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Deconstructing Urban Actor Perspectives in the Making of the Just Green City Urban Greening as Contested Practice Between Displacement and Environmental and Climate Justice

Emilia Oscilowicz

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Deconstructing Urban Actor Perspectives in the Making of the Just Green City

Urban Greening as Contested Practice Between Displacement and Environmental and Climate Justice

Emilia Oscilowicz

Ph.D. Dissertation

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Note: U.S. spelling is used in this work.

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SUMMARY

This dissertation addresses the urgent need to examine the role of various urban actors – planners, developers, activists, and researchers – in shaping, contesting, and navigating the intersections of urban greening, displacement, and environmental and climate justice. As cities increasingly adopt sustainability and climate adaptation agendas, these plans have simultaneously contributed to patterns of inequity, displacement, and injustice, particularly around housing affordability. This dissertation critically investigates how these different actors perceive, reinforce, resist, and reimagine the pursuit of the 'just green city.'

I undertake this investigation in four parts. First, I use a mixed-methods approach , combining quantitative analysis and qualitative insights from developers working across mid-sized cities in North America and Europe, to examine how greening initiatives correlate with patterns of real estate development and gentrification. I offer new insights into the uneven impacts of greening across differing regulatory and housing market contexts. Second, I investigate the role of grassroots activists and community organizations in resisting green gentrification through community infrastructures, strengthening social, economic, and political capacities to contest displacement and exclusion. Third, I draw on interviews with municipal planners in five major North American cities to examine how public practitioners grapple with the contradictions between climate action and housing affordability, offering insights into emerging planning praxis. Fourth, I bridge these empirical findings into a commentary on practitioner-oriented policy recommendations that aim to marry housing and greening justice.

In sum, this dissertation explores how activists, developers, and planners grapple with green and climate gentrification within each of their realms of practice. Drawing from original empirical research, this dissertation identifies drivers, mechanisms, and constraints that determine how planners address climate action alongside housing affordability, and how activists mobilize community infrastructure to resist displacement and demand inclusive greening. Moreover, by examining developers' practices alongside development histories, this research demonstrates that green gentrification emerges as a negative outcome for residents in those cases where greening aligns with speculative real estate processes, thus highlighting the critical role of planning regulation and housing policy in shaping whether greening exacerbates or mitigates displacement. In total, this dissertation contributes to advancing urban environmental justice scholarship by emphasizing the relational dynamics of green

gentrification and proposing innovative planning pathways toward achieving housing and greening justice.

Keywords: urban greening; green gentrification; environmental justice; urban planning; urban actors.

RESUMEN

Esta tesis aborda la necesidad urgente de examinar el papel de diversos actores urbanos — planificadores, promotores inmobiliarios, activistas e investigadores— en la configuración, disputa y gestión de las intersecciones entre el reverdecimiento urbano, el desplazamiento y la justicia ambiental y climática. A medida que las ciudades adoptan cada vez más agendas de sostenibilidad y adaptación al cambio climático, estos planes han contribuido simultáneamente a generar patrones de inequidad, desplazamiento e injusticia, especialmente en lo que respecta a la asequibilidad de la vivienda. Esta investigación analiza críticamente cómo estos diferentes actores perciben, refuerzan, resisten y reimaginan la construcción de la "ciudad verde justa".

Desarrollo esta investigación en cuatro partes. Primero, utilizo un enfoque de métodos mixtos, que combina análisis cuantitativo e insights cualitativos de promotores inmobiliarios en ciudades medianas de América del Norte y Europa, para examinar cómo las iniciativas de reverdecimiento se relacionan con los patrones de desarrollo inmobiliario y gentrificación. Ofrezco nuevos hallazgos sobre los impactos desiguales del reverdecimiento según diferentes contextos regulatorios y de mercado de la vivienda. Segundo, investigo el papel de los activistas de base y las organizaciones comunitarias en la resistencia a la gentrificación verde mediante infraestructuras comunitarias que fortalecen capacidades sociales, económicas y políticas para disputar el desplazamiento y la exclusión. Tercero, analizo entrevistas con planificadores municipales en cinco ciudades norteamericanas para examinar cómo enfrentan las contradicciones entre la acción climática y la asequibilidad de la vivienda, ofreciendo aportaciones sobre nuevas formas emergentes de práctica urbanística. Cuarto, traduzco estos hallazgos empíricos en una reflexión sobre recomendaciones de políticas orientadas a profesionales que buscan unir justicia habitacional y justicia verde.

En suma, esta tesis examina cómo activistas, promotores inmobiliarios y planificadores afrontan la gentrificación verde y climática desde sus respectivos ámbitos de práctica. A partir de investigación empírica original, la tesis identifica los factores, mecanismos y limitaciones que determinan cómo los planificadores abordan la acción climática junto con la asequibilidad de la vivienda, así como las formas en que los activistas movilizan infraestructuras comunitarias para resistir el desplazamiento y exigir una planificación verde inclusiva. Asimismo, al analizar las prácticas de los promotores inmobiliarios en relación con las trayectorias históricas del desarrollo urbano, esta investigación demuestra que la gentrificación verde emerge como un resultado negativo para los residentes cuando las intervenciones

de reverdecimiento se alinean con procesos especulativos del mercado inmobiliario, poniendo de relieve el papel crítico de la regulación urbanística y la política de vivienda en la configuración de si el reverdecimiento intensifica o mitiga el desplazamiento. En conjunto, esta tesis contribuye al avance de la investigación en justicia ambiental urbana al enfatizar las dinámicas relacionales de la gentrificación verde y proponer vías innovadoras de planificación orientadas a lograr justicia habitacional y ambiental.

Palabras clave: reverdecimiento urbano; gentrificación verde; justicia ambiental; planificación urbana; actores urbanos.

RESUM

Aquesta tesi aborda la necessitat urgent d'examinar el paper de diversos actors urbans —planificadors, promotors immobiliaris, activistes i investigadors— en la configuració, la disputa i la gestió de les interseccions entre el reverdir urbà, el desplaçament i la justícia ambiental i climàtica. A mesura que les ciutats adopten cada cop més agendes de sostenibilitat i adaptació climàtica, aquests plans han contribuït simultàniament a generar patrons d'inequitat, desplaçament i injustícia, especialment pel que fa a l'accessibilitat a l'habitatge. Aquesta investigació analitza críticament com aquests diferents actors perceben, reforcen, resisteixen i reimaginen la construcció de la "ciutat verda justa".

Dividisc aquesta investigació en quatre parts. Primer, utilitzo un enfocament de mètodes mixtos que combina anàlisi quantitativa i perspectives qualitatives d'agents promotors en ciutats mitjanes d'Amèrica del Nord i Europa per examinar com les iniciatives de reverdir es correlacionen amb patrons de desenvolupament immobiliari i gentrificació. Aporto nous coneixements sobre els impactes desiguals del reverdir segons els contextos regulatoris i de mercat de l'habitatge. En segon lloc, investigo el paper dels activistes de base i de les organitzacions comunitàries en la resistència a la gentrificació verda mitjançant infraestructures comunitàries que reforcen les capacitats socials, econòmiques i polítiques per contestar el desplaçament i l'exclusió. En tercer lloc, analitzo entrevistes amb planificadors municipals de cinc ciutats nord-americanes per examinar com afronten les contradiccions entre l'acció climàtica i l'accessibilitat a l'habitatge, oferint noves perspectives sobre pràctiques de planificació emergents. Finalment, connecto aquests resultats empírics amb una reflexió sobre recomanacions de polítiques públiques dirigides a professionals que busquen unir justícia verda i justícia residencial.

En síntesi, aquesta tesi analitza com activistes, promotors immobiliaris i planificadors afronten la gentrificació verda i climàtica dins dels seus respectius àmbits de pràctica. A partir de recerca empírica original, la tesi identifica els factors, mecanismes i constriccions que determinen com els planificadors aborden l'acció climàtica en relació amb l'assequibilitat de l'habitatge, així com la manera en què els activistes mobilitzen infraestructures comunitàries per resistir el desplaçament i reclamar un verd urbà inclusiu. A més, mitjançant l'anàlisi de les pràctiques dels promotors immobiliaris conjuntament amb les trajectòries històriques del desenvolupament urbà, aquesta recerca demostra que la gentrificació verda emergeix com un resultat negatiu per als residents quan les intervencions de renaturalització s'alineen amb processos especulatius del mercat immobiliari, posant de manifest el paper clau de la

regulació urbanística i de la política d'habitatge a l'hora de determinar si el verd urbà intensifica o mitiga el desplaçament. En conjunt, aquesta tesi contribueix a l'avenç de la recerca en justícia ambiental urbana en destacar les dinàmiques relacionals de la gentrificació verda i proposar vies innovadores de planificació orientades a assolir la justícia habitacional i ambiental.

Paraules clau: reverdir urbà; gentrificació verda; justícia ambiental; planificació urbana; actors urbans.

GLOSSARY

Climate Adaptation and Resilience

Climate adaptation concerns policies, practices, and infrastructure that serve to minimize or counter the adverse effects of climate change on urban infrastructure, ecosystems, homes, and residents. Resilience refers to the capacity of communities and systems to anticipate, prepare for, and recover from climate-related disruptions while strengthening over time. Equitable resilience often involves transforming development pathways and addressing systemic inequalities to ensure that adaptation strategies are socially just and inclusive.

Climate Mitigation

Climate mitigation includes efforts to reduce or prevent the emission of greenhouse gases, aiming to limit the severity of future climate impacts. Strategies include transitioning to renewable energy, improving energy efficiency, developing low-carbon transport systems, and restoring ecosystems such as forests.

Climate Risk

Climate risk refers to the potential adverse outcomes posed by climate change to people, communities, economies, and ecosystems. These risks include acute events like wildfires and floods, and slower-onset phenomena such as sea-level rise and extreme heat, all of which can damage infrastructure, disrupt livelihoods, and displace communities.

Climate Urbanism

Climate urbanism is both an ideology and a set of practices that position cities as key agents in climate action. It promotes urban policies that reduce greenhouse gas emissions and climate risks while enhancing infrastructure, ecological function, and public health. Tools include green infrastructure, renewable energy, and public transit, framed within an agenda of climate justice and resilience.

Community Investment Fund

A Community Investment Fund (CIF) allows residents to pool small-dollar investments to collectively own and manage community-serving assets like local businesses or properties. CIFs foster neighborhood wealth-building and economic development, though they face challenges related to scalability, regulation, and institutional support.

Ecodistrict

An ecodistrict is an urban neighborhood planned and managed to achieve sustainability goals, such as reducing energy consumption, waste, and emissions through green buildings, renewable energy, efficient transportation, and local food systems. These districts often prioritize inclusive governance and equity alongside environmental goals.

Equity

Equity refers to the fair and just distribution of resources, opportunities, and benefits. In urban planning, equity also entails dismantling institutional barriers and power structures that exclude marginalized communities from meaningful participation and access to environmental and infrastructural improvements. It requires attention to distributive, procedural, and intergenerational justice.

Gentrification

Gentrification is the process by which historically disinvested urban neighborhoods—often home to working-class and racialized communities—undergo reinvestment and redevelopment that leads to rising property values, increased rents, and the in-migration of more affluent residents. This process often results in the displacement of existing residents and the transformation of neighborhood identity and culture. Variants of gentrification include *green gentrification*, where the installation of green infrastructure (e.g., parks, gardens, bike lanes) raises nearby property values; *environmental gentrification*, where broader sustainability initiatives or environmental clean-ups attract upscale development; and *climate gentrification*, where climate-resilient neighborhoods or lower-risk areas become desirable for investment and wealthier populations, pricing out lower-income groups. These forms reveal how well-intentioned urban sustainability efforts can reinforce inequality if equity is not centered in planning.

Green Buildings

Green buildings are designed, constructed, and operated to minimize environmental impacts while maximizing resource efficiency. They often include energy- and water-efficient technologies, sustainable materials, and design elements that improve air quality and occupant well-being.

Green Economy Hubs

Green economy hubs are urban districts or centers that promote sustainable industries and low-carbon jobs. They support the green transition through localized networks of businesses, nonprofits, and government-backed incentives, advancing climate adaptation and economic resilience.

Green Infrastructure and Green Spaces

These refer to systems and features—both natural and constructed—that provide ecological, social, and economic benefits in cities. Examples include rain gardens, urban forests, green roofs, and permeable surfaces. They support stormwater management, improve air quality, reduce urban heat, and enhance public health and biodiversity.

Green Technologies

Green technologies include innovative systems and tools designed to improve sustainability and reduce ecological footprints in urban environments. These range from energy-efficient building systems and smart grids to electric transit and advanced recycling solutions.

Green Transition

The green transition involves shifting from fossil-fuel dependent systems to low-carbon, sustainable alternatives. In cities, this includes promoting renewable energy, public transportation, circular economies, and decarbonizing the built environment.

Poly-crisis

A poly-crisis is a convergence of multiple, interconnected crises—such as climate change, housing unaffordability, health emergencies, and inequality—that amplify each other. It challenges traditional siloed planning approaches and demands integrated, cross-sectoral strategies.

Renoviction

Renoviction describes the displacement of tenants due to real or purported property renovations. Landlords may use upgrades as a justification to evict current tenants, increase rents, or attract higher-income occupants. Renovictions can also occur indirectly, as upgrades raise housing costs beyond what existing tenants can afford.

Social Vulnerability

Social vulnerability reflects the extent to which individuals or groups are unable to withstand and recover from disruptions, whether from climate change, economic shocks, or social exclusion. It is

shaped by factors such as poverty, housing insecurity, limited access to resources, discrimination, and lack of political power.

Urban Green Justice

Urban green justice emphasizes fair access to the benefits of green infrastructure and climate action, especially for historically marginalized communities. It seeks to address uneven environmental burdens and prevent new forms of exclusion resulting from sustainability-focused development.

Urban Greening

Urban greening is the process of integrating green infrastructure—such as trees, parks, gardens, and vegetated roofs—into urban areas. In some definitions, it also includes low-carbon infrastructure (e.g., bike lanes, solar energy) that contributes to climate mitigation while improving quality of life and environmental health.

Vulnerability

Vulnerability describes the degree to which people, systems, or places are exposed to and unable to cope with external stressors, such as climate change, economic instability, or health crises. It reflects a mix of physical, social, and economic conditions that shape resilience capacity.

CHAPTER I. INTRODUCTION

1. Background and motivation

"If the language of decolonization, justice, and equity is stripped of its political urgency and reduced to rhetorical performance, then what is the purpose of critical inquiry? Do we wait for the 'moment' to pass to 'sharpen our pens'?"
Oboud Kamal

Global challenges today are deeply interconnected, with one often exacerbating another in ways that produce compounded and more severe impacts than if each were experienced in isolation (Lawrence et al. 2024). From 2023 to 2024, Europe experienced a 43.6% increase in homelessness, with much of that increase being from children who are refugees from war-torn countries (Horvat and Coupechoux 2024). During that same time, Europe was the fastest warming continent, creating increased severity of storms, floods and heatwaves that made meeting the needs of houseless individuals more challenging (Copernicus Climate Change Service (C3S) 2025). Meanwhile, in the United States, the devastating wildfires of 2025 in Los Angeles, California leveled thousands of homes across economic spectrums in an area already struggling to address housing shortages, raising urgent questions about equitable recovery in the aftermath of climate disasters. In Canada, rising housing insecurity and homelessness reflect an ongoing affordability crisis, exacerbated by soaring rents and the economic strain on lower-income families (Coletto 2024). Especially in western Canada, these issues are exacerbated by ongoing climate-related wildfires and floods (Gillett et al. 2022; Daniels et al. 2025). Amidst a backdrop of deepening nationalized authoritarian and populist tendencies in the 2020s, who is equipped to respond, and what would it mean to plan toward justice amid intersecting and unevenly experienced crises?

As I write this, in the United States the second Trump Administration (2025) has instituted a prohibition on the utilization of terms such as 'justice,' 'equity,' and 'DEI' (Diversity, Equity, and Inclusion) in any documentation affiliated with federal activities (Miller and Rabin 2025). Moreover, the administration has also systematically eliminated all environmental justice offices and programs within the Environmental Protection Agency (EPA) (Friedman 2025) and undone President Bill Clinton's landmark 1994 Executive Order 12898 upholding environmental justice principles. Many of my colleagues working at the intersection of climate change and social inequalities (and beyond) across

the United States have lost their careers, their livelihoods, the trajectories of their passions. This is, ultimately, a blow to those individuals dedicated to the realization of justice and equity. The communities with which I have directly engaged in my work now face uncertainty regarding the continuation of funding for their crucial missions, including efforts ranging from policy advocacy for air quality justice to the support of initiatives like permanently affordable community land trust housing. Although this extreme stripping of climate and equity action is taking place in the US, European governments are also increasingly turning right, from Italy to Sweden or Austria – demonstrating a form of policy transfer that is deeply challenging for efforts to push toward a more just and sustainable world.

Meanwhile, in response to national climate denial and regressive policies, municipal governments are increasingly called upon to leverage their authority in championing justice – a "mission" that they had already been entrusted with when efforts advancing climate action and climate justice in the 2000s saw them as the most nimble actors in this area. It seems that the notion that the municipal and community levels hold the greatest potential for real transformative change has only grown in saliency. Indeed, local municipal leadership and civic engagement have realized victories of progressive planning and activism, making it evident that they can continue to pave the way forward. Challenging political moments provide planners and communities an opportunity to clearly articulate and prioritize what matters most to them: their housing, their work, and their environment. Progressive planning and grassroots movements underscore the profound impact that localized actions and policies can have on shaping sustainable and equitable futures – whether in synergy, in complement to one another, or in a form of productive resistance.

Yet, urban planning – the very practice by which the urban world is made and systematized through order and logic – always cuts in two directions simultaneously. It bears the potential to undo the wrongs of past urban development (Perdicoúlis 2010) and has historically perpetuated and systemically sustained injustice (Marcuse et al. 2009; Marcuse 1986; Fainstein 2010; Campbell, Tait, and Watkins 2014; Harvey 2007). It is a practice that, in part, derives its hope from increased understanding of the ways it is complicit in the trajectory of injustice as it comprises economic policy, land use decisions, and resource allocation (Sweet and Harper-Anderson 2023). In fact, for some, planning practice is a vehicle of slow violence, one that encompasses "delayed destruction that has dispersed across time and space, and additional violence that is not typically viewed as violence at all" (Nixon 2011). Still, as federal governments increasingly embrace authoritarian policies (Sarah and Slipowitz 2022), the

potential for progressive and radical change in urban planning at the municipal level grows more necessary each day, presenting as what seems the only tangible opportunity for transformative, equitable, and just change that addresses the slow violence of the past.

In recent years, progressive urban planning has increasingly centered on climate justice and environmental sustainability, with green infrastructure as a key component. For example, the Anacostia Building Bridges Across the River project in Washington, D.C. seeks to bridge social and economic inequality by creating equitable green spaces and improving connectivity between historically marginalized communities and waterfront areas once isolated due to economic disinvestment and racial segregation (Anguelovski, Ranganathan, and Hyra 2021; Ranganathan and Bratman 2021). Meanwhile, the Living Cully initiative in Portland, Oregon is a community-led initiative in Portland's Cully neighborhood that focuses on fostering a sustainable, resilient community while addressing housing affordability, climate resilience, and environmental health concerns. It highlights efforts to address both historical inequities and contemporary urban challenges (Enelow and Hesselgrave 2015). In Europe, the ZAC (Zone d'Aménagement Concerté or Coordinated Development Zone) zoning tool in Nantes, France serves as an example of a progressive form of planning that integrates access to green infrastructure for all residents with a focus on the simultaneous inclusion of at least 56% of affordable social housing, according the local regulations from the Nantes Metropole, the main metropolitan governance agency for Nantes (Baró and Anguelovski 2021). These initiatives exemplify how green climate planning can not only create opportunities for affordable housing but also foster restorative and distributive justice by addressing historical inequities.

While these progressive planning efforts are critical in addressing green divides, wherein urban greening becomes a tool for exacerbating social inequities, they also underscore the complexities of balancing environmental sustainability with social equity. Where planners attempt to right the wrongs of segregated, divided, and unequal greening, they face ongoing challenges from forces that are not easily controlled that redirect those interventions toward compounding negative effects through greening. This has been demonstrated in cases of green gentrification, where green investments lead or contribute to the displacement of low-income and minority communities (Immergluck and Balan 2018; Harris et al. 2020; Anguelovski et al. 2022). Thus, as cities strive to green urban spaces, particularly those that have been historically disinvested, careful attention must be given to preventing the emergence of new inequalities.

This dissertation aims to project the perspectives and narratives of the main actors involved in the current effort to push toward the just green city, despite the complicated forces shaping outcomes. It is clear there is a nexus of action and communication amongst a greatest set of stakeholders focused on the urban realm. Yet, it is also abundantly clear that there appear to be differences in practice and gaps in perspectives amongst these groups. Tensions and trade-offs also exist between addressing historical green divides and re-naturing cities, on the one hand, and mitigating the creation of new inequalities, on the other. In response to this complex and shifting environment, I ask:

1. What role is played by urban greening in the perceptions and strategies of real estate developers? When greening predicts development, what are the broader ramifications for housing rights and affordability?
2. How do activists adapt and respond to environmental, economic, and social changes in their communities and navigate existing tensions and trade-offs?
3. What challenges are planners facing in coordinating climate action and housing in the current era of poly-crisis, and how are they responding through integrated planning approaches?
4. What specific policies and tools can urban practitioners employ to implement anti-displacement measures and inclusive greening measures? How can these strategies promote equitable, sustainable, and healthy urban environments through community-engaged planning practices?

In the remainder of this introductory chapter, I first lay out the theoretical and conceptual foundations on which my novel empirical contributions are built. I focus here on tracing previous literature that critically examines the dilemmas and contradictions of urban planning, from racial justice to environmental justice. I then analyze where the nexus of these injustices has emerged within housing, climate action, and economic development planning. I finally turn to a description of research gaps, objectives, and the overarching research design rooted in four empirical studies that are presented in Chapters II, III, and IV, and V.

2. Conceptual framework and theoretical approach

"Race is a ubiquitous reality that must be acknowledged if planners do not want to simply be the facilitators of social exclusion and economic isolation."

Robert Mier (1994, p. 236)

2.1. Urban planning as a historic mechanism for injustice

As a formal discipline, urban planning and policy maintains its origins in the colonization desires of European imperialist powers. In this context, planning was used to organize and control space for both economic resource exploitation and the proliferation of cultural ideologies, including religious doctrines (Njoh 2010). As European powers expanded their territories to include what are now known as the United States and Canada, they forcibly applied Eurocentric planning practice to the colonizing landscapes, naming the existing Indigenous governance as primitive and antithetical to development (Sandercock 2004). In Canada, this dynamic frequently manifested in the systematic oppression of First Nations and Metis communities, whose lands were coercively ceded to European colonizers and whose territories were reconfigured according to settler colonialist principles resulting in both cultural disenfranchisement and land theft (Tomiak 2017).

In the United States, urban planning has become both a legacy tool and reminder of slavery and plantations, as it produced the very land parcels designated for systematic forced labor and genocide (Raciti 2024). In planning's initial incarnations in the American context, zoning and planning law was used as an overt attempt to segregate and systematically prohibit equal opportunity and access to land (Rothstein 2017). Such mechanisms of undisguised oppression promoted and enacted by planners, developers, realtors, lenders, and guarantors alike included racial segregation ordinances and racially restrictive deed covenants, which prohibited Black individuals from purchasing in or living in predominantly white neighborhoods. These mechanisms also enabled more covert practices like blockbusting, the practice of fearmongering white homeowners to sell their homes at exorbitantly low prices by suggesting imminent minority influx, then turning and selling the property at inflated prices to the minority purchasers (2017). Still more subtle and covert practices emerged after the 1917 Supreme Court decision in *Buchanan v. Warley* which declared municipally mandated racial zoning unconstitutional, thereby pushing discriminatory practices into the private sector (Ely 1998). This shift was further compounded by the 1926 *Corrigan v. Buckley* case, where the Supreme Court upheld the constitutionality of private covenants which enabled communities to self-segregate without direct state

intervention (Welsh 2018; Rothstein 2017). With the prohibition of openly discriminatory zoning law, planning practice shifted toward normalizing white-resident owned single-family housing through an implicit assumption that lower-income, minority populations could not afford the high costs associated with such land parcels. In essence, "[single-family zoning] let prices discriminate when laws could not" (Manville, Monkkonen, and Lens 2020).

Urban renewal is a historical planning strategy used in both the United States and Europe which targeted inner-city, predominantly lower-income and minority neighborhoods and marketed to policymakers as a tool for revitalizing economically stagnant or deteriorating urban areas (Zipp 2013); yet, urban renewal instead has perpetuated segregation, displacement, and poor public health supports (Lopez 2009; Hyra 2012, 201; 2017). Urban renewal practices were justified at the federal, state, and municipal levels by the belief that elimination of poor and minority neighborhood slums would improve overall urban living conditions and inner-city property values; instead, these practices resulted in the demolition of affordable housing, the violent displacement of residents, and the reshaping of neighborhoods in ways that prioritized economic and transportation interests over social equity (Gotham, n.d.; Mickle 1962).

In Europe, exclusionary planning practices have deep historical roots, dating back to the mid-19th century when large-scale urban transformations, such as slum clearances and the construction of grand boulevards, monumental buildings, and affluent districts, reshaped cities in ways that privileged the elite while displacing working-class and poor communities (Wagenaar 1992). Such projects are often best illustrated by Haussmann's redesign of Paris (Paccoud 2023) or Cerdà's Eixample plan in Barcelona (Castrillo Romón and Pérez-Eguíluz 2023). Haussman's plans in particular cleared dense, working-class areas to make way for broad avenues, parks, and elite housing, often under the pretense of sanitation and beautification. These interventions institutionalized a planning logic that prioritized control, spectacle, and economic power over equity and inclusion.

Later in Spain, Francisco Franco's dictatorship (1939 – 1975) entrenched this same legacy in the urban built form, where many cities and neighborhoods were left in extreme disrepair and neglect (Saurí and and Domene 2009). Marketed as an attempt to revitalize these blighted areas, and more broadly redefine the international appeal of the city in a post-fascism era, the first democratic mayoral teams assumed new plans for urban renewal through the conceptualization and enaction of the Barcelona Model (Anguelovski et al. 2018). This narrative of regeneration supported by and co-designed with civic groups was advertised to benefit low-income and vulnerable populations, but also accomplished

large-scale infrastructure implementations that attracted and benefited the middle classes (Degen and García 2012). The Barcelona Model was advanced through the municipality-driven PERIs (Special Plans of Interior Reform) tools. In this model, often violent demolitions and slum removals (or *esponjamientos*) of undesirable – mostly lower-income and immigrant community – neighborhood blocks in the historic center of the city took place (Arbaci and Tapada-Berteli 2012).

Newer manifestations of exclusionary planning continued into the democratic era of Spain, where, in the 1990s, the Poblenou neighborhood of Barcelona was the target of redevelopment of the once industrial and working-class neighborhood into a transformed, luxury and white-collar residential and commercial area (Honey-Rosés 2022). Significant public criticism of the project emerged as the municipality was accused of integrating limited citizen input and promoting development for investment and financialization, resulting in limited social benefit (Kotsila et al. 2021). Today, significant gentrification, in both late and more recent stages of the process, are continuing to impact long term residents as new, wealthy, often expat residents are seeking housing and remote workspaces in the post-industrial neighborhood (Oscilowicz et al. 2020)

In sum, cases such as those in Paris or Barcelona show how government-led interventions in Europe, both historic and ongoing, have widened socio-spatial divides, priced out long-term residents, and created cities of exclusion and privilege. Such visibilized and invisibilized exclusionary, racist, segregated, and discriminatory practices continue to have consequences for minority, working-class, and lower-income residents today in the Global North. The foundational principles of control, exclusion, and exploitation have perpetuated cycles of disadvantage and environmental injustice that disproportionately affect marginalized communities (Grove et al. 2018; Harris et al. 2020). Urban planning and its policies are a constant reminder of colonial artifacts and the "afterlife of slavery" (Hartman 2016) and the exclusionary and segregated principles by which cities were so long shaped in the Global North as the legacy of these zoning and local laws remain visible in the built urban form and throughout urban environments. This dissertation draws from this foundational historic context to place attention on how the making of the just city must be cognizant of these discriminatory practices, and especially of not re-creating them.

2.2. Urban planning and environmental injustice

Just as the afterlife of slavery is embodied in past and present land use policy, so too is this trauma embodied in the planning for access to environmental amenities and climate action. In the United

States, the environmental justice movement of the 1980s largely emerged as a response to the disproportionate continued siting of toxic industrial sites in minority, lower-income neighborhoods (Chavis and Lee 1987). Over the last four decades, an abundance of environmental justice literature has further demonstrated that lower-income and minority residents continue to live in neighborhoods where zoning and land use laws disproportionately hold "the burden of noxious land uses and pathogenic infrastructure", those being fast food restaurants and few grocery stores with fresh foods (S. Wilson, Hutson, and Mujahid 2008), higher number of contaminated industries and waste sites (Chavis and Lee 1987), and low-quality, small, and undermaintained green spaces (Klompmaker et al. 2023). Moreover, research has demonstrated that low-income, minority, and vulnerable groups have reduced access to green space, often in the form of fewer green spaces within a reasonable distance to home, or green spaces that are poorly maintained, culturally unresponsive, or perceived as unsafe, thereby limiting their usability and benefits (Klompmaker et al. 2023; Hindman, Chien, and Pollack 2020; Cohen-Cline, Turkheimer, and Duncan 2015). Researchers have simultaneously demonstrated there to be little evidence of "minority move-in", wherein minorities are moving to lower-valued areas where these toxic land uses have been established (Saha and Mohai 2005). This siting inequity continues to have long-term effects on population health, including increased rates of asthma, cancer, obesity, diabetes, and cardiovascular disease (Northridge et al. 2003; Alvarez 2023).

Most recently, researchers of climate change and urban planning practice have demonstrated that lower-income and minority communities are disproportionately impacted by climate change in part due to the unjust planning practice and zoning laws that have only entrapped these communities in cycles of poverty, exclusion, and climate risk (Shi et al. 2016; Connolly and Anguelovski 2021). One such environmental harm experienced by minority and low-income neighborhoods includes heat as a severe and deadly climate risk as a result of a disproportionate lack of environmental amenities, such as parks and trees, in minority and low-income neighborhoods thus contributing to prevalence of deadly urban heat island effect (UHI) (Jung 2023; Rigolon 2016). UHI is a phenomenon where areas of intense development, industrialization, and lack of green space contribute to extreme, life-threatening heat (Saverino et al. 2021). These areas in cities have been demonstrated to significantly correlate with historic practices of redlining, wherein loans for home purchases were excluded in areas with high concentrations of minorities (Hoffman, Shandas, and Pendleton 2020). As global climate change progresses, the UHI effect is both elongating and intensifying the ways in which low-income and minority communities are suffering higher than average mortality rates (Braun et al. 2024).

Redlining is another historically harmful planning practice utilized in the United States that has had directly impact to environmental injustice. The practice of redlining purposely segregated racial minorities to low environmental quality neighborhoods and has been linked with underinvestment in resources and infrastructure, increased environmental exposure to contamination and lower access to environmental resources (healthy and affordable food, quality parks, efficient public transit), and most recently with greater exposure to climate change impacts (Cashin 2021; Dillon 2014; Grove et al. 2018; Morello-Frosch and Lopez 2006). For example, redlined neighborhoods, such as in Baltimore, Dallas, Kansas City, or Phoenix, face greater air and land contamination, higher land temperatures (B. Wilson 2020), higher areas of impervious surfaces, poor access to green space, and a lower tree canopy (Chow, Chuang, and Gober 2012), and more low-quality, poorly insulated buildings (Mitchell and Chakraborty 2015) in comparison with non-redlined areas. Redlined neighborhoods tend to show significantly lower measures of greenspace and are on average 2.6°C warmer than their invested counterparts (Nardone, Rudolph, Morello-Frosch, & Casey, 2021). United States neighborhoods with the highest percentages of LatinX and Black residents, like those in Los Angeles, New York City, Chicago or the Boston Metro, are also consistently associated with higher urban biophysical disadvantages (e.g. impervious surfaces, low or "maladaptive" greening with little cooling effect) and social risks (e.g. working-class residents) with acute climate and health impacts and inequalities (Walker, Keeler, and Derickson 2024). Some of these neighborhoods, especially when situated on higher grounds, more protected from climate impacts, and/or receiving resilience investments, are also the first ones to be gentrified (Keenan et al. 2018). Explicitly acknowledging such power structures and their production of compounding disadvantages is necessary in identifying a modality for planning practice which can address such socioeconomic and environmental inequalities (Jackson et al. 2023; Agyeman 2013; Zapata and Bates 2015).

In sum, this dissertation recognizes and engages the overt and covert planning practices that have led to many of the atrocities that minority and low-income people exist within. This dissertation acknowledges this planning history, and now looks to contemporary attempts of planning practice to engage with environmental and climate harms, while also responding to critical views of green climate action, such as the discourse on modern sustainability fixes, wherein green infrastructure and other climate resilient infrastructure, touted as a means to improve quality of urban life while addressing climate needs end up serving instead as tools for capital accumulation that only distribute those benefits to a narrow slice of the population (Neidig et al. 2022; Shokry, Connolly, and Anguelovski 2020; Shokry, Anguelovski, and Connolly 2023).

2.3. Just climate urbanism or continued environmental and climate (in)justice?

Urban greening and sustainable infrastructure are one of the fast-growing strategies implemented in planning as a means to reduce the environmental impacts of urbanization (Du and Zhang 2020) at the same time as responding to the climate emergency. Urban greening involves the integration or (re)development of green or blue spaces, urban forest or other vegetation, nature-based sustainability and climate solutions, or green infrastructure (Escobedo et al. 2019; Marques, Alvim, and Schroeder 2022). These initiatives provide broad benefits for individual health and wellbeing (Triguero-Mas et al. 2015), ecological functioning (Veerkamp et al. 2021), economic growth (Łaszkiewicz 2023), and civil society (Fisher, Svendsen, and Connolly 2015). Climate change experts including the Intergovernmental Panel on Climate Change recognize the population benefits and environmental services of urban greening and urban green spaces, calling for standardization and prioritization of both in planning practice as critical adaptation and mitigation tools in the context of climate change (Ali et al. 2022). Moreover, planners commonly recognize that urban greening and urban green spaces do serve as an actual low-cost, win-win solution to climate vulnerability and environmental degradation while supporting a community's sense of place and improving livability (Meerow, Pajouhesh, and Miller 2019; Cole et al. 2019). In short, as extreme weather and climate-change related disasters become more frequent, urban greening and the ecosystem benefits it provides are important tools for planners to support urban climate resiliency (Cheng et al. 2017; Cohen et al. 2021; Gill et al. 2007; Trainor et al. 2009).

While greening is much needed in communities that have long been deprived of the sociocultural, individual, and public health and wellbeing benefits, research has also demonstrated that the benefits of urban greening may not always extend to historically marginalized groups. In this context, while many municipalities have launched greening programs in underserved or 'environmental justice' neighborhoods (Nobles and and Moore 2024; Rigolon 2016), many of these programs are simply not addressing the deeper historic inequities that resulted in the uneven distribution to begin with. Further, as municipalities are offering such redress programs, many receiving communities face a systematic experience of municipal undergreening, or "the systematic reluctance of municipalities to incorporate and provide greenspace in communities of color" (Rivera and and Hendricks 2022). Continued inequities are further imposed as underserved communities and neighborhoods have been demonstrated to receive less funding for green infrastructure and improvements in comparison to

their wealthier, whiter counterparts (Heckert and Rosan 2016; Park and Kang 2024; Hendricks and Van Zandt 2021).

In fact, urban greening may be a harbinger of urban green injustices (Anguelovski et al. 2020). Studies have demonstrated the prevalence of processes known as environmental, ecological, or green gentrification whereby original residents are displaced as their neighborhoods become more desirable due to new green amenities (Blok 2020; Dooling 2009; Keenan, Hill, and Gumber 2018; Anguelovski 2016). We define gentrification as "a process in which the influx of capital transforms a neighborhood socially, economically, culturally, physically, and demographically", which can then expel low-income and socially marginalized residents from these neighborhoods (Helen V.S. Cole et al. 2020, p. 2). Green gentrification has also been demonstrated to result in a widening of rent gaps and property value increases thus initiating or exacerbating existing economic disparities and resulting housing affordability issues for working- and middle-class residents (Safransky 2014; Black and Richards 2020). Moreover, harmful impact to physical and mental health has been documented through a loss of home, reduced or terminated access to green space, inadequate provision of public amenities, as well as increase of crime, among other deleterious effects (Cole, Mehdipanah, et al. 2021; Jelks, Jennings, and Rigolon 2021; Triguero-Mas et al. 2021; Wolch, Byrne, and Newell 2014). Green gentrification is further compounded by race and class, producing a highly volatile riskscape for lower-income, racialized, and minority residents (Cole, Anguelovski, et al. 2021; Rigolon and Németh 2021; Shokry 2021). This process, in turn, further perpetuates a legacy of exclusionary dynamics of whiteness in greened neighborhoods (Angelo, 2021; Connolly, 2019; Connolly & Anguelovski, 2021).

Climate gentrification is an emerging lens of investigation within the green gentrification and urban green inequalities discourse. This phenomenon has been referred to as the process by which climate impacts and adaptation are contributing to differences in property value, thus reinforcing pathways of economic, social, and physical upgrading (Best and Jouzi 2022; Keenan, Hill, and Gumber 2018). Many of the very neighborhoods most in need of climate adaptation and mitigation interventions are the very same neighborhoods for which urban regeneration projects are targeted, thus imposing new, or extending existing, inequities (Planas-Carbonell et al. 2023; Shokry, Connolly, and Anguelovski 2020; Arbaci and Tapada-Berteli 2012; Dillon 2014). Seminal authors in this literature, Keenan, Hill, and Gumber (2018) initially focused their investigation towards the superior investment pathway of climate gentrification that relate to real-estate financial losses and project losses due to sea level rise and subsequent flooding in Miami. Since then, the literature has grown to include discussions of how

'resilience investments', those implementations that are intended to protect communities from the impacts of climate change, are the very investments that also lead to increases in property values and gentrification processes (Shokry, Connolly, and Anguelovski 2020). Climate gentrification continues as a growing sub-field in the gentrification literature as its wider implications (Connolly 2025) and specific climate-disaster event gentrification processes are continuing to be explored (Greenberg et al. 2024; Lambrou, Kolden, and Loukaitou-Sideris 2025).

With gentrification as a significant challenge faced by planners, it is clear that the supposed universal benefits of greening are often not realized for all residents. This discrepancy arises because urban planning frequently relies on a multi-discourse global narrative (Neidig et al. 2022) and a green orthodoxy (Connolly 2019), which tend to overlook the underlying power dynamics that shape these initiatives. This discourse framed around 'green is good' is tied to the adoption of a perspective where greening is a neutral and normative practice, one that can do no harm (Angelo 2021). However, large-scale, city-wide technocratic greening and climate action plans, delivered through a climate urbanism agenda, have been connected to profit-driven sentiments amongst urban planners and public policymakers (Gould and Lewis 2016; Long and Rice 2019; Garcia-Lamarca et al. 2021). In these contexts, distinct neoliberal and glitzy glamor agendas have been posited as urbanity's last chance for achieving sustainability or avoiding the dire consequences of climate disaster (Anguelovski and Connolly 2021; Kotsila et al. 2020). This has been further demonstrated in tactics of green washing, climate-friendly branding, and an urban green grabbing and growth machine which aims to attract local and global investments at the expense of community place-making, equity, and maintaining the ability to stay in place (Garcia-Lamarca et al. 2021; García-Lamarca et al. 2022; García-Lamarca and Ullström 2020).

Some critical environmental scholars are now raising flags that point to the emerging injustices produced by the recent planning goals related to climate action, mitigation, adaption, and resilience (Shokry, Anguelovski, and Connolly 2023). These scholars highlight how traditional planning approaches that generated inequitable land uses in the past, often repackaged under the guise of modern climate initiatives, continue to reproduce and amplify social and racial inequalities in urban environments. In some contexts, greening and climate adaptive implementations may be an expansive tool of both "racial banishment" (Roy 2017) and settler colonialism (Porter, Hurst, and Grandinetti 2020; Lewartowska et al. 2024). This legacy of inequity and oppression stems from the same discriminatory housing and race-based land use policies as those that led to the location of low-income,

racial/ethnic minorities in undesirable areas near landfills, highways, or industrial sites while simultaneously positioning high profile urban green spaces in whiter, higher-income neighborhoods (Anguelovski et al. 2021; Anguelovski and Connolly 2021; Klompmaker et al. 2023).

An instrument by which climate urbanism is often implemented is that of the Climate Action Plan (CAP), a guiding policy document that manages the ecological drivers and impacts of climate change at a municipal level and emphasizes pragmatic solutions to climate change through policy (Bassett and Shandas 2010; Stone, Vargo, and Habeeb 2012). CAPs have also drawn equity critiques, highlighting their role in their technocratic approach to greening, the exacerbation of the suburbanization of poverty, and the globalized assemblage of finance (Long and Rice 2019). As Angelo et al. (2022) point out, "equity-oriented CAPs more often 'missed the housing for the trees,' by focusing on aesthetically green, quality of life-oriented solutions such as trees and open space, while policies better suited to addressing local inequities such as housing or transit (and that also reduce emissions) appeared less often and were less well-developed" (1426).

This body of research on the injustices of urban greening and climate action, entwined with the racial injustices it is rooted in, demonstrates the powerful intended and unintended consequences of planning for urban greening, sustainability, and climate action. This dissertation will build upon this expansive literature to better understand the nuance of perspectives and strategies amongst the different urban actors engaged in the making of the just, green city.

2.4. Identifying key actors in the just green city: interactions, influences, and factors shaping perceptions and decisions related to urban greening

This dissertation is specifically focused on the diversity and combination of actors that play a critical role in the decision-making and implementation of climate and greening projects that can contribute to or negate injustices. These actors encompass a wide spectrum of interests and expertise while engaged in the decision making and implementation of such projects. Urban planners, community and non-profit activist groups who mobilize with and on behalf of local residents, and developers are all actors within urban processes (Wagner et al. 2019) – albeit with different levels of power and influence over the production of the green and just city.

Research on actors working in pursuit of the just green city in the context of green gentrification has started to provide evidence on their discourses, strategies, and alliances. Early researchers of green gentrification focus their investigation on the residents and communities that were impacted, harmed,

and/or vulnerable to green gentrification (Checker 2011; Dooling 2009; Gould and Lewis 2016; Curran and Hamilton 2012). Further research on residents and community groups has attempted to identify some of the tactical developments within grassroots mobilizations for just and sustainable neighborhoods (Anguelovski 2015; Derickson, Klein, and Keeler 2021; Pearsall and Anguelovski 2016, 201). Yet, few have focused on the practical discourse of green gentrification within these civic groups (Lewartowska et al. 2024; Matheney et al. 2024). Research on developers themselves, a more difficult group of actors to study and be in contact with, has focused on understanding the motivations for undertaking green development in urban spaces (García-Lamarca et al. 2022; Boanada-Fuchs and Boanada Fuchs 2022; Garboden and Jang-Trettien 2020; Willis et al. 2024; Chiu 2024). Other scholars have concentrated on exploring how planners and practitioners address the escalating demands of their communities in planning for urban sustainability and green/climate implementations (Lamb, Shi, and Spicer 2023; Won and Seto 2025; Quinton et al. 2024), however few have sought clarity on the planners' perspectives towards the intertwined climate, housing, and economic crisis.

As growing research increasingly reveals, developers themselves perceive new real estate investments around green sites as anchors for financial benefits, acting as "green grabbers" of rent and value, particularly so in gentrifying neighborhoods (García-Lamarca et al. 2022). Yet, broader city-wide and quantitative trends regarding whether residential real estate investment follows greening remain underexplored. Regardless of whether green gentrification trends and related social injustices occur (i.e. whether greening predicts gentrification) (Anguelovski et al. 2022; Cucca, Friesenecker, and Thaler 2023), analyzing investors' development practices can offer a new understanding of the extent to which greening operates as a conscious or unconscious strategy for attracting real estate, and, thus, of the implications greening has for housing rights, affordability, and justice. Investigations of real estate developers as actors have focused on the financialization of greening and developer's perspectives towards greening as a tool for real estate development (Galecka-Drozda et al. 2021; Garcia-Lamarca et al. 2021; García-Lamarca et al. 2022). This focus on the financialization of greening and developers' perspectives underscores the need for urban planners to implement tools that promote positive, equity-driven policies. As outlined in the final chapter of this dissertation, moving towards radical, transformative planning is imperative in positioning transformative policy as the next frontier for urban planners in crafting more just and equitable cities.

3. Research question, objectives, and research design

In this dissertation, I analyze the discourses, strategies, and actions of the many stakeholders integrated in housing and greening and whose work shapes the pursuit of and challenges to the just green city. In general, I ask:

> How do developers, activists, and planners form perceptions, strategies, and decisions within the urban climate and housing nexus, and how do those perceptions, strategies, and decisions shape urban green (in)justice?

This overarching research question is further inspired by several gaps in existing literature, as reviewed in Chapter I. This research fills gaps in existing literature where siloed perspectives have largely been studied, contributing a multi-specialty and differentiated understanding of urban actors' perspectives. These gaps are: how grassroots activists make calls for the integration of housing with greening and sustainability; how real estate development may impact green gentrification processes and vice versa; in what ways urban planners strategize in managing climate, housing, and economic challenges; and, finally, what might be effective anti-displacement and inclusive greening measures for urban practitioners.

Based on this main research question and the literature review provided in the previous section, I crafted four distinct sub-objectives and questions to guide my research:

> **Objective 1:** What role is played by urban greening in the perceptions and strategies of real estate developers? When greening predicts development, what are the broader ramifications for housing rights and affordability? (Chapter II). An investigation of broader city-wide and quantitative trends of whether residential real estate investment follows greening remains underexplored.
>
> **Objective 2:** How do grassroots activists organize to simultaneously address housing and greening and how do they operate to achieve justice in greening neighborhoods? (Chapter III). While prior research has explored tactical developments within grassroots mobilizations for just and sustainable neighborhoods, few researchers have investigated how these civic groups engage in organizational discourse as related to green gentrification.
>
> **Objective 3:** What are the challenges that planners face in regard to climate, housing, and economic development in the 2024 era of poly-crisis? Responding to these challenges, how are planners coordinating climate, housing, and economic action? How has their action recently

evolved, under which constraints and with which opportunities for a more just climate urbanism and housing practice? (Chapter IV). Such questions can provide insight to underexplored perspectives of planners towards the intertwined climate, housing, and economic crisis.

Objective 4: What specific policies and tools can urban practitioners employ to implement anti-displacement measures and inclusive greening measures? How can these strategies promote equitable, sustainable, and healthy urban environments through community-engaged planning practices? (Chapter V). Further research is needed to understand the tools and policies at planners' disposal to address the intersection of just, affordable housing and equitable, inclusive greening.

I explore each of these four questions through comparative qualitative and quantitative analyses of cities based in the United States, Canada, and Europe. This research on green and climate gentrification addresses an ongoing and urgent issue of policy and environmental/social justice. By examining the perceptions of planners, developers, and residents, this study takes a holistic approach to examining the dynamics of perspectives amongst the major stakeholders within the green gentrification process.

3.1. Research design

I use a mixed-methods research design to interrogate the perceptions, tactics, and considerations assumed by planners, developers, and residents in the context of green and climate gentrification, aiming to uncover the complex interplay of stakeholder interests and impacts on urban equity and sustainability. I focus on a multiplicity of cities and geographical contexts in order to explore differing governmental and contextual symptoms of the processes of green and climate gentrification and the planning, civic, and private actors involved. Furthermore, I extend this analysis to also include differing scalar and time units of analysis.

Each of the chapters of this dissertation draws from a focused analysis of data gathered for a substantial research initiative funded by the European Research Council, known as GreenLULUs, in which I took part as researcher. This parent project investigated the social, economic, and racial implications of neighborhood redevelopment via direct fieldwork across 24 mid-sized cities and quantitative analysis across 28 mid-sized cities in Canada, the United States, and Western Europe, each with populations ranging from 500,000 to 1.5 million. These cities were chosen for their diverse urban development trajectories, such as industrial, post-industrial, and varying economic growth patterns,

and featured different types of gentrification. Before city and site selection, a review of gray literature, media reports, and real estate and demographic changes, was performed. In addition, insights from local experts supported the selection of one or two neighborhoods in each of the 24 cities where field work was later conducted by partner researchers within the GreenLULUs parent project to examine green gentrification processes. My role in this parent project centered on thematically coding and analyzing these existing interview transcripts based on the research questions presented here in this dissertation.

The quantitative portion of this dissertation (Chapter II) draws from the GreenLULUs comprehensive dataset that examined new construction data across 26 cities, removing two cities (Lyon and Dublin) as development data was not publicly available. This quantitative analysis further aimed to examine the spatial dynamics of greening and development, utilizing a 400-meter buffer around greenspaces to estimate their impact on nearby residential development, which reflects a practical, walkable distance for urban residents. This methodological approach, coupled with Bayesian models to refine the relationship between greening and development, allowed for a nuanced understanding of the spatial and social dynamics at play. We sourced the dataset's information from public records such as land registries, taxation, and construction permits. My role in this quantitative research was particularly focused on interpreting the quantitative analysis within the broader context of qualitative insights that were gathered by research partners within the GreenLULUs parent project team. Again, I performed thematic coding and subsequent analysis of existing interview transcripts, thus producing the intellectual findings gathered from the qualitative data. By synthesizing quantitative data with qualitative narratives and observations, the dissertation provides a more holistic view of how greening influences urban landscapes and the socio-economic fabric of cities, offering crucial insights for urban planners committed to fostering sustainable and equitable urban environments.

Following the collection and analysis of quantitative data, understanding of the geographical, socioeconomic, and political contexts, researchers were selected to conduct detailed qualitative fieldwork in each city. Consistent protocols were followed for site selection, data collection, and analysis, and the research team developed and refined a semi-structured interview guide aligned with the broader project's objectives. From 2018 to 2020, members of the research team spent about a month in each chosen neighborhood, conducting a total of 480 interviews with local residents, activists, public employees, and community organization representatives, who agreed to participate anonymously without compensation. Most of the fieldwork and raw field data conducted in these

cities and of the qualitative data gathered as part of GreenLULUs was before my time as a doctoral student; however, I did conduct part of the GreenLULUs field work (21 interviews in Barcelona) from 2018 to 2020 and also conducted additional field work in North American cities (Vancouver, Denver, Portland, Washington DC, and Boston; a total of 32 interviews) in 2024. I analyzed all qualitative raw data I used for my thesis through grounded theory deductive and subsequent inductive thematic coding in NVivo to extract information pertinent to urban policies, greening, investment, and perceptions and strategies of civic groups. Further, I supported the development of narrative framing of the quantitative analysis presented in Chapter II as well as the translation of the quantitative findings into a clear, accessible format suitable for both academic publication and this dissertation. Finally, each of the empirical chapters includes details about the specific cities, sites, data collection, and data analysis techniques mobilized for each analysis. I led (and for one of the chapters co-led, building on statistical processing and raw analysis conducted by an expert team of spatial statisticians) the analysis of all data materials.

Each of the research objectives presented above correspond with the methodological approaches below:

Chapter II (Objective 1): This chapter delves into the relationship between urban greening and residential development through a mixed-method approach. Using a subset of the quantitative data gathered by the research team, we conducted a longitudinal quantitative analysis of socio-demographic, green spatial, and real estate data in 28 North American and European cities. Our quantitative analysis utilized socio-demographic, green spatial, and residential real estate data across four time points—baseline and three subsequent decades—to assess gentrification trends, creating a composite indicator that captures socio-demographic changes and real estate price fluctuations. We further complemented the multi-city quantitative analysis with analysis of qualitative interviews in two juxtaposing cities – Atlanta and Amsterdam. We inductively coded interviews with city planners, developers, and civic leaders from both Atlanta and Amsterdam, providing deeper insights into how local political and development dynamics as well as the varied responses to greening initiatives by planning officials and activists have shaped housing affordability **alongside** equity of greenspace access in both cities.

Chapter III (Objective 2): This chapter employs a comprehensive qualitative analysis based on interview data from GreenLULUs. Interviews were conducted between 2018 and 2020

focusing on diverse urban development contexts and gentrifying neighborhoods marked by new green projects and socio-demographic shifts. For this research objective, semi-structured interviews with community activists were thematically coded via an inductive analysis approach to better understand how activists perceive, interact with, and respond to the challenges and opportunities of green and climate gentrification. Community activists were chosen as research participants based on their existing public engagement in community work, making them more ethically appropriate and accessible as research subjects. While these activists may not represent all community members, particularly those who may benefit from the processes and effects of gentrification and thus do not resist or organize against it, they do often have awareness of community dynamics and ties to those most marginalized. This rich, multi-city dataset focused on community activists allowed for an examination of the nuanced strategies communities deploy to negotiate the complexities of urban environmental justice, making significant contributions to understanding equitable and sustainable urban planning.

Chapter IV (Objective 3): This chapter draws on interviews I conducted in May and June 2024 with community, municipal, and regional planners across five North American cities: Vancouver (British Columbia), Portland, Denver, Boston, and Washington D.C. (United States). These cities were selected for their similar mid-sized metropolitan populations, diverse urban development histories, competitive housing markets and distinctive climate-change-related concerns. Through a snowball sampling method, 32 planners were interviewed whose work is situated at the intersection of climate action, housing, and economic development. Moreover, we also included analytical comparative analysis of 2019 interview data from each city where data was collected as part of the same European Research Council-funded project that Chapter II and Chapter IV rely on (with the exception of Vancouver as it was not included in the original GreenLULUs qualitative study). We utilized this comparative dataset alongside the newly collected 2024 data set to contrast shifts in perceptions and planning strategies over time, especially in relation to urban greening and its implications for gentrification and housing justice. The interviews were complemented by extensive secondary data from city planning documents and academic literature and thematic coding of evolving challenges and strategies of urban planning, focusing on the integration of equity in sustainability efforts, while considering the growing housing crisis.

Chapter V (Objective 4): This chapter is based on a sub-analysis of data from GreenLULUs. The study involved systematic thematic coding of interview data, focusing on policy tools and planning strategies related to urban greening and housing. Additionally, a grounded theory approach was employed to identify and categorize policy tools discussed in the interviews, which helped outline various policy implementation strategies across the cities studied. The commentary offered in this chapter specifically calls for further research on policy tools that can support the development of just and sustainable urban environments, underscored by comprehensive data analysis and scenario development based on historical and political urban contexts. This chapter was based on a policy report I led called *Policy and Planning Tools for Urban Green Justice.*

	Research Questions	***Gap***	***Main Scientific Contribution***	***Literature Contribution***
Chapter II	What role is played by urban greening in the perceptions and strategies of real estate developers? When greening predicts development, what are the broader ramifications for housing rights and affordability?	Advances knowledge on integrated quantitative and qualitative analysis linking greening to development trends and developer perspectives behavior in both North American and European cities. Further extends existing research on how real estate developers themselves perceive and respond to greening initiatives, particularly across different regulatory and housing market contexts.	Provides a robust quantitative analysis that confirms the connection between urban greening and subsequent real estate development, supporting theories of hedonic pricing. It further contributes through a qualitative exploration of how urban green branding shapes real estate developers' strategies and urban planners' roles in promoting high-end investment in American and European contexts.	This chapter examines the influence of urban greening on real estate developers' perceptions and strategies, examining the link between greening and real estate development through quantitative and qualitative analyses. This study enriches the discourse on urban economic dynamics and green branding, contributing to urban planning and real estate

				economics literature.
Chapter III	How do grassroots activists organize to simultaneously address housing and greening and how do they operate to achieve justice in greening neighborhoods?	Identifies the need for more in-depth analysis and understanding of the strategies and mechanisms employed by activists and community groups in resisting gentrification through green inclusion and anti-displacement principles.	Highlights the effectiveness of multi-specialty coalitions and partnerships in empowering community activists to simultaneously tackle housing and green equity. Also underscores the importance of care and solidarity in community activism and advocates for supportive, collaborative approaches among urban practitioners and policymakers to address these intersectional issues through non-technocratic, grassroots initiatives.	This analysis contributes to the fields of urban sociology, environmental justice, and urban planning, focusing on non-technocratic solutions to integrate grassroots perspectives into sustainable urban development.
Chapter IV	What are the challenges that planners face in regard to climate, housing, and economic development in the 2024 era of poly-crisis? Responding to these challenges, how are planners coordinating climate, housing, and economic action?	This gap underscores the need for a systems approach that transcends traditional government silos, advocating for reparative justice integrating climate, social, and housing equity, with a significant research void on effective implementation in urban planning.	Demonstrates how planners reframe traditional models and planning-specific educational frameworks taught in undergraduate or graduate planning programs to incorporate bold, innovative approaches for equitable planning, facilitating a shift towards agile and adaptable methods for addressing housing,	Chapter IV explores the challenges urban planners face in coordinating climate, housing, and economic actions in the era of poly-crisis, advocating for innovative, equity-focused planning strategies. This

	How has their action recently evolved, under which constraints and with which opportunities for a more just climate urbanism and housing practice?		climate, and economic crises.	research advances the fields of equity planning by embedding a call for radical, reparative planning into the climate urbanism discourse.
Chapter V	What specific policies and tools can urban practitioners employ to implement anti-displacement measures and inclusive greening measures? How can these strategies promote equitable, sustainable, and healthy urban environments through community-engaged planning practices?	Highlights the scarcity of literature/reports that offer integrated approaches to equity planning which combine green inclusion with anti-displacement principles in a non-siloed manner.	Calls for research that prioritizes cooperative, creative, and empathetic strategies for urban greening that ensure low-income neighborhoods benefit without displacement.	This chapter investigates how urban practitioners can use specific policies and tools to effectively combine anti-displacement and greening measures, engaging with the broader environmental justice and green gentrification literature.

3.2. Strengths and limitations

This dissertation has several limitations, with mirrored strengths, that have implications. First, the theoretical framework presented in Chapter I is heavily reliant on literature pertaining to urban development and racial injustice in the United States, where there is a rich body of research. This focus may have led to an underrepresentation of perspectives and dynamics from other geographies, notably Canada and Europe. Still, the theories and drivers of these racial injustices remain very much present in the Canadian and European contexts, albeit through differing pathways and tools. Moreover, I provide some literature review for the historical planning contexts of both Canada and Europe in

order to more accurately understand the empirical findings of this dissertation. More specific research on planning historical contexts at the nexus of social and environmental injustice could provide valuable insights for future research.

Second, although the study encompasses multiple cities, it only delves into more contextual depth with Atlanta and Amsterdam in Chapter II regarding greening and development contexts. In Chapter III, IV, and V, a breadth over depth approach is taken as the chapters aim to perform a discourse analysis for the cities that are studied. This approach means that specific local nuances and detailed contextual factors in the cities where interviews take place may not be as thoroughly examined; yet, this breadth over depth approach is necessary in order to provide the robust comparative framework on which those chapters rely. Necessary historical and development contexts are offered for each of these case study cities without being overtly cumbersome dissertation chapters.

Third, the qualitative data utilized in Chapters II and III were not collected firsthand, but sourced from an existing data set of transcribed interviews (see Methodology section of each chapter for more details). While I meticulously analyzed this data, the secondary nature of this data collection might introduce biases in interpretation, as the original data collection parameters were not designed specifically for this dissertation's research questions. Despite this, the dataset was collected through a robust fieldwork process for which I was able to contact and discuss the data with the original researchers who conducted the interviews. This provided first-hand knowledge on the nuances of the dataset, thus ensuring my review and analysis were highly accurate. I also led and conducted part of the qualitative data collection for cities that were included in Chapter II and did parallel fieldwork for other research projects in the cities studied in those chapters, which also gave me robust first-hand insights and interpretation capacity on the relationship between greening and inequalities.

Fourth, in Chapter IV, the selection of cities for interviews was influenced by pre-established personal connections and prior knowledge of cities noted for progressive greening policies. This selection criteria may introduce a selection bias by potentially limiting the diversity of urban greening practices and perspectives examined, favoring more progressive narratives that may not be representative of broader urban realities. Nevertheless, the cities selected each offer important contexts, histories, and unique political dynamics which are representative of aspirational housing and climate policy. Moreover, the personal connections I had to each of these cities allowed me to access interviews with individuals with whom I may otherwise would not have been able. This chapter was also developed in ways that I led and coordinated the data collection and analysis from start to finish.

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CHAPTER II. DOES GREENING GENERATE EXCLUSIVE RESIDENTIAL REAL ESTATE DEVELOPMENT? CONTRASTING EXPERIENCES FROM NORTH AMERICA AND EUROPE

Abstract

With the branding of a city as green increasingly serving to amplify attractiveness and investment while also contributing to patterns of green gentrification, the incentive to link real estate development and green space is growing. Yet, little is known about the extent to which this incentive has generated a spatial relationship between green space and newly constructed housing at the city-wide level and in ways that can be compared between cities. This gap in knowledge makes it difficult to precisely indicate the implications for housing rights, affordability, and broader goals of urban green justice. In response, this study explores quantitative trends in 26 mid-sized North American and European cities, utilizing greening and real estate data from the last three decades. Results show that greening becomes a more significant driver of development over time and operates to attract development in a growing number of cities, although more so in US cities. Next, in order to contextualize the quantitative results, we employ qualitative field data gathered through field work in Atlanta and Amsterdam. We contrast the greening and development trajectories of these cities by examining implications for housing rights and social justice, accounting for the fact that those cities exhibit different green gentrification trends, as demonstrated in the literature. Green gentrification is indeed a proxy for understanding housing justice implications in the relationship between greening and development. We find that Amsterdam's legacy of housing rights and policies acts as a protection against growing inequities embedded in the relationship between urban greening, development, and gentrification. In contrast, Atlanta embodies patterns of historic racial segregation and continued gentrification of Black neighborhoods which urban greening has further intensified. This analysis shows that greening can attract real estate development across a city, but the implications need not always be harmful to social equity.

Keywords: real estate development; green gentrification; housing justice; environmental justice; urban greenspace

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1. Introduction

While municipal urban greening strategies prioritize branding to attract investment (Garcia-Lamarca et al., 2021), their direct role in spurring new real estate development at the city-wide scale remains unclear (Robin, 2022). Greenspaces and associated Nature-based Solutions (NbS) provide publicly available environmental and social benefits and thus have become a priority in urban and environmental planning, particularly in those neighborhoods most underserved, infrastructurally underdeveloped and within or adjacent to post-industrial landscapes. Yet, urban greening is always underpinned by financial aspirations, as funding and support for urban greening is often justified by prospective economic growth and revenues through new real estate investments, jobs, and increases in property taxes (Teo et al., 2023).

As growing research demonstrates, developers themselves perceive new real estate investments around green spaces as anchors for financial benefits and act as "green grabbers" of rent and value, particularly so in gentrifying neighborhoods (García-Lamarca et al., 2022). Yet, broader city-wide and quantitative trends regarding whether residential real estate investment follows greening remain underexplored. Analyzing investors' development practices on the ground can thus offer a new understanding of the extent to which greening operates as a conscious or unconscious driver for attracting real estate. Moreover, research shedding light on the implications greening has on access to housing across social groups and classes, housing affordability and rights, and justice is much needed.

In this paper, we examine the relationship between greening and new residential development in 26 European and North American mid-sized cities (out of an original sample of 28 cities). We assess new development as the dependent variable and use greening as an independent variable to determine its influence on the locational trends we observe and when/if greening can predict development. Our analysis differs from the many recent large-scale analyses on green gentrification (e.g. Rigolon and Németh 2021) since green gentrification can occur as greening attracts wealthier classes, but not necessarily via the creation of new housing or other investments (Connolly and Anguelovski, 2024).

First, we establish the quantitative extent to which development follows greening in 26 cities. In short, we find that, between 1990 and 2016, greening becomes a more relevant driver than other economic and landscape changes in a growing number of cities, even when accounting for other infrastructural and locational factors. Then, we then follow with qualitative research focused on two cases which are both most similar and most different (Yin 2018): Amsterdam and Atlanta. We aim to unpack data from both cities where the relationship between greening and development is similarly strong, but also where prior analyses found differing trends of green gentrification and housing justice concerns (Anguelovski et al. 2022). Here, we ask: When greening is found to predict development, and considering green gentrification is a proxy for understanding housing justice, what are the broader ramifications for housing rights and affordability? In Atlanta, what policy and planning strategies can help explain the transformation of real estate development into an exclusive green commodity for incoming educated, white, and high-income residents? What can further explain how housing affordability and security is jeopardized in newly greened neighborhoods? In Amsterdam, why are greening and development not as embedded in this green gentrification and exclusion dynamic despite the more recent and increasing trends towards the market-driven commodification of housing?

2. Exploring greening and residential real estate development dynamics

Urban greening includes the integration or (re)development of green or blue spaces and their associated ecosystem services into the urban form (Nesbitt et al., 2017; Pauleit et al., 2017). Such greening interventions can include park development, tree planting, urban gardening, waterfront redevelopment, and more (Escobedo et al., 2019). Through greening interventions, urban dwellers are able to benefit from positive health outcomes, social wellbeing, enhanced sense of place (Raymond et al., 2023), and heightened cultural and historical connection to place (Triguero Mas et al. 2021). As extreme climate-change related events become more frequent, the many forms of urban greening and their associated ecosystem benefits prove critical for how cities can respond to urban climate mitigation and adaptation.

Nevertheless, greening interventions and the delivered ecosystem services do also come alongside certain ecosystem disservices, including the spread of allergenic pollen, fear of violent animals, discomfort in unlit green spaces, or loss of social cohesion and threats to social equity (Rodgman et al. 2024). The negative impacts of urban greening are particularly visible when procedural (Rutt & Gulsrud, 2016) and distributive dimensions of planning and management are inadequately considered.

Urban greening can manifest into 'disruptive green landscapes' (Triguero-Mas et al., 2021), which are most impactful to historically marginalized groups, including low-income, racialized, and minority residents (Du & Zhang, 2020) and can result in uneven access to urban greening co-benefits (Grabowski et al., 2023; Rigolon, 2016). Furthermore, considering temporal and socio-spatial impacts of greening over time as well as potential exacerbation of existing social inequalities, new greenspaces have also been found to physically, emotionally, socially, financially or culturally exclude, displace, and otherwise isolate those residents from their changing neighborhoods in a process of environmental or green gentrification (Anguelovski, 2022; Black & Richards, 2020; Blok, 2020; García-Lamarca et al., 2020; Quinton et al., 2022). Green gentrification is the process by which the implementation of an environmental planning agenda, including urban greening and urban green spaces, can lead to increased perceptions of liveability and thus increases to cost to out-pricing, to the exclusion and displacement of politically disenfranchised residents. Green gentrification has been documented to result in harmful physical and mental health impacts on low-income, minority residents through loss of home, reduced effective access to green space, inadequate provision of public amenities, as well as increase of crime (Triguero-Mas et al., 2021). Green gentrification thus produces a highly volatile and complex riskscape for lower-income, racialized, and minority residents (Cole, Anguelovski, et al., 2021). This process, in turn, further perpetuates a legacy of exclusionary whiteness in greened neighborhoods (Angelo, 2021; Connolly, 2019; Connolly & Anguelovski, 2021).

In many mid-sized to large cities, these riskscapes have been shown to be often produced by lifestyle and economic attraction of which greening is a part, with significant profit harnessed by financial investors and real estate development around a process of green grabbing and land speculation (García-Lamarca et al., 2022). Furthermore, the domination of economic growth through the lens of sustainability and a 'green is good' orthodoxy (Angelo, 2021; Connolly, 2019) is what has led many local governments to a speculative fervor of operationalized land value capture projects and financial strategies that assume and capture property appreciation (Weber, 2021). An abundance of literature using hedonic price modelling supports this fervor through estimations of the extent to which urban green spaces affect residential real estate prices. While early studies from the 1980s and 1990s across American cities quantitatively confirmed historic observations from early English parks that urban green spaces make a notable contribution to proximate property values (Crompton, 2001), during the 2000s and 2010s, more studies have verified these results (Conway et al., 2010), also considering different typologies like community gardens, greenways, and forests. However, most of this research remains case study specific, based on data from one single city (and at times neighborhoods), with

market price variation fluctuating widely by location, type of green space, and study methodology (e.g. Kronenberg et al. 2023).

Scholarly theorization of the green growth machine (Gould & Lewis, 2016) as well as the utilization of green branding (Garcia-Lamarca et al., 2021; García-Lamarca & Ullström, 2020; Immergluck & Balan, 2018), green marketing (Gałecka-Drozda et al., 2021), and green gentrification reflective of strategic economic action remain ongoing critiques of the neoliberal and speculative dynamics embedded in urban green space planning and their impact on the housing rights of historically marginalized groups. As a result, researchers and activists alike are increasingly confronting municipalities and their economic growth agendas for their continued push of the 'green is good' agenda (Angelo, 2021; Oscilowicz, 2023) without operationalizing greening and NbS "towards more emancipatory and just socio-ecological futures" (Kotsila et al., 2020, p. 252). Their demands are centered on participatory and engaged planning processes for more inclusive, accessible green spaces while simultaneously protecting existing housing and its character as well as providing more affordable housing stock (Oscilowicz et al., 2022; Ranganathan & Bratman, 2021).

Many social justice-focused activists also actually oppose urban "pro-housing" movements such as YIMBY-driven[1] urbanism led by white, upper-middle class and tech industry-oriented millennials. These movements defend an affordable and inclusionary urban imaginary 'for all', despite utilization of tools such as upzoning, which changes the zoning code to allow for increased and denser development, also employed by exclusionary racial capitalism (Freemark, 2023). In the US, elected officials themselves often advocate for the construction of large amounts of private housing as a strategy to decrease housing prices and respond to increasing demand to what is seen as a housing shortage (Cole, Mehdipanah, et al., 2021). Yet, few of those officials contend with the fact that a significant majority of new housing are high-income and luxury condos (Immergluck, 2022) and that national housing policies have failed the poor in securing affordable housing and public housing has been either continuously sold or dismantled (Vale, 2018). Similarly, European cities and states have continued to undo social housing policies and privatize public housing (Byrne & Norris, 2022; Power,

[1] "Yes In My Backyard" (YIMBY or YIMBYism) is a pro-housing development movement associated with densification and re-zoning planning processes with the aims to 'build baby build'. YIMBYism has come under scrutiny by tenants unions and academics for the support of market-rate development that utilizes a "deregulatory, trickle-down framework for housing policy that does more harm than good" (Union, 2019).

2021), although they still have a stronger legacy of housing rights and safety nets in place (Anguelovski & Connolly, 2021; Oscilowicz et al., 2022) that limit the hyper-commodification of housing.

In calling for more housing construction, the dynamics of *rent gaps* are at the center of speculative development and unequal housing access: As Wyly (2022, p. 319) writes, "localized economic rent gaps become transnational, transhistorical moral rent gaps constituted through competing claims for inclusion into the inherent exclusivity of capitalizable property rights". All in all, rent grabbing risks as part of urban greening projects further compromising already precarious and insecure housing rights for working class and non-white residents in North America and Western Europe (Tretter & Heyman, 2022).

Building on existing research at the intersection of greenspace planning, real estate development and housing rights and affordability, this paper addresses questions raised regarding the specific links between greening and real estate development, the financial capture and commodification of greening identified in the green gentrification literature (Boanada-Fuchs & Boanada Fuchs, 2022), and broader investment behaviors in cities (Todes & Robinson, 2020). We ask the following questions: To what extent does real estate development happen after greening and where and when does this trend occur most acutely, separately from processes of green gentrification? When greening does happen after (and thus is a predictor of) development, what are the broader ramifications for housing rights and affordability?

3. Methods: Unpacking the relationship between greening and residential development

3.1 Parent study and context

This study is a subset of a larger European Research Council-funded parent project whose objective was to assess the relationship between green space development and gentrification in 28 mid-sized (between 500.000 and 1.5 million residents) North American and Western European cities. The quantitative analysis included socio-demographic data (census data from each city at the census tract or similar level), green spatial data (the locations of green spaces in each city with dates of creation of each space), and residential real estate data (data indicating where new housing had been built or where permits had been issued). We sought to include four time points of these datasets for each city—baseline, baseline + 10 years, baseline +20 years, and baseline +30 years – effectively dividing the

longitudinal datasets into three time periods. The gentrification outcome variable was a composite indicator which accounted for socio-demographic change and changes in real estate prices in order to obtain a more nuanced understanding of gentrification trends. Results from the parent study show that *city-wide* green gentrification trends are present in 17 out of 28 cities, with greening being the leading factor in gentrification in nine cities, including Copenhagen, Nantes, Vancouver, Montreal, Seattle, Boston, Atlanta, Milwaukee, and Louisville[2]. The study also found that there are no clear green gentrification trends in cities such as Amsterdam, Dublin, or Baltimore, with, overall, negative trends more present in the European sample of cities. [For full research results, see Anguelovski et al. 2022.]

3.3. Quantitative analysis of greening and development

This paper focuses on a two-phased subset of the parent study and sought to quantitatively examine the extent to which and where real estate development is driven by city-wide greening, independent of green gentrification trends (Figure 1). In other words, when a city is physically greened, does residential real estate development happen after? From the original set of 28 cities, we removed Lyon and Dublin for this analysis as development data was not publicly available. Through publicly available sources, we identified and mapped all new greenspaces (parks, greenways, preserves, gardens) inaugurated between 1990 and 2016 as well as new real estate developments for each of the 26 cities (see Supplemental Data in Appendix). We gathered two types of real estate datasets[3]: 1) a dataset with the year of construction of specific residential properties; and 2) a dataset of new residential developments per spatial unit for each time period collected. We located the new development data by mapping X,Y coordinates or joining appropriate data columns to shapefiles of statistical area boundaries for each city. Ultimately, we aimed to assemble data for each census tract (or equivalent) for the total number of new residential developments in every year. In all cases the majority of new residential development from the 1990s onwards are market-price housing while social or public housing remains residual.

[2] Examining city-wide, aggregate trends allowed for a more robust analysis of green gentrification, in contrast with specific case study sites, because it required trends to be present on a large scale in order to be labeled as a "green gentrification" city.

[3] We assembled the data from cadastral or tax archives (a mix of American, Canadian, and European cities), building permit archives (only some American cities), or by new developments per spatial unit (only some European cities).

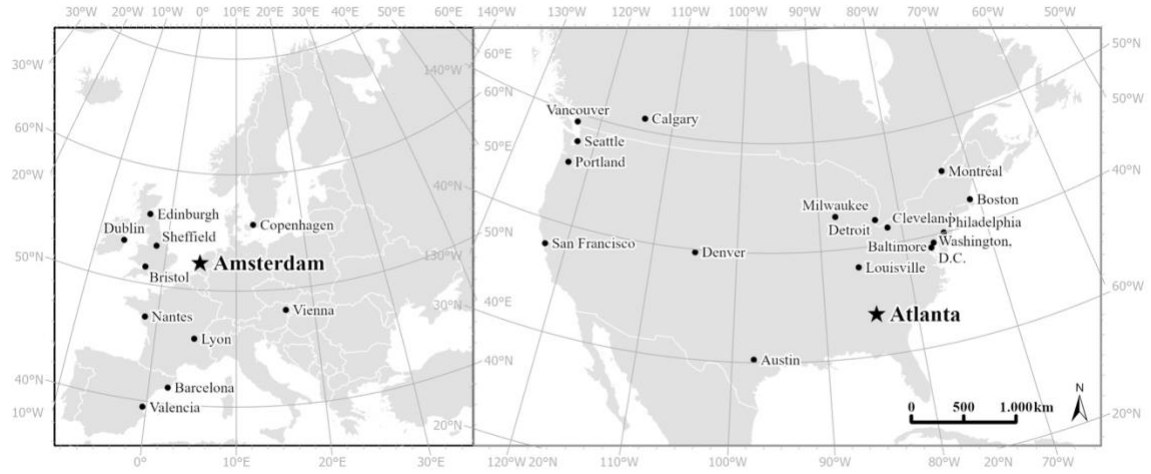


Figure 1. 28 cities were selected for analysis of the parent project. Of those 28 cities, Atlanta and Amsterdam are selected in this study on greening and real estate development as case studies. Dublin and Lyon were removed from the study described in the paper.

To test the relationship between greening and residential real estate development, we developed three spatial Bayesian Hierarchical models, one for each of the next time periods: 2000-2010 (time period 2), 2011-2020 (time period 3) and 2000-2020 (time period 2-3) (Figure 2). In our quantitative Results, we use the word "relevant" rather than "significant" to account for the Bayesian frameworks and models we used to develop our quantitative analysis. Further details on the Bayesian approach can be found in the Supplemental Data in the Appendix.

1. DEV_TIME2 = CH_GSAB_PRE2 + NEW TRANSIT_B_PRE2 + POP_CHANGE2 + GDP_CHANGE2 + PRE_1990_GREEN + CENTER + REGION + CITY + SIZE + TRACT_DENSITY_2010 + TIMEFROM1990

2. DEV_TIME3 = CH_GSAB_PRE3 + NEW TRANSIT_B_PRE3 + POP_CHANGE3 + GDP_CHANGE3 + PRE_1990_GREEN + CENTER + REGION + CITY + SIZE + TRACT_DENSITY_2010 + TIMEFROM1990

3. DEV_TIME23 = CH_GSAB_PRE2 + NEW TRANSIT_B_PRE2 + POP_CHANGE23 + GDP_CHANGE23 + PRE_1990_GREEN + CENTER + REGION + CITY + SIZE + TRACT_DENSITY_2010 + TIMEFROM1990

*Figure 2. Bayesian hierarchical models developed for the study. Each model included eight explanatory variables, with greening being one, and real estate development (**DEV_TIME**) as dependent variable. In addition to greening, seven other explanatory variables were selected based on expert opinion to account for a diversity of factors that could explain development:*

1. *total green space area added to the census tract (**CH_GSAB**),*

2. *the number of public transit stops added to the tract immediately before and during the first two years of the time period (**NEWTRANSITB**),*
3. *green coverage prior to 1990 (**PRE_1990_GREEN**),*
4. *distance to city center from the centroid of the census tract (**CENTER**),*
5. *population change at the city level during the decade of the dependent variable (**POP_CHANGE**),*
6. *change in GDP at the city level during the decade of the dependent variable (**GDP_CHANGE**),*
7. *the years from 1990 to the dependent variable (**TIMEFROM1990**), and*
8. *the population per square kilometer in the census tract in the year 2010 (**TRACTDENSITY_2010**).*

4. Results

4.1. Quantitative analysis of 26 North American and European cities

In terms of the overall positive relationship between greening and new development, our quantitative analysis (Table 1) reveals that greening on the whole is effectively a driver for development, and becomes a more relevant driver over longer. We find this also to be true over prolonged time periods instead of shorter time periods. In other words, when conducting the statistical analysis across the studied cities, more cities show a positively relevant result in time period 2-3 (2000-2020) than in time period 2 (2000-2010) or time period 3 (2011-2020). However, in most of the cities this relationship is not fully conclusive (see Table 1). In presenting our quantitative findings, we use the Bayesian term "positive relevant" or "negative relevant" to refer to the relationships we find. All relationships discussed account for the role of greening in the presence of all other potential explanatory factors in the models. Values in parentheses reflect scores of where the final spatial effect model best predicts the relationship between greening and development.

Focusing more on the temporal aspects of the relationship, considering all greenspaces built in the 1990s and real estate development from the 2000s, we found a positive relevant relationship in four cities, mostly in the US (Atlanta, Milwaukee, Seattle and Amsterdam). For the next time period (greenspaces from the 2000s and development from the 2010s), we further identified a positive relevant relationship in five cities (Atlanta, Louisville, Milwaukee, and Montreal) and close to relevant in Portland. Regarding longer term temporal trends (period 2 and 3 together), results show a higher number of positive relevant relationships between greening and real estate development when considering development built over two decades after green space built in the 1990s, with six cities

identified, mostly again in the US: Boston, Louisville, Milwaukee, Seattle, Washington, Amsterdam (with trends likely also taking place in Portland and Atlanta). In this sense, real estate development seems to make the most of green space construction over a period of several decades, not just in the years immediately after its construction.

In terms of the counter-trend, we found fewer negative relevant relationships between greening and development than positive relationships in studied cities. Negative relevant relationships – meaning greening is not a significant driver of development – are identified in Canada (Calgary, Montreal) and Europe (Barcelona, Valencia, Vienna) for greenspace from the 1990s and development built in the 2000s. In the US (Baltimore, Boston, and Washington DC), similar negatively relevant (and close to negatively relevant for Philadelphia) relationships are found for greenspace built in the 2000s and development in the 2010s, but not for the earlier period. There is also a clear negative relationship for green space from the 1990s and cumulative development from the 2000s and 2010s only in two cities in the EU (Barcelona) and Canada (Montreal), although in Montreal the relationship becomes strongly positive from the 2010s onwards.

		Pre Period 2 Greenspace Area and Development Period 2 (greenspaces from the 1990s and development from the 2000s)	**Pre Period 3 Greenspace Area and Development Period 3** (greenspaces from the 2000s and development from the 2010s)	**Pre Period 2 Greenspace Area and Development Period 23** (greenspaces from the 1990s and 2000s and development from the 2000s and 2010s; period 2 and 3 together)
USA	Atlanta	POSITIVE (0.730)	POSITIVE (0.966)	NOT RELEVANT POSITIVE (0.698)
	Milwaukee	POSITIVE (0.976)	POSITIVE (0.765)	POSITIVE (0.995)
	Louisville	NOT RELEVANT POSITIVE (0.534)	POSITIVE (0.976)	POSITIVE (1.000)
	Seattle	POSITIVE (1.00)	NOT RELEVANT POSITIVE (0.633)	POSITIVE (0.999)
	Baltimore	NOT RELEVANT POSITIVE (0.523)	NEGATIVE (0.257)	NOT RELEVANT POSITIVE (0.512)
	Boston	NOT RELEVANT NEGATIVE (0.4956)	NEGATIVE (0.180)	POSITIVE (0.722)
	Washington	NOT RELEVANT NEGATIVE (0.312)	NEGATIVE (0.244)	POSITIVE (0.903)
	Cleveland	NOT RELEVANT POSITIVE (0.501)	NOT RELEVANT NEGATIVE (0.476)	NOT RELEVANT POSITIVE (0.503)
	Philadelphia	NOT RELEVANT POSITIVE (0.517)	NOT RELEVANT NEGATIVE (0.303)	NOT RELEVANT POSITIVE (0.524)
	Austin	NOT RELEVANT POSITIVE (0.508)	NOT RELEVANT POSITIVE (0.510)	NOT RELEVANT NEGATIVE (0.482)
	Denver	NOT RELEVANT POSITIVE (0.515)	NOT RELEVANT POSITIVE (0.532)	NOT RELEVANT POSITIVE (0.551)
	Detroit	NOT RELEVANT POSITIVE (0.499)	NOT RELEVANT POSITIVE (0.563)	NOT RELEVANT POSITIVE (0.500)
	Portland	NOT RELEVANT POSITIVE (0.639)	NOT RELEVANT POSITIVE (0.680)	NOT RELEVANT POSITIVE (0.681)
	San Francisco	NOT RELEVANT POSITIVE (0.509)	NOT RELEVANT POSITIVE (0.508)	NOT RELEVANT POSITIVE (0.514)
Canada	Calgary	NEGATIVE (0)	NOT RELEVANT POSITIVE (0.529)	NOT RELEVANT NEGATIVE (0.414)
	Montreal	NEGATIVE (0.189)	POSITIVE (0.897)	NEGATIVE (0.155)
	Vancouver	NOT RELEVANT NEGATIVE (0.420)	NOT RELEVANT NEGATIVE (0.480)	NOT RELEVANT NEGATIVE (0.403)
Europe	Amsterdam	POSITIVE (0.999)	NOT RELEVANT POSITIVE (0.552)	POSITIVE (1.000)
	Barcelona	NEGATIVE (0)	NOT RELEVANT NEGATIVE (0.466)	NEGATIVE (0)
	Copenhagen*	NA (No data or not enough data)	NOT RELEVANT POSITIVE (0.712)	NA (No data or not enough data)
	Valencia*	NEGATIVE (0.002)	NA (No data or not enough data)	NA (No data or not enough data)
	Vienna*	NEGATIVE (0.326)	NA (No data or not enough data)	NA (No data or not enough data)
	Edinburgh*	NOT RELEVANT POSITIVE (0.528)	NA (No data or not enough data)	NA (No data or not enough data)
	Nantes*	NA (No data or not enough data)	NOT RELEVANT POSITIVE (0.552)	NA (No data or not enough data)
	Bristol*	NOT RELEVANT NEGATIVE (0.472)	NA (No data or not enough data)	NA (No data or not enough data)
	Sheffield*	NOT RELEVANT NEGATIVE (0.476)	NA (No data or not enough data)	NA (No data or not enough data)

* indicates more than one period with no data

Legend
- Greening is a driver of development
- Greening is likely a driver of development
- Greening is not a driver of development
- Greening is likely not a driver of development
- No data or not enough data

Table 1. Bayesian analysis results for 26 cities.

The Bayesian posterior predictive distributions (values in parentheses) refer to the distribution of the models in predicting the development index (outcome variable) in each census tract (or equivalent) produced by the final model (model that includes specified effects and includes random variables). These probabilities are not to be interpreted as traditional p-values (the probability of obtaining the observed results, assuming that the model is true). Values are rounded to the nearest 3 decimal.

Darker blue and yellow cells indicate those areas that signal statistically significant relationships between greening and development, that is the relationship is considered relevant. Lighter blue and yellow are the areas where the final specified best possible model still identifies a strong relationship, but this relationship is considered not-relevant.

Finally, in terms of quantitative findings, the trends between greening and real estate development were not clear and appeared non relevant in Cleveland, Philadelphia, Austin, Denver, Detroit, San Francisco, as well as Edinburgh, Bristol and Sheffield (for the early time period). Data for greening in the 2000s and development in the 2010s was also insufficient for Valencia, Vienna, Edinburgh, Bristol, and Sheffield.

Moving to results interpretation, in some Canadian cities, the already wider access to large scale metropolitan greening might explain why green space is not a driver for urban developers and thus for residents (this is an important observation when considering the goals of greening in wider planning initiatives). Moreover, many Canadian cities are also undergoing a process of re-densification where centrally located empty lots and smaller green spaces are replaced by new buildings (Anguelovski and Connolly, 2021). Negative relevant trends in Barcelona and Valencia may be explained by the high density of the cities and the overall reduced provision of greenspace within city limits, with new buildings developing independently of greening on any land parcel found available. Unclear trends in our results for greening reveal that factors other than greening may also explain real estate construction, including proximity to the city center, or transit lines, or population growth (as a proxy for conditions like expanded room for allowable development), demonstrating that developers value an array of geographical and physical amenities when making strategic investment decisions.

In sum, overall, we find a greater number of cities with a positive relevant and a positive non-relevant relationship between greening and development than the opposite (that is that greening is not a predictor of development) (Figure 3), and this positive relationship seems to become stronger over time. Based on these overall results in the next section we delve into two cases where we encountered a mostly positive relevant relationship: Atlanta and Amsterdam. We contrast these trajectories relative to housing and social justice implications by accounting for the fact that these cities exhibit different green gentrification trends, as demonstrated in the literature. In Atlanta, greening strongly predicts city-wide gentrification, and thus exclusion and displacement, while Amsterdam is a case where greening does not.

GREENING AND REAL ESTATE DEVELOPMENT Q: IS THERE A STRONGER RELATIONSHIP BETWEEN GREENING AND REAL ESTATE DEVELOPMENT OVER TIME? A: YES, AND IN A LARGER NUMBER OF CITIES		
	**Yes**	**No**
Greening from the 1990s shapes development in the 2000s	Atlanta, Milwaukee, Seattle, Amsterdam	Calgary, Montreal, Barcelona, Valencia, Vienna
Greening from the 2000s shapes development in the 2010s	Atlanta, Milwaukee, Louisville, Montreal	Baltimore, Boston, Washington
Greening from the 1990s and 2000s shapes development in the 2000s	Milwaukee, Louisville, Seattle, Boston, Washington, Amsterdam	Montreal, Barcelona

Figure 3: Greening and real estate development in North American and Europe

4.2. Qualitative analysis of greening, development, and housing justice

We aimed for a mixed-methodological framework in the second phase of this study. We drew the qualitative interview data from the database of interviews collected as part of the parent project of this study. The protocol for interviewing as part of this parent study used snowball sampling to conduct 25 and 35 interviews in 24 of 28 cities (as field study travel was disrupted due to COVID 19 to achieve all 28) between 2019 and 2020 for a total of 492 interviews on the social, racial, and economic impact of green redevelopment in neighborhood environments (See interview instrument in Appendix). We selected cities in order to maximize diversity of regions, city size, urban development dynamics, and growth patterns. We designed this field work to help us zooming in on emblematic neighborhoods where greening and urban residential redevelopment have been particularly intensive over the last three decades.

For the purpose of this paper, drawing from methodological literature on case study selection (Yin 2018) and building upon the mixed-methodological framework utilized in Garcia-Lamarca et al. (2021) where a quantitative analysis to determine trends across a variety of cities is paired with a qualitative case study analysis of opposing and comparative city contexts, we selected Amsterdam and Atlanta. Those cities are most similar cases in the relationship between greening and development, as revealed by the present quantitative analysis, yet different in green gentrification and housing injustice trends. We first analyze Atlanta, where green gentrification is sustained throughout the study period and the local and national political economy has led to significant housing injustice and insecurity. We then examine, Amsterdam, where no clear indication of green gentrification is present and the local and national political economy has, until more recently, largely focused on social and economic equity.

Our analysis is based on 18 interviews in Atlanta and 24 in Amsterdam, which we updated through additional qualitative insights in 2023. Interviews focused on the expert accounts of local planners, elected officials, residential real estate developers, and members of civic groups fighting for green and housing justice – informants with a strong knowledge of greening, development, housing, and civic mobilization dynamics in each city. This data was complemented by and triangulated with a comprehensive identification of relevant local policy and planning reports, changes in local ordinances, zoning, and plans, and media reports. Using the Nvivo software, all data was systematically coded through both a deductive, more thematic coding scheme regularly reviewed by the coding team, together with a more open-ended, inductive coding scheme (See full coding matrix in Supplementary Data). To make best use of the data, qualitative analysis is reported in a narrative format and based on the variety of triangulated qualitative data. Selected interviewee quotes highlight some of the trends found in the analysis.

4.1.1. Atlanta

Atlanta is a car-dominated city with concentrated urban poverty and institutionally designed redlining which have contributed to highly visible race and class divides (Immergluck and Balan 2018). These are epitomized by the segregationist power of highways and public transit lines that continue to physically separate areas of opportunity and wealth, keeping them out of everyday reach for residents outside of their geo-political boundaries (Immergluck, 2022). Moreover, residents in these neighborhoods are exposed not only to noise and atmospheric pollution from highways and rail lines but also to severe climatic risk of flooding due to the low permeability profiles of these neighborhoods. These social and environmental riskscapes position Atlanta's southern, western, and south-western

neighborhoods as lucrative potentials for real estate investors, particularly as few protective social services or institutionalized tenant/homeowners protections exist within the broader American national political landscape (Vale, 2018).

Within this context and as part of Atlanta's most visible and well-known urban redevelopment and greening work, the Atlanta Beltline[4] is a 22-mile large-scale green rail-to-trail loop project surrounded by largely residential and commercial land uses (Figure 4). Since its inception in 1999, it has been marketed as a holistic connectivity and livability solution to the historic and modern segregation, inequality, and injustice. The land procurement, planning, development, and design for the Beltline have largely been led and informed by private, non-profit groups which work closely with the city in a public-private partnership. These include Atlanta Beltline Inc. and Atlanta Beltline Partnership,

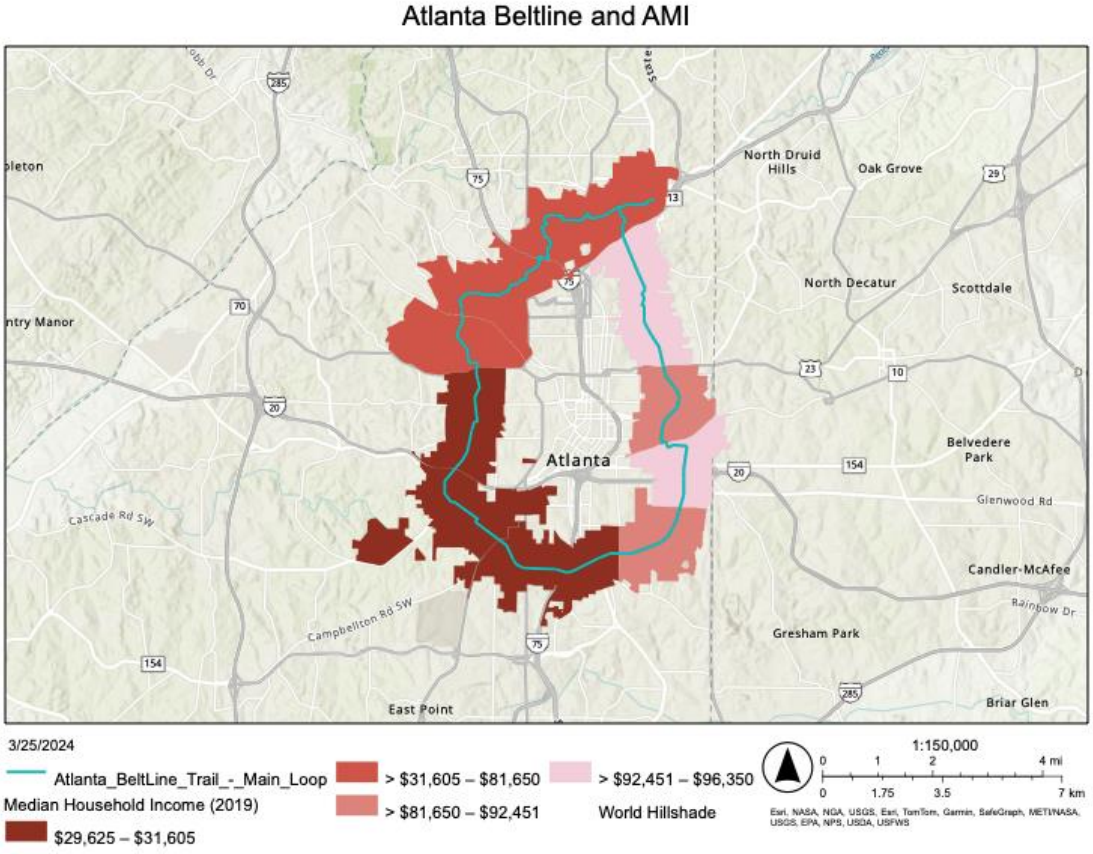


Figure 4. Map of Beltline and area median income (AMI) distribution

[4] https://Beltline.org/the-project/project-goals/project-goal-transit/

among others, that focus on environmental sustainability and conservation. Although both entities work closely with the City of Atlanta, they are private, non-profit organizations.

While the City took a backseat on new green projects, the non-residential development itself was planned in a staged approach, with construction for both the Eastside Beltline and nearby transit lines beginning in 2010, and has since incorporated a system of six interconnected parks. Significant commercial and residential change has occurred as a result of the parks construction, while speculative practices run rampant in the neighborhoods of planned Beltline redevelopment (Immergluck & Balan, 2018). This speculation was particularly aggravated as the Atlanta Beltline, Inc. focused the majority of its funding towards building trails and parks first, and too late came to consider land procurement for affordable housing.[5]

From a land use perspective, historically industrial buildings that line the new greenway have been redeveloped by high-profile investment companies to operate as non-residential real estate development, as with the example of the Ponce City Market built by the same developers as Chelsea Market on NYC's Highline (Figure 5). Meanwhile, the once historically Black, working-class neighborhood has since hastily transformed into a "flipping" market of financial gain, displacing long-term residents being priced out by increases to property taxes ranging from 74% (farthest from Beltline) to 160% (closest to Beltline) (Immergluck, 2007). This process also has a downstream effect on rent increases as landlords are forced to keep up with increasing annual homeownership costs (Lartey, 2018). Moreover, the incipient fear of gentrification and pressure of displacement has had documented impact on the sleep quality of Black adults in Atlanta (Williams et al., 2021). The state of the recent housing market, as described by an activist representing the West Atlanta Watershed Alliance (WAWA), arises as an additional stressor following the great losses suffered following the 2008 Great Recession, where the Black, middle class of Atlanta were most impacted:

> "Atlanta was ground zero for predatory lending… we did have a large population of Black middle class and so I would say in that market downturn a lot of Black wealth was lost because our wealth was in our homes. The market essentially flipped and people lost their houses, banks foreclosed on people and so that inventory of foreclosed houses… It's not

[5] See https://phys.org/news/2023-01-atlanta-Beltline-urban-green-gentrification.html

serendipitous that the market does what it does… people choose what neighborhoods are ripe for development."

Moreover, the current, post-COVID 'red hot' real estate market has contribute to the alienation of long-term residents excluded from the character, culture, and services of the neighborhood (Immergluck, 2022). These trends have been exasperated as tech giants such as Google, Honeywell and Microsoft, which often situate their tech-campuses in opportunity areas for revitalization (McElroy & Werth, 2019), have since brought over 100,000 high-paying workers from 2011 to 2019 into Beltline neighborhoods (Immergluck, 2022).



Figure 4. New development including Ponce City Market along the East Atlanta Beltline (2019). Photographed by Helen V.S. Cole (co-author).

While the two non-profits leading the Beltline development included the need for affordable housing in the plan proposal phase and the current development phase, too little has been built for this to be an effective anti-displacement effort. The affordability push came very late in the greening process, after land values had already greatly increased. One example of anti-displacement efforts is the Beltline's Legacy Resident Retention Program, which is designed to help long-term residents afford

rising property taxes in certain neighborhoods adjacent to the Beltline. However, this program was not launched until late 2020, 15 years after the Beltline was officially begun (Jones, 2021).

Despite implementing affordable housing targets for households with less than 80% of the metropolitan median income, our analysis found that income limits are based on highly stratified data across the city whereby limits are outstandingly high when compared to median income levels of long-term residents, especially Black residents, living in periphery Beltline neighborhoods. Moreover, these affordable housing targets largely exclude residents in the 50% area median income (AMI)[6] and especially residents below the 30% AMI. In total, the Beltline agenda aims to provide 5,600 units of 'affordable' homes by 2030, of which the majority are located in very low-income neighborhoods, including Peoplestown and Westin Heights, where long-term residents would still consider these far out of their financial scope. By 2030, at the current rate of price increases, many residents will likely already have been displaced. In another example, while the Beltline plans mandate inclusionary zoning practices of affordable housing units within a half mile of the periphery of the greenway, many developers are dodging these zoning obligations by building properties outside these boundaries. A housing community activist describes this trend of avoiding affordable housing construction:

> "The city has done things like inclusionary zoning along the BeltLine corridor but it's not enough and developers are just building outside of that half mile on either side of the BeltLine, to still get the BeltLine benefit without having to lose money by building affordable housing."

Moreover, an investigative journalism piece by the Atlanta journal *Constitution* reports that many affordable homes were later re-sold to higher-income households, data not reported by the Atlanta Beltline, Inc.[7]. Shortly after, the CEO of the Atlanta Beltline, Inc. resigned[8].

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[6] Area median income (AMI) refers to midpoint of a jurisdiction's income distribution where half of the households earn more than the median and half earn less than the median. A household's income is calculated by its gross income, which is the total income received before taxes and other payroll deductions. A 60% AMI household is one where the gross income is 60% or less of the area median income. See more: https://www.huduser.gov/portal/datasets/il.html

7https://www.ajc.com/news/local/how-the-atlanta-Beltline-broke-its-promise-affordable-housing/0VXnu1BlYC0IbA9U4u2CEM/

8 https://roughdraftatlanta.com/2017/08/23/atlanta-Beltline-ceo-stepping/

In another reactive anti-displacement effort, the Atlanta Beltline Partnership offered a Legacy Resident Retention Program to provide tax relief to cover the cost of increase to property taxes for existing long-term residents until 2030. Yet, this tax relief program was only accessed by 96 homeowners since 2022, a fraction of the housing-cost-burdened homeowners in the surrounding neighborhoods.[9] Furthermore, this property tax break program does not directly support renters in neighborhoods where homeownership rates are under 40% and sometimes as low as 20% (Immergluck, 2022). As one local developer and landscape architect puts it:

> "A developer is a certain type of personality and that personality is somebody who likes to make a lot of money... It's capitalism… anything outside the norm in terms of reduced parking spaces or subsidized rents or efficiency units… most developers do not do that."

Meanwhile, institutionalized political conservatism in the city (and state) – and more broadly at the national level with a very split US Congress – only supports endured hardship and challenge in achieving any state-wide legislation that would offer housing rights and protections. As a housing rights activist shared, the political ecosystem of the state makes systemic wins near impossible to achieve:

> "We live in a state that's very red and Republican so we can't do things like renter's protection, renter's rights, we're in a state that doesn't allow those things, it's a landlord's rights state and not a renter's rights state."

In sum, the Atlanta Beltline is an example of how a negative local and state political climate, de facto inexistent equity-driven planning of a green infrastructure, investors' green grabbing practices, and superficial intentions by the green infrastructure managers have come together to sacrifice the retention of affordable housing for green, exclusive, and mostly white profit. In Atlanta, real estate investors and speculators emerged with the upper-hand as they gained momentum in the announcement and development of the Beltline. At the same time, affordable housing planners were already at a disadvantage in providing housing units which was only magnified by the strategy and

9 Reporting from the 2022 Beltline Annual Report https://Beltline.org/2022-annual-report/

process of development for the Beltline, forcing hasty reactions as opposed to pre-meditated, pre-consulted, solutions. This haste is demonstrated through the poorly-accessed tax support programs and unrealistic affordable housing minimums – simply mild obstacles within a rather free, speculative green growth machine producing green gentrification through the marriage of greening and real estate development. Instead, extensive early investments in affordable housing through assembling and land banking *prior to* green announcement could have provided major anti-gentrification relief.

4.1.2. Amsterdam

Amsterdam is well-known for a historic commitment to urban sustainability and social planning. With a history of social planning through public green infrastructure development dating back to the 19th century, Amsterdam has demonstrated prioritization of public parks, gardens and social housing as part of its planning, with most recent goals aimed toward expansion of green infrastructure for achieving a sustainable and livable city (Balikci et al., 2022). While most of the urban parks and larger green spaces in Amsterdam were created before the 1980s, a new strategy, dubbed the *green compact city,* transformed the urban planning paradigm beginning in the 1990s. Through this strategy, rationale for greening was increasingly *"argued from a competitiveness perspective"* to the point that greening *"became part and parcel of the city's economic strategy"* (Amsterdam municipal strategist; City of Amsterdam Chief Urban Planning, Interviews, 2019). The *green compact city* strategy combines two purposes: Conserving and developing green recreational and natural landscapes in the urban fringes while developing 25% more pocket parks and small green recreational areas in in the city center. As illustrative of these changes, since the 1990s, new high-density residential homes, museums, hospitality industry infrastructure, as well as green, walking and biking paths have dominated redevelopment on the East Amsterdam waterfront as well as Amsterdam's northwest (Figure 6).



Figure 5. Wonam Luxury Residential Apartments Development in Amsterdam Nieuw-West (2019). Photographed by Helen V.S. Cole (co-author).

Prioritization of investment toward quality green space is clearly demonstrated in the municipal budget which amounted to close to €20 million yearly in the 2015-2018 Green Agenda (Amsterdam Green Agenda 2015-2018, 2015). Through this funding, goals changed from being quantitative (e.g., 200m2 of greenspace per 400 built households pre 2015), to becoming qualitative (considering specific characteristics of green space and its surroundings needed in new developed areas). As Amsterdam's Chief Urban Planner explains, greenspace and housing are perceived as a pairing match in the City's planning rhetoric:

> "If you want to have a successful park […] you don't have to do something in the park, but you have to do something around the park […]. If we [the city] invest in parks in areas that are too monotonous, too crowded with people who don't have enough money to support the amenities [...]then you can't change the quality of the park use […] if you want to develop the use of green areas you should densify and, after you have done that, then you can go into the park […] so it's not the quantity of green it's the quality of green and its surroundings" (Interview, 2019).

Many of these green developments take place in the context of a legacy of national social planning policies that have tended to protect housing rights and thus, indirectly, green justice. The latter include housing laws supportive of the decommodification of housing and universal access to affordable housing, anchored in the historically persistent subsidy of a universally accessible social housing owned by housing associations, a share which remained at 42% in 2022, despite a decrease from 58% in 1995 (van der Veer & Kornatowski, 2023) – one of the highest in Europe. Other social planning policies include strict and comprehensive rent regulation laws reinforcing long-term and affordable leases (Pérez-del-Pulgar, 2021), and inclusionary zoning requirements – currently set at a 40% social, 40% housing and 20% free-market housing (Wijburg, 2021; Van Gent et al. 2018). Underscoring this legacy and national policy framework is a high share of municipally owned land.

Yet these social planning policies that historically ensured housing access for all are slowly being dismantled through a neoliberal paradigm shift (Pérez del Pulgar, 2021). Emphasis is shifting to favor reducing national debt, producing a more competitive housing market, and eliminating the 'ghettoization' of low-income residents into densified areas (van Gent et al., 2018). While many long-standing protections have not yet completely been abolished or disappeared, a once robust system is now diminished in its capability of providing affordable and appropriate housing to lower-, working and middle-class residents.

It is in part the major green developments shift that took place since the 2000s in Amsterdam that have accompanied this restructuring of the housing system and the ambition to end the so-called ghettoization of lower income and ethnic minority residents in excluded neighborhoods (Pérez-del-Pulgar, 2021; van Gent et al., 2018). From a city where social housing constituted 57-64% of the total housing stock up to the early 2010s or so (Jonkman, 2021; van Gent et al., 2018), that share has fallen to 42%, as mentioned above (Jonkman, 2021). As high-earning tech- and knowledge-based capitalist industries have begun to move to new highly green, livable and walkable developments, demand for housing has increased for those groups (Figure 7), jeopardizing housing accessibility for the working- and middle-classes whom seem neither able to access the public social housing provision nor private market high-end housing. Indeed, since 2008 the EU legislation on competition has forced housing associations to limit social housing only to economically vulnerable households, excluding middle income households (Interview, Renters Union Representative, 2019). Municipal leaders and planners have also laid blame for this limited access to affordable housing on the free market, and the imbalance between housing supply and demand, particularly when compounded with overly rigid zoning and

regulatory frameworks (Interview, Social Housing Association, 2019; Interview, Real estate developer, 2019).



Figure 6. Mixed-use commercial and residential development in Pontkade neighborhood, Amsterdam (2019). Photographed by Carmen Pérez-del-Pulgar (co-author).

In response, under the hope that quickly built residential developments can and will drive down prices, the city has been developing and planning new urban expansions. However, to finance them and maximize returns, the municipality has declared greening as a long-term municipal strategy in order to attract investment and highly-qualified residents, thus prioritizing financial logics and green goals over social equity goals. As the Chief Urban Planner describes: "*if we see that [housing prices are] going up then we know there is gentrification, then we know we have to invest in the green*" (Interview, 2019).

In opposition with municipal views, housing activists and social housing developers argue that what incites the rapid growth of exclusive real estate development and the current housing accessibility crisis in Amsterdam is the coupling of development with the growing and complex role of the (global) financial sector, a coupling that leads to fewer affordable units built and contributes to skyrocketing housing prices benefiting high-income earners (Interview, Renters Union Representative, 2019). As an affordable housing developer in Amsterdam explains:

> "In 2013 only three parties joined the tenders [developers competitions] […] right now you would have 30 […] then it was possible to win a tender; right now it's just not possible because everyone wants to be in Amsterdam, because it's expanding so, the prices are going up, everyone wants to invest in housing here, especially if it's not specifically written down that they need middle rent housing" (Interview, 2019).

Furthermore, the urgency of the housing crisis is paving the way to further deregulations that ultimately contribute to bypassing or dismantling historically robust social planning legacies. The recent inclusion of the 40% 'affordable' housing segment in the inclusionary zoning regulations is one such example of a dismantling regulation. It ultimately operates as a chimera because affordable housing has no legal definition or regulation, and thus developers are not held responsible for retaining lower rents in this so-called affordable housing share. In addition, the City of Amsterdam keeps promoting 'affordable housing' developments as a solution to the housing crisis, further supporting developers who can in practice set higher rental prices. In return, it often provides developers with reductions in the regulated share of required 'social housing', in many cases from a 40% minimum to a 20% minimum (Wijburg, 2021) in exchange for increased shares of non-regulated 'affordable housing' (Interview, Affordable housing developer, 2019).

Other recent regulations that bypass or dismantle historic protection for lower-earners include the withdrawal of national public funding for social housing; a new landlord levy that demands a maximum of four months of dues equal to rental incomes of housing associations; and strict restrictions of profitable economic activities. All these regulations leave housing associations in a precarious situation and with limited capabilities to continue providing social housing (Pérez-del-Pulgar, 2021). In addition, the introduction of temporary contracts, to which not only private but also social housing developers are subscribing (e.g. up to 93% of the rental within new developments were temporary in 2019) are

further jeopardizing affordable, long-term rentals. Overall, more that 50% of new rental properties in Amsterdam are with a temporary contract (Interview, Renters Union, 2019).

In sum, Amsterdam illustrates how the remaining legacy of affordable housing provisions and planning instruments, in contrast with Atlanta, have until recently held at bay massive city-wide gentrification processes generated by twinned greening and residential development strategies. The analysis also underlines how national social planning policies ensuring access to green are being undermined by recent local hyper-segregation processes, whereby residents with top wages employed in creative industries are separated from middle- and working-class households who have lost access to the city center in what were once protected and robust housing associations that have since had to sell their housing stock in order to relocate to the periphery (City Strategist, 2019; Renters Union).

5. Discussion

This study renews and advances knowledge on the relationship between urban greening and real estate development both theoretically and methodologically. Findings provide a quantitative analysis of the relationship between greening and real estate development that supports much of the literature on hedonic pricing by showing that, in the majority of cases, development follows greening (Caprioli et al., 2023), in a growing number of cities and in a tighter relationship over time. Our analysis also offers a qualitative investigation of the role played by urban green branding in the perceptions and strategies of real estate developers and in the role played by urban planners in facilitating such concentrated, high-end investment (Garcia-Lamarca et al., 2021). Findings may also support recent calls for defining the green gentrification cycle, providing new evidence of the spatio-temporal scales of gentrification related to greening (Rigolon & Collins, 2023). Finally, our article is a key addition to the green gentrification literature as it points to how greening, as part of a continuum, is related to and influences real estate development and often gentrification, with a growing, stronger influence over time. These findings have been further supported in large, multi-scale, national and international studies which demonstrate the gentrification trends associated with greening across temporal scales (Anguelovski et al., 2022).

Moving to our two case examples, when contextualizing findings of Amsterdam and Atlanta, we saw that both have experienced strong economic growth, accelerating since the mid 2010s, where it is likely that greening and real estate development have co-occurred through a symbiotic relationship that contributed to this growing economy (Poe & Bellamy, 2020). In the case of Atlanta, a legacy of

racialized housing segregation has been further amplified by a political local and state economy that supports private, luxury, de-regulated real estate development (Immergluck, 2022). In Amsterdam, in contrast, the legacy of national housing protections and regulations is disrupting the acceleration and intensification of the green gentrification "potential" (Pérez-del-Pulgar, 2021). These paradoxical trends, where greening drives development but still does not drive gentrification citywide in Amsterdam, is partly due to the resistance created by welfare and housing policies which increases the city's capacity to mitigate some of the equity and housing accessibility impacts for the most disadvantaged in the face of powerful global investment (Perez-del-Pulgar, 2021). Our quantitative findings for Amsterdam do not mean that gentrification did not (and continues to) take place in specific pockets of the city, as our qualitative analysis illustrates. Instead, our qualitative analysis demonstrated that other drivers to gentrification are at play and protective regulatory barriers are eroding (Jonkman, 2021; Planas-Carbonell et al., 2023). Thus, gentrification in Amsterdam disrupts and spatially reorders the very social safety net mechanisms that have served tenants and residents for generations by offering secure, stable, and affordable housing to the middle- and working-class in more centrally located areas of the city.

Constrained by irregularities in data accessibility and methods for housing data classification across international contexts, this cross-national and trans-continental type of study does face limitations. Quantitative data presented in this study required multiple scales of inquiry, including neighborhood, multi-neighborhood and city. Because of the multiple scales, it was difficult to locate, utilize, and make comparisons through varying city, regional, national, and cultural contexts. Each location utilizes a different format or prioritizes differing measurements of development and greening, thus making the co-location of such data across a variety of cities difficult. Moreover, publicly available data for European cities did not exist and instead data must be purchased at significant cost. Future research would further benefit from supplementation of uniform data types and units of analysis and may build upon our analysis in order to more definitively establish causality between greening, green gentrification, and real estate development (or vice versa). Furthermore, inclusion of Global South contexts would be welcome in a literature that is largely saturated by Global North real estate development trends and green gentrification dynamics.

6. Conclusion

As cities look to green agendas and initiatives to provide urban residents with cultural ecosystem services, environmental sustainability benefits and climate resiliency solutions (Kosanic & Petzold, 2020), it is critical for urban leaders to consider the broader, city-wide, socioeconomic impacts that occur alongside greening and real estate development and impact marginalized communities at magnitude (Anguelovski, Cole, et al., 2021; Garboden & Jang-Trettien, 2020). Planning action must prioritize community-engaged anti-gentrification and anti-displacement policies while implementing inclusive greening and greenspace development for long-term and marginalized residents. This inherently includes protecting existing social and economic policies that have historically accomplished such goals (Oscilowicz et al., 2022). Ultimately, we believe that unpacking the relationship between greening and real estate development and examining the spatial dynamics occurring on the ground between those two drivers of current urban change is valuable in both planning practice and in supporting positive just, green housing outcomes. In this progressive scenario, new greening does not lead to more acute housing inequalities, but can actually increase both access to green space and secure and affordable housing for all.

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CHAPTER III. GRASSROOTS MOBILIZATION FOR A JUST, GREEN URBAN FUTURE: BUILDING COMMUNITY INFRASTRUCTURE AGAINST GREEN GENTRIFICATION AND DISPLACEMENT

Abstract

Municipal climate resiliency and re-naturing plans are promoting greening and green (re)development, such as the inclusion of new parks, greenways, or rehabilitated shorelines, frequently as a-political, win-win solutions for all residents. Greenwashing and (re)development of green amenities in vulnerable neighborhoods – those often most in need of support towards resilience and adaptation – exposes residents to the impacts of green gentrification, such as the pricing-out and physical displacement from housing, socio-cultural displacement from public space, and associated personal and community traumas. This paper explores an under-researched avenue in the green gentrification literature: How do grassroots community activists organize to address housing and greening simultaneously and how do they operate to achieve justice in greening neighborhoods? We examined the strategies and tools used by community groups in 10 cities in the United States facing green gentrification. We find that justice-driven strategies and tools are supported by the formation of multi-sectoral coalitions which strengthen what we define as "community infrastructures" – social, economic, and political capacities – against exclusive green-washing. We argue that each of the three capacities must be built amongst residents in order to fortify the material and immaterial components of community infrastructure.

Keywords: community activism, green gentrification, greenspace, housing justice, environmental justice

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1. Introduction

Green gentrification has proven to be a controversial and complex challenge for urban planners and the community and non-profit activist groups who mobilize with and on behalf of local residents with aims to achieve a more just, green city. While greening is much needed in communities that have long been deprived of the public health and wellbeing benefits of green space, such as increased outdoor activity with positive impacts on cardiovascular health, obesity rates, and stress levels (Cohen-Cline et al., 2015; Dadvand et al., 2018; Gill et al., 2007; Triguero-Mas et al., 2015), research has also demonstrated that green gentrification contributes to both residential and socio-cultural displacement as well as removal or exclusion from the benefits that are intended to emerge from green spaces and amenities (Anguelovski et al., 2021; Anguelovski et al., 2022; García-Lamarca et al., 2020; Jelks et al., 2021). It can be what some call "disruptive green landscapes" for the health of historically marginalized groups (Triguero-Mas et al., 2021).

Yet, local governments often present urban greening as an a-political discourse, a win-win solution whereby all can benefit from the 'good' of greening (Garcia-Lamarca et al. 2021), further framing any greening agenda through a performative lens that tends to deny any oversight of equity and justice, simply stating 'green is good' (Angelo, 2019). Governmental action tends to overlook that in many global cities undergoing green (re)development lower-income, minority and other socially vulnerable residents, both lower-income tenants and working-class homeowners are being been priced-out of their neighborhood housing and/or socio-culturally displaced by greening and gentrification (Oscilowicz et al. 2022). In response to housing and green space displacement, community and grassroots activists in socially and ecologically vulnerable neighborhoods organizing to demand improved housing affordability and accessibility rights simultaneously with more equitable green space/amenity rights (Anguelovski & Connolly, 2021). Previous research has provided case studies of such activism in the face of greening and gentrification (Alkon et al., 2020) while other research has attempted to identify some of the tactical developments within grassroots mobilizations for just and sustainable neighborhoods (Anguelovski, 2015; Derickson et al., 2021; Pearsall & Anguelovski, 2016, p. 201). However no study has yet addressed the construction of multi-stakeholder and cross-issue coalitions that can respond to green exclusion and address concurring socio-ecological challenges. Recognizing this gap, this paper builds on the following question: How do grassroots activists organize to simultaneously address housing and greening and how do they operate to achieve justice in greening neighborhoods?

Drawing from interviews with 250 community activists, non-profit employees, and municipal leaders in 10 cities in the US, we conducted a novel study at the intersection of green gentrification, community mobilization, and environmental justice. The originality of our work lies in exploring a diverse spread of mobilizations in neighborhoods experiencing green gentrification across a diversity of regional geographies and urban development histories based on data gathered from fieldwork conducted in 10 American cities. Our paper offers three contributions to the planning and community mobilization literature. First, we identify three mobilizing strategies and seven corresponding tools that coalitions use to address different processes and contexts of green gentrification and show how those strategies and tools are important transversal mechanisms for building social, economic, and political capacities. Those capacities are key because they make up the material and immaterial components of community infrastructure that can resist green gentrification (Pearsall & Anguelovski, 2016). We define the *strategies* discussed in this article as the plans of action made by coalitions and activists as a means to achieve an end goal and the *tools* discussed as the actions made within each strategy to achieve the end goals. Second, we discuss in which specific ways and innerworkings in which coalition building amongst community-serving actors/organizations and those outside the community can improve housing and greening equity outcomes (Chaskin, 2001b; Rigolon & Németh, 2018). Finally, building on these analyses, we offer a novel theoretical conceptualization of social, political, and economic capacities as components of community infrastructure – an essential characteristic of building neighborhood power in the context of unequal urban development.

The next section provides a literature review of green gentrification, displacement, and exclusion and connects it to the role that community infrastructure can play in addressing those threats. What follows is an explanation of our methodology and case selection, continued by a section detailing our empirical findings through the framing multi-expertise coalitions that enhance social, economic, and political capacities of individual residents in order to strengthen the larger community infrastructure. We conclude the paper with brief reflections on the contribution of our analysis to green gentrification literature and discuss how our findings may be useful to activists themselves.

2.1. Distributive to procedural injustice concerns in the context of green gentrification

The body of literature studying green gentrification is growing and, at its core, considers the magnitude of socio-environmental riskscapes (Cole et al., 2021). It also explores the social impacts of new green amenities that privilege the white, wealthy, and educated in historically marginalized communities undergoing urban greening transformation (Anguelovski, 2016; Gould & Lewis, 2016; Immergluck &

Balan, 2018; Pearsall, 2010). These urban greening transformations have taken the form of parks, gardens, nature preserves, recreational areas or greenways (Triguero-Mas et al., 2022) as well as climate-adaptive green roofs and buildings, run-off swales, and flood-resilient shorelines and canals (Staddon et al., 2018). A majority of the environmental gentrification literature has thus far focused on the distributional justice elements of green gentrification processes, such as physical displacement from green amenities as well as displacement and pricing out from housing within the periphery of these green (re)developments and amenities (Pearsall & Eller, 2020; Rigolon, 2017; Sax et al., 2022). More attention is recently being brought to procedural justice issues in green (re)development, focusing on by whom and under what processes are policy decisions for new green (re)developments made (Anguelovski, Connolly, Garcia-Lamarca, et al., 2019; Krings & Schusler, 2020; Rigolon et al., 2020). Another emerging research stream highlights the importance of protecting housing rights for working-class residents in urban greening projects, including the preservation of affordable green housing, a housing model where housing costs remain below 30% of tenant income. Affordable green housing can indeed support sustainable, healthy living environments, including energy efficiency projects, access and inclusivity of green spaces and its benefits, and a walkable urban design (Ahn et al., 2014; Rigolon et al., 2020; Williams & Bourland, 2008). Meanwhile, in a scoping review of all literature related to green gentrification, Quinton et al. (2022) frame the term green gentrification as an often nebulous joining of housing challenges that have arisen as a result of greening practices, further urging researchers to avoid the misrepresentation of *any* increase to property value as green gentrification.

Focusing in on the United States, social inequality driven by race and racism remains central to the understanding of distributive and procedural dimensions of green injustice (Pulido, 2017) and is a factor in the unequal localization and typology of greening within American cities (Boone et al., 2009; Connolly & Anguelovski, 2021; Rigolon, 2016). Urban growth patterns of American cities in particular have been demonstrated to be a determinant of environmental injustice, with recent studies finding that cities with continuous high and rapid levels of growth in the post-war period exhibit the strongest relationship between increased greening and whiter populations (Connolly & Anguelovski, 2021). In addition, in public-facing discourse and municipal sustainability/greening plans, the experiences of socially marginalized residents of green gentrification-related displacement, loss, stress, and detrimental effects on wellbeing are largely omitted or replaced with perceptions of greening as 'cleaning up' or 'improvement' (Melstrom et al., 2021). This exclusion leads to a non- or diminished response to the needs and knowledge of those residents whom are often racialized, minority,

marginalized, and most vulnerable to climate change and other urban transformations (Cole et al., 2019; Sharifi et al., 2021). In this context, some urban researchers – acknowledging and supporting the existing experiences, knowledge and agency of BIPOC, immigrant, racialized, low-income and other minority communities – have called for further investigation of the strategies and tools which activists employ to build green and just cities in order to better understand how and where community mobilization against green gentrification is occurring and what transformative potential they hold (Anguelovski et al., 2019; García-Lamarca, 2017).

2.2. Contestation and responses to green gentrification

As a preliminary prescription for the conundrum around greening as a potentially green locally unwanted land use (GreenLULU) (Anguelovski, 2016), initial findings in the planning literature pointed a variety of community resistance practices against green gentrification (Pearsall and Anguelovski, 2016). This literature also identified 'just green enough' practices as a municipality-led approach to prioritize consultation and participation with residents to resist displacement and exercise resilience through implementation of small-scale green planning and design interventions (Curran & Hamilton, 2012; Wolch et al., 2014). This practice has been presented as an alternative to larger, grander (re)development projects where investors would be drawn to speculate on real estate through investment next to and in greening projects (García-Lamarca et al., 2022). More recently researchers have found evidence that casts some doubt on the 'just green enough' approach, demonstrating that many scales of greening interventions, from smaller greening interventions – such as urban gardens or climate mitigation interventions (Anguelovski et al., 2018; Jim, 2013; Loder, 2020) – to high profile green (re)development projects and iconic parks – such as the New York High Line (Black & Richards, 2020) or the Atlanta Beltline (Immergluck & Balan, 2018) – may result in displacement of long-term residents.

With these findings, planning practitioners and urban researchers have since argued to articulate strategies that can complement or move beyond 'just green enough' interventions (Dooling, 2017; Mabon & Shih, 2018; Rigolon & Németh, 2020). They instead call for community-based research that can help prioritize long-term *procedural* justice and investigate the participatory processes of green (re)development strategies while incorporating comprehensive housing equity (Amorim-Maia et al., 2022; Oscilowicz et al., 2021; Rice et al., 2020; Shokry et al., 2021).. Instead, these researchers and others (Anguelovski et al., 2022) point to the compounding incidences of displacement from housing or pricing-out of neighborhoods as a result of new green spaces or infrastructures as a critical frontier

for novel investigation into residential and green space displacement. Here, direct engagement with affected residents and the supporting groups around them is seen as the basis of community-driven resistance and alternative building against unjust green cities. This approach is at the basis of our paper.

2.3. Conceptualizing 'community infrastructure' as a foundation to housing and greening equity

Another integral component to the implementation of long-term procedural and distributional justice in greening cities is the concept of community capacity, or the realization of individual and collective action for the protection and improvement of social, political, and economic community wellbeing (Chaskin, 2001a; Dapilah et al., 2020; Freudenberg et al., 2011; Gil-Rivas & Kilmer, 2016). Previous community-based participatory research, especially public health studies (Lisovicz et al., 2006; Pothukuchi, 2005; Richter et al., 2005), has aimed to define capacity and sustainability as outcomes of a developed *community infrastructure* (Chaskin, 2001b; Shandas & Messer, 2008). We further operationalize and expand on this definition, arguing that community infrastructure is an outcome variable of strengthened social, economic, and political capacities of residents, which can emerge from or become visibly mobilized as a neighborhood experiences rapid socio-economic disruption. Community infrastructure can be elaborated as the development of the material (organizational structures such as grassroots community associations and allies, as well as the physical spaces where residents can meet to strengthen capacities) as well as the immaterial (shared values, goals, care) networks that support a community over a longer period of time (Hacker et al., 2012). Care is indeed a central infrastructure to protect and advocate for and through in gentrifying neighborhoods (Binet et al., 2021), which our research further brings to the forefront. In short, we offer a novel conceptualization of the role of *community infrastructure* and define it as the material and immaterial backbone to community autonomy that provides determination to 'stay put' while reinforcing longevity of self-directed outcomes.

We define social capacity as the ability of individuals within community to maintain and develop relationships that share common values in order to progress in achieving specific goals (Stupar et al., 2022). Social capacity is often rooted in place, where material and physical spaces provide opportunity for residents to deepen their capacity to maintain and develop relationships (Manzi et al., 2010; P. Williams & Pocock, 2010). Economic capacity refers to the ability of communities to maintain and develop financial resources to support the community's goals and vision, including programming as

well as physical infrastructure spaces such as community centers, gyms, and schools (Westwood, 2009). And political capacities include the ability of communities to mobilize for the purpose of collectively working together to tackle issues within community (Wang et al., 2012). Moreover, community infrastructure and its components provide the social, functional, emotional and spatial bonds of place attachment that act as an attachment 'glue' to physical infrastructure (Hosseini et al., 2021). Nevertheless, community infrastructure, including each economic, social, and political capacity component held by community residents, has not yet been sufficiently examined and theorized in regard to community-based green urban planning, a key motivation for this paper.

3. Methodology

Our paper builds on the analysis of qualitative data systematically collected as part of a European Research Council-funded project which analyzed the social impact of urban green amenities as well as the relationship between green gentrification and community activism. Members of the research team conducted fieldwork between 2018 and 2020 in 24 mid-sized cities (defined as those with populations between 500,000 and 1.5 million residents) in Western Europe, Canada and the United States. These cities represent a diversity of urban development pathways and histories (i.e., industrial and post-industrial, economically growing or shrinking; compact or sprawling) are geographically distributed throughout the regions included in the study. After a comprehensive review of grey literature, media articles, demographic change, and local expert input, we selected one (at times two closely located ones) gentrifying neighborhoods as our focus for qualitative field work in each city.

According to the parent project inclusion criteria, selected neighborhoods were experiencing or threatened by gentrification processes along with urban renewal or revitalization, high-end and luxury (re)developments, retail changes, and socio-demographic changes where new green amenity developments were also being implemented. All neighborhoods had also been or were about to be the site of different types of greening projects, including new or rebuilt parks, gardens, greenways, community gardens, waterfronts, canals and/or riverways. These changes were made evident by the arrival of socially privileged residents, increased property value, property taxes, and increased rental costs. Some of those changes were taking place in post-industrial neighborhoods with large amounts of cleaned-up and/or regenerated land (i.e., San Francisco) while others were located in marginalized neighborhoods, that is, places which had historically suffered from under-investment and abandonment, and where historically marginalized groups—working class and racialized people—

were and are often still stigmatized and segregated. (i.e., Dallas, Washington DC, Portland). We verified these trends with quantitative data analysis wherein gentrification was measured using a neighborhood-scale index of multiple demographic indicators (Anguelovski et al., 2022). Each case also represented a unique urban history, specific gentrification dynamics and redevelopment projects, reflecting diverse relations between greening and development.

3.1. Study sample, data collection, and analysis

Field data collection in all case sites and analysis followed the same protocol. We pretested, modified and selected a final set of questions and probes for a semi-structured interview guide based on the overall aim of the larger study, from which this sub-study draws. Individual researchers spent approximately one month conducting intensive and targeted fieldwork in each neighborhood/city, after recruiting a diversity of participants representing community activists, city employees, developers, and community-based organizers to maximize the heterogeneity of perspectives on the topics of interest. In all cities, across Europe, the US, and Canada, 492 interviews were transcribed and coded, of which 250 were selected for this analysis from the American fieldwork. All data was coded through an initial round of thematic coding in Nvivo, identifying all interview materials related to community mobilization, activism, strategies, tools, housing, and greening. These codes were organized into two categories: general strategies and more specific tools within each of those strategies.

In a second stage, we elected to continue coding through a bottom-up inductive approach on American cities, as these cities demonstrated the greatest degree to which community mobilization, housing, and greening equity were discussed. Comparatively, Canadian and European data related to activism reflected a mitigated (comparatively to the American context) intensity related to intersectional challenges faced by activists, such as institutional racism, stigmatization of public/subsidized housing, that were discussed by American activists. After selecting only US data, we aimed for diversity in the development type, continental geography, and economy of cities in the 10 US cities/neighborhoods discussed (see Table 1). For those 10 cases we conducted a more specific, targeted coding of 250 semi-structured interviews with key activists and community leaders discussing community mobilization strategies and tools related to housing and greening equity. In this second round of coding, we used a bottom-up, inductive approach focusing on the following codes: youth/children involvement; equitable housing relations; housing coalition; environmental coalition; business partnership; alternative housing; data gathering; and, among others, conservation (see

Appendix). These codes were then cross-analyzed in a third stage in order to articulate the tools and strategies discussed in the results section of this paper.

During this analysis, we also went back to our larger dataset to complement our understanding of community mobilization with contextual data obtained in our broader set of interviews. These were interviews that did not discuss community mobilization in great detail yet helped us understand unequal redevelopment and greening in each city. In some cases, original interview transcripts were revisited manually to cite exemplary statements made by community activists, community-based organizations, and municipal leaders. We selected quotes from these actors, demonstrating the expectations, understanding and importance of each of the analyzed strategies and tools. This grounded theory approach and coding informed the identification of strategies and tools utilized by mobilized activists and community leaders in response to green gentrification and related pressures in their neighbourhood.

3.2. Limitations

While it was our goal to highlight common trends across cities while providing nuances in the exact strategies and tools deployed, it is important to recognize several limitations of this work. First, within each city, snowball sampling of interviewees occurred, leading to a non-representative sample amongst activists. However, while not exhaustive, our sample of 250 interviewees from 10 mid-sized US cities represented a diversity of voices and histories of urban development and city typologies, increasing the generalizability of our findings in the US context. Second, our analysis did not consider the outcomes or "successes" of all these strategies; instead, we focused on ongoing and continuing coalition work for urban green justice and call for future research on identifying the effectiveness of all the identified strategies. We bring attention to several tools that appear across the landscape of our case studies, pointing to the ease of application for these tools across different cultural, historical, and political contexts. Future studies should evaluate and monitor strategies of coalitions, partnerships, and programs between grassroots initiatives and non-community associated actors (Ruiz-Mallén et al., 2022). Moreover, future research may also identify the less frequently utilized strategies and tactics as these may also provide insight into unusual or special circumstances. Third, we did not pursue further analysis into scaling the degrees of intensity/power of capacity within community infrastructure (e.g. highest capacity vs. lowest capacity). Future research would likely provide significant contributions to planning literature should such a scale be produced. Last, our article does not analyze the question of

limited accountability of local non-profit groups, activists, and grassroots mobilizations in their actions and deliverables within their missions and objectives (Rigolon & Németh, 2018).

4. Identifying coalition strategies and tools to enhance community infrastructure in a green gentrification context

This section outlines the three major strategies we identified across the 10 neighborhoods studied, where each neighborhood was selected and analyzed with the observation that greening was contributing to displacement from both housing and new green spaces themselves (see Table 1, Column 2 for more details on green plans/projects). These strategies and tools are adopted in tandem by coalitions made up of community organizations, nonprofit groups, and civic leaders as a means to reduce and prevent displacement from both housing and greenspace. Identified strategies were observed in at least three of the 10 selected cities. Within each strategy, our analysis discusses tools that activists directly utilize in order to put their strategy to action. Throughout our results, we also point to the transversal mechanisms within each of the larger strategies and specific tools that then activate and strengthen the economic, social, and political capacities that make up what we define as community infrastructure (Figure 8). We include representative quotes for many of the applied tools within each strategy, whereby we identify the gender and ethnicity/race of each speaker in order to better frame the context and positionality of each activist strategy and tool, while leaving other identifiable characteristics anonymous.

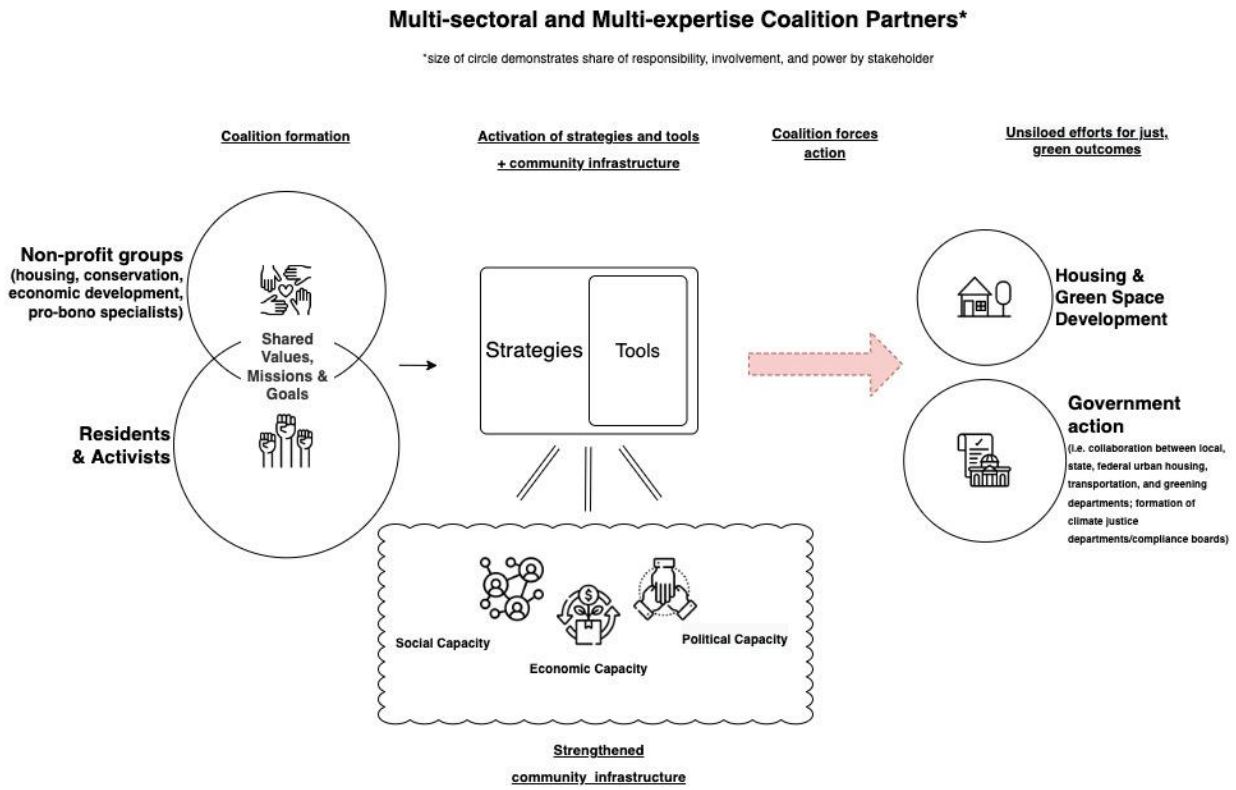


Figure 8. Multi-sectoral and multi-expertise coalition partners for equitable housing and inclusive urban green amenities. The size of the circles represents which stakeholder groups we found to play a more central role in building urban green justice.

These strategies as well as their tools have impact at the neighborhood scale, however many of them are also inherently multi-scalar, interacting with the municipal or federal governments. In Table 1, we outline the results of the thematic coding of strategies and tools utilized by activists in the 10 cities/neighborhoods studied, the context of the greening in each neighborhood, and identification of the relevant coalitions involved.

4.1. Strategy: Affordable and accessible housing outcomes through participatory development

4.1.1. Tools for imagining and implementing alternative community-owned neighborhood development

In some cities where cost of housing has increased dramatically as a result of or as part of municipally implanted greening strategies, non-profit groups and organizations are mobilizing around alternative neighborhood development schemes that can help secure affordable and accessible housing as well improvements to green amenities/spaces through enhanced participation. Three racially and ethnically diverse communities in three cities (Boston, Portland, and Washington DC) have all implemented Community Land Trusts (CLTs)[10] as an alternative development and housing model in cooperation with their municipalities in areas undergoing greening in order to direct the development of affordable housing, contribute to the equity growth of existing families, and protect the environmental quality status of a parcel of land. One white, male housing community activist from the Dudley Street Neighborhood Initiative (DSNI) in the Roxbury neighbourhood of Boston who has advocated for the development of a CLT in East Boston describes the immaterial components of housing, including heightened sense of ownership, strengthened sense of place, and positive health impacts, lending to strengthened social and political capacities, that have come as result of the Dudley Street CLT:

> "… to see a community or communal taking back of land and seeing that control and then putting it to good use… just that unifying force bringing people together around land and making sure that land is available long term. And then just I mean the cleaning up, that was the environmental justice issue… So initially I think it was a real environmental, health benefit of getting [the land parcel] cleaned up and then a source of pride."

By establishing a community-driven instrument for secure housing and community-driven development that also incorporates greening and environmental improvement, individuals describe the reduction of stress on families and the resulting generational impacts CLTs have on community, both lending to strengthened social capacity. The same housing activist in Boston explains the impact

[10] A CLT is a legal entity that holds legitimacy and decision power through eminent domain and develops and controls community assets such as affordable housing on behalf of a community as a means to reduce and prevent housing displacement that results from urban redevelopment, including green redevelopment and/or green gentrification (Anguelovski, Ranganathan, et al., 2021; Pearsall, 2018; Ranganathan & Bratman, 2021)

of an ecosystem of care within secure housing for community members on social, economic, and political capacity as well as the strengthening of political and economic capacity that the Dudley Street CLT would come to produce for its younger generations:

> "… having a base of homeowners means families… which means kids in the neighborhood who can participate in the DSNI youth program. Youth get involved at a young age in DSNI, maybe they live in the Land Trust, maybe they live next to somebody on the Land Trust, but they're in the neighborhood and they're benefiting from programs … [later on] they're benefiting from a job, or you know college application program, and then if they move back to the neighborhood, they can get a home on the community land trust…"

In the Anacostia neighborhood of Washington DC, the Douglass Community Land Trust (DCLT) is under development at the time of writing of this article (Fall 2022) and is similarly driven by community leadership and economic development, as defined in the 2018 Equitable Development Plan. Leaders from the Douglass CLT remarked on the core values of the upcoming CLT, such as community control of both housing and greening development and programming as well as healthy housing that benefits the physical, emotional, and environmental quality of life for residents. As part of the CLT development, a white, female leader from DCLT highlighted the need to ensure the immaterial stability of community leadership and power so as to best develop, manage, and secure affordable housing and wealth creation in the Black, working-class neighborhood yet gentrifying of Anacostia through the CLT:

> "So that notion of community control, the permanent affordability, the right to stay and thrive, the balancing public/community benefit with individual household benefit, and what that means is trying to create intentional pathways for asset building, wealth creation… [and] creating healthy sustainable environments…. [With inclusion and representation] of a diversity of voices [from the community]."

Co-operative housing is another form of alternative equitable housing which can support strengthening economic capacity through generational wealth accumulation and serve as a form of social protection amongst vulnerable neighbors. Non-profit community organizations, such as the Queen City Cooperative in Denver, have implemented a form of co-operative housing in centrally-

located, highly walkable and attractive green neighborhoods that rehabilitates existing housing and allows individuals or families to buy shares into a property and accrue limited equity over time, thus strengthening long-term economic capacity. One white, male representative from Queen City Cooperative of Denver which operates in the gentrifying neighborhoods of Athmar Park and Capitol Hill, explains how the tool provides affordability to material housing, while still also allowing the tenant to build equity and generational wealth within their share:

> "[Co-operative housing] is a structure where people own shares of the house, you know that grows over time but it's at a small rate. So if they were to own a house out in the world they would grow at the market rate and they would be able to sell it and buy it at whatever the market would bear but our house we want to grow at a smaller rate so we're aiming for 3% in order to protect affordability but also balance the need for affordability with the members desire to build an asset that they can have."

In the American context of a liberal-democratic system with a history of de-funding social and public housing programs, utilizing existing federal financial schemes to benefit low-income housing is another alternative housing tool by which community and housing activists can mobilize to provide opportunity for affordable housing outcomes. The Detroit Shoreway Community Development Organization[11] in Cleveland, Ohio was able to leverage a critical public-private working partnership to address rising housing costs in a neighborhood along a newly redeveloped riverfront that was previously an industrial shoreline. It formed a non-profit housing organization that was able to apply for the federal Low-Income Housing Tax Credit (LIHTC) in exchange for 15 to 30 years of housing rates accessible to residents below 60% of median income in a new build or renovation. The non-profit then partnered with a private developer with material capital means to construct the residential building, offering the developer the tax credit. The tax credit significantly reduces the cost of development, provides the developer incentive to participate, and retains low maintenance costs for the non-profit housing manager. A MENA (Middle Eastern, North African), male non-profit housing

[11] https://detroitshoreway.org/history

developer from CHN Housing Partners[12] describes the process for financing new affordable housing development in Cleveland's Detroit Shoreway:

> "Say you build $1 million project, you can get a tax credit that's worth up to $900,000. So, like I said we're a non-profit, we don't pay taxes so we can't do anything with a tax credit. A bank, for example, has a very big tax bill so what they can do is they invest in our project, they give us $900,000 and we give them the right to take that $900,000 credit. So instead of paying their taxes, they're paying us and then they get to reduce their tax bill. And so our $1 million project only has a mortgage of $100,000 because that's all that's left in there and that's how we can afford to rent it out at a very low cost."

For many non-profit groups, attracting public funds to secure housing stability and affordability and addressing overlapping environmental concerns has several challenges, especially in conservative states. In Dallas, housing activists described being confronted with little financial and legislative support from municipal and state governments, proving detrimental to community economic and political capacities, and further compounded by overturning of federal support by more conservative municipal planning committees and standards. For these housing activists, coalition building is imperative in order to provide affordable and subsidized housing particularly in neighborhoods that are seeing rapid increases to property taxes, rent, and cost of living after greening programs have been implemented by municipal government. Mobilization efforts amongst neighborhood coalitions of Black and Latiné communities within West Dallas during the toxins clean-up of a lead plant was crucial in the development of two physical infrastructures that also provide a immaterial community of care to residential neighborhoods, ultimately enhancing the social, economic, and political capacities of residents: the Bataan Community Health Center (advocated for by the Latiné community) and the Benito Juarez Parque de Heroes neighborhood sports field (advocated for by both the Black and Latiné community in cooperation with a governmental non-profit organization). As the health center and sports field were being built, the Black and Latiné residents approached the funding of the material spaces differently as the former was more readily accepting of cooperation and funding from

[12] https://chnhousingpartners.org/housing-and-community-services/

institutional structures including governments and charities, while the latter preferred an internal, self-funded grassroots approach.

Interviews with several housing activists in Boston, Denver, Cleveland, and Dallas demonstrated how coalitions of community groups, citizen housing movements, and non-profit developers utilized different tools to provide alternative housing arrangements in gentrifying neighborhoods undergoing new greening implementations. In turn, the coalitions and tools provided physical spaces for the strengthening of economic, social and political capacities of communities, which then deepened immaterial attachment to place and maintains longevity of secure housing in function. The same MENA, male representative from CHN Housing Partners summarizes this process through an understanding of the organization's mission statement:

> "Our motto is the power of a permanent address, and our primary objective is to promote the stability and health and economic vitality of communities and neighborhoods by making them more secure places to live, essentially our approach is that by stabilizing the household first in terms of having housing security that it kinda frees up family's cognitive overhead, their ability to focus on other aspects of their lives."

While varied in their structure and approach, communities can more fluidly mobilize in cooperation with their municipalities, developers, or other residents to secure more affordable and safe housing.

4.1.2. Tools for using data science and technical knowledge toward more effective advocacy in urban planning processes and decisions

Effective advocacy tools and strategies from residents/activists towards municipal planners is critical to producing the foundation to a strong community infrastructure. This advocacy, in turn, produces a heightened sense of political capacity within civic coalitions. In cases in which residents and activists were under pressures from industrial to residential transformations, brownfield clean up and conversion, and increased redevelopment – such as Atlanta, San Francisco, and Seattle – community members partnered with external, pro-bono specialists to sit on design review boards that would review, critique, and ensure new the physical materiality of neighborhood developments would follow previously adopted community guidelines, a procedurally-just step often overlooked as it can delay or redirect a project. In these three community cases, the partnership of citizen volunteers and pro-bono technical specialists provided opportunity for in-depth investigation and consideration of the technical

aspects of a project, particularly its contributions or changes to physical green spaces/amenities as well as consideration of a project's immaterial impact on social, economic, political capacities within the community infrastructure. In speaking with an Asian, male planner from the City of San Francisco, he explains the intensity of scrutiny during review and the improvements to communication amongst multi-expertise stakeholders as a result:

> "[The community is] really active around development. They've had for many years a really robust Design Review Committee that reviews every single development project that comes into the neighborhood, big and small. So, really conversant in design issues, planning issues".

Integration of residents into conversations with planning departments and urban experts was also accomplished in Portland, a city undergoing large-scale (re)development of neighborhood parks and construction of green transit networks catalyzing dramatic increased to rental costs. Members of the citizen's group Antidisplacement PDX[13] have been building political capacity by demanding rent control and consideration of the right to place for mobile home parks. Those affordable, low-cost housing units are indeed being threatened by applications for re-zoning to higher density, luxury developments. Here, a white, male representative from Antidisplacement PDX speaks on the political capacity needed in order to conduct an effective land use negotiation between planners and mobile home residents, and how "data science" from below – communicated by residents themselves – has great value:

> "I think we were able to kind of bring this combination of the land use, technicalities, and knowledge to have a technical land use conversation with the Planning Bureau, but also have the campaign be led by mobile home residents themselves telling their own stories and bringing those stories to decision makers who have probably never set foot in a mobile home park before and had never met someone who lived in a mobile home park before."

[13] https://www.livingcully.org/programs/normandy/

Many activists we spoke with also described the need for technical data and science to provide material evidence for the housing and environmental injustices occurring in their neighborhood that could validate their claims to municipal planners, enhancing residents' political capacities to advocate for themselves as well as economic capacities to fund community programming. In San Francisco, environmentally-oriented community organizations appeared especially connected to evidence-based housing demands and environmental justice interventions and mobilizations. In Bayview Hunters Point, air quality presents a significant, enduring health issue for residents, particularly children/youth and the elderly – an issue around which residents have created different advocacy tools through a combination of youth engagement in data collection and citizen science. A Black, female community civic group advocate highlights how the workforce development programming for youth together with data gathering and analysis are enhancing political, social and financial capacities of participants and, in turn, community infrastructure:

> "It started with youth and they train them in all kinds of stuff and last summer they did ground-truthing… this year all 10 of that cohort is going to also be trained in this technology as well. So, the hope is, particularly if we can get some government or corporate agencies, part of their salaries will continue to be [funded].

Co-production of data and community-led data gathering when coupled with coalition-building is an important tool in holding municipalities and government organizations accountable, empowering residents' political capacity through affirming their expertise of local knowledge, and building participatory coalitions between residents and non-profit groups. By pairing immaterial epistemic knowledge and material observational data with theoretical expertise through citizen-public partnerships, housing and greening equity outcomes objectives may be more efficiently realized. The same activist describes leveraging grassroots citizen science to create partnerships with health organizations and universities in order to apply for funding that benefits community economic capacity and political capabilities:

> "We just got [another] grant and we are just creating these theory committees and attempting to include every entity that has to do with the environment and with respiratory health and with maintaining and cleaning up the environment. Everybody that has to do with managing air quality [and] illnesses that are born out of air quality. We [will] have collected a trough of data that can validate these problems, that they cannot look

past anymore, and require them to do something about it. Because historically it has been like our social association and splinter groups in the community. No one speaking in one voice. But with this grant, all of the community organizations are joined."

As neighborhood change and displacement pressures threaten communities, residents may not feel they have significant political capacity to review, provide feedback, prove, or discuss on developments outside of the traditional townhall setting. However, expert and citizen collaboration has been shown to provide opportunity for coalition building and partnership around data science, ultimately with opportunity to deliver evidence-based data around a variety of economic, social, environmental, and health concerns.

4.2. Strategy: Community programming, coordination, and facilitation

4.2.1. Tools for multi-sectoral programming, activities, and skill building

In interviews, we also heard how the organizing of programming, activities, and events amongst partnered civic organizations constitutes a powerful tool for strengthening social capacity by fostering sense of community and sense of place and thereby empowering residents to mobilize in response to other issues within their communities (e.g. lack of affordable or appropriate housing or exclusive greening) that often comes as a result of greenwashing or neighborhood transformation. Coalitions of community groups in Boston, Atlanta, Cleveland, Dallas, San Francisco, and Philadelphia each established programming for environmental stewardship and ownership, small-scale agriculture, family and children's recreation, and more. In Boston, GreenRoots organizes *Caminatas Verdes* (Green Walks) for Latiné residents to help reclaim public space along the gentrifying green resilient shoreline in the East Boston waterfront. Many of these programs are aimed at supporting intersectional, vulnerable groups within communities, thus strengthening social, economic, and political capacities of those whom often have least capacity due to other burdens and responsibilities, further laying a strong foundation for a strong community infrastructure. In Atlanta, a Black, male leader for Parks with a Purpose[14] describes the multiple actions and purposes of the community environmental organization, all of which rely on the appropriation of green spaces by residents through improved outreach,

[14] https://www.conservationfund.org/our-work/cities-program/our-projects/parks-with-purpose

educational tools, or fundraising. The environmental programming around ecological management, such as weed and native plant gardening, and urban agriculture, such as small-scale vegetable garden beds, strengthens social, economic, and political capacity and in turn community infrastructure:

> "… [the organization] is focused on developing parks in vulnerable and marginalized communities, helping them to develop not only new parks and green space but to sort of wring all the potential benefits out of the projects, so capturing storm water on site, incorporating edible landscapes, job training programs, working with partners on environmental education… We [also help residents] get funding, broaden resources for them… creating flyers and marketing materials and social media content. We're going to send some of them to some Office classes so they can learn Excel and Word and so just really very basic capacity building. And then we've also been helping take residents to different conferences to speak so that they can share their story with other groups which has been really powerful."

The same conservation program leader made clear the importance coalition-building between organizations of shared values, but different expertise, providing further improvements to social, economic, and political capacities that can benefit both housing and greening goals in communities:

> "… we are a conservation organization and there's only so many of things we can tackle so we try to really bring a whole bunch of partners and others to the table so we can do what we specialize in and they can do what they specialize in and hopefully, you know, as a collaborative effort we get more results out of a smaller project… We obviously can get a lot more done when we partner together to get things accomplished where we all have our skills sets… When seven organizations say we need to look at something then we have a lot more visibility and attention for that request, both from the community and from our cities."

While missions and objectives may initially be different amongst these activist and non-profit groups, the shared value of strengthening community infrastructure can provide a unifying strategy to achieve housing and greening equity.

4.2.2. Tools for children/youth engagement around inclusive greening

In many communities, families, children, and youth are major users of green and public spaces while also most vulnerable to gentrification and displacement from neighbourhood green play spaces (Oscilowicz et al. 2020). As the incoming and inheriting generation of a community, children/youth and their social, economic, and political capacity are thus integral to sustaining attachment to physical space through healthy community infrastructure over the long-term in contexts of greening, gentrification, and displacement. Recognizing children's and youth's overlapping vulnerabilities, community groups in Atlanta, Cleveland, Philadelphia, Seattle, and San Francisco are engaging with children/youth and their families in order to assess their housing and greening needs while providing space for their own agency in the face of unequal neighborhood redevelopment. For example, a Black, female leader in the San Francisco community greening group Friends of the Urban Forest[15] describes that partnerships between residents and non-profit organizations give agency to neighborhood youth. This agency offers them opportunity to self-learn, support their sense of place in greenspace and strengthen the direct connection to their neighborhood and its environmental assets and physical infrastructures, all of which lend to strengthening of social and political capacities:

> "[We give] youth options for what it is that they want to do in programming that day, giving youth an outlet in which they are facilitating, right? So we are like breaking away from this model of like… I'm the expert here, all of you are listening here doing what I'm telling you to do, right? So sharing and building up those leadership skills… They're fundamental principles."

These values are further exemplified in child/youth engagement around neighborhood beautification projects as this approach also strengthens social capacity by increasing the longevity and acceptance of a project, (e.g. community gardening implemented through after-school environmental stewardship camps) while also extending this impact to parents, extended families, and even across generations. In Cleveland, a Black, male Detroit Shoreway Neighborhood climate ambassador describes youth engagement through partnership-based after-school programs as a means to creating a sense of attachment to place for youth by providing opportunity to be part of the decision-making and

[15] https://www.friendsoftheurbanforest.org/

stewardship components of park clean-up rather than "not getting 'buy-in' [if] somebody else is coming in and doing this for you rather than you having a stake in the land." In sum, activists regularly engage children/youth as part of their overall strategy for partnered, multi-stakeholder community programming that aims to strengthen the social capacity of community infrastructure, thereby enhancing attachment to physical infrastructure and youth's own agency. Activists also attempt to engage parents and older family members into place-based activism and stewardship.

4.2.3. Tools for community-oriented economic development and job empowerment around the green economy

As a complementary process to strengthening social capacity, many activists and non-profit representatives we spoke with also explained the priority given to strengthening the economic capacity amongst residents who were engaging with activist programming. In Portland and Atlanta, civic groups and cooperatives are contracting out many on-the-the-ground jobs related to environment conservation (e.g. green space maintenance and trail building) and housing development (e.g. construction or landscaping) to local residents in order to provide them with financial support while also offering job training. In both places, these contracts often became full-time, long-term hires for residents who had completed all trainings and demonstrated commitment to the community. In Atlanta, a Black, male non-profit representative from The Conservation Fund describes the benefits of hiring for programming amongst partnered organizations from within the community, and how this also has had an impact on other residents' sense of belonging, broader community building, and created a positive feedback loop for further community wealth creation:

> "It's sort of a way not only to provide some skills and some job training for [activists] but then to help get the other members of the community invested as well. When they see 'oh, these are people who live in our neighborhood who built this, not people we don't recognize' and then [activists are] paid throughout that whole process and then hopefully at the end of that either the contractor will hire them. [The contractor has] said they're willing to hire folks if they, you know, show that they're willing to work."

Partnerships and coalitions are also critical in the development of community and residents' economic capacity and construction of further community infrastructure to sustain this capacity in both neighborhoods of Atlanta and Portland. Networks of activists and cooperatives have formed and are taking control over broader hiring and job creation partnerships in the community. In Portland, the

Living Cully network[16] partners with non-profit housing developers and the social-enterprise landscaping and contracting company, Verde, for projects involving physical environmental and housing improvements with the aims to improve green space quality and address climate goals while combatting gentrification and displacement (see also Enelow & Hesselgrave, 2015). Within these solidarity economy enterprises, local residents are offered training and work on climate resilient, affordable housing construction and landscaping, which contributes to both the social and economic capacity of community infrastructure. A white, male representative of the 42nd Ave[17] neighborhood development association explains the prioritization of community negotiation power, agency, and solidarity when working amongst a variety of organizations and entities as well as their vision for community-driven economic development – that is development from within:

> "We might work with an outside business, but we want to negotiate with them to ensure that their hiring practices or other things related to their economic function are very intentional in creating opportunity for community members."

Community activists are also working to offer income stability to members of the community through grant-funded projects. In East Boston, the multi-lingual coalition network Solidarity Economic Initiative (SEI)[18] – consisting of seven philanthropic organizations including City Life/Vida Urbana, Eastie Farm, GreenRoots, and Solidarity – launched a Solidarity Fund to financially support community groups engaging in a socially-just and environmentally-just sustainable economy model[19]. These grants have funded projects to support community economic capacity programs and workshops on solidarity economy and funding strategies to support immigrant-led worker cooperatives in East Boston. These groups provide collective power, mutual benefit, and environmental stewardship to promote community solidarity in East Boston. Here, a locally-grounded model of economic development that supports economic capacity and in turn strengthens the community infrastructure allows for more just economic development models controlled by and born within local civic initiatives in order to support green neighborhood goals.

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[16] https://www.livingcully.org/about-living-cully/partners/
17 http://www.42ave.org/what-we-do
18 https://www.solidaritymass.com/
[19] https://www.solidaritymass.com/home

4.3. Strategy: Policy advocacy, education, and networking

4.3.1. Tools to demand equitable, affordable (green) housing rights

Activists demonstrated several approaches and action pathways in demanding equitable housing policy and advocating for tenants' rights in neighborhoods undergoing dramatic changes to rental costs. Community members in Atlanta, Cleveland, Denver, San Francisco, and Portland each described strengthening political capacity through education of housing stakeholders (tenants, landlords, homeowners, private management) in order to develop context-specific, human-rights oriented, campaigns or education platforms for which housing stability and security are prioritized in landscapes where gentrification is related to greening. In Cleveland, the Legal Aid Society of Cleveland[20] and the Housing Justice Alliance[21] has partnered to offer an educational methodology aimed at preventing evictions by teaching healthy and solidarity- and dignity- driven communication strategies to mom-and-pop landlords as well as tenants as a means to improve housing security, reduce displacement, and increase the social and economic capacities in community infrastructure of both stable landlords and tenants. Here, a white, male Cleveland landlord participating in landlord equity programming describes the coalition-produced program and how it has led to improved rental housing guidelines in other contexts:

> "If it's a financial issue that's causing [tenants] to fall behind, instead of pushing for eviction or to get the person out quickly to cut losses, that would be normal in the private market, we have sort of mediated with the tenant to figure out what is possible for them to pay or what they can do for repayment… It's kind of an amalgam, a whole bunch of different strategies usually based on the principle that we should be able to, or we hope that we're able to find a way to run this business in a way that preserves respect and dignity for tenants... [We aim to] create a sort of handbook [or] a model for equitable land-lording that we can then share and promote to others."

In Atlanta, a similar approach to empowering residents through anti-gentrification partnerships is provided for homeowners, particularly Black homeowners for whom homeownership provides

[20] https://lasclev.org/get-help/housing/evictions/
[21] https://lasclev.org/get-help/community-initiatives/housing-justice-alliance/

generational security that was historically denied to them. These activists offer educational events to existing homeowners to build awareness of ongoing tax exemptions, subsidized home efficiency greening programs, homestead exemptions, and other tools which provide homeowners more opportunity for maintaining and feeling connected with their homes without fear of gentrification impacts such as property tax increases and displacement. Coalition building and partnership remain critical aspects of strengthening social and political capacities within community infrastructure through homeowner activism, as described here by a Black, female housing activist in Atlanta:

> "We did a series of what we call homeowner empowerment workshops that help to connect [residents] and make sure residents knew about homestead exemptions… we had [also invited] partner organizations who help with home repair…"

Overall, values of respect and dignity remain as core goals when prioritizing equitable housing, asserting tenants' rights, and providing opportunity to enhance the material liveability of homes through new green spaces or environmental efficiency. Activists are able to tackle a compounded, intersectional issue at the root, as opposed to seeking superficial or confrontational solutions to miscommunication, disagreement, and eventual displacement, thus enhancing social, economic, and political capacities of community infrastructure. Meanwhile, by building and supporting residents' housing agency, leading to more prolonged periods without stress of displacement from their homes or leases, activists may mobilize these same residents to focus attention to other missions, such as improving greenspace, green amenity equity, and building greater political capacity around those goals and beyond them.

4.3.2. Tools for sharing successes

Opportunities for sharing, collaborating, discussion, and debate amongst residents and activists came up as cornerstones to improving programming, opening new creative channels for action, and strengthening political capacities within community infrastructure. Activists from communities we interviewed in Boston, Cleveland, Philadelphia, Portland, and Seattle each discussed how seeking knowledge, support, and advice from other activist groups outside of their context (be it municipality, region, state, or country) was an important component of continuing to build momentum within

effective housing and environmental campaigns/programs. In Philadelphia, Green Building United[22] – a non-profit green building group which promotes low-cost, low-risk interventions for homeowners to improve the efficiency of their homes – found significant support and opportunity for widespread coalition building by facilitating a gathering of green building professionals. As a white, female facilitating member of Green Building United shares, bringing together these professionals and experts from Pennsylvania and beyond provided opportunity to continue to develop policy and share creative, equity-driven alternatives to existing housing financing and construction practices, contributing to strengthening social, economic, and political capacity in community infrastructure:

> "What does it take to develop? What does it take to design? What does it take to implement? What sort of financing is available? What sort of financing is needed? What are the barriers? What is the actual performance of these buildings? … [These questions] developed into a conference and so we have anywhere from a dozen to 20 sessions, people coming from all over the world … sharing the lessons learned. So, they're architects, they're builders, they're developers and they're saying this is what I did, this is what I've seen, this is the data, how can we learn from each other... So we gather speakers, gather attendees and have these shared discussions about what it means to build affordably, equitably and in a way that's also considering climate change."

Other activist groups also found success in organizing amongst both activist residents as well as professionals. While residents may not be aware of exact terminologies when discussing the science of climate change or jargon related to housing development, activist groups and non-profits have shared and leveraged their first-hand experiences and embodied community knowledge of what is occurring in neighborhoods as a result of climate change or displacement. As the same Philadelphia Green Building United activist describes, listening and sharing amongst activists is also an effective way to foster social capacity in community infrastructure:

[22] https://greenbuildingunited.org/

> "The people who are impacted the most don't necessarily know the vocabulary of resilience and climate change, but they do know what's happening to their neighborhoods…"

Valuing community lived experience and perceptions related to climate change, greening impacts, or housing insecurity and displacement at a grassroots level provides opportunity to bridge silos and propose creative solutions to both housing and environmental equity challenges amongst a variety of stakeholders and learning from residents and activists.

In the two cases – the first of more formalized networking facilitated by activists, the second more casual networking amongst neighbors – knowledge, successes, and failures are shared with the result of strengthening social and political capacities of residents to engage further with their local activist groups and benefit the overall community infrastructure.

5. Discussion

Our study, based on 250 interviews from 10 US cities, investigated the strategies and tools used by neighborhood residents working in coalitions with civic groups, non-profit housing developers, non-profit conservation groups, and other major community stakeholders in the face of housing, community, and cultural displacement pressures resulting from (re)development of green amenities and real estate projects in previously underinvested or post-industrial neighborhoods. In our results, we identified how these strategies and tools utilized within coalitions were capable of strengthening social, economic, and political capacities within the community infrastructure of each neighborhood. We argue that each of the three capacities (social, economic, and political) must be built amongst residents in order to fortify the material and immaterial components of community infrastructure. We thus provide a unique analysis of recent activist strategies and tools through the lens of coalition building and their role in strengthening community infrastructures across gentrifying neighborhoods in the United States. These findings contribute to recent debates on activism strategies and practices for housing and green justice (Anguelovski & Connolly, 2021; Rigolon & Németh, 2018), broader processes of community mobilization (Alkon & Cadji, 2020; Anguelovski, 2014; Chaskin, 2001a; Pearsall & Anguelovski, 2016), and environmental justice in the context of greening (Anguelovski, 2016; Wolch et al., 2014).

Our approach was not comparative, but rather layered. The multiplicity of cases we analyzed allowed us to identify core trends in strategies, namely: affordable and accessible housing outcomes through participatory development; community programming, coordination, and facilitation; and policy advocacy, education, and networking. In addition, we found that tool (4.1.1) regarding alternative community-owned neighborhood housing was the most utilized tool within the selected studied cities. This is likely due to the immediate demand for affordable housing by residents across greening neighborhoods, as well as the multitude of developed financial mechanisms that have been tried, tested, and successfully utilized by communities and developers (Derickson et al., 2021; Oscilowicz et al., 2021). Other specific commonly used tools included: data science designed through citizen and specialist co-creation; environmental ownership and stewardship activities; economic asset building in the green economy; or education of housing stakeholders through a more compassionate approach. Our analytical approach also highlighted some unique cases and circumstances in coalition building, such as the case of West Dallas where two neighborhoods, one identifying as primary Latiné and the other primarily Black, were able to form a coalition that sought similar justice-oriented material and immaterial housing and greening outcomes.

Through this analysis, we have identified two major civic processes: a) Multi-sectoral, dynamic coalitions provide opportunity to challenge top-down, government imposed glitzy, green urbanism (Figure 8) and b) Those coalitions empower residents to reinforce *community infrastructure*, which itself is enabled by the strengthening of social, economic, and political capacities. In terms of the latter, we offer a novel definition of community infrastructure whereby long-term, durable social, economic, and political community capacities provide agency and power to processes of procedural justice needed in green gentrifying neighborhoods (Figure 9), thereby positively strengthening both material and immaterial housing and greening equity outcomes (10). These findings support the existing agency and visibility of community activists in accomplishing their goals.

5.1. Defying glitzy, green resilience traps and greenwashing through coalitions

First, our analysis calls attention to the multiplicity, overlap, and combination of coalitions amongst activists and non-profit groups that safeguard just greening, housing equity, and a fair community-centered economy while also starkly contrasting with the largely technocratic attempts for adaptation that many cities implement in low-income, vulnerable neighborhoods (Agyeman, 2013). We heard from activists that processes and attempts by local governments are largely short-sighted, siloed to only housing, siloed to only greening, and/or without proper discussion and consideration of

historically marginalized residents' needs. We find two major characteristics within the process of coalition building: *who* is an actor in the coalition as well as *what* is their expertise. We argue that coalitions consisting of multi-sector, multi-expertise organizations with complementary values and goals can better support communities in strengthening social, economic, and political capacities. These multi-sector, multi-expertise coalitions may derive from within multiple domains and expertises including but not limited to: housing stability, housing development, ecological resilience, just and equitable green spaces, political empowerment, community cohesion and place making, economic development and community wealth creation. Dynamic coalitions provide opportunity for a community to reclaim neighborhood urban transformations and utilize a community-born counter-narrative that defies top-down 'resilience traps' or 'greenwashing' (Angelo, 2019; Checker, 2011; Urson et al., 2022). The strategies and tools we analyzed provide methods by which dynamic coalitions might implement more equity-driven green (re)development plans (Anguelovski, 2015; Campbell-Arvai & Lindquist, 2021; Meenar et al., 2022).

Furthermore, this finding affirms that through strengthened community infrastructures, housing can indeed be 'within the same business as park development.' This result contrasts with recent research that identifies boundaries and silos between nonprofit groups and finds that both groups are not part of the same "business" (Rigolon & Németh, 2018). We thus call for municipal action to be taken toward supporting dynamic multi-sector and -expertise coalitions through empathetic and social justice-oriented empowerment, and early on in greening projects. Moreover, provision of seed, grant, or program funding led and directed by community groups may be effective in ensuring just, sustainable, and equitable neighborhood outcomes (Anguelovski et al., 2020; Bolland & McCallum, 2002; Campbell et al., 2021; Connolly, 2019; Schnake-Mahl & Norman, 2017; Shandas & Messer, 2008).

5.2. Building community infrastructures for enacting neighborhood green justice

Our second key finding demonstrates that there is a relationship between strong community infrastructures and positive housing and greening equity outcomes (9). What we see as strong social, political, and economic capacities provide residents and activists within communities the purpose, reasoning, and ability to identify, mobilize, and address enduring and emerging socio-ecological problems (Williamson et al., 2020). Furthermore, our analysis demonstrates that these three types of capacities make up the larger community infrastructure, of which can be further strengthened through coalition formation (Beckley et al., 2008). Additionally, we found the strengthening of one element of

community infrastructure (i.e. economic capacity) may also amplify another element of community infrastructure (i.e. political capacity) in order to address major compounding challenges, such as lack of affordable housing or socio-cultural displacement from greenspace. We argue that a strengthened and solidified community infrastructure lays the foundation to generate the "city of heart's desire" (Harvey, 2003) and protect residents against the multiple forms of displacement they may be experiencing in the green city. Realization of all three elements of community infrastructure can support both provision of physical space for affordable and accessible housing as well as their immaterial constructs, such as increased desire to participate in both social and political events as well as a strengthening sense of care amongst community, while also considering accessibility to and inclusivity of green space.



Figure 9. Three types of community capacities that make up community infrastructure and resulting vision of just green urban futures.

In strengthening community *social capacity*, we highlighted a novel aspect in housing activism: the unique, transformative potential of compassion, care, and empathy as an anti-displacement provision. As an ideal housing relationship framework that moves away from traditional models of paternalistic, aggressive landlording (Keller, 1987; Power & Gillon, 2022), some coalitions (made up of activists, tenants, homeowners/landlords, and non-profits) seem focused on establishing a long-term social foundation of trust, respect, and security amongst all participating stakeholders. Those practices highlight the emerging need for a reimagining of relationships amongst housing stakeholders, made possible through the coalition model that prioritizes frameworks of empathy, compassion, feminism, emancipation, and decolonization (Anguelovski et al., 2020; Anguelovski, Brand, et al., 2021; Slater, 2004).

Meanwhile, strengthening *economic capacity* takes on multiple responsibilities and roles at different levels of individual and community income creation and for a variety of social classes in each neighborhood. We determine *economic capacity* can be accomplished through the provision of entry-level and more advanced training towards jobs for both adult and youth residents around the green economy that build educational and job opportunities and reduce wealth gaps amongst local residents. Economic capacity also consists in the creation of community-driven and -owned green cooperatives and social enterprises that can vertically integrate the financing, construction and maintenance of affordable green housing and inclusive green infrastructure.

In consolidating *political capacity*, we found there to be a symbiotic relationship between residents' sense of place as well as physical and emotional belonging that endowed a renewed sense of ownership and empowerment in processes of reclaiming and advocating for neighborhood green space. Through reclamation and empowerment, residents, in turn, are emotionally, socially, and strategically equipped to mobilize and address compounding housing and greening riskscapes within their urban arenas (Shokry, 2021). This finding is also supported in European green gentrification literature, where investigation of strengthening political infrastructures through networking amongst citizen and worker activists allowed opportunity for alternative neighborhood visions that incorporated both social justice in housing as well as green infrastructures (Alexandrescu, Pizzol, and Critto 2021).

Finally, our analysis demonstrated the transformative justice potential of the immaterial outcomes of community infrastructure. We observed that when a combination of the three capacities of community infrastructure were strengthened, they would provide the necessary social, functional, emotional, and

spatial bonds to generate justice-centered immaterial green outcomes. These outcomes include attachment to place, a sense of community care, sense of community ownership, sense of community trust, sense of identity, and other iterations that describe relationships amongst people and the environment.

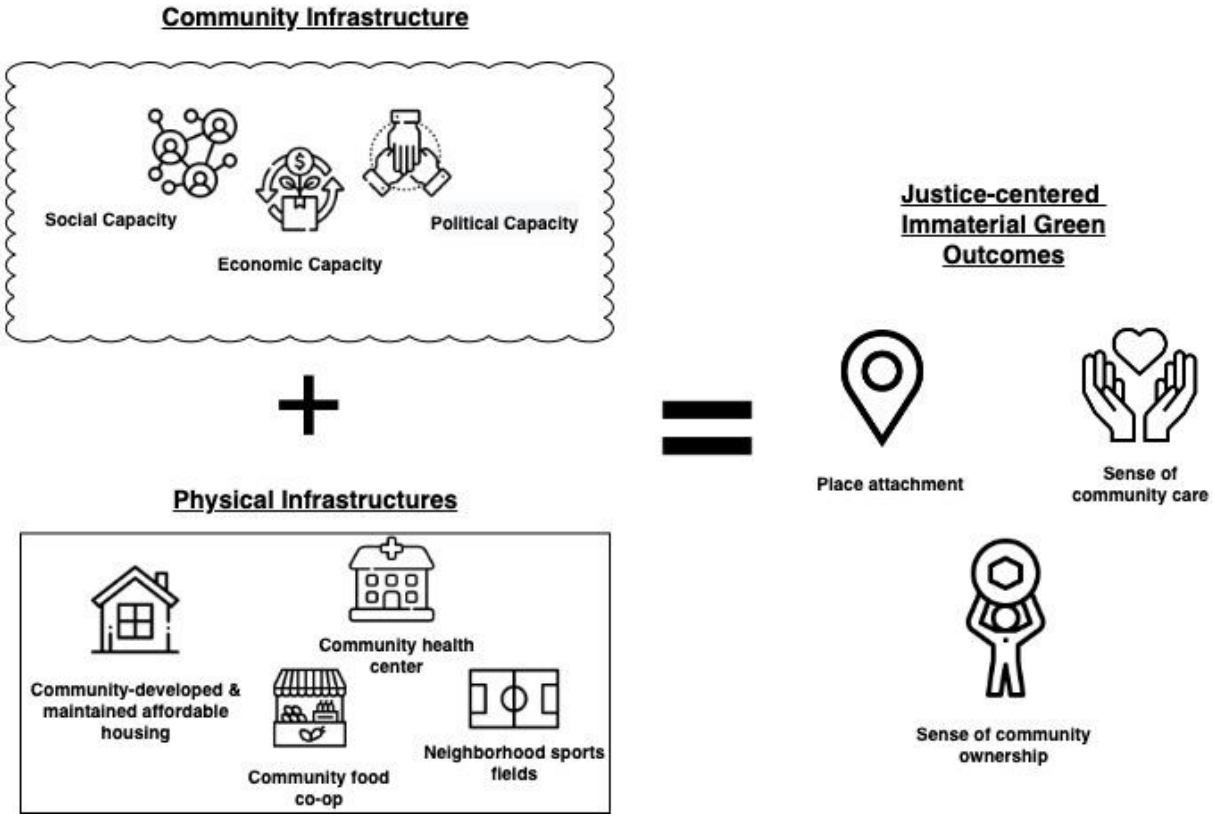


Figure 10. Community infrastructure and its three capacity components provide the social, functional, emotional and spatial bonds necessary for physical infrastructures (e.g. community-developed and maintained affordable housing, community health centers, neighborhood sports fields, community food co-ops, etc.) to provide reinforced justice-centered immaterial green outcomes, such as attachment to place, sense of community care, and sense of community ownership.

6. Conclusion

While it may appear ironic to contest urban greening projects, recent research and shared lived experiences of residents in neighborhoods undergoing significant urban (re)development have demonstrated the 'green is good' orthodoxy is impacting beyond mere access to local urban parks and into overall housing, health, and wellbeing of local residents. The experiences of activists in our studied

cities may offer lessons for green gentrification activism across the United States, considering similar histories of racial and social injustice, and other countries, particularly in the Global North. Identifying these similar threads of strategies and tools utilized in the face of green gentrification provides support and structure for mobilized groups to learn from one another's successes and failures, and bring a sense of community, partnership, and strength to larger national networks. Our discussion presents a novel perspective on the relationship between community infrastructures and activist coalition building and provides research support for future activist mobilization analysis in the context of green gentrification.

Our research has two implications for green gentrification literature that focuses on community activists. First, we encourage activists to feel empowered to tackle both housing and green equity together, not separately, and through an approach centered on care and solidarity, as our study demonstrates that there exists power in multi-specialty coalitions and partnerships that contribute towards building community infrastructure. Furthermore, we encourage urban practitioners and policymakers to support and collaborate with activists to address these intersectional issues from an un-siloed lens by "focus[ing] on power and agency, adaptation framings and recognition of injustice, and incremental timeframes for evaluation" (Malloy & Ashcraft, 2020). This support may come in the form of program funding to benefit non-technocratic, grassroots collaborative initiatives whereby the goal is to strengthen community infrastructures and feel a renewed sense of attachment, place, and community. While some researchers have already addressed this from a government policy standpoint (Derickson et al., 2021; Oscilowicz et al., 2022), this is the first attempt at addressing the multi-faceted strategies of activists at the intersection of greening and displacement in the American context. Future corresponding research may address findings specific to types of greening that cause gentrification and related strategies and tools that are utilized as responses.

Second, we have demonstrated within this study that coalition and partnership building amongst other non-profits or urban practitioners that strengthen community infrastructures is a critical process by which just, green housing and environmental equity can be achieved. The strategies and tools utilized by activists are facilitated through a foundation of multi-sector, dynamic coalitions that enable a variety of actors, lived-experiences, specialties, and expertise to collaborate in strengthening social, political, and economic community infrastructures while ultimately lending to more successful activism outcomes and visibility amongst residents and activists. In turn, civic mobilization for just and green

cities reveals the central role of immaterial benefits and outcomes, especially those that also contribute to more caring cities.

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CHAPTER IV. PLANNING IN AN ERA OF POLY-CRISIS: CHALLENGES AND PATHWAYS FOR CLIMATE AND HOUSING JUSTICE

Abstract

Social and climate injustices are deepening as climate disasters, affordable housing emergency, and economic precarity disproportionately impact marginalized communities. Legacies of redlining and property financialization in the U.S. and Canada compound these crises, demanding an evolution in equity planning. This paper synthesizes research on climate action, urban inequities, and green gentrification by analyzing shifts in planning through qualitative interviews with practitioners in Vancouver, Portland, Denver, Boston, and Washington, DC. We examine how planning adapts to poly-crisis, highlighting barriers and calls for reparative climate and housing justice amid systemic and relational constraints.

Keywords: housing planning; climate planning; green gentrification; poly-crisis; environmental justice; urban greening

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1. Introduction

There is an important qualitative difference in what would be the demands placed on planning and governance systems in cities facing one primary crisis, in theory, relative to those cities that simultaneously contend with multiple extreme challenges. In those latter cases, city planners must seek to build a future while managing immediate threats from climate change-related disasters, a dire lack of affordable housing, and dangerous levels of economic precarity among the most socioeconomically vulnerable residents; in sum, poly-crisis conditions necessarily shape what seems possible and the strategies that seem effective. A crisis is a systemic disruption often that reveals and further intensifies underlying social inequalities and vulnerabilities (Jessop 2015; Klein 2007; Weaver 2017). When two

or more crises converge, a poly-crisis can emerge, amplifying one another and producing complex, cascading risks that circumvent traditional planning capacities (J. Lawrence, Blackett, and Cradock-Henry 2020; M. Lawrence et al. 2024; Moloney et al. 2025). Thus, the condition of poly-crisis is becoming a wicked problem shaping contemporary planning, especially as it concerns the ways in which planners must navigate and strategize amongst both systemic challenges, as well as more practice-based or individualized contemporary challenges in the context of social and climate justice (Humbal, Chaudhary, and Pathak 2023; Anthony 2023; Blok 2020; Cucca, Friesenecker, and Thaler 2023).

As defined, the poly-crisis is not simply about the amplification of isolated challenges but rather also refers to the ways in which multiple, interconnected crises interact and compound one another and shape planning priorities and decisions. For example, the public health restrictions imposed during the COVID-19 pandemic overlapped with the emergency disaster response to Hurricane Ida in 2021 along the U.S. Gulf Coast, complicating access to shelters and housing assistance for those affected (Shultz et al. 2022). Ongoing poly-crisis conditions also compound underlying institutional challenges for just and equitable city planning. This is demonstrated in the legacy and continuing racist and colonial practices, such as redlining and financialization of property in the United States and Canada, that overlap with ongoing climate, housing, and economic crises to generate new degrees of inequality and injustice (Rothstein 2017; Tomiak 2017; Barry and Agyeman 2020). Given the potential for urban planning to be a tool for transformative change (Hess and McKane 2021; Grabowski, McPhearson, and Pickett 2023), researchers and practitioners have called for the practice of planning, and more specifically equity planning, to approach the poly-crisis challenge by adopting strategies that prioritize historically marginalized communities at the intersection of climate resilience, affordable housing, and equitable economic development (Oscilowicz et al. 2022; Angelo et al. 2022; Stein and McKendry 2023).

Existing research has yet to fully examine how planning practice is evolving in response to accelerating poly-crisis conditions, particularly in the context of the interconnected set of challenges related to housing and climate, recognizing them as deeply intertwined and central to the practice of urban planning. Additionally, there is a gap in understanding how equity planning has adapted over time to address both housing needs and climate resilience, especially within more emerging frameworks such as reparative and decolonial planning at the city level. In response, this paper integrates literature that critically examines the methods and patterns of equity planning used to address societal challenges

with recent research on the intersection of climate change and housing (i.e. climate action, urban green inequities, and green/climate gentrification). By doing so, we analyze current trends, shifts, and challenges that municipalities face when planning for equity in an era of poly-crisis. Using qualitative interviews conducted with planners and practitioners in five cities across North America (Vancouver, Portland, Denver, Boston, and Washington DC) in 2019 and 2024, we examine how climate planning and housing policy have co-evolved as both sectors are challenged by increasing social vulnerability to climate impacts and housing needs[23]. Here, we pay particular attention to how planning practice has shifted to incorporate new challenges over the past five years. Moreover, we illuminate a call by practitioners to reevaluate modalities of planning for poly-crisis and we focus our findings on the perceptions and the challenges planners face in implementing reparative climate and housing justice, despite systemic and relational barriers. In sum, we aim to provide a starting point of understanding for how and under what circumstances planners may challenge, reframe, and radically adapt the profession to address poly-crisis.

2. Planning for equity – where does housing, climate, and economic justice fit in?

2.1. From the wrongs of exclusionary development to the Just City and reparative, anti-racist planning

Racism and colonialism are ingrained in myriad discriminatory laws, policies, planning practices, and zoning decisions which have systematically produced inequitable socioeconomic, geographic, and environmental conditions for minority populations in North America (Rothstein 2017; Kobayashi 1990; Sandercock 2004; Barry and Agyeman 2020). For example, systematic segregation and land dispossession was undertaken through planning policy, including but not limited to, exclusionary and racial zoning practices, urban renewal and revitalization of blighted areas, redlining, blockbusting, eminent domain, and the deliberate destruction of working-class housing and placement of interstate highways and public housing within racial minority and low-income neighborhoods (Rothstein 2017;

[23] We utilize the same interview data and findings as in a policy focus report, A Climate of Change: Planning for equitable urbanism on a warming planet published for the Lincoln Institute of Land Policy. In this article, we present a distinctive argument towards the implications the findings described have for equity and radical planning practice.

Pulido 2017). Such powers of discrimination, exploitation, and domination are often encompassed in a broader racial capitalism framework and based in systems of White supremacy, neo-liberalism, settler colonialism, and patriarchy (R. Williams and Steil 2023; Brand 2015; Jacobs 2019; Roy 2001; Goetz, Williams, and Damiano 2020; Pulido 2017). The negative impacts of these systems are experienced uniquely, yet also simultaneously, by individuals and communities on the basis of race, gender, social class, sexuality, and ability (P. C. Williams et al. 2022; Crenshaw 2015; 1991; Davis 1983) as well as in the realms of housing, economy, environment/nature (e.g. climate adaptation and mitigation), and health (Lewartowska et al. 2024; Pulido 2017; Douglas et al. 2024; Agyeman et al. 2016).

Early calls for redressing the wrongs of exclusionary development were underpinned by planning frameworks such as the Just City. For example, in Fainstein's and Marcuse's views, equity and diversity had to become central value pieces of urban development, zoning, and land use planning and be institutionalized through different redistributive and procedural inclusion procedural schemes – that is, through both structural, relational, or planning practice changes (Fainstein 2010; Marcuse et al. 2009). Socio-spatial injustices were further denounced by environmental justice movement and scholars calling to address long-standing socio-environmental risks in regard to contamination exposure and lack of access to environmental amenities, thus aiming towards just sustainabilities (Agyeman et al. 2016). Over time, those historic and contemporary environmental injustices have become compounded by climate risks and the recent impacts of climate resilience policies (Cole et al. 2021; Shokry et al. 2021), further complexifying the tasks of equity planners.

2.2. Reparative justice is climate justice

An emerging paradigm of practice, 'climate urbanism', has entered planning rhetoric as a modality which "relates both to the localization of climate politics at the city level and to new ways of intervening in cities as a result of climate change" both in the Global North and South (Robin, Westman, and Castán Broto 2020, 17) by marrying housing, economy, and climate action (McArdle 2021). Practitioners of climate urbanism operate within a framework of carbon management (i.e. carbon mitigation, climate action planning and policy, etc.) and implementation of adaptive, climate resilient and green infrastructure within the urban arena (Castán Broto, Robin, and While 2020).

Climate urbanism is inscribed in the global green turn taken by cities, that is the growing use of green infrastructure and nature-based solutions (e.g. resilient parks and gardens, restored shorelines, traffic-pacified streets converted into greenways; or permeable areas and pavements) for combined climate

challenges, including addressing stormwater management or eliminating heat islands and cooling neighborhood areas (Shokry et al. 2020). In this green planning orthodoxy (Connolly, 2018), cities and investors are competing against each other for greater investment and attractiveness, capitalizing on the value and rent granted by greening projects (Garcia Lamarca et al. 2022). In those many cases, greening is often a side-project to new housing, whereby greening is meant to capitalize on future property value.

Yet, as greening and development are tightly enmeshed (Anguelovski et al. 2024) without intentional coordination and provision of affordable housing alongside climate action, climate solutions – especially green projects – might unintentionally deepen socio-spatial inequalities through physical and sociocultural displacement of historically marginalized groups, including low-income and minority residents, in a process known as green, resilient or climate (green) gentrification and found in both North America and Europe (Anguelovski et al. 2022; Dooling 2009; Keenan, Hill, and Gumber 2018).

In contrast and in response to those new exclusionary processes, critical planning scholars are calling for more emancipatory and reparative urban climate and greening practices (Anguelovski et al. 2020; Sultana 2024) through new housing, land, and labor arrangements that can simultaneously address the climate and housing crises in the context of continued exclusion and inequality (Aune, Gesch, and Smith 2020; Gould and Lewis 2018; Keenan, Hill, and Gumber 2018; Anguelovski et al. 2019). However, while much scholarly attention has been placed on identifying the scope and types of climate and environmental inequalities, only few studies have conducted investigation of the perceptions, experiences, and challenges of municipal, community, and regional planners in navigating both climate action and housing affordability (Matteucci, Best, and McKendry 2024; Quinton et al. 2024). For example, in an analysis utilizing surveys and qualitative interviews, Quinton et al. (2024) investigated perceptions of planners in Toronto and Vancouver towards green gentrification and how they were addressing the issue in their work, finding that practitioners have a moderate understanding of the term, but often do not use the concept in their work. Moreover, Matteucci, Best, and McKendry found there was a lack of mutual understanding amongst the definition and identification of climate gentrification, yet there was broad agreement amongst potential solutions for climate gentrification (2024).

Alongside this developing field of study, scholars have called for "further scholarship [which] may articulate how a new development paradigm may respond to the threats of climate change while simultaneously recognizing the need for social justice" (Long and Rice 2019, 1005). As such, there is

an appetite among scholars and planners alike for a re-envisioned systems approach that shifts away from siloed government interventions and instead works across sectors to prioritize principles of reparative justice that marry climate equity with housing and social equity. Towards this aim, evaluating the perceptions and perspectives of planners towards their own practice can provide an opportunity for them, in an area of poly-crisis, to reflect on how they contend with overlapping priorities while also providing deep insight into the play-by-play of their professional worlds within the context of reparative climate and housing justice. Put differently, in this paper, we build on the work of scholars advocating for equity and reparations in climate and housing planning and analyze the perspectives and experiences shared by urban, regional, and community planners as they are tasked with addressing challenges arising from climate, housing, and economic crisis.

Our analysis unfolds in the following five sections. Section two explains our study methodology while section three details our empirical findings, where we share the challenges identified by planners and the steps they are taking currently to address some of these challenges. We then discuss the implications of our findings considering other studies to offer further guidance for planners working at multiple jurisdictional levels facing crisis in housing affordability, increased climate impacts, and inequitable economic conditions. Finally, we conclude the paper with brief reflections on the contribution of our research as well as further considerations and research gaps.

3. Methodology

This paper draws from interviews conducted in summers of 2019 (GreenLULUs 216092022-F) and 2024 (COMIRB 23-2176). The most recent interviews were conducted in May and June 2024 with community, municipal, and regional planners in five selected cities in North America: Vancouver, British Columbia (Canada); Portland, Oregon; Denver, Colorado; Boston, Massachusetts; Washington DC (USA) (n=32). These cities were selected based on trans-coastal representation as well as similar mid-sized metropolitan populations. The cities were also selected for their differing urban development histories, yet similarly strained and competitive housing and economic markets. Moreover, each case city represents a unique urban and development history as well as specific climatic concerns, offering opportunity for comparative analysis of the modes of practice operationalized by planners working within the relevant regions and cities (Figure 11).

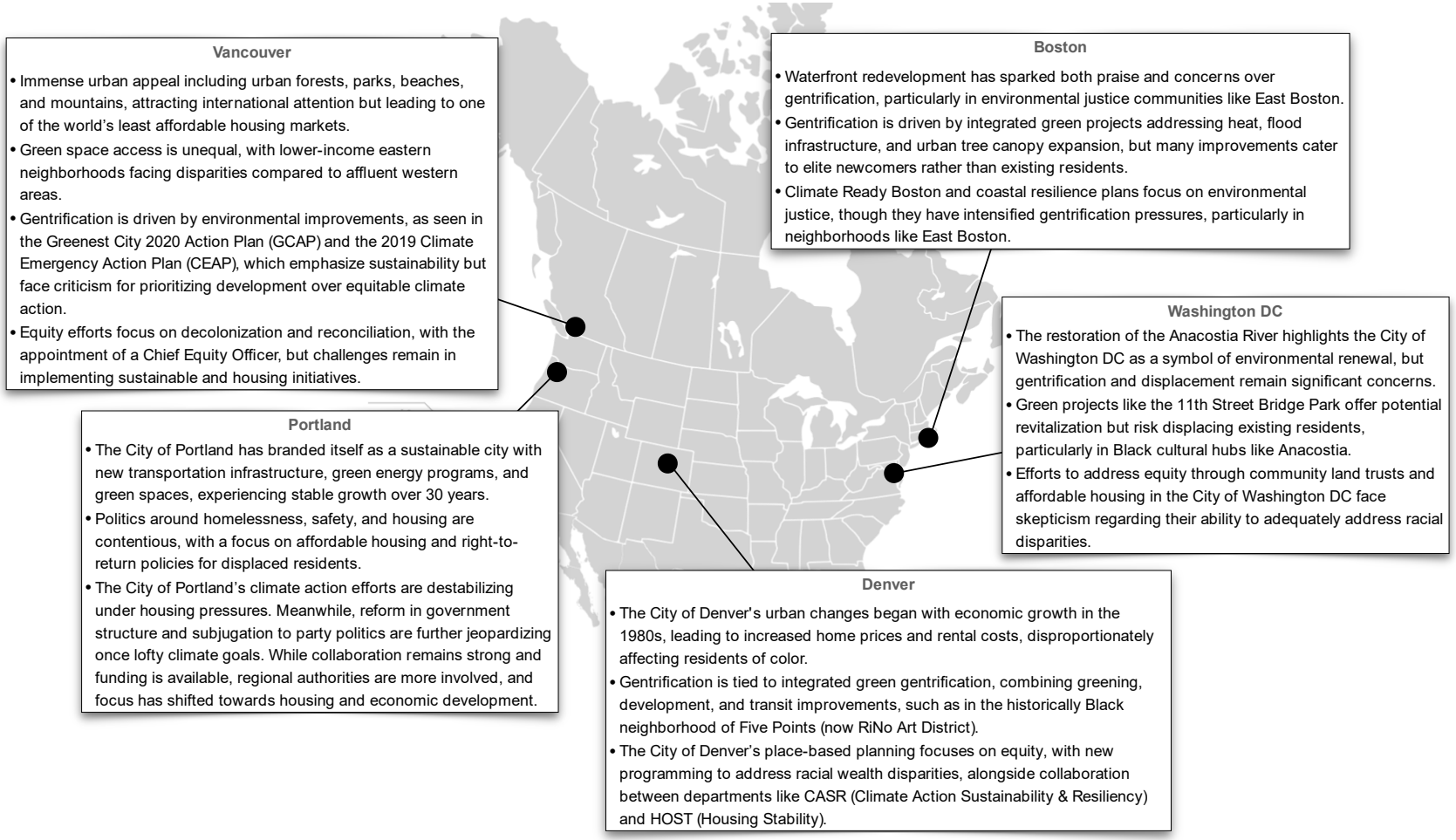


Figure 11. Map of cities selected for 2024 interviews, accompanied by vignettes to illustrate cities' historical planning and development patterns.

We contacted planners and community developers at the neighborhood, municipal, and regional levels via email who were identified as working within three professional planning scopes: climate action/resilience/mitigation, housing, and economic development. Through snowball sampling, we also invited participants to connect us with other planners within their municipality, region, or greater network to include in interviews (Parker, Scott, and Geddes 2019). We aimed to interview an even breadth of planners across these scopes of work and government, contacting 98 practitioners across all cities, of whom 32 were interviewed (Table 1). We do not include demographic data of planners as an intersectional analysis of each planner was beyond the scope of this work. We also contrasted these 2024 interviews with similar interviews (and recruitment processes) we conducted in May and June 2019[24], just before planners and media attention became more heavily drawn to the poly-crises described above. We do not quote or use individual interviews directly, however instead have gleaned the more general perspectives of professionals in their function in each city towards development, affordability, and greening during the earlier time period in order to begin with a baseline perception of how existing planning directions and practices have changed over the past five years. More broadly, we bring those two datasets together to contrast perceptions, priorities, and practices between those two time periods and identify how those have evolved within the paradigm shifts we outline in our results, especially in regard to the constraints and opportunities reported by planners.

[24] The interviews conducted in 2019 have been used as data in multiple publications examining green gentrification, its processes, manifestations, and consequences although this paper minimizes repetitions or use of quotes from those papers. See (Anguelovski et al. 2022) for other relevant analyses.

	2018/2019					2024					
City	**Organization**	**Count of Organization**	**Scope of Work**	**Count of Scope of Work**	*2018/2019* **Total participants per city**	**Organization**	**Count of Organization**	**Scope of Work**	**Count of Scope of Work**	*2024* **Total participants per city**	*(2018/2019 + 2024 Combined)* **Total participants per city**
Vancouver	N/A*		N/A*		0*	Regional Government Municipal Government Consultant Planner	3 2 1	Climate Mitigation Planning Land Use Planning Social Planning Regional Planning	1 2 2 1	6	6
Portland	Municipal Government	3	Urban Forestry Land Use Planning Social Planning	1 1 1	3	Municipal Government Regional Government	6 1	Climate Mitigation Planning Urban Forestry Transportation Planning Land Use Planning	2 2 1 2	7	10
Denver	Municipal Government Non-profit	2 1	Housing Planning Economic Development	2 1	3	Municipal Government	5	Climate Mitigation Planning Green Spaces Economic Development Housing Planning	2 1 1 1	5	8
Boston	Consultant Planner Municipal Government Philanthropic Entity	1 2 1	Land Use Planning Economic Development	1 3	4	Regional Government Municipal Government Philanthropic Entity	4 2 1	Climate Mitigation Planning Public Health Planning Economic Development Housing Planning	3 1 2 1	7	11
Washington DC	Municipal Government Non-profit	2 2	Community Development Land Use Planning Climate Planning	2 1 1	4	Regional Government Municipal Government Non-profit	2 3 2	Climate Mitigation Planning Land Use Planning Housing Planning Community Development	3 1 1 2	7	11

Table 1. Count of 2019 and 2024 interview participants by organization type and scope of work. In 2018/2019, participant data was not collected in Vancouver. This row is marked N/A.The table compares the number and type of planning practitioners interviewed in each city across two time periods: 2018/2019 and 2024. Each row reflects a city. Scope of work and organization types are based on interviewee self-identification. Some practitioners identified with more than one organization type or area of work, resulting in totals exceeding the number of individuals interviewed. Combined totals reflect unique participants per city across both time periods.

Interviews lasted from 45 to 75 min, were conducted and recorded either in person (for 2018 and 2019) or on Zoom (for 2024), and utilized a semi-structured interview protocol that focused on several themes which emerged based on interview protocol from the 2018 and 2019 studies:

1. Understanding planners' roles and experiences in integrating climate action, housing, and economic development within their work;
2. The relationship between planners' work and issues of displacement and gentrification;
3. Modalities and process in funding critical projects;
4. Key partners in their work and how these relationships are formed and maintained;
5. Perspectives towards shifts in planning priorities and strategies; and,
6. Thoughts towards the greatest challenges for environmental or social justice in their work and potential mechanisms to overcome them (see Appendix for interview protocols.)

3.1. Secondary data

In addition to primary data, we collected relevant secondary data including documents and fact sheets, reports, or policy documents from a variety of local organizations and city planning documents outlining cities' comprehensive greening, housing, and economic development plans from 2018 to 2024. This data was gathered from publicly available government websites and existing publicly available academic literature analyses. Data from these sources was used to triangulate, enrich, and verify the accounts of interviewees, and to identify additional development information, dates of relevant events or results of unpublished studies which respondents mentioned.

3.2. Data analysis

Each interview was recorded following ethics protocols [REFERENCE REMOVED FOR REVIEW] and with participant's permission. 2019 Interviews were manually transcribed and 2024 interview were transcribed using Zoom's built-in software. The transcripts were imported into NVivo 12.0 software and manually reviewed by the lead author for language and clarity. All data was fully coded through an initial round of thematic coding in NVivo where a grounded theory approach was taken, grouping together responses to identify specific discourses and imaginaries around climate action, housing, economic development,

and the practice of planning (Corbin and Strauss 2014). This grounded theory coding led to the emergence of the contrasting aspects of planners' work as demonstrated in the *systemic* and *relational* organizational strategy explained in the Results section. In some cases, original interview transcripts were revisited manually to cite exemplary statements made by planners.

As part of a second stage of data analysis, thematic and grounded theory coding from both data sets were comparatively analyzed. Trends, changes, and patterns in themes emerging from 2019 and 2024 data were considered in relation to our research questions:

1. What are the challenges that planners face in regard to climate, housing, and economic development in the 2024 era of poly-crisis?
2. Responding to these challenges, how are planners coordinating climate, housing, and economic action?
3. How has their action evolved since 2019, under which constraints and with which opportunities for a more just climate urbanism and housing practice?

4. Results

We organize our results in two sections. Part 1 illuminates the challenges experienced by planners in practicing within the context of poly-crisis, while Part 2 shares some of the strategies and processes by which planners have navigated the poly-crisis (Figure 12). Each of these two phases is further systematized according to whether they refer to *systemic*[25] or *relational*[26] challenges and strategies. Although the themes presented in each of the two dimensions of planning are not mutually exclusive, organizing the data this way alongside two categorical trends offers useful analytic insights for practice and future research. We summarize each theme below and include illustrative evidence through quotes from respondents in Tables (2-11).

[25] We select the term systemic to refer to planning challenges that are historically ingrained, systemic issues of the systems of governance and policy by which planners must operate within that hinder progress or create obstacles.

26 We select the term relational to refer to planning challenges that are embedded in individual psyches or practices of planners and their constituents, particularly those that are of the social, economic, or political fabric and can be difficult to address due to their complexity and scale.

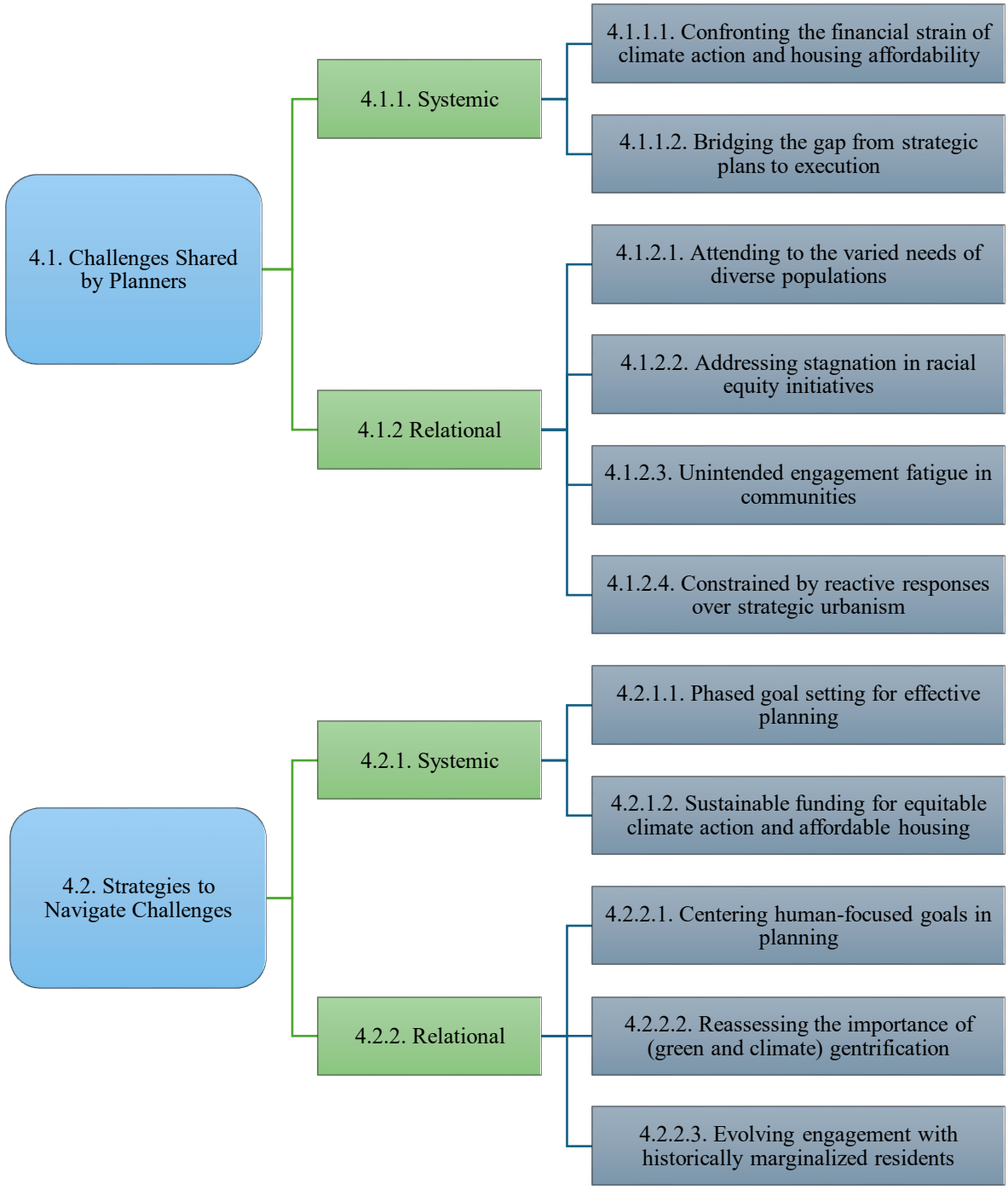


Figure 12. Framework outlining the organization of the analysis. Part 1 presents the challenges shared by planners, categorized into systemic (4.1.1) and relational (4.1.2) challenges, with specific challenges identified under each. Part 2 explores strategies to navigate these challenges, similarly divided into systemic (4.2.1) and relational (4.2.2) strategies, with detailed approaches offered by planners.

4.1. Part 1: Confronting complexity: Challenges shared by planners

4.1.1. Systemic challenges

4.1.1.1. Confronting the financial strain of climate action and housing affordability

Interviews with planners across all cities (Vancouver, Portland, Denver, Boston, and Washington DC) reveal significant challenges as of 2024 in balancing climate mitigation and climate resilience objectives with the costs of housing construction, particularly when developing more affordable housing. Planners highlighted the conflict between green building and affordable housing mandates often clash and that green and affordable housing together are considered financially infeasible in construction and development. Planners reflected on the struggle involved, arguing that it is not the case that businesses, particularly large developers, will not be able to make financial ends meet at the end of a project, but rather that developers push and lobby for wider profit margins and for making the possibility of lesser profit both unacceptable and inconceivable.

Further, planners noted that climate initiatives, such as green infrastructure as part of and around buildings as well as energy-efficient construction, often require substantial financial investments for which most developers are currently unwilling to make concessions, despite the momentum and policy support provided by federal programs that offset costs like the 2021 Infrastructure Investment and Jobs Act or the 2022 Inflation Reduction Act. In turn, many planners across all cities felt green building mandates and policies were losing out to development pressures, lowering standards for climate protection and mitigation. Moreover, it seemed that the attention on addressing the urgent need for housing provision and affordability would risk relegating climate action to a secondary plan. This is in contrast with the political and planning context of 2019 as well as in contrast to positing climate action in competition with affordability priorities.

In all cities, planners described urban development as highly developer-driven, which was seen as intensifying due to developers reporting concerns about increasing costs due to higher interest rates between 2021-2024, supply chain delays, and hikes in the cost of materials. This context seems to contrast with that of 2019 when developers such as those in Boston (e.g. Clippership Wharf by Lendlease in Boston) purposely built housing complexes with green resilient features in mind, including private investment in a natural, living shoreline on the East Boston waterfront. Although this development is far from meeting affordability principles, it at least included climate adaptation and resilient features

at its core through the fulfillment of a required resilience checklist[27]. Furthermore, planners also reported the difficulty of changing construction practices, even those that are cost-neutral, such as adopting more efficient and lower-energy water heating equipment, as contractors and builders often resist adjustments due to deeply ingrained construction methods that prevent climate goals from being met. Finally, all planners from all cities reflected on the ambiguity of supportive housing or climate action funding availability following the (at-the-time) upcoming November 2024 election, sharing that there was concern that funding may return to very low levels as had occurred in the 2016-2020 Trump Administration.

[27]https://www.bostonplans.org/planning-zoning/planning-initiatives/article-37-green-building-guidelines#:~:text=Boston%20Zoning%20Code%20Article%2037,to%20climate%20change%3B%20promote%20a

Challenge 4.1.1.1. Confronting the financial strain of climate action and housing affordability

Quote	City, Planning Sector, and Scope of Work
"There's a definite sense that you can't really do anything that might make it harder for businesses to succeed… We have a colleague who works on embodied carbon, which is all about building materials. And you know, low carbon construction methods and anything in that world is going to be really hard to get through because it's seen as either making it harder to develop housing for a developer, or it's going to hinder the development of affordable housing. So it sort of is this double edged sword, I think, even though it's great on a climate."	Portland – Municipal Economic Development Planner
"In the last two years, since interest rates have ticked up and production has gone down, there's been a lot of focus on sort of rolling back development requirements. Things like active ground floor uses and eco roofs... And sort of reducing those requirements in the name of reducing development costs in the hopes that it would produce more housing. So I think the big focus has sort of swung the other way. Like, we just want to get a lot of development going and it's less when the development was coming here and happening, then we can load it up with all these requirements."	Portland – Municipal Climate Action Planner
"There's a whole host of market conditions that we've been navigating through over the past couple of years, like supply chain issues and construction cost increases… astronomical interest rates with banks.. it's tough to get some of these projects even financed and out of the ground. [These] are projects that are really designed to kind of hit that environmental justice, social equity goals, you know, to provide safety and affordable housing for our residents. So I think when you have everything compounding on each other, it just makes these projects less and less feasible to move forward… There's so many scarce resources, like tax credits, like private activity bonds, which is another kind of funding mechanism for affordable housing development. And it just it makes things just less cost effective and just much tougher to do."	Denver – Municipal Development Planner
"I think there's been a pretty big contraction [of decarbonization efforts], especially as spurned by affordability issues, which are very real. But I think that it is erroneously, deleteriously and counterproductively framed as affordability versus climate action, affordability versus equity action. We only care about the affordability aspect of equity."	Vancouver - Regional Climate Action Planner

"...We have this new energy code that's being phased in, and cities and towns are adopting a more rigorous building code to encourage new development and redevelopment to be more energy efficient. And it's, as you can imagine, caused some tension because developers are like, '*If you require more of us, then we can't build as much. And especially not build under your inclusionary policies too.*' It's kind of like putting affordable housing development up against energy efficiency and development because both are costly. But we need both of those things."	Boston – Regional Climate Action Planner
"I would say bottom line, housing costs are getting higher and it's very hard to reduce housing costs. So that's one of the areas that I'm struggling with the most…is the margin to add cost for environmental sustainability. We're working in the negative. Probably going forward, we will need to cut more cost than just the additional sustainability cost because building materials get more expensive, labor gets more expensive. So we're not just trying to balance the scales with how do we build buildings that use less energy, include more shading and capture more of their stormwater. But we are [also] experiencing macroeconomic forces that are making all of that harder to do."	Washington DC – Regional Climate Action Planner
"[The City] has a bunch of requirements for buildings, mostly focused around energy efficiency and other sustainability measures. It's like kind of steep requirements. And that's come in over the past several years... Do we actually have to invest that much money in fixing all these energy efficiency problems? That creates some tension. And then when I come in later. Also there's a resiliency requirement that you have to do for your building. It's like hard to make that double ask. And now it's sort of like coming later after we've had five, six years of debate around all these other projects. So we're trying to figure out if there's a different avenue than [our agency] requiring of our housing partners for fixing their buildings, especially the ones that can barely fund any improvements at all… Yeah, I don't know if we have all solutions."	Washington DC – Municipal Climate Action Planner

Table 2. Illustrative quotes on the challenge of balancing climate action and housing affordability

4.1.1.2. Bridging the gap from strategic plans to execution

Planners from Vancouver, Boston, and Washington DC in 2024 shared that the traditional practice of developing, crafting, and writing strategic or core plans for climate action or local development is increasingly burdensome, and even outdated. Planners interviewed in 2024 noted that often plans reiterate the same goals and objectives as previous plans and can be confusing for policy and decision-makers when they are especially long-winded. There is a strong advocacy among these planners for a more agile and concise planning process that simplifies goals to ensure mandates and policies are palatable to city council and residents and to strengthen their ability to deliver action and benefits during a present municipal term. Neither Denver nor Portland – two cities that share a Climate Action Fund drawn from a municipal sales tax –identified this same sense of plan fatigue, probably due to having a sustained funding source from which to draw from to support climate action programs and implementations.

Further on the theme of plans as tools of practice, interviews with planners in Vancouver, Portland, and Boston revealed that a significant challenge to their practice as of 2024 is the disconnect between the development and announcement of plans and the subsequent implementation and realization of those goals and objectives. They expressed that they frequently observe that while planning documents are often visionary and aspirational, translating these concepts into actionable steps and tangible outcomes proves difficult, particularly in contexts where local city council political cycles are more rapid than the pace of planning implementation. This misalignment can result in challenges for continuity, accountability, and sustained focus on long-term goals, as political leaders shift or change alongside priorities. Meanwhile, urgent and acute short-term pressures, such as increased immigration of global political refugees, alongside ongoing chronic crises, such as homelessness and the related opioid-epidemics, may disrupt or redirect efforts before meaningful progress can be made. Planners shared that these sprint cycles were especially difficult to work within when planning documents contain numerous goals and objectives, making it challenging to achieve each established goal. The sheer volume of objectives can dilute focus and resources, resulting in slow progress or unfulfilled aspirations as priorities shift to align with changing political agendas

Challenge 4.1.1.2.: Bridging the gap from planning to execution	
Quote	**City, Planning Sector, and Scope of Work**
"While I'm a planner, I've migrated more and more towards the idea that planning is essential, but plans are useless. And it is something that I think I come back to a lot within this work, because I do think there was a period of time where the world appeared, or at least those operating in the world could look at the world as a very kind of like static thing. So when you had a plan, that would hold for ten years. I would say with most of our work, that just doesn't feel like the case to me anymore."	Boston – Regional Climate and Public Health Action Planner
"Like, you're gonna come in, make a whole bunch of fancy documents and have some big unveiling, and then who cares? Like, am I ever going to see the difference?"	Washington DC – Community Development Planner
"Plans say the same thing over and over."	Washington DC – Municipal Climate Action Planner
"Just last year had council approve our first requirements for existing buildings, and we focused it on large commercial and large office buildings, essentially downtown office towers and large commercial buildings. And a big part of the reason we did that is because those buildings are typically owned by large, sophisticated, wealthy owners. Pension funds, those sorts of groups who have the greatest ability to comply with the regulation and make the necessary building retrofits. Retrofits can have long term savings, but they can definitely have costs associated with retrofit. And so essentially, it's imposing requirement on those who can afford to have the ability to meet the requirements. We intentionally did not include multifamily buildings in that regulation. For multifamily, particularly rental and affordable housing, we're leaning more towards how can we provide funding? How can we incentivize, how can we do pilot projects? Ways to enable them without applying a burden to them? Yeah, I wouldn't say renovation would not be triggered by what we're sort of supporting or yeah, funding at the moment, really. We just don't want to impose a cost burden on those sorts of buildings."	Vancouver – Municipal Climate Action Planner

Table 3. Illustrative quotes on the challenge of bridging the gap from planning to execution

4.1.2. Societal and practice challenges

4.1.2.1. Attending to the varied needs of diverse populations

Interviews with planners in Denver, Boston, and Washington DC reveal an increasing effort to expand housing aid services to better support middle-income individuals and rental tenants, a shift from 2019 who have traditionally been neglected by federal funding and municipal grants, especially pre-pandemic ones. Middle-income residents often find themselves in a gap where their incomes are too high to qualify for low-income assistance programs (e.g. for example Section 8 Housing Choice Voicers) or for grants aimed at climate efficiency, retrofits, or resilience, but still insufficient to afford market-rate services comfortably. This scenario creates a precarious situation where these individuals are burdened with high living and climate costs without receiving any aid, making it challenging to achieve both financial stability and climate resilience.

Additionally, rental tenants face unique vulnerabilities as they are frequently excluded from climate-related funding, benefits and services tailored predominantly for homeowners and their homes, even in the federal programs approved under President Biden. Local programs addressing climate resilience, such as Denver's Home Energy Rebate program, which aims to eliminate natural gas dependency in single-family housing[28], as well as Washington, DC's Home Efficiency Rebates (HOMES) and Home Electrification and Appliance Rebates (HEAR)[29], which seek to lower energy bills by subsidizing energy efficiency improvements, often do not extend to rental properties. Instead, these programs typically benefit only the landlords, who may lack sufficient incentives to upgrade their properties for the benefit of tenants or may choose to increase rental prices after making such upgrades. Planners shared their awareness of the ongoing exclusion of renters from essential support systems as a significant problem in their approach to climate resilience as of 2024, as it leaves vulnerable populations without the necessary resources to cope with rising living costs and environmental challenges, ultimately perpetuating cycles of inequity and insecurity.

[28]https://denvergov.org/Government/Agencies-Departments-Offices/Agencies-Departments-Offices-Directory/Climate-Action-Sustainability-and-Resiliency/Cutting-Denvers-Carbon-Pollution/High-Performance-Buildings-and-Homes/Electrify-Your-Home/Space-Heating-and-Cooling/Home-Energy-Rebates

[29] https://www.energy.gov/scep/articles/biden-harris-administration-announces-district-columbias-launch-federal-home-energy

Challenge 4.1.2.1. Attending to the varied needs of diverse populations	
Quote	**City, Planning Sector, and Scope of Work**
"I think that there was more of a sense that we had to pay attention to middle income populations, right, people who are working in the community. And then what happened, I think, is that there was a more acute need, at least that was identified by some people, that resources need to be poured into [housing the homeless]. So you're almost talking about sort of differences in terms of the way that you're thinking about housing."	Denver – Economic Development Planner
"There's not been enough or it doesn't seem like there's been enough access for income restricted households, neighborhoods of color to participate in some of the homeownership-based opportunities there are for climate mitigation. [For example when] people are renters and things like that or essentially don't have the ability to essentially kind of do some of the investments that were required to make some of those energy efficient improvements. We've done some of that as well in school environments, but I think housing has been part of that, too.	Boston – Regional Climate and Public Health Action Planner
"And the frustration of a market rate participant like myself is why is it that the government policy is all the money from our Sustainable Energy Trust Fund, which is every electric user in the district is paying a couple pennies or whatever towards this sustainable energy utility that then has money to invest in efficiency and solar. None of that money is reaching me. It all goes to low income, which is good, but it's like, why are you leaving off the market-rate participants… You know, how do we get the all the society involved in this and not only direct every resource to the low-income piece?"	Washington DC – Regional Climate Action Planner

Table 4. Illustrative quotes on the challenge of attending to the varied needs of diverse populations

4.1.2.2. Addressing stagnation in racial equity initiatives

Planners reflected that in the wake of the 2020 Black Lives Matter movement, urban planning practice and discourse across all cities experienced a surge in discussions and policymaking (e.g. requirements for more departmental diverse staffing; emphasis on addressing the racial wealth gap in policies/programs; establishing guiding charters of social and environmental justice etc.) around racial equity and racial justice. Most of our 2019 and 2020 interviewees reported on their vision to prioritize anti-racist policies in those diverse domains, including climate action. For example, planners in Portland, Boston and Washington reported on pushing funding for green projects alongside waterfronts while giving support to equity-driven land use arrangements, such as community land trusts, or to housing equity cooperatives (e.g. Verde in Portland). However, planners across all cities (Vancouver, Portland, Denver, Boston, and Washington DC) shared their sense that racial equity efforts have since shifted and have taken a lesser prioritization of concerns as of 2024 within planning departments as well as in local city councils in comparison with broader equity needs, including rapid and mass construction of housing at all income levels.

Planners described positive impacts to departments of considerable changes to the structure and processes within planning departments, including the addition of new leadership roles such as Chief Equity Officers that highlight historic racial injustice and give priority to undoing them. Yet, they also noted that interdepartmental processes have not been streamlined to ensure that all aspects of planning work is validated and considered by such new racial equity roles. Planners did not reflect on whether budgets for racial equity have been cut or reduced, nor did they note that there had been a specific topic or focus that has been shifted toward in lieu of racial equity. They do note, though, that a unified and common understanding of what racial equity means to different organizations, departments, and projects does remain a significant challenge to achieving more just outcomes in their work.

Last, some planners note a disconnect between the rise of race-conscious policy developments at the local level, particularly since the 2020 Black Lives Matter protests and national calls for racial equity. There exists a continued lack of support from the federal government, where equity policies remain explicitly 'race blind', a tension that has persisted even prior to Trump's return to the White House in 2025.This difference undermines the ability of local agencies to pull funding, gather data, or pass programs that are race equity driven, especially those that might be at the intersection of climate and housing equity.

Challenge 4.1.2.2: Addressing stagnation in racial equity initiatives	
Quote	**City, Planning Sector, and Scope of Work**
"I feel that there's a backlash towards the, you know, the [Equity, Diversity, Inclusion] movement generally, and so the attention and support that those [received are] diminishing a little bit, both internally and certainly externally. And so, some of the more race specific things that we've been doing such as small business support, I think are going to be… more scrutinized."	Denver – Municipal Economic Development Planner
"Planning's a kind of flavor of the moment type of profession. And [racial equity is one] of the issues that worked its way through the planning field. It just feels like every couple years there's cycles where everybody's talking about climate and then everybody's talking about health. And so, you know, we went through one of those waves with respect to racial equity."	Portland – Regional Climate Action and Transportation Planner
"It feels like [racial equity action that] was happening has kind of either plateaued or kind of stopped where it was… I've just really become much more cognizant of the regression and how much effort that progress takes."	Boston – Climate Action Planner
"[Interest in] issues of equity, particularly racial equity, ebb and flow. It is a reactive process that [relies on] something bad to happen and [planners] react to it, and then something else catches their attention and they forget about it.	Boston – Regional Economic Developer
"I've had too many sleepless nights, both from my job and from just things in general. From my job, I would say not considering equity, particularly racial equity, as important and as necessary as what it is for our society to flourish. I think we get too caught up in it being the flavor of the month or it being something that doesn't take as much money as it really does to implement, much as much time for it to be implemented and as much just changing of hearts and minds, which is very hard to quantify in the world of a planner. So I would say that that's what. What keeps me up at night. I haven't seen it yet, but I. I always feel like a lot of the times we have to kind of like, stumble, pick ourselves up, dust ourselves off and start all again. And I think we lose a lot of people along the way because we operate in that format."	Boston – Regional Economic Development Planner

Table 5. Illustrative quotes on the challenge of addressing stagnation in racial equity initiatives

4.1.2.3. Unintended engagement fatigue in communities

The necessity for strong, deep engagement has become even more critical since 2020, prompting a move away from traditional stakeholder language towards more inclusive and participatory processes. This evolution is vital for responding to the demands of civic groups seeking more profound and meaningful engagement in shaping their communities rather than being considered a "stakeholder", which many now associate with people who once drove a stake into the land of indigenous people to demarcate new priorities being occupied and stolen from Indigenous territories – rather than decolonial planning practices (Reed et al. 2024). Some cities, like Portland, report that local plans can now be shaped entirely by the desires and input of frontline communities. For example, Portland's Bureau of Sustainability has implemented *Climate Justice by Design* (CJxD), which emphasizes the creation of 'third spaces'—"collaborative environments where community members and government officials engage as equals to identify shared priorities, develop strategies, and find innovative solutions to address the climate crisis"

While community engagement remains a critical and continuously improving component of planners' work, planners in Vancouver and Boston shared the unintended effects of exacerbated community engagement for which communities may be exhausted, fatigued, or at capacity. These recent 2020-2024 experiences were particularly felt when working with smaller communities with fewer staff or involved persons, such as Indigenous groups in the Vancouver context. Some planners had shared the recognition that Indigenous folks have already articulated their priorities in planning, such as requiring culturally appropriate housing and public spaces as well as culturally appropriate greening and sustainability practices, through comprehensive policy documents for which extensive engagement had already been conducted thereby making the multiplicity of requests for engagement by dozens of governing agencies and organizations within a region unnecessary and burdensome.

Challenge 4.1.2.3: Unintended engagement fatigue in communities	
Quote	**City, Planning Sector, and Scope of Work**
"There is a recognition that morally it's important [to engage with Indigenous communities] but there's also legal requirements under UNDRIP to genuinely consult with indigenous partners or nations or individuals on work. Which is fantastic, but it also puts a huge burden on nations that may only have like two staff people or this one individual that, like, always gets kind of tagged like, can you be on the board of this group? Can you know, consult on this? It's just it's almost this tsunami of governments and institutions now looking to indigenous communities or groups to kind of play a bigger role, which is great in theory, but in practice, they're just there's not the capacity to do that at this time in a lot of nations."	Vancouver – Contracting Housing and Social Planner
"[We have utilized a climate action planning strategy] called the community-driven climate resilience framework to do a community0led plan instead of having a really top-down process. It's meant to be bottom up, and it's meant to really shift power away from government to more shared governance, shared decision making… I'm the main representative just trying to create space for them to meet and guiding them through the process of writing the next climate action plan for the [community]. It's been way slower than a government plan would be but it's been really fulfilling for the organizations. And there are a lot of kind of these like usual suspect organizations that are involved in a lot of different coalitions, different policy kind of campaigns. But we've tried to bring in new organizations that aren't part of that [existing presence], always trying to broaden the coalition little by little. In the end we will have a plan that is like completely defined by frontline community organizations.	Portland – Municipal Economic Development Planner

Table 6. Illustrative quotes on the challenge of unintended engagement fatigue in communities

4.1.2.4. Constrained by reactive responses over strategic urbanism

Planners in all cities shared that they often face challenges in discerning whether their work is reactionary in nature, by responding to immediate crises or issues, or driven by opportunism and the leveraging of current events to push initiatives forward. This ambiguity can create confusion around the motivations and direction of planning efforts, making it difficult to determine if decisions are proactive in addressing the needs of the public, or merely reactive to acute events, including climate-change related disasters or a change in political power and directions. Planners in all cities report experiencing a desire to be proactive to the voiced needs of the public yet struggling to maintain control over the planning process as acute and catalytic moments determine planning priorities. Moreover, planners report this reactivity-bias to have also existed in 2020. This dual pressure leads to a feeling of 'backseat driving' in planning practice, where planners feel they are not fully in control of shaping outcomes but are instead reacting to external forces, often with little time to effectively provide foresight or strategic input. In 2024, a climate action planner in Washington DC described planning in Washington, DC, as an often opportunistic process driven by federal priorities and the availability of funding or immediate opportunities, such as disaster responses or infrastructure updates. The planner shared that this reactive approach, while yielding useful projects for the community, left them uneasy due to its lack of a clear, proactive strategy.

Several planners observed a marked change in their work environment after the Biden Administration replaced the Trump Administration in 2020, four years earlier. Under the Trump Administration (2016–2020), federal funding for climate action[30] and housing[31] was volatile or virtually nonexistent, and the silencing of the Environmental Protection Agency further exacerbated challenges. This period was described as a particularly difficult time for planners, especially those focused on climate action, with many perceiving their work during that administration as entirely devoid of viable opportunities. In contrast, while planning in 2024 was characterized as opportunistic, planners described some improvement over the earlier period of stagnation. In 2024, planners had greater access to funding and policies that made planning, especially for climate action, more feasible, although they were conscious

[30] https://www.nytimes.com/interactive/2020/climate/trump-environment-rollbacks-list.html
[31]https://www.npr.org/2019/04/03/709529287/bipartisan-disapproval-over-trump-administrations-housing-program-cuts

that funds had to be swiftly disbursed in case of a return of President Trump in January 2025. For example, the Biden Administration's Inflation Reduction Act provided *Environmental Justice Government-to-Government (EJG2G)* grant funding, valued at $1 million each, to the City of Boston which supported government partnerships with community-based organizations in communities disproportionately affected by environmental harms and funded projects for improving indoor air quality and electric infrastructure and replacing gas stoves with electric coil ranges and induction stoves, among other supportive benefits (US EPA 2023).

Challenge 4.1.2.4: Constrained by reactive responses over strategic urbanism	
Quote	**City, Planning Sector, and Scope of Work**
"This is a very development [and] developer driven city. And that's a huge challenge that I think all of the justice warriors within the city and the communities have really tried to push back and try to implement policies and regulations and programs that incentivize developers to do better."	Denver – Municipal Climate Action Planner
"[City-developed] projects just take so much more time. You know, the city has to go out and acquire the land, which that could take a year in and of itself to go through all of our due diligence work back and forth with the existing buyer. And then we have to put it out for an RFP, you know, competitively kind of procure a development partner that they have to go secure financing. So it just takes such a long time. Whereas a project can come to us, the developer already has site control, they already have financing in place, they can break ground in six months. So there's been much more emphasis on those shovel ready projects, which unfortunately takes us out of the driver's seat a little bit about what actually gets built.	Denver – Municipal Housing/Development Planner
"In general interagency engagement happens, like constantly. We're working with other people. It's a little more ad hoc. We do have this group, but we do a ton of stuff where we identify a project or we find a person and agencies willing to collaborate and we'll chase those opportunities. It's like opportunity based collaboration."	Washington DC – Municipal Climate Action Planner

Table 7. Illustrative quotes on the challenge of constraints by reactive responses over strategic urbanism

4.2. Adaptive strategies: How do planners navigate challenges to realize opportunities?

4.2.1. Strategies to navigate systemic challenges

4.2.1.1. Phased goal setting for effective planning

Planners in various of agencies and public organizations in Washington DC and Denver shared their efforts to implement periodization – or strategic structuring of planning goals into timed-periods including short-, medium-, and long-term goals – as a method as of 2024 to manage and achieve long-term climate, housing, and, economic development goals. Many expressed that they often grapple with the challenge of setting granular, myopic goals, particularly in Climate Action Plan (CAP) contexts, which can lead to slowed or even halted implementation. Recognizing this, planners emphasized the using short-term goals to maintain momentum and achieve tangible results, particularly through actionable pilot programming. Examples of such pilot programming include Denver's Basic Income Project[32], which offers up to $1,000 per month to families and individuals experiencing homelessness, and Boston's Fare-Free Bus Route Project[33], which mandates four years of free bus fares on major routes. The value of pilot and "quick wins" programs allow cities to innovate and respond proactively through small-scale initiatives which could effectively and amply demonstrate success to the community and policy-makers. This widening of the aperture allows for a more holistic approach that can incorporate smaller, incremental wins—each serving as a complementary building block towards larger achievements.

[32] https://www.denverbasicincomeproject.org/
[33]https://www.mbta.com/projects/fare-free-program-routes-23-28-and-29#:~:text=Service%20on%20routes%2023%2C%2028,by%20the%20City%20of%20Boston.

Challenge 4.2.1.1: Phased goal setting for effective planning	
Quote	**City, Planning Sector, and Scope of Work**
"[Recently implemented climate action community projects] are really sort of ways in which it's a learning opportunity through these pilots to see like what are we missing? You know, what are like what's the low hanging fruit that you can sort of take on, I think."	Denver – Municipal Climate Action Planner
"If you look at pretty much any climate action plan, particularly for regions like [Washington DC], which aren't heavily industrialized, it's, you know, just kind of residential, commercial, kind of standard societal stuff. You know, the strategies and actions, are the same again and again like you know it. It's amazing how much money consultants are developing plans that say pretty much the same thing over and over again… Now [Washington DC Metropolitan Region] has a policy committee to help guide the work across the region on what we want to do on climate. One of the first things they decided they wanted were short term climate action plans… we need short term goals and actions to keep get things moving."	Washington DC - Regional Climate Action Planner
"One of our key lessons learned that we share with everybody else is as we advise on this project, is make sure you're building in early wins to combat that, right?"	Washington DC – Community Development Planner

Table 8. Illustrative quotes on the strategy of phased goal setting for effective planning

4.2.1.2. Sustainable funding for equitable climate action and affordable housing

Interviews with planners revealed two primary challenges as of 2024 in addressing climate action and housing affordability. For climate action, planners frequently struggled with securing stable and consistent funding, often relying on piecemeal grants or politically influenced budgets, which hindered long-term planning and implementation. For housing, planners expressed frustration with their limited influence over affordability decisions, feeling relegated to "backseat driving" while developers held the reins on key outcomes – a trend that is not new in urban planning but that the climate and housing crises have certainly not altered. This dynamic underscored the tension between public interest goals and market-driven housing production.

Multiple planners from Denver described the city's creation of a dedicated and sustainable funding source for climate action in 2020 as an important step to alleviating housing and climate tensions. The passage of the 2020 ballot measure established the Climate Action Sustainability and Resilience (CASR) Department, funded by a 0.25% sales tax increase generating $30–40 million annually[34]. This reliable revenue stream, insulated from political fluctuations, has enabled Denver to implement equity-centered pilot projects addressing both climate and social vulnerabilities. Examples of such pilot projects include Denver Solar Co-Op, e-bike rebate programs, and the Healthy Affordable Home Electrification Program, which collectively enhance climate resilience while prioritizing underserved communities. Denver's model highlights how consistent funding can bridge gaps between ambitious climate goals and equitable implementation.

[34] https://denvergov.org/files/assets/public/v/2/climate-action/cpf_fiveyearplan_final.pdf

Strategy 4.2.1.2: Sustainable funding for equitable climate action and affordable housing	
Quote	**City, Planning Sector, and Scope of Work**
"I think another big catalyst was the last federal administration trying to pull out of the Paris Agreement. All of a sudden there was this huge new focus on subnational climate action. And it's not like cities hadn't been doing work before. I mean, Denver's been doing climate work since the 1990s, but all of a sudden there was this new focus that cities and states and businesses and everybody has to be all in, otherwise we're not going to hit our goals. And we can't only rely at the federal level for action… And then in 2019 is really when our community started pushing and saying we want Denver to be doing a lot more on climate action. We want a dedicated office, we want more funding. That's how the ballot measure that created the fund for the office came about… but it was really like a community driven kind of catalyst for change."	Denver – Climate Action Planner
So the Portland Clean Energy Fund … was a ballot measure that was passed by the voters in 2018… A large majority, 65% of the vote, [voted for it and it] puts a 1% tax on large businesses that gets put into a fund that is used for clean energy projects and priority populations. So those are demographic groups that are at the front lines of the climate crisis. So it's people of color, people with low incomes, people of disabilities… but it's not directly limited to that. I think over the next 5 years they're gonna be investing over a billion dollars… I mean, it's a huge part of the landscape here like any community based organization. You know, private industry is… They have a huge team and can basically not get the money out the door fast enough, because there's so much of it, and so much need. But it is really like Portland's flagship climate justice program. It's it's a green new deal. Just a massive investment into climate, justice and just transition… we're very, very, very proud of it.	Portland – Climate Action Planner

Table 9 . Illustrative quotes on the strategy of phased goal setting for effective planning

4.2.2. Strategies to navigate relational challenges

4.2.2.1. Centering human-focused goals in planning

Planners we spoke with in 2024 shared that they prioritize plans that place human needs at the human scale at the core of urban redevelopment. We heard planners highlight place-based, neighborhood-focused implementations with aims to enhance the overall quality of life for all residents in Denver, Boston, and Washington DC, reflecting a recent shift towards planning for healthy cities and prioritizing wellbeing and care approaches (Breton-Carbonneau et al. 2025). This people-centric approach emphasizes resilience and adaptation over the myopic focus on often technocratic climate mitigation action. Planners are opting to prioritize strategies that enhance a community and not just individual resident's ability to adapt and thrive amidst changing conditions in addition to the reduction of carbon or other environmental impacts. By focusing on quality of life, these plans ensure that urban development addresses immediate human needs in an equity- and intersectionality-centered manner, such as access to green spaces, safe housing, and reliable infrastructure while also addressing the risk of displacement of people of color and working-class communities. This shift illustrates the recent importance given to health and wellbeing at the center of planning action and the connections planners make between resilience, health, equity, and addressing compounding and intersectional vulnerability (P. C. Williams et al. 2022; Cole et al. 2021). In an example of human-centered planning, a community development planner from Washington, DC highlighted the plan to transform the Anacostia Bridge Park from a freeway bridge into a thriving public space that prioritizes local community needs while also prioritizing climate resiliency, housing affordability, and a just economy for long-term Black and working-class residents. The planner emphasized how the novel and inclusively engaged development of a community-led Equitable Development Plan (EDP) focuses on affordable housing, job training, small business support, and cultural preservation, while fostering both climate resilience and community cohesion through incremental actions that build trust, sense of place, and morale for momentum[35].

[35] https://buildingbridgesdc.org/11th-street-bridge-park/equity/

Strategy 4.2.2.1 : Centering human-focused goals in planning	
Quote	**City, Planning Sector, and Scope of Work**
"The short answer is absolutely our thinking has shifted. Over the last decade we weren't talking about the impacts of climate change [on people] per se. It was more of a focus on the mitigation side that was consuming our efforts, and how we could reduce emissions. Within the last few years we have pivoted very quickly, and realizing that climate impacts are upon us already... The reality is we're being hit now, and it's getting worse. So the focus has shifted to that adaptation side of the conversation, and that has grown and is still growing in terms of knowledge."	Vancouver – Regional Climate Action Planner
"[The relevant project] is a way of thinking from a human perspective. That helps me weigh in on environmental efforts so that I'm thinking not just from a community scale but from a human, lived-experience [scale]. An example of why that's important is I worked with the [Department of Energy and Environment looking at] floodplain regulations that would affect people who have lower incomes. And one of the things that we found is that the improvements were essentially protecting structures. So there were areas where structures were at risk of damage or loss in flooding, but the floodwaters were very unlikely to become deep enough to be a life safety issue. And so the regulations would have required would have probably would have caused displacement as they were originally drafted. And I was able to… create regulations that were better balanced so that they would not cause displacement and over time would make the area more resilient to the flooding risks that exist."	Washington DC – Regional Economic Development Planner
"[An issue we looked at was] how do we prioritize our funding and projects through an equity lens? So really centering people first rather than museums and offices, right? And within people, how do we make sure that we're focusing on the people that need it the most?… The other thing is we mapped assets that are usually connected with population you would want to protect and prioritize, like childcare centers, hospitals, you know, home living facilities, things like that. Then we kind of did that over total population and population density because, you kind of also want to be efficient, right?"	Washington DC – Climate Action Planner

Table 10. Illustrative quotes on the strategy of centering human-focused goals in planning

4.2.2.2. Reassessing the importance of (green and climate) gentrification

Planners in each of the five cities acknowledged the ongoing challenges of gentrification, particularly green and climate gentrification, recognizing their negative impacts on lower-income and vulnerable residents – a concern that was already visible in 2020 and at the center of planning work and remains a core concern in 2024 for environmental justice and housing justice groups denouncing new forms of settler colonialism in their neighborhood (Lewartowska et al. 2024). In 2024, planners in Portland, Vancouver, and Boston noted that while gentrification is a persistent issue in their cities, it is not currently a primary focus, with housing shortages and homelessness taking precedence. In these cities, planners emphasized that meaningful interventions to address these concerns are likely to require expanding housing stock through traditional more simple, silver-bullet solutions called for and accepted by a variety of private stakeholders and politicians, like new construction and development, over more multi-faceted approaches that revisit the combination of zoning, permitting, economic development, and affordable and public housing schemes towards addressing housing needs in green and gentrifying neighborhoods.

In contrast, planners in Denver and Washington, DC in 2024 emphasized the importance of focusing on actionable solutions to gentrification, which can be multi-faceted, rather than non-productive labeling of gentrification. These planners suggested that naming the process alone is not productive. In Denver, planners involved in climate action highlighted the community-led planning efforts in socioeconomically vulnerable neighborhoods, particularly through the three-year development of the West Area Plan[36]. This comprehensive framework, created by residents, business owners, and community leaders, guides growth, development, and infrastructure in West Denver. The plan has resulted in city-sponsored legislative rezoning, which is typically challenging to amend, while consistently prioritizing the improvement of residents' quality of life.

[36] https://denvergov.org/Government/Agencies-Departments-Offices/Agencies-Departments-Offices-Directory/Community-Planning-and-Development/Planning/Neighborhood-Planning/West-Area-Plan

• **Strategy 4.2.2.2: Reassessing the importance of (green and climate) gentrification**	
Quote	**City, Planning Sector, and Scope of Work**
"[Green gentrification] is something that we're concerned about. It's kind of a backburner concern at this moment since we're just focusing on benchmarking… So, short answer. Something we're aware of. Something we're concerned about. Not something that we're working on."	Vancouver – Regional Climate Action Planner
"I think we need to get more sophisticated and move beyond the idea of green gentrification and say what are the solutions here?"	Denver – Municipal Climate Action Planner
"I don't hear as much displacement and gentrification conversation of late, but I know it's still happening. I think I've heard a lot more conversations around lack of housing availability and the need for housing construction too."	Boston – Regional Climate and Public Health Action Planner
"What's the three things I need to do to stop gentrification? I'm like, well, I might respectfully reframe the question... how do you engage your community to understand what the needs of your local residents are?"	Washington DC – Community Development Planner

Table 11. Illustrative quotes on the strategy of reassessing the importance of (green) gentrification

4.2.2.3. Evolving engagement with historically marginalized residents

Planners from Vancouver, Portland, and Boston discussed the evolving and improving methods for engagement that have adapted to embrace participatory and inclusive processes since 2020 while also recognizing that traditional methods often excluded historically marginalized groups and needed to be revamped to support more decolonial and reparative practices. These planners expressed knowledge of communities' engagement fatigue, where repeated consultations without tangible results have led to disillusionment. Planners shared on their utilization of more progressive approaches that focus on removing barriers to participation, such as offering translation services, childcare, time compensation, and honorariums. Additionally, they shared that their engagement strategies have become more targeted and aimed at leveraging community organizations that are already active in local politics although they also value the importance of bringing in more unusual suspects. This shift supports deeper engagement and co-production, requiring longer time frames and more resources to be genuinely effective. Planners' efforts towards equity stress the importance of building relationships and committing to multi-year engagements in areas with existing inequities, moving away from one-off projects.

Planners highlighted the City of Vancouver's Climate Emergency Action Plan (CEAP) as a notable example of multi-year community engagement, where the integration of equity into climate action was guided by the Climate Equity Working Group (CEWG). This group, comprising diverse and marginalized community members played a pivotal role in shaping policies and co-developing Vancouver's Climate Justice Charter[37] which aims to establish climate solutions that are both inclusive and responsive to the needs of vulnerable populations, including Indigenous peoples and reparative practices to ensure their secure access to and property of land and housing.

[37] https://vancouver.ca/files/cov/climate-justice-charter-vancouver.PDF

Challenge 4.2.2.3: Evolving engagement with historically marginalized residents	
Quote	**City, Planning Sector, and Scope of Work**
"So there was, I think, a desire for many years within governments and sort of staff to engage communities that maybe don't tend to hold as much power. But I think now there's starting to be a recognition that like, in order to do that, we have to reduce some of the barriers to engagement. And so that might be providing translation, that might be providing, like, more generous honorariums for people to actually participate, recognizing that, like, not everyone has the luxury of volunteering their time to, like, come to, an event or something. It might mean giving up paid work or having to pay a babysitter or something. And so how can we try and kind of remove those barriers to facilitate these voices to participate in the engagement? … But yeah, like just kind of recognizing that engagement may have to look differently. It's probably gonna have a much longer time frame than what is typically given. It's probably going to cost more to really try and do it well."	Vancouver – Contracting Housing and Social Planner
"I think we've gotten more targeted about trying to understand our constellation of community partners and engage the right ones in the right process. [I learned] to start with the organizations that know how to influence the government and play the inside game."	Portland – Regional Climate Action and Transportation Planner
"Part of the work that we've done around equity is to say we can't go into do a one off project. If we want to be authentic about doing equity, we need to be really deliberate about where we're doing that work. So where existing inequities are present. Secondarily, we need to begin with relationships before we start doing the work so that we're having some level of trust. And then three, we need to be honest that we're making a multiyear commitment in a particular place... we just don't think doing a ten-year comprehensive plan [reflects] what the world actually operates like now or as we recognize it."	Boston – Regional Climate and Public Health Action Planner

Table 12. Illustrative quotes on the strategy of evolving engagement with historically marginalized residents

5. Discussion and conclusion

This paper integrates critical analyses of equity planning practices with recent scholarship on housing and climate justice to explore how community, municipal, and regional planners navigate the current era of poly-crisis. Through qualitative interviews with 32 planners and practitioners in Vancouver, Portland, Denver, Boston, and Washington, DC together with earlier interviews we reflected upon through the analysis, this study investigates the intersection of climate, housing, and economic development practices through the framework of equity planning, particularly in the context of increasing social and climate vulnerabilities. Additionally, this research contributes to a deeper understanding of the complex challenges practitioners face in planning through the contemporary poly-crisis and explores the strategies they employ to navigate these constraints, thus advancing incremental but meaningful progress. Although this study is focused on the North American context, it points at constraints and opportunities certainly relevant for other cities, as many, especially in Europe, contend with similar poly-crises as well as engrained racism and classism challenges (Lewartowska et al. 2024; Anguelovski and Connolly 2021; Ganzleben and Kazmierczak 2020; Nettelbladt 2023).

First, our findings highlight two praxis-based transformations, while not exhaustive, that planners should consider as integral to the continued growth of equity planning practice which further builds the equity planning scholarship. On the one hand, our analysis indicates that equity planning continues to evolve, with planners both seeking and creating new planning modalities to address compounding contemporary challenges. Originally rooted in addressing racial inequities during the Civil Rights era, equity planning has expanded to encompass climate and housing justice, alongside theoretical and methodological advancements in the 2020s (Arroyo, Sandoval, and Bernstein 2023; Zapata and Bates 2015). Over the past five years, the field has witnessed the rapid development of equity tools such as equity indices and participatory action research to operationalize goals in climate, housing, and economic equity (Rosan et al. 2022; Raub et al. 2023). Our findings indicate that although planners admit to the need to address compounding crises, they are limited in their attempt to deploy reparative or more holistic approaches that combine all these goals (through existing complex, repetitive plans) and are instead operating through small wins and concrete steps. Planners also emphasized the need for new approaches that simplify objectives, enable more agile climate and housing interventions, and integrate human-centered principles into pilot projects.

Second, the findings reveal a central tension – rather than a synergy or integration – between housing and climate goals driven by challenges such as securing stable funding, balancing proactive and reactive approaches, and addressing equity concerns. Planners are responding creatively to

these challenges by adapting planning practices, establishing reliable funding mechanisms, reimagining equitable engagement, and shifting towards solutions-oriented strategies for green and climate gentrification and displacement. These efforts underscore significant shifts in planning over the past five years and emphasize that equity planning is ill-situated to address compounded crises. In response, planning modalities towards equity planning need to be reevaluated both in terms of processes and outcomes. This finding aligns with the work of Angelo et al. (2022), who identified a significant disconnect between equity-focused language and its implementation in both gray (housing and infrastructure) and green (climate action and greening) planning. Their study concluded that the current planning approach is "not likely to accomplish its goals in its current state of being focused primarily on [greening and sustainability] while being unresponsive to local needs" (1426). Such transformations are essential for aligning planning practices with the evolving needs of communities and advancing equitable, sustainable outcomes in the face of multiple, overlapping crises.

Overall, this evolving vision aligns with calls for a shift toward more radical forms of equity planning and planners themselves. As Huq (2020) asserts, "[radical planning] is about training planners who work within the state to open themselves up to the dissenting voices in the streets. Definitively in alliance with emancipatory social movements, [radical planning] modulates official planning practices to resonate with dissenting voices and mobilizations of the disadvantaged" (380). Incorporating radical planning principles into everyday practice could address the static and time-intensive nature of comprehensive plans by fostering dynamic, community-driven relationships. These relationships may free up resources for pilot projects, placemaking, and securing funding, ultimately advancing equity planning into its next phase of development. Creative and alternative solutions to provide more affordable housing are sorely needed in municipalities across North America, for which planners shared during our interviews with them their professional dreams of cities being able to offer loans for affordable housing development, not banks, a service rarely offered because of tight municipal funding budgets in most American and Canadian cities. Providing such opportunities for planners to implement radical planning action that is equitable to constituents may be made possible by ending the estrangement from politics and adopting more radical planning identities in the next evolution of equity planning (Karki 2017).

Last, our findings on the reactivity bias of planning towards current micro and macroclimates of federal, state, and local politics underscore the necessity of embedding political awareness more deeply into planning practices to achieve equitable outcomes in affordable housing, climate action, and economic development at local and regional levels. Such an approach would enhance the

stability and security of funding for housing and climate initiatives while aligning policies with local political contexts to ensure effective implementation. This task is inherently challenging, as planners operate within political systems they do not fully control, nor always have the time to keep track of and understand, especially given the volatility of federal and state funding cycles that shift with each administration and the deep political rifts at the US federal level.

Despite these limitations, planning remains an inherently political act, requiring constant reform to address historical injustices (Marcuse 1989). As Albrechts (2003) notes, "planning is not an abstract analytical concept but a concrete socio-historical practice, which is indivisibly part of social reality. As such, planning is in politics, and cannot escape politics, but is not politics." In that regard, planners in Denver and Portland emphasized the importance of existing efforts for stable, consistent climate action funding through municipal financial mechanisms that can complement or counter federal schemes to provide for climate and housing action. This funding has bolstered their ability to implement projects. However, Portland planners noted that local political dynamics still pose significant barriers, even for well-funded, long-term initiatives. To navigate these challenges, they highlighted the importance of building coalitions with grassroots organizations and community leaders to advance climate action and support affordable housing principles (Rigolon and Németh 2018; Oscilowicz et al. 2023). Notably, none of the studied cities at the time of study had implemented a municipal housing fund supported by small local taxes[38], highlighting the urgent need for creative and alternative solutions to affordable housing. More research is needed to understand, analyze, and replicate the political leaps made to achieve these goals. Such visions may depend on planners embracing radical planning identities, ending estrangement from politics, and forging alliances amongst community groups and practitioners to advance equity-focused reforms as part of the next evolution in planning practice towards more reparative schemes (Oscilowicz et al. 2023; Karki 2017).

These findings and analyses aim to contribute to reimagining the future of planning in the face of poly-crisis conditions. Addressing the housing, climate, and economic crises at once is inherently complex, particularly in rapidly shifting political landscapes that have shifted from left to right and back again in recent political history in both American and Canadian contexts. Nonetheless, planners are actively reframing traditional planning models, challenging the foundational teachings and educational frameworks that have historically shaped the profession. To support this

[38] An affordable housing sales tax, Ballot Issue 2R, in Denver fell short in the November 2024 https://denverite.com/2024/11/09/denver-election-mike-johnston-affordable-housing-sales-tax-lagging/

transformation, it is essential for planning researchers to engage with and amplify this paradigm shift, offering pathways for planners to adopt bold, innovative, and radical approaches to equitable planning, including anti-displacement as well as inclusive greening tools (Barcelona Lab for Urban Environmental Justice and Sustainability (BCNUEJ) 2021). This requires not only a rethinking of planning methods but also a fundamental shift in planning education to align with the demands of an era defined by agility and adaptability. Through these efforts, the seemingly insurmountable task of planning for a poly-crisis becomes a tangible and achievable goal.

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CHAPTER V. GREEN JUSTICE THROUGH POLICY AND PRACTICE: A CALL FOR FURTHER RESEARCH INTO TOOLS THAT FOSTER HEALTHY GREEN CITIES FOR ALL

Abstract

Green or environmental gentrification has been shown to be directly related to residential physical and socio-cultural displacement and insecure housing conditions among socially or racially underprivileged residents, with clear related health impacts. In this context, those vulnerable groups become unable to benefit from the social, wellbeing, and overall health benefits of green amenities. To date, despite increasing gentrification and related civic concerns, cities in North America and Europe are still slow to respond. Siloed and reactive planning approaches to (re)development and greening generally do not include housing security and affordability provisions in ways that would be strategic and equity-driven. In this Commentary, we call for further research on the mix of policies and tools that posit multi-sectoral and de-siloed greening agendas in coordination with affordable and stable housing. We open discussion on four justice-driven policies and tools presented in the *Policy Tools for Urban Green Justice (BCNUEJ 2021)* report that derives from research conducted in 40 cities, analyzing 480 interviews with key neighborhood stakeholders across Europe and North America. We call for research that identifies how urban policy developments and anti-gentrification and anti-displacement strategies can be combined with inclusive greening tools to build healthy, green cities for all.

Keywords: real estate development; green gentrification; housing justice; environmental justice; urban greenspace

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1. Introduction

Despite the multiple co-benefits of urban greening, the deployment of a green city agenda has been demonstrated to increasingly contribute to green or environmental gentrification, a significant environmental justice issue with considerable impacts on securing affordable and stable housing for socially vulnerable groups (Immergluck and Balan 2018; Rice et al. 2020; Rigolon and Németh 2018). Urban greening has been connected to distributive (fairness of outcomes), procedural (perceptions of processes that lead to outcomes), and interactional (understood as the perceived degree one is treated with dignity and respect according to identities and needs during the processes) inequities due to real estate speculation, socio-cultural exclusion in new greened areas, as well as siloed and reactive approaches to green planning (Anguelovski and Connolly 2021; Garcia-Lamarca et al. 2021). Greening is indeed often confined to only one planning realm, often environmental planning, that lacks inclusion of protective policies that address both greening and housing simultaneously (Anguelovski et al. 2019; Checker 2011; Gould and Lewis 2016).

Urban greening refers to state- or privately-funded investments into economically deprived neighborhoods with the intention of land redevelopment and restoration together with the creation of new green amenities (e.g. parks, gardens, greenways, green roofs, restored waterfronts, climate resident infrastructure) (Dooling 2009; Gould and Lewis 2016). Green amenities are intended to offer ecological and climate benefits while improving quality of life, health, and wellbeing for those who have access or are exposed to these spaces (Argüelles, Cole, and Anguelovski 2021; Hunter et al. 2020; Rigolon and Németh 2018; Triguero-Mas et al. 2015). Despite those expected widespread benefits, the development of new green amenities may act as a catalyst for unintended (and sometimes also intended) impacts such as increased housing values and prices hence harnessing new attractiveness and profit as well as good health, but only for residents of higher socio-economic class (Black and Richards 2020; Bockarjova et al. 2020; H. V. S. Cole et al. 2019; Rice et al. 2020). As a result, under-privileged, often long-term residents of economically disinvested neighborhoods often experience living in permanent pressures of insecurity, loss, and emotional, cultural, and physical displacement as a result of green gentrification (Angelo 2019; Anguelovski et al. 2018; Goossens, Oosterlynck, and Bradt 2020).

Moreover, as growing research in Global North cities demonstrates, gentrification – and green gentrification in particular – has been identified as a pathway for negative individual physical, mental, and wellbeing effects, overlapping with continued exposure to

environmental toxins (Binet et al. 2021; Cole et al. 2017; Cole et al. 2021; Jelks, Jennings, and Rigolon 2021; Oscilowicz et al. 2020). In some cases, green amenities become disruptive green landscapes wherein residents feel no emotional or social connection to new green amenities and instead feel wary of them because of experiences of discrimination or socio-cultural exclusion – with clear health impacts (Triguero-Mas et al. 2021). Despite physical access to new green spaces, issues of real inclusivity and accessibility emerge. Recent research across North American and European cities shows the role played by green gentrification in a variety of health outcomes, including increased stress and anxiety, poor nutrition choices, lower sleep, and lower sense of self-worth (Anguelovski, Cole, et al. 2021). These combined negative impacts have left affected residents to mobilize for greater green justice while demanding of their political leaders and planners to take action (Pearsall and Anguelovski 2016) and address these combined environmental (in)justices and compounding health risks (Anguelovski 2014; Anguelovski, Brand, et al. 2020; H. Cole et al. 2021; Curran and Hamilton 2012).

As planners and urban policy-makers respond to community concerns and develop tools and policies that address these injustices, research – so far mostly conducted in Global North cities – points to patterns of continued injustice and wicked problems, or problems that have no definitive or win-win solution. In North America, cities remain confronted with racist urban histories that have produced an enduring pattern of housing segregation and discrimination affecting racialized minorities' property rights and tenants' ability to live in safe, healthy, and affordable housing conditions (Mohai and Saha 2015; Pulido 2017). Furthermore, racialized residents may have a conflicted or traumatic relation with public spaces and natural areas, as being both historically and at the present time heavily controlled, policed, and excluded from many urban spaces, including public and green spaces (Park and Pellow 2011; Pellow 2016; Triguero-Mas et al. 2021). In Europe, transitions from centralized social welfare and subsidized housing to neoliberalized and more exclusionary housing policies, even in historic progressive cities such Amsterdam, Copenhagen, or Vienna, are the core of new green, housing, and health injustices (Anguelovski and Connolly 2021; Gibb 2021; Sampson 2017). Moreover, racial discrimination remains a critical factor in the ghettoization of immigrant and ethnic neighborhoods in European cities (Pan Ké Shon 2010). Both regions thus face significant planning conundrums and a legacy of exclusion and discrimination vis-à-vis historically marginalized groups, from which green amenities are not exempt, and instead may become what some call Green Locally Unwanted Land Uses (GreenLULUS) (Anguelovski, 2016).

In this Commentary paper, we call for planners and policy-makers at the municipal and state levels to engage in cooperative, empathetic and creative action to allow residents in low-income, historically disinvested neighborhoods to share the health, ecological, and social benefits of greening while remaining in their communities and homes. Following emancipatory (Albrechts 2003), feminist (Hendler 1994), and abolitionist (Ranganathan and Bratman 2021) frameworks that "directly confront white supremacist forms of dispossession" (Anguelovski, Brand, et al. 2021), we argue that in order to build greener and healthier cities for all, urban policy developments and planning strategies should move beyond traditional silo, uni-sectoral thinking and reactive equity planning to provide more proactive equitable and inclusive greening in cities, while prioritizing anti-gentrification and anti-displacement practice for communities most socioeconomically vulnerable. Inspired by other recent practical reports which offer policies and tools relevant to housing equity (Chapple and Loukaitou-Sideris 2021; Rigolon and Christensen 2019) and green gentrification in the American context (Derickson, Klein, and Keeler 2021), this paper and related report offer a comprehensive review of American, Canadian, and Western-European just, green policy and planning tools while also inspiring a further investigation and implementation of radical tools that consider both displacement and greening equity. We do not argue that all tools will work in all places, but rather advance that cities must consider which combination and mix of tools can best and innovatively respond – in their local planning and policy context – to the green justice challenges they are facing while also addressing both long-term and new environmental and health inequities.

This paper stands as a Commentary on the original report, *Policy Tools for Urban Green Justice* (Barcelona Lab for Urban Environmental Justice and Sustainability (BCNUEJ) 2021)[39]. In this Commentary, we call for further research and practical emphasis towards policies and tools that can provide both anti-displacement and inclusive greening measures building on the set of tools outlined in the report. The report was developed from a larger EU research project in 40 cities (GreenLULUs, 2016-2022) that examined the social and racial impact of redeveloped neighborhood environmental amenities. Part of the project consisted in qualitative field work (close to 490 interviews in 24 cities conducted using snowball sampling techniques with neighborhood leaders, activists as well as planners and elected officials, and complemented by field observations and grey literature) in mid-sized cities in Canada, the

[39] http://www.bcnuej.org/wp-content/uploads/2021/04/Toolkit-Urban-Green-Justice.pdf

United States, and Western Europe.[40] Among the many themes we examined, some of our questions focused on promising policy and planning directions for the equitable green city as well as alternative routes for more equitable, democratic, and emancipatory green cities. This Commentary, as a separate, short analysis and critical reflection from the report, offers a brief, critical review and glimpse of four tools available to planners that ensure stable and secure affordable housing as well as equitable, inclusive, and accessible green amenities. We invite researchers, planners, policy-makers, and activists to engage with the 50 tools and recommendations provided in the *Policy Tools for Green Justice Report* (2021) and believe that those tools, when developed in partnership with community groups, can guide planning practice to provide for a just, sustainable, green and healthy city.

2. Anti-gentrification and inclusive greening

In the sections below, we examine in greater detail four out of 50 progressive and radical policy tools that have been, and could be further used, in several urban contexts to address the intersection of gentrification and displacement with green injustices and inequalities. In Figure 13, we outline our analyzed full set of anti-gentrification and anti displacement tools while Figure 14 presents the tools linked to the delivery of more inclusive and open green amenities. All of them include several "target" users and domains: (i.e. land use and zoning, financial instruments, developer requirements, renter-focused, homeowner-focused, community-focused, and broader regulations and ordinances)

The smaller set of tools selected for this Commentary includes a variety of implementation strategies and end users as well as more unique individual and combined tools than the ones often mobilized or called for to address gentrification and green gentrification (such as public or social housing provisions or rent control). We also opt for in-depth discussion of just four tools as a brief sampling in order to stir further interest, discussion, and debate[2]. Last, we include one *'double-edged sword'* tool, as an example of an innovative policy tool that in its processes yet simultaneously a potent catalyst for negative social impacts on vulnerable communities, thereby extending the call for application of critical lenses towards so called progressive green policies. The tools we consider here, amongst the 50 of the report, can act as a starting point for bold policy action that responds to the needs of underprivileged

[40] See Supplementary Materials for further details of the parent study and methodology of the report.

groups and to the civic mobilization of residents, community activists, and nonprofits working towards urban green justice.

ANTI GENTRIFICATION / DISPLACEMENT POLICY RESPONSES (30)							
Land use		**Developer requirements/ support**	**Housing focused financial schemes aimed at homeowners**		**Housing focused financial schemes aimed at renters**	**Community focused financial schemes**	**Other anti-gentrification regulations/ ordinances**
Inclusionary zoning	Regulations on touristic/short-term rental apartments (e.g. AirBnB)	Obligation for developers to include affordable units in development	Property tax payment support for homeowners	Loans for home ownership for middle/ low-income residents	Rent control	Investment incentives in specific areas - Opportunity Zones, Strategic Development Zone, Special Interest Zone, Business Improvement District)	Formal recognition of the right to stay/place OR right to return
Up-zoning	Moratorium on new businesses, hotels, and other hospitality industry permits	Density bonuses to encourage affordable housing	Homestead tax credit/tax exemption	Development tax paid by developers towards an affordable housing trust fund	Rent subsidies or vouchers	Regular support to housing coops and other non-profit housing organizations	Municipality or tenant opportunity to purchase act
Rezoning of green space to residential space	Defence of single family homes or minimum lot size	Support for developers to develop empty lots or buildings into affordable housing	Limitations or freezes to property tax increases	Transfer tax on luxury property with funds directed towards affordable housing			Public workforce housing
Preservation Districts or Historic Districts	Community Land Trusts		Housing tax credit programmes	Tax on foreign ownership of units			Equitable economic development plans with opportunity for equitable access to jobs
Land bank			Tax on vacant housing units				Equity scoring/evaluation/index of urban projects

Figure 73. 30 anti-displacement/anti-gentrification tools from the Policy and Planning Tools for Urban Green Justice: Fighting displacement and gentrification and improving accessibility and inclusiveness to green amenities report (Barcelona Lab for Urban Environmental Justice and Sustainability (BCNUEJ) 2021)[41].

[41] http://www.bcnuej.org/wp-content/uploads/2021/04/Toolkit-Urban-Green-Justice.pdf

MORE GREEN AMENITIES / OPEN PUBLIC AMENITIES (20)				
Land use		**Developer requirements/support**	**Financial schemes**	**Other greening regulations/ordinances**
Conservation areas to preserve green spaces	Eco-district zoning and climate change mitigation	Fee paid by developer directed to green funding	Specific national financial schemes to fund green infrastructure or parks	Improved maintenance and security of public space
Interim green spaces on vacant land	Rezoning of urban land to green space	Minimum amount of green space in new development projects	Green bonds	Clarification over administrative roles for green space management-security
Repurposing of streets of green transit areas	Opening of private green space to the public		Regulations to support the development of urban agriculture	Improved food security or sovereignty
Measuring/mapping access to green space	Ambitious green space development plan		New/improved urban green amenities	
Waterfront redevelopment	Green amenity planning in large-scale urban developments		Green resilient infrastructure funding in socially and environmentally vulnerable neighbourhoods	

Figure 14. 20 equitable green development tools from the Policy and Planning Tools for Urban Green Justice: Fighting displacement and gentrification and improving accessibility and inclusiveness to green amenities report (Barcelona Lab for Urban Environmental Justice and Sustainability (BCNUEJ) 2021)[42]

[42] http://www.bcnuej.org/wp-content/uploads/2021/04/Toolkit-Urban-Green-Justice.pdf

3. Selected tools

The following section zooms in on four tools from the reports, selected for their diversity in implementation themes: Workforce housing development, tax on foreign ownership, eco-district zoning, and green bonds.

3.1. Anti-displacement

3.1.1. Workforce housing

In many cities in the EU and US, lack of affordable housing and large scale real estate developments mostly aimed at luxury and high end housing has pushed out civil servants and essential service workers such as teachers, nurses, and firefighters, often to the peripheries of the city where housing tends to be less expensive (Duncan et al. 2021). This also has an impact on access to green space, as suburban dwellers tend to have lower access to park and public space despite their apparent proximity to it (Tomer 2019). Now burdened by the costs and inefficiencies of lengthy commutes from the urban peripheries, while also without important health benefits related to park access, displaced essential workers are choosing to seek positions closer to their areas of residences, leaving gaps in service provision in city centers (Sevil 2019). Providing subsidized or affordable housing aimed directly at these essential workers is a means to alleviate the pressures of essential service systems in urban centers. However, housing subsidies or alleviation-schemes must avoid providing only symptomatic and partial relief to already pressured housing systems and must dedicate substantial resources and new housing units to those workers, as well as to other vulnerable groups, in order to ensure broad accessible and quality subsidized housing.

As an example of this financial scheme in practice, in 2020 the City of Amsterdam implemented the Personnel Shortage Action Plan in order to relieve a shortage of healthcare workers in the downtown urban core — which was further exacerbated by the COVID-19 pandemic) (Ministerie van Volksgezondheid 2018). The comprehensive plan was intended to attract healthcare workers to the city center through a variety of mechanisms, including housing subsidies and priority access to already existing subsidized housing (Sevil 2019). However, this program relies on pre-existing affordable housing units without providing new-builds for other low-income and middle-income households who are not direct public employees. As an interviewee from a civic group stated: "40% of the housing that is allocated to social housing in Amsterdam is already going to [priority groups]…what about

prostitutes, artists, or mechanics, or whatever job that is not [directly] necessary for the city?" (BCNUEJ Interview, Housing Activist, 2019). The Personnel Shortage Action Plan also includes attempts at reducing financial costs on commuting through subsidies for the city's bicycle sharing program (Sabbatini 2020).

3.2. Anti-gentrification

3.2.1. Tax on foreign ownership

Tax on foreign ownership of a property is a financial scheme implemented at the municipal, provincial, state, or federal level to disincentivize property value speculation by international corporate or individual investors, and related pressure on the residential housing market. It responds to the public recognition that urban land is directly at the center of private global capital accumulation and real estate speculation and elite profit making (Anguelovski, Triguero-Mas, et al. 2020; Lees, Slater, and Wyly 2013) and that international investors with high purchasing power increasingly buy luxury units in globalizing cities, while seldom even living in those units. Furthermore, despite many units increasingly catering to an eco-friendly lifestyle, with many luxury homes constructed with reused materials and energy- and water- efficient systems (Daswani 2016) and branded as green buildings, these 'sustainable' dwellings are mostly occupied by residents whose global consumption and travel (and related CO2 emissions) habits might actually be at odds with green living (Rice et al. 2020). Within this global real estate investment context and in order to protect existing housing stock and affordability for local residents, some cities apply a one-time purchase tax or annual property tax on homes owned. As an additional bonus, taxes on foreign homeownership may indirectly increase local development and housing construction as lower property values are more accessible to developers seeking profits on their margins.

In Vancouver, one of the most expensive real estate markets in the world, 19.2% of all condos are owned by a non-resident of Canada and 6.5% of all housing is empty or underused (Ip 2019). To improve funding and access to affordable housing for residents, the Province of British Columbia implemented the *Additional Property Transfer Tax for Foreign Entities and Taxable Trustees* in 2018 which applies a tax of 20% towards the fair market value of the property purchased by foreign persons, regardless of the occupancy of the home (Province of British Columbia 2018), while the City of Vancouver had previously passed the 2017 *Empty Homes Tax (EHT)* as a 1.5% tax (increased to 3% in 2021) on property value of vacant units, affecting many foreign-buyers as their homes were left empty

following purchase. This vacant unit tax is designed to directly fund affordable housing initiatives (City of Vancouver 2017). The application of both taxes on the provincial and municipal level has helped to slow the growth rate of rental prices and mildly correct housing prices, indicating that the application of the tax at multiple levels of government a feasible solution in deaccelerating gentrification (Gul 2020). Meanwhile, however, many Chinese-Canadian residents report experiences of xenophobia as a result of targeting 'foreignness' throughout the Metro Vancouver region, pointing to stigma on immigrant communities despite the partial economic success of the program (Chan 2020).

3.3. Equitable green development tools

3.3.1. Eco-district zoning

Eco-districts are a form of land use scheme at the neighborhood scale that address climate mitigation and adaptation through an experimental-design framework that designates a strict implementation timeframe for low-carbon, climate-resilient solutions in order to generate quick data, analysis, and feedback (Fitzgerald and Lenhart 2016). To create low-carbon and resilient districts, eco-district schemes can make use of green building technology, smart infrastructure, renewable energy, and nature-based solutions all within a specific redevelopment area (Bottero et al. 2019). In cases of eco-districts that are designated by the municipality and not co-constructed with local residents, eco-urban experiments may increase disparities and create privatized, elite "islands of sustainability" within the neighborhood, particularly when housing is not integrated into experimental plans and when housing financialization is embedded in neighborhood (re)development (Rice et al. 2020).

In contrast, in some cities, eco-districts can be designed putting equity and health justice at the center. In Portland, Oregon, US long-standing struggles for socio-economic and racial equity have resulted in the Cully neighborhood's 2010 self-designation as an eco-district called *Living Cully* (Living Cully 2015). As part of a climate-responsive and sustainability endeavor to address rising costs of home maintenance and upgrading, the Living Cully Weatherization Project is an infrastructure improvement project that aims to decrease costs of living through reduction of energy bills (Enelow and Hesselgrave 2015). This program has managed to increase residents' income, improve livelihood opportunities, and enhanced access to environmental and climate-protective amenities of low-income people and people of color in the Cully neighborhood (Cultrera 2017; Triguero-Mas, Fontán-Vela, and Dommerholt 2021). In addition, the social enterprise Verde Landscaping employs local residents to

build sustainable landscapes for Hacienda Community Development Corp., a local non-profit housing developer, by training employees in stormwater management (e.g. tree planting, rain gardens, bioswales) and habitat restoration. As a social enterprise, Verde Landscaping runs a four-year training program and offers permanent employment opportunities to numerous community members, many of whom speak English as a second language and are part of the Latinx community. By developing its workforce, Verde Landscaping provides community members with the skills to be successful entrepreneurs, helping to break cycles of poverty and racial exclusion whilst constructing new green infrastructure. Verde and its partners have also successfully advocated for the construction of an inclusive park – the Thomas Cully park inaugurated in 2018 – as a space that provides native prairie habitat restoration and a Native American inter-tribal gathering area.

3.4. 'Double-edged sword' tools

3.4.1. Green bonds

Issued by municipalities, corporations, government agencies, and supranational bodies and functioning identical in structure, risk and return to conventional bonds, green bonds are used to fund environmentally-focused development such as green infrastructure, renewable energy, energy efficiency, clean transportation, agriculture, and water programs. The first green bond backed by the World Bank and the European Investment Bank (EIB) was issued in 2007, and the first municipal green bond by Gothenburg, Sweden in 2013. The green bond market has since grown exponentially as investor appetite has climbed from less than 11 billion USD in 2013 to 257 billion USD in 2019 (Almeida 2020; City of Gothenburg 2019). This growth is largely due to the opportunity such bonds provide in generating profit whilst simultaneously contributing to environmental improvements, thereby increasing impact-based investment which aims at achieving social and environmental goals (Gianfrate and Peri 2019; Maltais and Nykvist 2020).

In many ways, however, our research shows that green bonds may simply act as a neoliberal instrument of marketing/branding in the financialization, the process of financial elites or institutions gaining greater influence over urban sustainability policy and outcomes (Van der Zwan 2014), as justice and fairness concerns are not taken into consideration in their design or implementation. In the case of Gothenburg, the majority of green bond funding has been allocated to finance public environmentally low-impact housing developments. Yet despite being public, the price of this housing increased by 40-85% – largely unaffordable for Gothenburg's working-class residents (BCNUEJ Interview, City

Planner, 2019; García-Lamarca and Ullström 2020; Garcia-Lamarca et al. 2021). While the tool creates a culture of awareness and encourages ideas of sustainability among investors and the financial community (Immel et al. 2021), it can easily become greenwashing and glitzy greening, instead of the demonstrable integration of equity and justice into planning, implementation and reporting (García-Lamarca and Ullström 2020).

4. A look forward

In view of the presented benefits and limitations of each of these four tools presented, we call for practitioners to consider historical challenges and socioeconomic vulnerabilities of current residents as they develop robust multi-sectoral policies and tools that may provide for equitability in housing and greening across a variety of urban organizations, including non-profits, grassroots community groups, private developers, and municipal leaders. We call for urban planners and policy officials to consider recommendations provided in *Policy Tools for Green Justice Report* (2021) across a diverse range of Global North contexts so they may be able to implement a mix of bold and progressive policies and planning tools that provide just and equitable green urban living for all residents and ensure the provision of multiple benefits from greening projects through an equity-centered perspective (*Supplementary Materials, Fig. 7-9*).

In the North American context, we urge planners, policy-makers, and government leaders to consider the notion that socially vulnerable, often racialized communities have long been mobilizing for more equitable greening and environmental justice. This comes as a direct response to an enduring legacy of historical and political racial injustice that manifests in segregated, redlined neighborhoods undergoing continued exposure to environmental health risks , without equitable access to new green amenities, and a relative lack of public housing (Nardone, Chiang, and Corburn 2020; Pulido 2017; Skodra 2020). Taking these intersectional histories and neoliberal bearings of development into account, it is important for North American cities to strengthen their support to existing community green justice groups while also prioritizing funding and regulations for more and improved affordable and public housing.

In the European context, we urge the same practitioners to consider how urban residents have generally benefited from well-funded social housing programs (with several exceptions, such as the case of Spain) accompanied by top-down municipal efforts to provide enhanced green spaces to European residents. Lacking, however, is support for civic groups and residents in establishing

neighborhood leadership and a robust organizational structure for alternative housing and equitable green planning, particularly as affordable and public housing become increasingly privatized. Many European municipalities are also at risk of losing their long-term housing equity policies and privilege the arrival of younger, whiter newcomers to green neighborhoods while excluding racialized groups from secured housing. Several municipalities, including Bristol or Dublin, are also allowing for the privatization of new green space or of green space maintenance (Anguelovski and Connolly 2021).

5. Conclusion

Cities are confronted with tradeoffs and unequal socio-environmental impacts when deciding on policy priorities and corresponding sets of tools for building green and healthy cities and address gentrification and displacement risks. In the US and Canada, many planners can address housing affordability and shortage crises through development of new social housing and progressive taxation and financial incentives, but must also navigate the historical and cultural preference for home-ownership over rental-tenancy, with simultaneous stigmatization and lack of funding for affordable and social housing. In European countries, despite a stronger legacy of social housing access, recent financial austerity measures and privatization of social housing are compromising access to affordable housing. Added to this context, several countries and cities are privatizing green space construction and maintenance. For cities where an intensive tourism economy pervades in both geographical contexts, attempts by the local government to provide new green amenities can also often be appropriated to benefit the needs and uses of visitors and tourists, particularly when private development or financing become involved.

In order to develop robust solutions to social, ecological, and historical challenges presented by urban green inequalities and their drivers, we have called for refinement of both research and practice that prioritizes policies that provide both secure and affordable housing in combination with equitable and inclusive green space development. We argue that the selection of anti-displacement, anti-gentrification, and equitable green development tools from the *Policy Tools for Green Justice Report* (2021) is wide-reaching but not exhaustive and requires careful context-based balancing and combining for the realization of green futures that can be healthy and just. New research also needs to uncover complementary tools to be adapted to different local urban trajectories and assess the right balance and mix of policy tools in view of recent and past history. To this extent, future research should offer space for multi-sectoral planning processes, as demonstrated by Reis et al. (2016), and for feasibility

pattern matching analyses. Last, only bold policy and planning action pushed and supported by civic advocacy can build more promising and just green urban futures and avoid the formation of green privilege.

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CHAPTER VI. DISCUSSION AND CONCLUSION

In this concluding chapter, I briefly synthesize the key themes and findings presented in this dissertation, discuss limitations of the study and put forth suggestions for future research directions. In my research, I explored four objectives designed to enable assessment of the following topics:; (i) the role played by urban greening in the perceptions and strategies of real estate developers as well as the broader ramifications of greening for housing rights and affordability; (ii) how grassroots activists organize to simultaneously address housing and greening and how they operate to achieve justice in greening neighborhoods; (iii) the challenges that planners face in regard to climate, housing, and economic development and how they are responding; (iv) specific policies and tools that urban practitioners can employ to implement anti-displacement measures and inclusive greening measures.

To achieve these objectives, I conducted three empirical studies as presented in Chapters II – IV and contributed one reflection and policy-oriented Commentary as presented in Chapter V. I found: (i) urban greening has increasingly acted as a catalyst for real estate development often contributing to gentrification and actively shaped developers' core investments in a majority of cities; (ii) grassroots activists are building community infrastructures to counteract green gentrification and displacement; (iii) urban planners face challenges integrating climate resilience with affordable housing strategies amid socio-economic crises; and, finally, (iv) a need for further research into policies integrating urban greening with housing security to prevent green gentrification.

This dissertation tells the story of urban greening as a vehicle of power dynamics and struggle over the future of cities facing compounding and intersecting crises. I examine how developers, grassroots activists, and planners navigate and co-construct the politics of the green city under conditions of housing insecurity, climate anxiety, and economic instability. Through comparative quantitative and qualitative analysis alongside multi-actor perspectives, this research advances new insights into how green gentrification and its manifestations emerge and are contested, situating greening not as an isolated policy intervention but instead as a process that both reflects and reproduces uneven power relations across cities in North America and Europe. These power struggles over urban greening shift over time and space, as local, regional, and national socio-political contexts transform. In sum, the multitude of perspectives illustrated in this dissertation demonstrate how urban greening and climate action implementations are inseparable from the broader power struggles of the poly-crisis, revealing both the risks of deepening exclusion and the possibilities of more just, green urban futures.

Based on this urban greening and power dynamic narrative gathered from the findings of each empirical chapter, this dissertation has provided conceptual as well as policy contributions to improve our understanding of how urban actors in the United States, Canada, and Europe can more comprehensively address the challenges posed by climate change and urban greening in the context of increasing housing pressures and risks of displacement. This dissertation develops these contributions by grounding its empirical findings in an understanding of the deeply rooted historical and racial inequalities as well as the progressive community and planning practice by which the just green city can be achieved. My argument throughout this work is that the interests across a multitude of urban actors (activists, developers, and planners) must be considered in conjunction in order to better understand how best to confront the challenges they each face in working towards a just green city. I also have aimed to provide a clearer policy pathway to achieving the just green city by outlining how the conversational nexus of all four actors can be integrated.

1. Key results of individual studies

Chapter I, the introduction of this dissertation, offered an overview of literature related to the role of urban planning in producing injustices and how these historical injustices have been reproduced in modern climate urbanist planning practice. This chapter further introduced the conceptual framing of how actors in the urban realm have been considered in greening, sustainability, and research. Overall, this dissertation provides an original conceptualization of intersecting and compounding crises by foregrounding the insufficiency of a single-issue response and framing urban planning in the paradigm of the poly-crisis.

Chapter II investigates the relationship between urban greening and residential real estate development across mid-sized cities in North America and Europe. The quantitative methodology and its findings are instrumental in demonstrating that greening, while generally promoting development, does so with varying intensity and outcomes across different urban contexts. Specifically, the quantitative analysis revealed that greening initiatives are more likely to drive development in U.S. cities compared to their European and – to a lesser extent – Canadian counterparts, where the effects are either negative or negligible, except in Amsterdam. This suggests that the relationship between greening and development is not merely a direct causal pathway but is more likely determined by local economic, social, and regulatory contexts. In the U.S. context, the fragmentation of housing authority from federal government, elimination of regional government

powers, and concentration of regulatory authority to local government, property tax dependence, and limited tenant protections have all contributed to increased threat of green gentrification in American cities. Canada, while also suffering from the effects of financialization and decentralization of housing, as historically had stronger social housing systems as well as provincial and regional-level legislative powers to address housing. Finally, European countries maintain stronger regulatory governance systems, the largest share of public or social housing amongst the three continents, and strong tenant protections; yet, European cities are not exempt from the global capital investment powers that have created challenges related to the financialization of housing throughout the globe.

Ultimately,this chapter provides an original and innovative approach to understanding the relationship between greening, development and gentrification through a comparative European and North American framework that also contributes analysis on the local economic and regulatory contexts that shape gentrification dynamics, while also providing qualitative evidence for the greening-development nexus. Ultimately, this chapter provides insight into the relationship between greening and real estate development, one which may appear linear, yet, in fact, is related to the highly local restrictions or protections that favor residents' rights over the profit potential of development.

Chapter III empirically assesses how grassroots activists' movements counteract green gentrification and displacement. In this chapter, I find that grassroots organizations are developing and fostering community infrastructures, drawing from their social, economic, and political capacities, which make it possible to safeguard just greening, housing equity, and a more just economy. The chapter draws from interviews with community groups in ten diverse U.S. cities and aims to understand first, what the strategies and tools utilized are, and second, how these groups leverage multifaceted strategies and tools through the strengthening of community infrastructures – or those social, political, and economic capacities that are the essential characteristics of building neighborhood power in the context of unequal urban development – to combat the dual challenges of housing insecurity and inequitable greening practices. I highlight how the individual capacities of community members are strengthened through the mechanism of the community infrastructure, which in turn is further empowered through multi-organizational coalition-building. For example, when a combination of the three capacities (social, economic, and political) of community infrastructure are strengthened, they would generate positive outcomes amongst activists and residents, such as attachment to place, a sense of community care, sense of community ownership, sense of community trust, sense of identity, and other iterations that describe relationships amongst people and the environment. Thereafter, the

networking of value-aligned community organizations made up of activists and residents empowered by community infrastructure can, in turn, compound their impact by working together.

In this chapter, I further demonstrate how these community infrastructures also contrast significantly with the largely technocratic attempts of climate urbanism that many cities otherwise implement in low-income, minority neighborhoods. In these cases, cities may attempt to throw money at or hyper-engineer their way out of climate crisis through, for example, the prioritization of electric vehicles or the greening and increase of attractiveness of neighborhoods already at-risk of gentrification; yet, these strategies do not engender the same relationships between people and the environment when compared to the social, economic and political capacities that are strengthened through the development of community infrastructure.

The results of this chapter highlight the pivotal role of the immaterial outcomes of community infrastructure in developing mechanisms that ensure green implementations are equitable and inclusive, including the strength of sense of place, sense of purpose, and sense of community that are upheld through activism. This chapter concludes with a call to both activists and practitioners. To the former, we encourage expanding the power of such mutual care and solidarity tactics through geographical, participatory, and temporal scales. To the latter we encourage urban practitioners and policymakers to support and collaborate with activists to address these intersectional issues from an un-siloed perspective. In sum, this chapter produces an original conceptualization of *community infrastructure* as a central mechanism through which grassroots groups mobilize resources, build capacities, and foster housing and greening justice simultaneously.

Chapter IV focuses on understanding how urban planners are adapting their practices in the face of a poly-crisis, which encompasses climate disasters, affordable housing emergencies, and economic insecurity. The analysis, based on 32 qualitative interviews with practitioners from Vancouver, Portland, Denver, Boston, and Washington, DC, underscores the need to adapt schools of thought in planning to effectively integrate climate action with housing equity and economic security. This chapter demonstrates that despite the historic barriers posed by injustices like redlining and property financialization, there are emerging proactive strategies that planners are employing to integrate climate resilience with housing justice, including centering human-focused over growth-oriented goals within planning agendas or phasing goal setting to accommodate for the pace of modern planning regulatory protocols.

This chapter further calls for a more demonstrable move beyond equity planning, and instead calls for a shift to a radical, reparative planning practice. The evidence suggests that many planners are already assuming a transformative approach, yet the transition to this practice is often difficult due to challenges in stable and secure funding, political changes of power, and the limitations of the pedagogies of planning, which are shaped by schools of thought and narratives within training. As a result, planners are focusing on small wins and pilot projects as a means to more radical change. In sum, I advocate for a continued shift to a more radical, reparative form of planning where planners themselves are more integrated into communities and politics. This chapter provides original findings to identify existing constraints in existing planning pedagogy and suggests transformation to a more agile, progressive practice of radical, reparative planning practice.

Chapter V makes a call to practitioners to employ a multidisciplinary approach to urban planning that incorporates strategies for both green development as well as housing affordability to combat the unintended consequences of green gentrification. This commentary draws from foundational understanding of the dual nature of urban greening as both beneficial in terms of ecological and social gains yet also a catalyst for gentrification that can exacerbate socio-economic disparities. As part of a commentary piece on a larger report I led, the chapter provides examination of specific policy tools, including workforce housing, eco-district zoning, and green bonds, that align green urban development with social justice, thereby promoting more inclusive and sustainable urban environments. Ultimately, this chapter provides an original meta-framework of bridging theory and practice and underscores the necessity of rethinking and refining policy instruments that can effectively merge environmental and climate objectives with the imperatives of housing equity and inclusion, ensuring that the move towards greener cities does not leave the most vulnerable behind.

2. Research contributions

This dissertation advances the literature by tracing how urban actors, specifically planners, developers, activists, and researchers, shape and contest the production of green cities, with key implications for urban justice. This research makes relevant contributions to the critical geography, planning, and environmental justice fields through an investigation of critical actors in the urban climate and housing nexus. The three main lines of theoretical contribution synthesized in this dissertation are: 1) *Green growth machine and urban greening power dynamics;* 2) *Green gentrification as a non-linear, relational, and contextual process; and, 3)* The recent evolution within the environmental justice movement of *civic demands,*

strategies, and tools for just green cities. A conceptual framework displaying all transversal concepts that were mobilized, informed, and guided the research conducted throughout the thesis is shown in Fig 15.

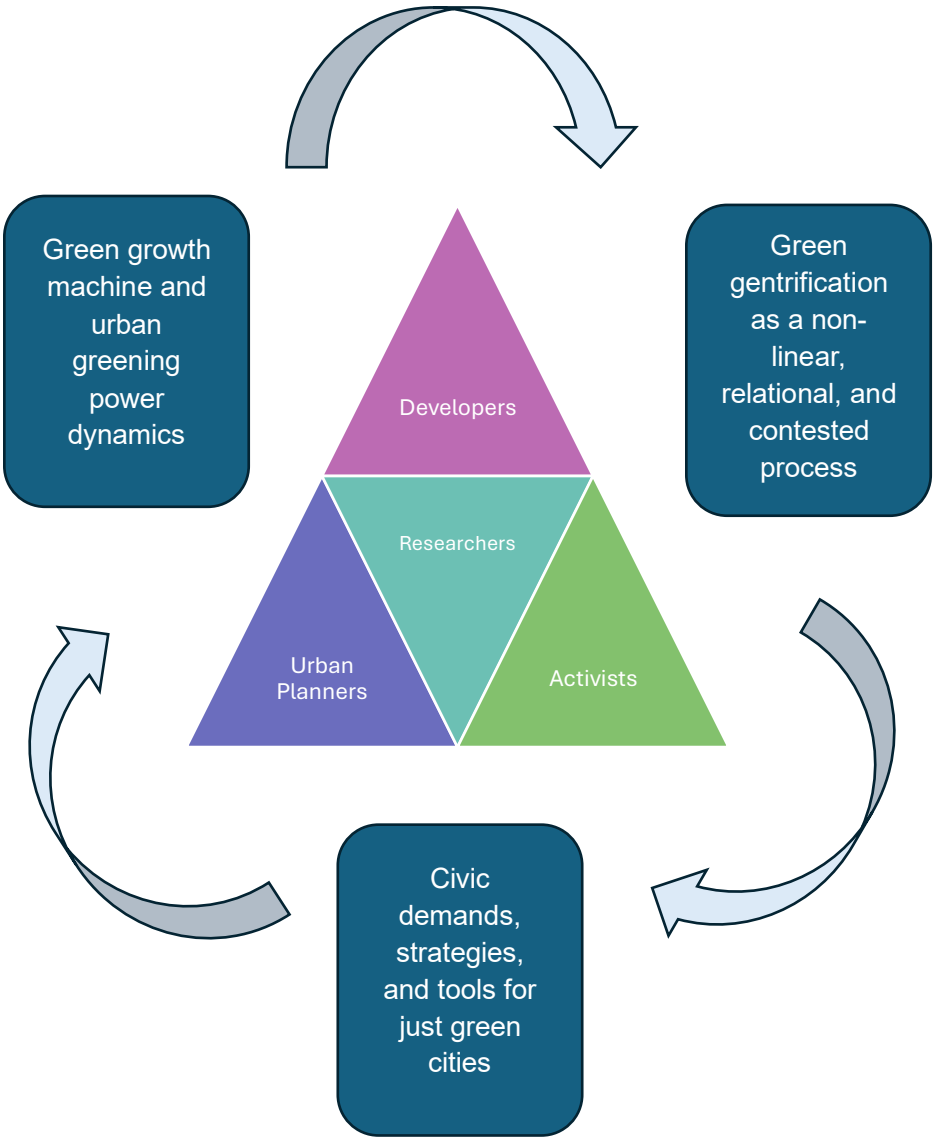


Figure 15. Conceptual framework of the contributions and feedbacks between three transversal theoretical contributions. The actors in this theoretical feedback loop are central to this conversation.

3. Theoretical contributions

This dissertation theoretically positions itself within the developing literature on the housing and climate nexus, advancing the empirical knowledge within this analytical framework (Connolly 2025).

I embed this dissertation in the broad body of literature that discusses the injustices of urban planning and development practice, focusing on the racial and environmental injustices (re)produced by such practices (Bruno 2022; Connolly and Anguelovski 2021; Rothstein 2017). Specifically, I bring novel theoretical contributions to green gentrification as a contentious environmental justice issue (Dooling 2009; Anguelovski 2016; Gould and Lewis 2016b; Jelks, Jennings, and Rigolon 2021; Anguelovski et al. 2019).

3.1. The green growth machine and urban greening power dynamics

First, I aim to theoretically contribute to existing literature on the technocratic and financialized urban processes of urban greening that result in negative sociocultural outcomes and displacement of low-income and minority residents for reasons including green gentrification (García-Lamarca et al. 2022; Anguelovski et al. 2022; Dooling 2009; Curran and Hamilton 2012). This body of prior literature has established how green new (re)development can serve as a spatial fix for capital accumulation through the apparatus of the green growth machine (DuPuis and Greenberg 2019; Gould and Lewis 2016a; Logan and Molotch 2010). This dissertation, however, advances a more differentiated understanding of how urban actors – specifically developers, planners, community activists, and researchers – instead engage with, reproduce, resist, or call into question the logics of urban greening and the built environment, thus embracing or contesting the green growth machine.

I begin by offering novel qualitative findings in Chapter II that illustrate the dynamic perspectives of developers, demonstrating that their decisions and priorities are deeply embedded in local regulatory regimes, public expectations, and evolving green city narratives (Angelo 2021; Neidig et al. 2022). By focusing on the two comparative case studies, Atlanta and Amsterdam, I demonstrate how developers are not the sole agents of gentrification, a narrative often painted of them by anti-gentrification and anti-displacement planners and activists alike (Garboden and Jang-Trettien 2020; Boanada-Fuchs and Boanada Fuchs 2022), but instead are embedded within institutional and discursive structures that shape the outcomes of their interventions within the urban fabric.

Later, Chapter III extends this analysis on actors to focus on the counter-narratives of grassroots activists to the green growth machine and negative urban greening dynamics. It introduces and develops the concept of *community infrastructure* as a tactical and effective framework through which neighborhood-based organizations can strengthen the material and immaterial components of community in order to respond to displacement and exclusion threats with dignity and safety. These

infrastructures are not only material and immaterial but also relational and symbolic, composed of mutual aid networks, children's programming, and coalitional strategies, all of which enable marginalized communities to engage in what this chapter identifies as radical, reparative, anti-subordination planning practices (Steil 2022; Anguelovski et al. 2020; Williams 2024). These practices contest dominant climate urbanism paradigms and assert alternative visions of human-centered, care-based, equitable, just, green urban development.

Complementing these perspectives is the analysis of planners in Chapter IV. This chapter highlights the tensions within and amongst planners, as many public sector leaders and policy implementors actively frame and defend the green growth machine, justifying their agenda as a means to revitalization and economic growth (Ortiz-Moya 2020; DuPuis and Greenberg 2019; Eyster, Rodríguez González, and Gould 2024). Other planners sense the tensions within themselves, as many are increasingly aware of the social injustices embedded in greening but remain constrained by bureaucratic inertia, shifting political mandates, and technocratic planning cultures (Nesbitt et al. 2023). Then, there are other planners whom are conscious of the negative manifestations of the green growth machine, and have instead situated their work within a praxis towards radical, reparative, anti-subordination planning (Steil 2022; Anguelovski et al. 2020; Williams 2024).

Finally, in Chapter V, I demonstrate that urban researchers also hold a role in dismantling the green growth machine by empirically studying its scope and manifestations and illustrating the critical relationship between knowledge translation and the reproduction of growth-driven urban paradigms. This chapter contributes theoretically by positioning researchers not as external observers but instead as embedded actors who can either sustain or contest the green growth machine (Loh and Kim 2021; Mullenbach et al. 2022; Matheney and Anguelovski 2024). The chapter advances a meta-framework that bridges theory and practice, offering practical policy tools to challenge green gentrification and displacement, offering pathways toward multi-scalar, anti-displacement and just equitable greening policy tools. Together, all chapters of this dissertation reconceptualize the green growth machine not as a top-down, stable apparatus but rather an instrument that simultaneously exists as both an evolving, contested process shaped by a diverse set of actors who hold differing degrees of power as well as diverse visions of the (just) green city.

3.2. Green gentrification as a non-linear, relational, and contested process

A second major contribution of this dissertation lies in its challenge to linear or deterministic models of green gentrification. Rather than assuming a uniform relationship between greening and displacement, this dissertation reveals processes of green gentrification as relational and context-sensitive as a result of differing institutional and policy environments.

Chapter II's comparative analysis of Amsterdam and Atlanta development patterns, particularly through the narratives of developers themselves and supported by a broader statistical model, provides compelling evidence that the relationship between greening and development is not linear nor universal. I demonstrate that the regulatory frameworks and tenant protections in Amsterdam play a crucial role in fostering the positive co-benefits of urban greening and development – in other words, we see that the relationship between greening and gentrification cannot be understood in a deterministic manner. Conversely, in Atlanta, the absence of robust regulations and protections leads to negative displacement effects associated with redevelopment and greening efforts. These findings coincide with literature that exemplify the complex relationship between development and greening. Together, they may be but are not always catalysts for gentrification, nor does gentrification occur in a linear pathway from green implementation to negative impacts of gentrification (Rigolon and Collins 2023; Quinton et al. 2023). I highlight how the consequences of development are highly relevant to the protections and regulations already in place in urban areas and longevity of potential positive benefits hinges on continuous dialogue between activists and planners as well as on planners' ability to regulate the role of developers (Marcuse 1989; Brenner, Marcuse, and Mayer 2009). I further extend this argument to offer a critique of racial segregation and prejudice, albeit in a modern and market-driven manifestation, that endures in post-colonial landscapes, driven in part by the cultural dominance of property rights and generational wealth accumulation that endures to shape housing inequality and exclusion (Lewartowska et al. 2024)..

In Chapter IV, interviews from planners demonstrate how the outcomes of greening are highly contingent on local political, economic, and social contexts. Interviews reveal that housing market structures, funding mechanisms for affordable housing, broader political climates, and the strength of coalitions between planning departments and activist groups are major determinants of whether those cities feel more prepared to address poly-crisis challenges, or s are more intensely feeling the negative effects of affordability, climate change, and gentrification. Many planners shared their awareness that even well-intentioned greening projects can reinforce displacement unless they are embedded within

robust housing justice frameworks with sustainable funding schemas, as well as stable and progressive political support systems. Similarly, Chapter III confirms and deepens these insights by demonstrating how the power of multi-sector coalitions, particularly those involving community-based organizations, housing advocates, and environmental justice groups, can shift the trajectory of green development toward more equitable outcomes. By illuminating the geographical, political, and social context of green gentrification processes through the perspectives of urban actors, this dissertation contributes to the conceptualization of green gentrification as a relational, co-produced, and contested phenomenon, rather than a direct and inevitable outcome of greening initiatives. This reframing supports a more nuanced understanding of how greening intersects with broader urban transformations, thus suggesting its impacts vary based on place, time, political climate, and governance structure.

3.3. Civic strategies and policy tools for just green cities

A third contribution of this dissertation engages a more praxis-oriented body of literature by articulating civic strategies and policy tools that can be mobilized to confront green gentrification and support more just forms of climate adaptation. It does so by documenting the community-based practices that resist displacement as well as the institutional policy tools emerging from within planning departments and allied organizations.

As developed in Chapter III, the notion of *community infrastructure* captures not only community-supported policy tools that promote emplacement, including land trusts or food cooperatives, but also the cultural, emotional, and political assets that sustain long-term neighborhood organizing. These infrastructures enable community groups to engage in forms of planning that challenge the dominant emphasis on technocratic solutions and performance metrics, foregrounding instead relational, care-based approaches to urban development.

Chapter IV identifies the ways in which planners, despite institutional constraints, are experimenting with pilot projects, cross-departmental collaboration, and narrative shifts to incrementally advance both housing and climate equity, or at least attempt to. These emergent practices may not yet constitute systemic transformation, but they represent meaningful steps toward more flexible and responsive planning.

Building on these empirical insights, Chapter V offers a commentary that consolidates existing concrete tools and strategies, including eco-district zoning, green bonds, and workforce housing

models, that may be adapted to different urban contexts and implemented by differing urban actors. It also highlights the role of researchers as active participants in the green city, capable of co-producing knowledge, challenging dominant narratives, and supporting alternative planning imaginaries. Rather than remaining distant observers, researchers are positioned as relevant actors in the pursuit of equitable housing, just greening, and climate justice (Goetz, Williams, and Damiano 2020; Mayer 2020; Castán Broto, Westman, and Huang 2021; Wyly 2011). By identifying how institutional and community actors are not only resisting gentrification, displacement, and poly-crisis, but also constructing new tools and strategies for inclusive greening and climate action, this dissertation contributes to the theoretical development of the just green city through alternative and radical praxis.

4. Empirical and methodological contributions

In this dissertation, I conducted an in-depth exploration of various scales and stages of planning for urban greening, climate action, and housing. My research aimed to synthesize and bridge the theoretical and practical divides between academic research, policy formulation, urban planning, and real-world application. The investigation began with a thorough analysis of the historical and enduring injustices that urban planning has perpetuated, particularly at the juncture of environmental justice. I then expanded this exploration by tracing the evolution of urban greening initiatives and their varying impacts on communities, employing a comparative multi-city approach to dissect activist strategies and discourse aimed at achieving equitable urban environments. I further scrutinized the complex interplay between urban greening and development, assessing how such initiatives can inadvertently lead to displacement and social inequity. Later, I examined the response of urban planners to the emerging crisis of housing, climate, and economic inequity. Finally, I contributed further empirical knowledge on the perceptions of planners towards their practice as related to the nexus of housing, economy, and climate.

Finally, this thesis explored and built on different methodological approaches, encompassing quantitative, qualitative, and mixed-method analysis. This approach contributes to the advancement of social science research methods in the fields of urban planning and environmental justice, two fields which are robust in a mixture of both quantitative and qualitative methodology. By relying predominantly on rich qualitative data from a broad spectrum of actors across North America and Europe, my research not only underscores the depth and breadth of the data but also enhances the resource base for both research and practice. In Chapter II, I paired this qualitative data, specifically

of developer insights, with a robust quantitative dataset of greenspaces and new real estate constructions. Through these datasets, we analyzed the relationship between urban greening and real estate development to statistically examine the extent to which development is driven by greening. This pairing of rich qualitative analysis with robust quantitative examination offers an original methodological contribution, demonstrating how integrating narrative perspectives with spatial and statistical data can more comprehensively capture the mechanisms of green development and displacement and their contestation and resistance. By bridging these approaches, the research advances methodological innovation in urban planning and environmental justice, offering a model for more holistic, multi-scalar and mixed-methods analyses of complex socio-environmental processes.

5. Further research

There are many opportunities for further exploration and expansion on the topics discussed in this thesis. In this section, I propose several potential directions for future research, offering a trajectory to enhance our comprehension of urban planning practices and their interplay with wider social, housing, and climate action dynamics.

First, this dissertation successfully analyzes the scope of policy and planners at the municipal and regional government level. There would be great benefit to the advancement of the field to broaden the scope of policy analysis to include actors from higher levels of government, such as national and state/provincial policymakers. Investigating the roles and influences of these actors could provide a more holistic view of the policy landscape that impacts urban planning, uncovering how top-down approaches support or impede local sustainability and equity initiatives. Moreover, further research is necessary to explore and define financial schemes at the federal/national level that could realistically support green and climate justice while simultaneously supporting affordable housing production and maintenance (Hernández 2022). Further, this broadened scope would benefit from a cross-national comparative analysis at these higher levels of government particularly considering the rapid change of global geopolitics in 2025 and beyond as a result of the Trump administration.

Second, future studies should explore the urban planning and policy dynamics within smaller as well as less progressive cities in the United States, Canada, and Europe. These cities often lack the resources or political climate of larger, more progressive urban areas and studying them could provide critical insights into the unique challenges and opportunities they face. This research could help develop urban

planning policies that are more tailored and applicable to more conservative urban contexts, often the very ones most in need of equitable planning interventions.

Third, future research could advance the field through a methodological approach to truly capture the nuances of urban planning. This research could conduct a novel methodological experimental study on the application of specific policies in urban contexts or employing pilot projects. This exploratory and experimental approach would allow researchers to test the efficacy of certain planning strategies in real-time, providing empirical evidence on their impacts. Such studies could significantly enhance our understanding of how certain policies perform in various urban environments, offering valuable data that can inform more effective and adaptive urban planning practices.

Fourth, and finally, green and climate gentrification research should continue to evolve and future inquiry in this field must consider the contextual relevancy of climate disasters, mobility, and migration (Anguelovski et al. [FORTHCOMING], Hoffmann 2024; Lustgarten 2020; Marandi and Main 2021). While research has mapped the broad relationships between greening and displacement, less attention has been paid to the specific planning and policy architectures, such as zoning reforms, financing mechanisms, and disaster recovery frameworks, that create or mitigate gentrification and displacement dynamics. Future studies should critically analyze the policy decisions that facilitate exclusionary rebuilding and adaptation processes, as well as investigate the institutional conditions that enable more equitable outcomes, including tenant protections, community land trusts, and equitable disaster recovery programs. As climate-induced migration reshapes urban and peri-urban regions, there is a growing need to understand how green and climate adaptation investments are distributed in communities at-risk-to- or recovering from disaster, and whether they entrench or disrupt new patterns of displacement

Together, these avenues for future research reveal there is still much to be accomplished in expanding the geographical and political scope of policy analysis, deepening case-specific investigations of smaller and mid-sized cities, and broadening the scope of climate gentrification inquiry to capture the real-world application and impacts of planning interventions as climate crisis further intensifies.

6. Implications for urban planning and policy recommendations

This dissertation has systematically explored the interconnections between urban greening, climate action, and housing through the perspectives of activists, developers, and planners. I have further offered insights into the policy implications of these intersections. The findings have important

repercussions for urban policy and planning, underscoring the need for integrated, un-siloed approaches that consider the multifaceted housing and climate nexus. In this section, I further offer concrete policy recommendations that can be undertaken at the local and regional government level. These recommendations draw from the qualitative data on which each chapter of this dissertation is based, but are largely formulated and informed from the latest fieldwork I conducted with policymakers in Chapter IV. Furthermore, these policy recommendations are also reflected in the Policy Focus Report I co-wrote alongside my dissertation supervisors, *A Climate of Change: Planning for Equitable Urbanism on a Warming Planet* (Oscilowicz, Connolly, Anguelovski [FORTHCOMING]).

6.1. Improving access to local climate action funding

The research underscores that funding access remains a critical barrier to implementing equitable climate action at the municipal level, particularly when considerations of housing affordability are (and should be) involved. Short-term policy efforts should prioritize investing in the capacity of local government staff and civic organizations to navigate and manage climate grants. This includes comprehensive training programs focused on financial management, regulatory compliance, grant-writing, and strategic funding deployment, alongside financial and technical support to civic groups to independently access and manage funding opportunities. Additionally, local government grant-offering departments can work to simplify and streamline grant application and reporting procedures to enable broader participation, particularly among grassroots organizations that often lack the administrative and time capacity to engage with complex municipal bureaucratic processes.

In the medium and long term, local and regional governments should prioritize establishing sustainable, diversified revenue streams for climate action funding. Strategies include crafting and advocating for local ballot initiatives that generate new tax revenues, as demonstrated in Denver with the creation of the Office of Climate Action and Resilience (Chapter IV), or creating municipal bonds earmarked for equity-centered climate and housing projects. Municipalities should also push for multi-year funding commitments from federal and national governments to shield climate initiatives from political turnover and annual budgetary instability. Building resilient and independent funding ecosystems is essential to ensuring that climate adaptation and housing affordability efforts are community-driven and equity-focused.

6.2. Creative and climate resilience-focused affordable housing strategies

Addressing the intersections of climate resilience and affordable housing requires creative, coordinated action in order to avoid displacement. Short-term policy goals should focus on maximizing existing housing resources by auditing under-utilized or vacant properties, especially those used for short-term rentals, and converting them into long-term affordable housing. Incentivizing climate-smart affordable housing development through grants, tax credits, and expedited permitting for projects that integrate green building standards and resilience features can decrease barriers to achieving both housing stability and climate action objectives.

Longer-term strategies must involve creating sustainable financial models for affordable housing development, including municipal housing funds, green housing bonds, and loan programs that bypass traditional financial institutions. Policymakers should promote mixed-income developments, support maintenance and retrofitting of existing housing (particularly those that are considered naturally occurring affordable housing), and advocate for rent stabilization policies where feasible to protect existing residents from renovictions, retrovictions, and other displacement pressures. Supporting models such as community land trusts and community-organized housing cooperatives will be crucial to ensuring that advance in affordable, resilient housing and the wellbeing benefits are community-controlled and sustainable, further supporting community-ownership principles and longevity.

6.3. Enhancing community connection to place through climate action

Climate action must be leveraged not only as a resilience imperative but also as an opportunity to strengthen sense of place and connection to space. Short-term initiatives should include the establishment of green workforce development programs, with a focus on training in renewable energy installation, energy efficiency retrofits, sustainable landscaping, and green infrastructure maintenance. Paired with financial incentives from local government, such as grants or low-interest loans for green start-ups and small businesses, these initiatives can foster local economic development while building community expertise, resilience, and ownership.

Over the long term, cities should work to create sustainable development zones or eco-districts that integrate climate resilience, affordable housing, and economic empowerment, with leadership structures that prioritize community control and participatory governance. Support for cooperative business models, green energy collectives, and community-owned renewable energy projects can anchor economic development in sustainability and collective ownership. Cultivating these local assets

ensures that climate action becomes a source of belonging, stability, and pride for historically marginalized communities—countering the risks of sociocultural displacement that often accompany urban greening and redevelopment projects.

6.4. Driving collaboration across departments and agencies through planning

The findings emphasize that siloed departments and fragmented levels of government often undermine the potential for integrated climate and housing strategies. Short-term measures should include the formal creation of cross-departmental working groups or liaison roles that intentionally bridge planning, housing, economic development, and climate action departments. Establishing regular, structured collaboration mechanisms, such as joint planning committees, interdepartmental climate action task forces, and racial justice officers, can break down silos and foster more coordinated housing and climate action across sectors.

In the longer term, cities should develop and fund comprehensive plans that explicitly integrate climate adaptation, housing affordability, racial equity, economic development, and public health. These plans must be living documents with regular updates, subject to ongoing community engagement and iterative revision. These documents should include concrete implementation pathways tied to funding mechanisms and measurable outcomes. Establishing and institutionalizing Climate Justice Offices and Racial Equity Offices within municipal governments, with direct reporting lines to the Mayor's Office and dedicated budgets for pilot projects and long-term programming, can further expand an integrated and robust approach to equitable climate urbanism.

7. Concluding remarks

This dissertation explores urban greening as a contested site of power within a landscape shaped by interwoven climate, housing, and economic crises. It examines how developers, grassroots activists, and urban planners interact within the politics of greening amid rising housing insecurity, climate disruption, and economic uncertainty. Drawing from comparative qualitative and quantitative research, the study reveals that greening initiatives, while often framed as climate solutions, reflect and reinforce existing power structures that vary across time and place, often manifesting as green gentrification, displacement, and disempowerment. Ultimately, this work demonstrates that the actors driving and contesting urban greening are deeply embedded in the struggles of the poly-crisis, and that

the future of green cities will depend on how power is negotiated within and against these intersecting challenges.

In writing this dissertation I was profoundly influenced by my own deep affection for our Earth and the built environment we have constructed upon it. I aimed to understand the diverse perspectives and narratives of those who shape, design, and inhabit our world. I knew I wanted to talk to people, learn from them, and so I did. I extend my gratitude to all the individuals who contributed to this research. I am particularly indebted to the urban planners I spoke with, whose ethical commitment to doing what is right affirms the moral foundations of our profession. As I conclude this dissertation, I return to the theme that first set this academic journey in motion. In an era marked by the unsettling rise of autocracy and fascism across the global stage, I often reflect on my own motivation—and that of many others—for choosing urban planning: a desire to effect meaningful, positive change and to serve the broader public. It feels unlikely to me that we stepped into that world to act otherwise. This shared motivation reaffirms the critical role of urban planning in shaping equitable and sustainable futures and it is a further reminder of the profound impact that thoughtful, radical, and antisubordinate planning can have not only on our cities and landscapes, but on the people and communities who inhabit them.

"The arc of the moral universe is long, but it bends toward justice."

Martin Luther King Jr.

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APPENDICES

Appendix A: Reflections on my research practice

My research practice has been shaped by an effort to bridge the gap between scholarship and policy action. Drawing from my background in applied planning, for which I hold a Master in Community and Regional Planning (MCRP) from the University of British Columbia, my research practice emphasizes both critique and pragmatism by acknowledging the structures that produce inequality but focusing in on policy pathways for more just urban futures. During the process of this dissertation, I both led and contributed to policy reports, community engagement events, as well as practitioner workshops to fundamentally shape the questions I asked, the methods I employed, and the theoretical frameworks I built.

My research-practice work began early in the dissertation process with the Policy Toolkit for Urban Green Justice (Barcelona Lab for Urban Environmental Justice and Sustainability (BCNUEJ) 2021), developed in partnership with ICLEI-Local Governments for Sustainability. This project, rooted in data and evidence from the GreenLULUs research initiatives, sought to translate emerging insights about green gentrification into actionable policies and tools for municipal planners and policymakers. Drawing on qualitative interview data from over forty cities across North America and Western Europe, the toolkit presented a robust framework of fifty anti-displacement and equitable green development tools. In the report, we offered five simulations of potential city characteristics for which potential applications of policy tools could be considered. In sum, the report advanced the idea that the pursuit of urban greening must be tied to the protection of affordable housing as well as the provision of equitable and just green spaces. Producing this toolkit allowed me to concretize theoretical insights about green gentrification and environmental injustice, not merely as an academic critique, but also as a set of policies and tools that planners and policymakers could strategically apply to achieve just greening.

My role as a lead author on the Lincoln Institute of Land Policy's working paper *Toward the Next Mode of Practice for Climate Urbanism* (Connolly, Anguelovski, and Oscilowicz 2023) further expanded my research to practice approach. This working paper examined the perverse outcomes of contemporary green climate urbanism, particularly how greening initiatives, when detached from housing justice, can exacerbate rather than mitigate urban and green inequalities. Reviewing the state of the literature, the paper advocated for a new practice of climate urbanism that embeds anti-displacement and non-siloed

governance at its core. Through this working paper, I laid a strong understanding of the current body of literature on climate action, green and climate gentrification, and displacement. I affirmed that planning practice must evolve beyond single-issue solutions toward multi-dimensional, justice-centered interventions. This reflection directly informed my analysis in Chapter IV of the dissertation, particularly around planners' struggles with institutional inertia and the need for transversal, multi-sector, and coalition-driven approaches.

Following the working paper, I contributed as lead author to the forthcoming Lincoln Institute Policy Focus Report, *A Climate of Change: Planning for Equitable Urbanism on a Warming Planet* (Oscilowicz, Connolly, Anguelovski [FORTHCOMING]). This report draws directly on the interview data collected and analyzed in Chapter IV, focusing on the experiences of professional planners and policymakers in Vancouver, Portland, Denver, Boston, and Washington, D.C. It offers action-oriented strategies and recommendations to help cities advance equitable climate urbanism by synthesizing emerging innovations that respond to the intertwined challenges of climate adaptation, housing affordability, and economic inequality. The report highlights both the constraints, including shifting political landscapes, limited funding, and deepening social vulnerabilities, as well as the creative strategies that practitioners are developing, including the use of pilot projects and enhancements to community engagement strategies, to move beyond ad hoc responses toward long-term, equity-centered climate action. Engaging in this research-to-policy translation process sharpened my understanding of the language of policymaking and inspired the transformation of the report into academic text, with foundation in planning theory.

Beyond report writing, I also engaged heavily in community-centered multi-media public scholarship. As co-producer and coordinator of *The Green Divide* web documentary and film (Bougleux 2023), I worked to amplify the voices of residents and activists navigating the injustices of green gentrification. By documenting struggles in Barcelona (ES), Nantes (FRA), Boston (USA), Washington D.C. (USA), Portland (USA), and Montreal (CAN), this web-documentary series and the longer-format film offered an alternative mode of knowledge production and research dissemination aimed at popular education, narrative story-telling, and policy influence outside of traditional academic channels.

Between 2023 and 2025, I helped organize and support several research-to-policy workshops aimed at fostering collaborative dialogue around just greening and affordable housing. The first workshop, held in Barcelona in October 2023, brought together local policymakers from Barcelona to share with them the BCNUEJ research findings on green gentrification in Barcelona and discuss the challenges

of integrating housing justice into urban greening initiatives. In October 2024, a second workshop was held again in Barcelona, expanding the dialogue to include policymakers, planners, and activists from both Barcelona and Boston. In this event, we aimed to facilitate comparative and cross-cultural exchange of strategies and experiences amongst planners and activists in both geographies. Finally, in June 2025, a third workshop for which I supported and contributed to organization and discussion was held in Boston, convening policymakers, planners, and activists from Denver, Portland, Boston, and Washington, DC. This workshop provided an opportunity for broader inter-city learning around how cities facing diverse political and economic contexts are addressing the intertwined crises of climate, housing, and economic crisis. Through these workshops, I learned that translating research into policy action requires sustained, iterative dialogue with the variety of urban actors. These workshops also helped sharpen my own dissertation framing, analysis, and interpretation of collected data.

In sum, these experiences have profoundly shaped both the empirical content and the theoretical underpinnings of my dissertation. They taught me that knowledge production cannot be isolated from subsequent policy action that must take place in order to implement and sustain transformative change. The values of my research practice are revealed in these policy reports and engagement workshops – I seek not only to document the processes of green and climate gentrification and related displacement, but to actively participate in the search for strategies that make greener cities both equitable, inclusive, and practical for all.

Appendix B. Supplementary data for Chapter II

B1. Supplementary Methods

In preparing the data for analysis, we used a number of data sources that helped us obtain real estate data. For each city we included in the present analysis, we looked for and identified data at the finest geographic scale available and best geolocalizable data[43].

Real estate development dataset

This dataset was developed during the Greenlulus project (2016-2021, Grant Agreement No. 670834), funded by the EU, over the years 2016 to 2018. It was designed to detail the annual construction of new residential buildings. The data collection method varied by city, resulting in two distinct dataset types: one detailing the construction year of residential buildings across 22 cities, and the other tracking new residential projects within specific spatial units over time in 6 cities. The information was sourced from land registry, taxation, or construction permitting records, accessible through public online platforms, direct communication with city authorities, or, in some cases, purchased from the cities.

Before it could be utilized, the data often required preliminary processing, such as the exclusion of non-residential property records. All data was geographically coded, either by plotting X,Y coordinates or by merging relevant data fields with city-provided spatial shapefiles. The ultimate objective was to compile comprehensive records for the total count of new residential constructions annually for each designated area.

Supplementary Table 1. Development data collected per city

City	Type of data	Data details
Amsterdam	Year built	The Cadaster of Amsterdam holds the BAG (Basisregistraties adressen en gebouwen, Basic Registration of Addresses and Buildings in English). A fee was paid to access the Cadaster and the BAG extract to obtain the year built information for all buildings in Amsterdam.
Atlanta	Year built	Annual city tax roll contains year built data for all building types, collected by the Fulton County Board of Assessors. Available free of charge online.

[43] This Supplementary Information is a modified and expanded version of the published paper (XXXX et al. 2022.). This study was built upon similar methodological instruments as this paper, yet the quantitative analysis of this paper is not based on the full data of the 2022 paper, that is it does not include gentrification data as part of our core quantitative methodology.

Austin	Year built	The land database digital map, created by the City of Austin Development Services Department, provides year built information. Available free of charge online.
Baltimore	Year built	Real property shapefile available for free of charge download online.
Barcelona	Year built	Cadastral parcels and year built was downloaded from the INSPIRE project at the Dirección General del Catastro, government of Spain. Available free of charge online.
Boston	Year built	Tax parcel information contains building ages, derived from the City of Boston's Building Permits data base thanks to collaboration between the Boston Area Research Initiative and the City of Boston. Available free of charge online.
Bristol	New residential developments per spatial unit	The Consumer Data Research Centre provided residential dwelling ages, grouped into approximately 10-year age bands and provided per spatial unit (263 in Bristol). We used four age bands to assess new building construction: 1) 1983-1992; 2) 1993-1999; 3) 2000-2009; 4) 2010-2015. Data provides the numbers of properties in each Lower Super Output Area (LSOA, around 1000 properties) for each age band, with data rounded at source near 10. Available free of charge online.
Calgary	Year built	The City of Calgary provided building ages in tabular data form from 2014-2018. From 1999 to 2013, permit history was used, with the Geodatabase files allowing for every building permit to be spatially correlated to actual parcels. Data was provided via email by the City of Calgary.
Cleveland	Year built	Parcel data files from Cuyahoga county provides the year all properties were built in Cleveland. Data was provided via email by the City of Cleveland.
Copenhagen	Year built	Cadastral data contains year built information, gathered by city of Copenhagen. Data was provided via email by Lifa, a Danish property inspection company.
Denver		Parcel data files from Denver Open Data Catalogue provide year built information. Available free of charge online.
Detroit	Year built	Parcel data files from City of Denver Open Data Portal provides year built information. Available free of charge online.
Dublin	Data not available	Data not available
Edinburgh	New residential developments per spatial unit	New buildings built per year from 2004 to 2016 per 2001 Data Zone (549 Data Zones in Edinburgh), provided by Scottish Neighbourhood Statistics. Calculated increase in total dwellings from year to year in overall dwellings per Data Zone and in number of dwellings per tax band.
Louisville	Year built	Building permits issued or in progress provides data on new buildings under construction, collected by the Louisville Office of Construction Review and posted on Louisville Open Data. Available free of charge online.
Lyon	New residential developments per spatial unit	Data provided by the National Institute of Statistics and Economic Studies (INSEE) lists new buildings built between 1991-2005 and per year from 2006 to 2010. Partial data per spatial unit (IRIS, 174 in Lyon) only available between 2011 to 2015. Available free of charge online, registration required on the Reseau Quetelet data platform for social scientists.

Montreal	Year built	Two data sets were combined to provide a comprehensive view of the city. 1) Building age data provided by the Canada Broadcast Corporation (CBC) for downtown area and 2) 2016 census data from Statistics Canada provided data on occupied private dwellings by period of construction (1960 or before; 1961-1980; 1981-1990; 1991-2000; 2001-2005; 2006-2010; 2011-2016). Available free of charge online.
Milwaukee	Year built	Master property file from Milwaukee Open Data provided year built information. Available free of charge online.
Nantes	New developments per spatial unit	Data provided by the National Institute of Statistics and Economic Studies (INSEE) lists new buildings built between 1991-2005 and per year from 2006 to 2010. Partial data per spatial unit (IRIS, 91 in Nantes) only available between 2011 to 2015. Available free of charge online, registration required on the Reseau Quetelet data platform for social scientists.
Portland	Year built	Building permits issued or in progress provides data on new buildings under construction, collected by the Portland Development Services Center since 1995. Available free of charge online. https://www.portlandmaps.com/arcgis/rest/services/Public/COP_OpenData_PlanningDevelopment/MapServer/89
Philadelphia	New developments per spatial unit	Building permits issued for new residential construction available free of charge online.
San Francisco	Year built	DataSF provides year built information, collected by the San Francisco property tax assessor. Available free of charge online.
Seattle	Year built	Building permits issued or in progress provides data on new buildings under construction, from data collected by the Seattle Department of Constructions and Inspections. Available free of charge online.
Sheffield	New residential developments per spatial unit	The Consumer Data Research Centre provided residential dwelling ages, grouped into approximately 10-year age bands and provided per spatial unit (345 in Sheffield). We used four age bands to assess new building construction: 1) 1983-1992; 2) 1993-1999; 3) 2000-2009; 4) 2010-2015. Data provides the numbers of properties in each Lower Super Output Area (LSOA, around 1000 properties) for each age band, with data rounded at source near 10. Available free of charge online.
Valencia	Year built	Cadastral parcels and year built was downloaded from the INSPIRE project at the Dirección General del Catastro, government of Spain. Available free of charge online.
Vancouver	Year built	Property tax report table from city of Vancouver provides data on building age. Available free of charge online.
Vienna	New residential developments per	City of Vienna, Department for Economy, Labour and Statistics, provided data on the number of constructed residential buildings per year at the Zählbezirk (smallest geography) spatial unit level. Data is collected by the Building-Housing-Address-Register of the Austrian Statistic Institute. Data was provided via email from the City of Vienna.

	spatial unit	
Washington DC	Year built	Historical data on the buildings of Washington DC, collected over 15 years by Brian Kraft, with support from JMT Inc., for the DC Historic Preservation Office. Available free of charge online.

Greening dataset

The dataset on greenspaces encompasses the delineated areas for all types of urban greenery such as parks, greenways, preserves, both officially recognized gardens and those not formally sanctioned, and recreational zones as they existed by 2016, including the commencement year of these spaces from 1990 onwards. Recognizing the varied interpretations and definitions of what constitutes a greenspace across different fields (Taylor and Hochuli, 2017), this study adopts a broad definition that includes any urban areas categorized as one of the following types: parks, greenways, preserves, gardens, or recreational spaces (Connolly and Anguelovski 2021). Occasionally, the documented extents and dimensions of these greenspaces were manually enhanced based on publicly accessible data when additional spaces were detected via alternative sources. The determination of each greenspace's initiation year involved multiple sources including direct contact with municipal or charitable organization personnel, municipal property records, scholarly and news publications, historical photos, and searches of municipal archives. The term 'inauguration' was assigned to the year a location was designated for public greenspace use; if this specific year was unknown, the year it was made accessible to the public was noted instead.

To estimate the expansion of greenspace over time within specific smaller geographic areas, we initially assumed each greenspace attracts nearby residents within its vicinity. A commonly accepted distance of 400 meters[44], deemed a short, walkable range of approximately 5-10 minutes, was used as a standard measure for a greenspace's catchment area. Therefore, to compute the greenspace metrics for any given small-area geography, we began by establishing a 400-meter Euclidean buffer around the area, incorporating this buffer along with the formal tract boundary for comprehensive greenspace analysis per tract (as detailed by Connolly and Anguelovski 2021).

44 https://www.healthyactivebydesign.com.au/design-features/public-open-spaces/evidence/#distancequal

Subsequently, we quantified the greenspace area developed during three distinct timeframes. Due to variable data, these intervals do not always precisely match typical decade divisions. For instance, while Time Period 1 might span from 1992-2001 in one city, it might cover 1990-2000 in another. To accommodate such discrepancies, the division of greenspaces into specific timeframes was adjusted based on our other parent study data, that is gentrification data. The aggregate area of greenspace added in each period was calculated by summing up the areas of all greenspaces established within the timeframe dictated by the gentrification data and including an additional two years post-period to account for potential "announcement effects," referring to spaces announced just before or during the timeframe but likely constructed within the subsequent two years (Immergluck 2009). For instance, if gentrification data for Time Period 2 in a city record shifts between 1999-2006, then the green space data for Period 2 would encompass the total area added from 1999 through 2008.

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Bayesian models

To examine the connection between greening and development across three hypotheses, a methodical three-step approach was used to identify pertinent variables and detect any spatial influences, thereby uncovering potential geographical factors stemming from the diverse dynamics inherent in urbanization. Initially, BayesVarSel (Donato and Forte, 2018) was employed to determine the significant covariates amidst others. Following this, the presence of spatial autocorrelation in the model's residuals was assessed using the Moran index (Moran 1950). If spatial autocorrelation was found, a third step involved incorporating a spatial random effect designed to account for the detected spatial influence, adhering to the principle that an area's characteristics are influenced by its surrounding areas. To prevent any overlap between the spatial effect and the covariates, the model was formulated as a spatially restricted regression, ensuring that the spatial random effect remains orthogonal to the space of covariates.

Analysis continued within a Bayesian framework, necessitating the prior determination for all parameters and hyperparameters involved in the model. Specifically, vague prior distributions were

selected to reflect the initial uncertainty regarding these parameters. The full model thus developed integrates these considerations to thoroughly analyze the relationship between urban greening and development:

$$
\begin{aligned}
y_i &\sim \mathcal{N}(\mu_i, \sigma_\epsilon)\,,\ i = 1, \ldots, n \\
\mu_i &= \boldsymbol{V_i}\boldsymbol{\beta} + s_i\,, \\
\beta_1, \beta_2, \ldots, \beta_{p+1} &\sim \mathcal{N}(0, \sigma^2 = 1000) \\
s_{i|j} &\sim \mathcal{N}\left(\frac{1}{k_i}\sum_{i\sim j} s_j, \frac{\sigma_s^2}{k_i}\right),\ i \neq j, \\
\sigma_\epsilon, \sigma_s &\sim \text{pc-prior}(2, 0.5)\,.
\end{aligned}
$$

Since the posterior distributions for the parameters and hyperparameters lack a formulaic representation, the fitting of all derived models was done through the Integrated Nested Laplace Approximation (INLA) approach. This technique, recognized for high computational efficiency, is implemented through software that delivers precise estimates of posterior distributions (Rue, Martino, and Chopin 2009). When interpreting results, it is crucial to understand that Bayesian probabilities differ from conventional p-values and should not be viewed as directly substitutable.

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B.2 Semi-structured interview instruments

The following is a protocol for semi-structured interviews with city officials, developers, and community organizers in the selected 23 cities where the project was implemented.

As part of the instrument, we indicate average time that each researcher spent on each section. Time was adjusted depending on each researcher's sense of how long the interview might/can have lasted. Most interviews lasted between 45' and 1h30.

In case researchers ran short of time, we have added asterisks (*) for the most important questions that had to be covered.

Before starting each interview, each researcher distributed the information sheet about the project to each respondent, left one of their business cards, and had the respondent read and complete the informed consent sheet.

For the present paper, we only used questions and data that belonged to or treated the relationship between greening and development.

INTERVIEW QUESTIONS – MUNICIPAL/PUBLIC SECTOR REPRESENTATIVES

(public officials, planners, departmental/ sectoral managers (including greenspace/environmental department, housing department, and health agency)

BACKGROUND

The goal of the background portion of the interview is to develop a 10-15 minute conversation about the general priorities of the agency with regard to greening; the motivations for those priorities; and the general extent to which greening and social issues are integrated in the agency's work. These questions should serve as a detailed guide to help accomplish this goal, but only focus on those questions where the respondent is particularly knowledgeable. Once the interviewer feels the general goal of this section is accomplished, move on. Try to limit this section to 10-15 minutes.

‣ *To begin with a bit of an overview…thinking about the period of the last twenty years or so, what has been the [AGENCY NAME] position on greening? What have been the main focal points and approaches for creating a greener [City Name]? How have they evolved over time? Since the period covers quite some years, it is obviously fine to summarize or highlight the main projects and approaches.

[*Mention a few of the key projects you have read about and that have caught your attention for being innovative or ambitious. Show you know the city!*]

[*Consider that we may be talking, for example, to an affordable housing agency, so the question is more have you had a position on greening or what have been the persons' perceptions of the greening projects rather than what have been the focal points for greening.*]

‣ * What were the most important trigger points or incentives for the City deciding to approach urban greening in those ways? What are the most important benefits and values that you see in creating a greener [City Name]? To what extent do health and well-being benefits fit into the projects/interventions?

[*Explain that you are referring to the ecological/environmental values, but not only. Probe for understanding about the overall logic of greening within the agency and how this logic has evolved over the last twenty years, if possible]*

[*For non-environmental agency/department, focus on the last two questions above. The first one is not that relevant]*

‣ *(Generally speaking, have social issues been integrated into the greening agenda? We refer here to issues related to equity, inclusion, access, neighbourhood affordability, health disparities/equity, among others. What kinds of neighbourhood, community, or other social issues have come up around greening?

PARTNERS AND PROJECTS

The goal of this section is to establish some specific examples of partnerships and projects that elaborate how the agency has done its work within the general context described above. This portion of the interview should take you about halfway through your time (approximately 15-20 minutes on this section). Focus on examples that seem particularly rich—partnerships and projects that stand out to you or the respondent as of particular interest.

‣ Who do you consider as the most important partners from government, nonprofit, and private sectors in creating a greener [City Name]? How do/did you work with them (if at all)? Can you describe how partnerships that you think were particularly important developed?

‣ Which partnerships are most important to make equity, inclusion, affordability, and anti-displacement a center of the municipality's planning and development work?

‣ As the main greening interventions have been executed [Name a few] [for Nantes, for example: Ile de Nantes regeneration process, eco-districts, community gardens plan, new parks], what, was your

role/responsibility in those projects? If any, what were the greatest challenges the City/you encountered? To what extent was the municipality able to overcome them? How?

SPECIAL TOPICS

The goal of this section is to use the specific examples and general context established earlier on as a basis for a 20-minute (roughly) conversation about issues of special concern. These issues should definitely include community resistance and green gentrification (detailed questions below), but can also include one other issue selected by the researcher. Note that this issue should reflect the researcher's specific area of interest, which can also be incorporated in the specific probes (follow up questions) asked in prior sections, but this section provides a chance to ask more directly about that topic. For respondents that are particularly knowledgeable about the researcher's specific topic of interest, it is likely that an extended or follow-up interview will be required.

‣* To what extent have XXX projects raised community concerns or resistance? [remain general here]? Which ones? Have there been other conflicts over the greening agenda that come to mind? Examples?

‣* In our field, we talk about green gentrification in reference to the undesirable social and economic impact of urban greening on the ability of long-term, often times socially vulnerable residents, to remain in place because of rising real estate prices or because those residents perceive that their neighbourhood is changing for the benefits of more socially privileged groups. Green gentrification also increasingly indicates that the health benefits of greening might not be equally distributed if residents fear that they might become displaced by greening, if they don't see themselves recognized/involved in the greening project, and if they are also experiencing a form of physical or social displacement. To what extent is this word/process relevant for a place like [City Name]?

If respondent argues it is not relevant, skip to next question. If relevant, probe further…

‣ How does GG manifest and take place? What have been the main contributing factors to GG? What type of pushback have you seen against GG? From which groups?

‣ What are the greatest obstacles and constraints here?

EQUITY TOOLS

‣ * Do you see a relationship between <u>your work</u> and addressing issues of displacement and possible gentrification – one way or another? If yes, in which way? If not, why?

‣ To what extent is the Municipality able to respond to green gentrification or gentrification/displacement risks or trends?

‣ * In general, can you describe the most important existing policy, planning, or regulatory tools to address risks of gentrification and displacement in the city [I.e., rent control; inclusionary zoning that constrains developers into building or financing affordable housing]?

‣ * Can you describe the most important existing financial tools or mechanisms to address risks of gentrification or displacement in the city [i.e., property tax reduction for working-class residents; rental vouchers to help pay for rent]?

‣ Are there any other measures or decisions or projects to highlight that helps protect long-term residents?

‣ * What other tools or mechanisms (any of them) would be important to put in place to address risks of gentrification displacement in the city?

‣ If any, with which other public, private, and community actors do you (or does the City) consider as central to work on anti-gentrification/displacement issues?

‣ [Add question on topic of interest to interviewer]

CLOSING

The goal of this section is to bring the interview to a logical stopping place. This section should include a 5-10 minute conversation about suggestions of model projects and other people to talk to.

‣ Have you encountered specific cases in [e.g. France, Europe, or beyond…adjust as needed] where a municipality has done interesting work to ensure that urban greening is equitable, inclusive, and affordable? If yes, what have they done?

‣ Is there anyone else you suggest I talk with about issues related to greening, growth, and social equity in [city name]?

INTERVIEW QUESTIONS – MUNICIPAL STAFF/LEADERS IN HOUSING AND COMMUNITY DEVELOPMENT

BACKGROUND

‣ *To begin with a bit of an overview…thinking about the period of the last ten years or so, what has been the Department of Housing and Community Development main strategy and work related to urban greening?

‣ * What were the most important trigger points or incentives your agency deciding to approach urban greening in those ways? To what extent do health and well-being benefits fit into the projects/interventions?

‣ *(Generally speaking, have social issues been integrated into the greening agenda? We refer here to issues related to equity, inclusion, access, neighbourhood affordability, health disparities/equity, among others. What kinds of neighbourhood, community, or other social issues have come up around greening?

‣ Who do you consider as the most important partners from government, nonprofit, and private sectors in creating a greener and affordable Washington? How do/did you work with them (if at all)? Can you describe how partnerships that you think were particularly important developed?

If any, with which other public, private, and community actors do you (or does the City) consider as central to work on anti-gentrification/displacement issues? (this might have been addressed earlier)

LOCAL NEIGHBORHOOD/PROJECT FOCUS

‣ To what extent and how has your agency been involved in the Anacostia greening projects?

‣ To what extent have you been involved in the 11th street bridge project and other sustainability projects in Anacostia and can you describe your experience in it?

To what extent do gentrification concerns play an important role in your work in those areas of the city?

‣ In which ways is your housing agency working respond to green gentrification or gentrification/displacement risks or trends?

CITY-WIDE QUESTIONS

‣ * In general, can you describe the most important existing policy, planning, or regulatory tools to address risks of gentrification and displacement in the city [I.e., rent control; inclusionary zoning that constrains developers into building or financing affordable housing]?

‣ * Can you describe the most important existing financial tools or mechanisms to address risks of gentrification or displacement in the city [i.e., property tax reduction for working-class residents; rental vouchers to help pay for rent]? (IF PRESSED FOR TIME, FOLD THIS QUESTION INTO THE PREVIOUS ONE)

‣ Are there any other existing measures or decisions or projects to highlight that helps protect long-term residents?

‣ * What other tools or mechanisms (any of them) would be important to put in place to address risks of gentrification displacement in the city?

INTERVIEW QUESTIONS – DEVELOPERS

(real estate investors, real estate developers, growth-oriented agencies)

BACKGROUND

The goal of the background portion of the interview is to develop a 10-15 minute conversation about the general priorities of the organization, the motivations for those priorities, and the extent to which greening and affordability play a part in their work (generally). These questions should serve as a detailed guide to help accomplish this goal, but only focus on those questions where the respondent is particularly knowledgeable. Once the interviewer feels the general goal of this section is accomplished, move on. Try to limit this section to 10-15 minutes.

What has made XXX become a hotter place for real estate development – say for the last 10 years?

‣* To begin with a bit of background, generally speaking, what have been your main real estate investment strategies/ development goals and objectives over the last 15 years or so? Where do you see the greatest opportunity for growth and new development in [City Name]?

[*Try to get a sense of the general areas they've been interested in, why, and for which type of investment and goal.*]

‣* [*If greening, sustainability, etc. come up within their listed priorities, stay general at this point, but follow up with*:] How and why is green development a priority?

[*Probe. Ask for details on where these priorities came from…internal organizational priorities or external pressures?*]

‣* [*If greening, sustainability, etc. does not come up, follow up with*:] To what extent does urban sustainability or urban greening play a role in your investment decisions?

‣* How about affordability? What shapes your thinking here? Do municipal tools/policies [CITE EXAMPLES IF ANY] to address housing affordability in the city [and in X neighborhood in particular] affect you positively or negatively?

PARTNERS AND PROJECTS

The goal of the Partners and Projects portion of the interview is to provide some more detailed context on particular green projects, particular projects dealing with social equity, and challenges and partnerships that the respondent sees as important in order to address these issues. This should be a 10-15 minute conversation that establishes some specific examples from which to work.

‣* [*If green is a priority*] Can you provide some detail on one or two examples of your development projects that prioritize greening? What were the greatest challenges? How did you overcome them?

‣* [*If green is not a priority*] Have you done any projects with a green focus? If not, can you provide some detail on one or two examples of development projects where green development proved to be difficult or impossible? What were the greatest challenges?

‣* Who do you consider as the most important partners from government, nonprofit, and private sectors in order to be a part of these opportunities for green development? How do/did you work with them? Examples of partnerships or projects that you think were particularly important?

SPECIAL TOPICS

The goal of the special topics section is to build on the earlier examples in order to discuss issues of special concern (roughly 15-20 minutes). These issues should definitely include the ways that greening, city policy, and community activism affect development decisions, but can also include issues of interest to the researcher.

‣* Are there any recent policy instruments or financial tools that support new developments that are especially important for your work? Are any of them related to greening [*thinking about, for example, green bonds*]?

‣* To what extent have any policies or processes of neighborhood change influenced your decision to invest in [area where green amenities have been built/renovated and led to some neighborhood change…based on prior research or projects mentioned in the above questions]? Examples?

‣ What have been your reactions/feelings about community concerns related to displacement [or other type of concern] in [neighborhood with community organizing related to GG]? Examples?

[IF NO COMMUNITY CONCERN: How do you expect residents in [neighborhood with urban greening and new investment by this company] to feel/react [AS NEUTRAL AS POSSIBLE] as a result of your new investment? Why?

‣ [Add question on topic of interest to the interviewer]

CLOSING

The goal of this section is to bring the interview to a logical stopping place. This section should include a 5-10 minute conversation about issues not discussed and additional people to talk to.

‣ Are there any issues we have not discussed that you think are important to consider when thinking about how to balance environmental and social equity concerns within development processes in (City Name)?

‣ Is there anyone else you would suggest I talk to about issues related to greening, growth and neighborhood change in [City Name]?

INTERVIEW QUESTIONS – COMMUNITY REPRESENTATIVES

(Community Development Groups, Community Based Organizations, Community Activists)

BACKGROUND

The goal of the background portion of the interview is to develop a 10-15 minute conversation about the general priorities of the organization with regard to greening; the motivations for those priorities; and the general extent to which greening and social issues are integrated in the organization's work. These questions should serve as a detailed guide to help accomplish this goal, but only focus on those questions where the respondent is particularly knowledgeable. Once the interviewer feels the general goal of this section is accomplished, move on. Try to limit this section to 10-15 minutes.

‣* To begin with a little background, if we think back 15 years or so, what type of environmental and related health issues have you hoped to see addressed in the neighborhood in the past (or have you worked on if talking to environmental org)? [*give options if needed or desirable*]

‣ To what extent have those earlier issues been addressed? How do you perceive the environmental changes/improvements?

[Feel free to skip the first question above if you have already enough information gathered/identified from desk and background research. Respondents might be ticked off by the fact we have not done our "homework" on their organization/group]

‣* To what extent have more recent environmental and related health issues become relevant? What are the priorities now, in your view? What are the key environmental or greening projects in your neighborhood now? *[Skip this last question if you already have a very good sense of them, and/or if you feel you need to move forward with the interview. You can always go back to it in the end too]*

‣* To what extent have recent environmental and related health issues or greening projects shaped your group/organization's goals/focus? What about your strategies/tactics as a group/organization?

‣ To what extent do you think your group/organization is going to have to make additional changes in goals and strategies?

PROJECTS AND PARTNERS

The goal of this section is to establish some specific examples of partnerships and projects that elaborate how the agency has done its work within the general context described above. This portion of the interview should take you about halfway through your time (approximately 15-20 minutes on this section). Focus on examples that seem particularly rich—partnerships and projects that stand out to you or the respondent as of particular interest.

‣* [Using a project, or two, you know in advance or that was raised in the first section] When was the first time you heard about [particular urban greening project]? How did the project seem to you at first? How do you perceive it now? To what extent do goals related to planning for healthier cities seem to be addressed in the project?

‣ What do you think was the city's intention or vision behind [project name]? How do you feel about it?

‣ What do you think of the way it was designed and conducted [*probe to understand how the planning and design process worked from their perspective*]?

‣ Which groups do you think most benefit from it? How? [*trying to get at interactive justice*]

‣ What have been, if any, interesting tools/policies/decisions taken by the City to make X project more inclusive?

‣To what extent have you been associated or have you participated in this project? To what extent has your group/organization's relationship with the City changed since the recent [greening project]? What about your relationship with investors?

SPECIAL TOPICS

The goal of this section is to use the specific examples and general context established earlier on as a basis for a 20-minute (roughly) conversation about issues of special concern. These issues should definitely include affordability and green gentrification (detailed questions below), but can also include one other issue selected by the researcher. Note that this issue should reflect the researcher's specific area of interest, which can also be incorporated in the specific probes (follow up questions) asked in prior sections, but this section provides a chance to ask more directly about that topic. For respondents that are particularly knowledgeable about the researcher's specific topic of interest, it is likely that an extended or follow-up interview will be required.

‣* What have been some non-environmental positive or negative impacts associated with this or other greening projects in the neighborhood? How do these affect your work?

‣* How do you perceive the neighborhood quality of life, now, especially considering these/this new urban greening project(s)? What about housing prices? Housing affordability? Exclusion in general? And the impact of those on people's everyday's well-being, concerns, stress, etc?

‣* What have been, if any, interesting tools/policies/decisions taken by the City to respond to concerns about housing affordability [or other concerns related to GG]? What do you consider are important tools/policies/decisions to achieve a more environmentally just [neighborhood] and that should be pushed for? If you could change any current policy, what would it be?

‣ [Add a question on a topic of interest to the researcher]

CLOSING

The goal of this section is to bring the interview to a logical stopping point. This section should include a 5-10-minute conversation about general perspectives and other people to talk to.

‣ How would this neighborhood ideally "look" in 10 years? [ecologically, socially, developmentally]

‣ Is there anyone else you suggest I talk with about issues related to greening, growth, and social equity in [City Name]?

B.3 Full qualitative coding matrix

Here are five final categories of codes for the qualitative interviewing coding process:

I. City/neighbourhood context

II. Community mobilisation

III. Policy measures

IV. Municipal processes and support to address green equity

V. Other codes

I. CITY/NEIGHBOURHOOD CONTEXT

1. Description of neighbourhood greening

2. History of environmental injustices (food access, contamination, neglect, racial inequality)

3. General development changes (real estate, new investments, demographic change)

4. Municipal motivations for and approaches to greening (why and how municipalities green)

5. Municipal partnerships and alliances for greening (with private sector, non-profits, non-governmental organisations, neighbourhood groups etc.)

6. Perceptions of or tensions related to greening, gentrification and/or issues of class and race (how informants view and perceive these relationships)

7. History of neighbourhood/city under-investment, degradation and segregation

8. Use of green space by residents

II. COMMUNITY MOBILISATION

1. CONCERNS/TRIGGERS (what respondents frame as something negative, as problems)

a. Urban regeneration/revitalisation (terms that in practice often equate to state-led or state-facilitated gentrification)

b. Gentrification

c. Displacement (from neighbourhood due to amenity creation/restoration or other, can happen without gentrification)

d. Lack of affordable housing

e. Real estate development on green space or community gardens

f. Racial injustices, inequalities and segregation

g. Widespread health risks related to (unequal) exposure to environmental hazards

h. Neoliberal urban development policies (e.g. policies that encourage market mechanisms and private actors, reduce roll of state, prioritise individual rather than collective benefits)

i. Long-term neglect of minority neighbourhoods

j. Lack of accessible/quality blue space

k. No or tokenistic participation in neighbourhood development schemes

l. Green types of inequities

    i. Little or no access to environmental education

    ii. Commodification of community gardens and food practices (e.g. they become pay for use/access, sponsored – exchange value prioritised over use value, reducing accessibility and affordability)

    iii. Privatisation and commodification of public parks/green space/public space

    iv. Lack of/poor quality/insufficient (public) green spaces

    v. "Green (lifestyle)" developments (inaccessible/excludes existing local residents)

m. Transit and transport

2. FRAMES OF RESISTANCE/MOBILISATION & CONTEMPTION (how communities/activists articulate (frame) what they are organising for or against. Could be implicit or explicit)

a. Environmental justice

b. Climate justice

c. Cultural preservation

d. Social justice

e. Racial justice

f. Food justice

g. Anti-gentrification

h. Right to the city (appropriation of space, city for people not capital, housing rights for all)

i. Participatory democracy

j. Abolitionist/anti-subordination/emancipatory (e.g. land rights recognising historic injustice (reparations), liberation from and/or transformation of the existing system)

k. Feminist approaches (care, wellness, social cohesion)

3. DEMANDS (what respondents frame as something positive, something they want)

a. Green space

i. Green space that meets residents' needs (better playgrounds etc. instead of "cool", flagship or speculative greening projects)
ii. Access to green space (improve access of what is already there)
iii. Preservation of green space (focus on conservation rather than use by people)
iv. Inclusive green spaces
v. Community ownership of green space
vi. Gender and access to green space
vii. Green jobs and other economic benefits

b. Self-management of land or housing

c. Affordable and/or secure housing for all

d. Affordable housing on public green land

e. Real participation in development processes and/or socially inclusive planning

f. Improved environmental quality (air, water)

g. Access to healthy and affordable food

h. Brownfield clean up (clean up of contaminated land, usually formerly industrial land)

i. Recognition of and addressing past and existing injustices

j. Stop displacement (of people being forced to move)

k. Access to blue space and blue space clean-up/redevelopment

4. STRATEGIES AND TACTICS OF COMMUNITY/ACTIVIST RESISTANCE

a. Strategies

Creation of community-owned spaces and/or reclaiming neighbourhood resources

Mobilisation for a Community Land Trust, CLT (a non-profit organisation that develops and stewards community assets (affordable housing, gardens, etc.) on behalf of a community)

Construction or funding of social/public housing

Community-led alternative development proposals or redevelopment processes

Community food security practices (food coops, growing networks, affordable restaurants, community/collective gardens: different options to ensure healthy food is accessible to low income and minority residents)

b. Tactics

Alliance building and creation of coalitions

Direct action (street marches; protests in front of city council; vandalism of organic food shops, estate agents or luxury housing)

Squatting (land or buildings) or blocking evictions

Collective allegations and court cases

Arts-based tools (theatre, graffiti, etc.)

Neighbourhood / public assemblies

Outreach / lobbying public institutions (participation in city council meetings and public consultations; letters to elected officials; petitions; proposing legal changes or new laws)

Research and mapping projects (on gentrification, evictions, environmental injustices, etc.)

Organisation of activities (workshops, neighbourhood tours, popular education activities, debates, conferences)

Campaigns (fundraising and political)

Use of media (social media advocacy; documentary films; podcasts)

Volunteer-based park maintenance and stewardship

III. POLICY MEASURES

1. ANTI GENTRIFICATION / DISPLACEMENT POLICY RESPONSES

a. Municipal regulations/ordinances

i. Inclusionary zoning (a planning ordinance that requires a given share of new construction to be affordable (for people with low to moderate incomes))

ii. Formal recognition of the right to stay/place OR right to return

iii. Defence of single family homes or minimum lot size (for some places this is an anti-gentrification measure)

iv. Limitations or freezes to property tax increases

v. Demolition fees paid by developers

vi. Development tax (paid by developers towards a trust fund or other, often dedicated to build affordable housing or amenities needed by existing community)

vii. Obligation for developers to include affordable units in development

viii. Tax on vacant housing units

ix. Payment of fee for developers who want to build green space

x. Rent control/tenant protection

xi. Regular support to housing coops and other non-profit housing schemes

xii. Municipality or tenant opportunity to purchase act (enables purchase of flats or buildings to preserve affordable housing, although can be perverse if encourages private individuals to buy instead of creating/maintaining public housing stock)

xiii. Regulations on tourist/short-term rental apartments (e.g. AirBnB)

xiv. Re-zoning of green space to residential space

xv. Up-zoning (changing zoning regulations to allow for higher-value or more density, or to redevelop brownfields – in some cases is anti-gentrification but in others the opposite)

xvi. Others

b. State/regional regulations/ordinances

i. Tax on foreign ownership of buildings/units

ii. Homestead tax credit/tax exemption (removes part of a home's value from taxation, so they pay lower taxes, benefits low income families whose home is increasing in value)

iii. Land use policy (e.g. regional or state level law allowing for collective purchase of vacant land or other measures)

iv. Rent control

v. Others

c. National regulations/ordinances (e.g. national legislation on collective land purchase)

d. Financial schemes and incentives (municipal, regional and national)

i. Rent subsidies or vouchers (helps low income renters or business owners pay rent)

ii. Property tax payment support

iii. Density bonuses to encourage affordable housing (obliges developers to build more housing units and designate them as affordable)

iv. "Strategic" density (increases neighbourhood density by building more homes, and dedicate a large portion of them to affordable housing)

v. Equitable job access and/or wages for low income and minority residents

vi. More financing/support for public, social, cooperative or "affordable" housing

vii. Loans for home ownership for middle income or low-income residents

viii. Public workforce housing (to help public sector workers access affordable homes in the city)

ix. Support for developers to develop empty lots or buildings into affordable housing

x. Equitable economic development (i.e. support of small district-based and minority or female-owned businesses)

xi. Housing tax credit programmes (for low-income residents to purchase housing or for long-term, lower-income residents to stay in homes despite property tax increases)

e. Planning instruments / documents

i. Investment incentives in specific areas (opportunity zones, strategic development zone, special interest zone, Business Improvement District)

ii. Community Land Trusts, CLT (a non-profit organisation that develops and stewards community assets (affordable housing, gardens, etc.) on behalf of a community)

iii. Preservation Districts or Historic Districts (areas protected from character-changing (re)development due to their historic or cultural characteristics)

iv. Equitable/inclusive/racial equity development plan or development team

v. Equity scoring/evaluation of urban projects, redevelopment schemes

vi. Moratorium on new businesses, hotels, etc. (freezes on licenses for new businesses)

vii. Neighbourhood improvement or green district (districts where homeowners and/or business owners agree to pay extra taxes to improve or green their neighbourhood)

viii. Eco district

4.

ix. Land bank

f. Tools specific to fight different types of gentrification

i. Food gentrification (urban gardens, access to farmer market etc. for low-income and or minority groups)

ii. Transit gentrification (measures to counteract negative impacts of TOD: transit oriented development, which improves metro, bus, bike access, and at the same time often increases property values, which can displace low income or minority residents)

2. MORE GREEN AMENITIES / OPEN-PUBLIC AMENITIES

a. Regulations/ordinances (municipal, state / regional or national)

i. Fee paid by developer directed to park funding

ii. Reduction of minimum area required for parking in new development projects (meant to deincentivise private car ownership and encourage sustainable transportation options)

iii. Opening of private green space to the public

iv. Interim green spaces (on vacant land, e.g. pop-up urban gardens)

v. Re-zoning of streets of green transit areas

vi. Re-zoning of urban land to green space

vii. Minimum amount of green space in new development projects

viii. Clarification over administrative roles for green space management-security

b. Financial tools and budgetary development

i. Increased budget for new/improved urban green amenities

ii. Green bonds (a loan agreement between a bond issuer (could be local government or a bank) and an investor, where the money is invested in "green" projects)

5. a.Motivations for green bonds: Moral and ethical benefits

   b.Motivations for green bonds: Community improvement benefits

   c.Motivations for green bonds: Marketing, branding, and sales tool

   d.Motivations for green bonds: Stability of public investments

iii. Green resilient infrastructure funding in socially/env. vulnerable neighbourhoods

iv. Tax breaks for vacant land used for urban agriculture

v. Specific national financial schemes (to fund green infrastructure or parks)

vi. Improved maintenance and security of public spaces

c. Planning instruments

i. Equality/ access to green space (e.g. stipulation of X square metres of green space per X number of residents) and/or benchmarking/mapping green space

ii. Ambitious green space development plan (with focus on under-represented neighbourhoods)

iii. Green amenity planning in large-scale urban developments

iv. Conservation areas (to preserve green spaces)

v. Improving food access

IV. MUNICIPAL PROCESSES AND SUPPORT TO IMPROVE GREEN EQUITY

1. PROCESSES TO IMPROVE (GREEN) EQUITY

a. Inclusive planning of green amenities and others

b. Inclusive design of green amenities and others

c. (Green) equity focus during planning process

d. Mapping gentrification (displacement, evictions, complaints against abusive landlords)

f. Resilience Planning

2. SUPPORT FOR LOCAL ORGANISATIONS

a. Support for non-profits doing inclusive programming in/around green amenities

b. Support for tenant rights' workshops or organising

c. Partnerships for preservation of affordable housing stock and quality

d. Support for urban gardens and the sale of urban agricultural products

V. OTHER CODES

1. Children (Carmen)

New green/open/play spaces for children

Children's right to the city (i.e, can be about poorer health, poorer secure housing or lower access green space) impacted by gentrification

2. Climate/resilience/mitigation (Galia)

Protection of vulnerable neighbourhoods through green infrastructure

Climate gentrification through green infrastructure

General climate resilience measures and planning

3. Health (Helen and Ita)

Health benefits of greening: mechanisms

Impacts of gentrification on health: mechanisms

Mental health – general

Physical health – general

Gentrification as modifier of the relationship between green space and health (gentrification negatively or neutrally impacts health, countering typically found positive relationship between green space and health)

4. Ecosystem (dis)services/green space for human wellbeing (Francesc)

a. Regulating (carbon sequestration, storm water management, air pollution removal, heat island effect)

b. Provisioning (food, water)

c. Cultural (recreational, social cohesion, esthetical)

d. Disservices (allergy, maintenance of green space that can be a burden, damage from green space to property, fear of green space, insects/pests)

5. Finance, development and green capitalism (Mel)

a. Developers' and investors' motivations for greening and for investment in general

b. Green branding of real estate development and investment

c. Developers' and investors' incentives for going green (tax credits, higher density etc.)

d. Developer´s relationship with the community

e. Real estate development incentives

6. Social-Ecological Politics (James)

a. Affordable Housing- Environmentalist conflicts/coalitions

Appendix C. Supplementary data for Chapter III

C.1 Coding matrix for qualitative analysis

Stage 1 (2019)		**Stage 2 (2022)**		**Stage 3 (2022)**	
Total interviews = 492 (US, Canada, & European cities)		Total interviews = 294 (US cities only)		**Strategies**	**Tools**
General Strategies	Creation of community-owned spaces and or reclaiming neighbourhood resources	**Codes**	Youth/ children involvement	Affordable and Accessible Housing Outcomes through Participatory Development	Imagining and implementing alternative neighborhood development
	Mobilisation for a Community Land Trust, CLT		Equitable housing relations		Coproduction of data science during urban development processes and committees
	Construction or funding of social or public housing		Housing coalition	Community Programming, Coordination, and Facilitation	Multi-sectoral programming, activities, and skill building
	Community-led alternative development proposals or redevelopment processes		Environmental coalition		Children/youth engagement around inclusive greening
	Community food security practices		Business partnership		Community-oriented economic development and job empowerment around the green economy

Specific Tools	Alliance building and creation of coalition		Alternative housing	Advocacy, Education, and Networking	Advocating for equitable, affordable (green) housing and tenants' rights
	Direct action		Data gathering		Children/youth engagement around inclusive greening
	Squatting (land or buildings) or blocking eviction		Conservation		
	Collective allegations and court cases		Federal funding		
	Organisation of workshops, neighbourhood tours, popular education activities, debates, conferences		Internal funding		
	Arts-based tools (theatre, graffiti, etc.)				
	Neighborhoods or public assemblies				
	Outreach or lobbying public institutions				
	Research and mapping projects (on gentrification, evictions, environmental injustices, etc.)				
	Campaigns				
	Volunteer-based park maintenance				

Appendix D. Supplementary data for Chapter IV

D.1 Interview instrument

1. What is your name, position, and the number of years you've worked in this role
2. Is there an intersection within your work of climate action or greening, housing, and economic development? If yes, how so? If not, can you describe your work's intersections?
    a. Through what projects?
3. How have priorities in your work changed over the last 5 years?
    a. When thinking of justice? Equity?
    b. Was there an event that triggered changes?
    c. Have issues of social justice or racial justice been integrated into your work?
        i. How so? By what processes?
    d. Has funding changed? Through what mechanisms is funding achieved?
4. Do you see a relationship between your work and displacement and gentrification?
    a. Are there tools in place to address these issues?
5. Who are important partners in your work?
    a. How do you work with them?
    b. How was the relationship formed?
6. **FIRE:** To what extent and how do planners in the urban core interact and work with planners in the urban periphery/fringe on issues related to regional housing affordability and regional climate action/mitigation. If so, how? Specifically, is wildland fire a conversation in current regional planning discourse?
7. What are the greatest challenges for environmental or social justice in your work?
    a. How can they be overcome? Can they be? Through what mechanisms?

D.2 Coding matrix

Name	Files	References
Challenges to equitable and green climate urbanism	2	2
Culture of prioritization	13	16
Reactive planning	11	21
Training focus	8	11
Economic development challenges	11	18
Other economic development	2	2
Gentrification & displacement	25	33
Transit-oriented development displacement	7	8
Housing challenges	8	10
Housing preservation	8	12
Housing production	18	39
lower income vs middle class	5	6
Other housing	16	22
Property taxes	1	1
Role of developers	14	23
Tenant participation in planning	3	4
Tenant protections	8	9
Other greening, climate action	14	21
Decarbonization	6	13
Political and administrative obstacles	2	2
Federal	11	16
Local	15	29

Regional	6	10
State	7	10
Prohibitory cost of climate action	16	33
Injustices	1	1
Economic Injustice	9	10
Environmental injustices	6	6
Current EJ	12	21
History of EJ	5	7
Housing Injustice	10	12
Racial injustice	16	22
Challenges to racial equity	4	4
Racial wealth gap	5	8
Segregation	3	5
Whiteness in green-ness	3	5
Intersection of climate action, housing, and economic development	3	3
Climate implementations	5	5
Building retrofitting	15	24
Climate action, EJ programming	15	17
Climate adaptation	3	4
Climate hazards	3	3
Flood resiliency	6	16
Climate mitigation	5	7
Climate resiliency	14	17
Energy code and regulations	9	17
Urban greening	8	18

Youth climate action programming	2	3
Economic development programming	7	8
Green workforce development	7	9
Small business grants	5	5
Workforce development and training	5	7
Housing and climate	21	30
Housing and economic development	8	13
Intersection of economic dev and climate	9	12
Long range housing planning	10	14
Technical assistance	3	4
NOT all three	7	8
Role of climate action plans	11	14
Pathways to more equitable green climate urbanism	0	0
Changes to practice	16	32
Changes in focus	9	17
Climate resiliency focus incorporation	14	19
Focus on disaster planning	6	10
Focus on equity	26	64
Focus on growth management	11	15
Focus on transit oriented growth	9	20
Housing as focus	6	6
Creation of roles	11	19
Improve engagement and participation	13	20
Cultural change	14	19
Cultural change to choice and preference	3	6

Funding	2	2
Changes to funding	17	25
Federal gov	21	40
Local Gov	10	21
Non-profit	2	5
Private	4	8
Regional Gov	7	7
State-Provincial gov	8	9
Partnerships	3	3
Coalitions	11	14
Community groups	22	39
Federal Gov	10	10
Formation of partnerships	17	23
Internal collaboration	21	42
Local Gov	13	26
Non-profit	12	18
Private	8	9
Regional Gov	8	10
State gov	11	13
Political change	0	0
Federal	7	10
Local	16	26
State	9	12
Solutions to Gentrification & Displacement	15	29
Information hub	3	3

Landlord engagement	2	2
Triggering major events	3	4
Black Lives Matter	5	6
Climate disaster event	10	10
COVID 19 Pandemic	14	25
Triggering legislation	15	22

Appendix E. Supplementary data for Chapter V

E.1 Research approach and methods

Study Design

This paper is based on a sub-analysis of empirical data collected for a large European Research Council-funded research project (GreenLULUs, the "parent project") which, among other goals, examined the social and racial impact of redeveloped neighborhood environments through in-person field work in a total of 24 mid-sized cities in Canada, the United States, and Western Europe. These cities, all between 500,000 and 1.5 million residents, encompassed a variety of urban development pathways (i.e., industrial, post-industrial, economically growing or shrinking; compact or sprawling) and included a variety of gentrification types. After a comprehensive review of grey literature, media articles, analyses of real estate and demographic change, together with local expert input, we selected one or two gentrifying neighborhoods as our focus for qualitative field work in each city. All case sites, field data collection, and analysis followed a similar protocol and we pretested, modified and selected a final set of questions and probes for a semi-structured interview guide based on the overall aim of the larger study, from which this sub-study draws. Overall, the individual researchers from the larger team spent approximately one month in each neighborhood/city between 2018-2020 conducting intensive and targeted fieldwork. In total, we conducted 480 interviews with local residents, activists, public employees, and representatives of community-based or non-profit organizations, all of whom gave consent to be interviewed and for their interview data to be disseminated anonymously. Interviewees were not compensated during the research. All data was fully coded through an initial round of thematic coding in Nvivo, identifying all interview materials related to policies and planning tools, investment and greening in all cities. The parent project underwent review by the ethics board of the Universtat Autònoma de Barcelona.

Reporting on policy tools for urban green justice

The development of the report *Policy Tools for Urban Green Justice* (http://www.bcnuej.org/wp-content/uploads/2021/04/Toolkit-Urban-Green-Justice.pdf) first started with an analysis of the parent study's interview data and utilization of a grounded theory approach to identify any mention of policy tool implementation. Original coding of the parent study identified municipal regulations, state regulations, national regulations, financial regulations, planning instruments, and tools specific to different types of gentrification. We further searched for codes such as *policy, green policy, displacement policy, anti-gentrification policy, policy implementation, tools, financial scheme, tax, act,* etc.. From these codes, we ordered tools by their impact, stakeholder-involvement, level of government implementation, and if they were either part of a greening strategy or a housing strategy. Through this restructuring, we identified relevant themes and performed both inductive reasoning in order to title policy and tool groups. After identifying relevant themes, we analyzed

types of stakeholders involved in the data, be it municipal planner, developer, government official, or resident. Through this, we were better able to identify and triangulate what actors were involved in relevant tools and policies. We followed with a grounded theory approach to group together responses that identify specific discourses and imaginaries related to policies and tools housing and greening. As a final step, we analyzed relevant secondary data collected from desktop research of publicly available grey literature to complement our analysis of urban development changes, equity issues, and policy implementation in each city: 1) documents and fact sheets, reports, or policy documents produced by a variety of local organizations, 2) media articles and 3) city planning documents. In total, we selected 26 American, Canadian, and European cities to highlight in the report as the vignettes to accompany the tools as case studies of just, green planning policies and tools (**Error! Reference source not found.**). These cities were selected based on the available combination of both primary and secondary data directly related to greening and housing policy.

The report *Policy Tools for Urban Green Justice* (http://www.bcnuej.org/wp-content/uploads/2021/04/Toolkit-Urban-Green-Justice.pdf) was released by the Barcelona Lab for Urban Environmental Justice and Sustainability in March 2021. The report was internally reviewed by lab members before release.

Scenarios development

After our analysis process, we developed five scenarios derived from a further analysis of local historical and political contexts, growth characteristics and associated city greening practices (Connolly and Anguelovski 2021), and socio-environmental challenges. In some cases, original interview transcripts were revisited manually to cite exemplary statements made by urban actors. Our analysis focuses on what are considered a) a typical North American municipality *(**Error! Reference source not found.**),* b) a typical Western-European municipality (***Error! Reference source not found.***), c) a city dependent on tourism or foreign investment (***Error! Reference source not found.***), and d) a municipality with strong community-based justice activism (***Error! Reference source not found.***) and e) smaller or rural municipalities (**Error! Reference source not found.**). These simulations are developed directly from urban planning literature that offers deductive inclusions for characterization through urban growth patterns (Adam 2006; Wilson et al. 2003), population decline/growth (Park and LaFrombois 2019), changes to economy and industry following Global North industrialization period (Grimm et al. 2008), radical activist mobilization efforts (Bolland and McCallum 2002) and act as archetypal profiles that represent possible urban development pressures which planners may come across in their practice. The scenarios are intended to act as imagined simulations of city typologies in the current Global North context, and may not represent all nuances and unique contexts of individual cities and regions however have been developed considering existing literature and deductive reasoning.

After analysis and discussion of the tools, we present a scenario-based guide which may help municipalities in determining what combination of tools are most appropriate for the socio-environmental challenges that

vulnerable communities are facing. We develop these scenarios in Figure 7 – 9, focusing on a variety of municipalities in North America and Western Europe and zooming in on a variety of economic development drivers. These scenarios also highlight the possible tools appropriate for positive outcomes as well as what may be (un)intentional negative outcomes, which may result after implementation of selected tools and policies. With the scenarios, planners may be better equipped as they confront the question, '*If the available policies and tools that address gentrification, displacement, and (in)equitable green development are laden with unintended consequences, what action should really be taken?*'. While the scenarios developed do not provide a definitive answer, we intend them to communicate that social and green equity can be achieved simultaneously through the right mix of anti-displacement/anti-gentrification tools as well as equitable, inclusive green development tools that are implemented in consistent consultation with local communities.