

# Green Spaces: Accessibility and Mobility in Urban Areas

MEGHAN JIN

*Stanford University*

## INTRODUCTION

The sea of green grass provides a sense of stillness, peacefulness, and calmness, while the trees act as protective barriers that encompass the surrounding nature in a warm embrace. Flowers wave happily in the wind, and squirrels race up trees, chasing each other while birds chirp all around. Children run and play, and their joyous laughter rings in the air. Friends lounge happily on a picnic blanket, catching up on each other's lives. The welcoming arms of nature encircle the atmosphere in a relaxing manner. However, this isn't always the reality. Grey skyscrapers, honking cars, and crowds of moving people often take over amidst the hustle and bustle of a city.

Green spaces in urban areas serve as a reprieve for many people. They create space for individuals to take a break and slow down, especially during the current pandemic that has locked us indoors and increased mental health concerns. Escaping into the outdoors is crucial for our health, and the necessity and luxury of open spaces has been accentuated throughout this pandemic.

## BENEFITS OF GREEN SPACES

Beyond just a space for relaxation, green spaces have multiple health benefits. Research suggests that green spaces decrease stress levels, protect against mood disorders, and alleviate depression ("Green Space," n.d.). In a study based in the UK, researchers found correlations between green spaces and lower perceived stress, as well as a healthier and steeper decline of daytime cortisol, or stress hormone, levels (Roe et al., 2013). Additionally, higher pleasantness ratings of the surrounding environment were correlated with lower physiological stress responses through the olfactory and auditory systems (Hedblom et al., 2019). Such findings are persistent across a variety of global and domestic studies (Barton & Rogerson, 2017), (Zhang et al., 2020), demonstrating the long-term impacts green spaces have on the mental health of individuals – ranging from adolescents to the elderly alike. By alleviating stress and improving mental health outcomes, individuals are overall healthier, find it easier to focus, and have greater expression of positive emotions.

Furthermore, beyond mental health benefits, green spaces also provide physical benefits. They lead to decreased rates of non-communicable diseases such as heart disease, obesity, and stroke (Merschel, 2021). For instance, studies looking into neighborhoods in the United States have found that the increased stroke risk of living in less green neighborhoods is equivalent to the increased stroke risk correlated with having diabetes (Merschel, 2021). Additionally, green spaces reduce general morbidity in urban residents “by providing psychological relaxation and stress alleviation, stimulating social cohesion, supporting physical activity, and reducing exposure to air pollutants” (World Health Organization, 2016). Especially as air pollutants can lead to increased risk of asthma and lung diseases, such declines in exposure influences long-term health outcomes; the decrease in chronic illnesses also means a decrease in healthcare expenses. Additionally, stimulating social cohesion improves soft skills and communication. Through social, physical, and mental benefits, green spaces act as havens in urban cities. Exposure to any type of green space, even limited settings such as residential city streets in urban areas, is just as beneficial to one’s health as visiting a large public park or natural setting (Slater et al., 2020).

However, amidst the clear positives that green spaces bring, not everyone has equal access. So *who* has access to green spaces? And what does this reveal to us about the presence or lack of accessible, inclusive public green spaces in an urban landscape?

## SAN FRANCISCO AND ENVIRONMENTAL JUSTICE

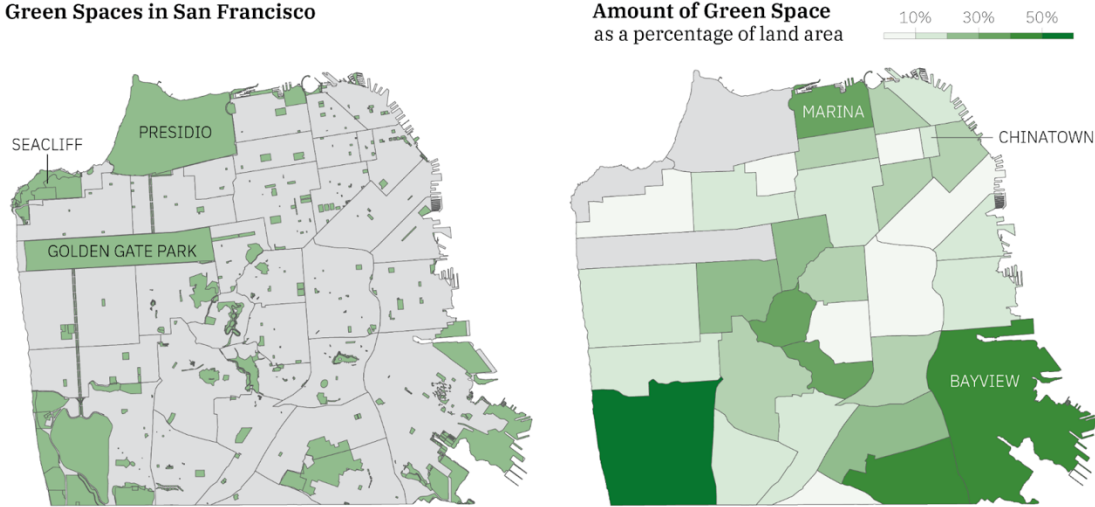
To begin tackling these questions, we must first acknowledge that there is disproportionate appropriation of open spaces among communities of different socioeconomic statuses. To do so, we’ll dive into looking at San Francisco – we’ll discuss the correlations between green spaces in San Francisco to inequities, socioeconomic factors that impact accessibility to open spaces, and regulations that the city has put in place related to public spaces.

But first, let’s acknowledge how inequities to green space access falls under the framework of environmental justice. As defined by the EPA, environmental justice “is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies” (United States Environmental Protection Agency, n.d.). In relation to green spaces, this suggests that the development, implementation, and accessibility of green spaces should be equal among *all* individuals. Ideally, urban green spaces should be open to everyone, but this is not the reality.

Specifically, most urban green spaces are more easily accessible and larger in wealthier and predominantly white neighborhoods (Rodriguez, 2021). In San Francisco, which is ranked third in the US for parks with 17.9% or 5384 acres of the city’s land being open space

(Harrison, 2013), wealthier communities have greater mobility to visit green spaces. For instance, villas in Seacliff enjoy 30% canopy cover while lower-income and immigrant communities in Mission and Outer Sunset only have 7.5% and 5% tree cover, respectively (Grinspan et al., 2020). To further view these differences, we'll take a look at maps comparing green spaces and socioeconomic inequality.

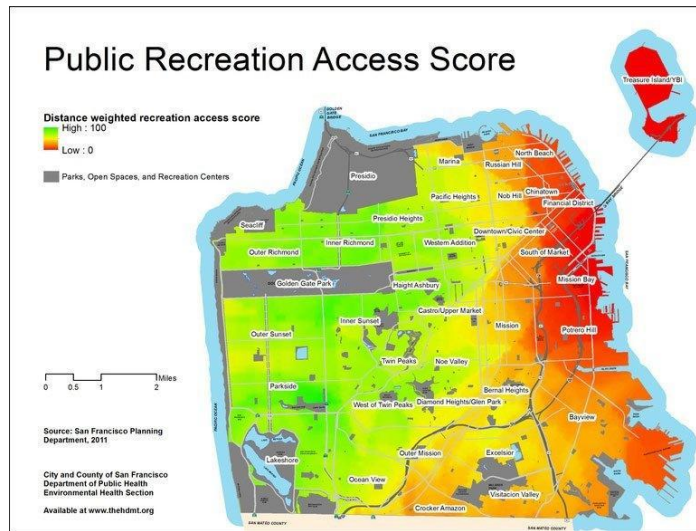
**Figure 1**



*Note.* Amount of green spaces in different San Francisco communities (James et al., 2015).

Figure 1, taken from Stanford Data Stories, demonstrates the variable spread of open areas in the city. To further contextualize the variability, we must also look at public recreation access scores across San Francisco. Figure 2, taken from the Francisco Park Conservancy, which aims to drive the construction of the new Francisco Park in collaboration with the San Francisco Recreation and Park Department, highlights the concentration of green spaces towards the center and western regions of the city.

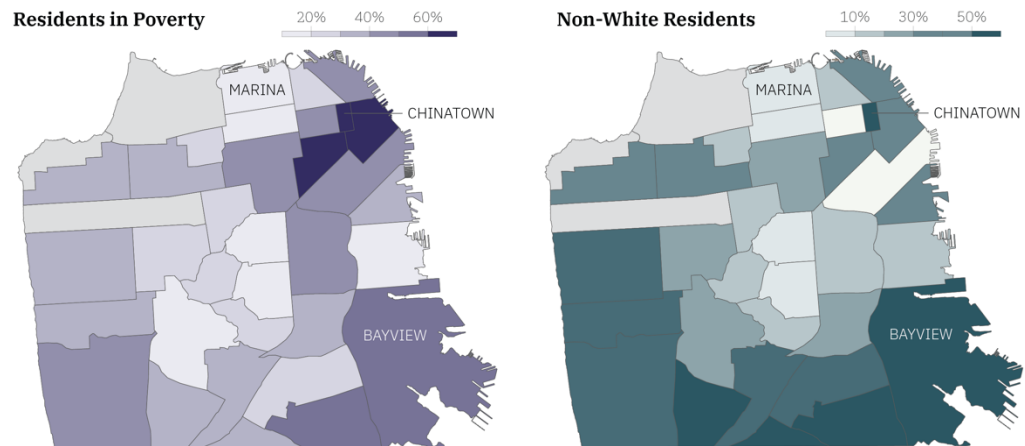
**Figure 2**



*Note.* Public recreation access scores analyzing mobility to park-and-open space areas in San Francisco (Francisco Park Conservancy, n.d.).

When comparing Figures 1 and 2 to Figure 3 and 4 (shown below), which highlight distribution of poverty, non-White residents, and inequality across San Francisco, we note a higher concentration of poverty and inequality across the eastern side of San Francisco, with wealthier, whiter communities more focused in the central and western portions.

**Figure 3**



*Note.* Distribution of residents in poverty and non-white residents in San Francisco (James et al., 2015).

**Figure 4**

## Inequality in San Francisco, 2010

Median family income, % of metropolitan area median:

**Lower-Income:**

- 0-45%
- 45-60%
- 60-75%

**Middle-Income:**

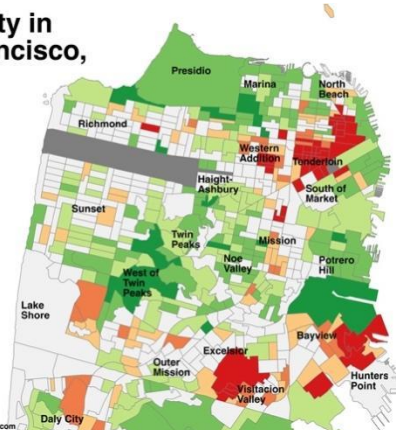
- 75-125%

**Upper-Income:**

- 125-150%
- 150-200%
- >200%

No Data

HickConwayBlog.wordpress.com



*Note.* Inequality in San Francisco based on income information from the 2010 census (Brinklow, 2016).

Thus, based on a comparison of these maps, we can conclude that lower recreational access scores and decreased green spaces exist among communities with higher poverty, lower income, and more non-White residents. For instance, central and western regions of San Francisco, such as Twin Peaks, have greater income levels, less people of color communities, and higher access to green spaces. In contrast, eastern portions such as Tenderloin have greater poverty and people of color, yet decreased green spaces. These correlations between wealth and race highlight inherent, biased construction of and access to open space across San Francisco.

On a larger scale outside of just San Francisco, similar trends are observed. The average park size is 14 acres in wealthy neighborhoods, compared to 6.4 acres in poor neighborhoods (Shukla, 2020). Reports such as those conducted by the Trust for Public Land, a non-profit founded in 1972 ensuring that all people have access to nature and the outdoors (Trust for Public Land, n.d.), have highlighted gaps in both the size and crowdedness of parks. For instance, parks that serve low-income households are  $\frac{1}{4}$  as large but 4 times as crowded when compared to higher-income neighborhoods. Similarly, green spaces in communities with people of color tend to be half as large and five times as crowded when compared to white neighborhoods (Trust for Public Land, n.d.). Especially since many of these socioeconomic factors, such as race and income, are intertwined, minority populations and low-income individuals are often disproportionately impacted by lack of access to green spaces.

## SOCIOECONOMIC FACTORS AND GREEN SPACE

To further expand on the impact of socioeconomic factors on urban open space access, we must recognize and review essential components related to socioeconomic status. Socioeconomic factors include aspects that can influence one's well-being, including, but not limited to: income,

education, employment, community safety, and social support (“Social & Economic,” n.d.). In studies determining factors related to green space quality and accessibility, such as one based in Portugal, researchers found that individuals with lower socioeconomic status suffered from individual and community resources (Hoffmann et al., 2017). The lack of input, community support, and individual mobility to visit green spaces accumulated in overall poorer physical activity and health levels. Other studies find similar correlations between minority populations (race) and green space access (Wen et al., 2013). While socioeconomic factors may not lead to distinct, directly causal relationships, the combination of various aspects leads to general decreased access to green spaces. Migrant communities may tend to lean lower-income, and lower-income communities often have fewer community resources, one of which is green spaces.

For instance, access to urban green space is strongly correlated with higher education and income; it is limited in areas with higher populations of Black or Latinx individuals (Shukla, 2020). Additionally, immigrant or people-of-color communities may also lack access to voting rights or equal voices in decision-making. This often means that construction of green spaces potentially “displace[s] poor residents or informal communities who lack land tenure, usage rights and representation” (Grinspan et al., 2020). Tying this back to our concept of environmental justice, the lack of representation can fall under the specific category of procedural environmental justice. Procedural environmental justice supports equal input to ensure equitable environmental rights (“What is Environmental,” n.d.). Thus, overall, from a socioeconomic perspective, individuals that fall on the lower end of the scale often have decreased access to urban green spaces. These individuals also often constitute the homeless population; thus to dive into deeper implications, we will acknowledge the impact that San Francisco’s open space regulations have on homeless and lower-income individuals.

## SIT-LIE ORDINANCES

Beyond the inherent inequities present across San Francisco, certain regulations controlling access to green spaces further exacerbates equity issues. Specifically, in 2010, San Francisco instituted a sit-lie ordinance. These sit-lie ordinances, which exist across cities in the US, but particularly in San Francisco, Portland, and Honolulu, were originally created as anti-homelessness laws (Fernandez, 2014). In allowing officers to issue a misdemeanor or ticket for lying or sitting on public spaces, the goal of these laws is to decrease public traffic and possible obstruction along city spaces, including green spaces (specifically between 7 am and 11 pm) (“SEC. 168.,” n.d.). Falling under the 36 “quality of life” laws that San Francisco has, the sit-lie ordinance under San Francisco’s Civil Sidewalk Ordinance Code, Section 168 of the San Francisco Penal Code criminalizes homelessness and decreases access to public parks

(Zambrano, 2018). For context, other such “quality of life” laws include no sleeping in public parks at night and no building of encampments (Sabatini, 2016). Met with much heated controversy, these laws ultimately limit the public’s access to urban open areas. Furthermore, the efficacy of these laws has come into question: not only have sit-lie ordinances exacerbated homelessness in atypical areas, but they have also increased costs for the city. In a report from Budget Analyst, it was found that San Francisco spends \$20.6 million annually on homelessness without actually reducing the number of people living on the streets (Sabatini, 2016).

Proponents of these laws claim that they allow greater care and open passage through public spaces. For instance, Supervisor Michela Alioto-Pier from San Francisco’s Board of Supervisors states, “What we are really talking about here is civility on our sidewalks.” As a representative responding to the needs of the people, Michela’s sentiment is echoed and supported by “civil sidewalk” proponents who complain about drugs, defecation, and thugs in front of financial and residential neighborhoods (Gaynor, 2010).

On the other hand, opponents claim that this criminalization of homelessness only further worsens the underlying causes. Public support, through “No on Sit Lie” rallies to a variety of social media pages, highlights how targeted laws lead to decreased accessibility to public resources, such as open spaces. For instance, the Facebook page *San Francisco Stands Against Sit/Lie*, publicly posts quotes, articles, and banners supporting the removal of sit-lie laws. Supporters highlight that “by relying on law enforcement to address an issue that should more appropriately be considered falling within the domain of public health, communities are expending a tremendous amount of public money unnecessarily and ineffectively...criminalizing homelessness in America” (San Francisco Stands Against Sit/Lie, n.d.). It’s interesting to also address how proponents of sit-lie ordinances claim that it will increase “civility,” implying that the homeless are not “civil” human beings and treating them as criminals instead of working to actively support and help them. This condescending treatment on individuals of lower socioeconomic status can also be extended to overall societal beliefs. These underlying biases further drive poor treatment of and decreased resource access to individuals of lower statuses. By creating such penalizing laws, as opposed to spending money to bridge the gap and increase resources, this only harms lower-income individuals more.

Beyond the roles that additional advocacy groups, such as @coalitiononhomelessness on Instagram play in fighting for greater equity and fair regulations via galvanizing the public through social media (Coalition on Homelessness, n.d.), one must also recognize the impact that privatization and societal biases have on green space access.

## SALESFORCE PARK

An example of such privatization of public spaces comes in the form of the Salesforce Park. Built and opened to the public in August of 2018, the Transbay Transit Center/Salesforce Park is a \$2.2 billion 5.4-acre floating park full of trees and open green space in the Financial District (Keeling, 2019). While it's technically a public park, individuals must access it through using an elevator in the Salesforce Transit Center. Specifically, this park sits atop the Transit Center next to the Salesforce Plaza and under the Salesforce Tower (Keeling, 2019). Additionally, the park has three levels of security – police, security officers, and ambassadors – and does not allow tents (“Tight Security, 2018).

Thus, what this actually means is that based on appearance, individuals may be turned away from this public park. Specifically, with the tight security and regulations, homeless individuals or individuals of low socioeconomic statuses, who may not be able to afford expensive suits, may be excluded. Thus, while the park claims to be open to the public, the reality of it highlights the limitations and exacerbations of societal perceptions of people of lower classes. Additionally, the idyllic imagery of a public park full of businessmen taking a break does not take into consideration the reality of *all* individuals who need to take a break. By creating a “utopia” through this floating park, it also further illustrates the power of high-profile businesses, such as Salesforce, in creating unrealistic and harmful societal standards. These standards widen the gap between the wealthy and the poor, the citizens and the immigrants, the well-educated and lower-educated, the employed and the unemployed. Sit-lie ordinances and societal prejudices impact all individuals of lower socioeconomic status – not just the homeless.

Amidst the negatives that Salesforce Park has brought, the idea of a floating park is innovative in terms of creating greater green space. Additional amounts of open spaces are beneficial for the public; however, the roles that privatization and implementation of Salesforce Park have played leave additional flaws that should be addressed.

## POTENTIAL APPROACHES TO SOLUTIONS

Thus, when considering ways to increase equal access to green spaces, we must consider current regulations in conjunction with inherent societal biases. One such project that looks at better urban planning is Stanford's Natural Capital Project. The Natural Capital Project “advances research frontiers around sustainable development and sustainable, livable cities,” such as “equity in access to nature and its benefits” (Natural Capital Project, n.d.). One such solution involves the usage of Urban InVEST, a cities-specific suite of software models to more easily and effectively approach urban planning (Cafasso, 2021).

Urban InVEST will help urban planners best invest in nature to improve people's lives through creating maps to visualize links between nature and human well-being. Especially as green infrastructure is keep



city temperatures cooler, buffer flood risk, and improve health, developing innovative plans for more green spaces are essential to increasing overall access. By asking the three questions of “where in a city is nature providing what benefits to people, how much of each benefit is it providing and who is receiving those benefits?” city planners can optimize important impacts, such as how the placement of certain parks in Shenzhen, China can reduce damages of up to \$25 billion amidst an intense storm (Cafasso, 2021).

In the optimization process, this software would also target inequities in improving universal access to nature, especially among marginalized communities. For instance, researchers were able to determine where in Paris extra bike paths and parks would boost health in an equitable manner (Cafasso, 2021). Something as simple as walking a few extra blocks or biking to work can benefit physical health (Su, 2021). By using scientific models to plan out new parks and open areas, lower-income communities would be better able to access green spaces and the benefits they bring.

Beyond a research-based approach, community organizations and alliances also aim to increase access to open urban areas, even through building their own spaces. One such alliance is California Green Zones or the California Environmental Justice Alliance (CEJA). CEJA is community-led and works to advance policy solutions through uniting organizing leaders and members of impacted communities (California Environmental Justice Alliance, n.d.). For instance, the People Organizing to Demand Environmental and Economic (PODER) group, which works with CEJA, aims to reclaim public lands to increase overall open space access, affordable housing, and community resources (“SAN FRANCISCO: People Organizing,” n.d.). Through advocating for equitable development and partnering with nonprofits to achieve better public space, improved health, and infrastructure development (ie. housing), PODER demonstrates the power of collaboration through communities. For instance, in creating an urban farm in Crocker Amazon Park in San Francisco, PODER encouraged residents to optimize green space and food production. In engaging residents, PODER further calls upon the power of the collective to design beneficial open spaces. Especially as the impacted residents understand their needs the best, having community members creatively come up with plans will effectively and directly target their needs. Furthermore, in 2017, PODER also organized to rezone a city-owned parking lot in the Mission and Tenderloin neighborhoods to a new green space, benefitting many immigrant Mayans (“SAN FRANCISCO: People Organizing,” n.d.). Thus, rallying successfully highlights marginalized voices, and is essential to improving access to environmental rights and green spaces. Through uniting with the community and local organizations, PODER (and CEJA) demonstrate the driving forces of collaboration and advocacy.

It is this synergistic combination of scientific, research-backed proposals along with community initiatives that will power change in increasing access to green spaces step by step.

## CONCLUSION

Our society is driven by constant stress, pressure, and movement; but everyone deserves – and needs – a space to decompress. These green spaces, especially in urban areas, are meant to be welcoming and open areas for everyone. However, socioeconomic factors such as race and income are correlated with green space access; in reality, those with lower socioeconomic statuses have limited access to open spaces and the benefits that they bring. Specifically, San Francisco’s sit-lie ordinance further exacerbates gaps in access and emphasizes underlying societal stigmas against the homeless and lower-income individuals. To approach this issue of green space access, it’s necessary to both utilize scientific data models and community advocacy efforts – we must make these peaceful reprieves accessible to *all*, one park at a time.

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