Exploring the distribution of bike sharing station in Berkeley

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Shared bikes have numerous advantages, as they're a kind of convenient and eco-friendly transportation, cost-effectiveness, and bring health benefits. Besides, it enhances urban mobility by providing the 'last-mile' transportation solution, an affordable alternative to personal vehicles or Ubers, and a positive impact on solving traffic jams in the city center.

Bay Wheels is the Bay Area's regional bike share program serving Berkeley, Emeryville, Oakland, San Jose and San Francisco. Bay Wheels offers convenient, healthy, climate-friendly transportation around the Bay Area (https://mtc.ca.gov/operations/traveler-services/bay-wheels-bike-share-program). As for Berkeley, Bay Wheels provides over 40 sharing bike stations. Data shows that in Berkeley alone, there are 8774 use records involving 117 different stations in the past January (https://s3.amazonaws.com/baywheels-data/index.html).

A 'hole' exists in Bay Wheels station coverage on the western edge of Downtown Berkeley, an area with lower average incomes, from the map. This observation raises my concerns about the equitable distribution of Bay Wheels stations. So maybe there's a potential bias towards wealthier communities?

For instance, my experience walking from the CED to my apartment along Bancroft Way reveals three stations, while Hearst Avenue, north of campus, has only one. Furthermore, some stations, such as the one at Bancroft Way and Fulton Street, are consistently full, while others, like the station near Sather Gate, are frequently empty. Given the increasing importance of Bay Wheels, it is crucial to investigate whether station distribution is truly equitable.

Scope

Bay Wheels Stations in downtown Berkeley and Emeryville, including the surroundings, the usage situation, with especially focus on the 3 stations along the Bancroft Way.

Stakes

Bay Wheel bike riders: This group encompasses commuters, students, and recreational riders. Low-income residents and parents with children are also users of such service.

Other bike riders: Individuals who may experience a loss of bicycle parking due to the installation of Bay Wheels stations.

Bay Wheel: This includes the company itself and its maintenance personnel.

City of Berkeley: The city government is responsible for ensuring the bike-sharing system addresses the needs of all residents and for securing funding for its operation.

Business: Retail stores and businesses located near Bay Wheels stations and along cycling routes.

Geographical and Political Context

Berkeley is a city that located in the east part of the Bay Area. According to 2020 U.S. Census Bureau reports, Asian residents account for 23.4% of the population, while African Americans comprise 7.8% (https://datausa.io/profile/geo/berkeley-ca/). The terrain transitions sharply from the Berkeley Hills' rugged outcrops (elevation 400m) eastward through the Strawberry Creek alluvial plain to tidal marshes along the western waterfront. The city's street layout is predominantly a grid system, with roads running in east-west and north-south directions.

Berkeley is also widely recognized for its historically progressive political environment. This political trend likely plays an important role in shaping the city's transportation policies, including those governing shared mobility options such as the Bay Wheels bike-sharing program, which may influence the city’s view on the future plan and development of the Bay Wheels shared bike.

Assignment 2

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Introduction

In August 2013, the Bay Area Air Quality Management District launched the Bay Area Bike Share project, which later became Bay Wheels (Metropolitan Transportation Commission, 2013). Berkeley was one of the initial launch cities and has spent over a decade expanding its shared bike network. However, recent observations show that West Berkeley still lacks sufficient stations, raising ongoing concerns about equity.

Similar research has been conducted in 2015 by a Berkeley group, finding that "bikeshare is not typically placed in low-income neighborhoods for a variety of reasons that vary across cities" (Saviskas & Paul, 2015). However, a decade later, it remains important to revisit and discuss issues of equity and non-discrimination in bike-share systems.

Observation Method

Study Area

To better understand the distribution and development of the Bay Wheels bike share program in Berkeley, the entire city was selected as the study area. I conducted field observations at three specific Bay Wheels stations: Fulton St at Bancroft Way, Downtown Berkeley BART, and Berkeley Civic Center. Figure 1 is a map showing the current distribution of Bay Wheels stations throughout the City of Berkeley.

Observation Method

Note Taking: Observations took place on March 28 and 29, 2025. During these observations, I recorded each station's capacity, the usage of different types of shared bikes, and overall accessibility, including features designed for people with disabilities.

Field photos: To gain a fuller understanding and accurately document my observations, I took photos of several Bay Wheels stations around UC Berkeley (as noted in the Study Area). First, I captured panoramic shots of each station to see how many bikes docks it had and how they were arranged. Second, I photographed any on-site maps to assess whether they clearly showed the surrounding area and offered clear usage instructions. Finally, I took photos of the nearby streets

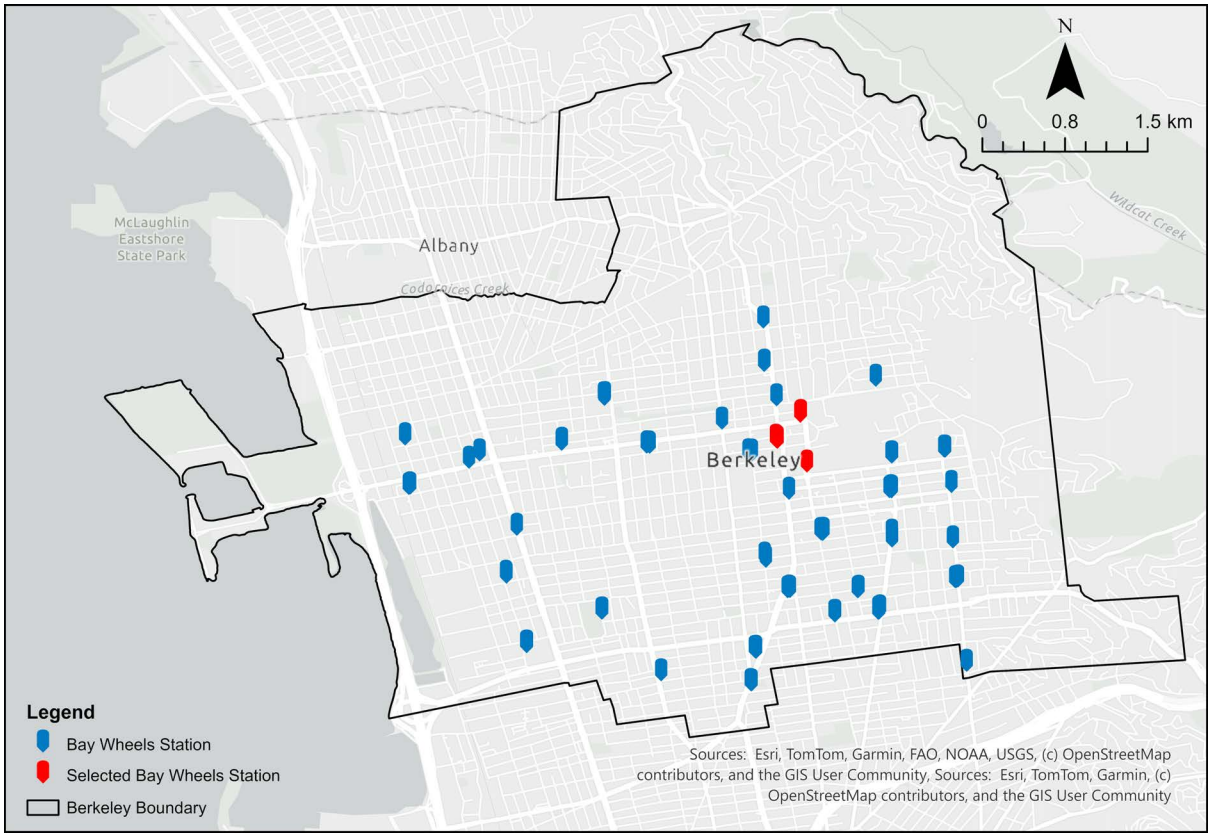

Figure 1. Study area and distribution of Bay Wheels Station, including the selected ones.

and neighborhood to determine if there was a dedicated bike lane, adequate night lighting for safety, and whether the setting was primarily commercial, residential, or part of the university.

Visual document: In addition to field photos, I collected census tract data from the Census Bureau and map data from the official Bay Wheels website. Other necessary documents are also searched, such as the Budgets report of City of Berkeley and development plan of the Metropolitan Transportation Commission (MTC).

Findings

Station observation and usage

Observation finds an unequal use of shared bikes. At downtown Berkeley BART station, almost all the shared bikes are left in the station on Saturday (Appendix Figure 2a). But when it comes to workdays, the station remains empty all the morning. Same thing happens at Fulton Street at Bancroft Way station, as shown in Appendix Figure 1a.

By analyzing datasets from the U.S. Census Bureau and Lyft (Lyft, 2025; U.S. Census Bureau, 2024), I examine the correlation between station distribution and median household income across census block groups (CBGs). As illustrated in Figure 2 below, station deployment demonstrates

significant spatial clustering around UC Berkeley's campus and adjacent affluent neighborhoods. Conversely, a conspicuous service gap, like a hole, emerges west of downtown Berkeley, where lower-income CBGs predominate.

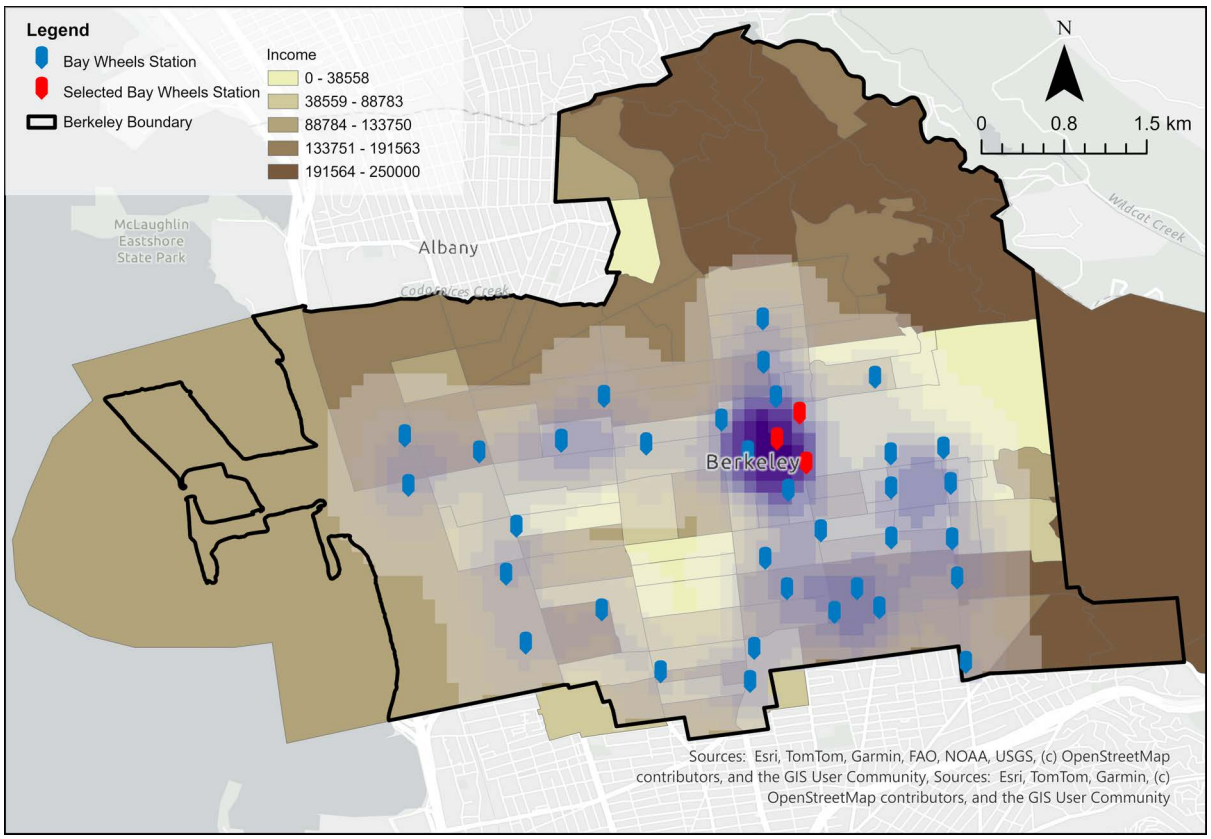

Figure 2. Relationship of income and kernel density in study area.

Surrounding Environment

All selected stations demonstrate advantageous surroundings. The Downtown Berkeley BART station is located on Shattuck Avenue with surrounding retail outlets, as shown in Appendix Figure 2b.

The Berkeley Civic Center station, while having limited commercial establishments, serves neighboring government facilities (Appendix Figure 3a). Fulton Street at Bancroft Way station is the same type as Berkeley Civic Center, expect it serve UC Berkeley.

None of these stations have barriers preventing parking occupancy, nor do they cause accessibility issues. The maps provide sufficient clarity, displaying nearby infrastructure accompanied by pricing information (Appendix Figure 1c). However, some bikes are vandalized with graffiti, making the ride experience appear unsafe (Appendix Figure 1d). Notably, nearly half of the fleet at each station exhibits graffiti vandalization.

Discussion and Interpretation

Review the planning history and policy

In August 2013, the Bay Area Air Quality Management District launched a project named Bay Area Bike Share, which is the first regional bicycle sharing system deployed on the West Coast of the United States and also the first regional system in the United States that services more than just a single city or adjacent cities. In 2019, Lyft acquired the original bike-share company and reached an agreement with MTC, which provides funding, identifies "Equity Priority Communities", and offers advisory support for the partnership between Lyft and the City of Berkeley ("Bay Wheels," 2025).

As one of its initial launch cities, Berkeley has invested in this project for over a decade. On January 22, 2016, Berkeley City Council adopted an Ordinance granting a Franchise Agreement with Bay Area Motivate to operate a bike share program in the City under the terms of the Coordination Agreement. In June 2020, the City Council adopted the Electric Mobility Roadmap, aiming to improve alternatives to driving and ensure equitable access to electric mobility options. However, at the beginning of the project, the city first considered the current bicycle commuting rate, the distance to BART stations, the retail and employment density, and their proximity to the existing bicycle network (CITY OF BERKELEY, 2022). Such planning strategies have caused the unequal distribution of stations to remain problematic, like a shortage of stations along California Street and Channing Way near downtown Berkeley, as shown on Figure 2. To deal with it, the city has required the operator to pursue a goal to "ensure equity in access to electric mobility" (*Bike Share Electric-Assist Bicycle Expansion Agreement*, 2024).

All the facts suggest that the history of Bay Wheels is deeply rooted in neoliberal governance. From the very beginning, the city has had to compromise due to a lack of funding, frequent changes in operating companies, and various communication and coordination challenges (Elwood, 2002). According to documents published on the City Council's website, it's clear that the city genuinely wants to improve the situation (*FY 2024 Mid-Biennial Adopted Budget Update*, 2023). However, the balance of power has never tilted in favor of the City of Berkeley. Given the city's long-standing urgency to revitalize Downtown and the central need to serve the UC Berkeley campus, achieving truly equitable station distribution remains an ideal that is difficult—if not impossible—to realize.

Why does income play a role in building such distribution?

First, I believe income plays an important role in shaping this kind of station distribution. As we discussed in class, the neoliberal revolution tends to prioritize profit over public interest (Elwood, 2002). Cities often promote urban projects by partnering with private companies and reducing

public spending. In this case, shared bike companies (or public-private partnerships) usually choose locations with higher potential profits, such as high-income neighborhoods, busy commercial areas, and university campuses. These areas often have higher transportation demand and better infrastructure. For companies, stations that can quickly generate usage and revenue are given priority, which results in areas that already have more public resources—like the bus line 7, 51B, and F, together with the Downtown Berkeley BART Station—gaining even more convenient transportation options.

Second, the City of Berkeley itself is facing a shortage of funding. According to the Fiscal Year 2024 Report (*FY 2024 Mid-Biennial Adopted Budget Update*, 2023), only $20 million out of a total $263 million budget is allocated for transportation improvements. Although the exact number of moneys for shared-bike improvements remains unclear, it won't be a big fund, meaning the city government cannot be secured only by the public fundings mainly due to the Neoliberalism revolutions.

Why is it important to have an equitable distribution of shared bikes?

From the perspective of spatial justice, the urban space should be equally used by all citizens, no matter their economic situation or accessible situation (Barton, 2012; Brenner et al., 2009). However, if the unequal distribution of shared bike stations remains existing, it will certainly lower the participation and sense of home of low-income community into the city (Sanyal, 2018). To regain the Right to City, Berkeley has some organization that deeply participating in the planning process of bike stations, like the "Walk Bike Berkeley" and "Bike Berkeley High" (Bike Berkeley High, 2024; Walk Bike Berkeley, 2023). UC Berkeley has also played a role in promoting bike sharing among its students, faculty, and staff through a partnership with Bay Wheels (UC Berkeley, 2025b). In fact, I have witnessed many professors ride a bike to CED at morning, some of whom ride with Bay Wheels. Another fun project conducted by the UC Berkeley students is the "Bike Share for All", which championed by community groups concerned with social equity, aims to make bike sharing more affordable and accessible to a wider segment of the population, addressing potential barriers to access for low-income individuals (UC Berkeley, 2025a).

Furthermore, gentrification often occurs alongside unequal shared-bike station distribution. For example, streets with bike stations tend to develop middle-class characteristics, as uneven access creates visible disparities between neighborhoods. This frequently leads to displacement of original low-income residents, who gradually get replaced by higher-income newcomers - the classic pattern of gentrification.

Therefore, the unequal distribution of shared-bike stations clearly creates disparate benefits across socioeconomic groups. Middle-and-high-income urban residents, particularly those in downtown neighborhoods, gain enhanced commuting convenience and leisure mobility without

bearing the costs of private transportation options like expensive downtown parking fees. This spatial inequality simultaneously benefits bike-sharing companies by allowing them to strategically place bike in "the most profitable area" and operational optimization. Conversely, this distribution pattern disadvantages opposite communities. Low-income residents may be expelled from urban mobility networks, effectively denying them equal access to city services and opportunities. Additionally, no-car populations suffer from reduced mobility options, as the lack of bike availability in their areas combines with insufficient alternative transit infrastructure to create mobility barriers.

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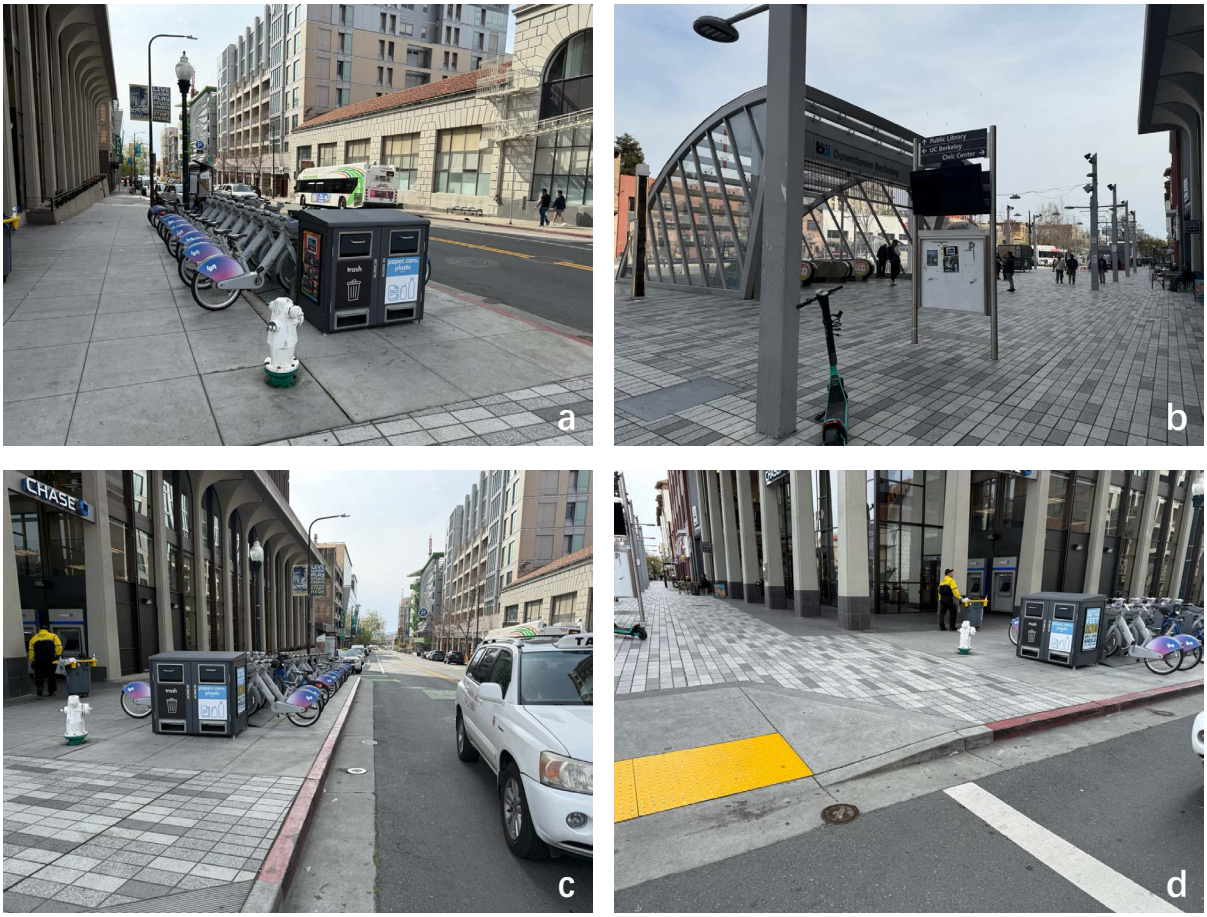
Appendix

Appendix Figure 1. Fulton St at Bancroft Way station. (a) Almost all the bike parked in station. (b) shows the entrance of station, while (c) presents the map and charging system used by Bay Wheels. But (d) tells that the bikes may be printed or sprayed.



Appendix Figure 2. Downtown Berkeley BART station. (a) Almost all the bikes are parked in the station. (b) shows that the station is just opposite to the BART station. (c) shows the surrounding area, and (d) presents the entrance of the station.

Appendix Figure 3. Berkeley Civic Center station. (a) shows the surrounding area of the station and (b) tells the station is already full of bikes.

Assignment 3

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Introduction

Bay Wheels offers Bay Area cities an eco-friendly first/last-mile option. It aims to bridge the "last-one-mile" gap between transit stops and destinations. For low-income residents, Bay Wheels offers programs like "Bike Share for All", which provides discounted memberships to ensure affordable access to Bay Wheels, making up 20 percent of total users. A study conducted by UC Berkeley found that 86% of low-income residents expressed interest in using bikeshare services, compared to 70% of high-income residents. Among all respondents, 86% identified station availability as the most important factor influencing their decision to use bikeshare (Saviskas & Paul, 2015).

West Berkeley's present-day mobility gap traces back to mid-twentieth century redlining that diverted investment east of San Pablo Avenue and zoned the western flats for polluting light industry (Barber, 2018). The truck traffic endures, but accessible multimodal infrastructure never arrived for residents there.

However, Bay Wheels' stations remain scant in low-income West Berkeley (see Figure 1 in Assignment 2). For low-income households, owning and maintaining a private car is financially burdensome (U.S. Census Bureau, 2024). Bay Wheels was intended to fill that gap, setting a minimum 20 percent of stations to be in low-income area in Berkeley, but the nearest dock for several census block groups lies more than 1 mile away (see Figure 2 in Assignment 2). The absence of first-mile bike access forces residents into longer car or bus trips, compounding particulate pollution in an area already burdened by I-80 trucking corridors.

Therefore, closing the gap in Berkeley is essential to uphold Bay Wheels' equity and to support the city's broader goal of providing accessible and affordable mobility for all residents.

Literature and reality

Literature exposes, but only partially captures, the complexity on the ground. Literature on spatial justice suggests that infrastructure often follows capital rather than genuine community need (Brenner et al., 2009). When shared-bike infrastructure clusters around affluent corridors, it erodes low-income communities' sense of home and capacity to claim the Right to the City (Sanyal, 2018). Scholarship on mobility justice further warns that such infrastructural imbalances

hard-wire privilege into everyday movement, amplifying displacement pressures as station density becomes a visual marker of speculative investment (Qian et al., 2023).

However, funding, rather than planning ideals, is the chief obstacle to putting the spatial-justice framework into practice. Severe budget constraints facing every partner, the City of Berkeley, MTC, and Lyft. Berkeley depends on its limited tax and MTC grants, MTC operates under tight state-federal caps, and Lyft must remain profitable. As a result, under a neoliberal governance structure where public services are increasingly dependent on market logic and fragmented public-private financing, achieving a truly equitable distribution of shared bike infrastructure remains a persistent challenge (Elwood, 2002)

Action taken

The City of Berkeley, Bay Wheels, and Metropolitan Transportation Commission (MTC) have undertaken several key measures to improve the equitable distribution of bike-share stations. Table 1 shows five of the most significant actions the authority conducted.

Table 1. Major actions to improve equality in Bay Wheels distribution

Year	Authority	Actions	Sources
2015	MTC & City	Berkeley and MTC came to an agreement to add 6,300 bikes and make sure 20% of new stations are built in low-income communities.	(MTC, 2015)
2016	City	The City Council oversaw an extensive public process to decide where station should go. The result ensured that 20% of Berkeley's 37 planned stations were in historically disadvantaged neighborhoods.	(Patch, 2017)
2020	City & Lyft	The City Council approved an amendment allowing a large e-bike rollout only if over 15% (49 out of 313) of the added e-bikes were sited in West Berkeley.	(*Electric Bike Share Program*, 2020)
2024	MTC & Lyft	MTC approved a 20 million investment to expand station in the East Bay, with Berkely slated to receive new stations to improve equality.	(Cycling West, 2024)
2025	City	City officials solicited community feedback on proposed 11 new stations in spring 2025, including three in West Berkeley to improve the balance of distribution.	(CITY OF BERKELEY, 2025a)

However, despite these initiatives, setting a flat 20% quota has proved insufficient attempts to address these inequities, which matches the proportion of discount members, may fall short. Such quotas can be insufficient if they don't account for the actual travel distances and diverse mobility needs of residents in underserved areas.

Popular storylines

Numerous news reports spotlight the unequal distribution of Bay Wheels stations and chronicle the system's efforts to expand more equitably. First, many articles emphasize on the act of expanding the Bay Wheels system, such as a recent announcements about adding 11 new stations (CITY OF BERKELEY, 2025a). Second, several widely circulated sources foreground residents' perspectives. The City of Berkeley has conducted surveys and hosted community meetings to gather feedback on future expansions (SFMTA, 2018; CITY OF BERKELEY, 2025b).

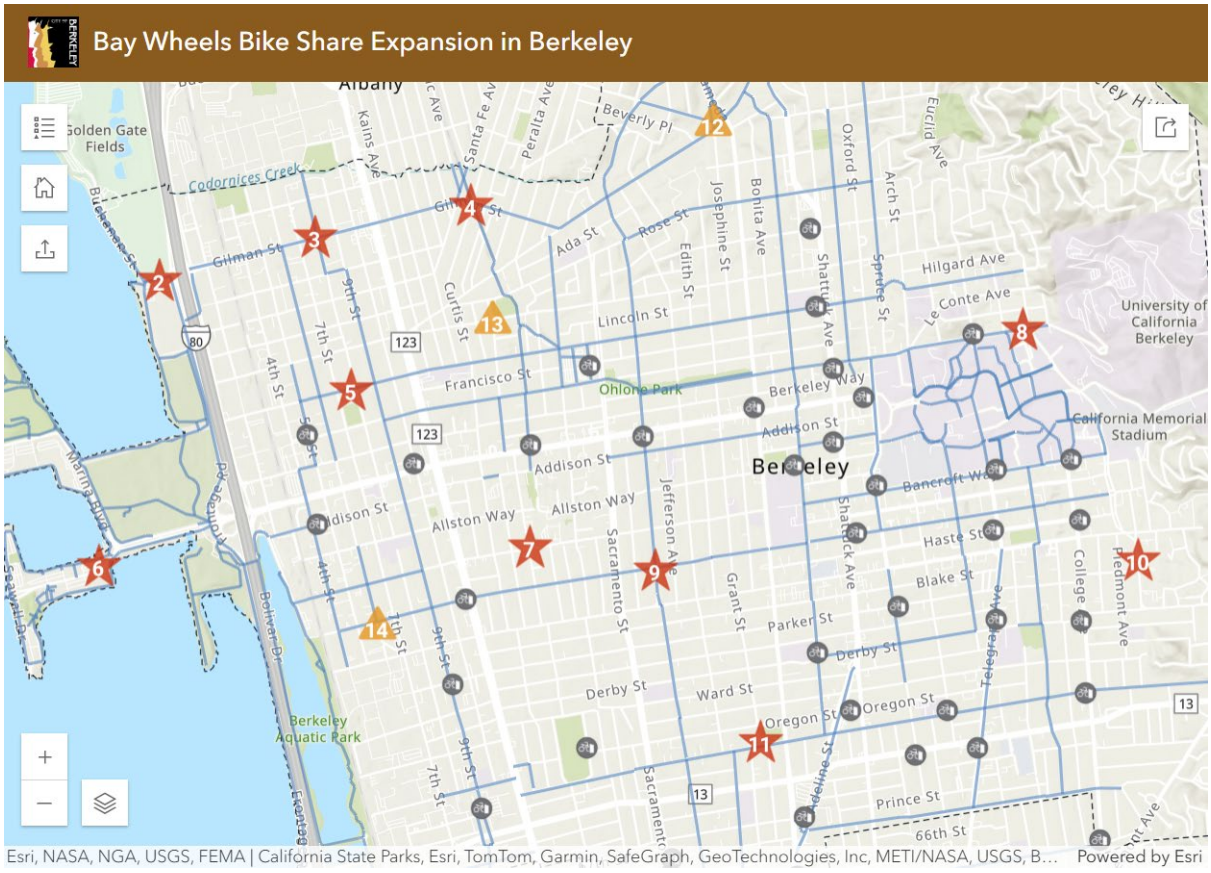

Figure 1. Proposed new station in Berkeley (CITY OF BERKELEY, 2025a)

However, several blind spots remain in these news stories. To begin with, none of the coverage addresses Berkeley's station-accessibility challenges. Although the "Bike Share for All" program reduces cost barriers and new stations aim to close the "last-one-mile" gap, they overlook the fact that Bay Wheels docks are still unevenly distributed. But such promotional narratives can mislead residents into believing the problem has already been solved. Although the city touts its latest round of Bay Wheels installations, only three new docks have been placed in West Berkeley, as shown in Figure 1. Moreover, most reports originate from the City of Berkeley, Lyft, or MTC, who have incentives to showcase their accomplishments rather than their shortcomings. Consequently, the coverage lacks in-depth scrutiny of existing inequities and a critical appraisal of official equity claims.

The path forward

For the city, it can add some acceptable restrictions to the operators, ensuring the low-income residents have access to Bay Wheels station in a more reasonable distance, which is measured by bike-share station density, socioeconomic data, and transit-access gaps within a 1/4-mile buffer. It forces every expansion phase to close spatial inequities that persist in Berkeley, and gives planners a quantitative way to defend location choices in public hearings, reducing NIMBY pushback (McNee & Pojani, 2022). But Lyft might resist the proposed restrictions.

For communities, they can launch a program, letting residents pinpoint desired locations on an open-source map and note barriers such as poor lighting or narrow sidewalks. Each proposed site would be paired with volunteers who handle outreach, report vandalism, and try to build local ridership. The resulting grassroots data and stewardship demonstrate latent demand, giving the City and Lyft concrete justification to fund new stations in underserved areas. However, the crowd-sourced data could raise privacy concerns.

Conclusion

Ensuring that every Berkeley resident lives within easy reach of Bay Wheels stations is not just an equity checkbox. It is a litmus test for climate-conscious, people-first mobility in the Bay Area. Turning quotas into on-the-ground access will require sustained public investment, enforceable siting standards, and grassroots data that keeps underserved communities at the center of every expansion plan.

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