A SHARED BELONGING

DESIGNING FOR EQUITABLE MICRO • MOBILITY IN PORTLAND, OREGON

HANNAH SIX

APPROVAL

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June 15, 2019

Submitted in partial fulfillment of the
Masters' of Landscape Architecture
Department of Landscape Architecture
University of Oregon

ABSTRACT

Portland Oregon's Forest Park— one of the largest urban forests in the United States—usership is in a state of inequitable distribution, disproportionately allocating "the benefits and burdens of [urban] growth and change".[1] Geospatial and economic transportation barriers in access to amenities exist with a disproportionate impact on residents of color. The embedded structural and institutional impacts of inequity influence an individual's transportation environment and access to amenities.

The urban transportation system is in a state of innovation and change. Shared micromobility has quickly become a part of American cities, bringing opportunities and challenges to an equitable future. The introduction of micromobility, on America's car-oriented streets create a tension between the benefits of increased equity and burdens of poor network safety. The disproportionate burden of poorly designed, car-oriented streets are majority bared by low-income residents of color.

This research conceives of design interventions to relieve the tension between safety and equity to procure the opportunity for emergent forms of micromobility to

exist. Providing space in the right-of-way to encourage equitable and carbon reducing forms of transportation can play a critical role in allocating open space resources for vulnerable, historically left out residents. This project examines the opportunity for shared micromobility to bridge Forest Parks access gap. Shared micromobility has vast equitable potential to strengthen connections between economic centers of opportunity, amenities and vulnerable residents. Aside clear potential, the risk of othering and perpetuating historic and contemporary inequalities exists.

john a. powell's conceptual framework, *targeted universalism and belonging* propel this project to consider interventions that aim to disrupt and dissolve structures of exclusion. This project uses mapping to understand the barriers of micromobility, amenity distribution and bike infrastructure. Politically and economically vulnerable communities are identified and overlaid with the geographic extent of micromobility trips informing a proposal for a protected route—Forest Lane.
Forest Lane is a micro-modal transit route that serves historically and currently marginalized communities to belong and exist in Portland with access to Portland's beloved Forest Park.

To my two very best friends,

Linda Susan Six + James Sidney Krigbaum

ACKNOWLEDGMENTS

This project would not have been possible without the support of my family: Linda + Robert + Meryl Six, Bob Hable and Rick Champion as well as the unconditional care of my cohort. Your laughter and wildly intelligent beings brought a tremendous amount of joy to my life and work across the last three years. I thank you dearly.

An enormous thank you to Liska Chan, Chris Enright, Mark Eischeid and Anne Brown for your mentorship and guidance.

Image on following spread:
Menja Stevenson

BELONGING

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chapter one

Introduction

Urban forested parks are relatively stable land uses within the fabric of cities. They experience considerably less development pressure in comparison to other types of urban green space. In Portland, Oregon, forested parks are highly valued urban amenities deeply tied to Portland's identity. Forest Park was established to serve as a refuge from the city, valued for its long-term preservation and positive health qualities for Portland residents and visitors. This begs the questions, who are we preserving this for? And how are we extending access to the urban fabric?

This project examines micromobility equity by applying two policy frameworks to extend infrastructure to vulnerable communities for access to Portland's Forest Park. The goal of this work is to scope and spatialize the impact of policy and micromobility models to present equity-based design interventions. A framework was created to understand gaps in access and bridge inequity through the employment of an existent framework Targeted universalism. Through the influence of john a. powells theoretical framework Targeted

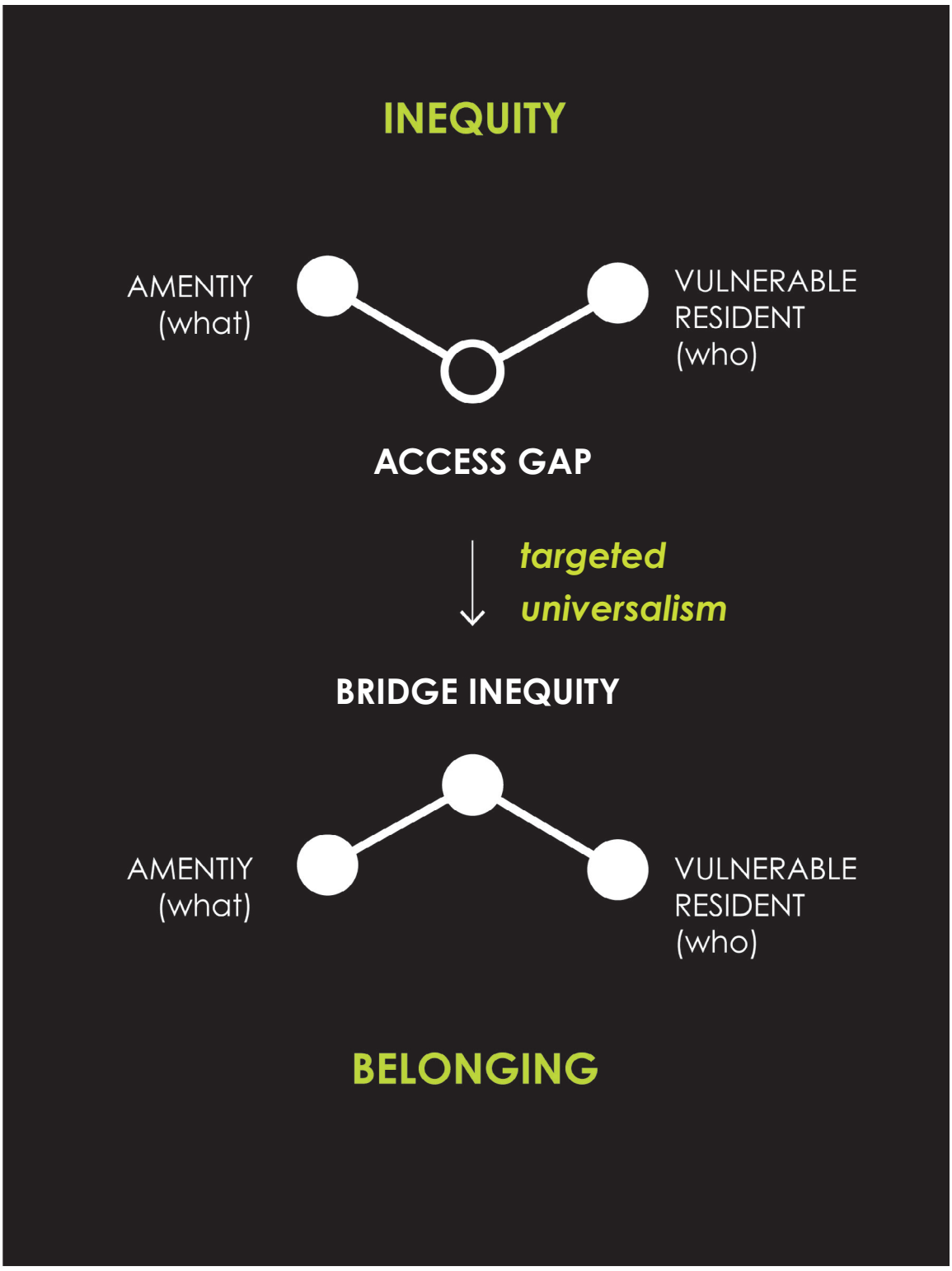
universalism and his theories of belonging, I developed a framework— Equitable Belonging— for landscape architects to navigate urban inequities.

It is important to recognize that inequity can emerge from a community group experiencing vulnerability due to an existent access gap or by identifying an amenity with an existent access gap. Identifying a discrepancy in access leads targeted universalism to foster connection and belonging to bridge gaps in access. The aim of my framework is to formulate designs using a lens of equity to bridge access gaps. I achieved that through adapting Targeted universalism from a framework to design policy, to a framework for transportation and streetscape design.

EQUITABLE BELONGING FRAMEWORK

Inequities at a framework level are a discrepancy in access between amenity and vulnerability, determining a level of access. This framework then provides the opportunity to understand and fill the identified gap in access. The framework asks designers to scope the type of amenity, site a determinant of a vulnerability which presents barriers to access and a type of access or connection to consider. Subsequently, spatialization occurs to prioritize an amenity, map distribution and density of vulnerability and determine a tool to bridge the identified access gap.

Figure 1 :
Equitable Belonging Framework
a framework for identifying and closing the inequity cap through frameowrk of belonging.


INEQUITY
AMENTIY
(what)
VULNERABLE
RESIDENT
(who)
ACCESS GAP
targeted
universalism
BRIDGE INEQUITY
AMENTIY
(what)
VULNERABLE
RESIDENT
(who)
BELONGING

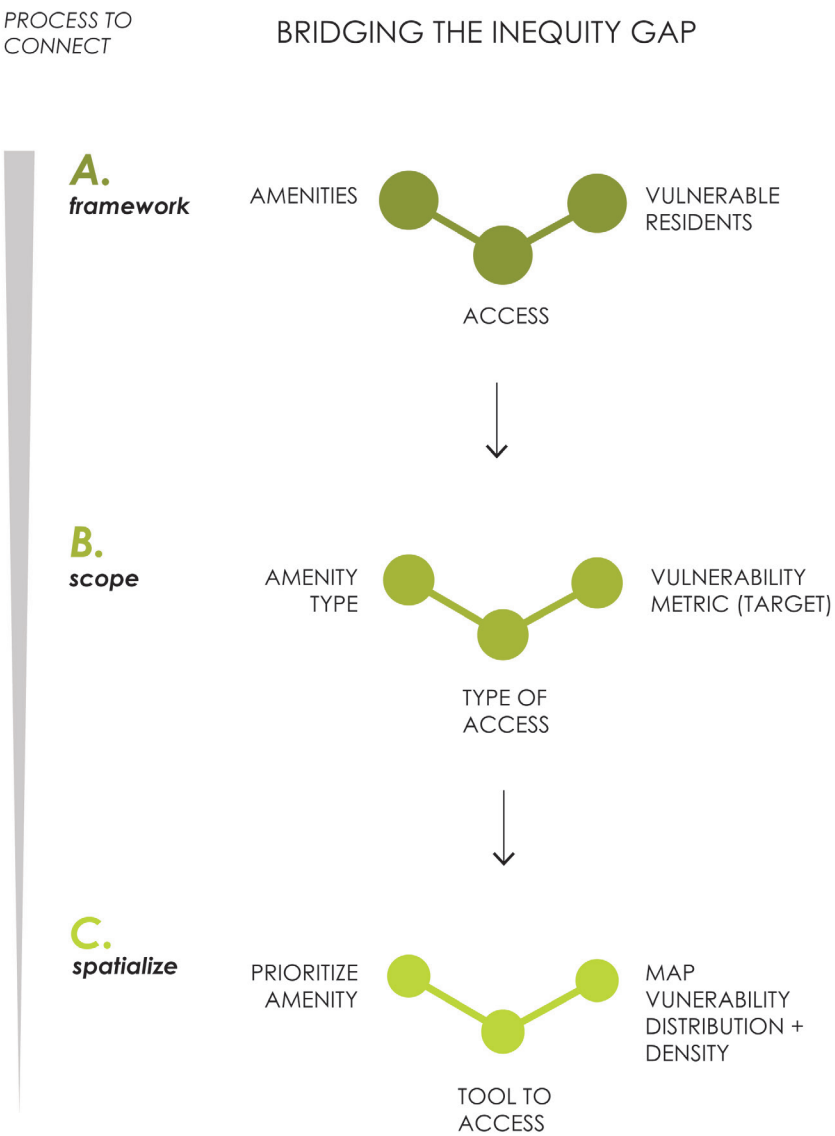


Figure 2 : Equitable Belonging Framework for the application of targeted universalism to design: a framework for identifying and closing the inequity cap through process to connect. Examined at framework, scope and spatial scale.

Figure 3 : Scaling the Equitable Belonging Framework Framework is broken down into three degrees of focus to spatialize inequity and amenities to then approach design development


FRAMEWORK
SCOPE
SPATIALIZE

I apply the equitable belonging framework I created, using Portland's Forest Park. I then looked to explore the role of micromobility as a tool to bridge the existent equity gap and apply the framework to procure a design.

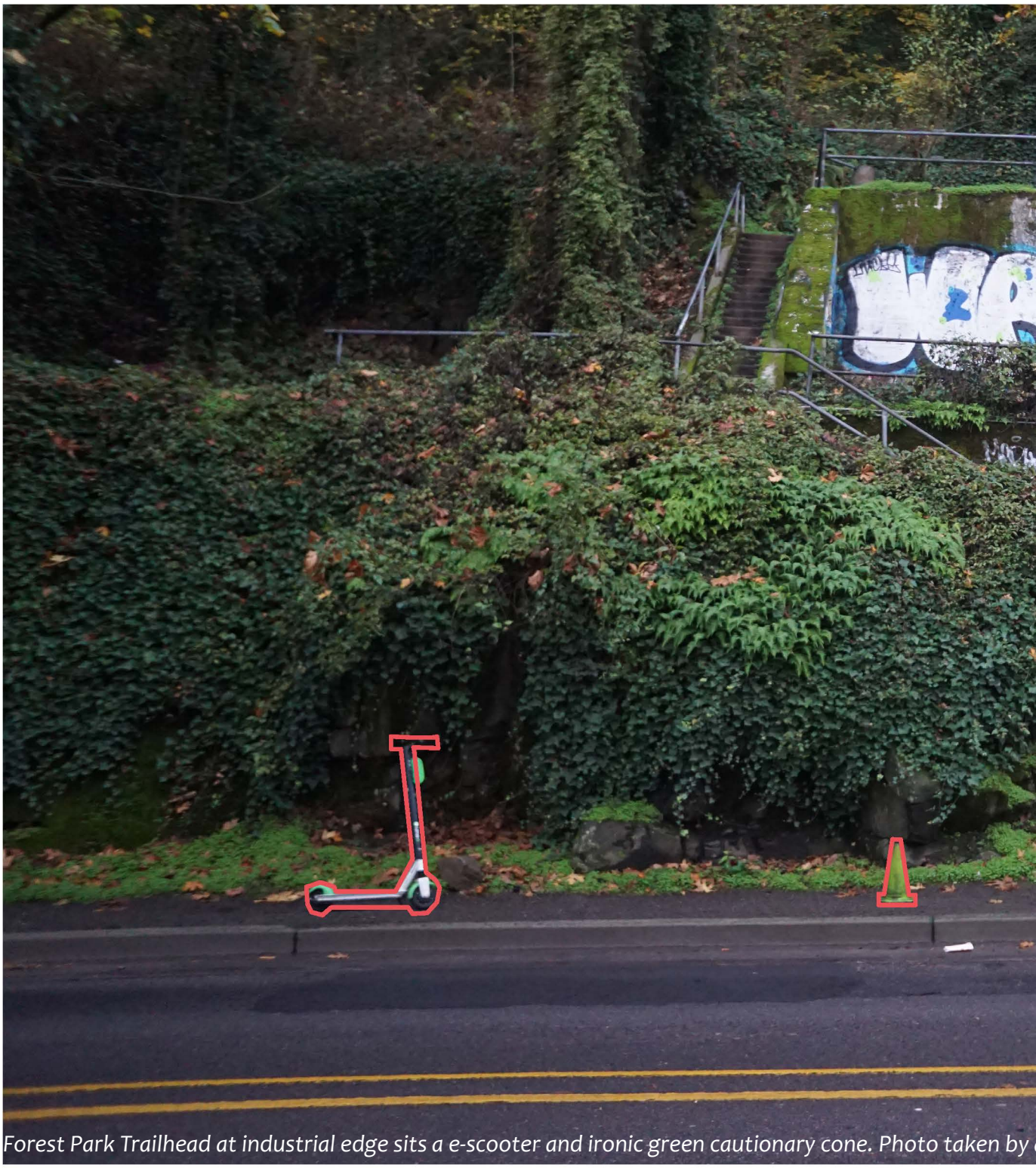
By adopting a policy framework for design, the equitable belonging framework can push designers to consider who they are designing for and project the potential implications of their designs. Policy has substantial spatial, economic and social impacts ingrained into the fabric of our cities, yet, often the negative externalities are overlooked, and attention is spent on the intentions of policy rather than the covert impacts. Policies overtly and covertly racialized wealth generation in America. A path toward equity begins with understanding the many forms of racism that exist at different scales: individual, internalized, interpersonal, institutional and structural.[1] Examining race relations at an institutional level acknowledges and aims to understand the covert impacts policy has on wealth, amenity and resource allocation for residents of color. This project focuses on institutional and structural forms of discrimination through the application of the equitable belonging framework, defining them as follows:

Figure 4 :
Forms and Levels of Racism, to understand the full spectrum of the political and economic impact of racial discrimination, the scale and relationship of the different forms of racism must be known.

"Institutional racism refers specifically to the ways in which institutional policies and practices create different outcomes for different racial groups."[2]

"Structural Racism lies underneath, all around and across society. It encompasses (1) history, (2) culture, (3) interconnected institutions and policies." [3]

john a. powell and Andrew Grant-Thomas emphasize that "racism is best defined with respect to the outcome it produces (racial inequality), rather than with reference to its specific content or intent".[4] Continued research is necessary to understand the legacies and effects of policies and the ways they are upheld as cities move toward an emergent shared transportation-as-a-service economy.



Forest Park Trailhead at industrial edge sits a e-scooter and ironic green cautionary cone. Photo taken by

by author.

I adopt john a. powell's frameworks, that deconstruct varying experiences of vulnerable residents to create policies that not only actively seek inclusionary practices but challenge the structures of barriers in place. His work offers a theoretical approach to dissolving exclusionary systems, which, I argue, are integral to design thinking and application. Fundamentally, this project adopts powell's work to understand the social and physical environment designers operate within and their relationship to equity.

This project examines the growing inequity in American cities, identify gaps in access, explore the human impact, understand inequity, and analyze micromobility models to visualize social impact. This analysis then employs design interventions to dissolve inequitable access to Forest Park and inner-city amenities while acknowledging the many disciplines and types of work necessary to advance inclusion to develop a state of equitable belonging in urban cities.

GROWING URBAN INEQUITY

Inequity exists in patterned ways often through 'non-race' factors such as class status, religious belief, and language, reinforcing institutional forms of racialization.[5] The growing inequity in America is informed by historic policies and practices, therefore, it must be approached from a structural and institutional angle.

Urban inequity is spatially visible in cities across the United States. This is evident in the dynamics of inner-city urban and suburban areas. Suburbs across the country are becoming more diverse while inner cities are often becoming whiter[6]. Economic power is spatial and racial. A nationwide study found that non-white home buyers' income is closely related to the income of the neighborhood they purchase within, while the income of white home buyers is significantly higher than the neighborhoods they purchase within.[7] This intersection of wealth and historically disinvested areas is not a coincidence nor only the work of the free market economy.

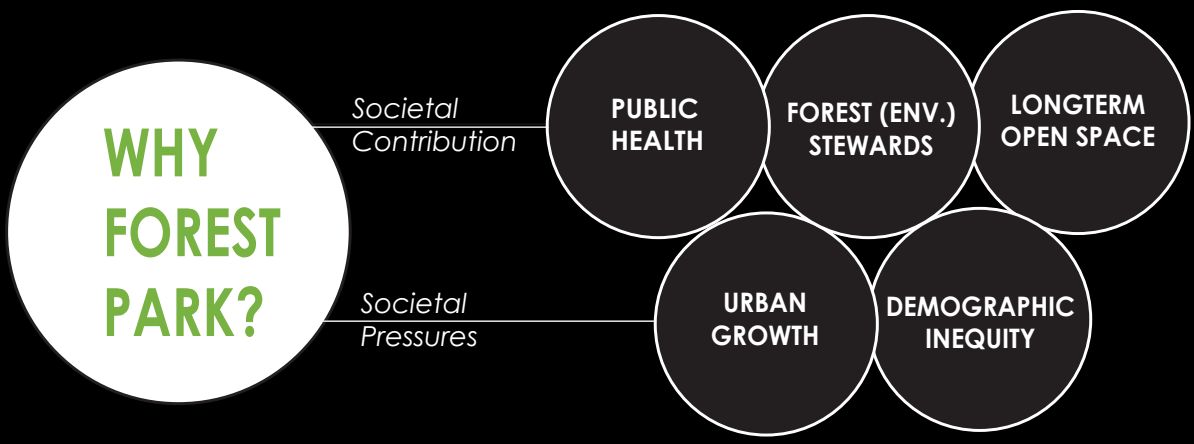
In the 1930's, urban cores across the United States politically organized limited areas for residents of color to live and own homes. [8] The Home Owners Loan Corporation (HOLC)—a federal agency— ranked neighborhoods to assess "Residential Security" prior to the 1950's rise of suburbanization. Areas mapped as "hazardous", were denied access to capital investment, the notes of which show reasoning upon the basis of racial composition. [9] Often these redlined, "hazardous" neighborhood area characteristics descriptions identified "favorable influences", noting convenience to center city yet "detrimental influences" noting heterogeneous population.[10] The absence of access to capital investment perpetuated disinvestment. The racialization of housing at this time excluded 'Finns,

Russians, Italians, Jewish, Blacks, Japanese, Chinese' as it classified them as non-white.[11] These redlined areas began as diverse areas yet those who had the social ability to assimilate into other neighborhoods and leave these areas did. The exclusionary terms of housing development and suburbanization outside of the redlined districts created majority Black neighborhoods. War-era northern migration heightened existent housing shortages for Black residents during World War II. War-industry workforce jobs provided income for women and residents incentivizing the move to port cities, such as Portland, Oregon. In the post-war era, whites benefited from the economic stimuli of New Deal housing legislation, which supported home ownership in the suburbs, inviting whites to move out of the city. Though many Blacks had the financial stability to purchase homes, this benefit barred 'non-whites' from participation in the federal benefits by racializing housing deeds to prohibit the purchasing, renting or future purchasing for non-whites. Politically and socially curated, race-based economics has invited investment into these formerly disinvested areas creating the opportunity for economic gain, much of this gain is to the benefit of white buyers.[12]

THE ACCESS GAP

Issues of inequitable park access need to be addressed, especially as urban density increases. Open space planning efforts are under pressure politically, ecologically, and by park users. As the urban population grows open space value will increase. Open space equity begins with understanding the historical and contemporary socioeconomics of the urban landscape in which open space exists.

Forested urban parks contribute positive environmental, social, and health benefits. Conversely, they magnify socio-economic disparities in access. Often in the development of new open space and transportation initiatives, communities are confronted with the impacts of increased economic value that often financially burden disadvantaged communities that live in proximity to improvements. This issue accumulates over time creating amplified discrepancies in access. Portland, Oregon has experienced this type of growth, in general, and regarding Forest Park.



"The fact that low-income people of color are disproportionately denied equal access to parks, school fields, beaches, trails, and forests is not an accident of unplanned growth, and not the result of an efficient free market distribution of land, but the result of a continuing history and pattern of discriminatory land use and economic policies and practices."[13]

High access to amenities of the inner-city is recognized in historic HOLC mapping and continues to exist at disproportionate levels when compared to suburban car-oriented developments. Suburban car-oriented forms create a reliance on cars to access amenities. The forms are less walkable, bikeable and transit is more sparse causing barriers to access. Greater amounts of paved areas exist and there is often less green infrastructure contributing to temperature differences creating heightened vulnerability to heat island effect. These areas are becoming more diverse, burdening historically and currently disadvantaged communities with disproportionate access to amenities and climate change risk due to low levels of green investment. Beyond the physical and spatial attributes, systemic barriers exist within the emergent technology shaping urban transportation systems. Transportation systems in the United States leave gaps between bus and train routes leaving certain neighborhoods with sparse opportunities for convenient transit options. [14] This gap in transit reach disproportionately effects and in fact, widens inequitable access gap in the more diverse urban fringe and suburban communities.

PORTLAND, OREGON

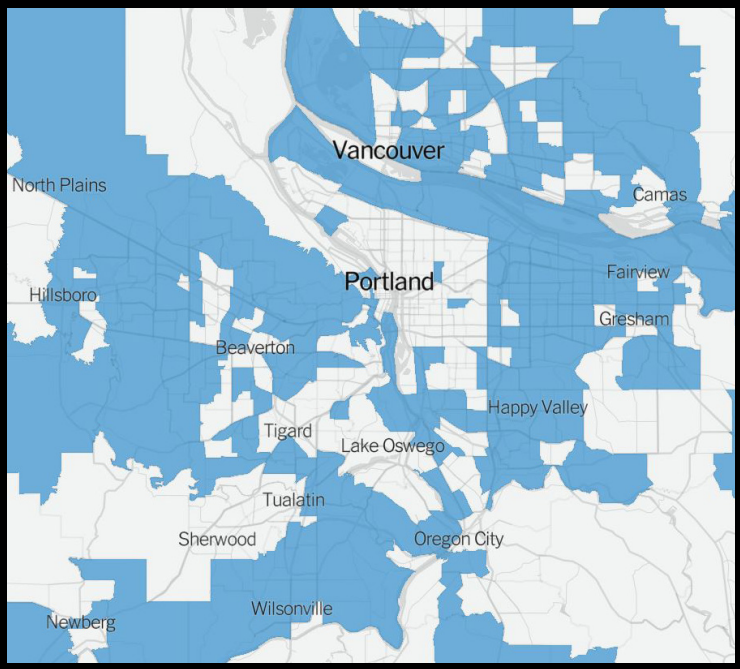


Figure 5 :
Suburban and Inner-urban shifts in whiteness and diversity. a nationwide trend of inner citeis populaiton growing more white and peripheral suburbs growing in diversity.

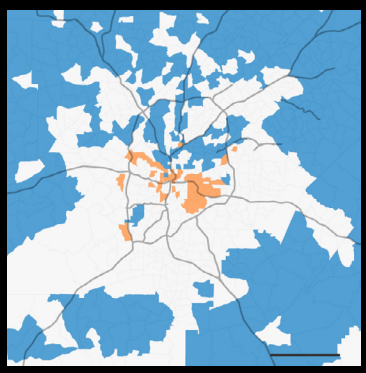
"The Neighborhood Is Mostly Black.
The Home Buyers Are Mostly White." (New York Times, 2019)

NON-WHITE POPULATION GREW

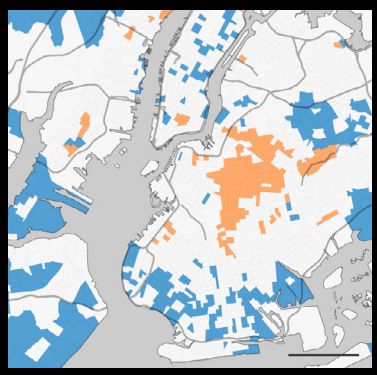
WHITE POPULATION GREW

DID NOT GROW DIVERSE

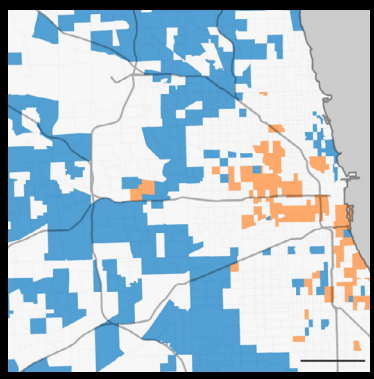
ATLANTA



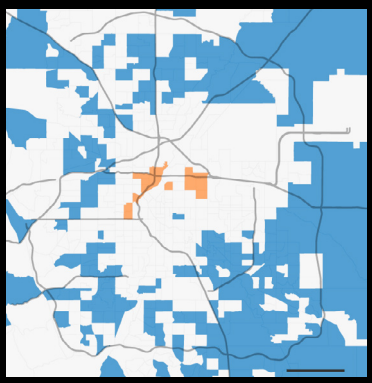
BROOKLYN



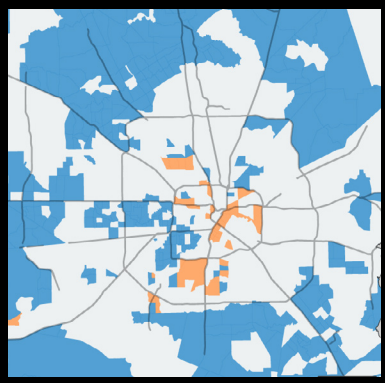
CHICAGO



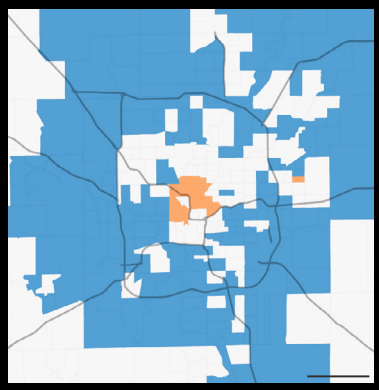
DENVER



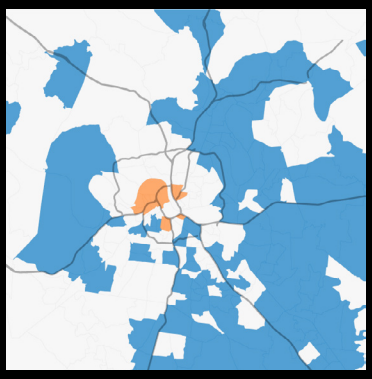
HOUSTON



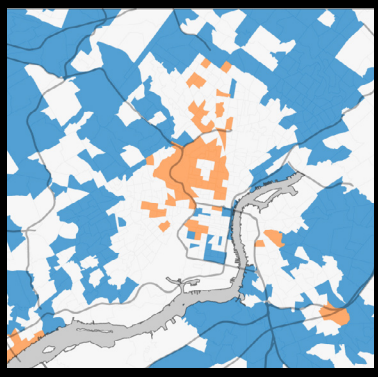
INDIANA



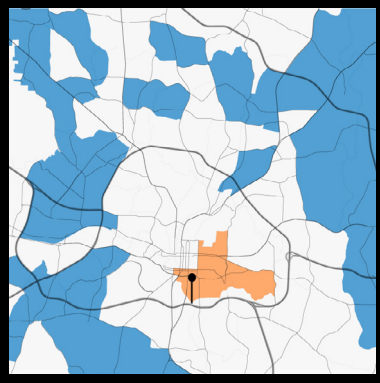
NASHVILLE



PHILADELPHIA



RALEIGH



chapter two

bridging the access gap

the potential of micromobility

Micromobility are small shared transportation devices such as e-bikes, e-scooters, and human-powered, pedal-bikes. The micromobility sector is a subset of transportation as a service — as you would share a car with Uber or Lyft, you can share a bike or e-scooter— filling gaps in micro-movements (travel under 3 miles). Forty-five percent of trips in the United States are less than three miles, seventy-eight percent of those three-mile trips are made by personal vehicle.[15] Micromobility offers urbanites a last-mile connection for transit or often replace car trips. Private micromobility providers offer convenient and flexible transportation to residents while reducing emissions through the adoption of shared electric and pedal powered transit tools. The micromobility movement has rapidly shifted the way people travel in cities ameliorating gaps in transit routes.

The transit ecosystem is in a state of innovation and change. E-scooters have rapidly entered the shared mobility arena shifting residents transportation modes.

Scooters themselves are not new, scooters were an active part of transportation in the 1910's-40's . What is new, is the shared ability to access scooters using personal smartphone device and the evolution of electric batteries that now power them. The diversity of transit tools entering the transportation scene are increasing with rapid rates of adoption. Eighty-four million shared micromobility trips were taken in the United States in 2018 more than doubling the 2017 trip counts[16]. E-scooters emergence in 2018 consisted of 38.5 million trips, 45.8 percent of all shared micromobility trips[17].

In 2010, shared micromobility tools began to arrive in U.S. cities. Steady growth in trips has occurred and with the onset of e-scooters in the last two years, trip counts have grown exponentially.[18] Scooters arrived abruptly in the U.S. market in 2017 and 2018, filling the streets of many mega-cities without the oversight of city-sanctioned permits.[19] Concerns of safety quickly arose, and cities took note pursuing innovative steps to curate the introduction or re-introduction of shared e-scooters. Portland, Oregon's has pursued a series of pilot projects acknowledging the potential of e-scooters to supplement the city's goals of reducing congestion, offset carbon emissions and equity.

Micromobility trends are rapidly adapting. Nationwide in 2018 non-electric dockless bikes have largely exited

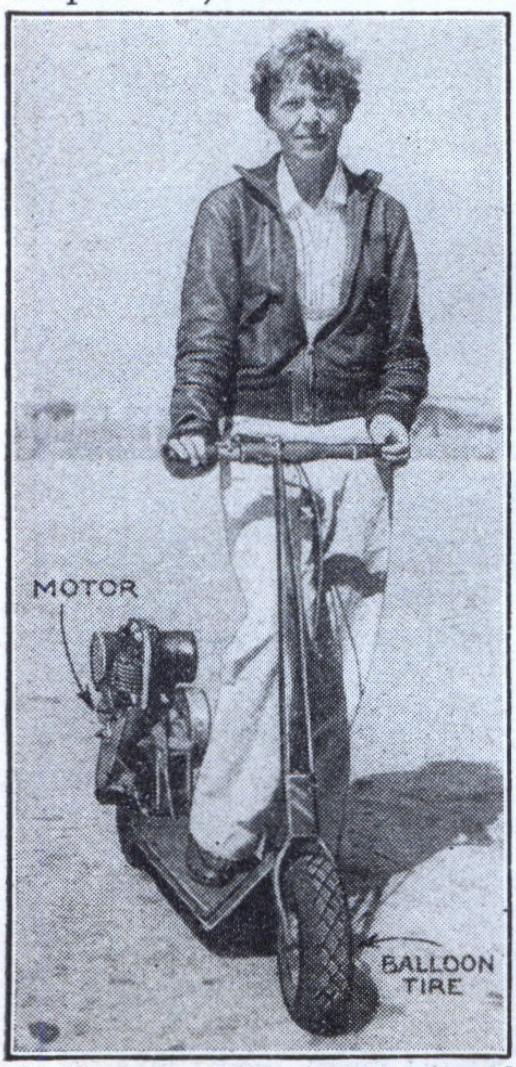
1920's Autopeding Adversisement, (right) the emergence of e-scooters has caused public debate across the country. Somethings are new about the e-scooters we see today although scooters dealogically as a part of our streets is not something new in transportation.

"La trottinette électrique roule depuis un siècle ", (BFMTY, 2018)


AUTOPEDING
— SOMETHING NEW
IN TRANSPORTATION

Motorized Scooter

● IN the near future, we are told, no one will walk at all. As a further step-saver, here is Amelia



A famous aviatrix making good time, though grounded. (Wide World)

Earhart with her new 15-mile-an-hour vehicle at Burbank, California.

1936 News Article, Amelia Earhart sports a new 15-mile-an-hour transportation tool.

"Amelia Earhart's Motorized Scooter (Jan, 1936)" (Modern Mechanix, 2008)

North American cities, as e-bikes and e-scooters have emerged.[20] E-bikes constituted about eight percent of trips nationwide in 2018, over 90 percent of which were dockless[21]. Dockless forms of micromobility rose to about 56 percent of all trips in 2018.[22]

Early recognition of the 2016 growth rate of micromobility was identified in comparison to the adoption rates of other transportation-as-a-service subgroups, comparing carsharing, ride-hailing, bike-sharing and e-scooters.

"Prior data on traditional carsharing services (i.e. Zipcar) suggest that 2% to 3% of the population over the age of 18 in metropolitan areas were members of carsharing services in 2012 and 2013, approximately 12 years after these companies launched commercial service. In comparison, e-scooter sharing has been available for less than 12 months (less than 5 months in most markets), and have already experienced an average adoption rate of 3.6% across major cities, as measured by the percentage of people who have ever used these services. There is significant variation by market. "[23]

City planners are quickly reacting to the emergence of e-scooters. National Association of City Transportation Officials (NACTO) reported that as of the beginning of 2019, over 44 e-scooter bills were introduced in 26 states.[24] A nuanced approach must accompany the institutional reaction of cities to understand structural implications beyond the well-intentioned to examine the strata of social underpinnings.

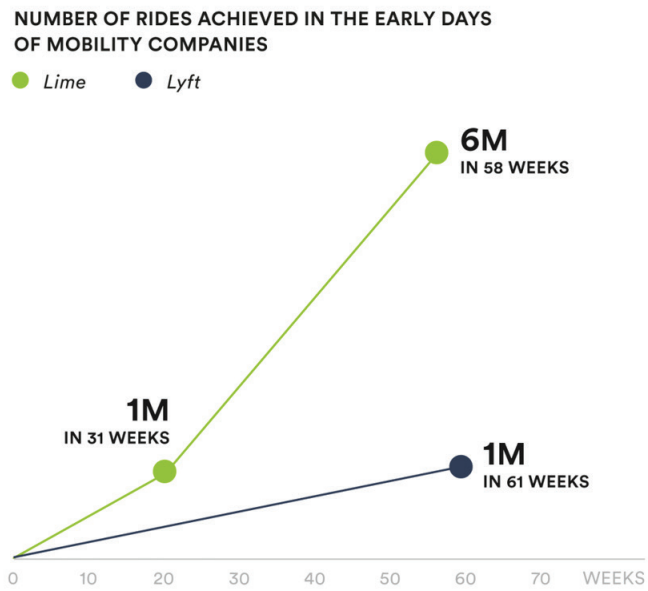


Figure 6 : Number of rides achieved in the early days of mobility companies Lyft and Lime.

Adeyemi Ajao, "Electric Scooters and Micromobility "(Forbes, 2019)

EQUITABLE MICROMOBILITY

I lean on three sources to define equity. Each definition clarifies a distinct component of equity: — inclusion, distribution, and access. Collectively these components form a base understanding of what equity means in the context of this project. The inclusion component is described within the scope of transit equity, defining "equitable vehicle utilization as the use of a vehicle by people with different demographic attributes"[25]. The distribution component is based on Title VI of the Civil Rights Act of 1964 that Portland Metro includes as one of the Six Desired Regional Outcomes of their equity strategy, "the benefits and burdens of growth and change are distributed equitably"[26]. Third, the 2012 Portland Plan: Framework for Equity defines equity in relationship to access to resources noting — "equity is when everyone has access to the opportunities necessary to satisfy their essential needs, advance their well-being and achieve their full potential... equity is both the means to healthy communities and an end that benefits us all"[27].

Transportation systems have experienced many shifts in operational models, fluctuating from private to public to recent mobility-as-a-service models. Shared micromobility has quickly become a part of American cities, which carries with it opportunities and challenges for an equitable future. Private mobility providers

contribute a shared low-cost transportation alternative relieving the costs associated with individual ownership, therefore, broadening access for residents. Shared transportation additionally offers the flexibility to move across different modes of public transportation, often replacing trips made by personal vehicle or ride-hailing. Portland's e-scooter pilot survey found that e-scooters replaced driving and ride-hailing trips for 34 percent of residents and 48 percent among tourists and visitors.[28] Micromobility presents cities with the opportunity to pursue equity and environmental goals by curating the operational environment of mobility providers to exist.

City governments and planners have devised terms of operation for private mobility providers, requiring that certain practices contribute to city equity goals in exchange for permitting operation. Cities have employed different strategies for holding mobility providers accountable for meeting equity goals. The fast-moving industry has required cities to be adaptive and creatively respond to the micro-mobility companies' actions. Portland, Oregon created a structure for e-scooters to exist using a series of pilot projects to control and study their beneficial and unfavorable impacts. Portland's controlled approach has given them the advantage to adopt policies based on performance. For instance, in the first pilot study conducted in 2018, Portland required each e-scooter company to offer low-income fairs and deploy 100 scooters a day to East Portland,

a contemporary and historically disinvested area. E-scooter companies did not fully comply, two of the three companies did not meet the requirement of 100 scooters per day or 20 percent of their fleet. Portland has adapted its terms to test the impact of restricting companies fleet size for noncompliance.[29] Although two companies underperformed in terms of city equity requirements, usership on Portland's Eastside was clear, showing that there are vast opportunities for city policy to inform the equitable future of micromobility.

Dockless forms of micromobility— as they exist in our current car-centric urban environment— pose a perceived and actual risk for pedestrian strolling and residents with disabilities. Multiple studies have found that most e-scooter users comply with parking requirements,72.8 percent compliance in Portland's 2018 pilot project[30] and 90 percent in a 2018 San Jose study[31]. In the San Jose study, compliance was measured based on the percent of e-scooters parked on the sidewalk that did not overtly disrupt pedestrian traffic whereas the Portland study is a measure of those properly parked in the furnishing zone. Shared vehicles parked or ridden in the pedestrian right-of-way pose conflicts for residents, especially residents with disabilities and/or those unable to move tools out of way.

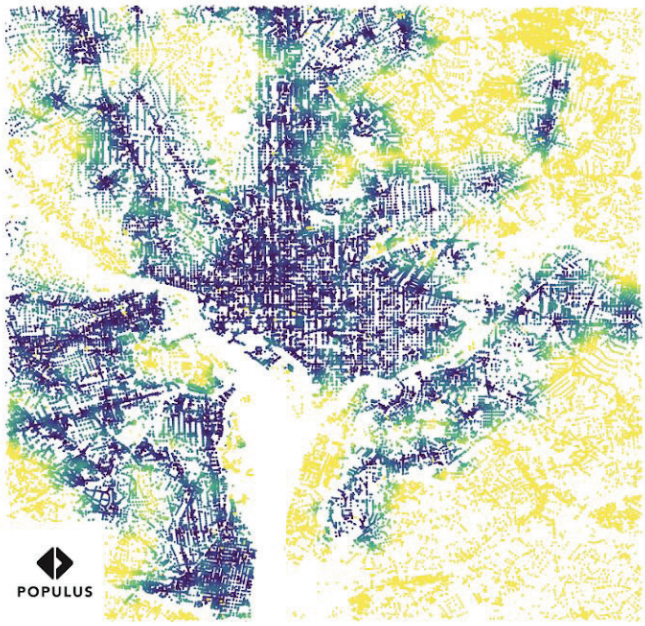
The American Disabilities Act compliance and adaptable inclusion is an increasingly important aspect

of transportation equity as shared Private Mobility Providers (PMP) enter the transportation system. ADA compliant accessibility is not a central focus and outside of the scope of this research. ADA cognizant design must accompany this work and it is a great consideration with the recent emergence of dockless shared micromobility tools. This research offers strategies to alleviate the disruption to public space for people with disabilities by creating intentional space for riding micromobility tools in the city. The parking of these tools will require further research to explore and test design solutions.

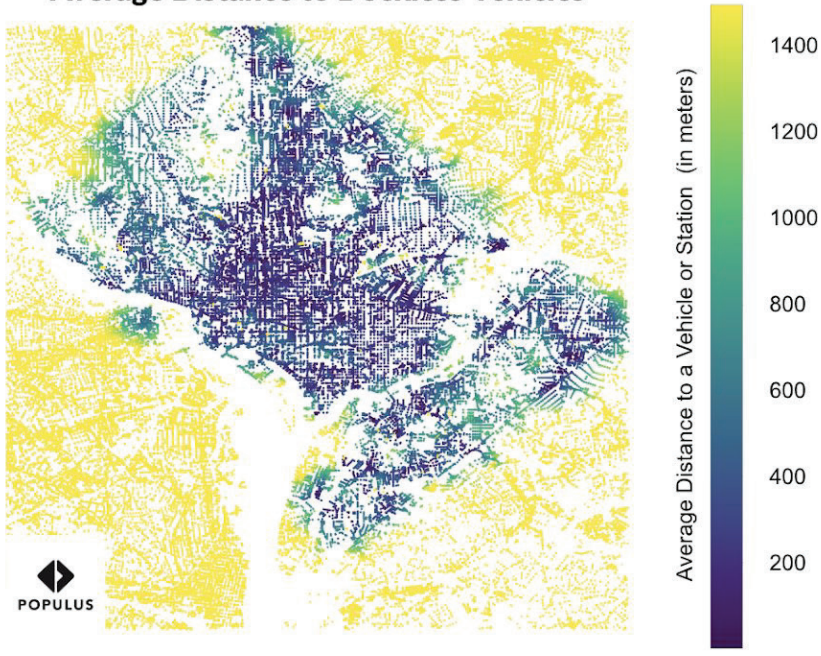
This research is focused on emergent micromobility because of its ability to serve a more demographically representative metro population and broader geographic area. Spatial distribution data show that dockless micro-mobility promotes increased usership in areas that are underserved by docked forms of micromobility. In docked models, the pattern of usership is often visible from individual dock hubs leaving gaps or geographic holes in service areas. A common business model for locating docks is by landowner application and city approval to site docks within the landowner/ developer's public space or within the right of way, in the furnishing strip or as a substitute for parking. This economically driven model of procuring hub locations supports profit motivation which is often not in the interest of vulnerable communities, disproportionately determining who uses the new mobility and the range of

Figure 7 : Comparison of the dockless program to Capital Bikeshare stations using Populus' method to evaluate the availability of shared mobility services.

Average Distance to Capital Bikeshare



Average Distance to Dockless Vehicles

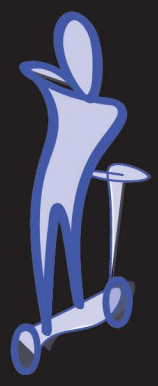


access it shares.

Figure 8 :
Portland e-scooter pilot project emission reductions.

Research conducted in Washington, DC compared a docked bike program to an aggregate of three forms of dockless micro-modal programs — bikes, e-scooters, and e-bikes. Similar to research findings in Portland, usership is more ubiquitous in its distribution, thus access to micromobility in the city is systemically more available to a greater regional share of the population with the use of dockless micromobility models. [32] Dockless adoption rates surpassed Capital Bikeshare— DC's station-based bike share— and adoption rates for dockless bike share were 2.6 times that of Capital Bikeshare for Black residents, who are 47 percent of the entire DC population.[32]

Examining the structural implications of micromobility models and reflecting upon demographic differences in adoption presents leverage for cities to prioritize or incentivize practices compatible with city goals. Shared dockless micromobility tools are economically accessible and profitable with the potential to advance cities' equity and environmental goals. Lime, a leader in U.S. micromobility, estimated that the cost of micromobility services in conjunction with public transit on average in cities across the U.S. is 74 percent less



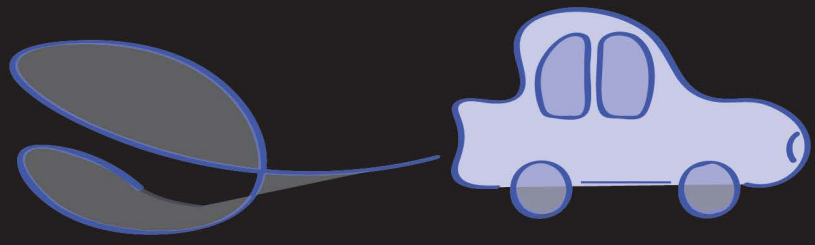
301,856

vehicle miles saved

in 120-day PDX pilot study

=

is equal to removing...



122 METRIC TONS OF CO_2

27 CARS for a year

than the cost of owning and operating a personal vehicle. Lime compared the average daily cost of car ownership in U.S. markets, $28.18, to the prices of two public transit trips and two micro-modal trips by e-scooters, e-bike and pedal bike which averages daily costs of $7.27.[33] Economically accessible pricing is a key component of equitable micromobility. Many companies have incorporated programs designed to further their inclusive nature by relieving barriers of cashless economy and reliance on smartphone ownership. Libraries and convenience stores across the United States offer cash payment for mobility cards to activate shared micromobility dissolving the need for a bank account or smartphone.[34] These types of systemic inclusion begin to reach demographics that are often excluded from resources.

chapter three

beyond inclusion + equity

A theoretical approach adapted from john a. powells work targeted universalism and belonging + othering

john a. powell, a Professor of Law and Professor of African American Studies and Ethnic Studies at the University of California, Berkeley, School of Law, developed "targeted universalism"—an approach to alleviate and uproot institutional and systemic exclusion. powell's' work most recently has focused on belonging and othering — a subsequent theoretical approach for the advancement of inclusive equity. This project pulls from powell's theories of 'targeted universalism' and 'belonging and othering' to examine emergent micromobility, assess equity and formulate design interventions.

In Visualizing Fairness, Equity Maps for Planners, Talen notes that with the goal of cost saving, decision making for public resource allocation often "ignores the social geography of urban areas"[35]. Targeted universalism

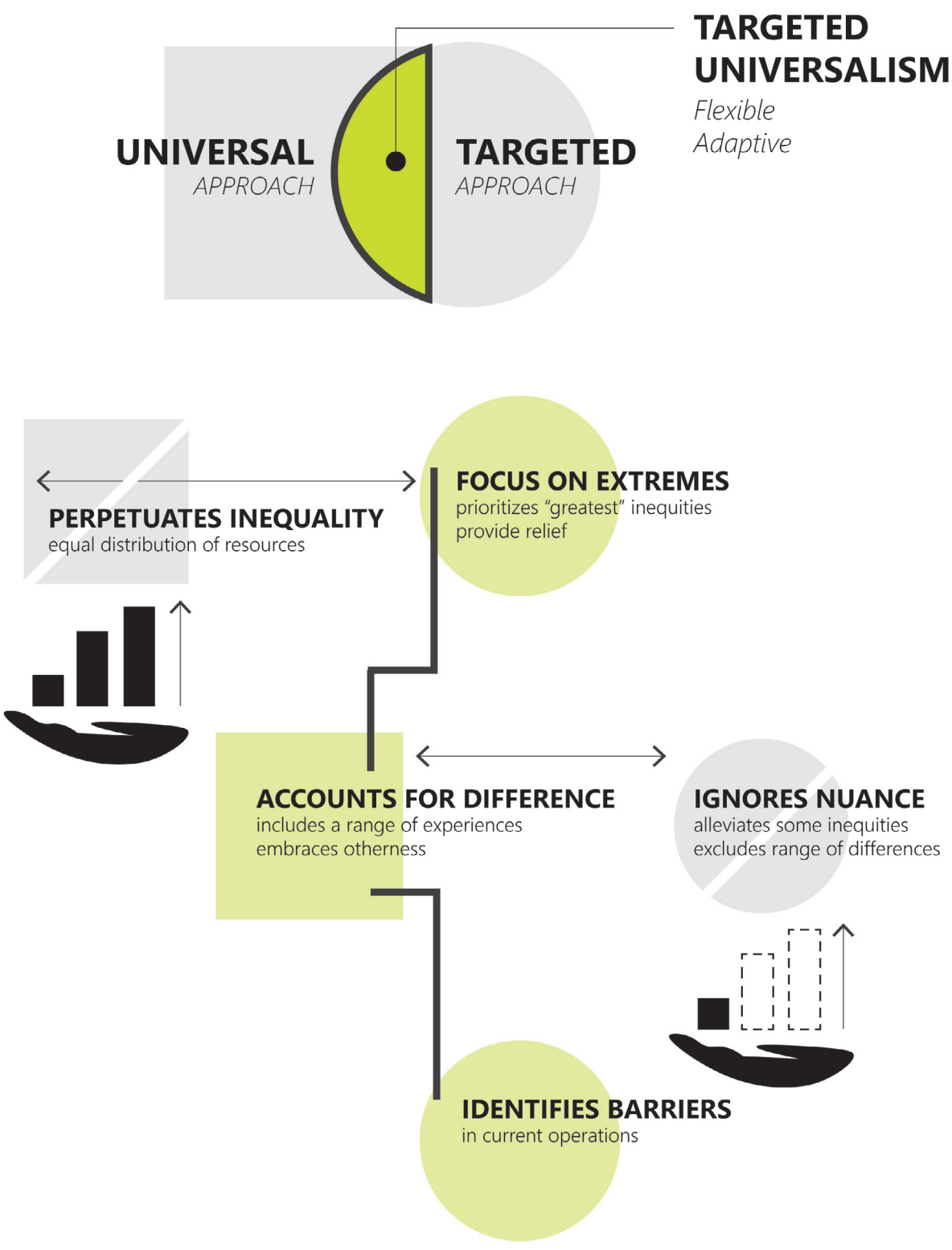
highlights the social geography of urban areas, acknowledging a range of experience and difference, blurring the distinction between vulnerability and non-vulnerability. Powell expands upon conceptual theories of inclusion and exclusion, pushing the boundaries of what it means to dissolve structures of exclusion. powell questions assumptions of inclusion by asking, what is the social, political or economic structure to which one is equally included? He asserts that belonging redefines structural boundaries with awareness to a range of differences, challenging the structure and exclusive condition of society.[36]

Figure 9 :
Targeted universalism: the benefits and risks.

Creativity is vital in the incorporation of social geography in public resource allocation. In conjunction with design interventions, policy must forge ways to contest the historically discriminative engine of economic growth in the United States; its history of exclusion and inequitable distribution of wealth.

"[Creativity] is a collective energy that has the potential to tackle capitalism's injustices rather than augment them. [It] can be used to produce more social justice in the world but it must be rescued from its current incarceration as purely an engine for economic growth."[37]

john a. powell's work and the pursuit of equity are deeply nuanced. It requires creative inquiry and solutions


TARGETED UNIVERSALISM
Flexible
Adaptive
UNIVERSAL
APPROACH
TARGETED
APPROACH
PERPETUATES INEQUALITY
equal distribution of resources
FOCUS ON EXTREMES
prioritizes "greatest" inequities
provide relief
ACCOUNTS FOR DIFFERENCE
includes a range of experiences
embraces otherness
IGNORES NUANCE
alleviates some inequities
excludes range of differences
IDENTIFIES BARRIERS
in current operations

to dissolve the structural faults of the U.S.'s prejudice political system. Targeted universalism confronts problematic approaches to equity by acting on an understanding of difference in the pursuit of a common goal. Goals are universal, while strategies are targeted to adjust to the different situatedness of communities.[38]

Targeted universalism adopts both targeted and universalist strategies, relieving each of their independent faults. Targeted Strategies alone perpetuate societal othering, by identifying communities most marginalized. These groups are consequently "vulnerable to political attack".[39] Additionally, targeted strategies classify communities to be vulnerable or non-vulnerable causing subgroups to experience exclusion. Universal strategies take an equality approach as opposed to an equity approach, the concept that a singular improvement or solution serves everyone. Providing equal resources to all, negates all differences, perpetuating the inequity that exists. Targeted universalism, through uniting universalism and targeted strategies —two seemingly contradictory strategies— cities can strategize goals that serve to improve conditions for all while targeting approaches to dissolve structural, institutional and systemic barriers that perpetuate inequities.

Figure 10 :
Beyond Exclusion and Inclusion to Belonging.

john a. powell and Stephen Menendian, explore the relationship of inclusiveness, othering and belonging

in a article titled, The Problem of Othering: Towards Inclusiveness and belonging. In this work they use artist Cecilia Paredes painting Both Worlds to describe the emotive quality of belonging and difference. [77]

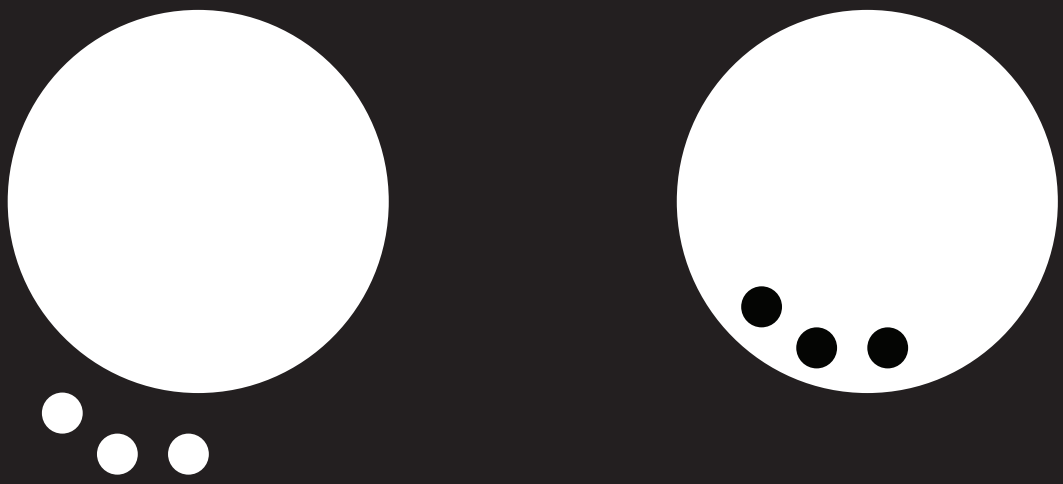
powell researches belongings' relationship to exclusion and inclusion. A strong focus on inclusive practices have become a part of many city governments. powell argues that inclusion may not be enough. Inclusion is a step above exclusion in that a society or amenity for which a resident has previously been excluded from is now included. But, perhaps the level of inclusion is not equal. Inclusion is often then described as equitable inclusion, where level of inclusion is equal across all residents. Each of these evolutions toward equity move the needle forward however inclusion and equitable inclusion are built to include residents within a structure that was intended to exclude them. powell asserts that belonging begins to move beyond inclusion to dissolve structures of exclusion and begin to redefine structures of belonging that account for difference and the overlap common experience across groups.

““Othering” is a broadly inclusive term, but sharp enough to point toward a deeper set of dynamics, suggesting something fundamental or essential about the nature of group-based exclusion.”[78]

"..."belonging" connotes something fundamental about how groups are positioned within society, as well as how they are perceived and regarded.

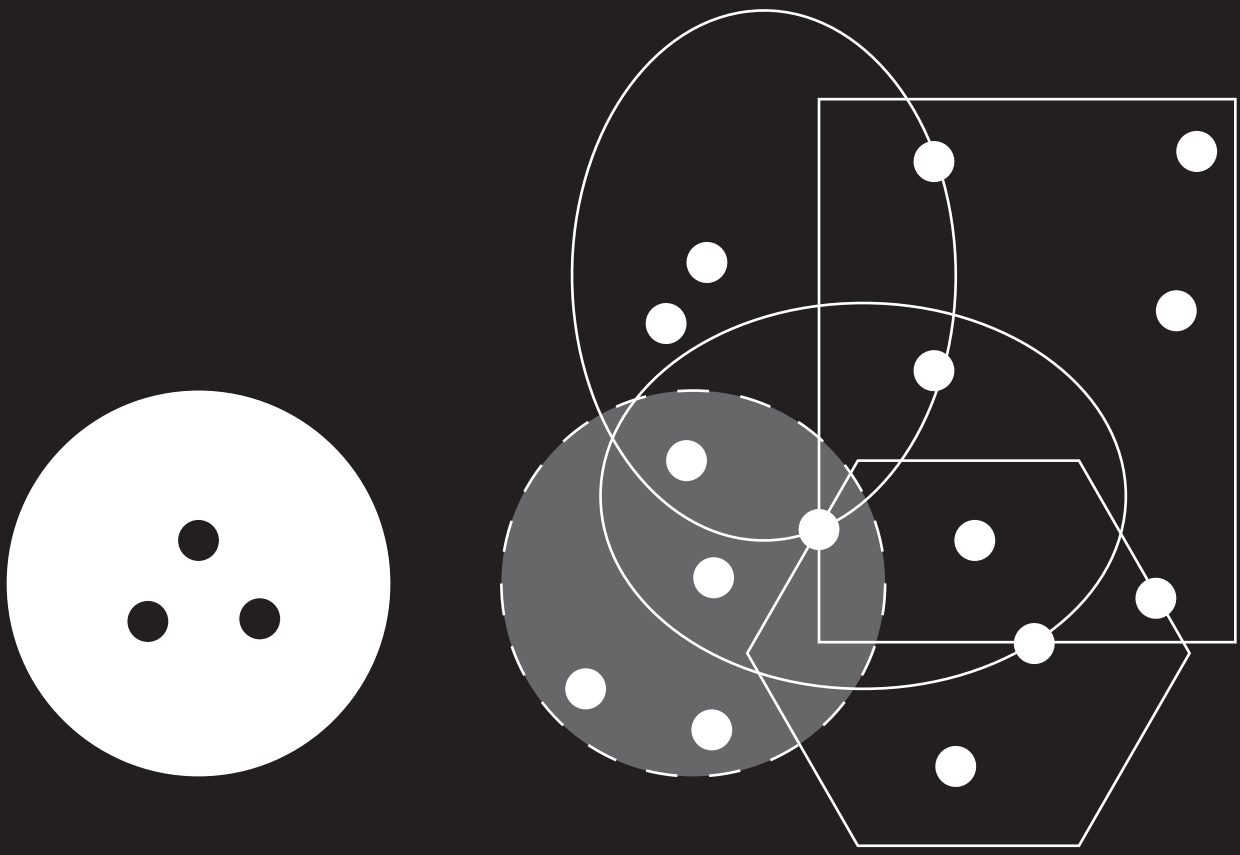
It reflects an objective position of power and resources as well as the intersubjective nature of group-based identities."[79]

Cecilia Paredes | Both Worlds



EXCLUSION

INCLUSION



EQUITABLE INCLUSION **BELONGING**

adapted from john a. powell's conference presentation, *Building Belonging in a Time of Othering*.

chapter four

methods + findings + design

Targeted universalism + belonging applied to Portland, Oregon's Forest Park

Combining targeted and universalist frameworks, "allows us to talk about race, ethnicity and our different situatedness within a universal language"[40]. The approach is structured into a six-step method with two phases: identify and design. Phase one objectives are to identify (1) goals + strategies, (2) people experiencing inconsistent access to amenity, (3) barriers to usership, and (4) how these barriers are upheld. Phase two objectives are to design interventions and spatialize infrastructure to (5) dissolve barriers and connect communities to amenities.[41] The complexity of racial inequities requires a sixth step to (6) "monitor and correct for negative feedback loops and other impediments to the achievement of set goals"[42]. The framework is cyclical, returning to original goals to understand not merely the intentions but rather the

covert affects strategies may create.

Returning to the equitable belonging framework, I propose to apply Targeted universalism to design. Targeted universalism begins to scope and spatialize foundational elements of equitable belonging to bridge the gap in access between Forest Park users and Portland Metro Population.

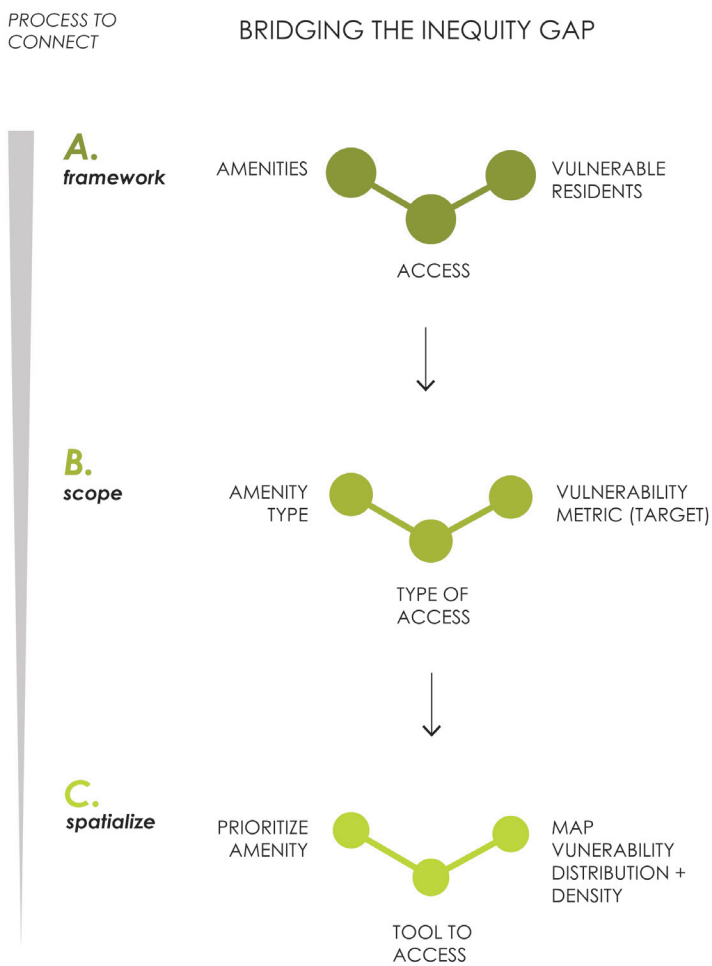


Figure 11:
Equitable Belonging Framework. A process to connect through scoping and spatializing access, amenity and vulnerability.

Figure 12:
Six-steps to design with targeted universalism.

Figure 13:
Targeted universalism for design: a detailed framework


1 GOAL
2 PEOPLE
3 BARRIERS
4 BARRIERS UPHELD
5a DISSOLVE
5b CONNECT
6 MONITOR + CORRECT
IDENTIFY
DESIGN /POLICY
TARGETED UNIVERSALISM

1 GOAL

IDENTIFY GOALS
MAKE EQUITABLE INVESTMENT
in emergent micromobility

IDENTIFY FOCUS AMENITIES
determine discrepancy in access

2 PEOPLE

IDENTIFY CHARACTERISTICS OF VULNERABILITY
define vulnerable communities

3 BARRIERS

WHY ARE THESE COMMUNITIES VULNERABILITY?
examine social structures, initiatives and policies.

EXAMINE POLITICAL, SOCIAL + SYSTEMIC
impact on emergent micromobility
geographic coverage/availability of mobility type

4 UPHELD

INSTITUTIONALLY + SYSTEMICALLY
determine how these social structures, policies and initiatives have evolved, faded or remain

CRITICALLY EXAMINE INCLUSIVE PRACTICES
identify intentions and problematic means/outcomes

5a DISSOLVE

DEVELOP STRUCTURAL EXPRESSIONS OF BELONGING
targeted approach to fulfil universal goals

DESIGNING A RANGE OF OPTIONS
+ for a range of vulnerability

5b CONNECT

SITE NODES OF CONNECTION
in vulnerable communities + amenity entry points

DEVELOP ROUTE TO AMENITIES
connecting nodal data points to park entry point

PRESCRIBE R.O.W. INFRASTRUCTURE
to increase safety + community belonging

6 MONITOR + CORRECT

DETERMINE + MITIGATE NEGATIVE FEEDBACK LOOPS.

phase one: identify

1. UNIVERSAL GOALS

identify goals + focus amenity

Gaps in demographic usership in Portland's Forest Park guide this project to explore discrepancies in access. Emergent and existent forms of transportation inform the universal goal: to provide a safe route in accommodation of new equitable transportation modes and strategically relieve disruption to streetscapes. The sub-goals are to lead a shift in transportation modes away from personal vehicles and reduce carbon emissions.

Targeted strategies are developed through examining difference in terms of structural and institutional forms of othering and the racial context of American cities. The methodology adopts john a. powell's approach, which is adapted and applied for use as a transportation design framework for landscape architects and city planners. Universal goals are set at the forefront of Targeted universalism, while strategies are informed by processes of understanding vulnerabilities, inequities, barriers, and barriers upheld.

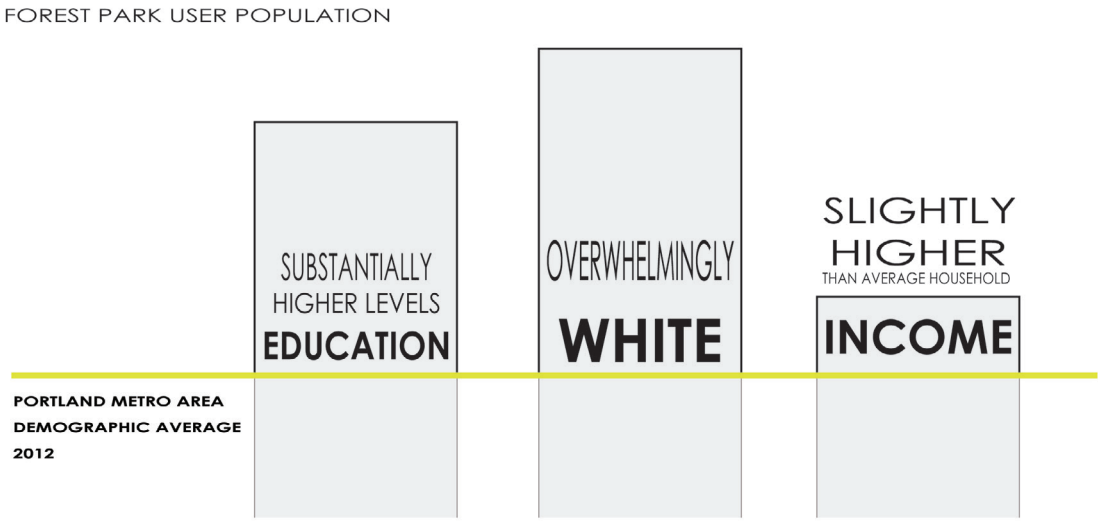
Figure 14:
Forest Park User Population Inequity.
based on 2012 user study.

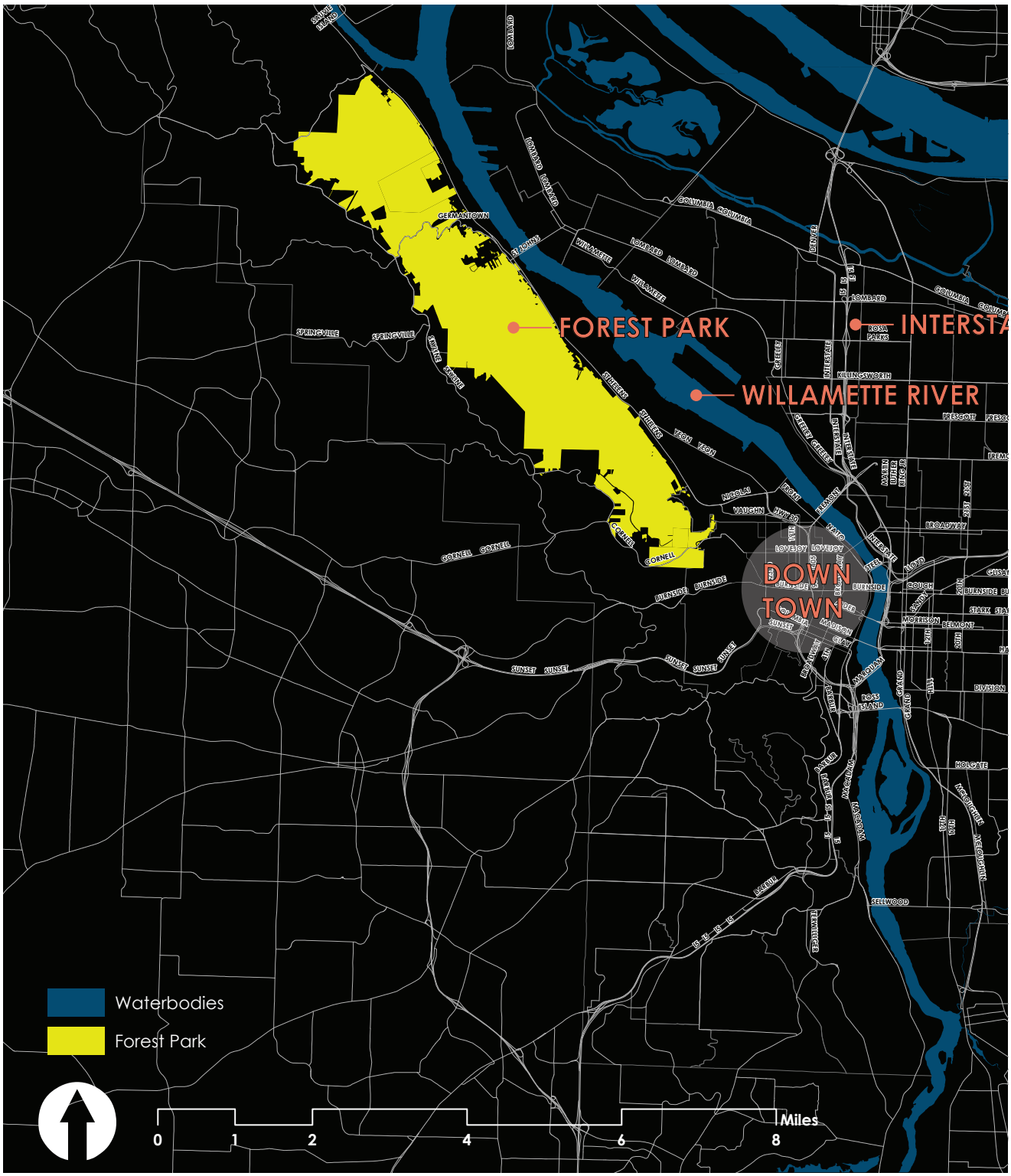
Figure 14:
Portland Context Map.

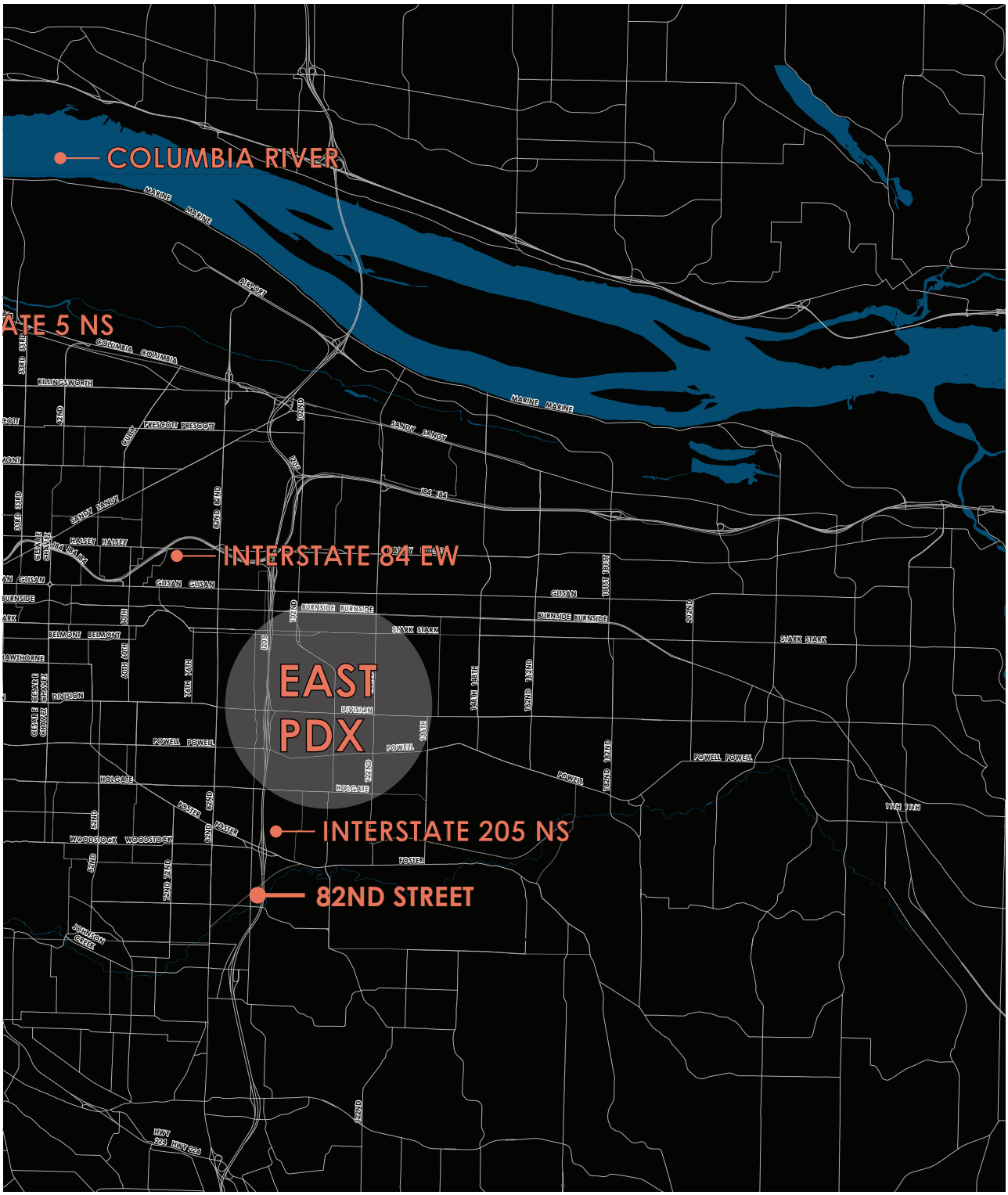
Identifying inequality in an amenity

Forest Park in Portland Oregon is a 5200-acre park located Northwest of Portland City Center, in the Tualatin Mountain Range. Concerns of access are exacerbated for Forest Park due to terrain, adjacent industrial use and the socioeconomic affluence of adjacent neighborhoods. These infringements on access motivated my research into the potential of emerging micromobility to provide equitable solutions to transit discrepancies in urban open space connections.

A 2012 Forest Park Recreation Survey conducted across a year found that Forest Park visitors are: "overwhelmingly white, have slightly higher than average household incomes and have substantially higher levels of education when compared to the Portland Metro Area population"[43]. Additionally, the




FOREST PARK
WILLAMETTE RIVER
DOWN TOWN
Waterbodies
Forest Park
0
1
2
4
6
8
Miles


COLUMBIA RIVER
ATE 5 NS
INTERSTATE 84 EW
EAST PDX
INTERSTATE 205 NS
82ND STREET

survey asked respondents to identify park improvement potential via an open-ended write-in. Requests to increase bike trail infrastructure and access received the greatest number of responses categorically. While these will help; designers and planners need to work toward making Forest Park an amenity to the greater Portland area with deliberate efforts to attract and include as broad a spectrum of community members as possible (race, income, education, etc.). Secondly, vital internal amenities including restrooms, provision of maps, better signage, and interpretive elements, respectively were noted as potential park improvements. Improvements indicate cues of fragmented mobility and low access to the information that allows users to maneuver into and within the Park. In the pursuit of such improvement requests from users, inclusion must play a forward role in the ongoing development of Forest Park and the transportation network that connects it to the urban center.

2. PEOPLE

Identifying vulnerable communities

In this study, vulnerability is measured using the Portland Department of Transportation's Equity Matrix which layers three factors: race, income, and limited English proficiency data using the 2012-2016 American Community Survey (ACS) by census tract. [44] Educational attainment is considered a factor of vulnerability using

Table 1: Portland vulnerability metric credentials for census tracts.

Data Source	*Measure per Census Tract*	*Credential*	*Threshold of vulnerability (based on city averages)*	*Number Tracts Meet Credential*
PDOT Equity Matrix (ACS 2012-2016)	Percent Residents of Color	above	29%	65
PDOT Equity Matrix (ACS 2012-2016)	Median Household Income	below	$ 54,085	42
PDOT Equity Matrix (ACS 2012-2016)	Limited English Proficiency (%)	above	6.20%	25
2013-2017 American Community Survey 5-Year Estimates	Population 25 years of age and over with bachelor's degree or higher	below	42%	80

2015-2017, 5-year ACS census tract data to understand divergences from city average demographics present in Forest Park's Recreation Survey. [45]

Mapping educational attainment visualizes concentrations of residents 25 years of age or older with a bachelor's degree or graduate/advanced degree. The geographical distribution of residents by measures of vulnerability creates a deeper understanding of the range of difference among residents allowing analysis to narrow in on vulnerabilities and expand to consider spatial systems and patterns.

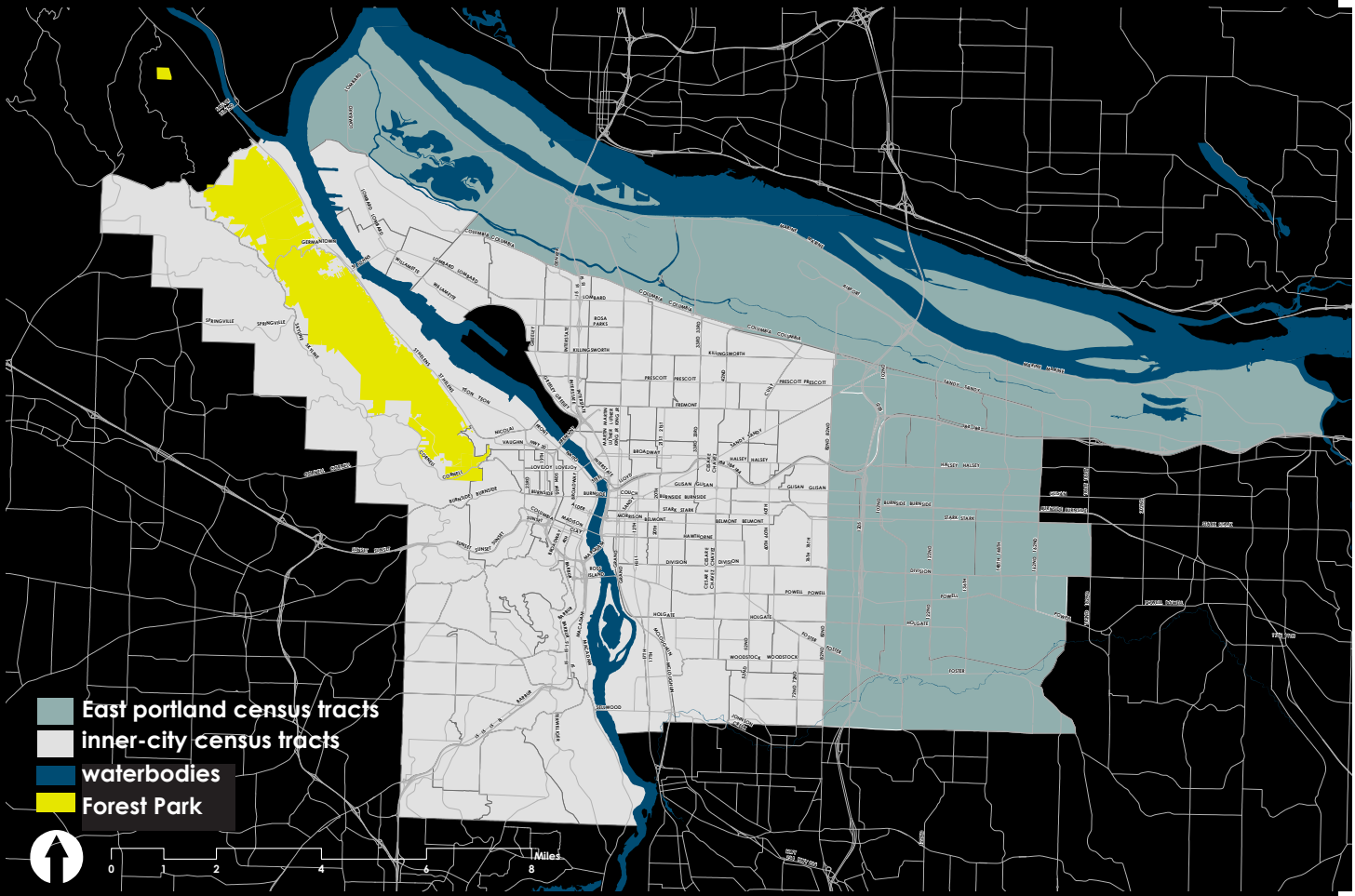
Table 2: Portland vulnerability metric comparison between East Portland and Inner-city census tracts.

Metric	*Mean*		*Range*	
	West of 82nd + South of Columbia Blvd.	East of 82nd + North of Columbia Blvd.	High	Low
***Residents of Color** (%)*	22.5 (10.5)	40.8	60.2	8
Standard Deviation	10.5	8.0		
*Residents with **Limited-English Language Proficiency** (%)*	2.2	8.7	26	0
Standard Deviation	2.5	5.6		
Educational Attainment *Residents over 25 years old with Bachelor's Degree or higher*	58.6	22.1	84.5	9.5
Standard Deviation	14.2	7.0		
***Mean household income** (dollars)*	$98,609.17	$60,131.42	$250,787	$32,781
Standard Deviation	$39,883.89	$10,821.67		

The table above shows prescribed thresholds of vulnerability as an organizing structure based upon the positioning of census tracts above or below Portland citywide averages.

A pattern emerged through the analysis of vulnerability factors heightened vulnerability exists along the urban fringe with distinct relationships to major arterial streets. This pattern aligns with nationwide patterns in cities across the United States. The inner-city is experiencing

Figure 16:
Portland vulnerability metric comparison spatialized as East Portland and Innercity census tracts.


East portland census tracts
inner-city census tracts
waterbodies
Forest Park
0
2
4
6
8
Miles

economic regrowth shifting the historic demographic composition of inner cities displacing vulnerable residents to urban edges and suburbs.[46]

To further understand the impact of these major arterials and how they inform patterns of vulnerability, census tracts were identified based upon patterns visible in each vulnerability at differing grains. Columbia Boulevard — an East-West major arterial— and East 82nd Avenue — a North-South major arterial surfaced as division/breaks in the overall pattern. Census tracts were grouped delineating tracts West of 82nd Avenue and South of Columbia Boulevard— relative low density of vulnerability tracts from East of 82nd Avenue and North of Columbia Boulevard — relatively high-density of vulnerable tracts. Significantly higher rates of vulnerability are present East of 82nd Avenue and North of Columbia Boulevard, identifying a need for further examination as to social, infrastructural and economic structures that underpin race, income, education, and language-based spatial divisions.

Using the Equity Matrix data and ACS education data each metric is compared to the city average to distinguish census tracts range of vulnerabilities. A targeted strategy distinguishes communities by census tract to identify heightened vulnerability. Each determinant of equity: race, income, educational attainment, and limited English language proficiencies

are visualized at a deeper gradient of difference, identifying targeted populations as well as clarifying the full range of populations regardless of whether they fall above or below the Portland city averages. This form of scoring— to understand patterns and identify the density of heightened vulnerabilities— is coupled with returning to the cities full range of vulnerability. Together these two strategies ultimately inform placement of interventions and a route in the context of micromobility use/distribution and level of transit amenities. In the following section, barriers are identified to cultivate a deeper understanding of what systematic and structural underpinnings are creating vulnerabilities and spatial relationships. In section four, Dissolve + Connect, these spatial relationships will be analyzed in the context of historic and contemporary barriers. See appendix for maps visualizing vulnerability distribution and densities.

3. BARRIERS

Identifying barriers to Portland's Forest Park

The major barrier to access for residents found to be underrepresented in Forest Park trail users is the distance from trailheads to residence. As discussed in section two of this chapter, People: Identifying a Range of Vulnerability, the majority of communities identified to be vulnerable and underrepresented, live

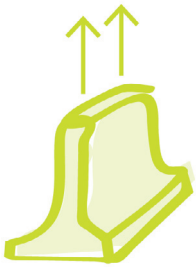
in East Portland. This may suggest that transportation is a significant barrier to equitable access. This drew the research to examine forms of transportation Forest Park users currently employ. In Forest Park's 2012 User Study, over seventy-five percent of all visits were made by car.[47] Forest Park is experiencing congestion at trailheads, where street parking is limited and operates as the primary type of parking. The limited parking availability combined with large topographic changes poses barriers to access for Portland residents who live outside walking distance from trailheads.

Land Use Form + Pressures

Land use forms and development pressures impact trailhead experience and access. Relics of Portland's industrial past are evident in the warehouse architecture of the Northwest Slabtown district and along the Willamette River's Edge. Slabtown district exists, between Forest Park and the Willamette Riverfront, as a mixed-use development inspired by its recent industrial past. Forest Park's most urban adjacency consists of high-income single-family housing and medium density apartment buildings. A historic land use change can be noted in the architecture transitioning into large industrial buildings, housing showrooms, industrial and craft manufacturing among contemporary mixed-use. Land development typologies transition once again, proceeding East toward the river into higher density

mixed-use dwelling units of the Pearl neighborhood.

In 2001, the Portland Bureau of Planning approved the Guild Lake Industrial Sanctuary Plan, which allocated land between Forest Park and the Willamette River to be preserved as long-term industrial use. This large industrial area is to be preserved as "one of the premier heavy industrial districts of the Pacific Northwest"[48]. This plan is in reaction to the pressure of land use and development patterns that Northwest neighborhoods are experiencing between Forest Park and the Willamette River. This industrial protection confines urban access to Forest Park, narrowing the urban area to develop a greater connection between Forest Park and Portland's urban fabric.



4. BARRIERS UPHELD

Identifying Portland's shifting geographies: a history of discriminative investment + disinvestment

Geospatial and economic transportation barriers exist with a disproportionate impact on residents of color. These barriers are the result of policies, practices, and initiatives that catalyze racial, educational, income, and language proficiency-based economic inequalities. These issues are embedded in societal structures and institutions. The structural and institutional impact influences an individual's environment and access to

"…social relations, race relations, [the] racial hierarchy in our society… [is] embedded into the built environment for reasons: both to ensure that the socio-hierarchy remains the same, to ensure property values, it is connected to wealth development."[75]

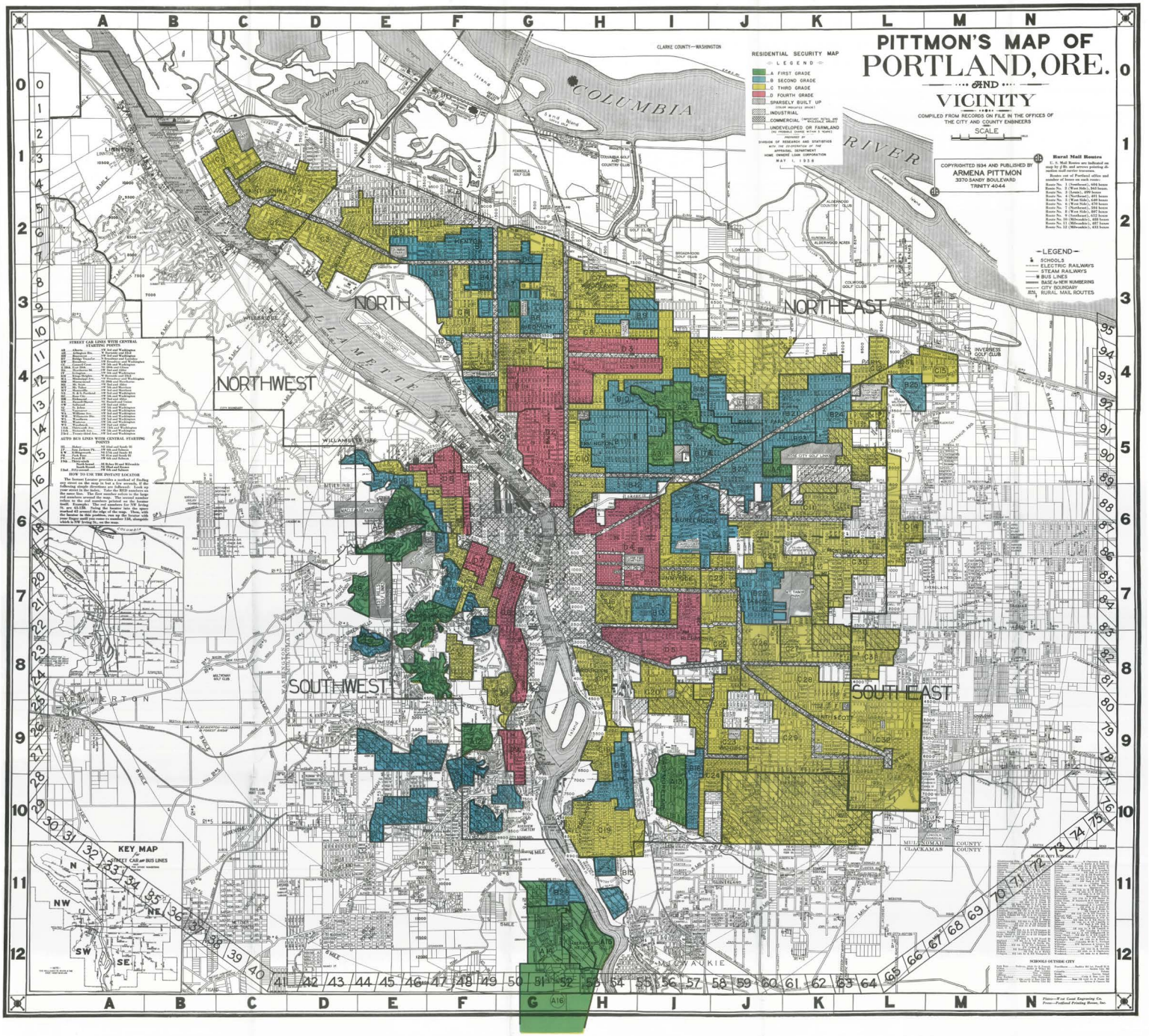
amenities.

Portland has a history of policies that had discriminatory effects that structure and suppress access to resources and amenities for minority populations. These histories are not erased and indeed inform spatial, cultural and political relationships that exist today and throughout the evolution of Portland's urban fabric.

Karen J Gibson focuses on housing policy at the intersection of race and economic inequalities. Gibson describes the link between societal and institutional racism and economics. A pattern has occurred in Portland and in the greater United States, socio-economically disadvantaged communities are being pushed away from a recently re-valued central city.

Each urban center has a unique geospatial relationship to the displacement of vulnerable communities. Understanding the pressures that constructed these socially established bounds allows designers and policymakers to dissolve the discrepancy in transportation privilege.

Laws enacted in Portland and in many urban centers to suppress the economic stability of residents deemed non-white often took hold in the housing market. Though many of these laws have been amended, the language often remains embedded in city documents


PITTMON'S MAP OF
PORTLAND, ORE.
AND
VICINITY
COMPILED FROM RECORDS ON FILE IN THE OFFICES OF THE CITY AND COUNTY ENGINEERS
SCALE
RESIDENTIAL SECURITY MAP
LEGEND
A FIRST GRADE
B SECOND GRADE
C THIRD GRADE
D FOURTH GRADE
SPARSELY BUILT UP
INDUSTRIAL
COMMERCIAL
UNDEVELOPED OR FARMLAND
MAY 1, 1938
COPYRIGHTED 1934 AND PUBLISHED BY
ARMENA PITTMON
3370 SANDY BOULEVARD
TRINITY 4044
Rural Mail Routes
LEGEND
SCHOOLS
ELECTRIC RAILWAYS
STEAM RAILWAYS
BUS LINES
BASE for NEW NUMBERING
CITY BOUNDARY
RURAL MAIL ROUTES
COLUMBIA
WILLAMETTE
NORTH
NORTHEAST
NORTHWEST
SOUTHWEST
SOUTHEAST
STREET CAR LINES WITH CENTRAL STARTING POINTS
AUTO BUS LINES WITH CENTRAL STARTING POINTS
HOW TO USE THE INSTANT LOCATOR
KEY MAP
STREET CAR and BUS LINES
SCHOOLS OUTSIDE CITY

and the effects of these discriminative practices are well set in urban wealth and amenity distribution. The connection between the physical environment, social standing and economic standing and the history that brought upon these connections are the foundation for understanding current patterns of urban inequities. This portion of the chapter will examine the policies and practices that structure the inequities Portland's low-income and residents of color, experience contextualizing current disparities.

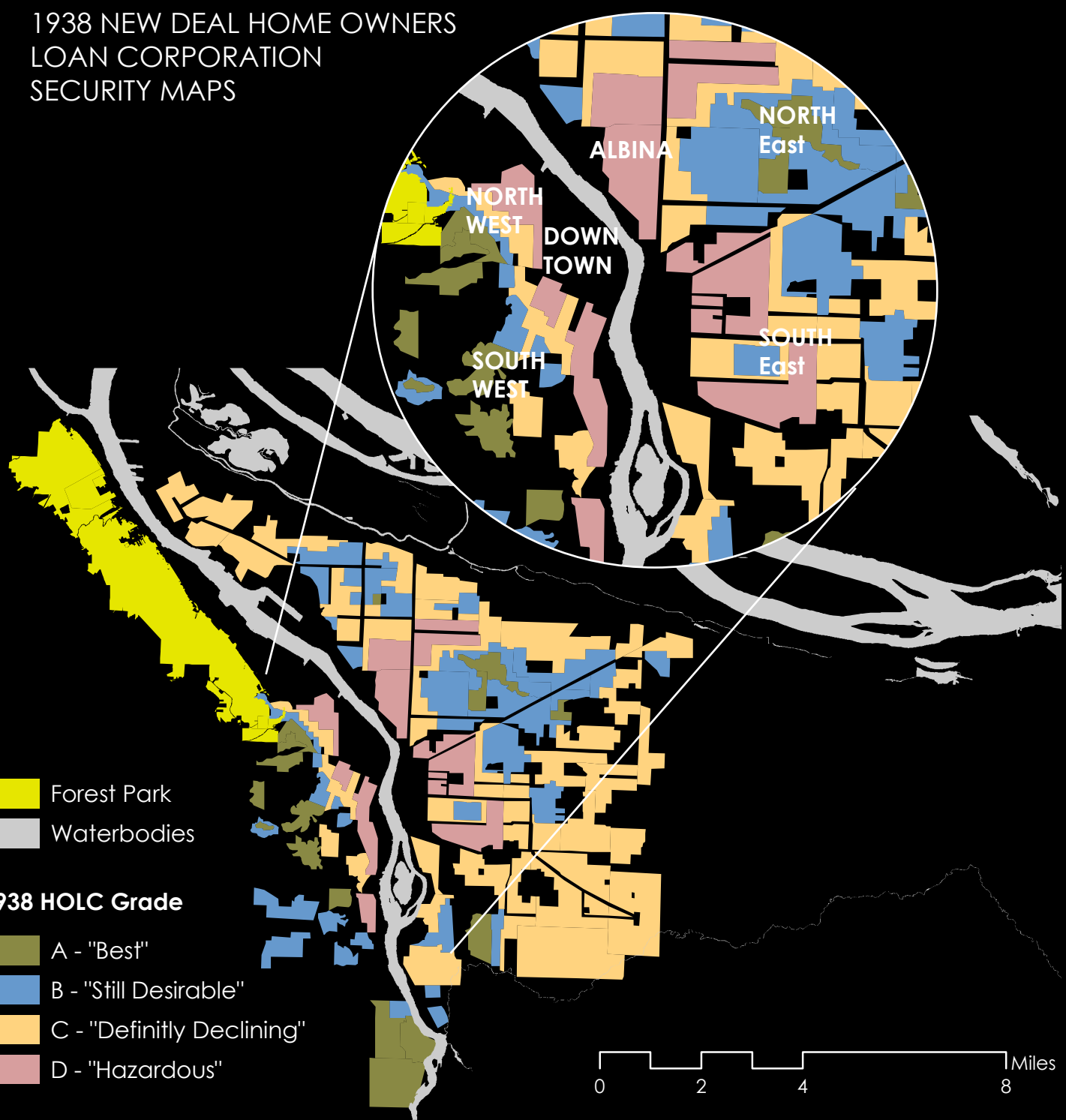
Figure 17 :
Portland 1938 HOLC Redlining Security Maps
Home Owners Loan Corporation.

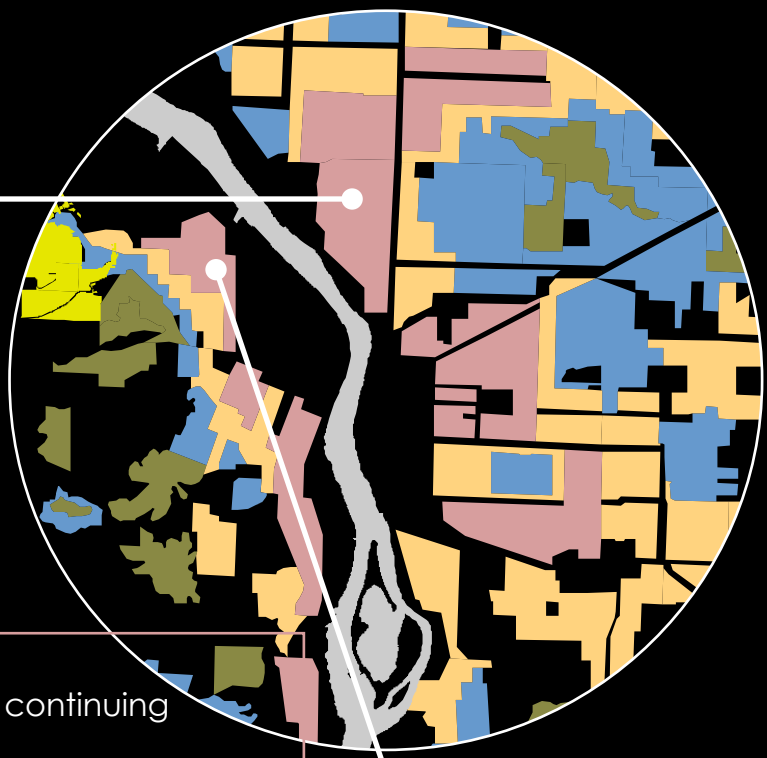
"HOLC "Redlining" maps: The persistent structure of segregation and economic inequality". (National Community Reinvestment Coalition (NCRC))

Across the U.S., the racialization of the real estate market and exclusionary subsidization of suburban housing developments occurred beginning in the 1930's and continued for decades to follow. Since the 1990's this has amalgamated with a growing economic interest in living. Inner cities across the nation were systemically segregated by federal housing authorities exclusionary tactics such as blockbusting, uninsured Black lending, and "white-only" development policies.[49] These policies and practices created housing shortages for non-white populations and majority-minority neighborhoods, some of which are visible in cities today. Policies formed and limited housing opportunities for Blacks to inner-city redlined districts experiencing overcrowding and disinvestment. The Housing Owners Loan Corporation (HOLC) established property risk assessments of residential neighborhoods, what Richard Rothstein describes as post-war barriers to exit.[50]

Figure 18 :
Portland 1938 HOLC Redlining Security Maps Digitalized
Home Owners Loan Corporation.

"Mapping Inequality, American Panorama" (University of Richmond Digital Scholarship Lab, 2019)


1938 NEW DEAL HOME OWNERS
LOAN CORPORATION
SECURITY MAPS
ALBINA
NORTH
East
NORTH
WEST
DOWN
TOWN
SOUTH
East
SOUTH
WEST
Forest Park
Waterbodies
1938 HOLC Grade
A - "Best"
B - "Still Desirable"
C - "Definitly Declining"
D - "Hazardous"
0
2
4
8
Miles



ALBINA NEIGHBORHOOD
Infiltration of Subversive races continuing

Favorable Influences: Convenience to city center, schools, churches transportation, recreational areas and trading centers.

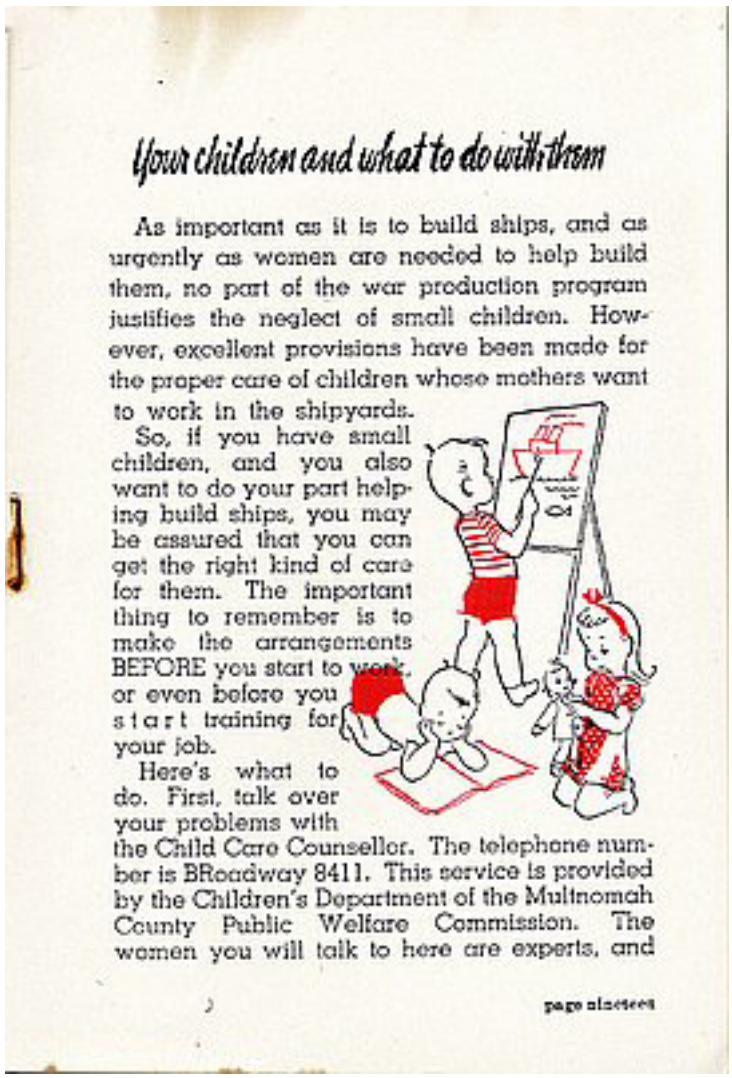
Detrimental Influences: Extremely heterogeneous population, dilapidated improvements, encroachment of business.

SLABTOWN NORTHWEST DISTRICT
Infiltration of Subversive races occurring

Favorable Influences: Walking distance of city center. Convenience to schools, churches, transportation, recreational areas, trading centers and areas of industrial employment.

Detrimental Influences: Encroachment of business and light industry. Heterogeneous improvements and population. Infiltration of subversive racial elements. High taxes

Figure 19 :
Women workers at Oregon Shipyard, Portland, Oregon
the Oregon History Project, Oregon in Depression and War, 1925-1945. African American and Women Workers in World War II.



Your children and what to do with them

As important as it is to build ships, and as urgently as women are needed to help build them, no part of the war production program justifies the neglect of small children. However, excellent provisions have been made for the proper care of children whose mothers want to work in the shipyards.

So, if you have small children, and you also want to do your part helping build ships, you may be assured that you can get the right kind of care for them. The important thing to remember is to make the arrangements BEFORE you start to work, or even before you start training for your job.

Here's what to do. First, talk over your problems with the Child Care Counsellor. The telephone number is BRoadway 8411. This service is provided by the Children's Department of the Multnomah County Public Welfare Commission. The women you will talk to here are experts, and

page nineteen

Figure 20 :
Handbook for women workers in shipyards, 1943
Courtesy of Oregon Hist. Society Lib. MSS 2547

World War II sent Portland further into a housing crisis, the northern migration shifted national racial demographics in the war era when many Blacks in the south journeyed to port cities in search of work and opportunity. During World War II, the population of Blacks in Portland grew by over 900 percent relative to pre-war in 1940, rising from 2,565 to 25,000 in 1942.[51] Many Blacks joined in the defense industry of WWII as a part of the cities shipyard war efforts, many of which paid into the shipping unions though were denied union benefits.

In Portland, the Kaiser Shipping Yards began building warships to close the shortage of ships after the attack at Pearl Harbor. The shores of the Willamette River in the center-city of Portland began booming with work, and with men drafted away to war, the conventional workforce shifted. Blacks and women were hired in the shipping yards, the patriotism of war temporarily loosened workforce norms of race and gender.[52] By 1944 at the Kaiser shipyards, women made up 30 percent of the workforce (28,000 women). "When the shipyards and other local defense industries began to bring in Black workers in 1943, the newcomers encountered a wall of racism and discrimination in housing, public transportation, union membership, and access to recreational facilities."[53]

World War II changed the urban conditions for low-

income residents and residents of color. Henry Kaiser a Portland industrialist and owner of Kaiser shipping took the housing shortage into his own hands. He needed shipbuilders and people needed homes. In support of his business, Kaiser gained federal money to build Vanport, the largest temporary wartime housing project in the nation, built in 110 days.[54] Many residents from Albina neighborhood and other integrated neighborhoods experiencing overcrowding and disinvestment moved into Vanport. Vanport built in the floodplain of the Columbia River north of Portland was lost to devastating flood on May 30th—Memorial Day, 1948 — displacing many low-income residents of color and low-income white residents. For many of these displaced residents, housing options were limited and the Albina neighborhood absorbed many of the Vanport flood refugees.

Portland's Albina district, located along the Northeastern edge of the Willamette River, where current day Interstate 405 and Interstate 5 meet, was for many years a majority Black neighborhood. Low property values and a history of city disinvestment prompted large scale Albina neighborhood demolitions for the development of Memorial Colosseum, Emanuel Hospital and multiple highway projects. The Federal-Aid Highway Act of 1956, set in motion a nationwide defense investment that

often cut through vulnerable communities dividing and exposing communities to new health issues. Reinvestments and high end-housing developments in Albina have pushed large populations of low-income, residents of color to East of 82nd and north of Columbia Boulevard, Portland's urban peripheries. Displacing vulnerable communities to East of 82nd alters the transit experience. It distances people from defined community space, reduces walkability and severs connections to amenities. The socio-spatial impacts of inequitable housing policy and substantial inner-city urban renewal overwhelmingly displace economically vulnerable communities to the fringes of city limits, distancing amenities and often warping pedestrian and bike experience.

inner-city urban renewal

A wealth and amenity distribution gap have widened with the presence of inner-city urban revitalization and the return of the white-middle-class into inner-city neighborhoods. Carter William Ause's research on Portland's Albina District, a historic Black neighborhood, examines the progression of discriminative housing policy and eco-gentrification, from 1940 to 2015. Ause's ends the article with a call to action: "If Portland is going to be as egalitarian as it is sustainable, we must seek future investment in affordable housing East of 82nd Avenue and make public transportation more

Figure 21 :
1963 Construction of curent day Interstate five, Minnesota Freeway and removal of residential neighborhood.
City of Portland Archieves.

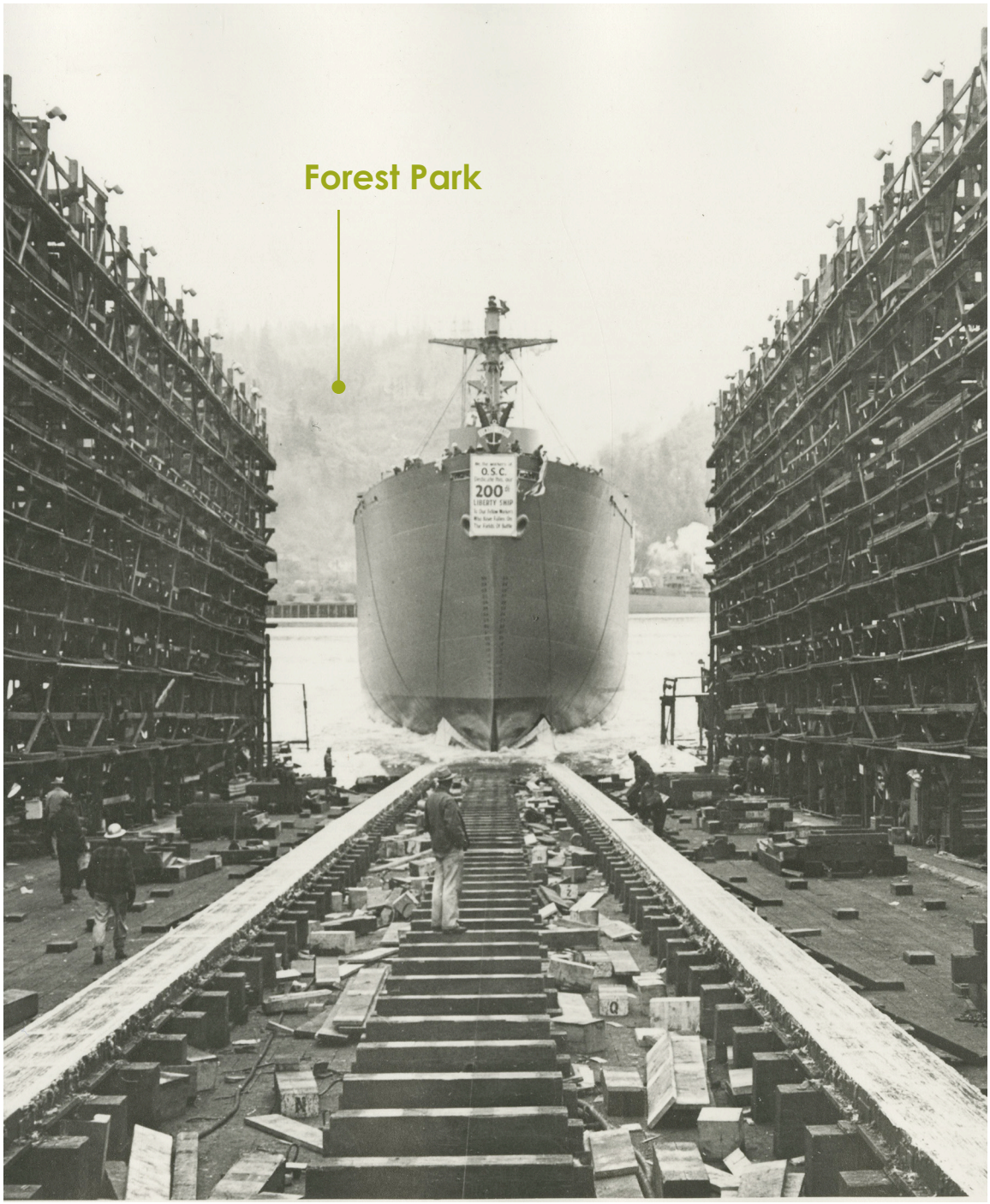

MINNESOTA FREEWAY CONSTRUCTION
LOOKING NORTH

readily available for East Portland residents who rely on public transit every day."[55] This project aims to develop inclusive processes for infrastructure investment to ensure vulnerable communities are included in emerging transit futures and progress is made to dissolve systemic and institutional barriers.

Disconnections in multi-modal transit infrastructure and housing affordability create barriers to access, determining vulnerable communities' level of access to Forest Park and inner-city amenities. Numerous residents were displaced to East of 82nd due to pressures of increasing housing costs in inner-city neighborhoods. A history of disinvestment in majority Black neighborhoods alongside systems of predatory lending and red-lining practices resulted in overcrowded, often disintegrating properties that did not meet housing standards with low land value; the combination of which became prime locations for transit and urban development forcing communities of color out post World War II.

Historic racial districting policies, predatory lending practices and lack of investment initiatives together with Portland's present surge in economic-driven investments have generated the pattern of vulnerable communities that exist. Vulnerable communities have shifted from inner-city neighborhoods to suburban contexts.[56]

Figure 22 :
Oregon Shipbuilding Corp.1943,
Courtesy of Oregon Historical Society Lib. Folder 2209. Shipbuilding in present day Swan Island Industrial Park, overlooking the Willamette River with Forest Park shown in the background. Note the forest harvest and regrowth in the park.


Forest Park
O.S.C.
200
LIBERTY SHIP

"Wealth is no longer concentrated in the post-war automobile suburbs of United States cities. Instead, wealth is rapidly shifting toward the urban core. Unlike Albina, East Portland's streets are not as easy to walk. Albina's grid pattern and flat streets make getting around by bike significantly easier than neighborhoods such as Southeast 122nd and Division"[57]

Exploring barriers, and barriers upheld, identifies nationwide patterns while seeking to spatialize Portland's vulnerable residents. A strong correlation exists between the positioning of vulnerable residents in cities and the designed environment. Historically industrial urban centers, urban renewal, and the suburbs all contribute to this dynamic. Clarifying this position as a designer or planner is imperative to seeking equitable design prior to providing an amenity or tool.

Figure 23 :
Inequitable barriers to inner-city amenities in Portland
Infastructural disconnect between Inner-city, top right and East Portland, bottom left.

Joe Steckert, "The Forgotten Portland How East Portland Was Born... and Ignored" (Portland Mercury, 2014)

Mapping shared micromobility + the risk of othering

Examining emergent urban micromobility services and policy structures provide policy writers, planners, and designers the analytic tools necessary to practice and promote equitable access to amenities. The evolution of

transportation structures has operated in conjunction with geospatial realities imposed by social constructs of race and economic difference.

Poverty in suburban areas from 2000 to 2008 has increased five times compared to that of inner-cities.[58] On trend, Portland housing unaffordability has displaced low-income residents away from the center city, a disproportionate majority of which are residents of color. This trend of displacement limits transit opportunities, concentrations, and reliability, distancing vulnerable communities from urban resources that contribute to job opportunity, health and well-being. Forest Park is among those resources and its user ship reflects the pointed barriers in access. Micromobility similarly has a nation-wide tendency to form a density of use and greater access to tools in urban centers. This is driven by policies, practices and bike infrastructure investments establishing the risk of othering as micromobility joins transportation-as-a-service.

Using publicly available data in Portland, a comparison is made between Biketown bike-share, a docked micromobility service, and a 2018 dockless e-scooter pilot study. The data allow a comparison of the spatial distribution of ridership across the same time period. There are multiple variables in this comparison: bike to scooter, human-powered to electric and semi-docked to dockless. None-the-less, the comparison offers insights

into the effects of policy on equitable distribution of micromobility in the first two years of e-scooters entering the shared economy.

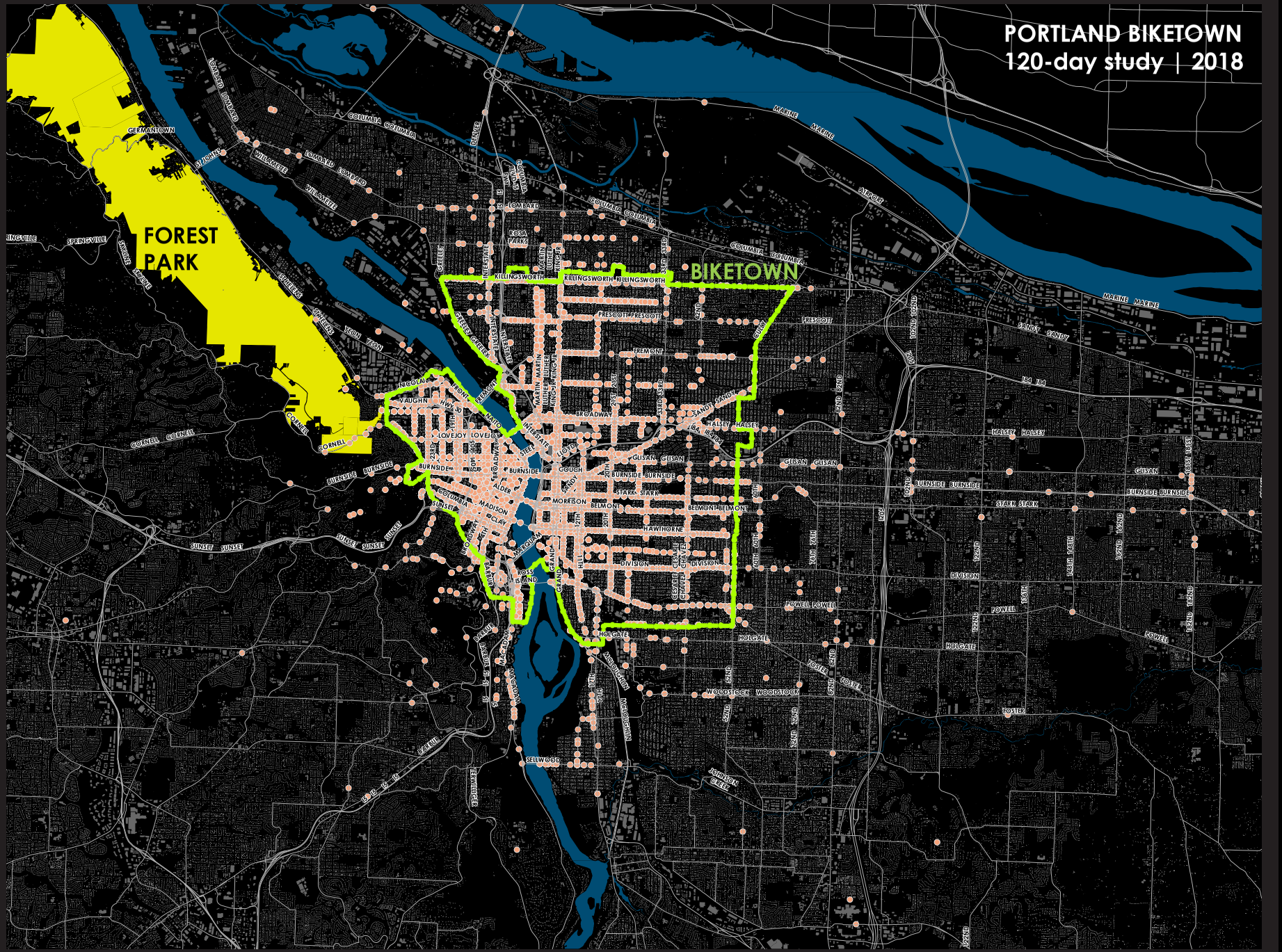
Portland's three-month e-scooter pilot study shows travel trends indicating that residents are using e-scooters to access Forest Park and in East Portland where the equity analysis found vulnerable residents to live.

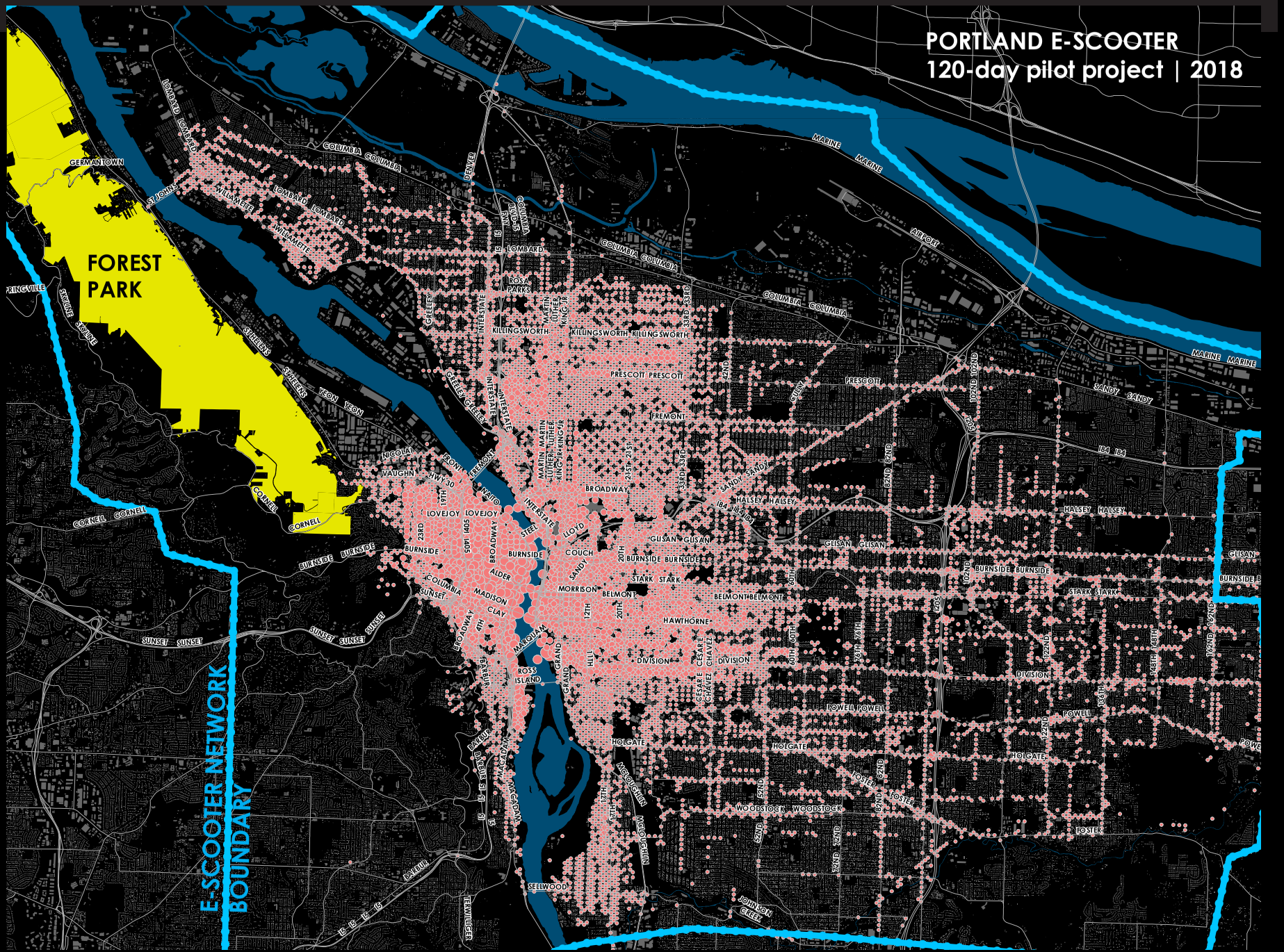
This project compares the geographical extent and use of shared micro-mobility in Portland, examining Biketown pedal-powered shared bikes and shared electric scooters. The study period is set by a 120-day e-scooter pilot study that took place from July 23 - November 20, 2018.[59] In comparing these two forms of micro-transit tools the geographical distribution of use is drastically different. Different levels of service exist in different neighborhoods in proximity to the city center where the greatest access to transit exists.

Figure 24 :
Portland Biketown Bike share Starting point data and network boundary. Each point is equivalent to a single ride durring 120-day period.

Figure 25:
2018 E-scooter 120-day Pilot Study. Points represent the density of street section use by e-scooters. compiling three e-scooter companies and network boundary.

Portland's Biketown has semi-docked system with a flexible locking system allowing users to operate outside of Biketown programed docks and leave bikes in an area of the city that does not offer docks. Even with this flexibility holes appear in the distribution of usership and reach. Biketown set a network boundary—service area— for its operations, with a monetary fee or bonus associated with leaving bikes outside the


PORTLAND BIKETOWN
120-day study | 2018
FOREST PARK
BIKETOWN


PORTLAND E-SCOOTER
120-day pilot project | 2018
FOREST PARK
E-SCOOTER NETWORK BOUNDARY

An analysis from the League of American Bicyclists found that Black and Hispanic cyclists had a fatality rate 30% and 23% higher than white cyclists, respectively.

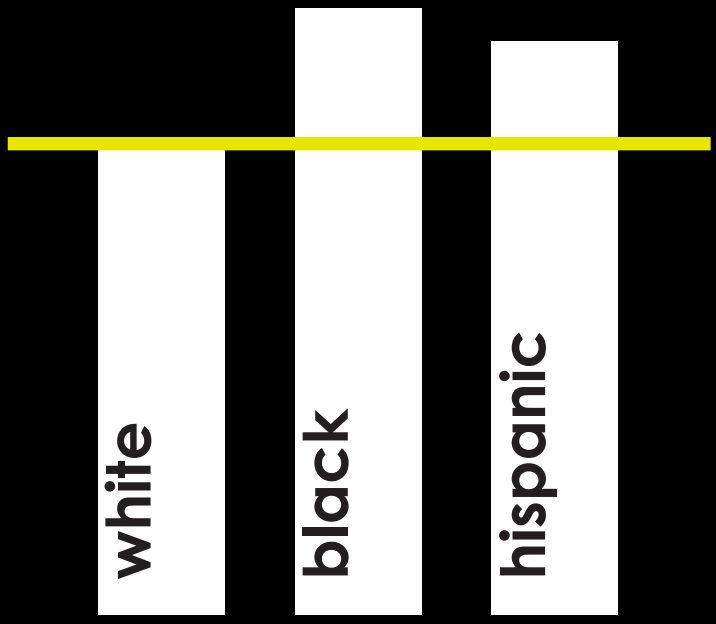


Figure 26:
Racial inequity in safety outcomes in urban cycling.
Equitable bike share means bike lanes (NACTO)

network boundary or bringing bikes back to within the boundary, respectively. Biketown offers a reduced fare membership—Biketown for All— which extends greater access to low-income residents who qualify. To qualify for Biketown for All residents must be a recipient of a form of social services or assistance for example State of Oregon food benefits or affordable housing. The reduced monthly fare for membership is accompanied by terms to negate fees for biking beyond the time limits or parking outside the service area. A financial incentive/ credit is given for bringing bikes back into the service area.

Biketown has found that Biketown for All users ride more and return bikes to stations more in comparison to other member types (full priced memberships and non-members). [60] This targeted strategy prioritizes low-income residents to receive access to affordable micromobility, though it does not account nor address the range of vulnerabilities present in cities. By using the metric of qualifying for social services a sharp and unforgiving line is drawn in the gray area of affordability.

The census tract analysis in section two, People: Identifying vulnerable communities, is examined spatially in relationship to Biketown and e-scooter service areas. Biketown individual rides and e-scooter street segment ridership are used to examine and compare the geographic distribution and reach. Ninety-

equitable access to micromobility is becoming increasingly available in Portland, Oregon.

access to safe infrastructure + a sense of belonging is needed

three percent of the census tract that Portland Bureau of Transportation's Equity Matrix Scores in the top third for high vulnerability by race and income, exist outside of the Biketown service area. If residents' earnings disqualify them from social services by any margin, thus disqualifying a resident from Biketowns' inclusionary practices, the burden of living outside of the service area is major. There is a ten-dollar fee incurred to lock a bike at a public rack outside system area. Biketowns' system area policies and practices limit the network of micromobility tools available, contributing to low dependability to find a bike within low-income, high residents of color neighborhood. Falling outside of the policy formed vulnerabilities limits access to the shared network of micromobility tools. Micromobility use is not a matter of interest but rather a matter of access, reinforced by if not directly driven by policies and practices.

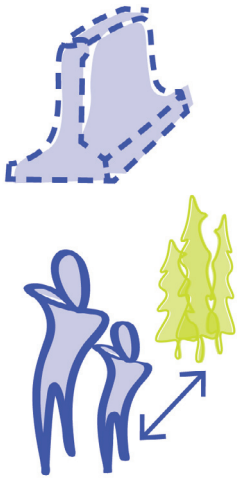
E-scooter companies in Portland have an expanded service area compared to Biketown services. The limits of Portland's e-scooter service areas mimic Portland city limits. The City of Portland has taken an active role in service regulation and prescribed inclusive equity practices aimed to include Eastside residents who historically and contemporarily experience disinvestment and displacement. Expansion of service areas and regulating access to micromobility tools in socially and economically vulnerable neighborhoods is

a critical step towards inclusion. Though as explained through john a. powell's belonging and othering framework, inclusion in a system does not dissolve active structures of exclusion. To expand equity in micromobility, safety infrastructure must accompany the provision and availability of tools.

A League of American Bicyclists study identified racial/ethnic bike safety gaps. A 2001 Center for Disease Control (CDC) study found that fatality rates among Black and Hispanic cyclists were higher than white cyclists by 30 percent and 23 percent, respectively.[61] The disproportionate burden of poorly designed, car-oriented streets is majority bared by low-income residents of color. NACTO argues that "Ensuring that people have transportation options that are efficient, convenient, and safe is fundamental to efforts to reduce income inequality in the United States today."[62] Strengthening connections between economic centers of opportunity, amenities and vulnerable residents through the introduction of shared micromobility has vast equitable potential. Aside clear potential, the risk of othering and perpetuating historic and contemporary inequalities exists. The design and connect component of the Targeted universalism framework influenced by the former steps directly derived from john a. powells writing departs to actively consider his theories of Belonging and Othering. Theoretical frameworks are used in conjunction with my adaption for application to

micromobility centric design.

PHASE TWO: DESIGN



5. TARGETED STRATEGIES TO DISSOLVE + CONNECT

A strategic approach to universal goals. Designing structural + spatial expressions of belonging

To return to the Portland Plan's definition of equity, "equity is both the means to healthy communities and an end that benefits us all"[63]. Using Targeted universalism framework designers and planners can toggle the complexity of equity by understanding inequality, difference and barriers to create targeted strategies in the pursuit of universal goals.

Research from the International Journal of Transportation Science and Technology sites that the health of our cities and citizens is elevated by improving traffic safety outcomes for bicyclists.[64] The study describes that these health outcomes are direct and indirect operating at various scales. Directly, injury and fatality rates are reduced; indirectly greater participation and increased physical activity leads to healthier residents. Additionally— at a metropolitan scale—cities' with greater levels of bicycling have safety outcome implications on all road users and lower air pollution.

"The connection between bike share ridership and high-quality bike lanes is clear: people ride more when they have safe places to ride. Less explored is the positive feedback loop between bike share, the creation of protected bike networks, and overall cyclist safety – and the importance of this feedback loop in helping to address the systemic inequities in the U.S. transportation system."[65]

Providing space in the transit landscape to encourage equitable and carbon reducing forms of transit can play a critical role in allocating open space resources for vulnerable, historically left out communities. Incentivizing the use of shared-micro-mobility-tools to access Forest Park would address emissions associated with a reliance on personal vehicles, while also shifting toward heightened belonging and equitable access.

Targeting low-income, communities of color, the majority of which live in suburban fringe is twofold. This demographic is underrepresented in Forest Park usership, and infrastructurally exposed to a greater safety risk as pedestrians and micromobility users, furthering discrepancies in access. A strong positive correlation exists between ridership and bike infrastructure in cities nationwide. The quality of bike infrastructure and the level of safety offered, often varies across cities having drastic influences on equity. Numerous surveys have identified safety as a central

barrier to urban cycling and use of shared micromobility for low-income residents of color. In Portland's 2018 e-scooter pilot study, a community member focus group consisting of East Portland residents expressed a concern for a lack of safe infrastructure.[66]

"I'd really like to see fewer cars everywhere, but the major thoroughfares are especially dangerous for non-driving travelers (peds, bikes, and now scooters)." – East Portlander [67]

Existing + projected infrastructure

Portland's 2014 active transportation plan acknowledges that arterial street function and use changes as the urban grid shifts from inner-urban to suburban areas.

"Many of the region's busiest and widest streets are also regional pedestrian and bicycle routes. Arterials often provide the most direct and efficient route for travel for all modes, especially in suburban areas where there may not be alternative parallel routes. Many essential destinations and services and transit stops are located on arterials. Regional trails and other pedestrian and bicycle routes intersect with arterials."[68]

These arterial streets are a vital connective tissue,

linking inner-city and East Portland for cars, bikes and pedestrians. Infrastructurally, many of these major arterials are dominated by car-oriented designs with rigid on-street parking. The current pedestrian and cyclist interventions along major arterials linking East Portland to inner-city lack a cohesive network to provide safe, convenient and reliable transportation. Portland Bureau of Transportation has a system of neighborhood greenways—low speed shared residential streets which prioritize bike and pedestrian travel—often adjacent to major arterial streets. Portland's greenway consists of a

network of sharrows—a low-stress street with painted white bike symbol and arrow in traffic lane—alongside interventions to slow and divert vehicular traffic.

Sharrows are found to work at the neighborhood scale, however, their success ranges in their ability to make connections, varying in success based upon urban grid structure. Research of the traffic safety implications of sharrows is unclear. Researchers are calling for more studies to better understand the relationship of sharrows to healthy outcomes of biking, bike safety and effects on ridership. Ferenchak and Marshall write that for cities "it may be useful to remember that sharrows are signage and not actual bike infrastructure".[69]

Figure 27 :
Sharow bike infrastructure Typology.
Ferenchak et. al.
Types of sharow markings.

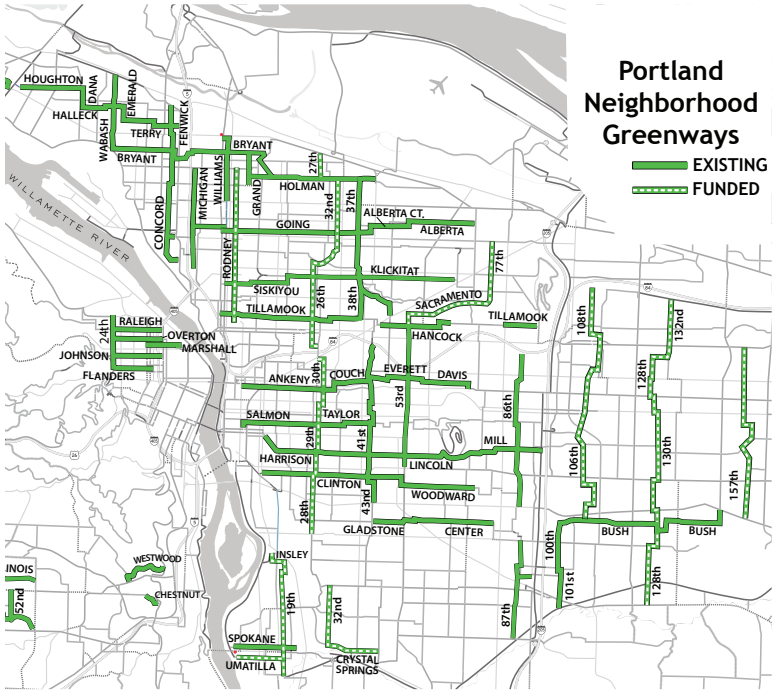


Figure 28 :
Portland Existing and Funded Neighborhood Greenways,
Portland's Neighborhood Greenway Assessment Report 2015. Note lack of existing greenways in East Portland and low strength East-west connections that extrude beyond I-205.

women make up 32% of cyclists in portland citywide.

all neighborhoods except East portland are within +/- 3% of the citywide average

Figure 29 :
Rate of women cyclists as an indicator of safety, City of Portland Bike counts.

The right-of-way width in combination with providing more direct connections, gives major arterial roads promise for infrastructure interventions to support shifting transportation innovation, and consider a range of resident needs and transportation tools. Boldly micro-modal-driven redesigning of major arterial streets serve to create a more robust connection across Portland and may have significant implications for cycling rates, micromobility tools, and universal health outcomes. Reallocating space on select arterial streets can help remedy inequities and bridge existent access gaps.

Portland's current and projected Neighborhood Greenways are a supporting structure to the broad network; however, major direct connections that splice East to West through the social and economic inequalities present in Portland are limited. Efforts are planned to expand Portland's network of Neighborhood Greenways to East Portland. Three major routes on the Eastside are currently funded running North-south at roughly, 106th ,130th, and 157th. The interventions to slow and divert cars on these roads may support internal connections and greater safety; however, a major infrastructural disconnect is present for East-west connections between inner-city Forest Park and residents found vulnerable in section two *Defining vulnerable residents.*

"You can't just paint sharrows on a street and expect that people are going to, voila! Start biking. It needs to be a reliable system and it needs to be safe. The way that we look at the health of our bike lanes and bike lane network is how many women and children are using the lanes because when you see women and kids, and families in the lanes you know that it is safe."[70]

- Janette Sadik-Khan

Sadik-Khan's metrics for the health of bike lanes are extended to absorb micromobility in lane. The amount of women cycling is well studied across many cities, while the amount of children using lanes is less studied. For that reason, women were chosen to explore the health of micromobility lanes in Portland. Women make up 32 percent of cyclists in Portland citywide. Most neighborhoods—Inner Northeast, North, Inner Southeast, Southwest, and Northwest— are within plus

or minus three percent of the citywide demographic. Women make up 21 percent of cyclists in East Portland. This discrepancy in use may indicate a discrepancy in safe infrastructure. Gender data is based on Portland bike counts measured through 2013 and 2014 manual peak 2-hour bike counts.

Portland's 2030 Bike Transportation System Plan projects a robust network of bike infrastructure, that I expand to be broadly termed micromobility infrastructure. The 2030 Portland Plan identifies that seeking a complete network of bike-able streets by 2030 brings great importance to the phasing and timeline of infrastructure changes. Equity should be at the forefront of prioritizing how, when and where investments in the route network are made.

Lanes projected in East Portland address "local difference" through identifying East Portland's circuitous grid and planning to align bikeways parallel to main high-volume collector streets.[71] Directness is prioritized for the automobile on most major arterial streets in East Portland. Understanding the grid to be circuitous beyond the major arterials suggests a missed opportunity for Portland to prioritize the health of the city. Portland can selectively transition major arterial rights-of-ways into robust infrastructure supportive of micromobility. These would act as backbones to the network creating broad

connections from those currently severed. The location of these robust inner-urban and suburban connections is a matter of equity. Equity development is beyond inclusionary practice, requiring strategies that account for difference in a way that instills a sense and ability to belong.

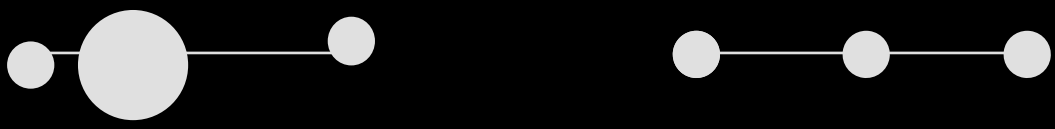
I divide section five, Dissolve + Connect into two components and scales of planning: planning for cohesion and planning for difference. This approach grew out of john a. powells belonging and othering framework and is applied to street design. At both scales, goals are to create, as powell states, expressions of belonging. The details of which ask the approach of the designer to shift what belonging means, and balance cohesion and structure, while allowing for a spectrum of representation to meet the spectrum of residents it serves. Cohesion is often seen as the role of designers and planners to approach problems and solutions as systems. They provide connectedness and clarity across the landscape signaling residents and shifting their behavior. Belonging as cohesion is a visual language of treatments which are in-dissolvable to changes in vulnerability, creating a universal design language. Belonging as difference requests flexibility and that the design reflect the variance of human experience, lending spaces to be "under-designed" providing space for expression. The space to visualize and celebrate differences is not to be filled by designers nor planners

Figure 30 :
Planning Belonging through designing for difference and cohesion.

PLANNING BELONGING

PLANNING DIFFERENCE

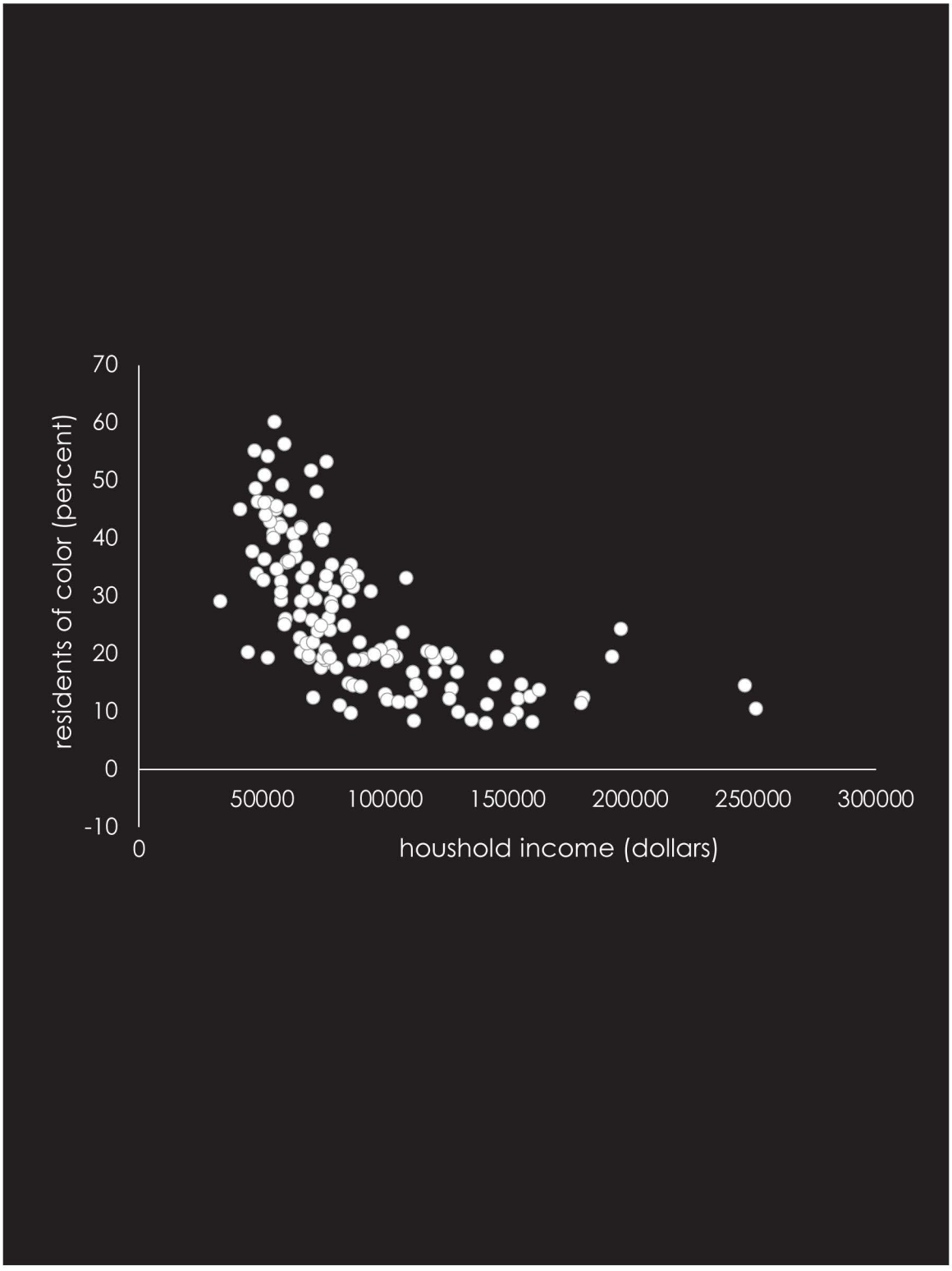
PLANNING COHESION



but by local users. This approach lays the scale on its side, aligning the hand of designers and planners with that of the community. They exist on a single axis, dissolving the hierarchy of traditional trickle-down planning and design.

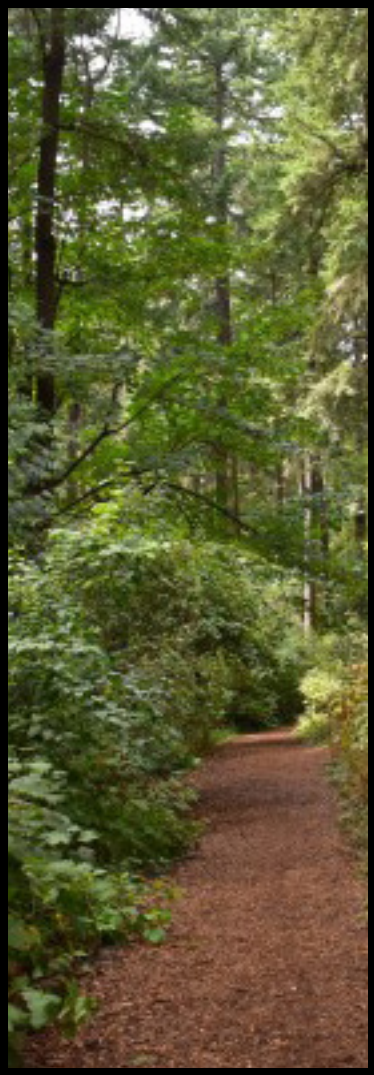
Utilizing the equitable belonging framework to narrow the access gap between Forest Park and residents found vulnerable—underrepresented in Forest Park— has led this research to identify a discrepancy in micromobility infrastructure. Tools such as e-scooters are available in high-density vulnerable neighborhoods due to Portland's equity policies and practices; however, usership is limited by poor infrastructure creating a lack of safety. This opportunity led to the design of Forest Lane—a micro-modal protected travel lane running East-West. It is imperative that the timing and phasing of this safety improvement be strategic in its targeted approach to connect vulnerable residents to inner-city amenities and Forest Park. I recommend that the phasing begin from the Eastside and work its way West, in contrast to typical Portland bike infrastructure which has the tendency to emerge from the inner-city and work its way to the urban peripheries. This approach concentrates initial infrastructure to greatest concentration of Portland's most vulnerable communities experiencing the majority burden of urban growth. This tactic alongside policy may allow residents to remain in place as growth and investment occur.

Figure 31 :
Linear relationship of race to income in Portland.


70
60
50
40
30
20
10
0
-10
residents of color (percent)
0
50000
100000
150000
200000
250000
300000
houshold income (dollars)

Forest Park

5,172 Acres



MOUNT TABOR

190 Acres

POWELL BUTTE

612 Acres

Figure 32 :
E. Burnside Street + SE. 102nd Avenue,
Google Earth Imagry. Limited opportunity for reallocation of right-of-way for protected micromobility lane.

Figure 33:
E. Stark Street + SE. 102nd Avenue,
Google Earth Imagry. Ample opportunity to reallocate vehicular lanes and parking to acomidate protected micromobility lane interventions.

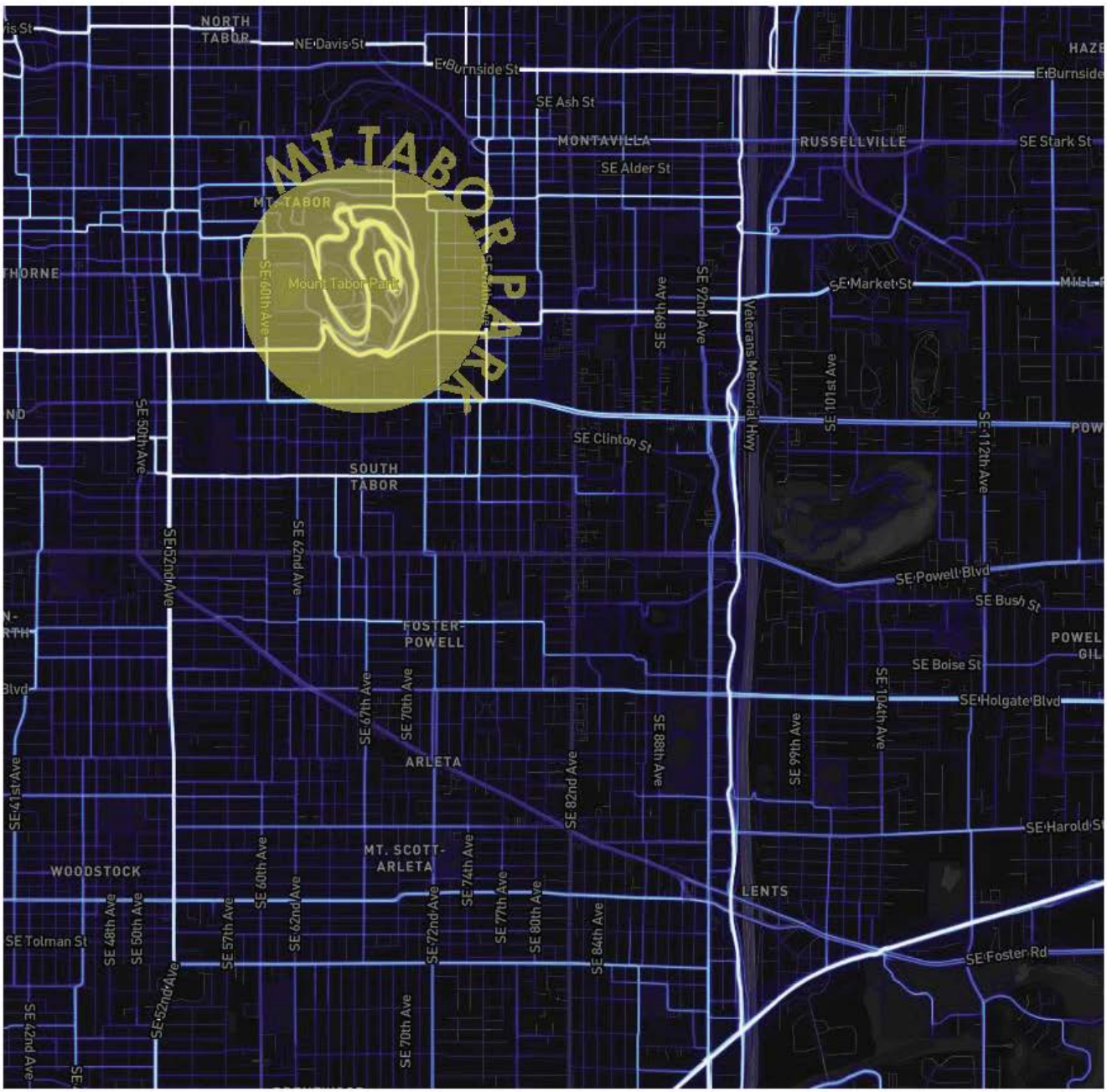


Figure 34 :
Bike Use Heat Map East Portland, Strava App,
Lighter color signifies higher density of usership, and darker color signifies lower density of usership.

High use routes **Low use routes**

Figure 35 :
Heat Map of cyclist and pedetrian use at Forest Park major urban facing trailheads, Strava App,
Lighter color signifies higher density of usership, and darker color signifies lower density of usership.

PEDESTRIAN USE HEAT MAP

High use routes **Low use routes**

Planning cohesion: siting structural expressions of belonging, Forest Lane

Forest Lane's route was determined by spatializing vulnerable residents and understanding resident travel behavior by micromobility, biking and walking. Vulnerability metrics were examined in section two, People: Identifying vulnerable residents, in relationship to the citywide average. These maps were used to select the route placement. The barriers and vulnerabilities revealed a historic and contemporary linear relationship between race and income in Portland. This led to income and race as primary vulnerability metrics, while English Language Proficiency and Education were framed as inextricably linked yet secondary. A focus on major arterial routes narrowed the search to Burnside Street, Division Street, Powell Boulevard and Stark/Belmont. Burnside was eliminated due to the current Blue line max joining street level at Interstate-205, limiting the adaptable space in the right-of-way for a protected bike lane. High-frequency bus and max lines—routes that run every 15 minutes for most of the day, every day— and 24-hour routes were used to examine the distribution of reliable transit network. The high-frequency bus route 15 currently runs from Forest Park East to Gateway Transit Station. The route capitalizes on the opportunity to highlight the current shared bus transportation while diversifying transit mode opportunities to include micromobility.

Stark/Belmont were chosen in part due to their location relative to census blocks with a high percentage of residents with limited education, low-income, limited English language proficiency and residents of color. Stark's series of one-way splits between Morrison and Belmont and Stark and Washington show positive characteristics for reduced potential conflict between cars and bikes at intersections. Intersections with one directional traffic reduce potential points of contact between micromobility and vehicular traffic during turns, increasing safety. Additionally, Stark/Belmont and Division offer an East-west connection giving Forest Lane the ability to include Mount Tabor, another one of Portland's Forested Parks. Mount Tabor is a 190 acres park between East Division and Belmont Street.

Strava—a smartphone app for runners, hikers and cyclists— mapping of route use density data, reinforced my selection of two trailheads on Forest Park's Urban Edge, Lower Macleay Park and Thurman Street, Leif Erickson Trail entrances. The Strava data showed a significant density of pedestrian use at the Lower Macleay Park entrance while significant bike use was present at the Leif Erickson Trailhead. Stava data was referenced to understand access to additional Forested Parks Mount Tabor and Powell Butte. Powell Buttes low forested area, southern location and project time limitations prohibited the exploration of connecting it to Forest Lane. In future project iterations designers

and planners should consider linking Powell Butte and Kelly Butte to the Forest Lane system of protective micromobility lanes.

Portland 2018 e-scooter pilot data was analyzed in the placement of the lane to prioritize streets with a high concentration of current e-scooter travel. E-scooter travel patterns around Mount Tabor were considered for Forest Lane to navigate the topographic change. Additionally, existent bike infrastructure and density of use were compounded in the selection of street sections using Strava, Portland Bureau of Transportation e-scooter data and Google Earth.

Analysis of e-scooter use during Portland's 2018 e-scooter pilot study show travel trends reaching to major trailheads, Lower Macleay Park Entrance and Thurman Street Entrance. A significant drop in street segment use occurs thereafter suggesting a Forest Park may be a prominent destination for e-scooter users. During the 2018 pilot project, 44,155 e-scooter trips originated in East Portland. This suggests significant interest in e-scooters as a tool to access amenities in East Portland reinforcing the need for safe infrastructure to utilize emergent micromobility.

Micro-modal-driven redesigning of major arterial streets serve to create a robust connection across Portland and may have significant implications for

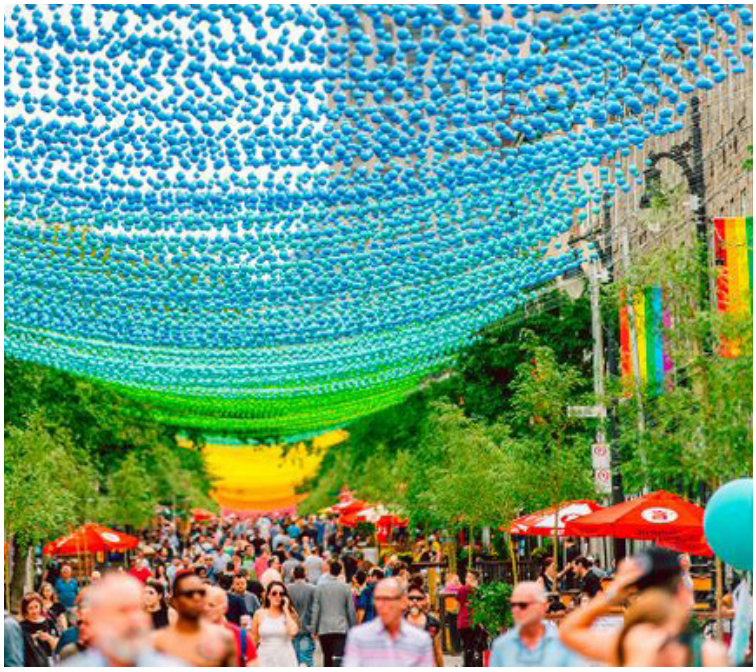
cycling rates, micromobility tools, and universal health outcomes. Reallocating space on select arterial streets can help remedy infrastructure inequities and bridge existent access gaps in a manner that instills a sense of belonging. Forest Lane is an iconic connective route stretching 13.7 miles with an average slope of 1.6 percent. Design interventions along Forest Lane route develop spatial and structural expressions of belonging. The next section will describe design interventions along the route which target planning for difference.

Planning difference: designing spatial expressions of belonging along Forest Lane

Once the underpinnings of a structural route location are set it is necessary to consider all intervention as opportunities to instill belonging. In this phase, I began by looking into three precedent studies: New York 9th Avenue protected bike lanes, Philadelphia Rail Park, and Montreal's Linear placemaking interventions 18 shades of gay. Each of these precedents contributed unique inspirations. New York inspired the transformative opportunity of active public space as protective to micromobility lanes. Philadelphia inspired linear forms and places for rest, while Montreal inspired the opportunity to incorporate community identity in wayfinding and placemaking.

PRECEDENTS

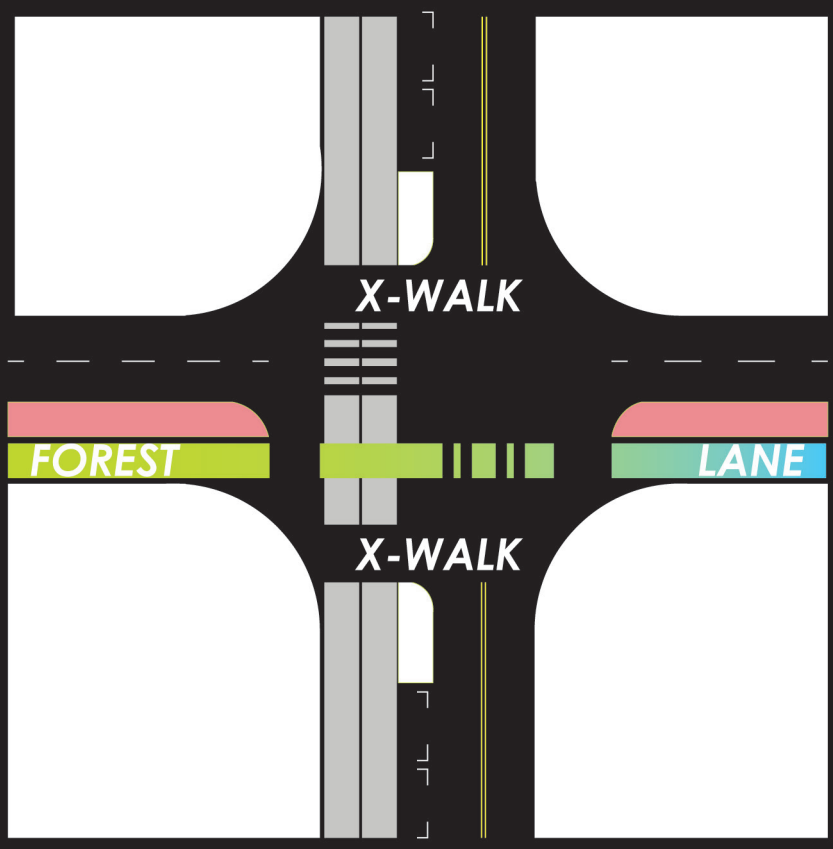
NEW YORK
8TH + 9TH AVENUE
PROTECTED BIKE LANES



MONTREAL
18 SHADES OF GAY

PHILADELPHIA
LINEAR RAIL PARK

BELONGING AS SAFETY



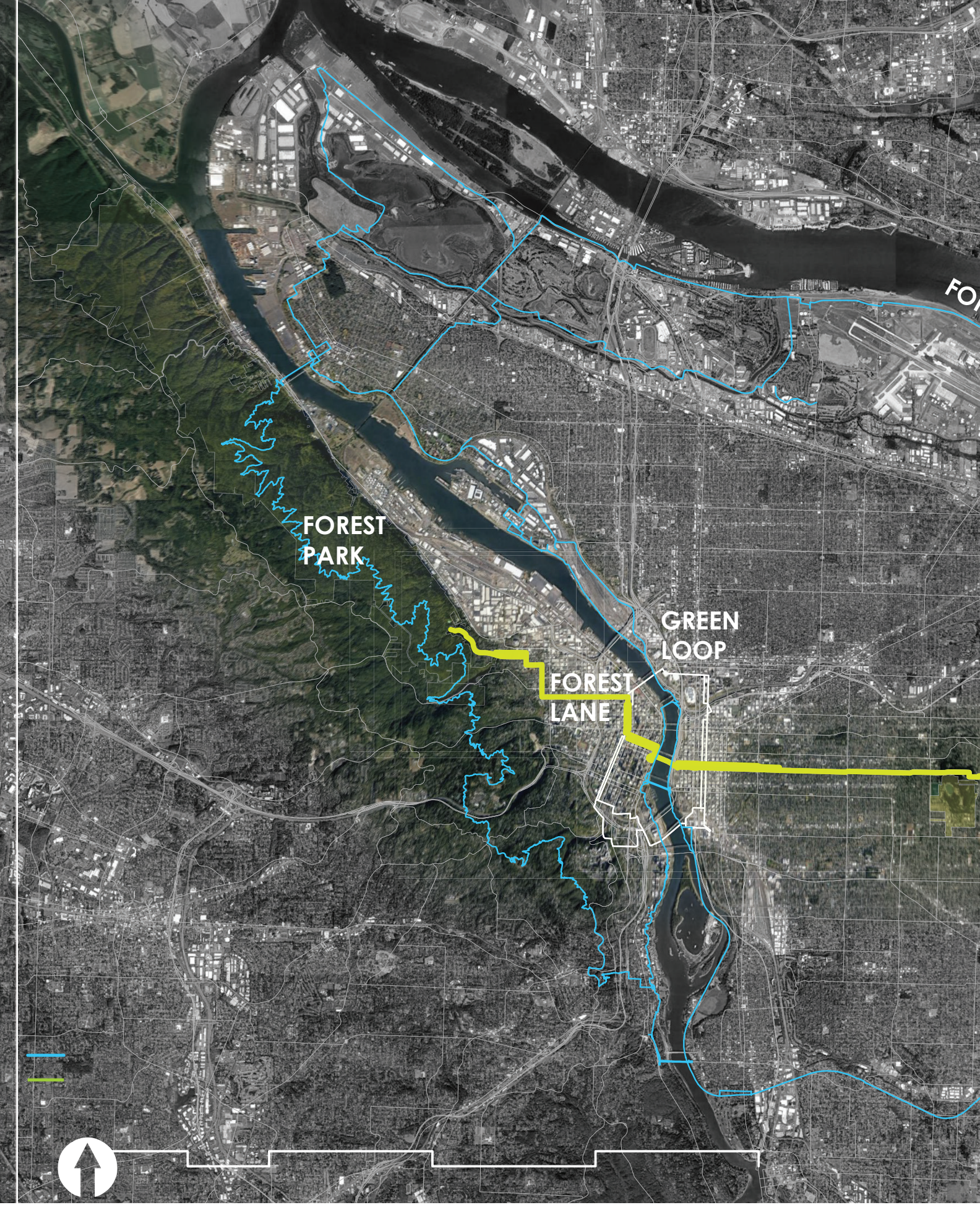
lane identity

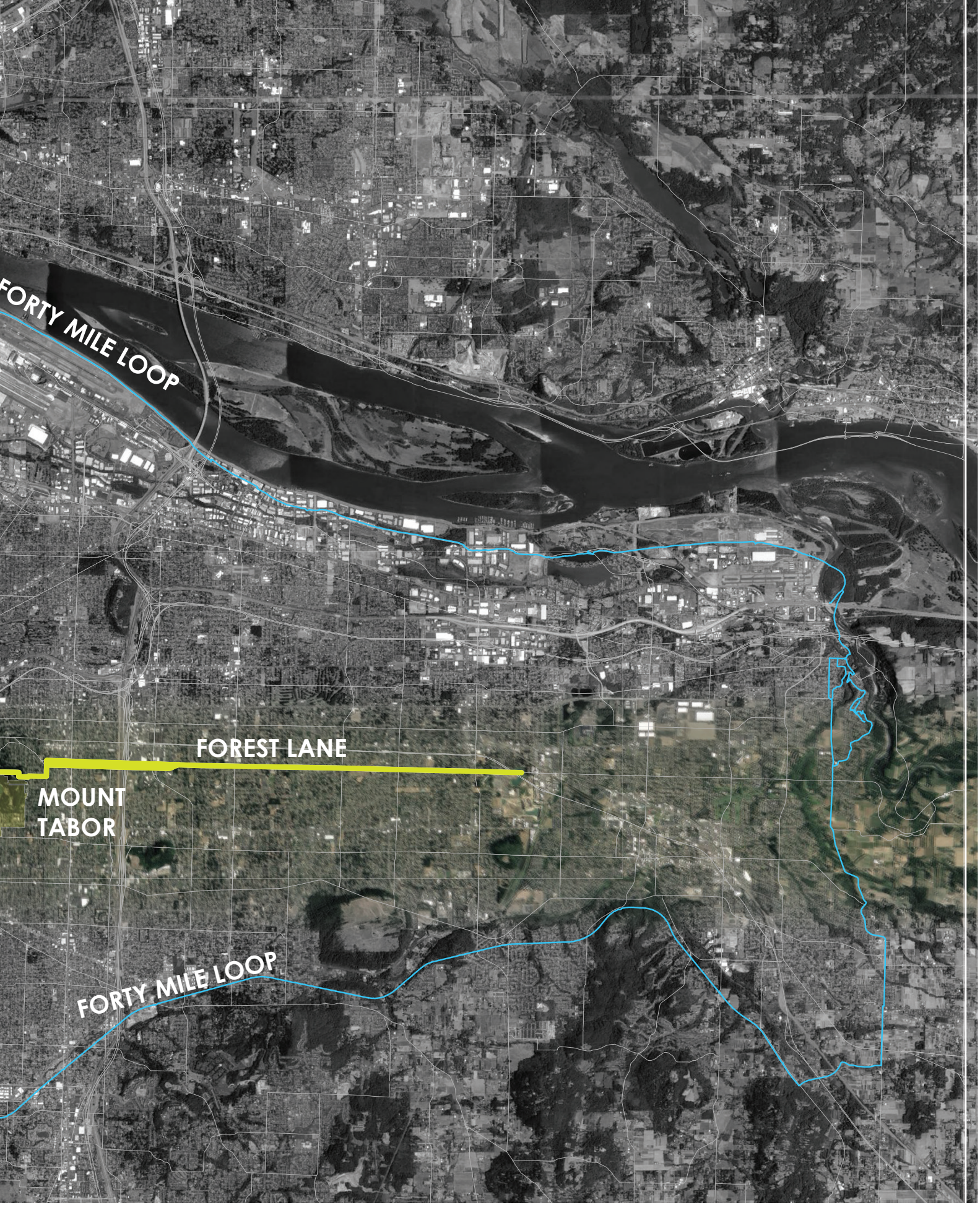
lane protection (passive + active)

Figure 36:
Belonging as Safety, lane identity and lane protection.

Planning belonging requires a nuanced approach that allows for design uncertainty, inviting opportunities for expression to develop community ownership and absorption of local identity. I explore two ways of constructing safety as belonging: lane protection and lane identity. Lane protection focuses on passive and active social space as lane buffers, while lane identity focuses on wayfinding elements and safety infrastructure via art.

Passive lane protection considers conventional typology of buffering micro-vehicles from macro-vehicle(car) traffic such as delineator posts, tall armadillos and planers. Active lane protection considers innovative ways to occupy and expand spatial requirements for buffering cars and micromobility users. Active lane protection can be envisioned as a social space, or a space that full-fills a utility need. For example, social space can be used for resting activities such as but not limited to eating, mild swinging, talking, finding shade, reading, etc. Utility space, I define more narrowly as designated space such as parking needs for multiple vehicle types: cars, e-scooter corrals, conventional bike parking, docking stations etc. Along the route, the protective element buffering Forest Lane will undulate form between active and passive. Transportation is viewed as a social act and one of utility. The space in the right-of-way dedicated to transportation staging—waiting—is framed as equally social and utility, a convergence of


FOREST
PARK
GREEN
LOOP
FOREST
LANE


FORTY MILE LOOP
FOREST LANE
MOUNT TABOR
FORTY MILE LOOP

Forest Lane looking East.

Forest Lane looking West.

BEFORE | *Stark Street + 78th eastfacing*


AFTER | Stark Street + 78th eastfacing
FOREST LANE

the two. Spatial requirements of the right-of-way are changing with the onset of transportation-as-a-service to entail more than travel lanes and parking requirements. Waiting in the age of shared transportation-as-a-service requires spatial considerations that conventional personal car-oriented street-design does not. This change requires a reframing of the urban street to accommodate space for waiting to hail a rideshare, autonomous car, bus or simply waiting for a friend to arrive. Envisioning these utility and social needs of the street and their potential to exist as buffers between modes of transportation presents an opportunity to activate streets while designing objects to instill belonging.

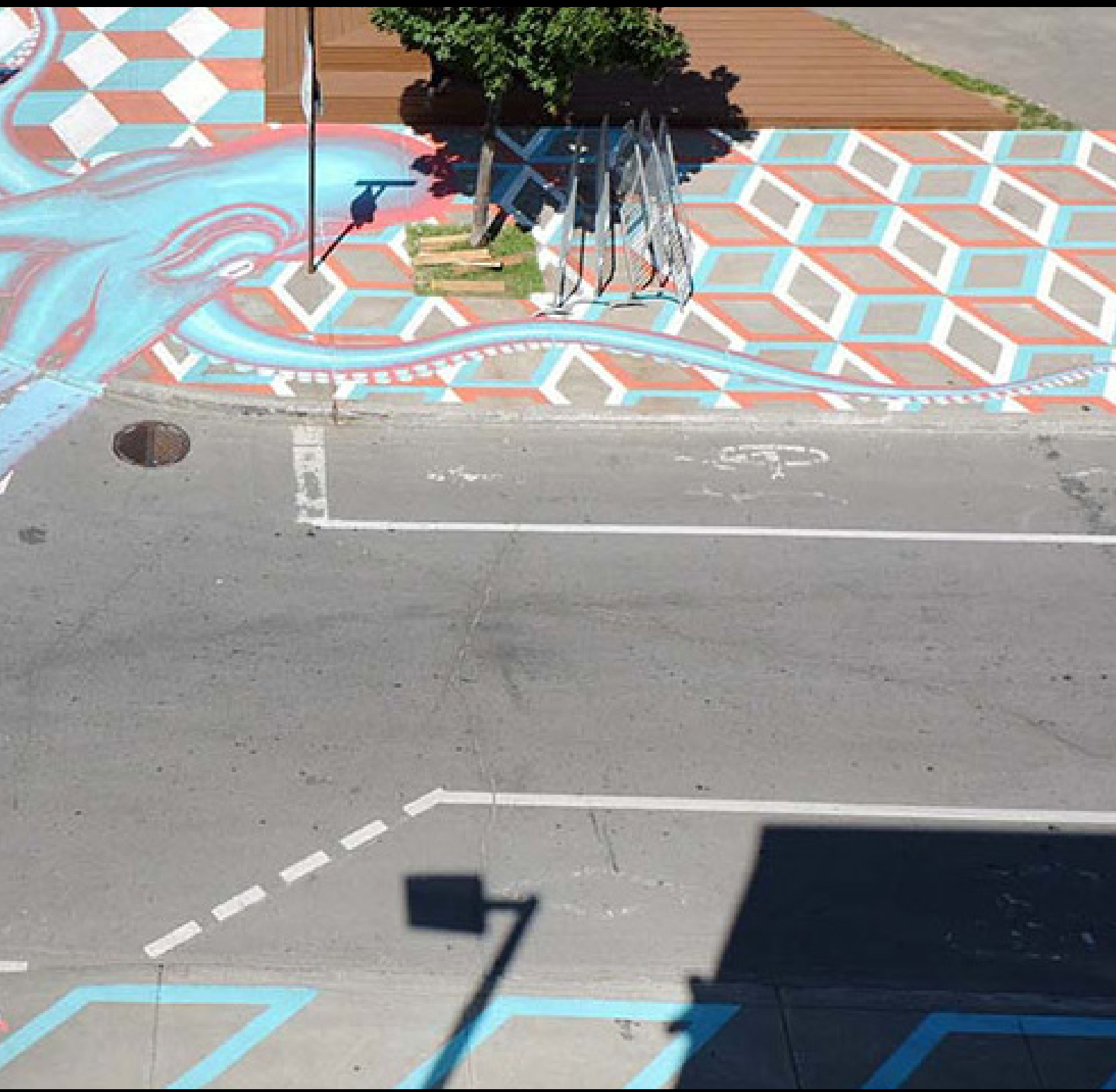
To accommodate for wait space, a shelter with seating and information was designed. The shelter is held up on each side with two opportunities for community intervention, one metal canvas to be laser cut, and secondly, a wood canvas. A rigid swing inspired by and engraved with the industrial history of Portland and Portland residents offer space to rest or wait while buffering Forest Lane. The design of this swing is adopted from a seating design in Philadelphia's Rail Park. Each element is a form of planning belonging which as formerly noted, allows for design uncertainty, inviting opportunities for expression to develop community ownership and absorption of local identity. I visualize what these may look like providing initial

Figure 35:
Parking to Public Space, Pearl Street Triangle in Brooklyn New York, Pilot phasing to test use of newly acquired pedestrian space.
Art by David Ellis titled "motion painting".

NYC Plaza Program

Figure 36:
Public ground plane art in Montreal, Canada.
"Artist 'Roadsworth' Uses Public Streets as a Canvas for Art and Activism" (Colossal, 2017)


STOP



ACTIVE LANE PROTECTION

instill + install safety to belong

resting

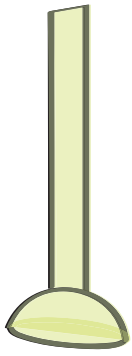
eating
swinging
just sitting
reading

rigid swing seating

a unifying industrial aesthetic showing homage to the industrial history of Portland.

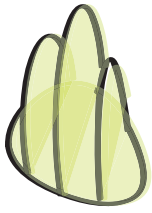
PASSIVE LANE PROTECTION

instill + install safety to belong



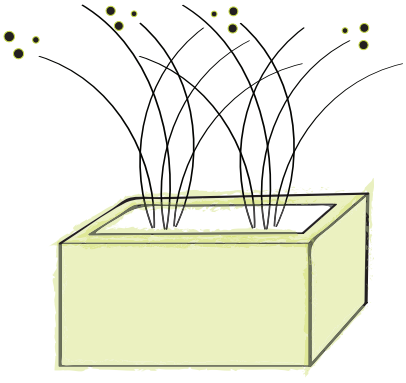
DELINEATOR POST

+ 1.5' width
$15-30k per lane mile



TALL ARMADILLO

+ 1.5' width
$15-30k per lane mile



PLANTER

+ 3' width
$80k-400k per lane mile

cost and spatial needs data sourced from People for Bike

ACTIVE LANE PROTECTION

instill + install safety to belong

parking (utility)

car
e-scooter
bike

resting (social)

eating
swinging
just sitting
reading
finding shade
talking

waiting (social utility)

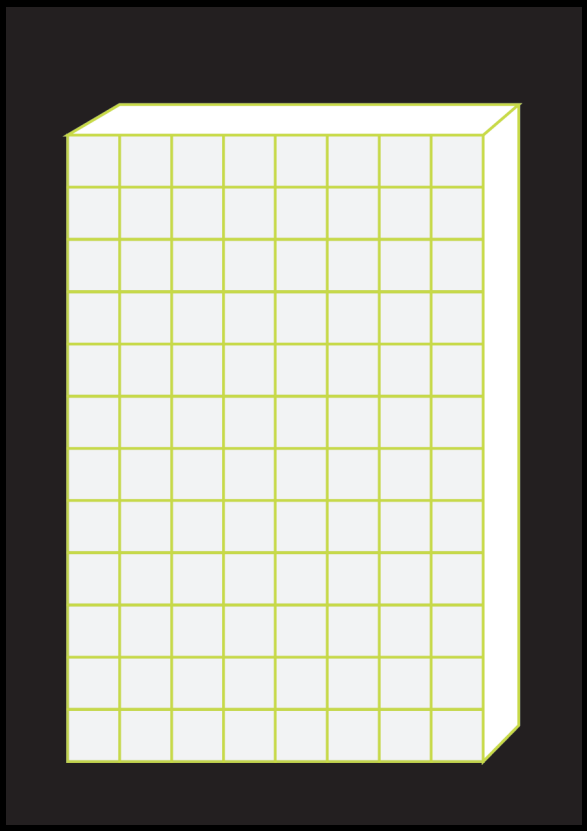
ride-share
autonomous car
bus
a friend

ACTIVE LANE PROTECTION

instill + install safety to belong

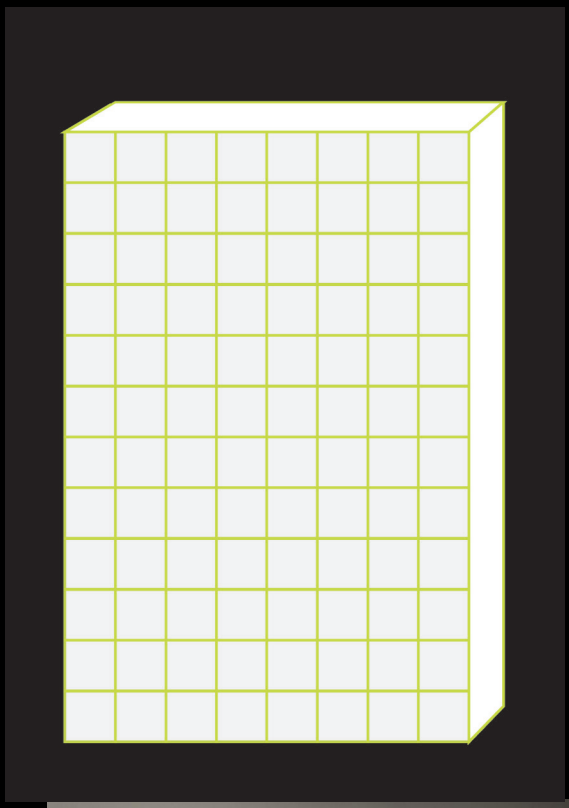
WOOD CANVAS

LASER CUT METAL CANVAS



WOOD CANVAS

LASER CUT METAL CANVAS



WOOD CANVAS

inviting opportunity for expression and identity in the right-of-way to incorporate a unifying forest aesthetic.

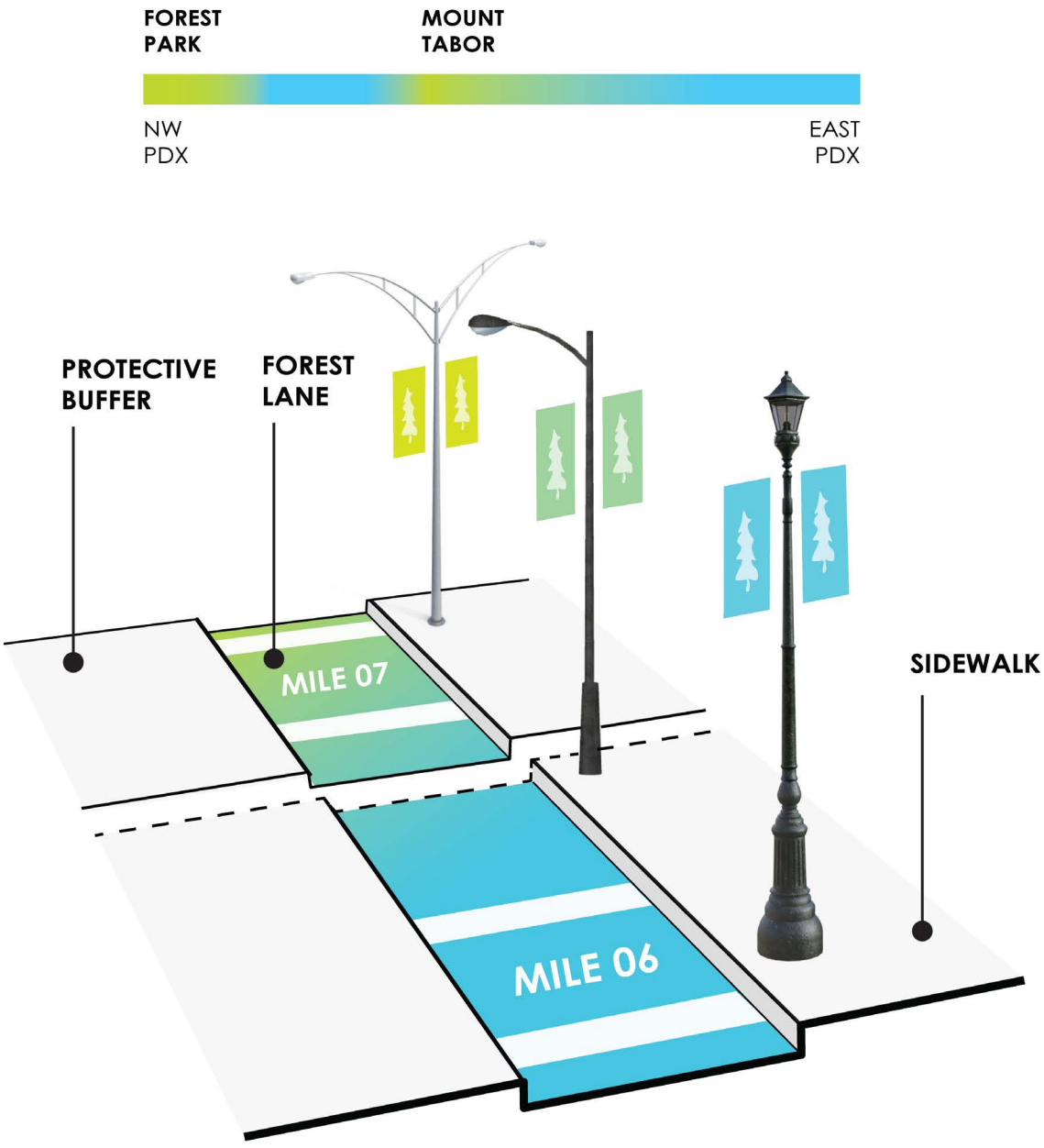
inspired by
Ursula Von Rydingsvard

artistic direction with the intent of only semi-prescriptive treatments to enable expressions of cohesion and difference.

Lane identity is conceived through wayfinding and tactical uses of art to slow traffic and increase pedestrian and micromobility safety while providing space for lane adjacent community expression. A color gradient is used as a metric to show proximity to Forested parks along the route. Paint marking the lane and street light banners transition from blue to green denoting proximity to Forest Park and Mount Tabor. As a pedestrian or micromobility user, the route shifts to green as users approach forest areas and fades to blue as users depart forest areas. Mile markers are layers upon the color gradients in lane and on street light banners as a wayfinding device. Mileage is oriented based upon Willamette River at mile zero, increasing as it moves East and West. Forest Lane's color gradient wayfinding is inspired by Claude Cormier + Associes' *18 Shades of Gay* which transformed a Montreal LGBTQI neighborhood through a chromatic ribbon of color spanning a district to create social and iconic spaces[72].

Lane Identity and safety are additionally, promoted through two-dimensional ground-plane art. Art has the capacity to instill placemaking and slow traffic, bringing awareness to a multiplicity of street users. Opportunities exist to convert parking to social space

LANE IDENTITY
orienting users to their proximity to forested parks



through this type of painting. In many urban cities, space previously dedicated to parking has been repurposed through pilot studies to understand level and type of use. In Brooklyn's Pearl Street Triangle, a corner lot was reimagined as a micro-park, planter boxes and movable seating were brought in and the area was painted a solid green for initial testing. After found successful, artist David Ellis was brought in to paint a mural. Differing more tactical and cost-reducing approaches can be used for initial testing such as colored duct tape to demark pedestrian or transit space to test design interventions. I imagine that these murals will expand into the street to calm traffic at crossings and high-stress intersections. Murals in intersections would utilize space unobstructed by car tires to reduce wear.

To create space in the right-of-way for a protected Forest Lane, parking is diverted to adjacent streets and space is reallocated to micromobility infrastructure. In a limited section of the route travel lanes are reduced when in excess of two two-directional lanes. Existing and proposed sections are diagrammed to show the reallocation of space from car-oriented to multi-modal.

"I don't think there is a better investment. If you want to build a better city you can start by building bike lanes".[73]

chapter five

discussion

When designing for vulnerable communities', often those previously displaced experience an ongoing threat of displacement. Policy can take on the role of mediating pressures of displacement. Equitable design must be accompanied by policy when dealing with inequity, to disrupt historic equality-based distributions of resources which perpetuate inequity.

The equitable belonging framework scopes then spatializes' amenities and vulnerable residents through the application of Targeted universalism for design and policy outcomes. Moving forward into design application, the targeted universalism framework should be employed to create policy that supports vulnerable residents remaining in place. This allows benefit from the urban growth to be absorbed by vulnerable residents. Returning to targeted universalism to reinforce design goals with policy extends project reach to equality. The accompaniment of policy acknowledges group differences to restructure society beyond inclusion.

Although I identify amenities to be low on the Eastside, these neighborhoods are not void of amenities. To reach a shared belonging, memory mapping techniques such as those created by scholar Katya Reyna are essential to understand, value and protect existent community spaces.[74] Co-creation frameworks are valuable to invite community participation. Community participation is the foundational underpinning to create landscapes with a shared belonging. Employing these techniques orients designers and planners to understand current community amenities, validate the data with the community to align common needs and interests.

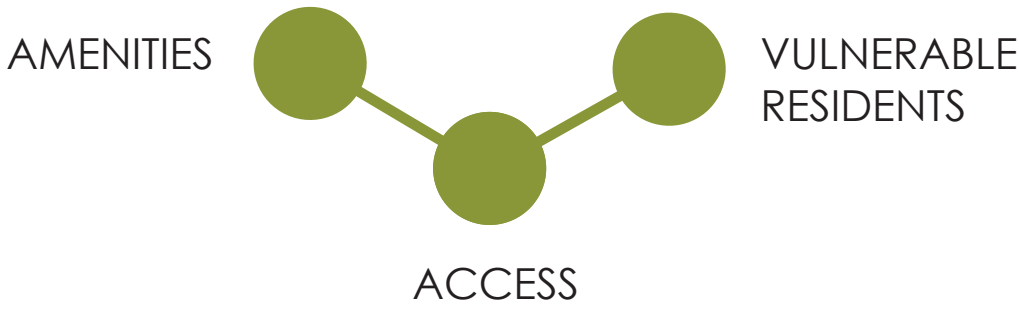
Further research is necessary to better understand the national and local policies affecting ridership outcomes of populations experiencing inequitably policing. Altering policies that overtly or covertly disincentivize resident use of micromobility due to a fear inequitable policing, has the potential to significantly alter who is using emergent transportation.

Micromobility parking is a continued design concern that will require further design iterations and research to understand the spatial right-of-way needs.

Equitable belonging framework has many applications beyond transportation, forested open space and income-based vulnerability. Each of the three components of the framework: amenities, access and,

FRAMEWORK APPLICABILITY

CLOSING INEQUITY



FORESTED OPEN SPACE

Forest Park

CLEAN WATER

CLEAN AIR

HEAT REFUGEE/RESILIENCE

FLOOD RESILIENCE

HEALTHY FOODS

HOSPITALS

SCHOOLS

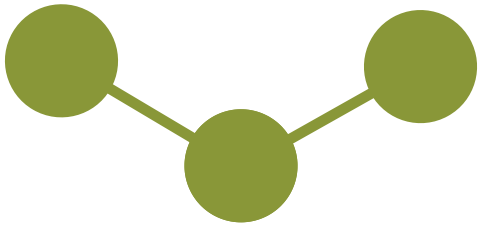
ARTS

HEALTH CARE

EARTHQUAKE RESILIENCE/REFUGE

CLOSING INEQUITY

AMENITIES



VULNERABLE RESIDENTS

ACCESS

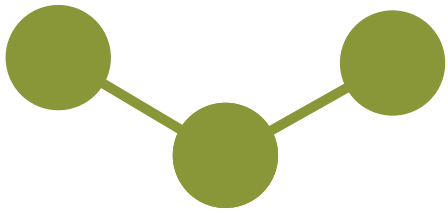
TRANSPORTATION

MICROMOBILITY

PLACE YOU LIVE OR WORK ITSELF

CLOSING INEQUITY

AMENITIES



ACCESS

VULNERABLE RESIDENTS

Low-income RESIDENTS OF COLOR

East PORTLAND RESIDENTS

SOCIAL + ECONOMICAL

- INCOME
- EDUCATION
- RACE

PHYSICALLY + MENTALLY IMPAIRED

- VISUAL
- NEUROLOGICAL
- POST-TRAUMATIC STRESS

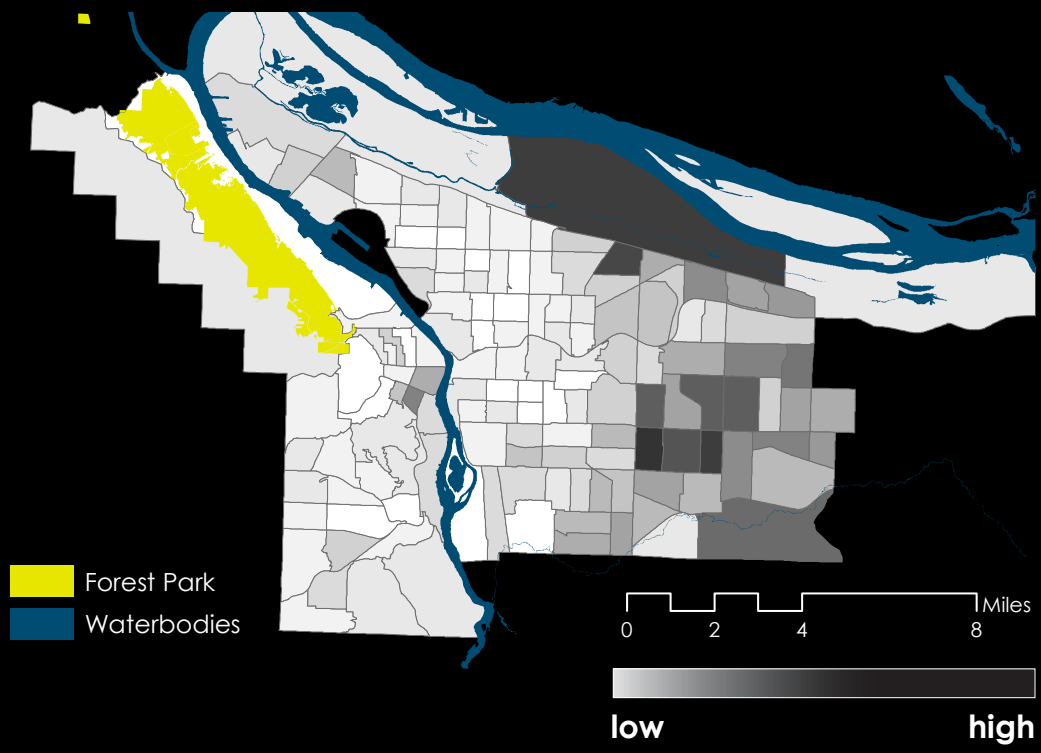
vulnerabilities have vast applicability to the diversity of inequities residents experience. For instance, amenities can be considered as access to a resource or climactic amenities such as access to clean water, air, schools, or earthquake resilience. Similarly, access can be viewed as transportation, or more broadly as the place you live or work. Vulnerabilities are typically reinforced by a complex contemporary and historic system of race, education and income based inequity. Vulnerabilities can be reframed to understand these inequities by targeting subsets of the population such as residents that experience physical or mental impairments. The flexibility of the shared belonging framework allows for communities to be targeted for strategic relief of inequities while in pursuit of universal goals that serve universal outcomes.

Policy, community outreach and design professional's collaboration is critical to reach goals of expanding access for the underserved. In addition, proactive low-income housing, home-ownership and age-in-place policies are required to mediate the potential for continued displacement. Portland's current trajectory is at risk of that of San Francisco where vulnerable communities have been almost entirely pushed out to adjacent cities and subdued to multi-hour commute

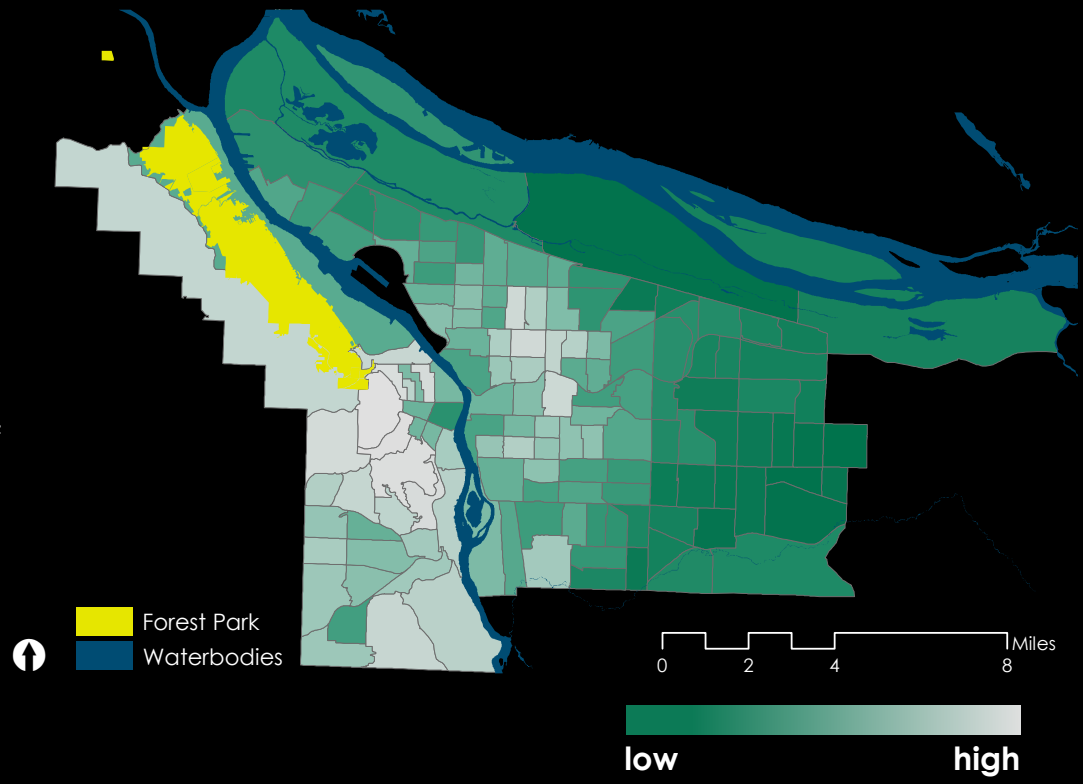
times. This project concentrates efforts to design a micro-modal transit route that serves vulnerable communities to belong and exist in Portland with access to Portland's beloved Forest Park.

appendix

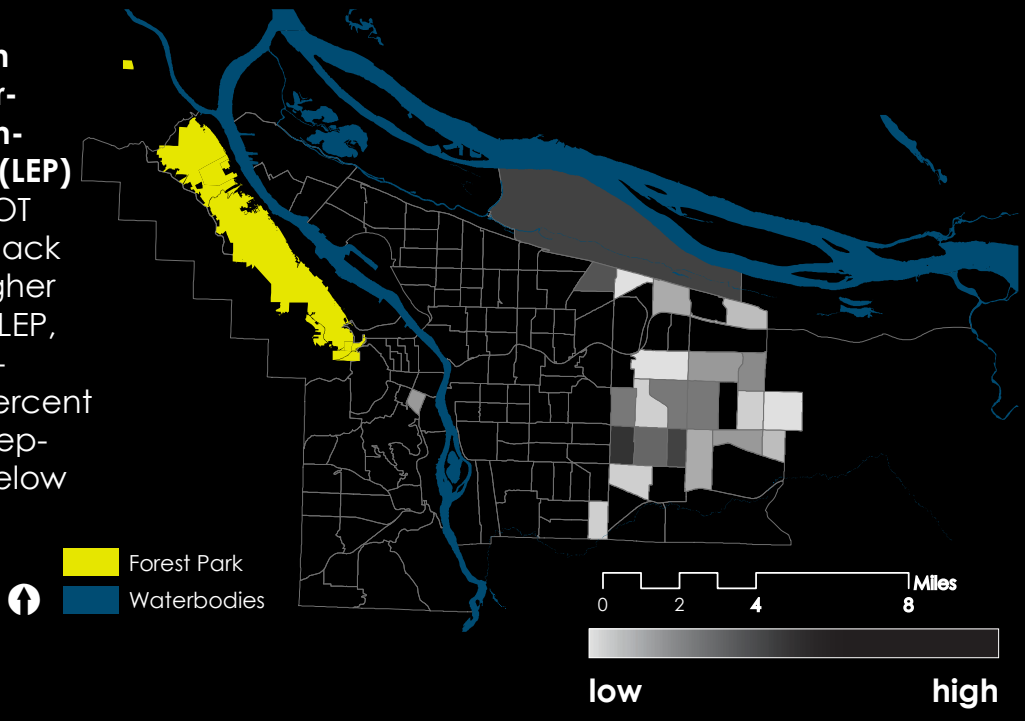
Percent people with a limited English language (LEP) proficiency, PBOT equity matrix. Black represents a high percentage of LEP, lighter gray represents lower percent LEP and white represents zero percent LEP.



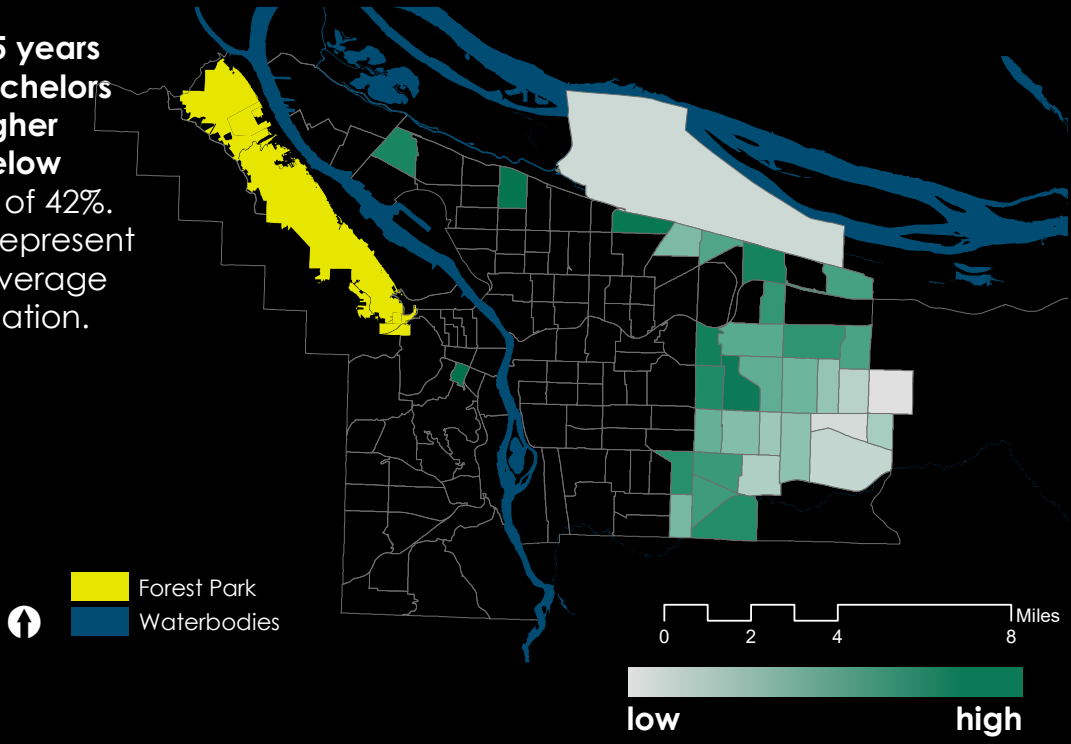
Percent population 25 years or older with Bachelors degree or higher, 2013-2017 5-year estimates American Community Survey. Dark green represents the lower levels of education lighter reen represents higher education levels.



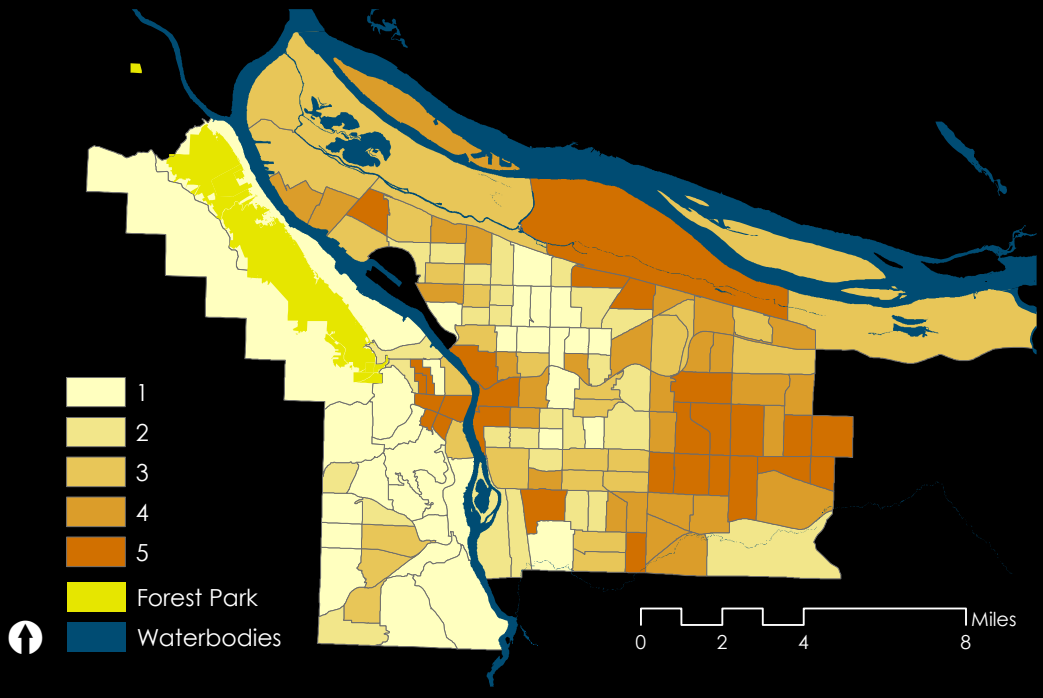
Populations with above city average a limited English language (LEP) proficiency, PBOT equity matrix. Black represents a higher percentage of LEP, lighter gray represents lower percent LEP and white represents tracts below average LEP.



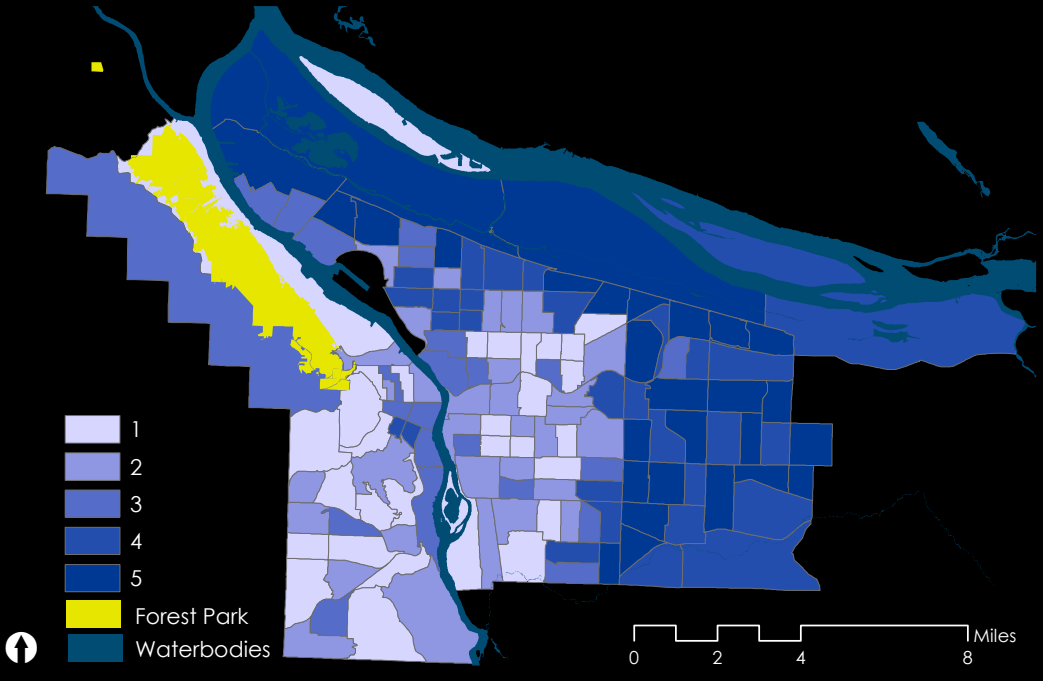
Population 25 years old with a bachelors degree or higher education below city average of 42%. White tracts represent above city average level of education.

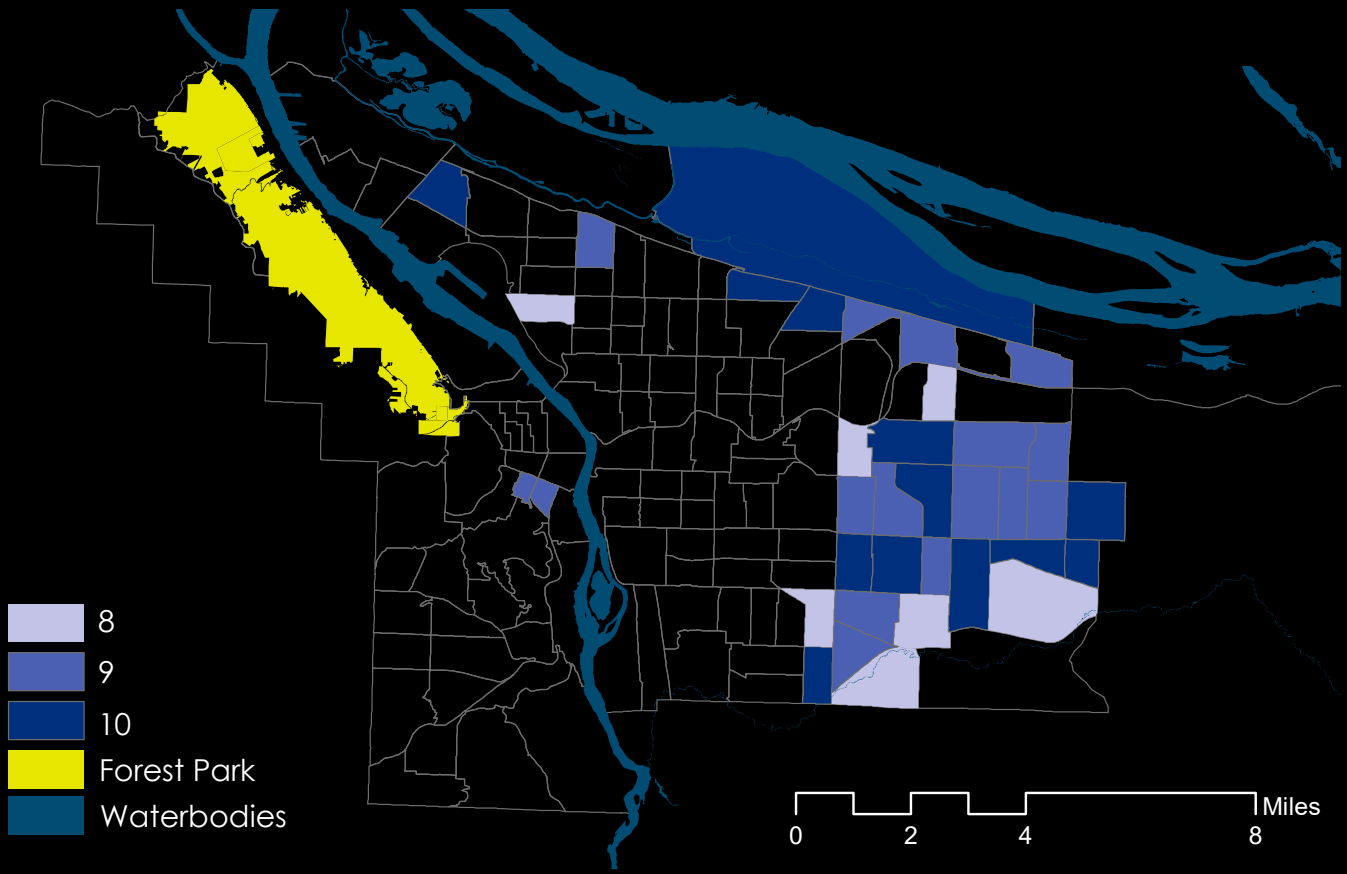


Median Household Income, 2013-2017 5-year estimates American Community Survey. Lighter yellow represents greater household income and a low vulnerability (1), darker yellow represents low household income, high vulnerability (5).



Percent population of color or Latino, PBOT equity matrix. Dark blue represents the higher percentage of people of color or Latino and a high vulnerability (5). lighter blue represents lower percent, a low vulnerability (1)





Census tracts with Heightened Vulnerability PBOT Income and Racial equity scores. Tracts are selected based upon an equity score of four or five in both income and race equity scores.

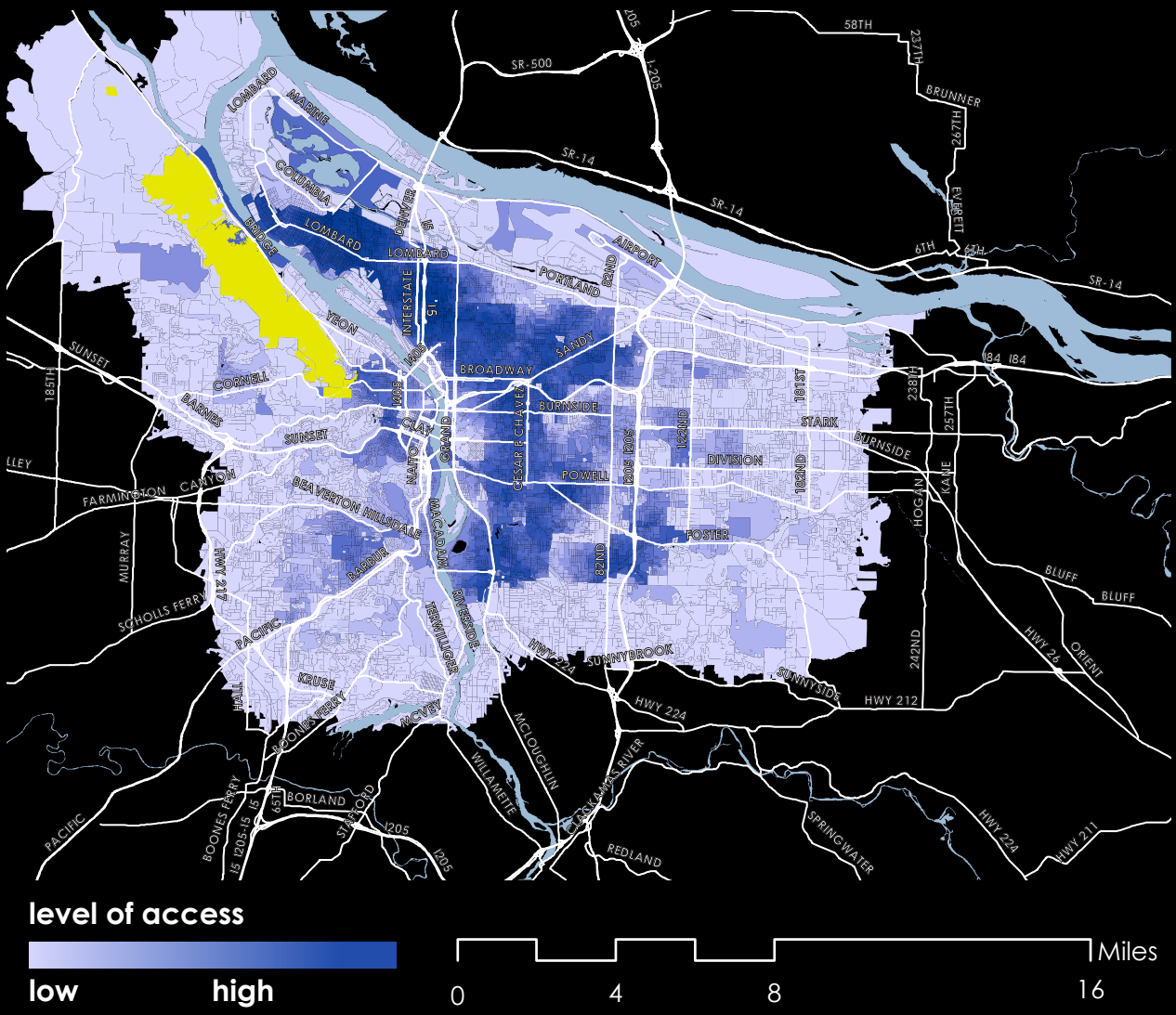
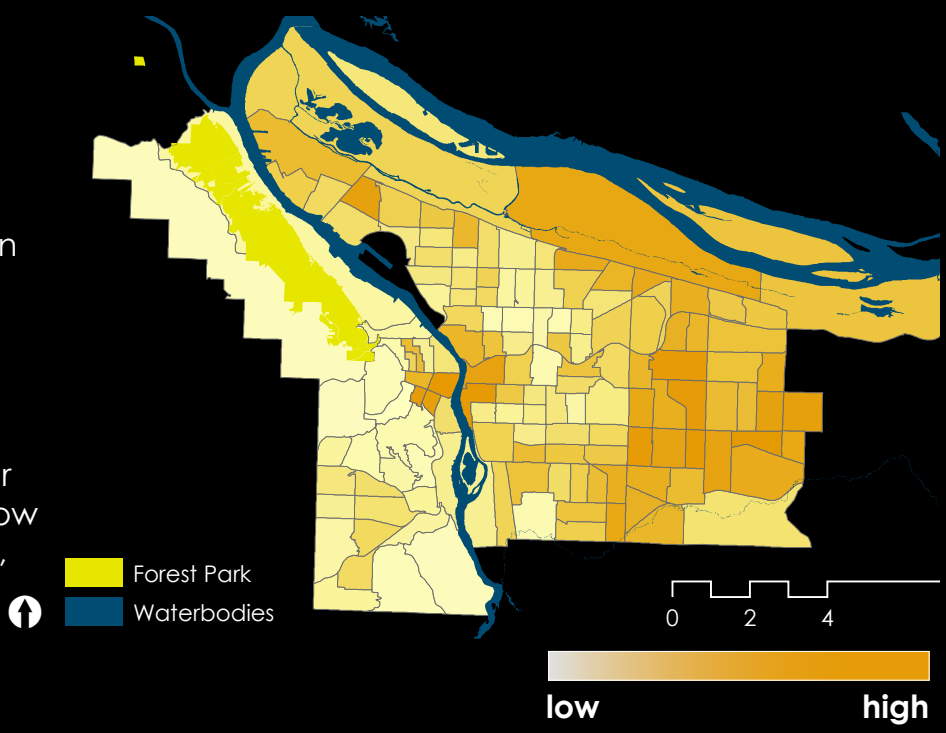
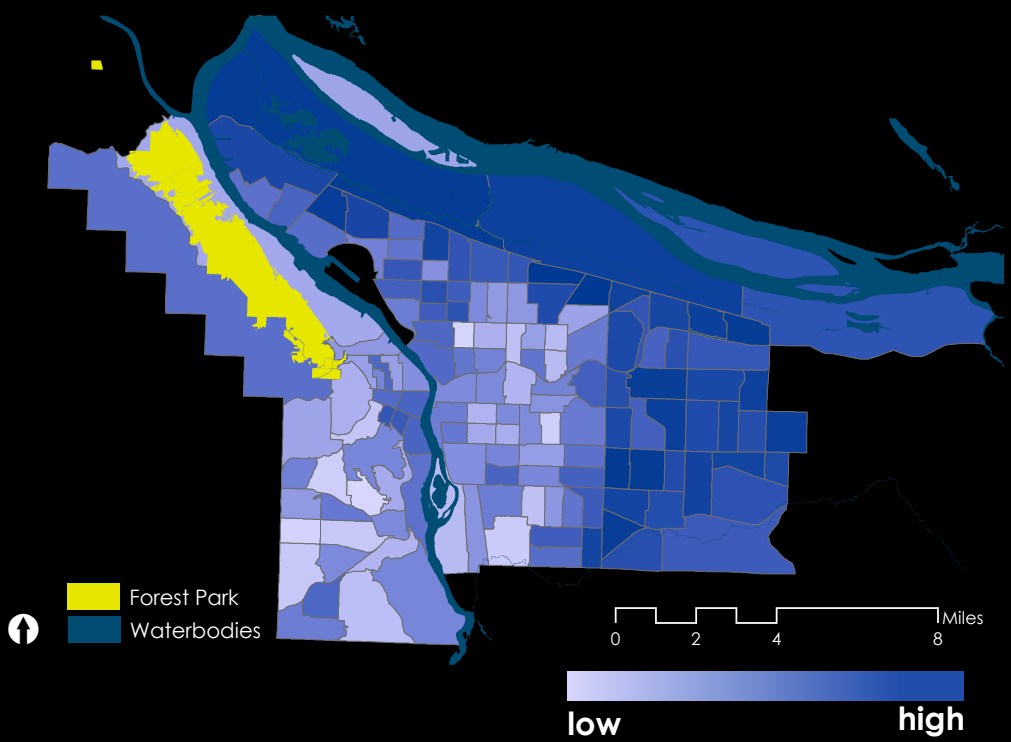


Figure X :
Overall Access to Amenities by Bike. Bike Network Analysis of Portland, Oregon. census block data aggregates amenities to create an overall score (1-100) for ease of bike access to amenity. light blue shows low level of access (a low score) and dark blue shows a high level of access (a high score).

Median Household Income, 2013-2017 5-year estimates American Community Survey. Lighter yellow represents greater household income and a low vulnerability, darker yellow represents low household income, high vulnerability.

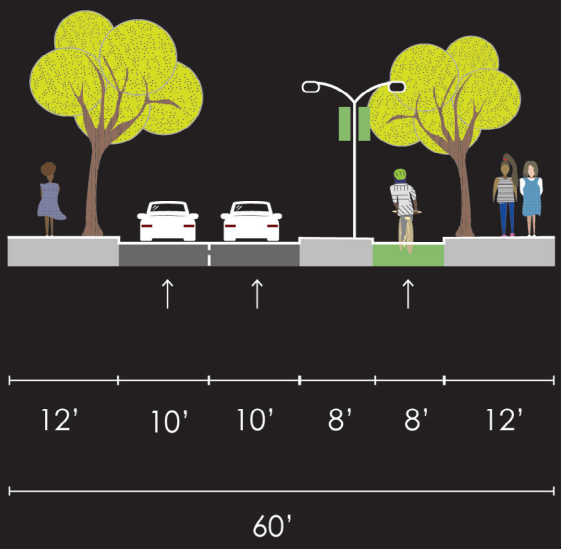


Percent population of color or Latino, PBOT equity matrix. Dark blue represents the higher percentage of people of color or Latino and a high vulnerability. lighter blue represents lower percent, a low vulnerability.

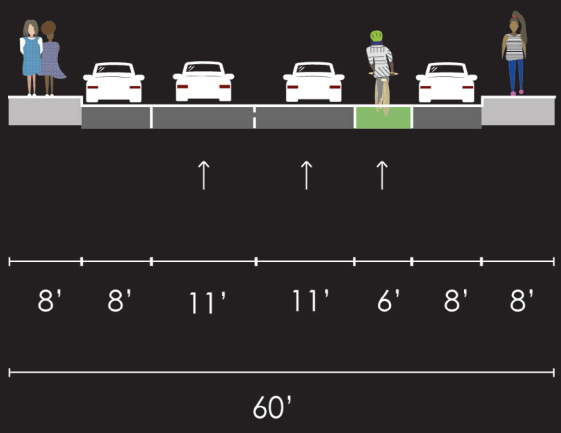


SE. 72ND STREET + STARK

proposed

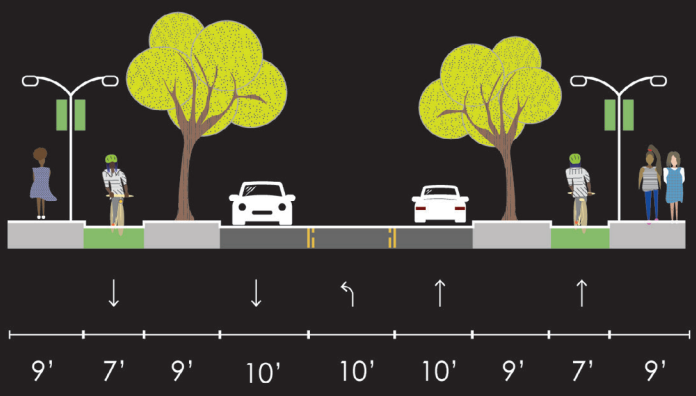


existing



SE. 162ND STREET + STARK

proposed

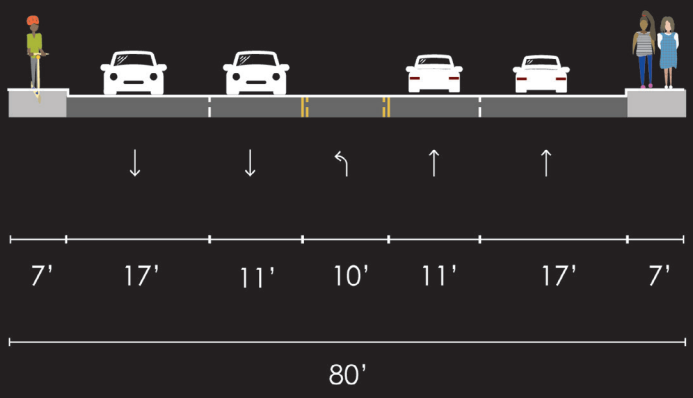


existing

SIDE WALK

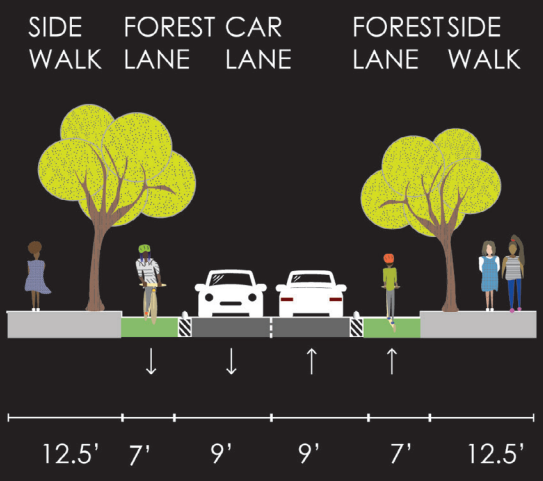
CAR LANE

SIDE WALK

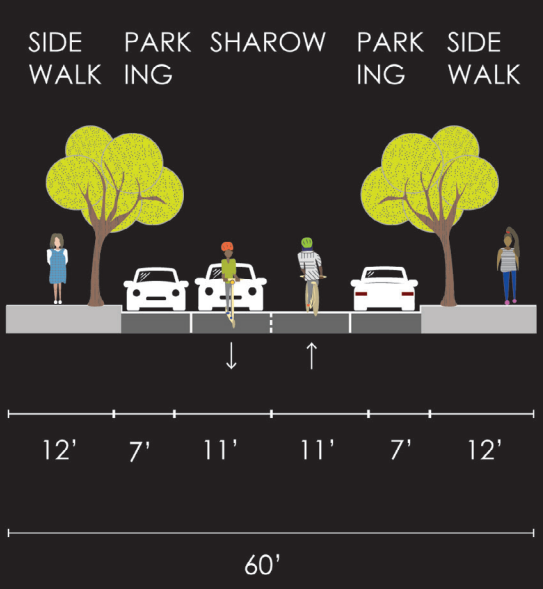


NW. JOHNSON STREET

proposed

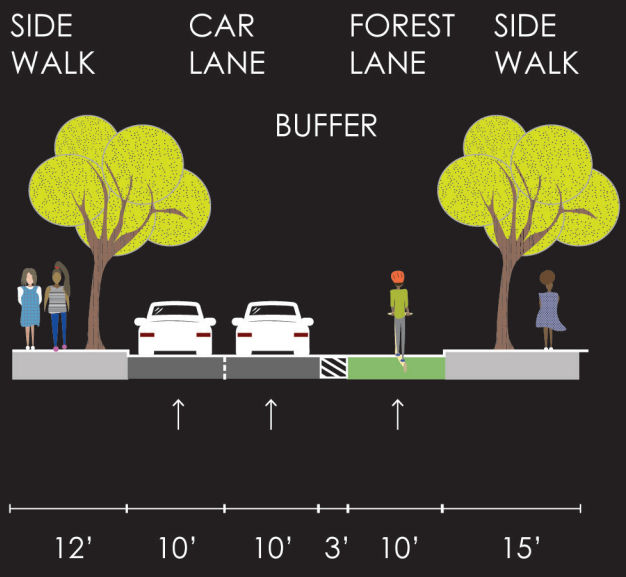


existing

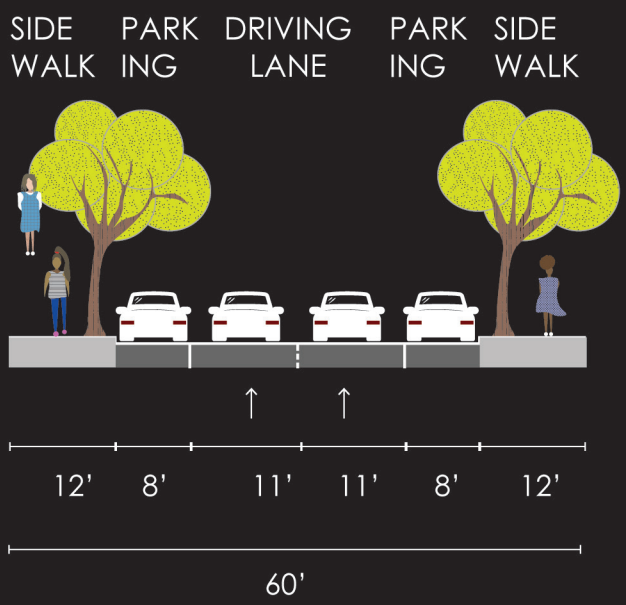


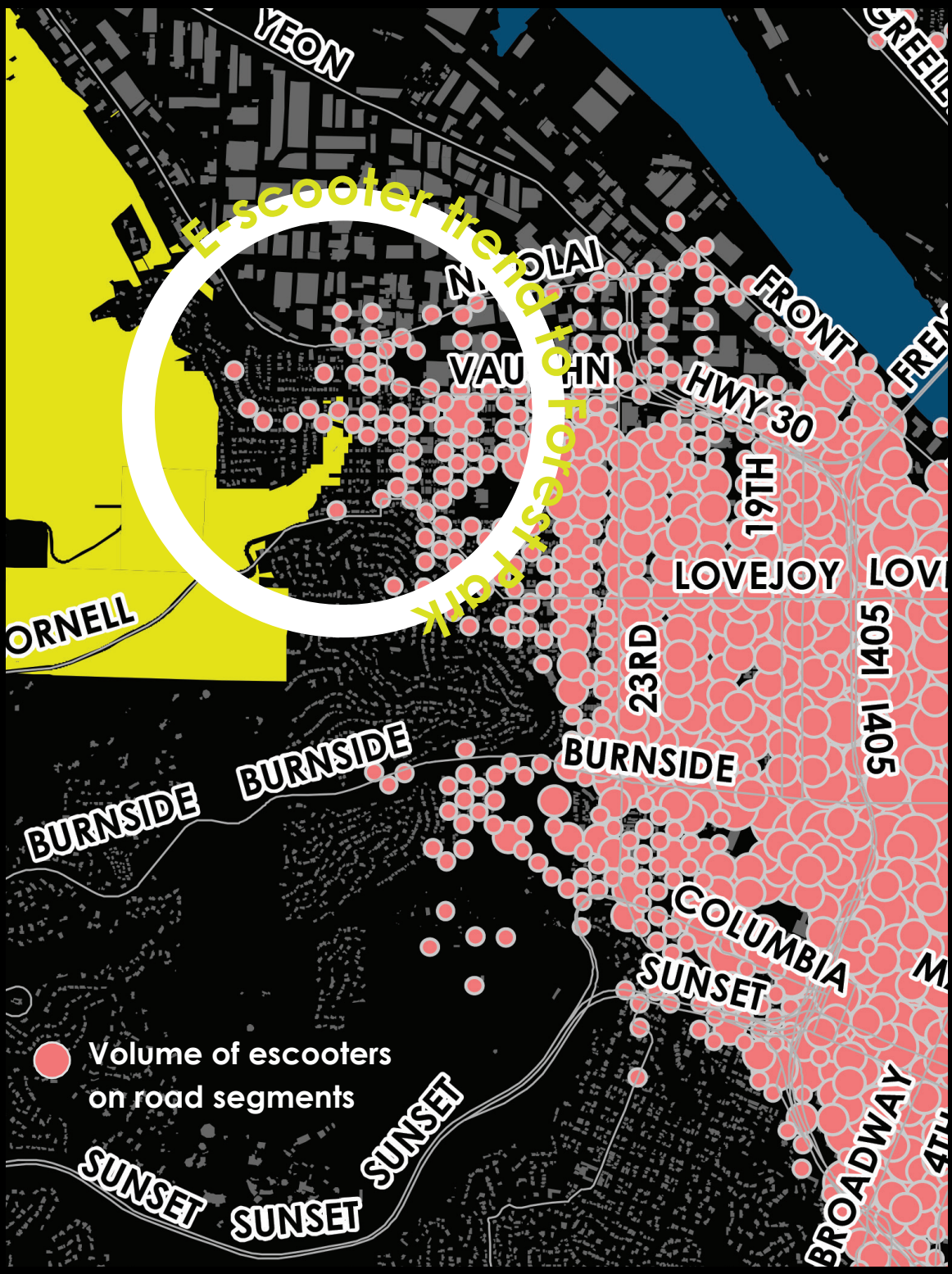
NW. PARK STREET
NORTH PARK BLOCKS

proposed

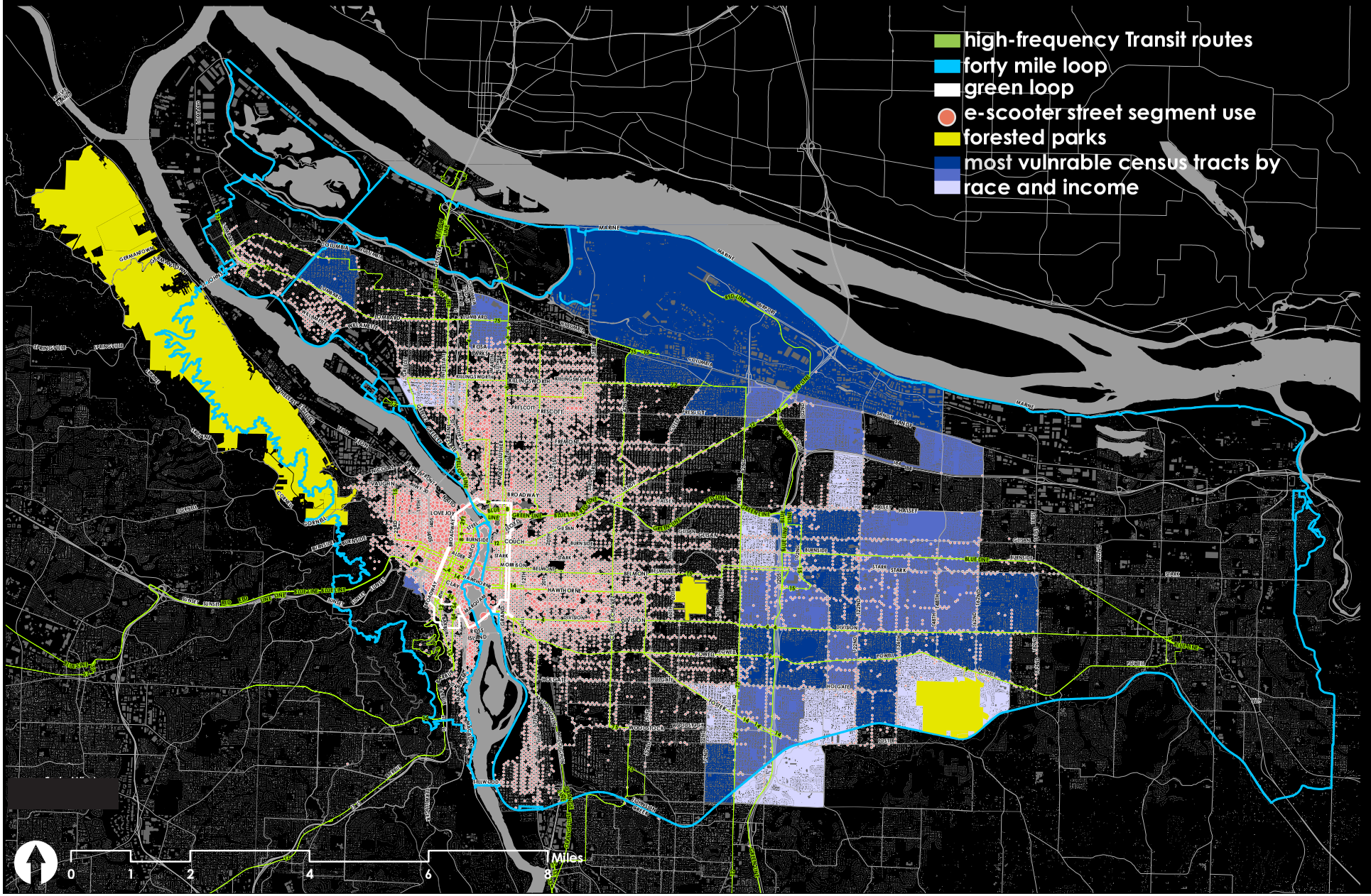


existing




E-scooter trend to forest park
YEON
FRONT
VAUGHN
HWY 30
19TH
LOVEJOY
23RD
I405
BURNSIDE
BURNSIDE
BURNSIDE
COLUMBIA
SUNSET
SUNSET
SUNSET
SUNSET
BROADWAY
ORNELL
Volume of escooters
on road segments

ROUTE SELECTION CRITERIA



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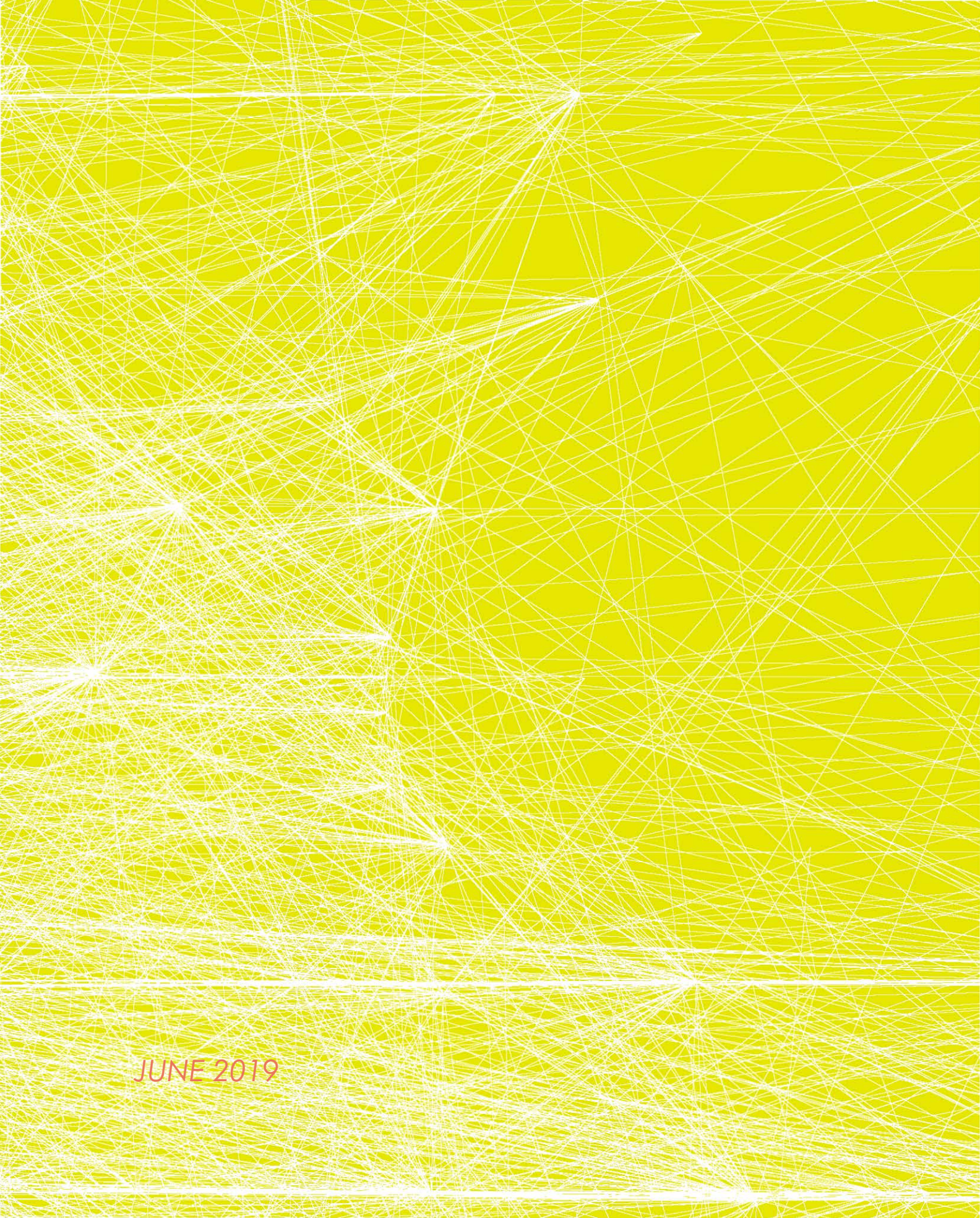
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