 2017, Citi Bike had expanded into upper Manhattan and further into Brooklyn and Queens, with a total of 754 stations and 12,000 bikes – over double the number three years prior.[14] Toward the end of Motivate's operations, riders made over 50 million trips in 2017.[15]

Lyft (2018-present)

In the summer of 2018, Lyft acquired Motivate for $250 million. Shortly after the sale, Lyft announced plans to invest an additional $100 million into Citi Bike to double its service area and triple the number of bikes in its fleet.[16] The investment expanded user discounts, offering $5 monthly memberships to Supplemental Nutrition Assistance Program (SNAP) recipients as well as NYCHA residents. Lyft also introduced a new function in its mobile app for riders to check out bikes. After Lyft introduced electric bikes into its fleet for the first time in 2019, average daily ridership was regularly well over 100,000 trips per day.[17]

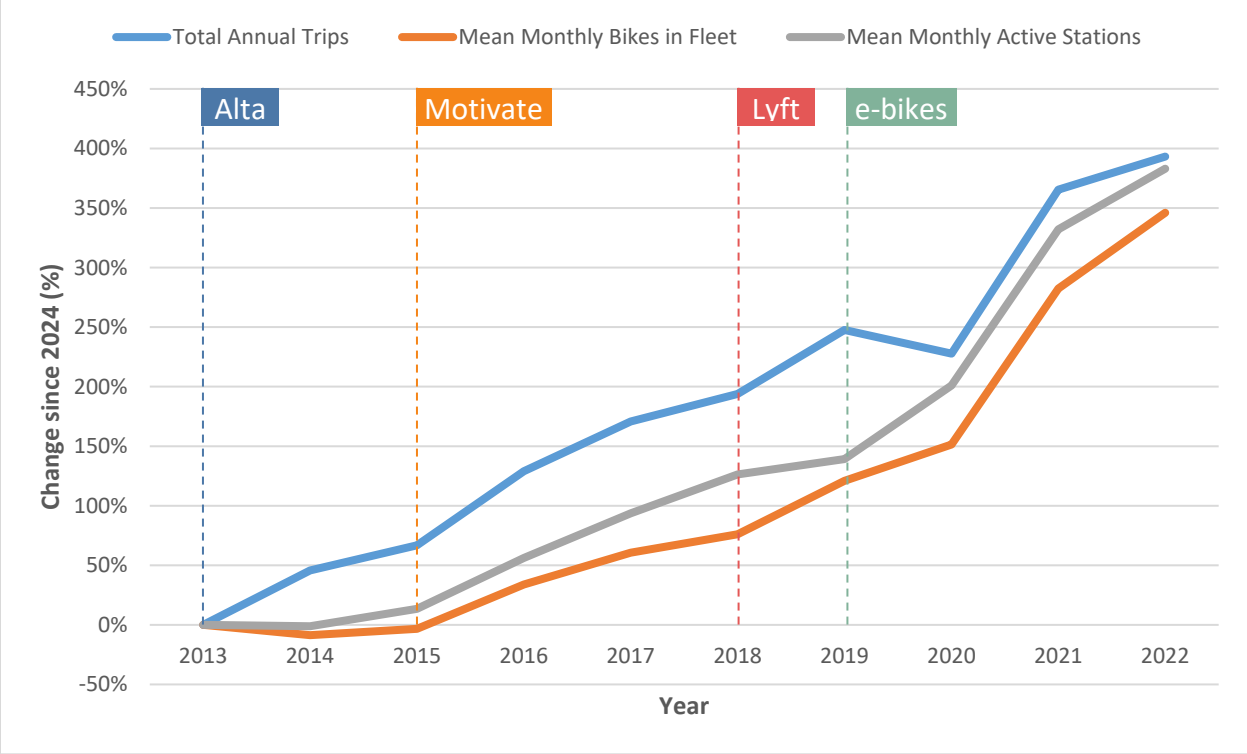
Under Lyft, Citi Bike experienced a second, more rapid expansion (Figure 2). There were approximately 750 active stations in July 2018. This number doubled within three years, reaching 1,500 active stations in July 2021.[18] Citi Bike's expanded service area spanned throughout multiple neighborhoods in the Bronx, Queens, and Brooklyn, in addition to all of Manhattan. Lyft also followed through on its commitment to expand Citi Bike's fleet, which doubled from approximately 10,000 bikes in 2018 to well over 20,000 in 2021.[19] As of June 2023, Citi Bike's fleet consisted of nearly 29,000 bikes, 20% of which were electric bikes.[20]

Ridership continued to grow during this period (Figure 1). While transit ridership and, to a lesser extent, vehicle traffic dropped due to the Covid-19 pandemic, Citi Bike usage increased dramatically. Annual membership sign-ups increased by 25% (180,000 in 2019 compared to 225,000 in 2020).[21] While overall ridership in 2020 was slightly lower than in 2019, total trips jumped from 19.7 million in 2019 to 28 million in 2021 – a 42% increase. This trend reflects the overall increase in cycling that took place amidst the pandemic. Ridership has continued to increase through 2023, outpacing prior years through the first half of the year and reaching 3.4 million trips in May 2023. More neighborhoods have access to Citi Bike than ever before, with new stations opened in Jackson Heights, Queens in August 2023.[22]

While ridership grew steadily in recent years, expansion of the system outpaced ridership growth since Lyft took over operations. The average number of rides per bike per day fell from five in 2015 to 3.2 in 2022, with the sharpest decrease occurring between 2019 and 2020, when total ridership dipped. This drop is consistent, even accounting for seasonal ridership patterns. Although this number does not differentiate between different types of bikes, users rent out electric bikes three times as often as classic bikes, driving up total ridership.[23]

In 2023, Lyft announced that the company was seeking a buyer for Citi Bike and intended to sell off the system. The news broke following years of financial challenges at Lyft, which could face bankruptcy in the coming months.[24] Lyft's downturn poses serious challenges for the City of New York, which has come to depend on Citi Bike as an essential transportation service. Despite the challenges facing the system, Lyft and the City revealed plans in November 2023 to double the number of electric bikes in the fleet and electrify 20% of stations in future years.[25] In that agreement, the City also negotiated a limited expansion of membership discounts for first-time enrollments who live in the Phase 3 expansion area, as well as price caps for e-bike rides for the first time, ending a rule preventing the City from setting e-bike prices. These actions will help meet growing ridership demands and allow for onsite charging of e-bikes, ensuring better availability. However, operating costs have increased as the system expanded and more bikes, especially e-bikes, were added to its fleet. Doubling the number of e-bikes may further contribute to the maintenance pressures facing Citi Bike.

Figure 2: System Growth (2013 to 2023)



The total annual trips and the size of the system have consistently grown since the system launch. On this chart, system owners are noted at top with the year they took over the system. Electric bikes were first introduced in 2019.

What's Next for Citi Bike?

The public-private partnership governing Citi Bike to-date has allowed the system to expand, serve more riders, and upgrade its equipment and software at no cost to taxpayers. However, with Lyft looking to exit the bikeshare business, Citi Bike's future is uncertain. Another private company may opt to purchase the system, or the City could choose to publicly fund it. Both scenarios carry challenges for the management and maintenance of the system. A new private operator could choose to shut down or sell off the system at any time with no input from the public, as seen in cities like Minneapolis. While Citi Bike's strong ridership and visibility as an essential transportation service may insulate the system from extreme outcomes, the City must establish a contingency plan to ensure its long-term availability as an essential component of New York City's transportation network.

Analysis of Citi Bike Performance

Every month since its launch in May 2013, Citi Bike has published public reports containing data on the system's performance, compliance with its contract, and ridership levels as part of its agreement with the City. Citi Bike also maintains a real-time source of station and system data, in the General Bikeshare Feed Specification format. These data sources help provide insight into both the performance of the system as well as its usage and growth, over time and at specific points in-time.

System Performance

The quality of service provided by Citi Bike has fluctuated over the years, particularly in the availability of bikes and docks across the system. While Citi Bike monthly operating reports are somewhat limited in performance data, Citi Bike does post real-time system data on the status of individual stations throughout the system, including the number of bikes and number of docks available and the number of broken bikes and docks. Live feed data collected during the months of June and July 2023, a period of high ridership for the system, reveal significant disparities in the quality of service across different parts of the system and along different metrics.[1]

Inspections and Repairs

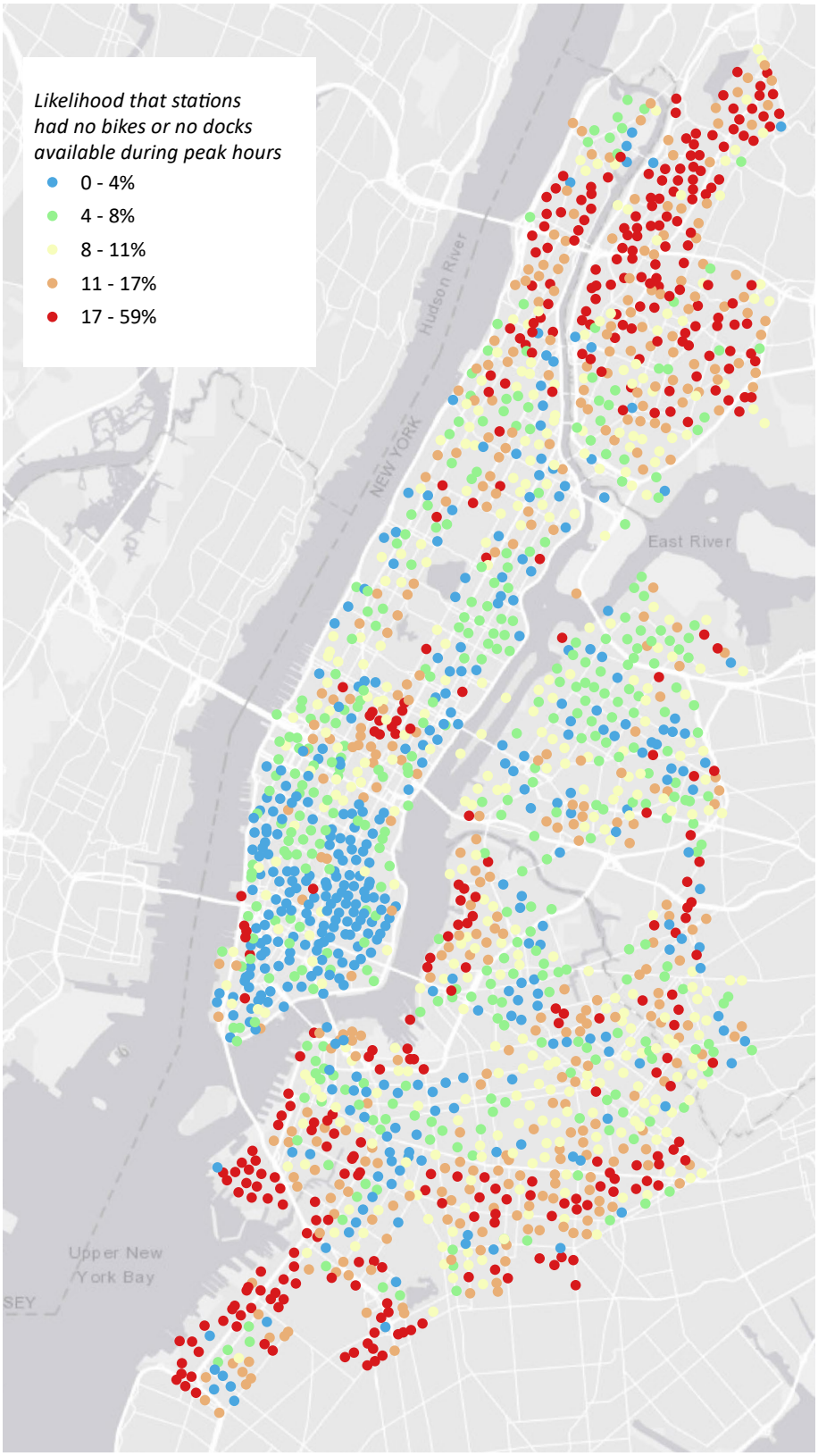
As the number of bikes in Citi Bike's fleet grew, so did the system's maintenance needs. Citi Bike's operating agreement with City requires a full mechanical check for every bike at least once every month. Maintenance for individual bikes must be conducted at least 10 days apart. Prior to 2015, individual bikes received less than one inspection or repair each month. The number has since increased, with each bike receiving 1.95 inspections or repairs per month as of 2022. Electric bikes need more maintenance than classic bikes because technicians must charge them offsite. Following the November 2023 announcement that Lyft will double the number of e-bikes in its fleet, the maintenance demands on the system will grow at least in the short term. Electrification of docks can ease this burden by enabling onsite recharging of e-bikes. Up to this point, the number of inspections and repairs per bike has been flat since 2016, three years before Citi Bike introduced e-bikes into its fleet.

[1] This report relies on Generalized Bikeshare Feed Specification (GBFS) data to assess Citi Bike usage and performance patterns in June and July 2023. Citi Bike maintains this data feed and there are occasionally instances where data is missing or incomplete. Therefore, the analysis presented in this section of the report relies on estimates derived from available GBFS data. See Methodology section for a detailed description of data sources and limitations.

Bike and Dock Availability

Riders in neighborhoods at the edges of the Citi Bike system are more likely to encounter a scenario where all nearby stations have no bikes or docks available (Figure 4). Most stations have bikes and docks available most of the time. During peak travel times between 7 am to 11 am and 4 pm to 10 pm, the average station had either no available bikes or available docks 9% of the time. However, riders in the Bronx and along the southern edge of the system in Brooklyn were more likely to encounter unusable stations with no available bikes or docks 25% to 59% of the time during peak hours (Figure 3).

Figure 3: Station Availability



Rebalancing

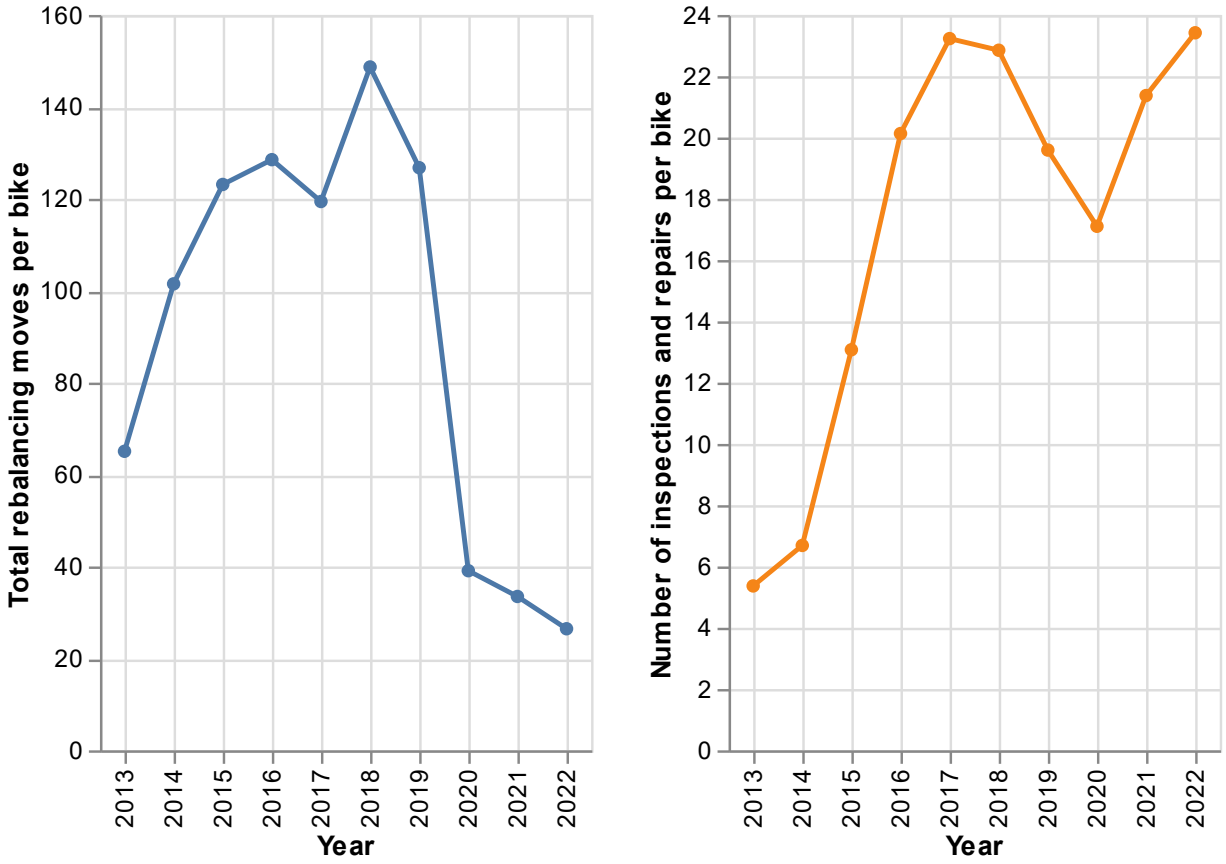
Citi Bike works best when both bikes and docks are consistently available throughout the system so that at any given time a rider can take out or return a bike at any station. Bike rebalancing is critical to ensuring high-quality, consistent service and the availability of bikes at every station. In New York City, the rush in and out of Manhattan during commuting hours, one-way trips, and other idiosyncrasies in how New Yorkers use Citi Bike leave some stations empty and some stations full at any given point in the day.

Citi Bike's contract with the City requires operators to deploy crews to move bikes between stations to ensure bikes and docks are consistently available to riders across locations, among other maintenance tasks. Citi Bike's workforce of mechanics, call center operators, and truck drivers unionized in 2014 and the system currently supports just under 1,000 high-quality jobs.[26] To supplement rebalancing operations conducted by staff, Motivate created a "Bike Angels" program in April 2017.[27] The program, now administered by Lyft, incentivizes customers to drop off or pick-up bikes at specific stations in exchange for cash or credits for rides.

One of the most concerning metrics of Citi Bike's performance is that Lyft currently makes far fewer rebalancing moves per bike now than operators in years past. From 2014 to 2019, there were over 100 annual rebalancing moves for every bike in the fleet. That rate has fallen sharply to just 26 rebalancing moves per bike last year – an 80% drop (Figure 4). Analysis of current service levels shows frequent and extended periods at multiple points during which bikes and docks were unavailable, indicating the need for more rebalancing system wide.

While the numbers in Figure 3 only reflect rebalancing moves made by Citi Bike staff, analysis of real-time system data reveals widespread bike and dock shortages throughout the system. Riders in Sunset Park or Kensington in Brooklyn or University Heights, Fordham, Morrisania, or Fordham Heights in the Bronx would have encountered Citi Bike stations with no bikes or no docks more than 20% of the time during peak hours throughout June and July. In comparison, typical stations in Manhattan below 59th St were unavailable 5% of the time. Stations in these Brooklyn and Bronx neighborhoods also remained completely empty or full for longer durations. The typical durations with no bikes or docks were more than three hours in Sunset Park and Ocean Hill, Brooklyn, and Maspeth, Queens, and more than two hours in Bedford Park, Bronx, and Ridgewood and Sunnyside, Queens. Outages at Manhattan stations below 59th Street typically lasted just 22 minutes.

Figure 4: Total rebalancing moves and inspections/repairs per bike per year



Demographic Disparities in Service

Unusable stations – defined as either a lack of docks or lack of bikes – are concentrated in areas that have higher portions of Black and Latino residents and low-income residents than Citi Bike's service area overall (Figure 6). This trend is most noticeable in Brooklyn neighborhoods at the outer edges of the system, including Sunset Park, Flatbush, and Crown Heights (Figure 5). Nearly all stations in upper Manhattan and the Bronx experience chronically poor service, relative to the system overall. Citi Bike users in the Bronx are 89% more likely to encounter an unusable station than they would in the other three boroughs where Citi Bike operates (see Figure 5).

Figure 5: Poor service areas and proportion of the population that is Black and/or Hispanic/Latino

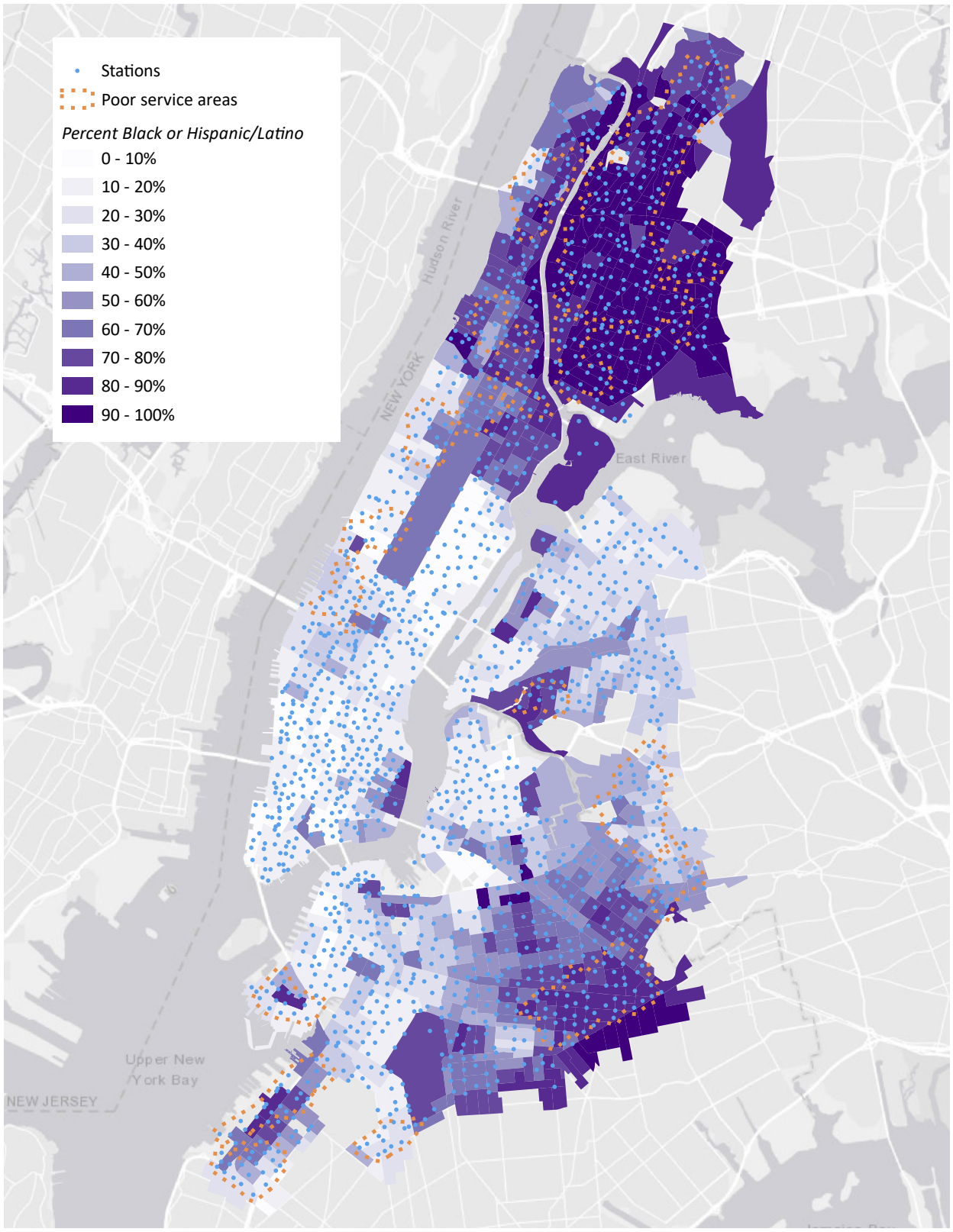
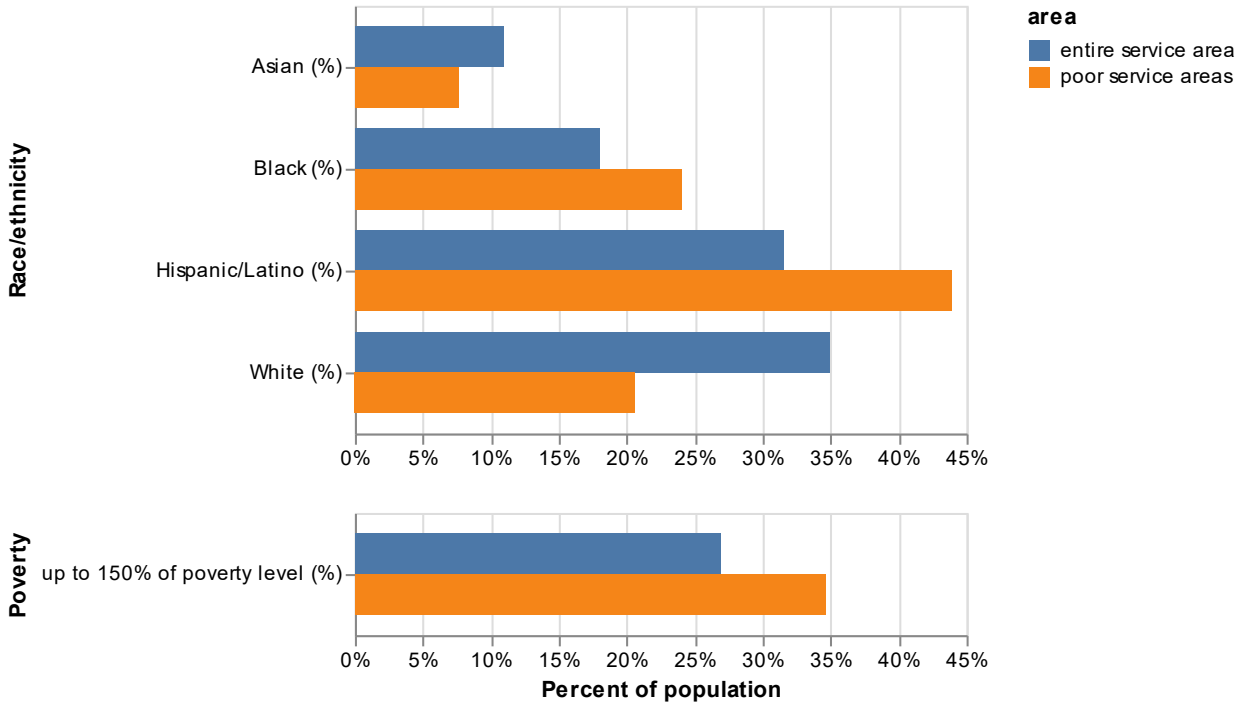


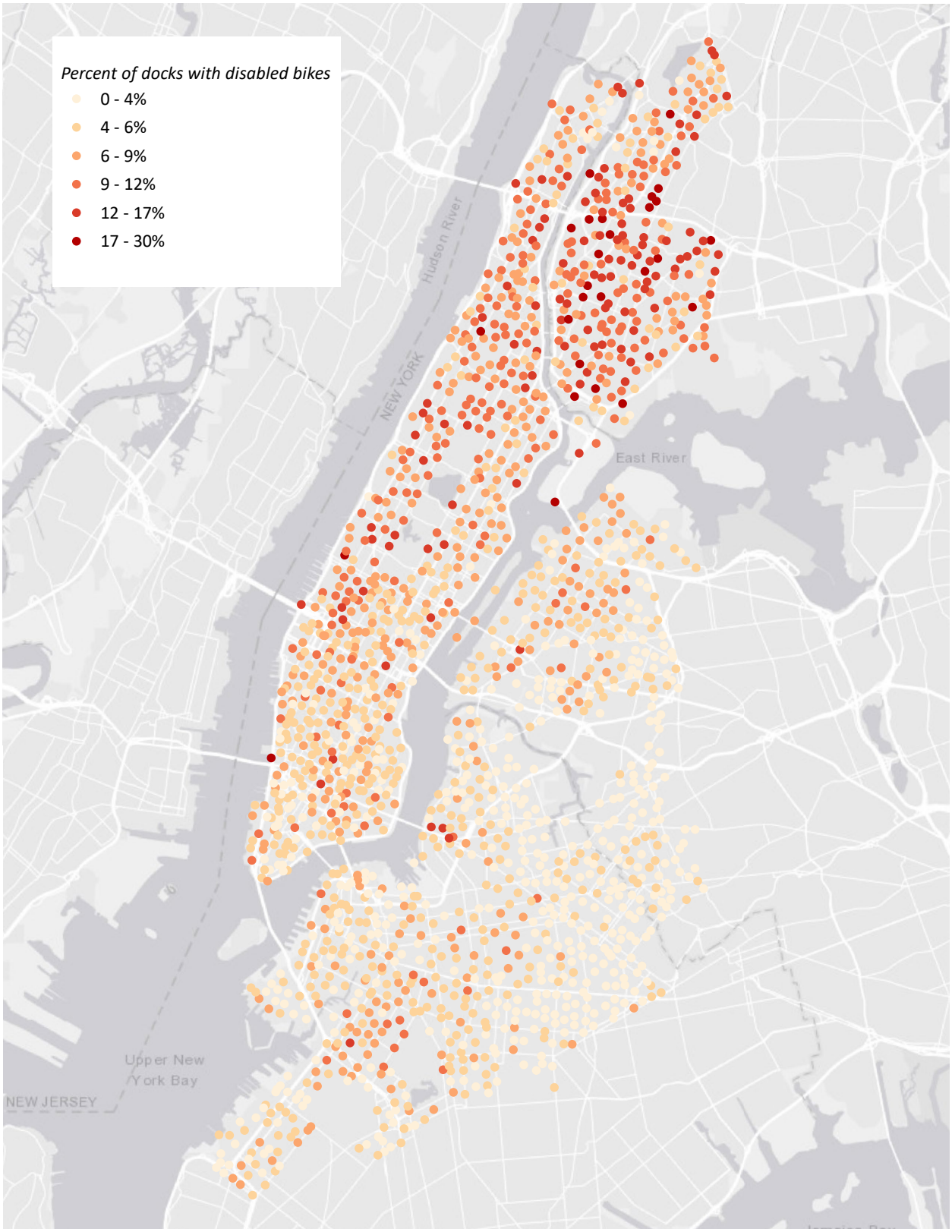
Figure 6: Racial/ethnic and income characteristics of areas with poor service



Broken and Disabled Bikes

The exceptionally poor service in the Bronx is partly attributable to the number of disabled or broken bikes at stations in the borough compared to the rest of the system (Figure 7). The number of bikes in Citi Bike's fleet is at an all-time high and each bike in the system received an average of 1.8 inspections or repairs per month in 2023. This number has remained consistent even as the fleet grew. However, Citi Bike users would encounter twice as many disabled or broken bikes at a typical station in the Bronx than in other boroughs (as a fraction of the number of total docks at each station). This points to a need for more geographically focused repair and maintenance operations.

Figure 7: Average percent of docks with broken bikes by station



Citi Bike's Contract and Performance Standards

Under its agreement with the City, Citi Bike must meet certain performance standards designed to ensure operators provide high-quality service to riders. The current operating agreement went into effect in 2012 and stipulated that Citi Bike would be available to the public for an initial five-year term from 2012 to 2017. In 2018, DOT opted to extend the current agreement through 2029.[28] Although the contract does not officially expire until then, parties can revise it at any time and have done so at least ten times in the past ten years.

Figure 8 lists a selection of performance standards from the contract.

Figure 8: Citi Bike Contractual Performance Standards

Service Metric	Description	Required Performance Level	Penalty
Bicycle Fleet	At least 90% of the Bicycle Fleet must be available between March and November. At least 70% must be available between December and February.	<100%	$15 per bicycle
Rebalancing – Peak Hours	Stations must not be completely full or completely empty between 8am and 8pm Monday through Friday. No penalties sought unless the next closest station in any direction is also full or empty at the same time.	<98%	$50 per hour per station, after 60 minutes
Rebalancing – Off-peak Hours	Stations must not be completely full or completely empty between 8:01pm and 7:59am any day of the week. No penalties sought unless the next closest station in any direction is also full or empty at the same time.	<96%	$50 per hour per station, after 120 minutes
Station Uptime	All station communication and transaction systems must be fully functional, unless operator has notified DOT and customers in advance about upgrades.	<98%	$8 per minute (sum total across stations)

Service Metric	Description	Required Performance Level	Penalty
Operational Docks	Docks must be repaired within 48 hours of discovery or notification of a defect.	<99%	$10 per dock
Customer Service	New York City-based call center must answer a minimum of 80% of calls received, from 7am to 7pm 365 days per year.	<100%	$95 per call below 80% minimum
Data Availability	The operator must provide all reports on the agreed-upon schedule.	<100%	$50 per day

Unlike many contracts involving private entities that provide a public service, the City does not subsidize Citi Bike or directly compensate the operator, aside from providing street and sidewalk space for stations. All Citi Bike revenues come from sponsorships and payments riders make in exchange for memberships and bike rentals. Citi Bike is also exempt from approval from the Franchise and Concession Review Committee (FCRC), which typically oversees agreements involving the private use of city-owned property.

It is unclear if the City enforces the terms of its contract with Lyft or levies fines against the operator for failing to meet predefined performance standards. In September 2018, the system experienced a dramatic decline in service, with only 57% of bikes available to riders due to repair needs. This was far below the required 97%.[29] Motivate, the operator at the time, failed to meet the required standard for the entire month. While the City had the authority to levy over $1 million in fines, the contract grants the Department of Transportation (DOT) discretion over whether to pursue damages. DOT chose not to fine Motivate in this instance.

Analysis of real-time Citi Bike usage data recorded in June and July 2023 reveal frequent failures to meet performance standards. During this two-month period alone, there were 11,600 instances when stations were empty or full, and the nearest station was also empty or full, for more than two hours off peak or more than one hour in peak hours. In each of these instances the City could have fined Lyft. These outages lasted, on average, more than four and a half hours during off-peak times and more than two hours at peak times. Lyft would have been liable for $812,000 in penalties for these failures to meet rebalancing requirements.

The Citi Bike contract also requires that no more than 10% of its fleet (approximately 2,900 bikes based on the current fleet size) be out of service during summer months. In reality, an average of 3,645 broken bikes were docked at stations throughout June and July. The true number of out-of-service bikes was likely higher, as the count does not include bikes removed from circulation for repair. Because the contract terms do not specify exactly how to calculate $15/bike penalty

for this requirement, it was not possible to estimate the amount in fines for which Lyft could have been liable.

Notably, these instances are not evenly distributed throughout the system. As discussed in the previous section on system performance, stations remained entirely full or empty for longer durations in at the outer edges of the system in Brooklyn, Queens, the Bronx, and upper Manhattan. This points to a need for geographically focused performance standards to deliver more equitable service.

Public data on Citi Bike usage and performance is self-reported, and packaged in a format that does not necessarily match standards in the contract. Lyft issues performance reports on a monthly basis that aggregate data over a 30-day period. Although more detailed real-time performance and service data are available via the Generalized Bike Share Feed Specification (GBFS) format, this dataset cannot be easily viewed or analyzed without advanced data processing skills (Figure 9). Even with such methods, real-time data must be recorded before being analyzed and the current nature of the feed mean any instances when the data are unavailable are lost to further analysis. Private citizens can and have utilized this data to build dashboards and tools to provide snapshots of bike and station availability throughout the system. However, Citi Bike does not maintain a platform for visualizing or analyzing historical GBFS data or using it to assess contract compliance.

Figure 9: Snapshot of Citi Bike data in the Generalized Bike Share Feed Specification (GBFS)

{"data": {"stations": [{"num_docks_available": 0, "last_reported": 86400, "is_renting": 0, "is_returning": 0, "vehicle_docks_available": [{"vehicle_type_ids": ["1", "2"],
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Recommendations

Ten years after its launch, Citi Bike has become an essential transportation service for New Yorkers. Investments in both the system and citywide bike infrastructure contributed to steady growth in ridership and more widespread adoption of cycling as a means of transportation. Maintaining reliable, high-quality Citi Bike service requires a great deal of resources on the part of its operator as well as the City. As the system's fleet and footprint grew, enabling growth in ridership, so did the effort and cost of operating it. Ensuring Citi Bike's viability in the future requires optimizing the performance of the current system. The City's contract with Citi Bike's operator, currently Lyft, is the best tool for improving performance in the near-term as well as ensuring the system's durability as a high-quality transportation service. The City should overhaul its contract to send a clear message Lyft and all future operators that Citi Bike must be held to higher standards.

Citi Bike's contract remains almost entirely unchanged since 2013, despite major changes to the system and its operators. Although the contract does not expire until 2029, the City can modify it at any time and has done so at least 10 times in the past 10 years. In the decade since Citi Bike's launch, ridership, fleet size, and number of stations have increased five-fold. The system now includes thousands of e-bikes and its geographic footprint spans across four boroughs. A new contract can set higher performance standards appropriate for a system of Citi Bike's size and complexity and be designed to deliver consistent, high-quality service regardless of whether Lyft continues to operate the system or sells it down the road.

To secure Citi Bike's future as a vital and equitable component of New York City's transportation network, the City must overhaul its Citi Bike contract to include a more strategic mix of oversight and incentives as outlined in the following recommendations.

1. **Create neighborhood-level performance standards to ensure high-quality service throughout the system, not just in aggregate.** Service is currently worst at the edges of the system and worse in areas with more Black and Hispanic/Latino residents compared to the overall service area, but the contract does not currently require Lyft to meet performance standards at the neighborhood-level. Instead, the contract exclusively defines aggregate, citywide performance metrics that may obscure enduring pockets of poor performance. This leaves the system vulnerable to inequitable and inconsistent service. The contract should be amended to include neighborhood-level performance standards, requiring operators to provide high-quality, equitable service. In practice, this could work by requiring the operator to meet each performance standard at the borough-level, or a more granular unit of geography such as Zip Code, Council District, or Community District.

2. **Strengthen enforcement of basic performance standards.** The schedule of fines and fees defined in the contract remains the City's primary means of compelling better service from the operator. These fines are rarely, if ever, enforced. The City should exercise its authority to impose fines where Lyft has failed to meet key performance targets, such as minimum rebalancing and fleet availability standards. Given existing patterns of substandard service, the City should also step up its oversight and enforcement of contract terms. Requiring approval by the Franchise and Concession Review Committee (FCRC), which oversees most agreements involving the private use of city-owned property, can further ensure the operator consistently meets contract terms.

3. **Incentivize better performance by offering payments or subsidies when the operator consistently exceeds service standards.** Citi Bike is a public-private partnership that exclusively relies on sponsorships and funding from its operator, currently Lyft, to maintain the system. A schedule of steep fines defined in the contract is currently the City's primary tool for holding Lyft accountable to contractually defined minimum performance standards. Instead of relying on a purely punitive enforcement measure, the City should renegotiate its contract with Citi Bike operators – either Lyft or a future operator – that use the existing standards as a minimum and offer payments to the operator for performance that surpasses those minimum thresholds. This structure will incentivize the operator strive to sustain strong performance above and beyond a set of bare minimum targets.

   For example, the contract currently requires that a minimum of 90% of Citi Bike's fleet remain available between the months of March and November. To incentivize improved fleet availability, the City could offer a bonus payment if this metric exceeds 98% throughout the highest ridership months or a full year. Payments should be structured to incentivize sustained high performance over many months to improve the reliability of the systems. Such payments should be calculated against any outstanding fines or penalties for not meeting minimum service standards. The structure of these payments and incentives could also encourage further alignment with new performance goals such as improved maintenance of e-bikes and consistent bike and dock availability at system edges.

4. **Expand eligibility for Citi Bike's existing discounted membership program to reach more low-income New Yorkers.** Citi Bike currently offers $5 monthly memberships to NYCHA residents and SNAP recipients, which is significantly more affordable than the standard $205 annual membership that also requires a 12-month commitment. New Yorkers with incomes at or below 200% of the federal poverty line are eligible for SNAP and, by extension, discounted Citi Bike memberships. However, linking eligibility for discounted memberships to SNAP enrollment risks artificially depressing membership sign-ups. The City's Department of Social Services has been slow to process applications in recent years

resulting in fewer people receiving benefits.[30] The contract should require operators to independently verify income eligibility for its discounted membership program, rather than relying on an externally administered program experiencing long processing delays. The most recent contract amendment in November 2023 also includes new membership discounts for New Yorkers living within the Phase 3 Citi Bike expansion zone. Residents with zip codes in the Phase 3 expansion area will automatically receive 40% discounts for first-time enrollment and 25% discount for the second year. While this program improves Citi Bike affordability for residents of the Phase 3 zone, the City should expand discounted membership programs to low-income New Yorkers citywide.

5. **Improve transparency through enhanced public reporting on Citi Bike's operations.** Lyft currently shares data with the public in two formats – monthly performance reports and real-time system data in the generalized bikeshare feed specification (GBFS) format. While both sources contain a great deal of information, the data is not presented in a format that matches the terms specified in Lyft's contract. The monthly reports aggregate system performance over a 30-day period, obscuring individual days or hours where issues occurred. The real-time data provides more detailed information on the status of individual bikes and stations but does not maintain historical records of that data. As a result, the public, and possibly the City, have limited insight into the system's performance at the level of granularity specified in the contract and cannot extract it from the available sources. Various private individuals have developed independent platforms assessing bike and dock availability, as well as overall system performance, using GBFS data. These tools have provided useful insight into Citi Bike's performance over the years but are not consistently available or regularly updated. Instead of relying on members of the public to evaluate operators' performance, the City's contract for Citi Bike should require operators to create a platform displaying real-time data and providing riders with a more accurate picture of the quality of service and operator performance.

Conclusion

Citi Bike is at a crossroads. Over the past decades, the system has become the nation's largest and most successful bike share service. Ridership continues to grow and more New Yorkers have access to Citi Bike today than ever before. However, the potential sale of the system and shifts in the bike and micro mobility market leave Citi Bike in a precarious position. If a new operator could step in at any time, the City must act to stabilize the system and ensure better performance outcomes.

Citi Bike's size and high utilization reflect its success but also generate significant costs and maintenance obligations. The system requires ongoing investment to ensure users consistently have access to functioning, high-quality equipment. The City must simultaneously work to improve its bike network and ensure cyclists can travel safely and efficiently through city streets. The resources invested in the system and citywide bike infrastructure to-date cemented Citi Bike's status as an essential mobility service. By highlighting the measures by which current performance falls short of the standards set by its operating agreement with the City and defining recommendations to correct course, this report serves to ensure Citi Bike remains a reliable transportation service for years to come.

Methodology

Citi Bike publishes monthly system performance reports providing details including the total number of trips, number of stations and bikes, number of inspections, repairs, and rebalancing moves. All data are aggregated systemwide. We compiled all data from each monthly report. As of publication, the most recent performance report is from June 2023.

Data

For a more granular look at performance and availability, we made use of Citi Bike's live data feed. This live feed (shown in Figure 9) provides details about the status of each station, including the number of bikes and number of docks available and the number of broken bikes and docks. The data is shared through the GBFS standard to allow apps and other uses to get and share and up-to-the-minute status of the system (for example, to route riders to stations with docks currently available). However, these data are only available live, not historically. To generate a historical record that we could analyze, we created an automated tool that loaded these data every 15 minutes and stored the system status at that time. By running this tool through June and July 2023, we built a two-month, fine-grained dataset of the system status spanning June and July 2023. This method collected relatively consistent data, with the exception of some irregularities when the data feed was unavailable or the data-loading tool was not able to get data. Across the two months of data, there were 228 gaps of more than 30 minutes, accounting for 5 percent of samples. Data were consistently missing from the hours of 8:00-9:00 pm and at 8:00 am on all days and at other hours on June 7-9 and July 19-20, 2023.

Instances when the number of bikes listed at a station exceeded the capacity of docks listed at that time were removed from the data before further analysis of the portion of docks in stations with disabled bikes. The capacity listed is supposed to be the physical number of docks at a station, including any broken docks or docks with broken bikes. The instances when the number of bikes at a station exceeded listed dock capacity were generally when number of docks at a station were very low (less than 10 listed docks). These instances were widely dispersed, appearing at over 100 different stations across thousands of sample times, but account for less than 0.1% of samples.

Stations that were not operable at least once in each week of the June-July study period were removed from the data prior to analysis. For comparisons of performance across New York City, we excluded stations in New Jersey.

After exploring various measures in the data, we computed three measures of station availability:

1. The frequency that a station had either no bikes or no docks available, during either morning (7:00 am-11:00 am) or evening (4:00 pm-10:00 pm) hours.

2. The median duration a station remained with no bikes or no docks, excluding overnight hours (12:00 am-6:00 am)[2]

3. The mean percent of docks at a station holding broken or disabled bikes.

To compare Citi Bike performance to neighborhood demographics, we drew data on race, ethnicity, and income from Census. To measure race and ethnicity, we analyzed the portion of the Census Tract and Neighborhood Tabulation Area population which were non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, and Hispanic or Latino (of any race) from the 2020 Decennial Census. To measure income, we used median income and the portion of individuals earning below 150 percent of the poverty level from the 2021 American Community Survey.

Analysis

To identify spatial patterns in these data, we mapped each of various indicators and identified clusters of poor service. Except for a few stations with unique service disruptions, performance measures were found to be generally similar across neighborhoods or other wide areas.

We computed clusters of stations with similar poor availability as a more serious challenge for riders. For instance, if a station has no bikes and all nearby station have no bikes, the entire area is effectively out of service.

We quantified these clusters of poor service by computing local indicators of spatial association. These statistics identify stations which themselves have exceptionally poor availability and which are surrounded by other stations which also have poor performance (on the same indicator). Additionally, this method provides a measure of statistical significance indicating that the identified geographic pattern is unlikely to be by random chance.

This data-driven method identifies thresholds for poor availability based on how exceptionally poor a station's availability is compared to all other stations. Stations found to be in the poor performance groups had no bikes or no docks at least 12% of the time, or a median duration without bikes or docks of more than 41 minutes, or more than 5% of docks with disabled bikes.

We combined all stations that were found to be in a poor-availability group, removed isolated groups of fewer than five stations, and then composed poor performance areas bounded by and including station with poor performance.

We joined Census Tracts that intersected with any poor performance area and summarized the demographic composition of these areas, compared to the composition of all Tracts within the

[2] Because our data are from discrete points in time, we base this computation on the assumption that if a station has no bikes or docks available at two consecutive sample times fifteen minutes apart, it has remained empty or full for that entire time. Because some time samples missing from our data, so we did not count a duration over a period for which we had no data for 40 minutes or more (approximately equivalent to more than one missing data sample).

Citi Bike service area. This analysis allowed us to analyze bike availability in areas with different racial/ethnicity demographics.

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