

DOCKLESS BIKES AND SCOOTERS:

The Transportation Option New Yorkers Need Now



Lime



Executive Summary

New York City is suffering from a transportation crisis. Despite having one of the largest subway systems in the world and nearly 6,000 buses running on more than 300 bus routes, a large percentage of New Yorkers cannot easily, affordably get around their own city. Many live beyond walking distance to mass transportation. Many simply cannot rely on the system, even though they have access to it.

The majority of these New Yorkers are middle- and lower-income. The majority are also not white. They cannot afford to drive to work--and many cannot afford a car at all. They cannot afford ride-share services or taxis. And it is unlikely that the cash-strapped Metropolitan Transit Authority will be expanding its subway or bus systems any time soon to help.

These underserved communities need new, reliable, affordable transportation options--and they need them now.

Today, around the world, new mobility companies are connecting stranded citizens like these in dozens of other cities. Dockless bikeshare and scooter share is a nimble, cost-effective and innovative approach to an issue that has been long ignored. Research shows that dockless mobility:

- **Improves equity:** A study commissioned by the District of Columbia Department of Transportation found that people of color are 2.6 times more likely to ride dockless bikeshare than dock-based bikeshare². This is largely because dockless bikesharing companies serve the entire city instead of just centrally located areas³.
- **Increases affordability:** A Virginia Tech study of dockless bikeshare found that, in addition to attracting more people of color, low-income individuals are more likely to use dockless bikeshare⁴. While fixed-station bike operators like Citi Bike offer weekly and monthly “memberships” that reduce costs for frequent users, they require upfront payments that lower-income riders may not be able to easily pay.

2 <https://medium.com/populus-ai/measuring-equity-dockless-27c40af259f8>

3 <http://seattle.legistar.com/View.ashx?M=F&ID=6282625&GUID=35E77DEF-C77F-45D3-9141-93263D6C5B4D>

4 <https://vtnews.vt.edu/articles/2018/05/ncr-docklessbikes.html>

- **Shifts people to more efficient, more environmentally friendly modes:** In cities around the country, dockless bikeshare and scooter share have removed cars from the road. According to the City of Portland, Oregon, 40% of all scooters trips would have been made using Uber, Lyft, taxis or a personal car⁵.
- **Is popular:** Dockless mobility – both bikes and scooters – is increasing bike ridership. In addition to the data from Portland which shows 45% of scooter riders are new to dockless mobility or biking, data from other cities show similar results. DC saw ridership from dockless bikeshare rise while the dock system stayed flat-meaning overall bike ridership went up⁶.
- **Is scale-able:** Smaller towns and cities across the country deploy a few hundred dockless bikes or a few thousand in order to meet demand. Larger cities have successfully scaled way up in proportion to their populations. Seattle has a cap of 20,000 dockless vehicles that serves the entire city, for instance. To have the same number of dockless vehicles available per capita, New York City would need to deploy 75,000 dockless vehicles.

Private companies like Lime are heavily focused on transportation equity. Lime – the only major multi-modal operator that serves large fleets of pedal bikes, e-bikes and scooters – leads the “new mobility” space by focusing on creating better access and affordable options for communities that have been previously ignored. Dockless bikeshare and scooter share will fill gaps where the subways and other bikeshare models have not gone. It helps to eliminate transit deserts while creating affordable and sustainable solutions for all New Yorkers. Offering dockless bikeshare and scooter share citywide would put an additional 1.5 million New Yorkers within a 10-minute walk, bike, or scoot of a subway line. Overall, it would ensure that ALL New Yorkers have access to the benefits of affordable, reliable dockless mobility.

5 https://www.portlandoregon.gov/transportation/article/700916?utm_medium=email&utm_source=govdelivery

6 <https://ggwash.org/view/67638/dockless-bikeshare-helped-grow-the-total-shared-bicycle-trips-in-dc>

Overview

The current transit landscape of New York City is tailored to accommodate high-density areas where the cost of living is higher than the average New Yorker can afford. As a result, packed transfer stations offer multiple types of transit options while leaving fewer subway stations in farther out boroughs, infrequent service, and expensive alternatives to public transportation. These areas – commonly known as transit deserts – are a major problem for New York and its diverse neighborhoods. Some neighborhoods, such as South East Brooklyn, are served only by a single subway line and many residents are more than three miles from the subway.

Transportation is second only to housing in New Yorkers' expenses. And accessible transportation options have become a privilege to those able to afford the cost. According to a report released by Community Service Society of New York, 58% of poor New Yorkers rely on the subway and buses as a means of transportation -- more so than any other income group -- and spend more than 10 percent to their income on transit. Transit deserts are scattered throughout the city, often forcing commuters to make multiple transfers, and take long walks just to make it back-and-forth from work and home. The amount of money and time spent thinking about travel each day is costly--environmentally, financially, and mentally. Exhausting for many New Yorkers, this issue limits access to opportunities due to lack of options for mobility.

It is clearly time to invest in more affordable, faster and more sustainable transportation options to make a meaningful difference for the communities that need it the most.

Transit Deserts: Meeting the Needs of New York City's Most Populated and Underserved Communities

In our city, there are significant gaps in access to equitable transportation options especially for communities of color and low-income neighborhoods. The data included in this report demonstrates how transit deserts drastically and disproportionately affect low-income populations and communities of color, resulting in significant barriers to upward mobility.

All New Yorkers deserve access to equitable transit solutions. Lime — utilizing data from Sam Schwartz Engineering in this report — is on a mission to bring smart, accessible and equitable options to New York’s arsenal of transportation options. In particular, a system of dockless e-bikes, bikes and scooters that are not limited by fixed stations, present the opportunity to completely transform barren transit landscapes. Lime, a multimodal company that builds and operates all of these transit options, is already helping residents save time and money spent traveling while increasing efficiency, health outcomes, and environmental sustainability.

NEW YORK CITY RAIL DESERTS

The above map demonstrates that specific, high-density and high trafficked areas

Figure 1



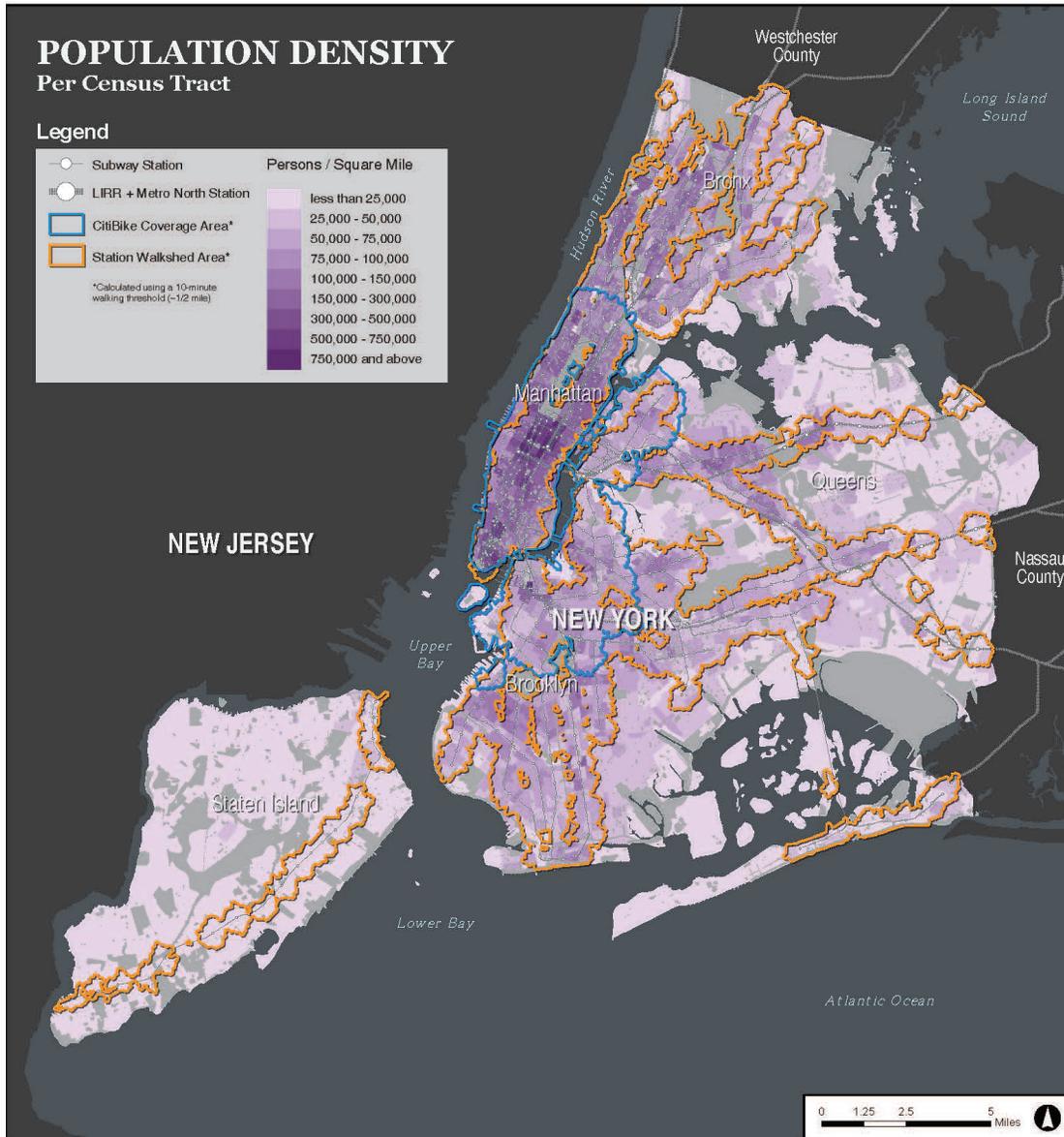
Source: 2012-2016 American Community Survey 5-Year Estimates

of New York City are serviced by the subway system, leaving many outer-borough neighborhoods and a large percentage of the population dependent on other forms of transportation. The orange highlighted areas are abundant with multiple lines going up, down and across boroughs. However, this changes in South East Brooklyn, Middle Village and the outer parts of Queens. It is clear that areas not included in the orange highlighted section are disconnected from train lines, severely limiting the ability to travel throughout the boroughs. There is a major disparity in access to train lines that are within a 10-minute walking radius of communities. It should be noted

that there is also significant overlap in service with subway and Citi Bike stations (the blue highlighted areas) throughout the five boroughs. Citi Bike locations mirror that of subway lines in very dense areas, only adding to the variety of travel options for commuters in these already well-served locations, yet not providing the same options farther out in less-dense residential areas. That is because Citi Bike is only successful on a density demand model when there is a high number of users who are going from certain geographic locations to another—dock-to-dock. This model is a deterrent for further expansion of both subway lines and bikeshare infrastructure. Therefore, in order to create a successful connectivity network of transit options throughout the five boroughs, dockless bikeshare rollout needs to be comprehensive and citywide, not just in areas of low transit options, so that equitable travel happens in and out of currently lower trafficked areas. Regardless where they live or work, the color of their skin or their income, New Yorkers are entitled to accessible, affordable and sustainable transportation options.

For dockless bikeshare the opportunity to reach these underserved neighborhoods is not limited by infrastructure, money, or density. In fact, private companies like Lime are able to deploy multi-modal fleets of bikes, e-bikes, and scooters to alleviate the burden of limited transit options. Elsewhere around the country, dockless bike share is filling in the gaps where train stations and docked bike stations end. With no defined endpoint, parking restrictions or high expenses, dockless bike share is transforming communities that have not been afforded infrastructure, financial resources, or programs that allow for easier access to traveling beyond their neighborhood.

Figure 2



Source: 2012-2016 American Community Survey 5-Year Estimates

DOCKED BIKESHARE IS NOT LIVING UP TO ITS PROMISE

When Citi Bike launched in 2013 as a new form of mass transit, it promised affordable and reliable transportation. However, it appeared in neighborhoods already rich in transportation options and higher incomes, not low-income communities and communities of color in the outer boroughs. The average median household income in New York is about \$59,000, but the average median income of the population of Citi Bike is nearly \$79,000. To date, Citi Bike's metrics have not added to New York

City's sustainable, equitable NYC transportation goals:

- White New Yorkers make up 32% of the City population, but make up 50% of the population within walking distance of Citi Bike service
- Black and Latino New Yorkers make up 51% of the City population, but just 25% of the populations within walking distance of Citi Bike
- The median income for households in the Citi Bike service area is \$94,000 while the median income is \$59,000
- Citi Bike stations are twice as likely to be within walking distance of a white New Yorkers' residence than Latino New Yorkers and three times as likely to be within walking distance of white New Yorkers' residence than Black New Yorkers.

Citi Bike's current service area (31 square miles) covers just 10% of the City. With the newly announced expansion, the new service area will expand by only 35 square miles. While the new service area has not been shared with the public, this expansion will only cover 12% more of New York City. Even after the expansion and almost a decade of operation, Citi Bike will still serve less than 25% of New York City.

Living in a neighborhood that has longer commute times has a big impact on income mobility. Typically, factors like segregation, social capital, crime, and population density are the primary points of reference for an issue like transit access. Although these should not be discounted, another major indicator that has become a contentious marker for social mobility is commuting time. Results from this study show that the characteristic most associated with income mobility is a commute of fewer than 15 minutes.

Comparing these insights to the data gathered by Sam Schwartz Engineering around median household income, the map below illustrates how areas throughout the five boroughs are more likely to have a higher range of combined household income (ranging \$60,000 to \$100,000) if they're located within a subway station's walkshed coverage area. This is all the more true when looking at the Citi Bike coverage area. Within the areas that are serviced by both walkable subway stations and Citi Bike, the amount of annual income only increases; visible by the amount of neighborhoods

color coded with darker shades of green. Areas that are serviced by both have more neighborhoods that have annual incomes in the ranges of \$100,000 to \$160,000 or above.

Figure 3

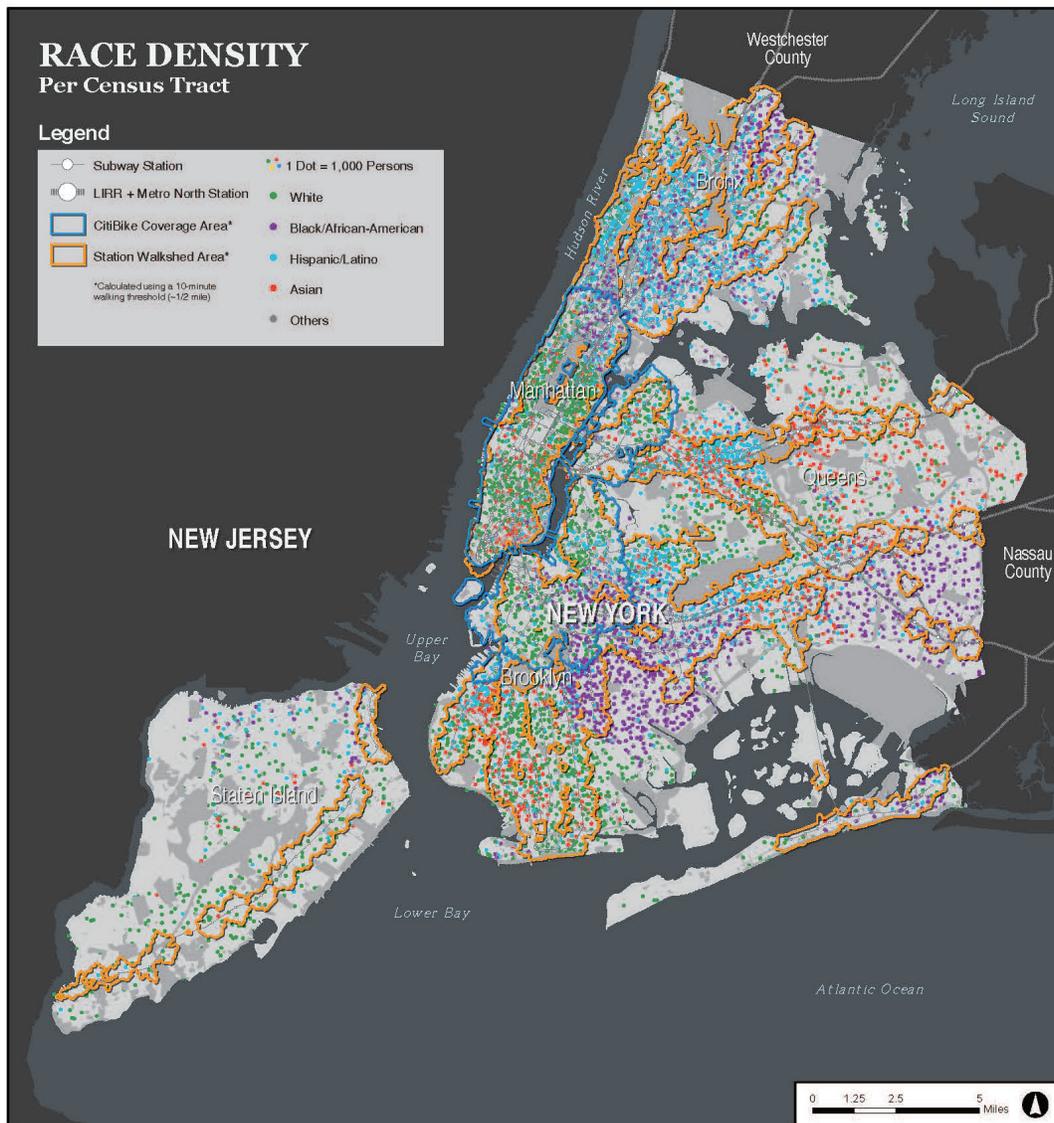


The current model of New York City’s transit landscape floods areas with higher incomes with additional transit option like bikeshare, even though residents have both geographic and financial access to affordable methods transportation. Citi Bike’s current operating zones are maximizing wealthy New Yorkers’ ability to move around the city, get to work faster and more affordably while doing little to support communities that are in desperate need of affordable methods of transportation. As a result, residents in communities that are underserved by reliable, accessible and

affordable transit options are oftentimes left to rely on cars or bus services. Not only is this detrimental to the environment by forcing more cars onto the road, but buying and maintaining a car (per trip) is a significantly higher expense compared to that of a subway fare or bikeshare ride. The current framework only exacerbates residents in lower income brackets to spend more money on transportation because financial resources, subway lines and bikeshare infrastructure has not been provided in these communities when the money they are spending on transportation could be used for other expenses or saved.

Currently, Citi Bike only operates in the southern to central part of Manhattan, as

Figure 4



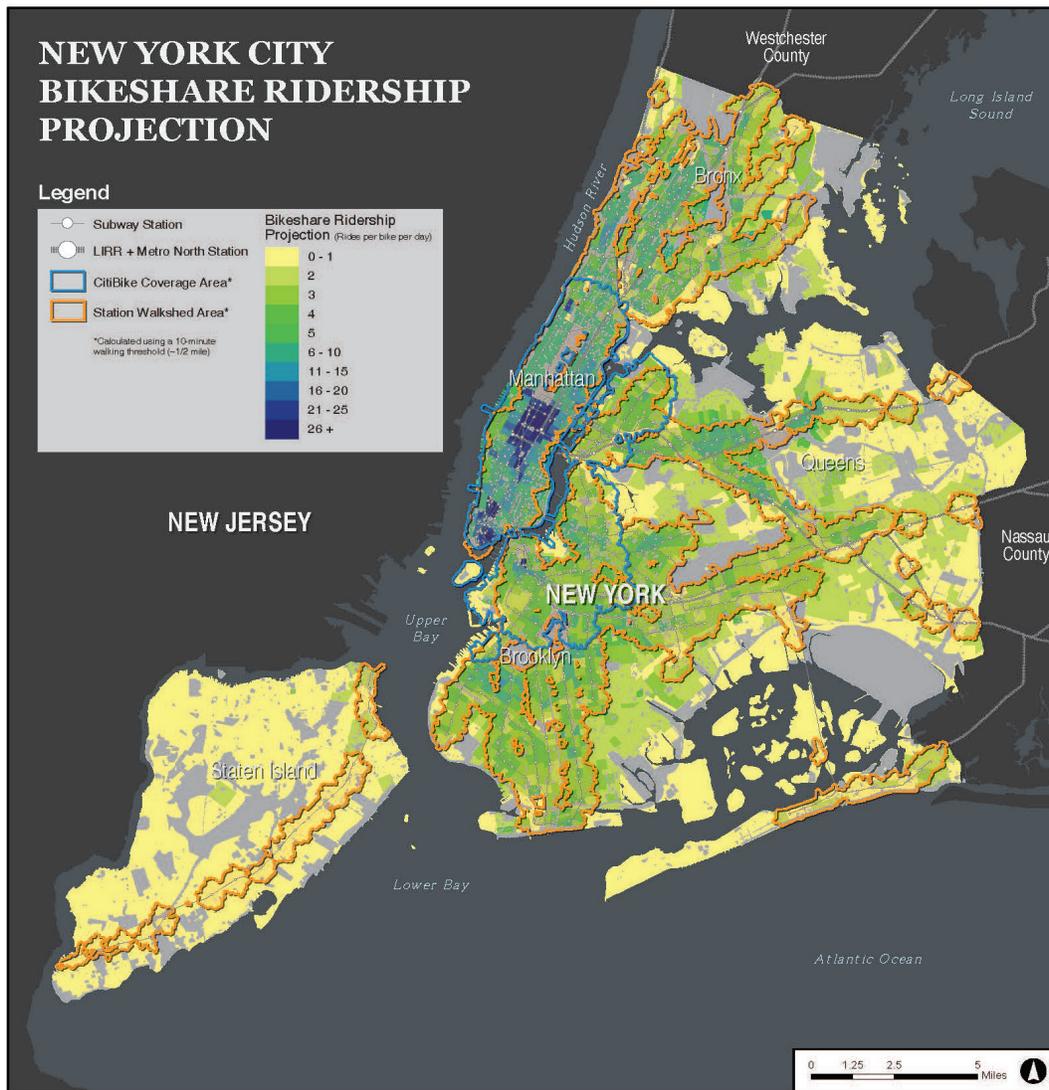
Source: 2012-2016 American Community Survey 5-Year Estimates

well as the northwest section of Brooklyn and the very west side of Queens. Not only are these overwhelmingly wealthier neighborhoods that are already well-served by transit options such as subway, bus, and taxi service, but they are disproportionately white. These areas are inflated with innovation, technology and services, and offering bikeshare that only services areas of innovation and growth, rather than connecting to an entire citywide transit network, continues to support the notion that these opportunities are exclusive to these neighborhoods- only accessible in concentrated areas of wealth.

Citi Bike has yet to serve Northern Manhattan and The Bronx, home to large Black and Latino communities,. Furthermore, Citi Bike coverage in Brooklyn ends almost exactly where white populations taper off. Neighborhoods with predominantly Black populations such as Canarsie, East New York, and East Flatbush are not only cut off from subway service, but they also are denied vital last mile transportation options that could help them reach the subway.

NEW YORK CITY BIKESHARE RIDERSHIP PROJECTION

Figure 6



Although the outer-boroughs have a lower population density than lower Manhattan, there is ample demand for bike share⁷.

The results of the analysis above confirm that expansion of bikeshare would result in high system utilization. Dense outer-borough neighborhoods such as Flushing, the

7 Building off the population density map, a geospatial bikeshare analysis was prepared and mapped for the whole city to estimate potential bikeshare ridership if the entire city had bike-share coverage. Potential ridership levels were determined by calculating ratios between existing population density (including both residents and workers) and historical Citi Bike usage data. The ridership ratio was then applied to the whole city to assess potential unmet bikeshare

West Bronx, and Sunset Park would see a surge in ridership of up to 6-10 rides per bike per day. Even less dense and more transit-starved neighborhoods would see a large number of rides per bike per day as the result of an expansion.

It is no secret that communities that have the largest population lack the variety of transportation options they need to get around a City as vast as New York. These areas include but are not limited to communities like:

- East Flatbush/Flatlands/Canarsie, Brooklyn
- Middle Village, Brooklyn
- Whitestone/College Point/Clearview, Queens
- Kew Gardens Hills, Queens
- South Jamaica, Queens

Dockless bikes and scooters offer a real alternative to these communities that have consistently had to rely on the government to provide better public transit infrastructure that is long overdue.

By sharing these qualitative and quantitative insights with broader audiences outside of the transit community, Lime is hoping to emphasize not only the opportunity but also the need for dockless bikes and scooters in New York City. It is evident that areas of New York City have been neglected by both subway lines and the current bikeshare programs hosted by Citi Bike. Lime wants to change that. Lime hopes to enable a more thorough public understanding of the benefits of equitable and accessible mobility and demonstrate Lime's commitment to transparency and policy collaboration. In order to do so, there needs to be robust support by government leaders, the administration and community voices to make dockless a success in New York City.

A Solution to Transportation Inequity

DOCKLESS MOBILITY

This study employed Citi Bike data for June 2018 because it factors in usage trends during favorable weather conditions and the summer tourism season. During June 2018, Citi Bike recorded an average of 65,000 trips per day with approximately 7 trips per bike per day. Using results from the population density analysis, the population density within the current Citi Bike service area (assumed to be a 10-minute walking threshold from each bikeshare station), is approximately 140,000 persons per square mile. Individual census tracts' population density was then compared with the existing Citi Bike service area's population density to create the ridership ratio. This ratio, when multiplied with the existing average Citi Bike ridership, forecasted potential bikeshare ridership based on population density.

Since as far back as 2009 the NYCDOT has recognized that bikeshare offers a critical point-to-point mobility option that could serve all New Yorkers. Shared scooters, while not a concept in 2009, serve the same needs. Back in 2009 the City estimated that NYC needed approximately a 100,000-bike bike sharing system to serve the whole City⁸. This report was completed before New York dramatically improved its bike infrastructure and before the development of pedal assist bikeshare. More recently Uber released a report demonstrating the need for 100,000 to 200,000 bikes to service New York City⁹.

The rise of dockless mobility has led to innovations that are better serving customers and the cities they live in.

- **Financial Models:** Dockless bike and scooter sharing services are 100% privately funded. This is in contrast to dock-based systems that require dedicated public space for stations. The public space is taken up whether the bike is there or not.
- **Electric Vehicles:** When docked bikeshare (the Citi Bike model) launched, electric

8 https://www1.nyc.gov/assets/planning/download/pdf/plans/transportation/bike_share_part1.pdf

9 https://www.scribd.com/document/392995977/Uber-Jump-Report-on-Shared-Ebike-Potential#-from_embed

pedal assist bikes were not available. Over the past year intense competition in the bikeshare and scooter share industry has led to the development of ubiquitous, affordable electric mobility, which is making it easier for people of all ages and abilities to enjoy the pleasures of biking or scooting.

- **Affordability:** Competition is also driving down costs for the consumer. Lime charges \$1 to start and \$0.15 per minute to ride its e-bikes or scooters. By contrast, Citi Bike charges \$3 per trip for the first 30 minutes. With a typical trip lasting around 10 to 12 minutes, this means that the typical trip is a little cheaper. Lime, and other dockless competitors, also offer 50%-off all trips for qualified, low-income customers.
- **Cash Payment:** Lime and fellow dockless providers have also pioneered cash payments, opening up bikeshare to the unbanked.
- **Faster Transaction Speeds:** The ability to unlock and ride a bike by simply scanning a QR code means there is no waiting in lines at crowded stations.

Together this is helping cities meet their policy goals of improving equity and getting people out of cars:

1. **Improved Equity:** A study commissioned by the District of Columbia Department of Transportation found that people of color are 2.6 times more likely to ride dockless bikeshare than dock-based bikeshare¹⁰. This is because in most cities dockless bike sharing companies are serving the entire city instead of just the most lucrative parts¹¹.
2. **Increased Affordability:** A Virginia Tech study of dockless bikeshare found that, in addition to attracting more people of color to ride, that low-income individuals are more likely to ride dockless bikeshare¹². While Citi Bike does offer weekly and monthly “memberships” that offer cheaper rides for frequent users, it requires upfront money that many New Yorkers may not have.

10 <https://medium.com/populus-ai/measuring-equity-dockless-27c40af259f8>

11 <http://seattle.legistar.com/View.ashx?M=F&ID=6282625&GUID=35E77DEF-C77F-45D3-9141-93263D6C5B4D>

12 <https://vtnews.vt.edu/articles/2018/05/ncr-docklessbikes.html>

3. **Mode Shift:** Cities around the country have seen that dockless bikeshare, and especially scootersharing, has taken cars off the road. In Portland, 40% of all scooters trips, as reported by the City, would have been made using Uber, Lyft, taxis or a personal car¹³.
4. **Ridership Increase:** Dockless mobility, bikes and scooters, is increasing ridership. In addition to the data from Portland which shows 45% of scooter riders are new to dockless mobility or biking, data from other cities is showing similar results. DC saw ridership from dockless bikeshare rise while the dock system stayed flat - meaning overall bike ridership went up¹⁴.

Lime is revolutionizing mobility in cities and campuses by empowering residents with more efficient, accessible and affordable options that contribute to improving urban sustainability. By partnering with local key stakeholders Lime is changing urban mobility by making the first and last mile faster, cheaper, and healthier for riders.

Lime believes in providing mobility for all. A one of kind program, LimeAccess is an affordable way to use Lime in New York City. A proud partner with PayNearMe, the program is supported by a text-to-unlock feature, both of which promote equitable mobility by removing the barrier of smartphone and credit card ownership. To qualify for LimeAccess, an individual simply needs to demonstrate eligibility or participation in any state or federally-run assistance program. Lime Access members receive a 95% discount on all Lime pedal bike rides and a 50% discount on all Lime-E electric-assist bike and Lime-S electric scooter rides.

If the current model of operation continues around how we address transportation, and continues to only cater to transportation fixes in high density and high income, New York City will only further support the growing gap between equal and equitable opportunity for all New Yorkers.

13 https://www.portlandoregon.gov/transportation/article/700916?utm_medium=email&utm_source=govdelivery

14 <https://ggwash.org/view/67638/dockless-bikeshare-helped-grow-the-total-shared-bicycle-trips-in-dc>

Recommendations

In order to offset the current transit situation, and provide equitable and affordable transit services to all New Yorkers, the following recommendations are suggested for immediate implementation:

1. Roll out dockless bikeshare in transit deserts first, addressing immediate needs and rapidly expand dockless bikes citywide.
2. Launch electric scooters in every borough with this mobility expansion to support all types of transit needs as soon as possible.
3. During the permit issuing process for bikeshare, the Department of Transportation needs to include community benefit language and opportunities as a part of each permit.
4. Programs must be established, implemented and maintained for underserved communities that relate to health and wellness, bike advocacy and other related topics.
5. Rebalancing fleets and other service vehicles involved in dockless need to be carbon neutral.

ABOUT LIME

Lime is founded on the simple idea that all communities deserve access to smart, affordable mobility. Through the equitable distribution of shared scooters, bikes and transit vehicles, we aim to reduce dependence on personal automobiles for short distance transportation and leave future generations with a cleaner, healthier planet.



Lime

Capalino+Company

we know **who**. we know **how**.