THESIS APPROVAL SHEET

Title of Thesis: Planting Money. Exploring the implications of Federal & State environmental justice policy in relation to funding for green space projects in Baltimore neighborhoods

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ABSTRACT

Title of Document:	PLANTING MONEY. EXPLORING THE IMPLICATIONS OF FEDERAL & STATE ENVIRONMENTAL JUSTICE POLICY IN RELATION TO FUNDING FOR GREEN SPACE PROJECTS IN BALTIMORE NEIGHBORHOODS.
	Meredith (Molly) G.S. Finch, M.S. Geography & Environmental Systems, 2024
Directed By:	Associate Professor & Chair, Dr. Margaret Buck Holland, Department of Geography & Environmental Systems

Cities promote investing in green spaces as a step toward justice in neighborhoods that have lacked places like parks, gardens, and other vegetated spaces that can be a benefit to people who live nearby. Creating more vegetated spaces in cities has also been promoted as an action to reduce the impact of climate change and extreme weather events on city residents now and into the future. However, residents may see these projects as addressing surface-level eyesores and not investments in addressing deeper challenges in their neighborhood. This is because what may appear to an outsider as an eyesore can be connected to long-term, systemic disinvestment in neighborhoods based on racist policies. In Baltimore, where many neighborhoods are identified by recent environmental justice policy to be eligible for funding from a wide variety of federal programs related to climate change issues, I investigate how these policies can be accessed by resident groups to advocate for community-led

development interests alongside green space investment in their neighborhoods. This research is guided by three themes: green space, funding, and environmental justice. Methods included participant observation fieldwork and informal interviews alongside document and screening tool analysis. Research outcomes include recommendations to align investments to both increase green space while also addressing other neighborhood challenges as one way to change perceptions of urban greening initiatives from surface-level investment to environmental justice action.

PLANTING MONEY.
EXPLORING THE IMPLICATIONS OF FEDERAL & STATE ENVIRONMENTAL JUSTICE POLICY IN RELATION TO FUNDING FOR GREEN SPACE PROJECTS IN BALTIMORE NEIGHBORHOODS.

By

Meredith (Molly) G.S. Finch

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore County, in partial fulfillment
of the requirements for the degree of
Master of Science in
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Dedication

This thesis is dedicated to all the inspirational people I am privileged to know who

are working every day not just for *equality* –

not just for *equity* –

but for *justice*.

Acknowledgments

While I am the only listed author on this manuscript, I am not the only person who contributed to the successful completion of this thesis. When reflecting on who to acknowledge for their support of this achievement, it is impossible to thank everyone, but there are some I would like to use this space to acknowledge.

First, I feel lucky to have claimed a grad school office nook in the basement of Sondheim Hall that was shared with Laura Torres Vargas and Jaime Barrett, two graduate school sages and geography scholars who welcomed me in. Over shared chats and snacks, I appreciated being able to banter about the small stuff, celebrate our successes, and be honest about our challenges. Your consistent support and encouragement helped me believe that I could succeed at grad school. Thank you.

I also benefited from the support of two brilliant women scientists that I am fortunate to know – Dr. Jessamine Finch and Dr. Sarah Isbell. From our early conversations about whether I should apply to graduate school to the feedback that was offered on all my graduate school application materials and the time shared to support me during the many twists and turns of my graduate school experience – you supported me in achieving what I set out to do! If it wasn't for all these gifts of support, big and small, I wouldn't be on the cusp of submitting this thesis today. Thank you.

I also want to thank my parents for their support of my educational journey – both within academia and within the world. I have inherited many qualities from my

parents that can be found sprinkled in the background of this thesis. One quality I'd highlight is the patience and curiosity I employed to attend over 80 meetings and events as part of my research, all for the possibility of learning a new gem – which is something I can attribute to my Mom. Another quality is my tendency to take in and process all auditory information through the putting of pen to paper, which can end up looking like a non-linear jumble of words and imaginings - a way of processing I share with my Dad. These qualities became important parts of this research in unexpected ways and ultimately helped bring me to my successful completion. Thank you.

I want to share an appreciation for the ICARE program team that supported me through a challenging and rewarding graduate school experience. I appreciate the work of all the program committee members in developing the program vision and making it a reality. This includes designing the program, leading ICARE courses, hosting research lunches and brunches… oh, and applying to the National Science Foundation, whose funding covered both my research and graduate coursework. All these pieces took time and effort that I do not take for granted. I especially want to thank the ICARE PI, Tamra Mendelson, and Program Specialist, Alek Fredriksson, for the patience and kindness you both shared and the efforts you made to create spaces to celebrate our achievements. I didn't always think I needed them, but in the moment, I realized I needed all of them.

Speaking of ICARE, I would be remiss if I didn't thank my fellow cohort members Ally, Aiman, Rylee, Autumn, and Erin. I feel so lucky to have been surrounded by such supportive and thoughtful people over the past two years. Thank you for being my accountability buddies and keeping me on track to complete this achievement!

Other people to thank who made this thesis stronger include Cheryl Knott, who acted as both my professional mentor for this research and a member of my thesis committee, and Dr. Dawn Biehler, who was a member of my thesis committee; both gifted me their precious time and thoughtful comments. It's also important to thank the unnamed individuals I connected with through my fieldwork, whose insights guided this final text.

In closing, I want to thank my faculty mentor, Dr. Maggie Holland. When I struggled to see what success could even look like, you championed keeping the vision that it was possible. Without that this thesis may have never been written. Thank you.

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Introduction

On December 5th, 2022, I attended a virtual public information session for a large-scale green space project in Baltimore. As a Baltimore resident, and frequent visitor to the green space that was caught up in this project, I was not new to attending these sessions. But now I had taken on an additional identity that I was bringing into the space as "graduate student researcher". I was actually hoping to connect, in some way, to this very project. So, I was bringing my dual identities – prospective research partner and resident – into this information session. I was both excited and nervous about the possibility of this project. The project area is a place that is less developed and more "green" than other parts of the city, partially due to abandoned industrial areas. I was excited about the area remaining less developed, but with expanded trails, so this nook would retain what I thought made it pretty unique. But, at the same time, I wanted to be open to my neighbors preferences because they lived closer to the project. I didn't want my "less developed" green space preference to be considered over visions they had for their neighborhood. This project had the potential for an extraordinary investment.

Back to the meeting – as the community engagement consultant gave a refresher on previous meeting content, they flipped to a slide titled "outstanding issues," and one of the points on the list was "displacement." Thinking back to this moment I was not necessarily surprised to see that word used to list a concern for this project. But this

project was also promoted as having very intentional community engagement; planning with the community. So, because of that intentionality, I assumed displacement would be less of a concern. To think that residents near this project might not be able to benefit from the project – that they perceived that this project could lead to their displacement – made me genuinely concerned. These were not neighborhoods where I lived, but I visited these neighborhood elementary schools many times to hold class programs over my three-year stint at a nearby urban wildlife refuge. I knew a master's level research project was not enough time to address a large, complex issue like displacement, but I wanted to know how concerns like this could be functionally addressed.

Talking to a Baltimore City planner a few months earlier about the roll-out of this same project I learned about a federal initiative that this planner referred to as a future funding opportunity for projects just like this. The federal initiative was called the Justice40 Initiative. The initiative's intent was to prioritize funding for communities around the country that have experienced disinvestment of money and related resources. Looking into this new piece of information after the meeting, I found an initiative-related map that actually called out census tracts around the country as being "disadvantaged communities" – many of which were in Baltimore. And a few blue polygons – that is the color used to label "disadvantaged communities" on this map – overlapped with this project area. With limited information, I had the illusion after a cursory glance at this map that there was federal money out there that could be caught and brought into this project – as a benefit to the neighborhood or to the

detriment if this displacement issue wasn't addressed. But with an initiative like this out there, funding for this project may not be as big a hurdle as it may have been in the past. There was money to be claimed, and for more than just greening.

Hearing about displacement concerns, learning about funding opportunities recently opened for specific places/spaces, and my experiences being a resident and land steward in Baltimore, piqued my interest in focusing on community green space, funding, and environmental justice. With the limitations of a master's timeline, I ultimately decided not to attach myself to this large-scale green space project, which has a substantial time scale in comparison. Instead, I decided to investigate green spaces at the neighborhood scale. This introductory story was meant to bring you into my research journey, especially early on when I was connecting with active projects I was interested in within Baltimore. In the next section I will share more about my interest in green space, funding, and environmental justice and my identity as a researcher.

Research Inspiration

My interest in green space, funding, and environmental justice really came into formation around an unimaginable loss I experienced. This is a loss I experienced in my own neighborhood, and it has to do with a community garden. I still carry strong emotions from this loss, and it has impacted how I view all neighborhood spaces. While every situation is unique, and this experience is not intended to be generalized,

this experience did leave me with a smoldering frustration about how systems impact the neighborhood landscape. Now that you know how the story ends (loss), let me start from the beginning.

In March 2020, before I realized the direction that the world was about to take, I attended an interest meeting at a neighborhood community garden. Somehow, this garden had existed just a block away from me, and I had yet to come across it, even though I had been an almost-neighbor for two years and the garden was already well-established, at eight years old. It was situated at the end of a dead-end street, behind a nondescript fence, and I had never noticed it. Maybe my weekends were a little more busy then, so I wasn't around during the garden's weekend workdays. I had attended the interest meeting knowing that I most likely couldn't join the group – I had too many other interests that filled my time – but I was glad to have come out and learned about the place.

Pandemic being the pandemic, my weekends quickly became very open, and I ended up becoming an invested garden member. I would attend the Sunday workdays religiously and, in return for my weekly sweat contribution and a minimal financial contribution, I had the privilege of accessing most of my food needs from this garden. Things I had never been able to grow before flourished in this space - asparagus, snap peas, carrots, okra… and fruits! Berries, paw paws, figs, and pears. The list goes on and on. This garden flourished from the years of stewardship and care.

As a community group we were beginning conversations at the end of 2021 around how we could gain greater ownership over the land. It was said that a handshake agreement with the private landowner gave us access to the property. At this point, I was still relatively new to the garden group and had no concept of land ownership, agreements, and other aspects of land access. As we began these conversations, there was no sense of rush to make any changes to our current status. It was more like musing about what our options could be. Our conversations included discussions of types of ownership and the possibility of going under land trust protection, which to my knowledge had previously been denied due to soil contamination levels at the site.

Our lack of urgency changed abruptly when we learned in 2022 that the property, without our knowledge, had gone up for tax sale and it now had a new owner. This led to a tumultuous year of negotiations with the new owner, who refused to sell us the land and instead put the lot back up for auction. As we planned amongst ourselves about tactics going into the auction, we felt assured that the price would remain minimal – it was an undevelopable lot, by our understanding; who would want to be competing with us for this lot? Well, turns out there were people at that auction who were willing to pay and the lot got bought at a price beyond our financial means. This was a turn of events we did not expect, along with the new owner requiring a substantial monthly rent payment if we were to stay. Rumor had it that the new owner knew about some flexible grant funding that we had been awarded and intended for us to pay their monthly rent fee with this money. While we couldn't bear the idea of leaving our garden trapped with this new owner, the future looked bleak. This person

was taking advantage of our love for the garden. At this point, we had to make the painful decision to vacate the property.

Our garden season ended in December 2022 with displacement from the property. The lot now sits as a neglected vacant lot; as neglected as it was the day the people showed up in 2012 to transform it into a garden. This experience left me very mad at this person – this landowner who did not value the use of this lot as a garden unless he could profit from it and instead made the choice to have the land sit vacant. Left to be another overgrown lot owned by a neglectful outside investor; an eyesore to the neighborhood. Violence. I had never thought about violence in this way. And then I learned about other spaces and places around Baltimore that have faced similar challenges – resulting in some victories but many losses – and I realized that this is beyond one total scumbag. This is a systems issue. A system that needs to be challenged to change. But how does one challenge and change a system? I wasn't sure how to begin or if that was even worth pursuing; maybe someone has done this before and failed - maybe this is just the way things are.

We had moved off the garden property by the end of my first semester at UMBC, so this was all going through my mind as I was beginning my graduate program. I did not consider this experience as a point of research – it was too painful, too raw – but this experience did jade how I see the world around me in Baltimore. The neighborhood landscape around me is transformed by the power of ownership – either the presence or absence of it – and persistent absence presents as owners wielding

their power in violent ways. I was at a point of divergence – to embrace my bitterness or find a way to take my anger and apply it – reaching for some form of justice. I think this experience, anger, and reach for justice had a part in forming my research questions; I'll present these in a later section, but before that I want to share a statement on my positionality coming into this research journey.

Positionality

The intent of this positionality statement is to place myself in relation to who I am within my communities and professional journey. I identify as a cis woman of European heritage who grew up in Maryland and am a life-long member of the Religious Society of Friends (Quakers). My ancestors benefited from their identified race in many ways, including through government programs that supported education and homeownership for people who were identified as white. Reflecting on my childhood, I felt far removed from polluting industries and other direct environmental injustice. A healthy environment felt accessible to me playing in the small forest patch my parents stewarded in our backyard or walking down to the babbling creek at the end of our block.

Quakerism, as a part of my identity, may not show through my outward attire. Unlike early Quakers (and some still today!) who donned plain clothing, many modern Quakers have dropped this outward expression of their spirituality. Plain dress is an outward expression of Simplicity, a Quaker Testimony. Quaker Testimony is

considered a spiritual guide for how Quakers engage with the world – "living in the world, but not of it" as early Quaker George Fox once said (Daniels and Grant 2022). To me, this statement reminds Quakers that we should not be complicit in systems "of the world" that humans create if they do not align with our spiritual morals, formally known as Testimony. Quaker activism against systems "of the world" led to involvement in the abolition of slavery, prison reform, women's suffrage, and more (Dandelion 2007). Another testimony is Peace, or a commitment to nonviolence, which means Quakers are pacifists. This is not to be confused with being passive, which is a state of inaction. Being nonviolent is "what you are going to do about the violence and injustice we see in our own hearts, our homes, our neighborhoods, and society at large. It is about taking a proactive stance against violence and injustice." (Haga 2020, p 56) I quote Kazu Haga here, though he is not a Quaker, because he is a dedicated practitioner of nonviolence whose words illustrate how nonviolence is a state of action. My commitment to growing as an advocate and organizer comes from my commitment to Quaker testimony, including Peace and nonviolence.

Now I'm going to transition to talking about my professional journey. After completing my undergraduate degree in North Carolina I had a variety of jobs related to my interest in the natural environment or skills working with people. Before moving to Baltimore, I was an AmeriCorps VISTA in Philadelphia, stationed with a watershed organization that spanned a suburban to urban area. I didn't have the language at that time to speak to environmental injustice across this landscape; at the time, my language was probably focused on putting "green" practices on land to

reduce water pollution. This was around the same time that Philadelphia was starting to invest in green infrastructure as the way to address stormwater pollution – a real leader of the time, from what I could tell. As an environmental advocate, I was on board with the use of plants to reduce water pollution – it seemed like a win-win: wins for the environment (like habitat for wildlife and reducing pollution through plant natural processes) and wins for people's health (like tree shade and improved air quality). But, I think my opinion is slightly biased since I'm already a big plant fan. I grew up with a mom who is a professional forester and landscape architect, so family vacations typically include trips to arboretums, botanical gardens, and Olmsted parks (lots of those around). I moved to Baltimore in 2013 and found similar investments in green infrastructure over "grey" infrastructure (like pipes) spread across the city; as a trainee for a workshop offered by the Center for Watershed Protection, I learned about BMPs (Best Management Practices) and how to build and maintain them while touring sites in west Baltimore.

Facing challenges pursuing my interest in working in the field as an environmental scientist, I decided to make an investment of time and money to boost my technical credentials. Many job postings listed GIS as a desired skill, so I started researching programs with this focus in Baltimore. I knew I was not interested in going through any of the bureaucratic steps of applying to a program because I wasn't even sure that GIS was something I would want to pursue past one class; I was not ready to apply to a program without some initial exposure. This low-bar commitment brought me to the door of the Geospatial Program at the Community College of Baltimore County

where I met Professor Scott Jeffrey, someone with an infectious excitement for GIS. He not only got me through the door, but the next thing I knew, I was through my first semester and committed to completing a technical certificate in GIS. Turns out, GIS is a pretty fascinating tool. I completed the technical certificate in geospatial information systems in 2016, which opened up for me a whole new way to address questions using spatial data and started me down a new line of work.

After working as a GIS professional for over 5 years, my interest was piqued when I saw a posting about the ICARE program shared on a Baltimore environmental nonprofit contact list. ICARE stands for "Interdisciplinary Consortium for Applied Research in the Environment". My interest in pursuing a master's wasn't learning a new skill – per se. What stood out to me about the ICARE Program was the opportunity to merge my skills developed as a working professional under a credential with a new (for me) focus on environmental justice and community-engaged research. And trying this in Baltimore, a city that has been my home for the last eight years, seemed like a safe place to build new skills in authentic community engagement. As one of the trainees in Cohort 2, I know I am lucky to have had the opportunity to embody this new focus. Over the last 18 months of my research journey, very little of what I pictured in my early research plan has stuck. But going back to my original personal statement I see many points that were inspirations for applying that reassure me that I can find success in where I've arrived. As written in my statement: "The makeup of the urban landscape is not random; there is a complex history that has shaped how people have been included, or excluded, from accessing

the waterfront, green space, and the field of environmental science. The explicit focus of the ICARE Master's Program on improving diversity and inclusion in the environmental science field stands out to me because of the intentionality, which is necessary to make systemic changes." Revisiting this statement now, I realize my language around environmental justice was still being developed, but my statement about the intentionality of the ICARE Program still rings true; this has had a strong influence on my research journey and outcome. I'll be sharing more about the ICARE Program, its intentional design, and how that has influenced my research journey in the next section.

Sharing my positionality is meant to throw light on what I bring with me into my research; the succeeding sections will touch on topics that are more external-facing pieces of my research. This will include an introduction to the ICARE program and how I engaged with its mission, as well as an overview of the research I'm sharing in this thesis. I'll be reviewing methods, ethics, and research questions and will close with chapter summaries to set the stage for Chapters 1, 2, 3, and 4.

ICARE Program

The ICARE Program framework challenged me to define what "community" and "community-engagement" would mean for my research and the flexible nature of the program allowed me the freedom to design research that supported my named "community" issues, concerns, and challenges. These definitions were important because they would direct contacts and agreements I would make to move my

research forward. They would also influence Partner Mentor and Community Stakeholder[1] decisions; people on my research team who would support research community engagement. The flexibility of the program excited me, and I made some commitments to myself on how I wanted to define these pieces of my research.

First, when considering "communities" there were a few things I was committed to. I was committed to "communities" located within Baltimore; ideally, my research would connect with a challenge being voiced from within the city for my research. I was also committed to challenging myself to reach for new connections; not just using familiar groups from volunteer or employment experience I've had around the region. And finally, I was committed to connecting my research at the neighborhood level instead of in some in-between space like a city agency or intermediary organization; I was a graduate student with funding that could finance research - I saw this as potentially impactful for organizations that have limited access to funds.

When it came to "community-engagement", I was inspired by examples shared during the ICARE "Engaged Research in the Environmental Sector" course and

[1] Concerns about the term "stakeholder" being problematic have been voiced for a variety of reasons including its reference to value language, lack of clarity, and actions by colonizers - among other concerns. The fact is, as Elizabeth Pryor (associate professor of history at Smith College) states, "Language works best when it brings […] many people into communication with each other […] If we know, by using certain language, we're disinviting certain people from that conversation, language isn't doing its job." (Andrew and Kaur 2020) Because "stakeholder" is a term still used heavily, I'll be using this language in my text where it is specifically referencing language used by a source.

examples of UMBC faculty research. Inspirations include Dr. Nicole King, who partners with the Poppleton neighborhood to stand up against development violence; or Dr. Charlotte Kensington, who co-creates with Black Yield Institute, a Pan-African power institution addressing food apartheid in Cherry Hill. These are people who present as European heritage, like myself, and are building relationships and using their resources – from institutional affiliation – to support localized action in Baltimore. Standing up to development violence and food apartheid! They were using methodologies I was only just learning about, like Participatory Action Research which prioritizes experiential knowledge as valuable in facing problems caused by unequal and harmful social systems – seeking environmental justice! (Fine and Torre 2021) This type of research was not the result of a short-term relationship, and I knew it was not realistic to hold up my research to this standard. But anything less than this felt in the danger-zone of self-serving and, even worse, extractive.

Conversations with my fellow ICARE trainees also influenced my research decisions, especially one that came out of a class discussion for the "Justice, Equity, Diversity, and Inclusion in the Environmental Sector" course. The topic was funding and it got me thinking about ways funding is set up to not be accessible at the "ground level" and instead gets caught up in intermediary spaces. My classmate was calling out the fact that graduate trainee programs, like ICARE, that are focused on community-engaged research may actually just be presenting a hurdle for communities to access funding – they have to access it through this graduate student's research. Was I myself part of a dysfunctional system funneling money to support local challenges through

student research funds – instead of providing funding directly to the issue? Would it be more impactful to just give my $7,000 fund directly to an organized group working to solve whatever challenge they were facing? Was there a possibility that I was using this funding as a means of connecting with people, but there was an unequal power balance? This conversation made me self-conscious of how self-serving I may appear approaching a possible community stakeholder, knowing I needed them as part of my program project structure.

I was intentional in how I approached and conducted my research because of topics I grappled with through coursework, program activities, and around the broader campus community. My explicit definition of community as being at the neighborhood level and a group outside of my professional and volunteer circles was set by myself. I knew that these sorts of connections do not just manifest by themselves, and it would require me to put in time and intentionality to build new relationships. So maybe stubbornly sticking to these definitions was a fault of the researcher. But, ultimately, my commitment to how I interpreted the goals of the ICARE Program directed my research ethics and methods, which I will discuss in the next section.

Research Overview

In this section, I am going to review the methods that I used to connect community-engagement with my research and explain the ethics that shaped the context for my

methods. I'll then jump into my research questions and close with summaries of what to expect in the next four chapters.

Methods

For this research, I used qualitative social science methods, which was a new experience. I mainly used participant observation fieldwork and informal interviews (which I refer to as content expert conversations) alongside document analysis. Throughout the course of my active research period, between Fall 2022 and Spring 2024, I engaged in 89 individual "activities" that I consider related to my research, which are plotted out in Appendix B. I'm using activities as an umbrella term to refer to the variety of events, expert conversations, and meetings that I attended, and I grouped them into the following categories: (1) events, (2) content expert conversations, (3) organized group meetings, (4) government entity meetings, and (3) research-centric meetings. These activities were identified through my co-occurring fieldwork and document and policy analysis process. As individual and group actors were brought to my attention through my research, I would either contact them directly or identify opportunities to learn more about a topic through an event or meeting. Some activities also came to my attention through connections or recommendations shared during prior activities.

Now I will share a brief overview of each fieldwork category. First, the thirty-five events I attended covered a diverse spread including public engagement meetings, book talks, lectures, panels, community celebrations, information sessions, trainings,

volunteer events, and advocacy events. Next, my thirty individual expert conversations included professionals in city planning, large-scale project implementation, city government, spatial data analysis, green infrastructure, neighborhood organizing, housing, community development, federal and state funding and governance, screening tool development, greening implementors, and environmental justice advocates. Also, fieldwork included attending government entities and organized group meetings; these are considered different because of the convener. I attended ten government entity meetings that included federal, state, and city government. I also attended ten organized group meetings, which are organized at the neighborhood level, that included neighborhood associations and committees. I revisited some meetings multiple times to build relationships; for example, with one group, I attended four of their meetings. Finally, I attended three research-centric meetings in Baltimore with a research focus on the urban environment.

I took notes and documented every activity that I took part in and kept a digital record in my personal files. I did not make any recordings during events and took very few photos, if I took any at all. After an event occurred, I would sometimes seek out a social media post about the event I attended and save photos to document the event. I think I made a methodological mistake by not writing regular reflections on my fieldwork process; I was very intentional about getting experiences down as notes from activities, but the bigger picture of how all these individual experiences were connecting relating to my research was all left in my head. When I came to the end of my research process, it was challenging to remember how my understanding of

concepts and systems progressed during the 18-month process. Luckily, I take very good notes and was able to reference them to try and recreate this progression, but in the future I would adopt a practice of memo writing as promoted by grounded theory methodology (Birks and Mills 2011).

More information about how I landed on these methods will be shared in Chapter 3. At this point, what I want you to know is that while I will rarely directly reference the participant observation and informal interview methods I used for this research, these methods informed and directed the content of the four chapters you are about to read.

Ethics

My personal research ethics and the standards for how I want to be as a community-engaged researcher had a substantial impact on my ultimate research focus and methods. As I shared earlier, initially I was pursuing research alongside a large-scale green space project. However, I ultimately changed focus because I was concerned about my outsider status and being perceived as a self-serving researcher. I have no regrets about this decision, even though it set back my research progress. As someone who lives in Baltimore and plans to continue living here after my master's is complete, I was sensitive to the need to do right by my fellow residents. Doing right included questioning research approaches that felt transactional or extractive. In a previous job, I experienced being a transactional and extractive researcher, and it felt… awful. I don't think I fully realized what I was complicit in until after the job was complete. I continue to live with regrets about being engaged with that work, and

I'm committed to outwardly challenging that type of research work in the future. This experience, along with the complicated history of research in Baltimore (Pitas 2023), creates warranted stigma for me around qualitative field research.

All these things influenced my decision not to use qualitative methods that requested information from people; I was not convinced I had a deep understanding of who my research would serve and how participants would benefit from the outcome. Ethical considerations with my research will be discussed more in Chapter 3, but this brief statement on ethics is meant to give context to my methods. Next, I will review my research questions.

Research Questions

The themes of my research developed before my questions. My research questions were delayed in solidifying because I intended to have a community stakeholder, as part of the ICARE program project framework, to help guide my questions. Community stakeholder involvement in developing research questions can be a component of community-engaged research and brings added value to the project. The value comes from the fact that the outcome is more likely to be something of interest to a group outside of academic circles so we are not just doing research for research sake. That added value is important to me. Because I failed to connect with a community stakeholder to join my research team, I resigned myself to co-developing research questions with my faculty advisor (who was extremely helpful and gracious throughout that process).

Overall, my biggest source of curiosity has been understanding the landscape of green space in Baltimore neighborhoods, funding opportunities and gaps, and environmental justice policy implications. This larger curiosity was broken down into a series of questions and sub-questions connected to the themes of urban green space, funding, and environmental justice. The questions themselves evolved during the course of my fieldwork as I balanced the tension between impact and accusations. By this, I am referring to wanting my research to have an impact that is strong in the face of "so what?" while not crossing into accusatory against someone or something if I only have limited understanding. Below are the more specific research questions that I'll address over my thesis, grouped by chapter.

Chapter 1: How "Urban Greening" Presents in Cities

This chapter introduces urban greening terminology, shares outcomes of urban greening projects, gives historical context of Baltimore and green space, and reviews the current state of Baltimore neighborhoods and greening efforts. I also examine how urban greening and the outcomes of projects can be shaped by where power is held to define and shape greening, which connects to funding. The following research questions are addressed in this chapter:

1. How have urban greening initiatives in Baltimore City aligned with Environmental Justice action?

a. What is considered “urban greening”, and how has it been defined (and by whom) to benefit people?
b. How are neighborhood urban greening projects funded? What are the outcomes and challenges of that funding?

Chapter 2: How Policies Affect Environmental Justice

This chapter presents the background history of the environmental justice movement and related policy in the United States and Maryland, reviews definitions for environmental justice communities, and discusses how environmental justice screening tools display these definitions using spatial data. The section closes with a ground-truthing of screening tools using the context of Baltimore. The following research questions are addressed in this chapter:

2. How do different definitions of “environmental justice (EJ) communities” come together for who and where funding should be invested in the city?
    a. How has federal policy influenced state-level environmental justice and environmental policy?
    b. How are “EJ screening tools” used to implement policy, how do tools differ in areas they identify, and how do these tools incorporate greening or proxies for greening?

Chapter 3: How Research Can Be Guided by Community Engagement

This chapter reflects on the qualitative methods used, whether they were successful in achieving community-engagement goals, and what unique information resulted through this type of fieldwork. The following research question is addressed in this chapter:

3. How might future urban greening be better aligned with EJ community demands?

The final chapter, Chapter 4, closes with some recommendations based on results shared in the previous three chapters. Before we move into the first chapter of the thesis, I will share summaries of the four thesis chapters.

Chapter Summaries

Chapter 1 starts out by introducing urban greening as a concept and environmental justice issue. Then I introduce the Baltimore Green Network Plan, released in 2018, as a local urban greening plan that promises many interconnected benefits by increasing green spaces in the city. I transition to talking about outcomes of urban greening, including benefits and disservices, before bringing the focus back to neighborhoods experiences with greening projects. From there, I give a brief history of disinvestment in Baltimore's Black neighborhoods to provide context for the current state of neighborhoods in Baltimore and why park space may be perceived as

a bandage trying to cover up a larger injustice. The section closes with a discussion of who the urban greening actors are implementing projects today, what the funding streams are for urban greening projects, and how that funding is distributed. My goal in this chapter is to set the context for urban greening in Baltimore and how, and whether, neighborhood communities consider urban greening projects as viable strategies for righting an environmental injustice.

Chapter 2 explores the historic and current context of how environmental justice is defined and translated into policy at the state and federal level and how urban greening is positioned within those policies. First, I give a brief history of the environmental justice movement and federal policy development that has influenced state level environmental justice and environmental policy. Then I discuss the development of two environmental justice screening tools and review how they implement policy, similarities and differences, and how greening and proxies for greening are incorporated into the tools. I close the section by ground-truthing the tools using the context of Baltimore to evaluate the inclusion of indicators within the tools. My goal in this chapter is to provide policy history and current context for environmental justice screening tools and highlight how the tools represent Baltimore.

Chapter 3 addresses the research methodology I used, reviews outcomes of the research process, and discusses limitations with this method. This section also includes additional background on how my research ethics influenced the

methodology that I ultimately used. The section closes with a discussion of how embedded learning can be used as stepping stones on the path toward community-engaged research. My goal in this chapter is to emphasize the value of relationships in community-engaged research and our commitment as researchers not just to the communities we are embedded in for our research but also to our colleague community who we want to call in to genuine community-engaged research.

Chapter 4 will provide a brief summary of everything that was covered in the prior chapters. I will also reflect on how my three themes (green space, funding, and environmental justice) have come together through this research process and give some simple recommendations for actions that residents can take at the city/local or state level to support intersectional solutions.

What I hope you get out of reading this is that maybe you learn something new. Maybe that new thing is something related to a larger project, or maybe it is just for self-growth, or maybe it connects to your interest in taking action on an issue. I will admit that writing this was tough because I know I am not the expert on any topics that I address, but I have learned some things. While it is uncomfortable to attempt to write about something where you know you still have gaps in awareness, it is helpful to remind oneself that you know more now than you knew before, and so maybe you have something to teach to someone who still embodies that earlier version of yourself on your knowledge journey. I welcome your insights as you consider what

may not be included in my writing, or maybe is represented inaccurately, and hold me to account. It is with this open perspective that I invite you to join me.

Chapter 1: How “Urban Greening” Presents in Cities

When I ride my bike around the streets near my home, I see many green spaces. At the end of my street is a large park green space with sports fields, playgrounds, and picnic areas. I may stop there if it’s hot out and rest under the large shade trees. With a railroad line running along the top of the park, there are only a few ways to access it from the north side, which makes me feel lucky to live where I do. Going out the way I came, and crossing under the railroad track, I spot a quadruple wide empty lot. Another green space with its lush grass, recently painted two-by-four post fence and a young tree. The lot looks cared for, but maybe it's just meant for looking. I turn the corner. In the middle of the first block of houses, there are two large empty lots – one on either side of the street. Both looked overgrown, and one has attracted some items that would be more appropriate for a dumpster. Green space? In the next block, there is another empty lot in the middle of the house row that is bordered by rose bushes. Along with the bushes, there is a simple chain link fence separating the lot from the sidewalk, and looking past the fence, I see a manicured garden with flowers and small trees bordered by white stones. Whoever is taking care of this green space, I’d like to meet! On the final leg of my ride, I make it to some wide-open spaces of vegetation, full city blocks that resemble green spaces. I never see people using this space; it gives off a sense of abandonment even though there are rows of homes across the street. I’ve reached the end of my route and loop around toward home. You don’t have to travel far to see a variety of green spaces where I live.

Access to green space – an environmental justice issue

My bike ride story is meant to emphasize that green space is about more than just whether a space is vegetated, and accessibility can be more nuanced than a ride-by judgment. Green spaces are found to increase social connectedness, promote physical activity, and increase mental health (Kuo et al. 1998; Jennings and Bamkole 2019; Barton and Pretty 2010; Wolch, Byrne, and Newell 2014). But if green spaces are inaccessible, these benefits may not be experienced by people living nearby. Inaccessibility is not necessarily a judgment you can make by measuring distance or biking past. This is because accessibility involves broader factors than just distance traveled, such as the quality of the green space amenities (think benches, sports fields, flower plantings), perceptions of safety, and challenges in walking access (Ekkel and de Vries 2017; Jennings, Larson, and Yun 2016). And because green spaces are within a larger airshed environment, accessibility needs to also be measured by presence of nearby air pollution. A green space is less accessible when it is polluted and can make you sick. So, access to green space is complex. Green space accessibility that supports people's health and well-being is considered an environmental justice issue.

Early in the environmental justice movement, environmental justice mainly focused on toxic wastes disproportionality impacting people of color (Perez et al. 2015). I will be sharing a bit about the beginnings of this movement in Chapter 2, but for the time

being what you need to know is that the contemporary environmental justice movement started being active in 1982 and this organizing was against the siting of a toxic waste dump (United Church of Christ 1987). This movement built nationwide momentum, and a few years later in October 1991, The First National People of Color Environmental Leadership Summit convened 300 African, Latino, Native, and Asian Americans from across the country to redefine environmental issues (Lee 1992; Alston 1992). During the Summit the environmental justice movement was broadened to include environments where you live, work, and play (Lee 1992). By broadening the scope, local community concerns with disinvestment in urban neighborhoods came under the Summit definition of environmental justice issues.

Disinvested[2] neighborhoods tend to lack high-quality green space, and the struggle for "green" environmental justice can mean organizing around green space from two different sides. One side is advocating for increasing the presence of parks, tree canopy, and gardens in neighborhoods and calling for control of vacant lots that cause blight (Rigolon 2016; Fight Blight Bmore 2023). From the other side, this struggle can take the form of resistance to "green gentrification", or the dangers of

[2] Environmental justice advocates may use terms like "segregated", "exclusion", or "expulsion" because they consider these terms to more accurately describe the systems that have purposefully disregarded neighborhoods. Because "disinvestment" is the language used by the Baltimore Green Network Plan, which I will be referencing heavily later in this chapter, and other literature sources as well, I will continue to use this term in my writing. Please refer to the Baltimore context section of this chapter, titled "Historical context for city development", for information on why other terms are considered more appropriate.

neighborhoods being vulnerable to gentrification because of investments in green spaces (Anguelovski et al. 2019). Since current efforts to mitigate climate change in urban spaces promote investing in more green spaces, resistance to green space projects may seem counter-intuitive (Pancewicz and Kurianowicz 2024). The fact is, we live during a time when the two defining crises are climate change and social inequity (Angelo et al. 2022), and we can make decisions now on how we approach climate change mitigation and adaptation that could either deepen existing socio-spatial inequities or help remedy them (Anguelovski et al. 2016). This chapter will provide a foundation for understanding the current opportunities cities face.

In this chapter, I review the scholarly literature to offer a more in-depth analysis of the complex characterization of "urban greening". Then, I identify and review the outcomes tied to urban greening projects, as they are documented in project materials. After this review, I trace the history of urban greening in Baltimore alongside the city's development. Finally, I will return to the present and describe the landscape of greening project implementation in the city, which will include a focus on project funding. This chapter, with its many pieces, explores how urban greening initiatives in Baltimore City have aligned with environmental justice action.

Intro to "urban greening" terminology

The term "greening" can be taken literally to mean making something more "green" by adding vegetation. In reviewing the literature, a surprising number of articles that

include the word “greening” in their abstract do not define their use of the term. In fact, the term seems to be used interchangeably with other terms, such as: “green space”, “green infrastructure”, and “green areas”. Also, “greening” terms have been found to have extremely broad definitions, like how Derkzen (2015) uses the term “urban green space” to imply all green space. Despite the lack of a clear definition, “greening” has been promoted as a solution to many urban challenges. Beyond being a solution, many times “greening” is framed as a win-win proposition (Mees and Driessen 2011), implying that outcomes benefit everyone and there are few downsides. When the wider umbrella term “green infrastructure” is used this sentiment is especially present. For example, city planning documents list the benefits of green infrastructure to include social, environmental, economic, ecological, and increased resiliency (Grabowski et al. 2022).

Thinking about “greening” as infrastructure in cities is not a new concept. But with “green” becoming an interchangeable word for “sustainability” (Rosan 2012), and “sustainability” being criticized as an amorphous concept or “empty signifier” (Wachsmuth and Angelo 2018), the functionality that is implied with the use of the word “infrastructure” can get watered down in practice. A more traditional definition for “green infrastructure” would describe it as an “interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas – space that maintain ecological processes” (Walmsley 2006). Using this definition, these spaces that maintain natural ecological processes are a must-have, while “green space” is considered a “nice to have”. This definition also stresses the interconnection

of spaces and the value of a larger planning vision. More recent definitions have stretched to include urbanized spaces such as urban green spaces, parks, and rain gardens that may provide a variety of social and ecological benefits as well as improve public health by supporting processes like stormwater management (Meerow and Newell 2017).

One way to think about "green infrastructure" is to understand it as a term that can be applied to three primary categories: 1) greenspace planning, 2) urban ecology, and 3) water or stormwater management (Matsler et al. 2021). Greenspace planning uses greenways and greenbelts to construct "green infrastructure"; these are natural areas like parks (federal, state, and municipal), non-profit preserved lands, trails and rails-to-trails, and forests (Walmsley 2006). Urban ecology uses ecosystem services, urban forestry, and ecological infrastructure to construct "green infrastructure"; this is a nature-based perspective focused on projects benefiting flora and fauna as part of an ecological system (Matsler et al. 2021). Water or stormwater management uses waste management as the main design focus for "green infrastructure"; this can be a focus for cities that are trying to meet regulatory permits related to water pollution (Meerow and Newell 2017). These three categories cover the broad range of applications that are contained in the term green infrastructure and explain why the use of this term can occur in a variety of fields of scholarship.

International agencies have made statements regarding "green infrastructure" as having an important role in urban climate change resilience through mitigation and

adaptation; these terms are related but not interchangeable. Climate resiliency is "coping with and managing the impacts of climate change while preventing those impacts from growing worse" (Union of Concerned Scientists 2022). Coping and management techniques include mitigation and adaptation actions. Mitigation means taking actions to reduce greenhouse gas emissions at multiple levels while also using different land uses to remove carbon from the atmosphere. Adaptation means protecting against current threats and preparing for future threats by taking actions that protect infrastructure and people; future threats can include extreme weather, flooding, and sea level rise (Union of Concerned Scientists 2022). Urban green infrastructure can be impactful for both mitigation and adaptation and The World Health Organization (WHO) Regional Office for Europe released a brief on the relevance of urban green space that asserts that enhancing local resilience is an important function of urban green space. The brief defines urban green space as a component of green infrastructure, and green space examples include parks, playgrounds, or vegetation in public or private places. The WHO states that these types of green spaces can provide benefits like maintaining and protecting urban biodiversity, reducing environmental hazards like air pollution, mitigating impacts of extreme weather events, and improving the health and well-being of residents. (World Health Organization 2017). This briefing aligns with general sentiments that "green spaces" are considered a solution for a long list of urban challenges (Derkzen, van Teeffelen, and Verburg 2015).

The focus of research related to "urban green space", which can fall under the umbrella concept of "urban green infrastructure" (World Health Organization 2017), has changed over time. Farkas et al (2023) found that research related to this "greening" term fell into three phases over the last 30 years. In the first phase, "urban green space," research tended to concentrate on urban forestry with a focus on trees as ecosystem service providers. In the second phase, "urban green space" research began broadening its focus to include nature-based solutions and planning. This focus considers "urban green space" as a solution for urban challenges and incorporates larger-scale planning processes. In the third phase, "urban green space" research started to focus on social aspects like disparities in access to green space, impact on land surface temperature, and the connection of environmental justice. This change in focus over time illustrates a shift from understanding urban green space to implementing urban green space as a solution to urban challenges and environmental injustices.

"Urban green infrastructure" at the local level

So how has "urban green infrastructure" been adopted in cities at the local level? To explore this, I reviewed Baltimore's Green Network Plan, a city plan that embraces the idea of "green infrastructure as a system" (Department of Planning 2018). This plan, released in 2018, is built on a shared aspiration: "To develop a bold and actionable plan for an urban green network that connects and supports the residents of the City of Baltimore and produces a system of healthy, vibrant, and resilient places" (Department of Planning 2018, II-1). The plan uses what it refers to as nodes and

corridors to build out its urban green infrastructure. Nodes can include open, green spaces for people and nature to meet, and includes both nature nodes which focus on wildlife habitat and community nodes which focus on activity centers and neighborhood green spaces. Corridors are the connections between the nodes and neighborhoods that provide safe, comfortable movement for both humans and wildlife. This plan, as written, includes all three categories Matsler et al. (2021) identified for "green infrastructure": 1) greenspace planning, 2) urban ecology, and 3) stormwater management.

Plans, like Baltimore's Green Network Plan, are intended to shape the landscape of urban green infrastructure decision-making across the city and can influence decisions at larger scales as well. This is why it is important to acknowledge the role actors play and their level of involvement in designing a city plan. (Jim, Lo, and Byrne 2015) The Green Network Plans structure of involvement includes: 1) Leadership Team and Advisory Team, 2) Subcommittees, and 3) Community and stakeholder engagement. Individuals involved as part of the Leadership Team, Advisory Team, and Subcommittees are documented in the appendix of the plan. Community and stakeholder engagement is documented through activities and number of participants; activities include six city-wide meetings, nearly a dozen focus area meetings, and an online survey, which resulted in input into the plan from "hundreds of residents and stakeholders from neighborhoods throughout the city" (Department of Planning 2018, II-9). While city-wide plans have the potential to co-opt neighborhood needs to reach a larger city goal (Wachsmuth and Angelo 2018;

Angelo et al. 2022; Rosan 2012), the Green Network Plan includes Focus Area Plans as an outcome of its engagement process, with the intent to include localized community goals.

The Focus Areas were initially identified through a suitability analysis to identify neighborhoods with "high concentration of vacancies, as well as the greatest opportunity for creating economic, environmental, and health benefits through greening" (Department of Planning 2018, II-10). Vacant properties are named as a serious problem in Baltimore City, and the Green Network Vision intends to view them as an opportunity; Focus Area Plans, developed for each Focus Area, include pilot greening projects that capitalize on where vacant lots exist or could be created through vacant property demolition. These projects are meant to support the wider city vision of the Green Network Plan while also having local neighborhood impact. Neighborhood greening projects, identified through suitability analysis and neighborhood focus group conversations, are considered to have the potential to "spur new investment and neighborhood stabilization and renewal in target areas" (Department of Planning 2018, II-10). Language in this plan implies that greening investment can lead to other future investments in neighborhoods and considers vacant properties as "blank slate" opportunities for development (Safransky 2017; Meerow and Newell 2017).

The Green Network Plan states that the resulting network will "provide interconnected benefits" that include: "safer and healthier communities, by

eliminating blight […] and connecting more people to green assets, which can improve resident health and mental wellbeing"; "enhanced community economic development, through stabilized land and property values, proposed mechanisms to help maintain neighborhood affordability, as well as the potential to spur job creation"; and a "cleaner and greener environment, including better stormwater management and improved air quality […], [and] increased ecosystem resilience and biodiversity[…]" (Department of Planning 2018, 2). These benefits are not just aspirational but are found in scholarly research that will be reviewed in the next section.

Outcomes of "urban greening"

The benefits of safer and healthier communities can impact mental health, physical health, or both. The fact that the Green Network Plan focuses on the "opportunity" of blighted properties speaks to the concern these properties are for community safety and health. Blight refers to the vacant properties, both buildings and lots, that came to be in that state through intentional disinvestment in Black communities by federal, state, and local government policies and practices (Fight Blight Bmore 2023). Vacant properties are associated with dangers to public safety like increased risk of fires, exposure to airborne allergens, and crime. Blight can also affect individual emotions and self-esteem, which is harder to quantify. (Fight Blight Bmore 2023) By taking some blighted properties and turning them into greening projects, the Green Network Plan could reduce the burden of blight brought by the presence of vacant properties.

Beyond removal of blight, accessible green spaces like parks can increase physical and mental health (Wolch, Byrne, and Newell 2014). Green spaces have been found to increase social interactions that can build social cohesion and increase perceptions of safety and belonging (Kuo et al. 1998; Jennings and Bamkole 2019). They can also promote physical activity that is known to have a positive effect on overall health (Wolch, Byrne, and Newell 2014; Barton and Pretty 2010). Overall well-being has been shown to be affected by urban green space characteristics, such as having a variety of vegetation types (Reyes-Riveros et al. 2021). These benefits coming to actuality is strongly tied to green space accessibility. Using distance as a measurement between green space to neighboring residential areas is not on its own considered the best measurement for accessibility. Accessibility should also consider broader factors such as the quality of green space amenities, perceptions of safety, and challenges in walking access (Ekkel and de Vries 2017; Jennings, Larson, and Yun 2016).

These green space benefits can extend beyond human health to economic health in a neighborhood. One way gardens and other green spaces have been shown to enhance community economic development is by stabilizing and increasing land and property values. This value benefit can occur even in areas where residents have a much lower income when compared to other study sites in the same city. This suggests that investment in community gardens and other green spaces has a sizable payoff for the surrounding community and, ultimately, the city itself because increased property

values mean an increase in property tax that is returned to the city. (Voicu and Been 2006; Heckert and Mennis 2012). The positive impact can be less noticeable in neighborhoods that have very high concentrations of low income and additional challenges like unemployment and crime (Heckert and Mennis 2012), which speaks to the reality that investing in green spaces shouldn't be considered an all-encompassing solution to community investment needs.

The potential to spur job creation is an additional community economic development benefit of green space. Implementing green infrastructure plans can increase "green collar jobs" and open up employment opportunities in the public and private sectors (King and Shackleton 2020). Organizations focused on urban forestry often highlight workforce development and employment as a key outcome of large-scale tree-planting programs (Horn 2018). That said, many greening initiatives depend on ongoing and long-term maintenance post-planting by counting on unpaid or volunteer work by residents (E. Riedman 2021). Thus, the reality is that most of the employment benefits from greening are only embedded in the up-front initiatives, which don't account for the long-term sustainability of green spaces. Neighborhood residents, therefore, are more likely to perceive greening efforts as an imposition and waste of money when they continually witness trees being planted and dying from lack of follow-up from planting entities (Battaglia et al. 2014). Investment in green infrastructure and the labor force that will maintain its success is a key part of realizing green space as a community and economic development benefit.

Green space investment can also support a cleaner and greener environment by improving water quality, air quality, and ecosystem resilience. Water quality improvements come from vegetation slowing down water during a rain event by capturing water in roots or infiltrating water into the soil. These two actions slow down and stop pollutants that are being carried by the water so they don't make their way from the land into local waterbodies. Air quality improvements can occur through vegetation phytoremediation, which is the absorption of pollutants by leaves and roots (Han et al. 2022). Improvements to air quality can have a greater impact in places with more green space, though smaller areas like green roofs and community gardens can still have a positive effect (Semeraro et al. 2021; Meo et al. 2021). Ecosystem resilience comes from green infrastructures ability to support climate regulation by mitigating high temperatures (Semeraro et al. 2021; Wang et al. 2022). This is an especially important feature in cities where the built environment made up of buildings, roads, and sidewalks captures heat (Bounoua et al. 2015), which is known as the Urban Heat Island (UHI) effect.

Vegetation like mature trees can regulate local climate by keeping the temperature felt at ground surface much cooler, reducing the Urban Heat Island effect and improving thermal comfort for people (Gill et al. 2007; Gulyás, Unger, and Matzarakis 2006). Urban parks can have different local climate regulation impacts depending on the park's characteristics and coverage; more paved coverage and less tree or shrub coverage can reduce a green space cooling effect (Chang, Li, and Chang 2007). But even a green space that is less than 200 m2 (or less than half an American

football field) can have a significant impact on cooling down an urban neighborhood (Park et al. 2017). With the potential for climate change to increase droughts in some regions, cities investing in green spaces to benefit from climate regulation need to consider future climate conditions and plant vegetation accordingly; for example, including more drought-resistant plants that will require less watering (Gill et al. 2007).

All these benefits of green spaces have contributed to a popular opinion that "green" should be equated with "good" and the promotion of "greening" as a "win-win" solution. A win for people, the economy, and the planet. The Baltimore Green Network Plan echoes this sentiment by listing plan benefits as overlapping economic, environmental, and health gains (Department of Planning 2018, 1). But, environmental justice advocates remind us that "greening" should not be considered a solution for ongoing injustice (Jennings, Reid, and Fuller 2021). In the next section, I will address opportunities for disservice or harm from urban greening.

Disservices connected with "urban greening"

Despite the potential for benefits to people, these claimed benefits from increasing vegetation through urban greening are a cause of some concern. First, by claiming that urban greening is a universal climate change adaptation solution, the assumption is being made that all vegetation investment should be considered of equal adaptation value. Yet not all green infrastructure has an equal impact on cooling in urban areas,

with several studies revealing that green spaces have different levels of effectiveness depending on plant species, soil water availability, and other factors (Cameron et al. 2012). This means that valuing all urban greening investments equally, while it can streamline implementation, could also have a mixed level of impact on nearby residents. Some residents may be by a project that includes vegetation that is good at cooling, while others may be near a project that includes different vegetation that is not as effective. These differences in benefit outcomes for urban greening projects are lost when using a blanket term and need to be transparent.

Development strategies that leverage park and green space amenities, using the language of "livability", can be another disservice connected with urban greening; this is because development can encourage market-led property value changes and gentrification (Wachsmuth and Angelo 2018). Underinvested neighborhoods with open land, like in Baltimore, may be treated as blank slates where any investment could be looked at as beneficial, especially under the veil of yielding a "greening benefit" (Safransky 2017; Meerow and Newell 2017). However, gentrification can lead to the displacement of residents, leaving the benefit of greening limited to the new residents (Gibbons et al., n.d.). Housing precariousness or physical displacement can happen when the development of desirable green space causes housing costs in a neighborhood to increase (Wolch, Byrne, and Newell 2014). This housing instability can be a repetitive cycle without efforts made to put housing protections in place. Potential consequences like affordable housing impact are an important aspect to consider so that residents have sustainable access and opportunity to experience the

benefits of green space that may be marketed as increasing their community's "livability" (Jennings and Bamkole 2019).

Examples of greening projects in U.S. cities that have resulted in housing insecurity include the 606 in Chicago, the Beltline in Atlanta, and the Highline in New York City (Rigolon and Németh 2018; Yee, Trinh, and Zappella, n.d.; Jo Black and Richards 2020). The 606 in Chicago was initially born of neighborhood interest in increasing green space accessibility for their community. This grassroots effort resulted in a large-scale urban greening and trail project that triggered a loss of affordable housing because protections were not put in place. (Rigolon and Németh 2018). The national environmental nonprofit that was chosen to lead the project stated, "We are not in the business of housing" (Rigolon and Németh 2018). What this statement isn't acknowledging is that, based on the scale and size of the project, it has the potential to be a transformative infrastructure, which can be a catalyst for a dramatic neighborhood transformation. This neighborhood change can include the displacement of adjacent low-income residents of color (Yee, Trinh, and Zappella, n.d.); this outcome has been referred to as green gentrification.

The concept of "just green enough" has emerged out of these growing concerns that "greening" projects might trigger a process of green gentrification (Wolch, Byrne, and Newell 2014). This is the idea that small-scale greening projects that are scattered should be promoted over concentrated projects. Using this approach, a neighborhood would be able to reap the public health benefits of improved access to green space,

while “avoiding the urban green space paradox that could lead to green gentrification” (Wolch, Byrne, and Newell 2014). Other anti-gentrification approaches could include creating provisions for affordable housing and housing trust funds, setting up rent stabilization programs, and providing financial incentives for homeownership and shared equity housing projects (Wolch, Byrne, and Newell 2014); these approaches require intentional efforts beyond “greening”. Under its listing of resulting plan benefits, the Green Network Plan for Baltimore mentions “proposed mechanisms to help maintain neighborhood affordability” (Department of Planning 2018, 2), which acknowledges the possible housing instability that green investments can cause. Some local solutions for sustainable “greening” in communities (meaning community sustainability) will be addressed further in Chapter 4.

So, while urban greening is generally presented as a win-win solution for city challenges, there are reasons to be concerned about widespread and hasty implementation. In the next section I’ll be discussing perceptions of urban greening by disinvested neighborhoods and how these projects can be viewed as an environmental injustice.

Perceptions of “urban greening” by disinvested neighborhoods

The fact is that investing in “urban greening” is, in itself, not enough for communities that have experienced historic and ongoing disinvestment. The historical context of

disinvestment in Baltimore will be addressed further in the next section, though disinvestment in neighborhoods that are composed of majority Black or other people of color (POC) populations is not unique to this city. This section will include a brief discussion on how urban greening can be an environmental injustice and be perceived negatively by residents of disinvested neighborhoods.

Environmental injustice concerning park quality, quantity, and accessibility across socioeconomic and ethnic groups is referred to as "park poverty" (Meerow and Newell 2017; Jennings, Johnson Gaither, and Gragg 2012; Wolch, Byrne, and Newell 2014; Rigolon 2016). Inequities when comparing park quality, quantity, and accessibility can include the available amenities, regularity of maintenance, safety considerations, and acreage (Rigolon 2016). An example of why multiple inequities need to be considered together when evaluating park accessibility comes from a study in Baltimore; this study found that Black residents were more likely than White residents to live within walking distance of a park but that White residents had access to more park acres overall (Grove et al. 2018). This study illustrates how park poverty in Baltimore can manifest as a diffuse network of green space related to the availability of vacant land that fails to address acreage and quality.

The reason why there is an availability of vacant land that is considered an "opportunity" by the Green Network Plan is not overlooked in the plan document. There is a section dedicated to addressing social legacy, and it gives an overview of historic harmful policies like mortgage redlining that entrenched racial inequity in the

city (Department of Planning 2018). The section ends with this statement of intent: "This plan envisions increased access to open space, recreation, and natural areas for residents who live in communities that lack adequate green amenities; it is an important step toward a more equitable and just city." (Department of Planning 2018, II-6). However, structural issues in Baltimore rooted in a long history of racism and socioeconomic disparities cannot be resolved simply by adding more or better green spaces (Shcheglovitova and Pitas 2023; "Centering Justice: A Conversation With Environmental Justice Leaders, Dr. Beverly Wright & Dr. Jalonne White-Newsome" 2024). This misalignment with urban greening and moving toward equity and justice can be noticed in conversations with Baltimore residents who, based on previous experiences, may view urban greening projects critically and with a question of intent (Shcheglovitova and Pitas 2023; Battaglia et al. 2014).

These grounds for skepticism align with other study outcomes on conventional approaches to urban greening implementation, like tree planting and green infrastructure programs (Shcheglovitova and Pitas 2023; Locke and Grove 2016; E. Riedman et al. 2022). Locke & Grove (2016) found that free yard tree programs in Washington, D.C., were mainly implemented in higher-income, White communities when comparing tree planting locations to market demographic data. Researchers who conducted interviews with neighborhood residents as part of a tree program assessment in Philadelphia learned that, because of long-term disservice from municipal structures, there were concerns that tree plantings would lead to the cost of maintenance being passed on to the residents (E. Riedman et al. 2022). And

researchers interviewing neighborhood residents in Boston, Philadelphia, Amsterdam, and Barcelona, found that civic group members mostly identified negative social impacts of green infrastructure for marginalized residents – considering these projects "short lived benefits" (Planas-Carbonell et al. 2023).

Media coverage has also documented how urban greening has been used as a veil to "cover" disinvestment in cities. In 1996, coverage of the implementation of $2.95 million in federal grants awarded to St. Louis highlighted the fact that neighborhood groups were actively working on beautification projects through planting vegetation in the most economically depressed areas, results that would show immediately, unlike larger project visions under the federal grant monies. The article includes a quote from a resident, who has been living in the neighborhood for over 15 years, stating that she hopes someday something will come of the "big federal plans for jobs, business, and housing […] but for now, she'll be content to plant some flowers, putting something pretty in a place where, before, there was nothing". This alludes to the fact that large programs have been promised before, and there has not been follow-through; residents are left with beautification projects that are only a "tiny step toward fixing the problems" faced by economically depressed neighborhoods. (Poor and Armas 1996) Similar sentiments of skepticism on follow-through were captured in coverage of $20 million dollars in federal spending by the Department of Interior going toward "greening" of 15 open space sites in South Bronx along with federal loans for jobs and an $8.2 million program to rehabilitate public housing; "[announcements of program funding] were received enthusiastically by the

politicians and bureaucrats […] but […] also fell on the skeptical ears of several hundred community residents". (Afro-American 1978) Urban greening as a veil can be seen in the reactions of residents in these stories.

In the next section, I will be covering some of Baltimore's history and how the city's development and policies related to housing and urban greening influence the current state of the city's neighborhoods today.

"Urban greening" in Baltimore

> *"Cities are the product of thousands of individual and collective decisions, made in the context of larger social and economic cycles, environmental limitations and possibilities, and politics."*
>
> *(Boone et al. 2009, 777)*

Given the layers of context through which cities evolve, in this section, I explore the following questions: (1) What is the historical context of urban greening, development, and neighborhood investment in Baltimore?; (2) What is the current state of Baltimore neighborhoods?; (3) Who are the urban greening actors in Baltimore neighborhoods?; and (4) What are common funding streams for urban greening projects in neighborhoods and how has it been distributed? This chapter theme will be revisited in Chapter 2 when discussing environmental justice indicators and in Chapter 3 when discussing community engagement outcomes. In this next section, I'll be providing a brief history of Baltimore City's development to provide historical context for neighborhoods in the present.

Historical context of city development

Strategic "greening" has not always been part of Baltimore's history. Under Lord Baltimore's instruction, colonists first arrived to the area in 1633 where, on arrival, they had first contact with Indigenous tribes (Hall 1946). Over time, the English colonization resulted in the violent displacement of Indigenous people who had lived in the region for thousands of years (Fight Blight Bmore 2023). In the 1700s the city area experienced explosive growth; between 1790 to 1820 the population of the area grew from 13,500 to 62,700, and the city was officially incorporated (Department of Planning 2018, VIII-11). Planning for open space, or space that was not developed, as a public asset is considered to have first occurred in 1831 with the development of the public square around the Washington Monument. These four public square green spaces surrounding the monument in the Mount Vernon neighborhood are considered an early example of planned open space tied to residential real estate development post-colonization (Department of Planning 2018, VIII-11).

From the mid-1800s to early 1900s, the city invested in London-style squares and boulevards (like Franklin Square, Federal Hill, and Eutaw Place) as well as former estates (Boone et al. 2009) to create some of the larger iconic city parks (Patterson, Druid Hill, Carroll, and Clifton). Some parkland was acquired from real estate developers who donated or sold the land inexpensively. Other areas were purchased using a dedicated funding stream related to streetcar companies from laying track on public streets. Between 1860 and 1904, Baltimore added more than 1,300 acres of parkland across 32 different sites. (Department of Planning 2018, VIII-12)

Important historical context to add for some of these early park spaces is their direct connection to the enslavement of Africans and African descendants. For example, Carroll Park in southwest Baltimore was originally part of the Mount Clare plantation, which Charles Carroll Barrister owned in the mid-eighteenth century (Gwynns Falls Trails Council, n.d.; TCLF, n.d.). Historic records show that the Carroll family held many enslaved people and was one of only a few who held more than 100 enslaved people in the state (TCLF, n.d.). In north Baltimore, Druid Hill Park was originally part of the Rogers family estate, a White family that was considered the land owners since the 1700s (Hopkins, n.d.; MD Zoo, n.d.). It is unclear if enslaved people were connected to the estate. The city acquired the estate in 1860 (Boone et al. 2009). Historic connections of city green space to White colonialism and chattel slavery are not unique to these two parks and need to be acknowledged when writing about Baltimore park spaces. City recreational spaces were also subject to segregation policies that will be discussed later in this section.

In 1902, a landscape architecture firm was hired to study and provide recommendations for improving Baltimore's park system (Boone et al. 2009). The Municipal Art Society in Baltimore retained the famous Olmsted Brothers Landscape Architects firm to develop a comprehensive plan for creating parkland in outer Baltimore (Department of Planning 2018). City planning was not a common tool till the 1920s, so typically private groups, like the Municipal Art Society, sponsored this sort of effort (US National Park Service, n.d.). The plan, published in 1904, was titled

Report Upon the Development of Public Grounds for Baltimore. This plan envisioned a city where parkland and various public spaces were connected using a system of planted ("park") boulevards. (Holden 2004). A similar concept in some ways to the Baltimore Green Network Plan, which envisions a city-wide system of nodes (open, green spaces for people and nature to meet) and corridors (linear passageways for people and wildlife to travel) (Department of Planning 2018). Despite early enthusiasm from city leaders and residents, the plan was delayed two years due to the fire of 1904 that destroyed much of downtown. Ultimately, the plan failed to be implemented fully due to a lack of investment in land acquisition and rapid urban growth. (US National Park Service, n.d.; Holden 2004) Olmsted later spoke out on how many specific land acquisitions for parks did not reach the minimum acreage needed to make the initial report vision fully realized (Holden 2004).

From 1910 – 1920, Baltimore began experiencing a great migration of African Americans from the southern states, moving into northern cities for work and to escape the racism and violence that they were encountering in the south. In the 1910s the threat of white supremacist urban violence in Baltimore was making headlines; Black families moving into a White neighborhood experienced vandalism, intimidation, physical violence, and threats of death from their White neighbors (Brown 2021). Racist sentiments among White residents led to the first housing segregation ordinance in the United States to be passed in Baltimore: Ordinance 610. The ordinance was passed by the City Council with the support of Baltimore's White residents, especially those who fell within the middle class. (Fight Blight Bmore

2023; Boger 2009) While the ordinance was overturned in 1913 when the local criminal court ruled in favor of a case challenging a technicality on ordinance wording (Boger 2009), additional policies followed that were intended to have a similar effect of restricting where Black people and groups considered "non-White" could live; these include Single-Family Zoning and Restrictive Covenants (Fight Blight Bmore 2023).

Another tool structuring racial segregation in Baltimore, and other cities around the country, was the housing security maps (HOLC maps) of the 1930's (Fight Blight Bmore 2023). These maps were designed to show the lending risk in neighborhoods and color-coded communities based on risk level; communities of higher risk were restricted in their access to federal mortgages and loans (Fight Blight Bmore 2023). High-risk communities, which happened to also be communities with Black or "foreign" residents, were outlined in red. This visual categorizing connects to the term "redlining". While the HOLC maps are tangible evidence of the strategic disinvestment in non-White communities, redlining can refer to a suite of policies that racialized residential property (Robert Gioielli 2022). And, research has shown that these policies have influenced the present environment in those same redlined communities through lack of green space, tree canopy coverage, and allocation of environmental dis-amenities (Locke et al. 2021; Nardone et al. 2021).

Parks were a public space that reinforced city segregation policies. Until the 1950s, Baltimore City parks were formally policed using segregation policies that kept them

"separate but equal" spaces (J. E. Wells, Buckley, and Boone 2008). This included limiting what park amenities were accessible to residents based on the color of their skin; either building separate facilities, limiting hours of use, or completely restricting access to Black residents (J. E. Wells, Buckley, and Boone 2008). Baltimore's Board of Public Park Commissioners also used park police officers to enforce policies like only one "race" could use a sports field or court at a time and that interracial games could not occur (J. E. Wells, Buckley, and Boone 2008). The desegregation of the Carroll Park golf course was a pivotal fight that led to the removal of restrictions on access to other city park amenities, and legal authority for park segregation in Baltimore was lost in 1955 with the Supreme Court decision to desegregate a state park (J. E. Wells, Buckley, and Boone 2008). The court record states: "It is now obvious […] that segregation cannot be justified as a means to preserve the public peace merely because the tangible facilities furnished to one race are equal to those furnished to the other." (Dawson v. Mayor City of Baltimore City 1955) This ruling was heavily influenced by the recent outcome of Brown v. Board of Education of Topeka and directly references that case within the court records. The court record goes on to state: "With this in mind [referring to the Brown V. Board of Education of Topeka decision], it is obvious that racial segregation in recreational activities can no longer be sustained as a proper exercise of the police power of the State; for if that power cannot be invoked to sustain racial segregation in the schools, where attendance is compulsory and racial friction may be apprehended from the enforced commingling of the races, it cannot be sustained with respect to public beach and bathhouse facilities, the use of which is entirely optional." (Dawson v. Mayor City of

Baltimore City 1955) Thus, the legality of policies that explicitly segregated public parks and amenities was removed.

As park desegregation was being decided in the court system, "urban renewal" was beginning to cause upheaval for Black neighborhoods. "Urban renewal" refers to a period between 1950s to mid-1970s when cities literally demolished and displaced Black neighborhoods. This harm was mainly authorized and funded by three pieces of federal policy: the Housing Act of 1949, the Housing Act of 1954, and the Federal-Aid Highway Act of 1956. (Brown 2021) James Baldwin described urban renewal as "moving Negroes out […] it means Negro Removal – that is what it means. The federal government is an accomplice to this fact" (Brown 2021; Graham 2015). Baldwin is referring to the fact that urban renewal projects were focused on "slum clearance"; this involved using eminent domain to acquire private homes (under the guise of poor housing quality), demolishing them, and then rebuilding on the emptied land. New development included public housing, private housing, and commercial development like stores or office buildings. (Digital Scholarship Lab, n.d.) Urban renewal demolished and displaced mainly non-White communities across the country, but Baltimore's use of the urban renewal program is notable. When comparing the amount of money that Chicago and Baltimore spent on urban renewal projects, Chicago spent more than $200 million while Baltimore, a city with about a quarter of Chicago's population, spent $900 million. (Brown 2021) Projects under these federal policies include the "highway to nowhere" and the Harlem Park Renewal Plan in central Baltimore (BURHA 1960). Of interest for this paper, one reason put forth for

the choice of the Harlem Park community as a project site, whose population was 100% Black, was the need for recreational facilities; the plan included creating open areas by removing inner blocks so that "there will be green grass and a chance for air and sun to be enjoyed by the residents of the surrounding homes" (BURHA 1960). The outcome of urban renewal projects was not only the displacement of tens of thousands of Black residents but also an intensification of racial segregation in the city (Brown 2021).

The passage of the Fair Housing Act and Housing and Urban Development Act, both in 1968, set a federal tone regarding housing discrimination and investment. With the Environmental Justice Movement organizing around this same time, these two pieces of federal policy could be considered early environmental justice bills because housing is the environment where you live. The Fair Housing Act (1968) prohibits discrimination by direct providers of housing or real estate-related transactions that would make housing unavailable to persons because of their race or color, religion, sex, national origin, familial status, or disability. While these policies set a federal tone regarding housing discrimination, local policies that are designed to appear "race neutral" have impacts on housing that are fundamentally racial, like the Baltimore city tax-sale process (Fight Blight Bmore 2023). Under the tax sale process, if property owners have past-due bills, then their property is put up for tax sale; investors buy the debt, and if homeowners are unable to repay the investor, they could lose their home. This is a system that is designed to enrich the investor at the expense of the city's poorest homeowners, most of whom are African American. (Jacobson

2014) Homes that are lost to this tax-sale process can become vacant properties that destabilize neighborhoods and result in blight (Jacobson 2014). Because of the hypersegregation of Baltimore, initiated by early residential segregation policies like Ordinance 610 and continued by other restrictive policies once the ordinance was overturned, people are more likely to live in neighborhoods that are made up of mainly people of their same "race". This means that houses that become vacant due to tax sales are predominately located in African American neighborhoods, which presents an environmental injustice. In 2024, the tax sale process continues to be an ongoing destabilizing threat to low-income African American communities (SOS Fund, 2024).

The change in city population over time also impacts the presence and persistence of vacancy in Baltimore neighborhoods. After the 2020 Census the city population was determined to be 585,708, which is the lowest population in the past 100 years (Shertz 2021). But this loss was not equal across all neighborhoods. According to the Baltimore Neighborhood Indicators Alliance (BNIA), which uses geographical areas referred to as "Community Statistical Areas" or CSAs to combine neighborhoods into larger areas for data analysis, some areas grew in population substantially. For example, CSAs such as Fells Point, Highlandtown, and South Baltimore experienced a >17% gain in population between 2010 to 2020. In contrast, other parts of the city experienced a >21% loss in population during the same time period; examples of CSAs that lost population include Clifton-Berea, Southwest Baltimore, and Sandtown-Winchester/Harlem Park. (Shertz 2021) Loss of population in

neighborhoods is a sign of concern because fewer people in a neighborhood increases the opportunity for property vacancy. This is especially true in disinvested neighborhoods that do not have a robust housing market that (1) owners can sell into and (2) incentivizes property maintenance.

The issue of building vacancy led to the development of a demolition fund that was launched in January 2016 under Maryland Governor Larry Hogan and Baltimore Mayor Stephanie Rawlings-Blake. Project C.O.R.E., which stands for Creating Opportunity for Renewal & Enterprise, was created with the goal to "remove blight in the city while creating new opportunities in neighborhoods that for too long have been neglected" (MD-DHCD 2021) Project C.O.R.E. is a state investment initiative for Baltimore City that is administered by the Maryland Department of Housing and Community Development (MD-DHCD 2022). Originally, Project C.O.R.E. was developed as a demolition funding program that primarily targeted areas of high vacancy, measured by the number of Vacant Building Notices (or VBNs) in a neighborhood (MD-DHCD 2021). It also focused on half-block or whole-block demolition, which is considered more economically efficient and impactful because larger areas of land would become available for green space or attracting redevelopment ("Project C.O.R.E.: Demolition FAQ," n.d.). Properties are meant to be identified through multiple avenues including examining data and gathering input from community members, City agencies, and other stakeholders. Community member input is gathered through a variety of methods, including community meetings, outreach efforts, and online. ("Project C.O.R.E.: Demolition FAQ," n.d.)

This process is repeated regularly to develop property lists for demolition and stabilization. This approach, promoted as eliminating blight by removing vacant and abandoned buildings, is described as critical to "stabilize housing values, enhance public safety, create green space, and promote new investment" ("Project C.O.R.E.: Demolition FAQ," n.d.). With this charge, between January 2016 and June 2022, over 5,280 vacant buildings have been demolished, deconstructed, or stabilized (MD-DHCD 2022).

Sites that experience demolition transition to a "Clean and Green" condition where they are topped with topsoil and compost and seeded with a grass seed mix, putting the land in a waiting state for future development. The Growing Green Initiative can offer improvements to "Clean and Green" sites, converting them to "mid- or long-term green space" through coordination by the Office of Sustainability ("Project C.O.R.E.: Demolition FAQ," n.d.). In addition to the demolition funding, the program also offers a competitive Request for Application process where applicants can request support for projects eligible for Project C.O.R.E. funding that build on existing community strengths; this includes projects that support implementing recent comprehensive plans like the Green Network Plan (MD-DHCD 2022). The 2016-2021 program milestone report boasts that $5.37 million has been invested in 15 awards toward new community parks using the Request for Application process (MD-DHCD 2021). Project C.O.R.E. is a more recent investment program that has resulted in major landscape changes in areas of Baltimore City that experience high

vacancy; this looks like empty spaces created by demolition in neighborhoods that persist as vacant land since developers don't invest in labeled weak housing markets.

In this section, I provided a brief overview of the history of Baltimore City's development, including some history of public spaces, development programs, and the legacy of segregation and racism. Much more could be shared on these topics, and I encourage you to use the citations included to continue your learning. The intent was to provide enough background for you to be able to connect the historical context with the present-day neighborhood landscape in Baltimore. The next section will address the second question: (2) What is the current state of Baltimore neighborhoods?

Currently in Baltimore…

The current state of Baltimore neighborhoods is very much impacted by the historical trauma that I attempted to cover in the previous section, which can manifest as blight. This has a disproportionate effect in neighborhoods that are predominately people of color; in 2020, communities that had the highest percentage of vacant and abandoned residential properties were also made up of residents who were mostly people of color (Brown 2021). The fact that vacant properties in Baltimore predominately impact communities of color is a blatant environmental injustice; next, I will be discussing how blight can impact individual and community health and well-being.

An anti-blight organization based in Baltimore wrote in a recent report that blight "adversely impacts people's ability to maintain family and community bonds, […] resulting in psychological trauma. When untreated, health and wellness diminish. Sadly, the toll on individual emotions and self-esteem is harder to quantify, but the impact is easy to notice." (Fight Blight Bmore 2023, 9) While the psychological toll of blight can be hard to quantify, during listening sessions facilitated by this anti-blight organization, participants shared that their living conditions "often impacted their self-worth" (Fight Blight Bmore 2023, 37). This was frequently discussed in the "context of historical trauma and loss of neighborhood identity, wealth and social conditions" (Fight Blight Bmore 2023, 37), which can be traced back to traumas such as redlining, segregation, and displacement.

Neighborhood concern about vacant and abandoned properties impacting their community's well-being has been a persistent issue; community engagement efforts 25 years ago related to environmental issues in neighborhoods documented residents in the city listing "vacant houses and lots" as a top concern alongside "trash/litter" (Revitalizing Baltimore Technical Committee 1999). These issues have been known to co-occur when vacant properties attract illegal dumping of trash, which can result in a negative feedback loop where the presence of trash leads to more dumping (Little et al. 2017). An additional priority concern listed by residents was "public open space issues – poor maintenance and lack of" (Revitalizing Baltimore Technical Committee 1999). The concern of vacant lots alongside public open space issues brings up an

important point that I opened with at the beginning of this Chapter and will address in greater detail next; not all "green" is perceived as a community benefit.

Vacant parcels have been found to make a disproportionately large contribution to neighborhood greening in residential areas that experience disinvestment when methods such as remote sensing tools are used to quantify vegetation (Berland et al. 2020). Studies quantifying green space commonly use remotely sensed datasets like the Normalized Difference Vegetation Index (NDVI), which assigns values based on the amount of green vegetation, to identify green space as an amenity for communities; but what this dataset may not account for is the type of vegetation it is considering (Berland et al. 2020). Vegetation that may be growing on vacant parcels and appear as a benefit in the data, but may actually be a concern, is "volunteer vegetation", or vegetation that succeeds because of active neglect (Schwarz, Berland, and Herrmann 2018). While urban green spaces can have many public health benefits, as previously stated, negative impacts have been connected to this vegetation on neglected lots; this can introduce a negative impact on well-being and reduced access to green space (Little et al. 2017). The pairing of needs and concerns related to green space connects back to the Baltimore Green Network Plan and its intent to utilize vacant properties to expand access to green spaces in Baltimore.

The Baltimore Green Network Plan acknowledges that neighborhoods with high vacancies tend to have fewer quality outdoor public spaces and less access to natural areas, which is why an analysis was included as part of the plan development to

identify priority areas for investment in green space on vacant lands in disinvested neighborhoods (Department of Planning 2018, II-7). With this intentional focus on disinvested neighborhoods, this plan is casting greening as a solution to structural racism without fully addressing the limitations that urban greening can offer to repairing injustice (Shcheglovitova and Pitas 2023). In fact, greening efforts that are intended to be beneficial to underinvested communities can result in a continued feeling of disinvestment if there is a lack of follow-through and care (Shcheglovitova 2020). I would argue this continued feeling of disinvestment is what you would feel if you visited some of the Baltimore Green Network Plan pilot project sites. Plans for future parks seem to have been put on hold due in at least some part to lack of funding, but all necessary demolition has been completed to open the site; this results in large open blocks in underinvested neighborhoods that have yet to reach their intended purpose. Instead, they add to blight. In Figure 1 (below), the removal of vacant housing on a pilot project site over time is captured using satellite imagery; currently, in 2023, the pilot project site has yet to receive full funding to move forward this planned park expansion.

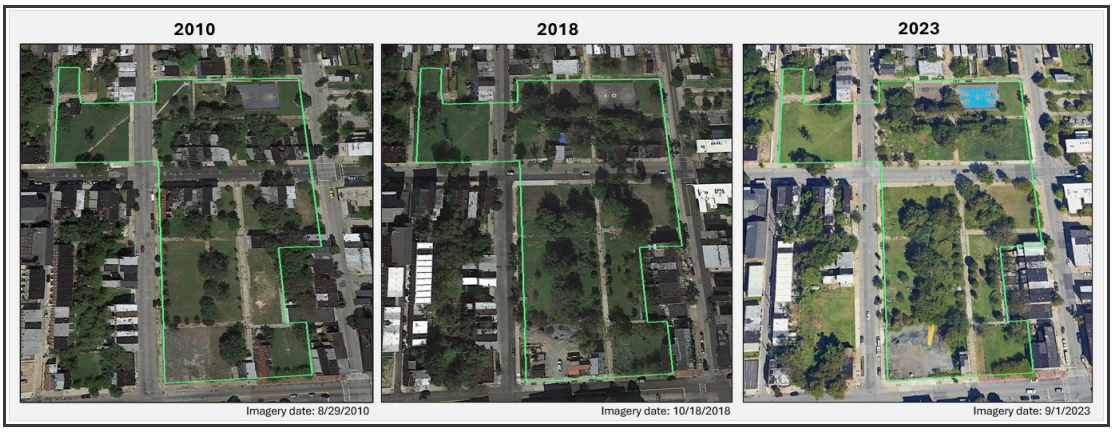


Figure 1: Satellite imagery over time shows the change in landscape at a Baltimore Green Network Plan pilot project site. Imagery is included from before the plan was released, the year the plan was released, and current imagery. Buildings have been removed over time and the site is currently cleared. (Imagery accessed from Google Earth Pro)

This issue of lack of funding is always a challenge in the world of planning processes and can actually lead to confusion. A whole planning process can be completed, involving various points of community engagement, and can culminate in a plan that still requires significant work to fund, design, and implement. This may catch people unfamiliar with the development process by surprise – why would you invest in this whole process without being fully funded to deliver the outcome? That is how I feel about the current state of some of the Green Network Plan pilot projects, where vacant lots present as construction sites, with piles of rubble and no acknowledgment of an intent to move forward in any direction that benefits the people who live among the lots every day. When larger plans falter, this can encourage a piecemeal approach to urban greening development at the individual vacant lot level, lowering project costs and shifting the focus to faster results (read benefits) (Young 2011). Focusing on smaller urban greening projects also aligns with the concept of "just green enough" and the tension between green space amenity development and affordability

and accessibility protection (Wolch, Byrne, and Newell 2014). There are many "urban greening actors" who contribute to small-scale neighborhood projects in an attempt to reduce blight and achieve other environmental and community goals. The next section will focus on these types of efforts by addressing the question of who the urban greening actors in Baltimore are, which will lead to my closing question regarding urban greening funding streams and how funding is distributed across neighborhoods.

Identifying "urban greening" actors

Most of the actors, or primary implementers, of urban greening are intermediary organizations that can provide technical support and resources for resident-led urban greening projects. Typically, these are non-profit organizations that rely on applying for grant funding to cover their operational and administrative costs. These organizations may have a specialty in a type of "greening" (e.g., tree planting, stormwater management, etc.) and have limited ranges (geographically) where they work. Sometimes, these organizations apply for project funding on their own to support projects, while other times, they are included as an implementing agent for another organization's or agency's grant. The Green Pattern Book, designed to be a tool to support vacant land greening in Baltimore, includes a list of local nonprofit organizations that provide project support; these include Baltimore Tree Trust, Blue Water Baltimore, Civic Works, and Parks & People (US FS 2015). Combined, these organizations have been working to "green" Baltimore for over 100 years, with Civic Works and Parks & People having the longest recognition with 30+ years each.

These actors can play an important part in implementing urban greening projects around the city. Some types of development require certain green infrastructure to be included in the development plan to reduce water pollution from stormwater runoff; this is tied to development permits (Solins et al. 2023). But for areas of the city that are not experiencing new development, “urban greening” projects tend to be voluntary actions that neighborhoods pursue as beautification efforts and urban greening actors can provide support (Solins et al. 2023). This relationship has also been known to be switched, where urban greening actors have a funding source, and they are seeking sites to partner with to implement projects (Respondent A, pers comm). With this dual relationship in mind, urban greening actors are a key source of information on funding sources for neighborhood-scale urban greening projects in the city.

Initially, I thought I’d be able to access information about project funding from organization documents that were publicly available online. Some organizations shared informational resources on funding opportunities, but other than one-off information sources like project blog posts, it proved to be challenging to identify the project funding sources different implementing organizations were using. One document type I thought would be especially helpful was an organization's annual report, but this proved to not be the case. In my experience, these were not always easy to find and tended to have funding information shared in a general way. This means I could either not distinguish which specific funder the organization was

referencing, or I could not distinguish the specific type of project the funding was supporting. Since I am interested in urban greening projects specifically, knowing the project type is important. Often it was easier to go to a funding entity itself and read through their awardee reports to see if an organization was listed, but this required knowing which funders to inquire about – otherwise, it would be a lot of educated guessing. Also, since individual organization projects may be piecemeal and not part of a larger plan with reporting, it was challenging to find a central source of information for greening projects in Baltimore. This unanticipated challenge led me to incorporate informal informational interviews into my research methodology.

Through informal informational interviews with three urban greening actors who are currently active in implementing projects in Baltimore City, I sought to learn about funding sources they used for projects, how funding may have changed over time, whether there is a central source for information on greening projects in Baltimore, and any issues they face with regards to funding or project implementation. The respondents each represented an organization with a unique mission and had been working for their organization for over five years. In addition, informational interviews were conducted with two representatives from organizations involved in neighborhood community development efforts; they are connected to urban greening projects through high-level project management but do not consider themselves urban greening experts and typically are one step removed from implementation. Questions that I used to guide the conversation included: (1) Who mainly provides funding for your greening projects and has this changed over the past 5-10 years?; (2) Are you

aware of any database for Baltimore greening projects that would include information on the type of project, location, and funding sources?; and (3) What concerns, challenges, or limitations have you encountered related to funding and/or urban greening projects? These conversations led to a unique insight into funding access and challenges related to urban greening projects. These insights related to (1) funding limiting accessibility, (2) funding limiting outcomes, and (3) funding not supporting long-term success.

Respondents shared experiences where they considered funding for urban greening projects inaccessible based on requests for proposals (RFPs) and how funders ranked submitted project proposals. This ranking is associated with the types of metrics the funder is hoping to achieve. For example, funders who are interested in improving water quality will prioritize project proposals that have the greatest impact on reducing water pollution. This metric can result in urban projects being ranked lower because the size of the projects tends to be smaller, which can reduce metric impact. In one conversation, a respondent shared how they experienced challenges getting proposals funded because they weren't considered "environmental enough"; this was before equity became more of a focus in funding opportunities, a shift that they perceived as taking place after the murder of George Floyd in 2020. Before 2020, this respondent did not consider environmental justice to be well-funded or supported by environmental funders (Respondent B, pers comm). Accessibility limitations were also mentioned in reference to federal funding. One respondent shared that their organization had been awarded federal funding that required them to front the cost,

and they had waited years for reimbursement, which they shared made them less likely to want to pursue federal funding in the future (Respondent A, pers comm). Related to federal funding, another respondent shared that their organization used their staff capacity and technical skills to pursue federal grants that they could pass along to community organizations on the ground who may not be able to pursue that level of funding on their own (Respondent B, pers comm). These experiences with federal funding highlight the challenge of accessing this level of funding because it requires technical skill, capacity, and fronting costs.

Respondents also shared that the funding for urban greening projects had limitations on what was approved spending, which limited project outcomes. One respondent shared about a time when a large amount of money was dedicated to urban community-based projects from a funding source that focused on nonpoint source pollution reduction tied to nitrogen, phosphorous, and sediment. This was intended to be a big support for urban communities, who have a hard time accessing this type of funding because reduction projects in the city tend to be more expensive and have less of a pollution reduction impact. However, this respondent found the funding hard to implement because the funding didn't allow flexibility to support any of the community's immediate needs, which may not be related to stormwater. (Respondent A, pers comm) This respondent came away from that experience seeing this particular funding source, known for its abundance, as not being useful for the types of community projects their organization was trying to implement. Funding inflexibility

can lead to experiences like this, where you are stuck trying to fit the project to the funder's needs instead of fitting the funding to the community's needs.

In addition, respondents shared that they experienced a funding gap where there is limited access to funding that would maintain “urban greening” projects long-term. This is a sentiment that both implementers and community development contacts shared. Sometimes this gap could be overcome by using workforce development funding to support continued care (Respondent B, C, pers comm). But even that approach had its own unique challenges; one respondent shared that they partnered with a workforce development group that provided maintenance to green spaces, but since that group was financed by federal funding there were lots of limitations on where they could work. For example, they couldn’t work on privately owned land. (Respondent C, pers comm) Accessing maintenance funding is seen as a challenge because long-term maintenance doesn’t gain funder interest; funders typically want to invest in something new. This meant that many urban greening projects rely on volunteer champions who, for various reasons, are not considered long-term reliable solutions. People can move away or have irregular availability. In one respondent's experience, as a staff member at a non-profit community development organization for over nine years, they found that paying someone to do the work meant it was more likely to lead to the outcome of maintenance happening at regular intervals (Respondent C, pers comm); this ensures that the project maintains amenity status in the community. Another community development professional shared that a goal of their organization is to involve community members in maintenance if there is

capacity and desire, but that they rely mostly on trying to add maintenance funding to capital projects to support long-term project care. Local landscapers and/or urban greening actors who partner on the project can be paid using these funds to complete necessary maintenance. (Respondent D, pers comm) The gap in funding for long-term maintenance that some respondents voiced does not align with the discourse that promotes urban greening as a form of "green infrastructure" that should be invested in like any other type of infrastructure; "although there are some short-term effects, green space interventions need to be considered as an urban investment that delivers the strongest benefits over a longer period of time." (World Health Organization 2017). Finding funding that aligns with this investment discourse seems challenging for Baltimore's urban greening actors and can negatively impact how community development organizations perceive these types of projects.

Typical funding sources that were shared seemed to be related to staff capacity, expertise, and scale of the organization. Also, some funding sources were shared as being part of a partnership with another organization. The following funding sources were mentioned by the majority of the participants: Chesapeake Bay Trust (CBT) and National Fish and Wildlife Foundation (NFWF). Each of these funding sources have specific grant programs for urban greening projects (see Table 1, below). Respondents also mentioned the Chesapeake & Atlantic Coastal Bays Trust Fund as a funding source used in the past (Respondent A, pers comm).

Table 1: Green space project grant programs named by urban greening actors. This table lists specific grant programs offered by funders and additional program details on program outcome, metrics, funding amount, and eligibility. These funding programs were specifically mentioned in conversations with greening actors as programs they apply for to fund urban greening projects.

Funding sources mentioned by actors				
Funding organization	Chesapeake Bay Trust (CBT) *In partnership with other funding entities.*	Chesapeake Bay Trust (CBT) *In partnership with other funding entities.*	Chesapeake Bay Trust (CBT) *In partnership with other funding entities.*	National Fish & Wildlife Foundation (NFWF) *In partnership with other funding entities.*
Specific funding program	Green Streets, Green Jobs, Green Towns Grant Program	Outreach and Restoration Grant Program	Urban Tree Grant Program	Small Watershed Grant (SWG) Program
Program stated outcome	Increase urban green spaces by supporting community greening projects and tree canopy projects that enhance livability in communities.	Implement on-the-ground restoration projects that increase knowledge, change behavior, and accelerate stewardship of natural environment.	Increase urban tree canopy to improve quality of life and mitigate climate change in areas that are urban and underserved.	Implementation of conservation or restoration actions; assessment, planning, design, and other technical assistance-oriented activities
Program metrics *Related to urban green space*	# of trees planted; amount of area being replanted or impervious being removed	*No state metrics; includes a list of criteria including impact on water quality, natural resources, and community needs.*	# of tree planted (key metric as part of state-wide 5,000,000-tree goal by 2031)	# of trees planted; annual nitrogen, phosphorous, and/or sediment load reductions from project
Program funding amount	Community Greening *Up to $50,000*	Restoration Projects *Up to $100,000* Outreach & Restoration *Up to $125,000*	Single small neighborhood *Up to $15,000 (25-50 trees)* Multiple neighborhoods *Up to $45,000 (75-300 trees)*	SWG Implementation - *$150,000 – 1,000,000* SWG Planning & Tech Ass. *Up to $150,000*
Program eligibility *Related to neighborhoods*	Nonprofits; Faith-based Organizations; Local government agencies	Nonprofits; Faith-based Organizations; Service, Youth and Civic Groups; Municipal Public Agencies	Nonprofits; Community associations; Municipalities; Service, Youth, and Civic Groups; Schools	Non-profits; Community based organizations; K-12 educational institutions; Local governments

Funding organizations like Chesapeake Bay Trust or National Fish & Wildlife Foundation are commonly referred to as intermediary organizations or pass-through organizations. This refers to the fact that they take money directly from funding groups, package the funding up into programs, and then release those programs for eligible organizations to apply for to support on-the-ground projects (see Figure 2, below). Examples of primary funders that are used by intermediary organizations include the federal or state government, corporations, and foundations or philanthropic groups.

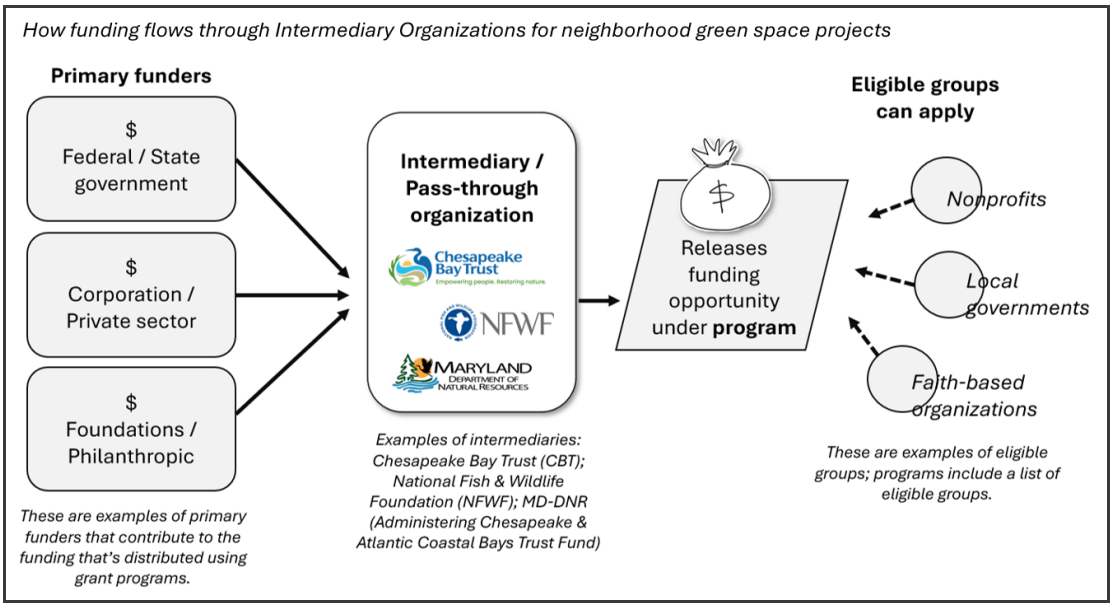


Figure 2: Intermediary organizations as a funding mechanism for neighborhood green space projects. These were specifically mentioned in conversations with greening actors as a common funding source for their projects. Intermediary organizations use many primary funding sources to release funding opportunities under specific programs and eligible groups can apply.

Two respondents also mentioned pursuing federal funding directly through an Urban Community Forestry program; it turns out they were partners on the grant, and one of the organizations was acting as the intermediary in the partnership to help access federal funding for community projects (Respondent E, B, pers comm). Respondents also mentioned foundations and corporations as funding sources for aspects of green space engagement (youth programs, park activation) that may not be covered by funding more tied to environmental outcomes. Typically, these types of funding sources offer less money overall, but the funding is more accessible because you receive it as a lump sum. (Respondent A, pers comm) Many respondents noted the delicate balance of having funding source diversity: on the one hand, relying on a few sources is a risk because you may have to front a lot of money while you're waiting for funding to come through, but on the other, the more funding sources you are

relying on, the more funding reporting and multiple funding timelines you need to juggle (Respondent E, A, pers comm). Using the funding sources named through these informal informational interviews, I conducted additional research to evaluate the "trackability" of these funding sources to specific project sites in Baltimore based on publicly available data.

The next section will address the concluding question for Chapter 1: what are the funding streams for urban greening projects in neighborhoods and how has it been distributed? Through informal informational conversations with respondents who are involved with urban greening projects in Baltimore, I was able to learn about specific funding sources that are regularly pursued for these types of projects. Next, I will discuss the trackability of these funding sources to specific project sites through publicly available data.

Tracking funding for "urban greening" projects

Many of the funding sources shared during my informal informational interviews were corroborated by the Green Pattern Book resource list of potential funders (US FS 2015). Next, I accessed funding websites to learn what type of data related to funding awards was publicly available. All the funders included information on their websites about funding awards, but the format and level of detail available varied (see Table 2, below). For example, the Chesapeake Bay Trust and the National Fish &

Wildlife Foundation (NFWF) both displayed their awarded projects as points on an interactive map. Depending on the type of project, a specific point can be an accurate method for displaying project information – like where a restoration project was implemented. Other urban greening projects are more challenging to accurately capture with a single-point location, like a neighborhood tree planting project.

Table 2: Named green space project funders and available project data. Three green space project funders that were named had publicly available data that could be used to investigate urban green funding distribution in Baltimore. While all three of these sources have publicly available data, only CBT and DNR Trust Fund had projects listed related to neighborhood green space projects in Baltimore City. Site location accuracy was an issue depending on the type of project.

Green space project funders and available project data (format, location, funding)			
Greenspace project funders	Format of publicly available data	Project site location included (Y/N)	Foundation amount for project included (Y/N)
Chesapeake Bay Trust (CBT)	Project awards interactive map; List of awardees on program webpages; Spatial data accessible through ArcGIS Online	**Yes** *Spatial dataset includes project point location, but accuracy of point varies by project type.*	**Yes** *Full award amount for grant is accessible.*
National Fish & Wildlife Foundation (NFWF)	Grant awards interactive map – can be filtered by specific grant program.	**Yes** *Spatial dataset includes project point location, but accuracy of point varies by project type. Also, spatial data cannot be accessed outside interactive map.*	**Yes** *Full award amount for grant is accessible.*
Chesapeake and Atlantic Coastal Bays Trust Fund (DNR Trust Fund)*	Grant awards interactive map color-coded by progress; Spatial data accessible through ArcGIS Online; Grant awards listed in annual report	**Yes** *Spatial dataset includes project point location, but accuracy of point varies by project type.*	**Yes** *Full award amount for grant is accessible.*

I tried to simplify this type of spatial challenge by focusing my attention on urban greening projects like vacant lot improvements only. However, I found that across the multiple funding sources, publicly available data with project location was limited, or funding details were lacking. This lack of publicly accessible location-specific information could be a result of funder metrics. For example, funders who are

focused on stormwater management find it necessary to require information about the exact site where a project is installed to calculate potential pollutant removal based on the area that is draining to the project site. In comparison, a funder focused on community development may require information about the number of people who attended a series of park activation programs over the summer but may be less concerned about the exact location of each of the programs.

Funding being accessed from a federal entity directly can be especially hard to trace down to the community level. One reason for this is the way some federal funding programs are distributed; formula funding is distributed to states as large sums of money and those dollars can go through dozens of transactions before they are implemented as part of a project (Walls et al. 2024). Other federal funding programs are based on a competitive grant process where eligible entities can apply directly to the program; this can be slightly easier to trace because it can be a more direct connection to a project or program (Dwelley et al. 2023). The USAspending.gov website allows you to search through award data using various filters. By knowing the Assistance Listing code (name and associated code for a funding program) you can access information about who received the funding, when the funding starts and ends, how much funding is awarded and spent up until that point, and sub-grants awarded from the funding award. Sometimes, an award can include a description associated with the grant, but the amount of detail included in this text block can vary drastically. The smallest level of geography associated with the project is at the

county or congressional district level, so you would still have to reach out to the listed awardee to request more detailed location information.

The poor level of tracking at small geographies is a common critique of publicly accessible federal data, and data collection practices are being challenged as part of the roll-out of the Justice40 Initiative associated with Executive Order 14008 (Walls et al. 2024). This initiative will be discussed in greater detail in the next chapter, but the overall intention of the initiative is to get 40% of the benefit from specific federal programs related to seven different categories going to identified "disadvantaged communities". The unit of analysis for these communities is the census tract level, which means that program benefits need to be tracked at scales smaller than they currently are presented. Until more recently, federal data collection was not designed for this level of benefit analysis and accountability (Walls et al. 2024). This initiative is also changing the way funding programs are offered with the intention of being more accessible for organizations that work with and represent "disadvantaged communities".

Summary

In Chapter 1, the following topics were discussed: (1) What is "urban greening", using a variety of terms; (2) How "greening" is promoted as a solution to many urban challenges and incorporated in urban planning; (3) How "greening" acts as a service and disservice in urban communities; (4) How "greening" can be an environmental

injustice; (5) What the historical context of "urban greening" is in Baltimore; (6) What is the current state of Baltimore neighborhoods; (7) Who are the "urban greening" actors implementing projects; and (8) What are the funding streams for "urban greening" projects and how has funding been distributed. My goal in this chapter was to set the context for urban greening in Baltimore and how and whether communities consider urban greening projects as viable strategies for righting an environmental injustice. Investigating funding sources that urban greening actors use to support neighborhood greening projects, I learned how metrics associated with the most accessed funding sources may be limiting project outcomes and success from the neighborhood perspective. Coming away from this chapter, I realize that trying to access funding distribution by tracking location of funding investment can be a challenge because, while urban greening projects tend to have associated location information, the type of project being installed can drastically impact cost. This presents as some neighborhoods having multiple projects, but with a lower cost point, while others having only one, but the cost was much greater. These nuances in the data make it difficult to make broad statements about funding distribution and impact when it comes to urban greening funding sources. In the next section, I will explore the historical and current context of how environmental justice is defined and translated into policy at the state and federal levels and how urban greening is positioned within those policies.

Chapter 2: How Policies Seek Environmental Justice

A transformational time for environmental justice

With the recent recommitment of the federal government to environmental justice with the Justice40 Initiative, there is the possibility of historic investment in communities that have been overburdened by pollution and underserved by investment. This unprecedented moment for spurring investment was the topic for a conference panel in 2023 where environmental justice leaders were asked to comment on the opportunity that the Justice40 Initiative presents. One panelist, who founded a leading community-based environmental justice and advocacy organization in 1988, responded, "For the first time in my lifetime money is not the challenge. The challenge is the political will to do what's right for every community – no matter who they are or where they live." Later in the discussion, they went on to say "[…] the amount of money that the Biden-Harris administration is moving - is the kind of money that is meant to create social transformation. But it's only going to do that - if they put in place these pieces that need to happen - so a reimagining of how you move the system […]". (Dr. S. Wilson et al. 2023) This acknowledgment of opportunity, but concern about the "same old" system were sentiments shared by all panel participants.

In the previous chapter, I discussed the historical context of systems that created the green space we see in Baltimore today. Now, let's shift to the governance systems that have carried us to this possibly transformational moment for environmental justice. First, I'll focus on a brief history of the environmental justice movement, including the use of spatial data, to set the stage for this current transformational time. Then, I'll provide background on environmental justice policies at the federal and state levels that have embedded terms and engagement within the governance space. Following that, I'll explain how screening tools are used as part of policy implementation for recent federal and state policies. And, finally, I will close this chapter with a process called "ground-truthing" and examine how these tools and the systems they are connected to identify and align with challenges and potential understood by Baltimore neighborhoods.

The main question being addressed by this section is: How do different definitions of "environmental justice communities" come together for where funding should be invested in Baltimore? This question can be addressed by understanding two systems-related questions: (1) How has federal policy influenced state-level environmental justice and environmental policy?, and (2) How are "EJ screening tools" used to implement policy, do tools differ in areas they identify, and do these tools incorporate the environmental justice issue of access to green space? Answering these questions will connect current governance systems at the state and federal levels to the environmental justice issue of green space development and access in Baltimore.

Before I proceed, I will take a moment to briefly revisit my positionality statement. As a spatial data professional, I used my expertise in spatial data tools and maps to drive my pursuit of expanding knowledge in environmental justice and policy - both nationally in the United States and locally in Maryland - for the benefit of my research. The environmental justice movement and environmental justice policy are new to me, and I still have much to learn. I am writing the next section not as a content expert, but as a spatial data professional and young learner. As the reader, you are invited to consider what may or may not be included or represented accurately and help me expand my understanding.

Environmental justice in the United States

This section will begin with a brief history of the contemporary Environmental Justice Movement, which gained prominence in 1982 with opposition to the siting of a PCB disposal landfill in a predominantly African American community in Warren County, NC. This citing opposition led to a nonviolent civil disobedience campaign that resulted in more than 500 arrests. (Perez et al. 2015; United Church of Christ 1987). Leaders in the contemporary movement pushed for the first federal recognition of environmental justice and continued to push for government action up until the present. I will discuss the early legislation that resulted from this advocacy effort and proceed to review key federal policies up until the recent introduction of the Justice40 Initiative. This review will include the introduction and development of map tools for "screening" as well. By including all these pieces together, I will begin to address the

question of how federal policy has influenced state-level environmental justice and policy.

Environmental Justice Movement – Defining the "environment"

When reflecting on the history of environmental justice, maps are influential tools in visualizing and validating lived experiences. A map that put a national focus on environmental injustices happening in the United States was released as part of the Toxic Wastes and Race in the United States report in 1987 (see Image 1, below). The United Church of Christ commissioned this report in reaction to the previously mentioned 1982 demonstrations in response to the sighting of a hazardous waste landfill in Warren County, NC. (United Church of Christ 1987) The report preface describes the report as the first national documentation of the presence of hazardous waste sites located "in racial and ethnic communities throughout the United States." (United Church of Christ 1987, ix) The map included in this report showed what people were saying was their lived experience – that they were seeing race as being connected to the location of hazardous waste sites.

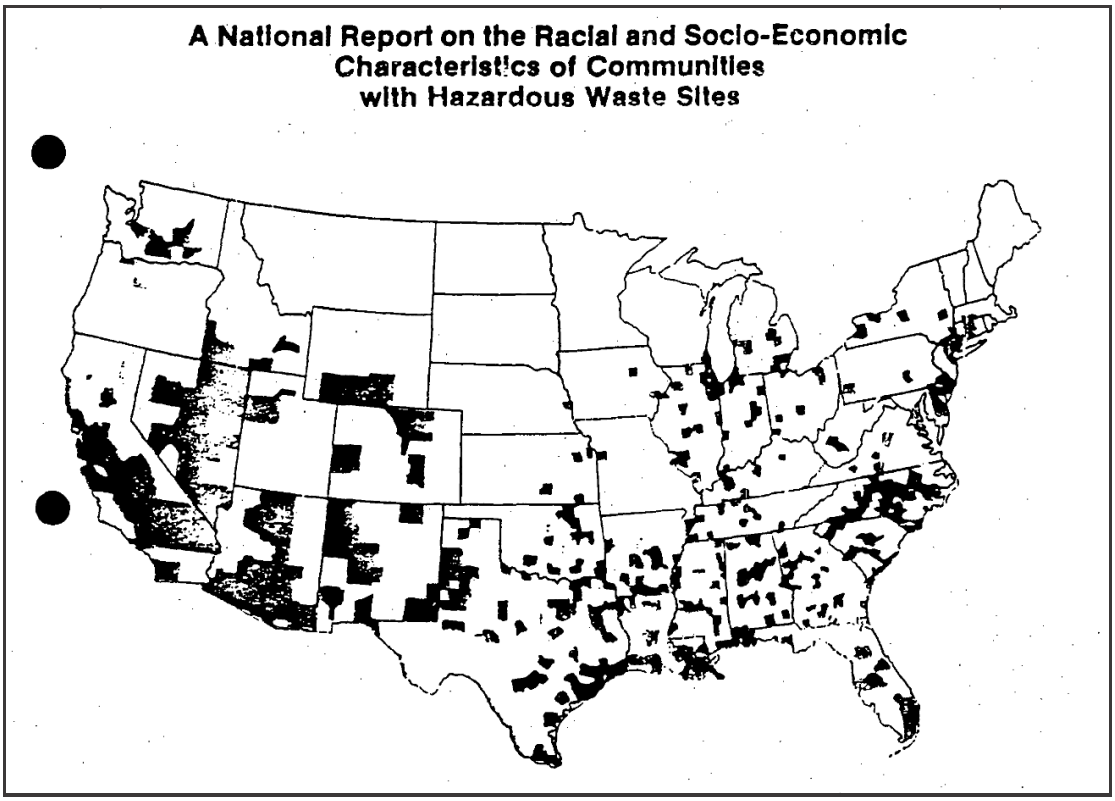


Image 1: Toxic Wastes and Race report map published by the United Church of Christ in 1987. Dark areas are counties where the Black and/or Hispanic percentage of the population is greater than their respective national percentages and where five or more uncontrolled toxic waste sites are located (United Church of Christ, 1987)

The release of this report is considered a formative moment for the environmental justice movement. Another is the release of the US General Accounting Office investigation report of 1983, which was also connected to the Warren County, NC demonstrations. The purpose of the investigation was to report on the socioeconomic and racial composition of communities that lived near the four major landfills of that time in the southern U.S. (Mohai and Bryant 1992) Results of that study showed a pattern that was later supported by the United Church of Christ report – that race was a significant variable in predicting the location of hazardous waste facilities (US General Accounting Office 1983; United Church of Christ 1987). While the early

successes of the environmental justice movement were focused on struggles against toxics and facility siting, over time, this expanded to become a movement spanning many issues, ethnicities, and regions (Bullard 2001).

After these historic reports were released connecting race and toxic waste, two pivotal events happened in the 1990s. First, there was the 1990 Conference on Race and the Incidence of Environmental Hazards, hosted by the School of Natural Resources and Environment at the University of Michigan. This event brought together academics and activists to discuss the evidence and policy solutions for the published reports; out of this convening, an ad hoc group formed, referred to as the "Michigan Coalition", that became active in engaging with the United States Environmental Protection Agency (EPA) on issues of environmental justice. This convening also laid the groundwork for the next pivotal event, the First National People of Color Environmental Leadership Summit in 1991. (Bullard et al. 2007; Holifield 2012) The First National People of Color Environmental Leadership Summit was a defining event for the expanding environmental justice movement. Representatives from "people of color communities" traveled from across the country and internationally to be part of this convening of social justice and environmental activists in Washington, D.C. (Lee 1992) The Summit had a call to action that demanded a "restructuring of the relationship between communities of color and government policy makers, the polluting industries, traditional mainstream environmental organizations and the philanthropic community which supports environmental protection, research, and action." (Lee 1992, v) This convening of over 300 African, Latino, Native and Asian

Americans, with representation from all 50 states, “dispelled the myth that people of color are not interested in or active on issues of the environment” (Alston 1992, 29); on the contrary, “for people of color, the environment is woven into an overall framework and understanding of social, racial, and economic justice.” (Alston 1992, 28) This broad definition, mentioned in the last chapter, is central to the modern environmental justice movement.

Before environmental justice reached the White House, environmental justice movement organizers focused on accountability from the U.S. EPA (Bullard et al. 2007). In 1992, the EPA created the Office of Environmental Justice with the goal of integrating environmental justice considerations into agency policies, programs, and activities (Bullard et al. 2007). The following year, EPA established the National Environmental Justice Advisory Council (NEJAC), which was the first time that representatives from across groups (academia, industry, environmental, government, etc.) were “brought together in an effort to create a dialogue that can define and “reinvent” solutions to environmental justice problems” (Bullard et al. 2007). This recognition within a federal agency, along with growing public concern, led to an executive order released by President Bill Clinton soon after.

Executive Order 12898 – Attempting to address environmental injustice

In 1994, President Bill Clinton signed Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”. This Order was the first attempt to address environmental injustice

within existing federal laws and regulations and formalized the term "environmental justice" across the federal government. (Zrzavy et al. 2022; Bullard 2001; Holifield 2001; Bullard et al. 2007) The focus of the Order was not to create any new policies but to reinforce policies that were already in place. These include Title VI of the Civil Rights Act of 1964 and the National Environmental Policy Act (NEPA) of 1970. (Bullard 2001) The Order states that environmental justice will be achieved by "identifying and addressing […] disproportionately high and adverse human health or environmental effects of [federal government] programs, policies, and activities on minority populations and low-income populations." (U.S. President 1994) This Order is critiqued as being largely symbolic because it did not include enforcement mechanisms to ensure environmental justice considerations were being maintained in government agencies (Zrzavy et al. 2022). It also encompassed both race/ethnicity and income as key constituencies (Holifield 2012; Mohai and Bryant 1992) in identifying "environmental justice areas".

Implementation of this Order was called into question from within the federal government a decade later. In 2004 an evaluation report from the Environmental Protection Agency's (EPA) Office of the Inspector General stated that the agency's environmental justice program was not meeting the directive of EO 12898. One of the main concerns listed in the Inspector General's evaluation was the program did not have a nationally consistent definition of disproportionate impact. (Holifield 2012) At the time of the report, each EPA region had a separate protocol for identifying potential environmental justice areas or areas of disproportionate impact. Without a

standard definition, the Inspector General concluded that the program could not document and report its progress in addressing the disproportionately impacted people that the agency was supposed to be serving. (Holifield 2014)

The EPA pushed back on this negative evaluation. They argued that uniformity in identifying environmental justice areas was not an effective approach due to the fact that "… The variations include differential environmental conditions, population groups, institutional histories and relationships, and require different approaches and strategies." (U.S. EPA 2004, 53) In addition, the Agency took issue with a uniform approach that identified environmental justice areas using an "arbitrary predetermined national threshold value for race or income" and stated that this approach "is not only, in fact, not workable but will inevitably produce more harm than good." (U.S. EPA 2004, 54)

This concern over standardization was echoed by members of the EPA's National Environmental Justice Advisory Council (NEJAC), the Agency's independent advisory council regarding environmental justice issues. In addition to concerns about how standardizing the approach would fail to accommodate local conditions, there were also concerns that the Inspector General's report recommendations would threaten the concept of cumulative impact. (Holifield 2014) Addressing cumulative impacts, or the fact that communities burdened by environmental justice issues typically face many environmental and social vulnerabilities at the same time, is a core strategy for advancing environmental justice (Lee 2021). The ability to capture

cumulative impacts is important when it comes to developing screening tools for environmental justice policy implementation; how cumulative impact presents in environmental justice screening tools will be discussed in the tool development section of this chapter. NEJAC also advocated for the people of color to be the main constituents within the scope of disadvantaged communities, instead of extending the scope to include low-income groups (Holifield 2012). Because the language in EO 12898 specifically mentions "minority populations and low-income populations" (U.S. President 1994), Federal agencies were tied to focusing on these two sometimes overlapping constituencies, but the debate over how to incorporate race and income as indicators of environmental injustice persists to the present day.

While there was disagreement on whether factors considered for defining "disproportionate impact" should be nationally standardized or more place-based, as well as the exclusive use of demographic and socioeconomic characteristics for national consistency (Liang 2016), the EPA did ultimately take steps toward some uniformity within the agency. Implementation of this uniform definition involved map tool development. Tools developed after the EPA Office of Inspector General report of 2004 included EJView, which was released by the EPA in 2010 and oriented toward providing relevant information to external stakeholders. During this same timeframe (mid-2000s), the EPA also released the Environmental Justice Strategic Enforcement Assessment Tool (EJSEAT), designed specifically to support internal agency staff (Case 2011). The EJSEAT tool included a set of eighteen individual environmental justice indicators grouped into four categories: demographic,

environmental, health, and compliance. These categories were combined to create an EJSEAT score that was the basis for ranking census tracts across the U.S. for "environmental justice potential" (Case 2011). This score standardized identifying communities that were the focus of EO 12898 and was meant to be used by agency staff to enhance enforcement and compliance efforts in areas that had a high ranking (Case 2011).

Plan EJ 2014 & EJScreen – Evolving implementation tools

In 2010, to mark the 20th anniversary of the signing of EO 12898 and the federal government's commitment to environmental justice, the EPA released "Plan EJ 2014" (U.S. EPA, n.d.). This was meant to show the agency's commitment to participating in addressing environmental issues through operationalizing it into its programs, policies, and activities (Liang 2016). One of the major sections of the plan was Tool Development Areas, including tool development covering science, law, information, and resources. The implementation strategy states that the EPA would create a nationally consistent environmental justice screening tool as a key information tool. This tool would be developed through collaboration with Senior Agency Officials and NEJAC, as well as public engagement. (U.S. EPA 2011) This was the impetus behind the development of the EPA EJScreen (U.S. EPA 2015), which the EPA began using internally in 2012.

While the EPA EJScreen tool can be used within the agency as a preliminary screening step, the tool was also released to the public in 2015 so that anyone

interested in environmental justice issues can have access. (U.S. EPA 2023a) It is important to note that the EJScreen does not label specific areas as "EJ Communities", even though it is considered an environmental justice screening tool. Instead of using this tool as a "cut point" to make decisions on programs, policies, and activities, the EPA sees the tools intended to be for initial screenings to ensure areas are not overlooked. (U.S. EPA 2015)

Because the federal environmental justice oversight at the EPA is in place through the original executive order (12898), acting on this order can vary across presidential administrations. During "sympathetic" administrations, engagement with environmental justice increases (Kohl 2019). During President Donald Trump's administration, which lasted from 2016-2020, the EPA's environmental justice program experienced marginalization and hostility, and the administration's emphasis on deregulation had negative consequences for environmental justice communities. (Kohl 2019; Kohl et al. 2022) The resignation of EPA leadership staff happened in protest of attempts to defund environmental justice programs and close the Office of Environmental Justice (Kohl 2019; Dennis 2017). This administration's impact illustrates how governance coming from an executive order can lead to instability for the EPA's environmental justice programs. Ultimately, pressure from within the EPA and also external to the agency was able to counter dismantling attempts from the Trump administration (Kohl et al. 2021). At the end of his term in 2020, President Trump lost the presidential election to Democrat Joe Biden and Biden was sworn into office in January 2021.

Executive Order 14008 & Climate and Economic Justice Screening Tool – "Historic commitment"

The same month he was sworn into office, President Biden released Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, as a part of the Biden-Harris Administration's "historic commitment to addressing environmental justice" (Council on Environmental Quality 2023). This order opens by stating the world and the United States is facing a profound climate crisis. The order goes on to state that mitigating climate change will require securing environmental and economic justice "in how we govern" (U.S. President 2021). To secure environmental and economic justice in governance, the executive order sets up the following governance structures: the White House Environmental Justice Interagency Council, the White House Environmental Justice Advisory Council, and the Justice40 Initiative. The order also names the Climate and Economic Justice Screening Tool (CEJST) as a geospatial mapping tool that the White House Chair of the Council on Environmental Quality (CEQ) will create to identify "disadvantaged communities" (U.S. President 2021). This tool is later named in implementation guidelines as the tool that should be used to ensure spatial equity and achievement of goals stated in the Justice40 Initiative. Below, Figure 3 illustrates how these different structures work together in implementing the Justice20 Initiative.

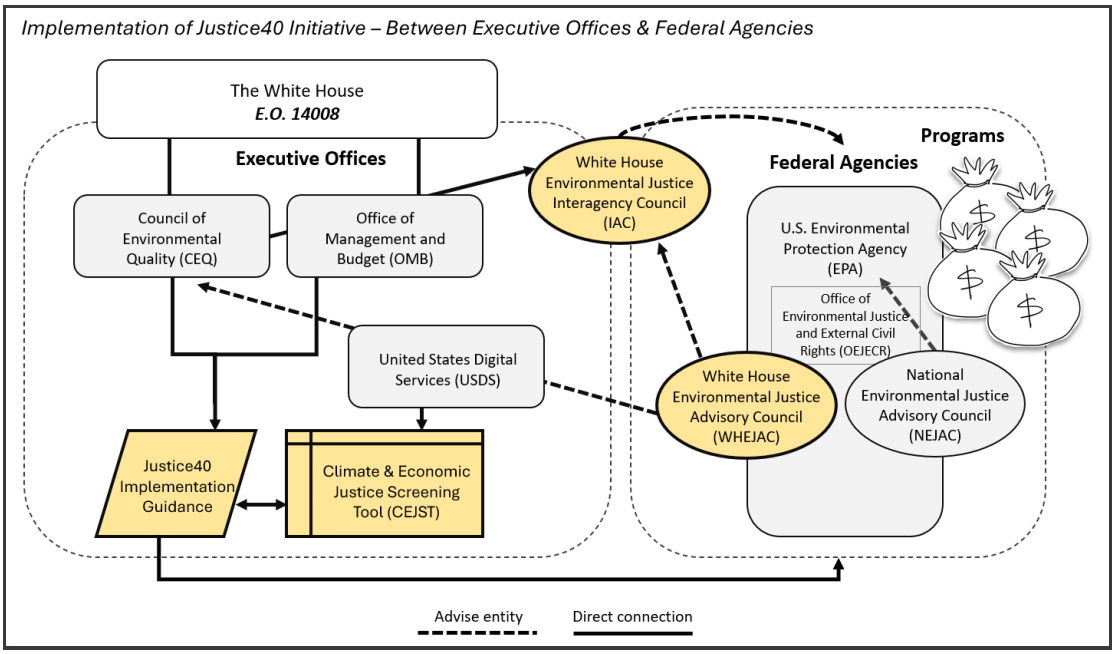


Figure 3: Executive offices, federal agencies, and advisory councils engaged in the implementation of the Justice40 Initiative (E.O. 14008). New governance structures were created or enhanced as part of the implementation; these are bolded and colored orange.

The goal of the Justice40 Initiative, as mentioned earlier, is to have 40 percent of the overall benefits from certain Federal investments flow to "disadvantaged communities". These are described as communities that have been "marginalized by society, overburdened by pollution, and underserved by infrastructure and other basic services" (Council on Environmental Quality 2023). Recommendations are intended to focus federal investments in seven specific areas: (1) clean energy and energy efficiency, (2) clean transit, (3) affordable and sustainable housing, (4) training and workforce development, (5) remediation and reduction of legacy pollution, (6) development of critical clean water infrastructure, and (7) climate change (which was added as a focus program area based on the intent and title of the executive order) (Council on Environmental Quality 2023). Interim investment guidelines were to be developed by the Chair of the Council on Environmental Quality (CEQ), the Director

of the Office of Management and Budget (OMB), and the National Climate Advisor in consultation with the White House Environmental Justice Advisory Council (WHEJAC). Consultation with "affected disadvantaged communities" was also part of the guideline development process.

The White House Environmental Justice Advisory Council (WHEJAC), one of the new councils created by EO 14008, was established within the Environmental Protection Agency (EPA) to advise two groups; the White House Environmental Justice Interagency Council (IAC), also newly established by the same order, and the Chair of the Council on Environmental Quality (CEQ) (U.S. President 2021). The Biden-Harris administration states this is the first Presidential advisory body to be tasked with providing advice and recommendations on addressing current and historic environmental injustice ("White House Environmental Justice Advisory Council," n.d.). Members of the WHEJAC are appointed by the President and selected based on their "knowledge about or experience in environmental justice, climate change, disaster preparedness, or racial inequity, among other areas of expertise" ("White House Environmental Justice Advisory Council," n.d.). Currently, there are twenty-four members serving on the council, including at least three environmental justice leaders - to my knowledge - who were part of the convening of The First National People of Color Environmental Leadership Summit in October 1991 ("White House Environmental Justice Advisory Council," n.d.). These leaders include Richard Moore, Dr. Robert D. Bullard, and Dr. Beverly L. Wright.

The WHEJAC is different from the National Environmental Justice Advisory Council (NEJAC) because of whom they were established to advise. While both councils are formally part of the EPA (see Figure 3), the NEJAC was established in 1993 to provide independent advice and recommendations to the EPA, while the WHEJAC was established to advise the IAC and CEQ, which extends outside the EPA purview ("White House Environmental Justice Advisory Council," n.d.). The WHEJAC serves the unique purpose of bringing "greater visibility to environmental justice issues across the Federal Government" ("White House Environmental Justice Advisory Council," n.d.). There are five working groups within the WHEJAC; each working group is dedicated to a topic related to advising the Chair of the CEQ and the White House ICEJ on "how to increase the Federal Government's efforts to address current and historic injustice" (U.S. EPA 2023b). This includes a "WHEJAC Climate and Economic Justice Screening Tool Workgroup" that is charged with providing "advice and recommendations to the WHEJAC to inform future versions of the Climate Economic Justice Screening Tool (CEJST) and ensure that the tool continues to accurately identify disadvantaged communities." (U.S. EPA 2023b) This can include identifying datasets that could be incorporated, improving methodology to better reflect cumulative burdens, approaches to linguistic outreach, enhancing the usability of the tool, and other strategies that would support updates and implementation. (U.S. EPA 2023b)

With the leadership of the WHEJAC and the intent of the Justice40 Initiative, the CEJST is meant to be used by federal agencies to support action toward addressing

current and historic environmental injustice. Originally, interim guidance in 2021 delegated many decisions to agencies regarding which programs were covered under Justice40 and how to measure and define benefits. This changed in January 2023, when the White House issued an addendum to this guidance and stated that agencies must transition to using the CEJST to implement Justice40 by October 2023. (Walls, Hines, and Ruggles 2024) This formalization of CEJST as the sole implementation tool goes against implementation recommendations offered by outside groups; a report produced by an academic group, through feedback from advisors and state-level experts on environmental justice, advised against relying on one tool to "do it all". They instead recommend allowing for multiple tools and methods to identify whom and where to target investments, so that specific disparities agencies are focused on could be better addressed. (UCLA 2021) As of November 2023, the Justice40 initiative includes 518 covered programs across federal agencies; programs have been removed and added since the original pilot list of programs was released in July 2021 (Walls, Hines, and Ruggles 2024). The use of CEJST as an implementation and investment tool will be discussed further in upcoming sections.

The federal government has been known to set a standard or tone that state governments can then choose to follow. In the next section, I'll discuss state-level environmental justice policies in Maryland to answer the question of how federal policy influences state-level environmental justice and policy.

Environmental Justice in Maryland

Acknowledgment at the state level and efforts to address environmental injustice in Maryland began with the establishment of the Maryland Advisory Council on Environmental Justice. This council would later be reestablished under a new name and grow in membership and charge over time. In this first section, I'll review the timeline of environmental justice policy in Maryland since the founding of the state council.

The Commission for Environmental Justice & Sustainable Communities

The State created the Maryland Advisory Council on Environmental Justice (MACEJ) in 1997 as a response to federal initiatives to promote environmental justice (Jones et al. 2020). This was after President Bill Clinton had signed Executive Order 12898 in 1994, which was the first and a significant federal action to promote environmental justice in the United States (Jones et al. 2020; Bowman and Crews-Meyer 1997). This federal executive order set the stage for how states could approach governance and environmental justice, including the use of advisory councils. The charge for the federal working group on environmental justice was used as a guide in developing the charge for MACEJ.

The bill that created the MACEJ states in its preamble, "historical decisions on land use and siting of industrial development and its byproducts have placed an inordinate burden of environmental degradation on communities disadvantaged by ethnic background, low income, and ignorance" (H.B. 1350 1997). MACEJ was created to

study environmental justice issues across the state and recommend solutions to the Governor and General Assembly. The Council's study included “over 75 small open meetings, and […] larger workshops in Washington County, Baltimore City, Wicomico County, and Prince George’s County” (Barrett et al. 2015). The work of the Council was required to be done over a period of 2 years and 1 month, ending in 1999 with the completion of a report and draft state policy on environmental justice and recommendations. (H.B. 1350 1997) At the end of the Council’s term, the Council sunsetted on June 30, 1999, because of the effective date language baked into the bill (H.B. 1350 1997).

The study captured concerns from communities of color and low-income communities that there was a failure to enforce environmental regulations in low-income communities and a racial bias in state decision-making (Barrett et al. 2015). The report noted that people of color and low-income people perceive themselves as not included in the development of policies that govern siting of locally undesirable land uses and pollution standards. Broader social and economic justice issues were also included in the study, such as vacant homes and dilapidated housing (Barrett et al. 2015). Despite all the work done by MACEJ to conduct their study, many of the report recommendations went unrealized (Barrett et al. 2015). One of the few recommendations that was implemented soon after the report was shared was the creation of a permanent environmental justice commission: the Commission for Environmental Justice and Sustainable Communities (CEJSC).

The CEJSC was established in 2001 through an executive order from then-Governor Glendening about two years after the MACEJ was sunset (Rehr and Wilson 2013; Jones et al. 2020). This order recommitted the state of Maryland to "the principles of environmental justice and equal protection of all citizens of the State in a manner that fully complies with Title VI and the Civil Rights Act of 1964". Specially, the order calls on environmental justice to be integrated into State's development initiatives and recognizes that prioritizing environmental justice does not "hinder" economic development; in fact, "economic development and environmental equity in the State can and should be effectively balanced". Effective immediately, the order established a Commission on Environmental Justice & Sustainable Communities, established a membership that included 6-15 individuals (including representatives from the Environment, Health and Mental Hygiene, and Planning agencies), and set the duties. (Executive Order 01.01.2001.01 2001) This broad charge included: (1) Advising state agencies; (2) Reviewing and analyzing state law and policies for impact; (3) Assessing state and local law adequacy; (4) Coordinating with the Children's Environmental Health and Protection Advisory Council; (5) Developing criteria for assessing community injustice; and (6) Providing environmental justice recommendations to the Governor and General Assembly. (Barrett et al. 2015; Rehr and Wilson 2013) The commission was codified into law in 2003. (Jones et al. 2020; Rehr and Wilson 2013)

There have been critiques that while this Commission could provide an important role in integrating environmental justice into State agency work, it has been limited by its

membership, authority, and State support. A review of the Commission's annual reports from 2001 – 2011 identified three clear action phases in its development and priority-setting: community engagement (under the Executive Order from 2001-2004), legislative focus (after the Commission was codified in law in 2003), and efficiency and moving toward change (with expanded membership after 2010) (Rehr and Wilson 2013). There was additional reform to the Commission in 2021 with the passage of Senate Bill 674, which more specifically defined the Commission's duties to require the Commission to submit policy recommendations and findings to the General Assembly and the Governor. The bill also increased the commission membership and included positions appointed by people who were not the Governor (Shwe 2021).

The CEJSC acts as an advisory council like environmental justice councils at the federal level. In 2022, the state continued to follow the lead of the federal government by codifying definitions and tools related to identifying "environmental justice communities".

Policy & environmental justice in 2022 – Codifying terms and tools

Policy passed in 2022 institutionalized an environmental justice screening tool in state policy and set clear definitions for "overburdened" and "underserved" communities. These two policies include SB0528, "Climate Solutions Now Act of 2022," and HB1200, "Environment Permit Applications -Environmental Justice Screening." The Climate Solutions Now Act had returned after not passing in 2021; I

think it is important to point out that the original version did not include language defining “overburdened” and “underserved”, and this language was added for the 2022 version. This new addition came from a different bill that was introduced that session by the Mid-Atlantic Justice Coalition (MAJC). The intent of the bill introduced by MAJC was to codify language similar to the Justice40 Initiative to support funding to environmental justice communities. Thousands of bills are introduced for each Maryland General Assembly session and only about half successfully pass into law. When it was clear the MAJC bill was not going to pass before the close of the general assembly in April 2022, advocates worked quickly with lawmakers to amend the definitional language onto the Climate Solutions Now Act, which did pass. (Rehr 2023, pers comm)

With the passing of the Climate Solutions Now Act of 2022, the definition of what was intended to be “environmental justice communities” was codified in law. This definition was also considered “ground-truthed” because it was developed by the Mid-Atlantic Justice Coalition (MAJC), a coalition consisting of partners from Maryland, Delaware, Virginia, and Washington D.C. working on issues at the intersection of the economy and environmental justice. With this definition clearly in state law, a lack of definition could no longer be an excuse for inaction on environmental justice or an opportunity for opponents to sow confusion. (Rehr 2023, pers comm)

The Climate Solutions Now Act also includes language around benefits to environmental justice communities. Advocates would have liked to see more specificity around the benefit (i.e. the number), like how the federal Justice40 Initiative saw "40 percent of the benefit" (Rehr 2023, pers comm). The bill does include language that charges the Commission for Environmental Justice & Sustainable Communities to provide recommendations on "the establishment of goals for the percentage of State funding for greenhouse gas emission reduction measures that should be used for the benefit of disproportionately affected communities" (S.B. 528 2022).

This bill also tasks the Commission for Environmental Justice & Sustainable Communities with (1) Adopting a methodology for identifying communities disproportionately affected by climate "impacts"; (2) Developing specific strategies to address "geographical impact" concerns, reduce greenhouse gas emissions, and "build climate equity and resilience within disproportionately affected communities"; in addition, the Commission is to set the percentage of state funding for greenhouse gas emissions reduction that is going to benefit "disproportionately affected communities" (S.B. 528 2022). Within the bill, some original language has been changed; this includes climate "impact," replacing climate change, and "geographical impact," replacing environmental justice. The word "environmental justice" was only included when it was describing the work of the Commission for Environmental Justice & Sustainable Communities; all other use of the word was replaced with "geographical impact".

In addition to the Climate Solutions Now Act of 2022 codifying language defining environmental justice communities, HB1200 was passed, which codified the use of "environmental justice screening" as part of permit applications. Certain permit applicants would now have to include an EJ Score as part of their permit application to the regulating State agency. This would require Maryland Department of the Environment (MDE) to develop a screening tool that could be used to implement the bill. The bill included language for defining the "EJ Score," and functionality for the "EJ Tool," and clarified the unit of analysis as a census tract. (H.B. 1200 2022) In this bill, the original language of "Maryland EJScreen" was replaced with "Maryland EJ tool." This change could be a recognition of the MD EJSCREEN tool developed by the Community Engagement, Environmental Justice, & Health (CEEJH) Lab in 2017, directed by Dr. Sacoby Wilson (CEEJH, n.d.).

The MD EJSCREEN is considered a strong example of including community engagement as part of the development of a screening tool. During the development of the original tool, presentations were made to affected community members and stakeholders like the Commission on Environmental Justice & Sustainable Communities (Sotolongo 2023; Driver et al. 2019); this type of public participation incorporates lived experiences and is important in environmental health research (Driver et al. 2019). The tool is intended to be applied to policy decisions and community advocacy (Driver et al. 2019). This tool was presented to the Commission for Environmental Justice & Sustainable Communities in February 2020 as part of the

Commission's review process to choose a mapping tool to use in prioritizing the identification of communities with EJ issues (Archer and Wilson 2020; MD CEJSC 2022). Based on their review process, CEJSC recommended to the Maryland Department of the Environment (MDE) that it "(1) use a combination of EPA EJSCREEN and the UMD Screening tool, or (2) create its own". MDE took this recommendation and decided to make its own tool (MD CEJSC 2021), but the methodology of its current tool for calculating an EJ Score is very similar to the MD EJSCREEN methodology.

The MDE EJ Screening Tool was shared with the CEJSC in April 2022, after the passing of HB 1200 "Environment – Permit Applications – Environmental Justice screening" that same month. During this meeting, the MDE EJ Screening Tool was presented as a tool that incorporates "Dr. Wilson's tool and data from the Department". This was presented as a tool that could be used to meet bill requirements for HB 1200. (MD CEJSC 2022) While the MDE EJ Screening tool is not as robust in the indicators it includes to calculate an EJ Score, compared to the MD EJSCREEN, it does include all indicators that are codified in law to identify "underserved" and "overburdened" communities.

It is important to point out that SB 528, which defines "underserved" and "overburdened" communities, does not include any language that requires these two community types to be considered together to identify "environmental justice communities". By this, I mean that a community does not have to meet the thresholds

for both underserved and overburdened to be assigned an EJ Score. Later on, I will review the calculations used to generate the final EJ Score, but at this point, I want to clarify what is and what is not present in the law.

This past section was intended to highlight how federal policy influences state-level environmental justice and environmental policy. Figure 4 (below) is designed to highlight some of the key milestones between the 1990s – 2020s for environmental justice as a movement, within policies, and with the introduction of screening tools. A more detailed timeline is included in Appendix C.

Environmental [In]Justice Milestones, 1990s – 2020s

Year	Environmental Justice Movement	Federal Government	Maryland State Government	Environmental Justice Screening Tools
1980s	**Warren County, NC protests in reaction to toxic waste citing.** **Toxic Wastes and Race Report released** by United Church of Christ shows race is a factor in toxic waste citing.	**General Accounting Office investigation report released** showing race is a factor in hazardous waste citing.		
1990s	**First People of Color Environmental Leadership Summit in D.C.** leads to 17 principles of environmental justice and setting EJ issues.	**E.O. 12898 signed by President Clinton**; formalized environmental justice in federal government.	**Maryland Advisory Council on Environmental Justice** established by HB1350.	
2000s	**Toxic Wastes and Race at Twenty 1987 – 2007** finds that people of color continue to be facing injustice.	**EPA evaluation report by Office of Inspector General** finds agency is not meeting EO 12898 directive.	**Commission on Environmental Justice and Sustainable Communities (CEJST)** established and codified in law.	**EPA Environmental Justice Strategic Enforcement Assessment Tool (EJSEAT)** introduced.
2010s		**EPA released 'Plan EJ 2014'** to show commitment to environmental justice.		**CalEnviroScreen** introduced. **Two tools are released by EPA: EJView**, which was then followed by **EJSCREEN.**
2020s		**E.O. 14008 establishes the Justice40 Initiative** and other new EJ governance.	**Climate Solutions Now Act** and **Permit Applications – Environmental Justice Screening** pass into law.	New policy implementation tools: **Climate & Economic Justice Screening Tool (CEJST)** and **MDE EJ Screening Tool.**

Figure 4: Major environmental justice milestones, federal and state government policies, and environmental justice screening tool development between the 1990s – 2020s. *A more detailed timeline is included in Appendix B.*

Over time, the state of Maryland seemed to follow the federal government's lead with some environmental justice governance actions. This includes the creation of the

state-level environmental justice council and codifying language related to "environmental justice communities" and distributing benefits. In the next section, I will address the question of how environmental justice screening tools, or "EJ screening tools", are used to implement policy.

"EJ Screening Tools" and policy implementation

Development of screening tools (Functionality, intended use, definition)

As mentioned in previous sections, screening tools are not new to environmental justice policy. The EPA specifically has developed multiple tools since Executive Order 12898 to support environmental justice efforts internally and externally. Alongside federal screening tools, there has also been an increase in screening tool development at the state level. This section will address the following key topics related to screening tool development (identified by Zrzavy et al. 2022): creating indicators (to identify "environmental justice communities"), use of tools, limitations of tools, resistance to tools, and metrics of success.

Indicator creation & controversy

Indicators are created to identify "environmental justice communities" at a specific unit of analysis; this is the geographical boundary that data will be summarized. The majority of "EJ screening tools" use census tract as their unit of analysis. Census tracts fall within counties and are statistical boundaries created by the U.S. Census to analyze data temporarily. One major way they are defined is by their population size;

a census tract is designed to encompass an area of 1,200 to 8,000 people with an optimal population of around 4,000. Since census tracts were designed as a statistical boundary, their boundaries rarely change. Tracts may be split or merged depending on changes in population, and there may be other small changes to boundaries that can occur through feedback from named local participants like county planning departments. (U.S. Census Bureau 2013; M. Riedman and Abbasi 2024) The census tract is a unit of analysis used for screening tools because it is common for federal datasets, like the Census, to be aggregated at this level. While smaller statistical boundaries and units of analysis, like the block group, are offered by tools like the EPA EJSCREEN, this level of precision can lead to some uncertainty due to the nature of using estimations and margins of error (Driver et al. 2019; Spielman, Folch, and Nagle 2014); but census tracts are considered less precise for rural areas where tracts cover larger areas (Spielman, Folch, and Nagle 2014). So, while the census tract is a common unit of analysis for screening tools, there are pros and cons to its use.

Creating cumulative impact indicators to rank across a unit of analysis, like census tracts, is a core strategy for advancing environmental justice (Lee 2021). Indicators, like determining “environmental justice communities”, are typically constructed through a multi-stage process that involves transforming the ideal attributes of a goal into a concrete indicator. This process has been critiqued for its limitations, but the construction of indicators is important because they can be used to assess progress toward policy goals. (Fredericks 2011) While many spatial data layers can be

included in screening tools, for this section, “indicator” refers to a data layer that is generated to identify “environmental justice communities”. This can involve a combination of environmental and socio-economic data.

When it comes to environmental justice screening tools, policy language typically dictates the attributes of interest when developing an indicator. For example, language in EO 12898 specifically mentions “minority populations and low-income populations” (U.S. President 1994), so these socioeconomic groups would both be included to create an indicator of “environmental justice areas”. There has been controversy over the inclusion of race as an indicator (Boone et al. 2014; Bullard 2001), which I mentioned briefly in the previous chapter. Those advocating for the inclusion of race call out the role systemic racism has played in enhancing current environmental injustices (Zrzavy et al. 2022; S. M. Wilson et al. 2010).

Since the process of determining “environmental justice communities” can easily get caught up in technical spaces as a matter for scientific analysis (Holifield 2001), the development of indicators has to come from a combined effort of communities, academia, and government (Lee 2021). While the definition of “disadvantaged communities” was ultimately set by the White House Council on Environmental Quality (CEQ), this indicator was developed through some stakeholder collaboration. Stakeholders that provided advice from outside federal agencies included members of the White House Environmental Justice Advisory Council (WHEJAC) and the Open Source Community. While WHEJAC is composed of members appointed by the

President because of their expertise related to environmental justice (U.S. EPA 2021), the Open Source Community membership is open to wide participation and specifically encourages participants who are interested in contributing direct or indirect lived experiences of environmental justice issues (USDS 2021).

Using a collaborative process with a broad range of stakeholder groups could be considered a form of procedural justice (Holifield 2001). It is especially important that tools that hold power are developed using a collaborative process, and the type of power held by the MDE EJ Screening Tool and CESJST will be discussed further in the next section. Because of this, providing access for citizens to be part of the decision-making process through making recommendations and having a platform to share experiences is important. These involvement mechanisms do not necessarily ensure that recommendations are incorporated, and it can be an iterative process. For example, recommendations shared by the WHEJAC in August 2022, after they reviewed the public beta form of the CEJST, included recommending the inclusion of indicators of structural racism – since race is actively excluded from the tool – and a cumulative impact measurement.

Aligning environmental justice screening tools with policy language and ensuring the development process includes a collaborative approach is important for indicator development. The next section will discuss how indicators and policy influence tool use.

Use of tools & acknowledging limitations

Generally, environmental justice screening tools have been developed for a variety of purposes, including education, advocacy, the incorporation of environmental justice into policies or programs, or some combination of all of the above (Zrzavy et al., 2022). While there have been times when tools were being developed to prove the existence of environmental injustices, there has been a shift in focus to which communities face higher risk (Holifield 2001; Grier et al. 2022). One of the intended uses of the CEJST is to impact funding distribution decisions when it comes to investments in "disadvantaged communities", but the community indicator is currently lacking any ranking score. The MDE EJ Screening Tool, on the other hand, is used to add an 'EJ Score' (which is a ranking score) to permit applications that identify areas with a higher risk.

Environmental justice advocates have called for screening tools to be connected to policy and funding mechanisms (Arriens, Schlesinger, and Wilson 2020), but the lack of a scoring attribute for "disadvantaged communities" with the CEJST seems like a missed opportunity. This is because "identifying and prioritizing environmental burdened and vulnerable communities is a fundamental first step to integrating [Environmental Justice] in government decision making" (Lee 2021). Calculating a scoring attribute requires decisions on how to combine and weigh different indicators as part of the score; in future sections the exact process of how MDE EJ Screening Tool calculates it's 'EJ Score' will be discussed.

Additional limitations to tools include limitations of data sources, especially when they cover a state or national scope. Data sources may not be available at a useful unit of analysis (for example, aggregated at the zip code level is not useful), may be out of date, or may be unique to a smaller geography and so can't be included in tools that cover a larger geographic area (Blondell et al. 2022). Because environmental justice issues are connected to the local context, tools try to address this disconnection by including additional layers, sometimes referred to as "context layers" (Williams et al. 2022). While these are layers that can be "turned on" to compare with an environmental justice community indicator, they are not necessarily included in any analysis.

Resistance to tools & metrics of success

There has been resistance to screening tool development, especially at larger national scales, by environmental justice advocates. This is connected to data limitations that were discussed in previous sections. Advocates also see limitations in indicators capturing the extension of issues across space and time. For example, "environmental justice indicators cannot yet register the fact that those experiencing injustice are often significantly spatially and temporally distant from those contributing to the injustice (e.g., in climate change)." (Fredericks 2011) This is knowledge that is challenging to capture in indicators limited by scope or issue. Incidentally, reality could be ignored, and this makes it difficult to measure progress towards success (Fredericks 2011).

Measurement of success is an important outcome of the creation of screening tools for environmental justice advocates. While metrics of success are typically not found in tools, some generally accepted metrics of success include coalition-building and community resiliency, allocation of funds for EJ communities, changes to policy or decision-making process, and overall reduction in pollution (Blondell et al. 2022). WHEJAC states in its original recommendations for the CEST use that the tool "should be leveraged to track progress on EJ goals, including Justice40 Investments and their impact." This includes "evaluating the effects of regulatory and policy interventions (tracking progress toward EJ goals)". (WHEJAC 2021) External recommendation reports also include the importance of developing "next-generation tools to identify and track absolute magnitudes of disparities within communities over time to support robust evaluation and accountability." (UCLA 2021)

So, while screening tools - despite their limitations - are generally supported as implementation tools, it appears that they are not necessarily developed to reflect back accountability after the policy goes past the stage of implementation. In the case of Justice40, agencies were required in federal guidance to develop internal metrics of success to track progress toward the Justice40 goal of 40 percent of the benefit going to "disadvantaged communities" (OMB 2021). In the next section, I'm going to revisit the two policy screening tools introduced earlier, and I will discuss the promised additional details related to tool development, intended use, methodology, and functionality. With this background, we can address questions related to how

these screening tools are used to implement policy, how the tools differ in areas they identify, and how the tools incorporate green space as an environmental justice issue.

Justice40 & CEJST – Federal-level implementation

The background on the Order that established the Justice40 Initiative and the Climate and Economic Justice Screening Tool (CEJST) were discussed in an earlier section. This section will focus on the development, intended use, methodology, and functionality of the CEJST.

Development of CEJST

This geospatial mapping tool was developed in partnership with the White House Council on Environmental Quality (CEQ), which I mentioned earlier as part of the federal environmental governance structure, and the United States Digital Services (USDS), whom you many have not heard of before (OMB 2021). The USDS was founded in 2014 under the Obama administration to provide technical support in the development of digital services across government services (USDS, n.d.). Because of their expertise in digital services, USDS was tasked with assisting CEQ with designing the CEJST. Required tool functionality included an interactive map, displaying "disadvantaged communities" identified by CEQ's definition, and making data available for download by federal employees and the public. (USDS 2021)

A Beta version of the tool was released in February 2022 (Walls, Hines, and Ruggles 2024) to solicit feedback on identified "disadvantaged communities". Based on

feedback from almost 3,000 comments, updates were made to the tool and methodology (USDS 2022b). The WHEJAC CEJST Workgroup also provided recommendations on CEJST, which were submitted as part of a larger WHEJAC report in May 2021 (WHEJAC 2021). Recommendations were related to the goal and purpose of the tool, identifying indicators or datasets to include, and a statement of principles (WHEJAC 2021). Principles included the importance of integrating local community knowledge/data, investment in continuously updating and improving the tool as data becomes available, and acknowledging data gaps and uncertainties – not seeing no data or poor data availability as a reason to assume that there is not a problem (WHEJAC 2021). These principles speak to the known limitation USDS has in tool development because of the necessity of using publicly available nationally consistent datasets to identify "disadvantaged communities" (USDS 2022b).

Part of tool development included fostering a Justice40 Open-Source Group. This group aims to foster collaboration and network building between environmental justice, civic tech, and data communities. By hosting an Open-Source Community that welcomes participants from government, academic, nonprofit, private sector, and environmental justice communities, USDS foresees better development of the CEJST and improved development of "tech and data tools to advance environmental justice causes" (USDS 2021). Open-source community meetings are currently scheduled monthly and include presentations on research and data products developed by community members to track Justice40's impact. By sharing research and data

products, community members can build off each other's work to support Justice40 Initiative implementation and spending accountability.

Through feedback the Beta version was updated to include new datasets and methodology updates like new calculations for identifying low income. The current tool version for CEJST is Version 1.0, which was released in November 2022. (USDS 2022b) The CEJST is intended to be updated annually each year and is expected to coincide with the start of the Federal Fiscal Year (USDS 2022b), which runs from October 1 through September 30, but has not been updated since Version 1.0 as of this writing. All discussions of the CEJST tool moving forward will refer to Version 1.0 unless otherwise stated.

Intended use of CEJST

As previously stated, the intended use of the tool is to assist agencies in defining and identifying "disadvantaged communities" that can be geospatially mapped (OMB 2021). The definitions utilized by the tool were developed by the CEQ with support from USDS and recommendations from a variety of groups, including the WHEJAC. As mentioned previously, in January 2023, guidance was released that identified the CEJST as the tool that agencies must transition to using by October 2023 for the purpose of implementing Justice40 (Walls, Hines, and Ruggles 2024); this translates to the tool directing financial investment. Entities that are pursuing federal funding connected to Justice40 can also be users of this tool. This connection of tool to policy

and funding aligns with environmental justice advocates calls for tools to have power (Arriens, Schlesinger, and Wilson 2020).

Methodology of CEJST

The tool uses nationally available spatial data to identify "disadvantaged communities" using language from the executive order. Typically, for environmental justice screening tools, there is a socio-demographic set of data that is used to identify vulnerable communities, and this is combined with additional datasets related to the environment that, when merged, is considered to highlight "disadvantaged communities". A flow chart of the CEJST methodology and data incorporation can be found in Appendix D. The CEJST utilizes a variety of datasets that are aggregated at the census tract level, using the 2010 census tract boundaries (USDS 2022b).

Communities are considered "disadvantaged" using CEJST methodology if they meet one of the following: (1) meet at least one of the categories of burden (which is a combination of environmental, climate, or other burden and socioeconomic burden), (2) are within the boundaries of a Federally Recognized Tribe, or (3) are within a low-income "doughnut" (completely surrounded by census tracts that meet the threshold of burden and meet a low-income threshold). These are three ways that a "disadvantaged community" can be identified; the data must show the community meeting one of these three criteria.

Based on these criteria, census tracts within Federally Recognized Tribe boundaries are automatically considered “disadvantaged communities”. Other census tracts are identified by using spatial data correlated to environmental, climate, and other burdens alongside socioeconomic burdens. There are some limitations as to the exact datasets the CEJST can use because it is a national tool. This means that the datasets it utilizes have to cover the entire United States, as well as territories. Since the focus of this research is screening tool impact in Baltimore, MD, my discussion of datasets and methodology will only refer to data used for this region. Additional information about substitutions made for specific territories or regions can be found in the tool Technical Support Document. While there are many Native American tribes represented in Maryland, there are no Federally Recognized Tribes in the state, so “disadvantaged communities” have to meet one of the alternate criteria.

A methodology was developed to connect environmental, climate, and other burdens using categories of burden to identify census tracts as “disadvantaged.” (see Appendix D) The eight categories of burden include Climate change, Energy, Health, Housing, Legacy pollution, Transportation, Water and wastewater, and Workforce development. Seven of these categories come directly from the executive order statement (USDS 2022b), and transportation was added after the CEJST Beta version through the engagement process (USDS 2022b). Each of these burden categories includes multiple datasets used to quantify the category burden. Unlike some screening tool methodologies that show compounding burden by combining multiple datasets, the CEJST methodology is strictly focused on identifying presence/absence

based on a category threshold. The methodology may change to account for compounding burden in a future version (USDS 2022b), but the current version of the tool does not include any prioritization method beyond identifying “disadvantaged communities”.

Within each category of burden, there are two to five datasets that are each analyzed individually to determine if a burden threshold is met. For example, the Housing category includes five indicators: (1) Historic underinvestment (identified using Historic Redlining Score), (2) Housing cost (calculated by the amount of earnings being spent on housing), (3) Lack of greenspace (identified using percent developed imperviousness), (4) Lack of indoor plumbing (identified by housing without indoor kitchen facilities or complete plumbing facilities), and (5) Lead paint (share of homes that have potential for lead paint exposure based on the buildings age). Each of these five criteria has a threshold at which the indicator is considered a community burden. Having one of these indicators reach that threshold would mean the community is considered burdened in that category (Housing). However, the community is only considered a “disadvantaged community” if it also goes above the threshold for socioeconomic burden.

The method for calculating the socioeconomic burden is the same for almost all categories; workforce development is unique because it only includes an indicator for high school education. For all other categories, the socioeconomic burden is determined using Census data to calculate the percent of census tract population by

households, where household income is at or below 200% of the Federal poverty level; this is after excluding students enrolled in higher education. This was a methodology update that occurred with the release of Version 1.0; in the Beta version, an alternate calculation was used that was deemed inadequate for accounting for "college town" areas (USDS 2022b).

In the current version of the federal Climate and Economic Justice Screening Tool (CEJST) race is excluded, which is because race was not mentioned in the original Order language. Order language states that the focus of the screening tool is to identify "disadvantaged communities"; this is defined earlier in the Order as communities that have been "historically marginalized and overburdened" by "pollution and underinvestment in housing, transportation, water and wastewater infrastructure, and health care" (U.S. President 2021). Because of this language, only income or education level is used to identify socioeconomic burden. (USDS 2022b)

Functionality of CEJST

The CEJST tool loaded on the tool webpage can be seen below in Image 2. There is no data processing happening actively within the tool itself; all data processing according to an approved methodology was completed outside the tool and then data was embedded in the screening tool. Consider the screening tool a window frame through which people can access and explore the data.

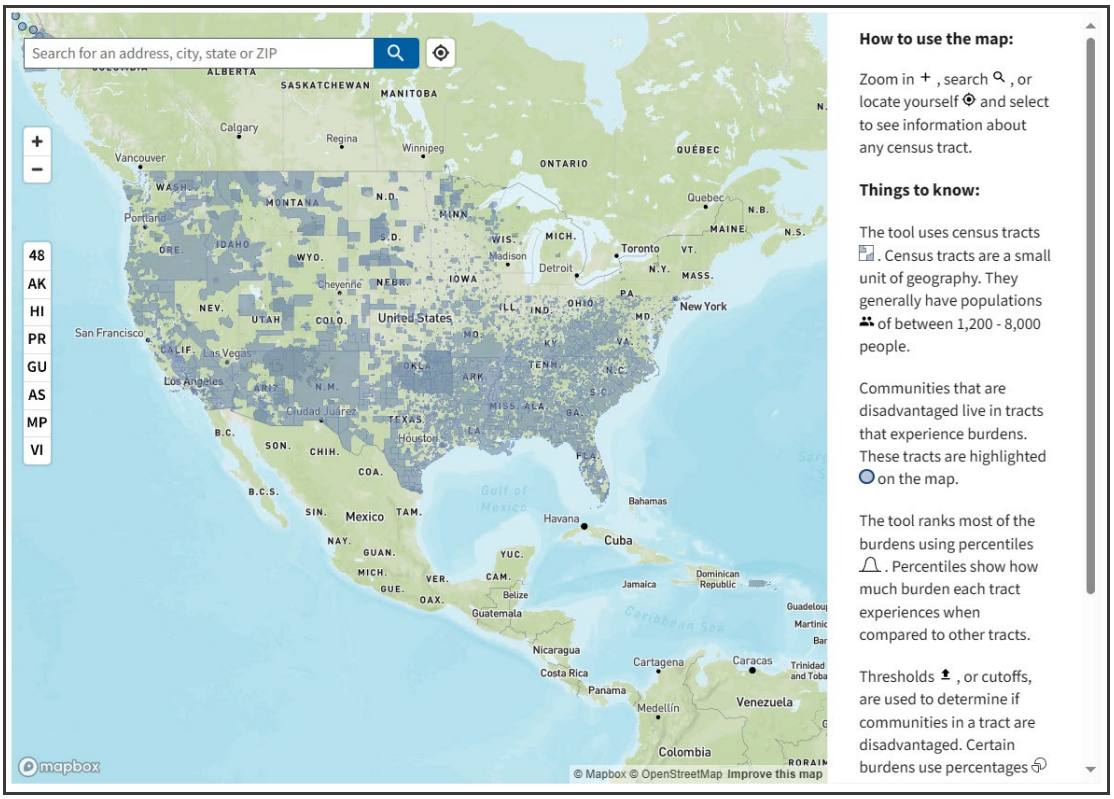


Image 2: Climate & Economic Justice Screening Tool (CEJST) screenshot from the tool website. ("CEJST" 2022)

The map uses a simple symbology (see Image 2), with a blue fill meaning "disadvantaged community," and by selecting an individual census tract, you can access additional information. You can search for an area of interest by navigating in the map window or typing in a specific location in the search bar widget. And, once an area on the map is selected, attribute information related to the eight categories of burden populate outside of the map frame; by looking through this information, you can understand why or why not the area was identified as "disadvantaged". You can also access tract demographics, like race/ethnicity and age. You cannot download data for a single location through the map; to download data, you navigate to a

separate webpage and can download the full dataset along with a codebook and information on how to use the list of communities (USDS 2022a).

Now that we have reviewed the development, intended use, methodology, and functionality of the CEJST we will next be covering the same topics for the MDE EJ Screening Tool.

MDE Permitting & EJ Screening Tool – State-level implementation

The background on the legislation (HB1200) that codified the use of the MDE EJ Screening Tool was discussed in an earlier section. In this section I will focus on the development, intended use, methodology, and functionality of the MDE EJ Screening Tool.

Development of MDE EJ Screening Tool

The MDE EJ Screening Tool was developed from within the Maryland Department of the Environment and involved input from the Commission for Environmental Justice & Sustainable Communities (MD CEJSC 2022; Majchrzak 2023, pers comm). The use of a screening tool to assign 'EJ Scores' was codified in Maryland law with the passing of HB1200 in 2022 and the development of this tool is a key part of this new law being implemented. The MDE EJ Screening Tool development timeline includes three iterations. The original tool, version 1.0, was released in February 2023 and only included "underserved communities" because of data limitations. In June 2023, Version 2.0 (beta) was released and included "underserved communities,"

"overburdened communities," and an 'EJ Score' ranking, along with additional context layers. Version 2.1 is planned for release in early 2024 and will include removing some datasets that were found to lack accuracy for this type of application. (Majchrzak 2023, pers comm) At the time of this writing, Version 2.0 (Beta) was the most recent version of the tool, and discussions of the MDE EJ Screening Tool moving forward will refer to this version unless otherwise stated.

Intended use of MDE EJ Screening Tool

The tool is meant to provide users with data to inform decision-making related to siting, permitting, enforcement, and infrastructure improvements (Majchrzak 2023, pers comm). Certain permit applications that fall under public participation permits, which require public notice, will need to include a census tract EJ Score to be submitted with the application (MD CEJSC 2022). These currently include some permits related to air quality, landfill and incineration facilities, discharge of pollutants into waters, sewage facilities, hazardous substance facilities, low-level nuclear waste facilities, and potable reuse. (Article - Environment §1–601) This connection of tools to policy and permit application consideration aligns with environmental justice advocates' calls for tools to have power (Arriens, Schlesinger, and Wilson 2020).

Methodology of MDE EJ Screening Tool

Census tracts that are considered "underserved" and/or "overburdened" are identified by the tool methodology as having a high "EJ Score". The "EJ Score" is calculated by

combining indicators that are grouped into four categories: (1) Socioeconomic/Demographic indicators, (2) Pollution burden exposure, (3) Pollution burden environmental effects; and (4) Sensitive populations. A full breakdown of this tool's methodology can be found in Appendix E. These categories match the "EJ Indicator Domains" used in the MD EJSCREEN (Williams et al. 2022), but instead of being grouped by "pollution burden" and "population characteristics", the MDE EJ Screening Tool groups by "underserved" and "overburdened". This determines the indicators that are used within each category – because they are predetermined by codified Maryland law (HB1200, SB1528).

The current version of the MDE EJ Screening Tool uses 2020 census tract boundaries that have areas without population removed (these include full census tracts as well as areas that are considered water bodies) (Majchrzak 2023, pers comm). These community boundaries are joined with the American Community Survey 5-year estimates for 2016-2020. It is important to note that between 2010 and 2020, Baltimore City lost one census tract; previously, there were 200 tracts, and currently, there are 199. Due to this loss in population, two census tracts were dissolved and reidentified as one with a new unique ID code. (Cheryl Knott, email message to M. Finch, 2024) While both the MDE EJ Screening Tool and the CEJST use the same unit of analysis (census tracts), they use different versions; this is a nuance that is important to keep in mind when evaluating and comparing screening tools.

Calculations are first made within each category using assigned indicators to determine preliminary scores. Higher scores overall are associated with a community being considered "underserved" and/or "overburdened". Within "overburdened," the following scores based on indicator presence are calculated: (1) Pollution burden exposure, (2) Pollution burden environmental effects, and (3) sensitive populations. Census tracts in which at least three or more indicators within these groupings are at or above the 75th percentile statewide are considered an "overburdened community"; in the calculation, individual indicator scores are averaged to generate an overburdened community score. Multiple indicators could be above the threshold percentile, which would indicate a higher overall score for that group.

A similar calculation is completed to assign scores for "underserved" census tracts. Within "underserved," the score is calculated based on Socioeconomic/Demographic indicators. Census tracts in which ANY of the following are true are considered an "underserved community": (1) at least 25% of the residents qualify as low-income; (2) at least 50% of the residents identify as non-white; and/or (3) at least 15% of the residents have limited English proficiency. Unlike the "overburdened" thresholds, which set thresholds using percentiles that compare census tracts to other census tracts across the state, these thresholds are all based on percentages of the population within the census tract. Census tracts are not removed from the analysis if they do not meet these "underserved" thresholds, but it is assumed that the census tracts with low percentages for these socioeconomic/demographic indicators will have a low overall EJ Score.

Each of the three “overburdened” community groups will be combined to create an overall “overburdened” community score based on an average. This is a layer on the screening tool called “MDE Overburdened Communities Combined”. The combined “overburdened” community score is then added to the “underserved” community score; this creates a final average that is the EJ Score. This is how twenty-four different indicators representing socioeconomic/demographics, pollution exposure, negative environmental effects, and sensitive populations are combined to create one overall score. This score is then transformed into percentiles, which is a common way to rank units of analysis in screening tools. While percentages give you a number based on the combined indicators for a single census tract, percentiles tell you about a comparison between that number and the percentage other census tracts received within the whole analysis area (in this case, within the whole state). A percentile tells us roughly what percent of Marylanders live in a census tract that has a lower value; if the percentile is very high, that means there is a low percent of other census tracts that share that value (U.S. EPA 2015). This is why percentiles are informative when comparing census tracts across a large area, like a state.

Functionality of MDE EJ Screening Tool

The MDE EJ Screening Tool loaded from the tool webpage can be seen below in Image 3. In addition to displaying the overall EJ Score for each census tract in Maryland, the screening tool includes additional layers and many widget options to engage with the data. Engaging with available layers is accessible through the ‘Layer

list' on the left side of the tool. Other widgets of interest are included as buttons within the map frame or along the top right of the toolbar across the top of the screen. I next go into some functionality of these widgets that may be of interest to users who are interested in engaging with the data beyond accessing the 'EJ Score' value.

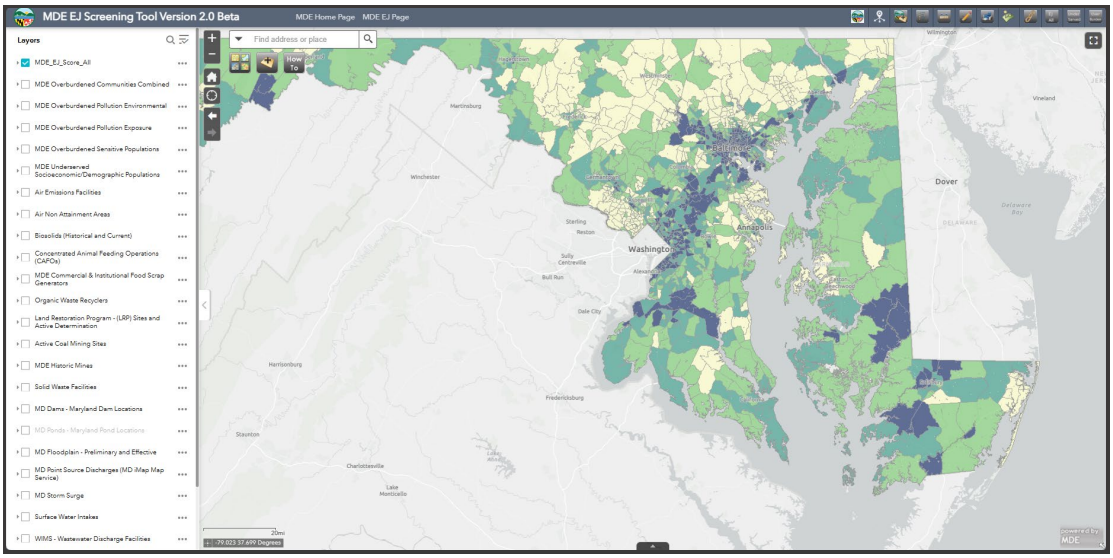


Image 3: MDE EJ Screening Tool screenshot from the tool website. (MDE, n.d.)

I'll begin the tour on the left side of the tool screen with the layer list widget. The Layer list hosts a volume of data, including the layers that were combined to calculate the final 'EJ Score' data layer, starting with the original datasets. For example, "Concentrated Animal Feeding Operations (CAFOs)" is included as a layer in the list; this layer shows point locations for CAFO operations across Maryland. This specific data layer was summarized by census tract boundary and included as part of the "MDE Overburdened – Pollution Environmental" score, which then was combined with the three other cumulative scores (across "overburdened" and "underserved") to calculate the final 'EJ Score' (MDE_EJ_Score_All). The Layer list also includes

additional context layers that can be turned on related to environmental concerns not included as indicators within the state's codified law.

Users may be interested in adding additional datasets to the tool, which can be accomplished using the 'Add data' widget. Using this button, which is located underneath the address search bar, you can add layers from the following sources: ArcGIS Online, a web service (think URL), and your own computer files. File types that can be uploaded into the tool for temporary use include spatial data files and CSV's. The ArcGIS Online catalog includes the Justice40 "disadvantaged community" data layer, which could be added to the map for comparison. An additional data-adding tool is the "Add MDE Data" button located along the toolbar; this tool includes numerous datasets collected by MDE related to regulation and permitting.

Users can also use query and summarize tools with the data. The "Query All EJ Scores combined", "Query Underserved Communities", and "Query Overburdened Communities" query tools are located on the top toolbar and allow you to filter the data based on a certain value, so you can identify census tracts that meet a certain query criteria threshold. This functionality changes what you see on the map screen based on the query you enter. An alternative function is to summarize data on the map screen to understand what is present. For this, you can use the Info Summary widget, also located in the top toolbar. This tool summarizes point features that are visible on the map screen.

Users may be interested in sharing information that they generate within the map tool. Specifically, data queries and maps are able to be exported through a few widgets: "MDE Screening Report," "Print," and "Share." The "MDE Screening Report" widget allows you to select a point location, draw an area, upload a shapefile, or enter coordinates and then summarize scores for census tracts that intersect or are in close proximity. This widget is unique from the other two data export tools because it includes quantitative values for census tracts. The other widget options – "Print" and "Share" – are map-focused and do not include a tabular data export. You can also export as a CSV any queries that are done within the Attribute Table widget. This is located at the bottom of the map screen.

Now that I have reviewed the development, intended use, methodology, and functionality of both the CEJST and the MDE EJ Screening Tool, I will next be providing a brief comparison of the two tools.

Comparison between federal and state-level tools

At this point, I will address how these two tools are achieving or falling short of best practices for environmental justice screening tool methods. These practices are related to creating indicators, connecting tools to power, and metrics of success. The federal and state tools go about creating indicators in two unique ways, but the MDE EJ Screening Tool is the one that includes cumulative impacts by using a scoring method; the CEJST currently lacks this approach. This means that the CEJST falls

short of the modern environmental justice movement's call for the inclusion of cumulative impact to be necessary in prioritizing efforts (Zrzavy et al. 2022). The lack of ranking could be seen as a failure to account for cumulative impact, which could prioritize the funding distribution process. Regarding connecting tools to power, both tools are connected to a type of power (policy implementation, funding distribution), which aligns with environmental justice movement recommendations. Finally, neither tool clearly includes metrics of success that would be an outcome of the tool's use. An additional feature worth mentioning is that the MDE EJ Screening Tool includes additional context layers, while the CEJST does not; it only includes information related to attributes that were combined to generate the resulting indicator. Context layers are typically included in recommendations from environmental justice advocates so users can consider proximity, etc. (Balakrishnan et al. 2022) A difference that comes up between the two tools, but isn't necessarily included in Zrzavy et al. (2022) best practices, is the inclusion of race as an indicator. I'll address this later in the ground-truthing section. Table 3, below, includes a summary of what was just covered related to the functionality and application of the CEJST and MDE EJ Screening Tool.

Table 3: Comparing the functionality, application, and definitions of the state and federal screening tools.

EJ Screening Tool functionality & application		
Tool name *Version #*	**Climate & Economic Justice Screening Tool** *Version 1.0*	**MDE EJ Screening Tool** *Version 2.0 Beta*
Government / Developer	U.S. Federal Government / U.S. Digital Services	State of Maryland / Department of the Environment
Policy Connection	E.O. 14008 – Justice40 Initiative (2021)	SB0528 - Climate Solutions Now Act (2022) HB1200 - Permit Applications – Environmental Justice Screening (2022)
Scale / Unit of Analysis	U.S. states & territories / Census tracts	State of Maryland / Census tract
"EJ" Definition	*Communities are "**disadvantaged**" if they exceed thresholds within categories of "burden"; categories combine (1) environmental, climate, or other burdens, AND (2) socioeconomic burdens.*	*"**Underserved**" communities – meaning they exceed a socioeconomic threshold;* *"**Overburdened**" communities – exceed environmental health indicator threshold.*
Tool Function / Power	Identifying communities that should be receiving 40% of the benefits of programs under the Justice40 Initiative / Funding.	Assessing community "EJ Score" for applicants to submit as part of an MDE permit application process / Regulatory.
Current Concerns	Excludes race from indicators; also, does not consider cumulative burden.	State law does not require "underserved" AND "overburdened" threshold to be met; also, EJ Score calculation may miss thresholds.

This section included a deep dive into screening tool development and the intricacies of two specific tools: the federal CEJST and the state MDE EJ Screening Tool. I also reviewed environmental justice advocates best practices for screening tool development and compared how the federal and state tools do at achieving these best practices. Now I'm going to take this comparison to a more local level. For the next section, I'm going to "ground-truth" these tools in the Baltimore context.

"Ground-truthing" in Baltimore

This section is dedicated to "ground-truthing" environmental justice screening tools for Baltimore. "Ground-truthing" is the process of comparing data gathered remotely to what is present "on the ground" (J. Sadd et al. 2014). This can be an important

validation process for many types of projects and can be especially important to undertake when a data analysis covers a large geographic area and may include local geographical inaccuracies and gaps (J. Sadd et al. 2014). Ground-truthing can also make highly technical tools more transparent to community members (J. Sadd et al. 2014). Methods for working with residents on "ground-truthing" data can be more technical, like verifying the location of hazards, or based on personal experience, like identifying important places in your community. (J. L. Sadd et al. 2015; Vajjhala 2006)

The method of "ground-truthing" used in this section will use local context to evaluate the use of indicators included in these environmental justice screening tools. The book "The Black Butterfly," by Lawrence T. Brown includes the historical context of disinvestment in Black neighborhoods of Baltimore. And many of Baltimore's Black neighborhoods are identified as areas experiencing inequity according to environmental justice screening tools. So how do screening tool indicators connect to or act as proxies for local challenges in Baltimore - and are they accurate in their representation? The following indicators will be addressed in this section: "redlining", percent impervious surface, income, and race.

"Redlining" as indicator of disinvestment

In the book "The Black Butterfly", a heavy emphasis is placed on the impact that redlining has had on Black neighborhoods in Baltimore; a historical trauma that persists in the present. Brown states: "What redlined Black neighborhoods have

needed for restoration, but what they have never received, is the authentic desegregation of power, resources, and wealth." (p 107) While there have been many policies created to supply funding to redlined neighborhoods over centuries (Model Cities under President Johnson, Enterprise Zones under President Reagan, Empowerment Zones under President Clinton, and Promise Zones under President Obama), Brown asserts that these policies have failed to produce the desired results. Brown sees this failure in the fact that redlined Black communities still exist all across the nation (p 356).

Baltimore is a hypersegregated city, and Brown introduces a term developed by Noliwe Rooks to describe how hypersegregation [spurs] economics; "segrenomics" is the business of profiting specifically from levels of racial and economic segregation (p 317). The fact that there is White complicity in the economic benefit of some at the expense of redlined Black neighborhoods is captured by the National Advisory Commission on Civil Disorders in their 1968 report: "…Segregation and poverty have created in the racial ghetto a destructive environment totally unknown to most white Americans. What white Americans have never fully understood but what the Negro can never forget – is that white society is deeply implicated in the ghetto. White institutions created it, white institutions maintain it, and white society condones it." (p 317) I would agree that white Americans do not fully realize systemic injustices that continue to disrupt and destabilize redlined Black neighborhoods. It can be a great hurdle to educate people about an injustice they do

not experience, but this means white society can maintain complicity (ignorant or aware).

This reality of injustice hidden in plain sight was spoken out loud by an esteemed environmental justice scholar and Black woman who shared that it's good to have "one good white friend" (Centering Justice 2024). Through white friends she shared that she was able to learn about financial opportunities that were not made available to her from the same benefits provider. Similarly, in Baltimore, an example of injustice hidden in plain site is the fact that lower-income Black Baltimoreans often pay higher property tax rates than their higher-income white counterparts (p 222). Taxes, which are collected and meant to be spent for the public good, are not being distributed equitably – or even equally – across Baltimore neighborhoods (Brown 2021). This can be called out when Black Baltimore communities are more likely to have community resources like their public schools, recreation centers, and public housing developments closed down, even though they may be investing more tax dollars into the city. Brown calls for "spatial equity" with funding investment in redlined Black neighborhoods (p 257).

The use of proxy datasets to represent historic redlining, like the Home Owners' Loan Corporation (HOLC) map, is an important dataset to include to make an environmental justice screening tool applicable for Baltimore. As mentioned in Chapter 1, these maps were color-coded to identify areas that were considered a lending risk, with red being considered the highest risk. Areas considered to be a high

lending risk also happened to be areas that were Black and "foreign" communities; this was not a coincidence, but intentional and excluded these communities from access to home ownership loans (Brown 2021). Research shows that many areas coded red in these historic maps continue to be economically and racially segregated today, and economic inequality persists (Meier and Mitchell 2022). While redlining is commonly associated with the HOLC maps, redlining is not confined to this map context; "the differential spending on public goods in segregated cities from the early 1900s onward – particularly in Black neighborhoods – is an unrecognized form of redlining" (Brown 2021, p 13).

The CEJST does include the historic HOLC color-coded scores as an indicator of historic underinvestment in its methodology to identify "disadvantaged communities". The MDE EJ Screening Tool, on the other hand, does not include any datasets that directly connect to historic disinvestment. The only datasets that are included in the state-level tool that could possibly be considered a proxy are the inclusion of race and income thresholds; these could be considered proxies since historic disinvestment occurred under racist policies that impeded Black residents from wealth-building opportunities like owning property.

Percent of Impervious Space

Residents in what Dr. Brown calls "Black Butterfly neighborhoods" tend to have higher rates of obesity, diabetes, hypertension, and heart disease; access to green space through equitable spending on public parks could help reduce these health

burdens (Brown 2021, p 157). This can be evaluated using a metric for spaces that are the opposite of green; the built environment. Impervious space is another way to describe the built environment and includes anywhere that is void of vegetation. Using percent impervious is a common indicator for assessing lack of green space and uses the line of thought that the more developed the land is (with buildings, parking lots, etc.), the less space there is for vegetation to grow. But what this indicator does not consider is disinvestment and demolition in city neighborhoods, which can create less impervious space.

For Baltimore communities, the connection between removing homes and creating green space is direct. Dr. Brown includes a statement made by residents of the Fulton Heights community in West Baltimore who were organizing against demolition in their neighborhood by putting out lawn signs stating, “We Need Our Homes, Not Unsightly Trashed Green Spaces.” News coverage includes statements from residents saying they were against the city demolishing buildings without any plan for what would be built in the building's place. (Zumer 2018) Residents' reactions show that this type of green space creation, which reduces the percentage of impervious space, is not considered a benefit to the community; it is perceived as continued disinvestment. Google Map imagery from 2024 shows the place where these contested buildings stood is now an empty grassy lot lacking any development, like senior housing or playgrounds for children, that residents were requesting in the building's place (Zumer 2018).

Access to green space is included as an indicator in the CEJST, but not in the MDE EJ Screening Tool. The CEJST accounts for access to green space using the % of developed impervious surface within a census tract. This indicator could, at first glance, seem misleading considering how some Baltimore neighborhoods experience blight from building demolition that has resulted in large open spaces; but, the 30-meter resolution that is used for the CEJST does not seem to capture this issue. The MDE EJ Screening Tool does include myocardial infarction discharges (commonly referred to as heart attacks), which some may argue could be a result of a lack of access to green space to experience health benefits. But, this cannot be considered a direct proxy for access to green space.

Income & Race

When incorporating income as an indicator, it's important to note that there is a racial income gap in Baltimore. Brown (2021) illustrates this using 2016 census data. While Baltimore City's median annual household income (MAHI) was $62,820 a year, when broken down by race White Baltimorean's MAHI was $76,992 while Black Baltimorean's MAHI was $38,688. (p 207)(Sotolongo 2023) This income gap within Baltimore, which can be hidden by a median income that does not include race, illustrates why the use of an income indicator as a proxy for race is not simple. Disparities like this difference in household income need to be taken into account.

It is important to remember that this racial income gap was created by a system that continues to maintain spatial racism in cities like Baltimore, and who benefit from its

continuation. Dr. Brown includes many on the list of "beneficiaries" of "concentrated poverty", including philanthropies and large nonprofits that "gain funding under the guise of helping Black people while leaving apartheid systems intact." (p 111) This gaining under the system could be considered connected to "segrenomics," the business of profiting specifically from levels of racial and economic segregation (p 317).

The use of race and income is common in indicators for environmental justice screening tools. This is especially true when tools are designed to cover larger scales, like states or countries (Sotolongo 2023). Data consistency across scales is important when building screening tools, and race and income are data that can be easily accessed from Census datasets.

Some opt for one over the other; for example, the Justice40 Initiative Climate & Economic Just Screening Tool (CEJST) excludes race as an indicator completely. This exclusion of race could be considered validated by studies like Boone et al (2014), which find that White neighborhoods in Baltimore are more likely than African American neighborhoods to contain polluting facilities. What is the importance of race if studies are finding that White neighborhoods in Baltimore are more likely to be near polluting facilities? Is this cause to not use race to exclude communities that are exposed to environmental hazards?

When considering race as an indicator, it is also important to consider ethnicities that may be "counted" as White. For example, during interviews related to environmental justice screening tools, Grier et al. (2022) had an interviewee share, "We're a Yemen American community and […] classified as White." This could be considered another argument for the exclusion of race to define environmental justice communities; the way data is collected could exclude some groups under the guise of "White" when they could also be vulnerable communities.

Downey (1998) calls out that the "pitfall of race v. income debate as framed […] is that it implies one factor found 'right' has to be at the expense of the other" (p 774). I see this call echoed by Boone et al (2014) when they discuss indicators besides race that seem to be significantly connected to pollution burden over time, that being low education levels. Boone stated that there are limitations in fully understanding their study outcomes because this would require ground-truthing data regarding racist land access policies, which is challenging to access and "messy". But this is an important part of exploring environmental injustice, and Downey (1998) agrees stating that "efforts to disaggregate income and race have distorted the meaning of environmental justice and racism as originally conceived by environmental justice movement leaders."

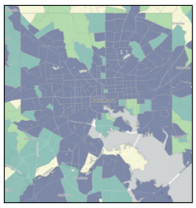
As part of comparing race and income as indicators in identifying environmental justice communities, Downey (1998) brings environmental discrimination theses into his interpretation of analysis outcomes. One thesis is that environmental

discrimination happens because racial discrimination is the intent of the citing process (Downey 1998; Been 1994). The opposing thesis is that environmental discrimination occurs when the policy, practice, directive, etc. differently impacts or disadvantages based on race; this is the thesis used by environmental justice moment leaders (Downey 1998; Bullard 2001). Downey states that "it is the contextual and historic issues […] and not racist intent that is at the heart of institutional racism models" (Downey 1998, p 770). This context is something that is hard to consider when working at large scales (state, national) and relying on "simple" indicators (race, income); these indicators are attempting to capture the present state created by historical and context-specific issues.

So, where do the two tools fall when comparing the inclusion of race and income? The CEJST, as briefly mentioned earlier, does not include race as an indicator in its tool at all and mainly includes low income (defined as the percent of census tracts' population in households where household income is at or below 200% of the Federal poverty level, not including students enrolled in higher education) as the tools indicator of socioeconomic burden. Some would argue that the exclusion of race by CEJST could further racial inequity in the application of the tool; in this case, inequity in Justice40 Initiatives funding distribution (Sotolongo 2023). In comparison, the MDE EJ Screening Tool includes both income and race as indicators of socioeconomic burden. Income is defined as "at least 25% of the residents qualify as low income" and race is defined as "at least 50% of the residents identify as non-white" (MDE, n.d.). Both of these tools use slightly different indicators for income.

By reviewing indicators included in the federal and state-level tools related to redlining, green space, income, and race we "ground-truthed" these tools to Baltimore even though they were developed to cover a larger scale (see Table 4, below).

Table 4: Comparing indicators of interest used in the state and federal screening tools. The Climate & Economic Justice Screening Tool (CEJST) and MDE EJ Screening Tool have indicator differences. These differences are most likely a result of the different intended use of the tools; the CEJST is specifically designed to address climate issues and historically disinvested areas, while the MDE tool is designed for permitting pollution regulation.

Comparing Indicators of Interest for Environmental Justice & Green Space	 **CEJST**	 **MDE**
Historic disinvestment (Redlining scores)	**YES** *High risk areas used as indicator.*	NO
Race (% People of Color)	NO *Included as context information.*	**YES** *Race included in definition.*
Lack of green space	**YES** *Impervious surface used as indicator.*	NO
Cumulative impact	NO *Includes as context information.*	**YES** *Includes, but does not set threshold.*

Through comparison of these two tools, I illustrate that the tools do not uniformly include data layers to enable Baltimore "ground-truthing", which is important to consider when applying these tools in Baltimore. The next section will briefly touch on the use of screening tools to track funding and the benefits that are the intended outcomes of these tools.

Tracking funding & benefits

Reflecting back on the beginning of this chapter, the Justice40 Initiative was described as an opportunity for social transformation. There have been many funding opportunities created with the surface intention of "revitalizing" (or transforming) redlined areas around Baltimore. Examples of these that are active today include previously mentioned Project C.O.R.E. funding, Enterprise Zone tax credits, and tax increment financing (TIFs). Funding opportunities such as these are critiqued as being designed to subsidize developers and incentivize wealthier and demographically whiter residents to move in. (Brown 2021) When it comes to funding for community economic development, Brown warns that "the subversive implementation of past economic development policies should teach advocates for racial equity a valuable lesson. **Policies that initially look good on paper can fail due to inattention to the intricacies of implementation or an absence of enforcement to ensure spatial equity is achieved**." (Brown 2021, p 198) This concern about policy implementation has also been echoed by environmental justice leaders regarding Justice40, like the ones present on the panel I spoke about at the beginning of the chapter.

When considering policy implementation and attaining metrics of success, Project C.O.R.E. funding is a local policy that Brown critiques. He states this funding goes toward the demolition of vacant housing and millions of dollars of subsidies and tax breaks go to developers to build in redlined areas of Baltimore (Brown 2021), while having no protections to ensure that these developers include current community residents in the design and co-ownership of the development. This could be why

some Project C.O.R.E. funding may not be considered a direct investment in the community it is intended to serve; the development as a single act could be considered a success by some metrics, but if the intent is to benefit people living in those neighborhoods tracking funding may not be an accurate metric of investment impact. This demolition investment could be perceived as a willingness to invest in a future developer and interest in reducing the metric of Vacant Building Notices more than a willingness to invest directly in redlined Black neighborhoods. As mentioned earlier, there are also many areas of the city where Project C.O.R.E. funding has been invested in demolition, and the land has been in "holding" for years, waiting on a developer to show interest (Brown 2021). Alternatively, Project C.O.R.E. funding that is distributed through Request for Proposal (RFP) applications can result in direct funding for community projects, like green spaces. While the program's large investment in demolition funding is intended to benefit community members, measuring long-term success should include assessing the current state of the neighborhood landscape multiple years post-demolition or RFP implementation using residents' perceptions of project success.

Tracking of funding and benefits, specifically for Justice40, has proven to be challenging. This can partially be accounted for by the fact that some federal funding methods funnel money directly to the state and the state directs the funding from there (see information on non-competitive programs in Image 4). Another challenge is that metrics are not typically collected at the census tract level; more common geographies include county, district, or zip code. Efforts have been made from

outside the federal government to track funding flows for programs that fall under Justice40, including programs under the Bipartisan Infrastructure Law (BIL) and Infrastructure Reinvestment Act (IRA) (The White House, n.d.-a; USDS 2021). Tracking attempts can be found in some tools that are outside of the CEJST tool, but these tools are not comprehensive (The White House, n.d.-b).

Image 4: High-level steps for funding flow from federal government. Money flows from the federal government through four steps: Budget, Plan, Award, and Completion. The award type can impact how challenging it is to follow funding from the federal government directly to an implemented project. (The White House, n.d.-b)

Funding awards for competitive programs (see information on competitive programs in Image 4) are typically available to organizations and institutions to apply, and if awarded, they receive funding directly. I learned about three awarded projects in Baltimore that are related to the Justice40 Initiative and urban green space (listed in Table 5, below); they include a field laboratory, a technical assistance center, and an urban tree initiative. While only one of these three projects is directly associated with

greening, the other two provide avenues for urban greening funding either through leveraging their project for community project funding or supporting community groups applying for funding. These projects illustrate how benefits from funding are hard to track when strictly using data available through the federal government. You can learn specific award amounts, but how those or associated investments filter down to specific project locations requires additional investigation at the local level with the awarded organization.

Table 5: Three funded projects in Baltimore related to the Justice40 Initiative and urban green space. I learned about these projects through my qualitative methods process. These include a field laboratory (that can be used as leverage for groups to access funding), a technical assistance center (that helps groups access funding), and an urban tree initiative (that directly implements greening). With these large funding amounts you can see how tracking funding to a single awardee still leaves a lot of unknowns about where directly the money has been spent and would require additional research.

Funded projects in Baltimore related to the Justice40 Initiative & urban green space			
Project name	Funding Entity & Program name	Funding program intent	Funding amount
Baltimore Social-Environmental Collaborative (BSEC)	U.S. Department of Energy, Office of Science **Urban Integrated Field Laboratories (IFL)**	Effort to advance science underpinning understanding of the predictability of urban systems and interactions with the climate system, and to provide knowledge and information necessary to inform equitable climate and energy solutions that can strengthen community-scale resilience across urban landscapes.	**$25 MM 5 yrs.**
Mid-Atlantic Thriving Communities Hub (MATCH)	U.S. Environmental Protection Agency / U.S. Department of Energy **Environmental Justice Thriving Communities Technical Assistance Center (EJ TCTAC)**	Provide technical assistance and capacity building resources for communities in their region to access funding opportunities. Lead partners include NWF, UMD CEEJH, UMD EFC. Uses the 'hub' approach with core partners with a community presence; includes Baltimore's South Baltimore Community Land Trust (SBCLT).	**$12MM 5 yrs.**
Baltimore Tree Trust	U.S. Department of Agriculture / U.S. Forest Service **IRA - Urban & Community Forestry Grants**	For tree planting and related activates like maintenance and monitoring; intended to advance the mission of Justice40 by supporting disadvantaged communities experiencing low tree canopy. NOT eligible for basic research. Includes a sub-award requirement minimum of 80% for pass-through entity awards.	**$7MM 5 yrs.**

To overcome the challenge of tracking funding, illustrated in Table 5, intermediary groups like those reviewed in Chapter 1 may serve as an important mechanism for

benefits tracking. For example, the Chesapeake Bay Trust recently released some program funding that includes funding from programs associated with the Justice40 Initiative. Reflecting this funding intent, program descriptions now explicitly include Justice40 language and the intent of the money to benefit defined "disadvantaged communities". With this update to the language of the program description, moving forward the Climate & Economic Justice Screening Tool (CEJST) could be used to track and assess if program funding is achieving the intended goal of benefiting specific communities. Other urban greening grant programs mentioned in Chapter 1 by Baltimore urban greening actors, like the Small Watersheds Grant administered by the National Fish & Wildlife Foundation, have also been recently announced program awards associated with the Justice40 Initiative (US EPA 2024). This could be seen as an exciting opportunity for increased funding for developing green spaces in Baltimore, while at the same time using an old system to pass along money that is intended to be transformative. After hearing critiques about the limitations of these funding sources from urban greening actors, I think these programs will require more intentional efforts beyond language change in program descriptions to ensure that the intent of Justice40 funding is being achieved.

This gets back to the question of systems and whether the same system could do something transformative; without transparent fund distribution tracking, there is concern that the money will fall from the sky and never hit the ground. "History is clear – it is not enough to […] allocate dollars to Black communities, when large corporations and developers are the actual beneficiaries." (Brown 2021, p 247) This

quote speaks to the fact that allocation of funding is not enough; intentionality in implementation is imperative. When it comes to implementing urban greening projects at the neighborhood level, following the allocation of dollars to "disadvantaged communities" may be possible using project information available through intermediary organizations.

Summary

In Chapter 2, I addressed the question of how different definitions of "environmental justice communities" come together for where funding should be invested and ground-truthed these definitions in Baltimore. This included a thorough overview of federal environmental justice policy and governance, followed by policies enacted at the state level. Then, I examined two specific tools that are currently being used to implement policy: the federal CEJST and the state MDE EJ Screening Tool. I closed the chapter with a ground-truthing exercise to assess how these screening tools capture specific challenges and opportunities for Baltimore. The purpose of this section was to give you a strong grounding in environmental justice policy and screening tool development and apply this knowledge to assess recent environmental justice policy actions. Coming away from this chapter, I realize that while the benefits of the Justice40 Initiative may be hard to track from the federal level, intermediary organizations that are distributing funding associated with the initiative may provide a means of tracking funding benefits when it comes to urban greening projects at the neighborhood level. But there is concern that the use of the same systems, like the

same grant programs, to distribute this possibly transformational funding could lead to the same, less impactful results for “disadvantaged communities”. In Chapter 3, I will focus on my research methodology and my use of community engagement to guide my research with green space, funding, and environmental justice.

Chapter 3: How Research Can Be Guided by Community Engagement

Introduction

As shared in the opening introduction, the graduate program that I am a member of uses a research team framework with a position for a Community Stakeholder, or someone outside of academia, with a "stake in the research outcome" (ICARE, n.d.). While in my pursuit of finding a genuine research interest connection with a group that was within Baltimore, a new personal connection, and active at the neighborhood level, my research methods were evolving in a way I didn't expect. When I was reaching the end of my research, I began to understand just how much the many activities that I was taking part in were actually contributing to my understanding of the systems and connections between green space, funding, and environmental justice.

This chapter is focused on the qualitative methods I used to learn about my topics of interest and how different communities are engaging with these topics. First, I'll revisit the fieldwork component of my research, followed by a review of what community-engage research is and why it adds value to any research project. Then I will share some ethical considerations that are important to weigh when considering a community-engaged research project. This will lead to my exploration of "embedded learning", which is how I describe my attempt to connect my research process within

and across communities. After exploring this framing and the outcomes and limitations I'll transition to presenting this approach as a stepping stone that can be used on the path toward community-engaged research.

Methods & community-engagement

The qualitative research fieldwork methods I landed on included informal interviews and participant observation. Overall, between Fall 2022 and Spring 2024, I engaged in over eighty "field" activities that I grouped into the following categories: events (35 activities), content expert conversations (30 activities), organized group meetings (10 activities), government entity meetings (8 activities), and research-centric meetings (3 activities). These only include the field activities that I consider as giving me insight into my research and there are over twenty activities not included in this final count. Methods included some form of notetaking, either during the activity or after, that could include attendees, topics covered, and learning outcomes related to my research. Nothing was coded using any particular methodology, but these summary notes could be referred to later in the research process to jog a memory or realize connections that were beyond my understanding at the time of the activity. Appendix A can be referenced for the research timeline and activity details.

Landing on this type of methodology was in some ways unintentional, but reflective of the way that I engage with learning. I began by using these activities to gain an understanding of my three major themes (green space, funding, and environmental

justice) and the systems and relationships that they fell within. During this time, I engaged in activities to learn. Over time this method evolved from a way to learn about systems and relationships to a way of engaging with systems and relationships. I became an active participant, instead of an observer. This transition did not come as a surprise; the purpose of the participant observation fieldwork was to gain confidence in knowledge that could be acted upon.

This transition also connects back to the "community-engaged research" intentionality of the ICARE program. This process of research to benefit a particular community can fall on a spectrum of engagement; ranging from presenting completed research to a specific community to inform and gather feedback (a lesser-engaged choice), to involving identified partners from a particular community in the entire research process – generating questions, methodology, analysis, and distribution of results (a higher-engaged choice with a greater likelihood of the outcome of applicable research) (Key et al. 2019). While lesser-engaged research may send a message that "We care about what you think," higher-engaged research can bridge a divide between researchers and the community, which can result in a more meaningful outcome for the participating community (González 2019). Figure 5, below, illustrates this community-engagement continuum.

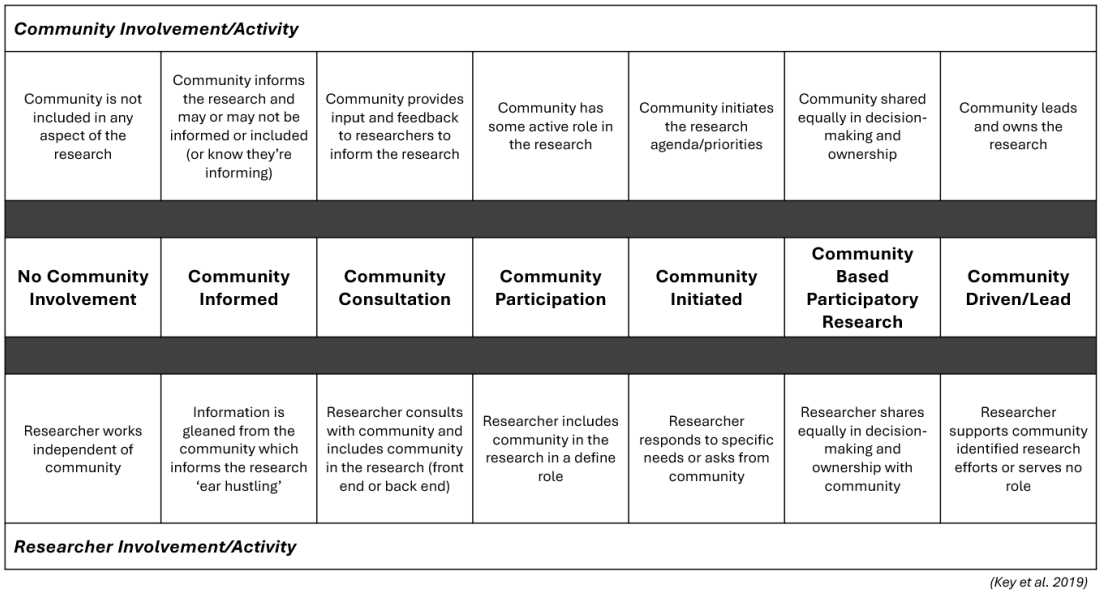


Figure 5: Continuum of community-engagement between communities and researchers. The continuum of community engagement in research ranges from no community involvement to community-driven or lead; this figure breaks down community-engaged research by community and researcher involvement and activity along the continuum. (This was recreated from Key et al, 2019)

Attempting to conduct research that aligns with higher engagement can be challenging, especially if, as a researcher, you are trying to build relationships and understanding about the topic in question while also beginning your research process. It wasn't until six months into my research process that I decided I was pursuing a "community-engaged research" false-start. This overlapped with a course that required substantial time in the field as part of a social science research project connected to a local neighborhood association. As a member of this course research team, I was introduced to many ethical considerations that I had to navigate. These concerns were related to an inner tension I experienced with my dual identities as a Baltimore resident and a "student researcher". A particular exchange sticks with me; one day, I was walking the project neighborhood attempting to connect with people to

interview for the research project, and a woman I ended up talking to responded, “Didn’t I talk to you already?”. I took this to reflect the type of research that this resident has experienced, the type of research that you only participate in at certain points. To her, I was just another transient “student researcher” asking the same questions and taking the information I was learning elsewhere, reinforcing a negative research cycle. To be fair, this could all be my personal interpretation of a two-sided exchange, and the other person's perspective of the exchange could be completely different. Or not.

These experiences with community-engaged research early on in my graduate school experience led to personal reflection on research and ethics. The outcome of this is manifested in my ultimate approach to this thesis research.

Ethical considerations with research

The topic of ethics and research was already addressed in the introduction but is worth emphasizing in a section that goes deeper into methodology and outcomes. As alluded to earlier, being a graduate student in Baltimore introduced instant and warranted stigma from people you interact with. This climate challenges oneself to prove that you are different, while also questioning whether you are any different, leading you to challenge yourself to think about how you are going to be different. It was within this climate that my research intent evolved from achieving “research with” community toward approaching research as a means of understanding how to engage. My thought was that by understanding the systems and organizing that

engaged with my topics of interest, in itself a relationship-building effort, I could engage in a meaningful way that could extend beyond my thesis timeline.

The thesis timeline was a huge barrier for me to overcome related to ethics and community-engaged research. Additional concerns included attempting research where I was entering from "the outside", jumping in to support an effort without full knowledge of project history and dynamics, and not hearing interest around what I found interesting. These concerns all surfaced during my early attempts to generate a genuine collaborative research opportunity as part of that large-scale urban green space development effort in Baltimore I mentioned in the opening paragraphs of this thesis. After completing numerous content expert conversations and attending events like community engagement events hosted by the project organizers, I decided to change the focus of my project while holding true to my original themes of interest: green space, funding, and environmental justice.

This change in focus resulted in me embracing "embedded learning" as an approach to my research, with the goal of being able to apply knowledge learned in a yet-to-be-determined form to benefit relationships I was building – mainly thinking about the neighborhood scale. At times this approach was confusing because I was balancing my two identities – one, being an engaged Baltimore resident, and the other, being a master's student. The intent for attending activities could get blurred. Reflecting on this, I wonder if it was unethical for me to choose to use one identity over another, but all the activities I engaged in (beyond content expert conversations, where I

introduced myself using my graduate student identity) were publicly accessible (granted, you may have needed to be "in the know" to go). In the next section, I will be discussing the intent and outcome of this embedded learning research approach.

"Embedded learning"?

Embedding researchers in different settings is an approach used in social sciences to enhance research capacity by connecting the research directly to the consumer, influencer, beneficiary, or stakeholders who are directly or indirectly connected to the research outcome. Embedded researchers in public health have been defined as researchers who are working inside a host organization, either as a staff member or other role, while maintaining an affiliation with an academic institution. This type of research approach can actively span boundaries between research and outside organizations where the researcher is embedded, fostering academic research that aligns with outside organization needs. (Graziosi 2021) I have taken this concept of embedded researcher and am using the term "embedded learning" to frame my fieldwork process. The intent of embedded learning was to gain a broad understanding of systems and relationships using themes that are based on my original research questions. These themes include: (1) green space, (2) funding, and (3) environmental justice. These themes were used to identify and engage with content experts, meetings, and events; activities were pursued because they aligned with learning on at least one of the listed themes. I attempted to capture this interconnected process using a mind mapping exercise shown in Image 5, below. In

this section I will address the following topics: (1) how I defined my themes, (2) how I defined activities, with examples, (3) my personal role in engagement, and (4) limitations to this approach.

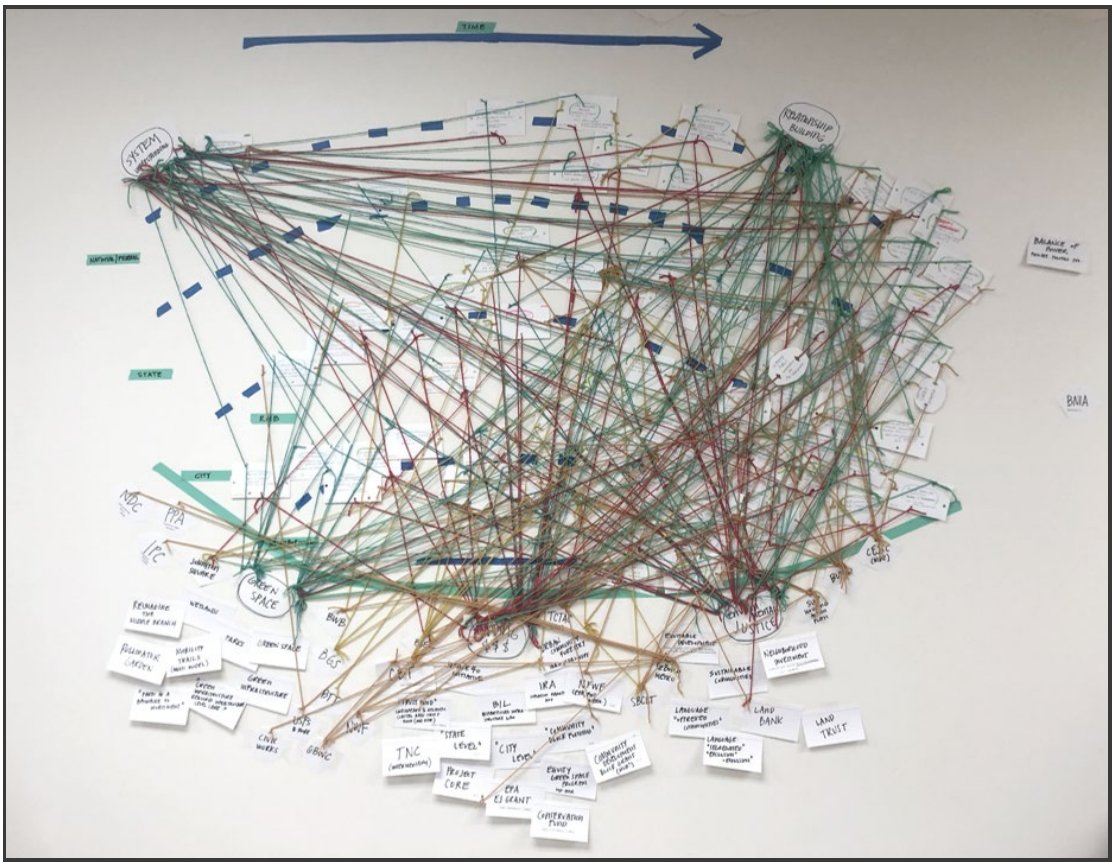


Image 5: A mind mapping exercise product from my field notes processing. The center of the map is made up of notecards with activities written on them and I used strings to connect each activity to my main research themes (green space, funding, and environmental justice) and overarching interests (system understanding and relationship building). String color represents how I engaged with the activity: green being what I knew I wanted to learn about, red being something new I learned that I may not have expected, and yellow being a connection between activities or key pieces of information. Key information related to themes and learned from activities is written on note cards and clustered at the bottom of the map. Additional map dimensions include vertically the activities are placed based on neighborhood – to – federal government level of involvement and horizontally the activities are placed as experienced over time.

First, I will begin with defining themes. As was mentioned, these themes led to the development of research questions that guided this process. Each of these themes took on a more open definition early on in the "embedded learning" process as I tried to develop a definition through activities. For example, connections to the theme "green space" could include a green space type (wetlands, parks, pollinator gardens, vacant lots), a location (like a neighborhood), or organizations (who were connected to green space efforts). The theme "funding" has a similar spread of connections, including specific funding policies (at the federal and state level), intermediary organizations (organizations that pass money between source and receiver), and programs benefiting from particular funding (like technical assistance centers). For the theme "environmental justice", connections had a neighborhood environment focus; this includes community development organizations (named for their connection to green space development), policies that define communities or support equitable development (at the city, state, and federal level), and tools developed to support environmental justice (like map screening tools). As you can see, these definitions include many interrelated topics and leave much to be learned.

Next, I will review and define what I have identified as the types of "activities" I participated in as part of my embedded learning process. As mentioned earlier, activities include events, content expert conversations, organized group meetings, government entity meetings, and research-centric meetings. I'm listing these based on how many times I participated in that type of activity, with the first being the activity that I took part in the most.

Events were attended the most, with thirty-five occurrences, but was also a more catch-all category for any activity that didn't clearly fit under any other activity definition. These tended to be activities that were not recurring commitments, were designed to fulfill a purpose during that one gathering, and/or were open to a cycling of attendees. Examples of events include public input sessions, funding information sessions, symposiums or talks, and green space volunteer events. The role of embedded learner when it comes to this category could include engaging in a Q&A session, identifying contacts for follow-up content expert conversations, or physically pulling weeds; so, different levels of activity, but by no means passive.

Content expert conversations were the second most common activity, with thirty occurrences. These were activities where I had scheduled a meeting with someone who I considered an expert on a topic, related to either one or multiple of my themes, and I approached these meetings with specific questions. Examples of content expert conversations include people with expertise in environmental justice policy, green space implementation, community development, and city-wide organizing. Expertise ranged across many geographic scales and systems, from neighborhood level to national. The role of the embedded learner when it comes to this category was leading a conversation using pre-developed questions related to the participant's expertise. These questions were meant to add structure to the conservation, and ensure relevant topics were addressed, but were not intended to limit what the conversation could

cover. Some content experts were engaged in conversation more than one time over the course of the project, but the majority consisted of a single conversation.

Organized group meetings were the third most common activity, with ten occurrences. These were activities that were a reoccurring commitment on a topic with recurring participants, and meetings tended to build off the previous one. Examples of organized group meetings include neighborhood association meetings or housing-focused working groups; these are meetings that are not being convened by a government entity and tend to be resident organized. The role of the embedded learner when it comes to this activity varied depending on my association with the group; for example, in meetings that I attended where I had resident status, I was comfortable being more outwardly inquisitive than during meetings where I was a visitor (connected, but not a resident of that neighborhood).

Government entity meetings were the fourth most common activity, with eight occurrences. These share many characteristics of organized group meetings, but they are convened by a government entity or are directly affiliated to a government entity. Examples of government entity meetings include state commissions, city council committees, and federal partnerships. The role of the embedded learner when it comes to this activity was typically more observational in nature, unlike other activities. These were larger group meetings that tended to have a set agenda or list of items to be addressed and were open to the public. During these meetings I was

interested in how meeting members were engaging on issues related to my themes of interest.

Research-centric meetings were the least common activity, with three occurrences, which was intentional. These activities were either an event or regularly occurring meetings related to a research program, and the main content of these meetings was related to scientific research. Examples of research-centric meetings include federally funded research programs based in Baltimore. The role of the embedded learner when it comes to this activity was to understand and keep tabs on the "traditional" research activities and perspectives on topics related to my themes of interest. Also, by linking up with my fellow research community I was being intentional about not being duplicative in my efforts – for example, learning about public survey datasets that have already been developed that would support personal research goals and reduce over-surveying of Baltimore residents. Some attendees of research-centric meetings later became content expert conversations because of their expertise related to my themes of interest.

Table 6, below, includes a summary of all activity types, number of occurrences, and examples of activities.

Table 6: Embedded learning activities grouped by categories; I attended 86 unique activities and 89 activities in total.

Activity categories	# of occurrences	Examples of activity topics
Event	35	Public information sessions; funding information sessions; symposiums or talks; green space volunteer events
Content expert conversation	30	Expertise in environmental justice policy, green space implementation, community development, and city-wide organizing
Organized group meeting	10	Neighborhood association meetings; housing-focused working groups
Government entity meeting	8	State commissions; City Council committees; federal partnerships
Research-centric meeting	3	Federally funded research programs based in Baltimore

Outcomes of "embedded learning"

The engagement of the embedded learner evolves over time. You are not a "fly on the wall", and as someone who may be a repeat attender in certain spaces, you take on new responsibilities and a more comfortable understanding of how to engage. This marks a transition from systems understanding toward relationship building; you have started to understand the system, and what your role can be in it, and that role can be used to construct relationships. You also evolve in your understanding of systems and connections. This can happen within a theme, for example, how different green space implementors are connected to each other. This can also happen across themes, for example, what funding programs are designated for environmental justice "communities." Relationship building can also be with specific parts of the system you learn about, like neighborhood organizations. As part of relationship building, you may attend activities that are no longer directly connected to your research themes but support a greater goal of building an authentic relationship.

Also, with knowledge comes responsibility. As an embedded learner, you reach a point where you know enough that knowledge transforms into action. For example, I attended three government entity meetings for one specific group that included public comment time in their agenda. On the fourth meeting, after hearing a discussion related to one of my themes, I made the decision to share a public comment during that meeting because it was timely and something I had been wanting to bring up to this group. This was a point of transition for me from being a participant observing to being a participant engaging with the group's charge.

Another example of a point of transition was when I was a participant in a community engagement meeting related to a planning process. At the end of that meeting, I became aware that I knew this project had an extremely high likelihood of moving forward despite mixed responses from the community members present, and I knew this because of my embedded learning process. So, an embedded learning outcome may also be preparation for action on community issues (Haga 2020); might this be associated with community-engaged research?

Reflections on “embedded learning” and research themes

In reflecting on this fieldwork approach, this method encouraged me to stretch my understanding of my research themes. For example, coming into this research, I was generally familiar with green space implementors and typical funders but was less familiar with environmental justice. As I pursued my embedded learning fieldwork, I

was able to learn about connections that spanned green space actors and environmental justice organizers that I don't think would have come to my attention otherwise. I was also able to learn about organizing efforts that are one step removed from project implementation, but whose outcomes could potentially impact project implementation. For example, learning about Land Banking legislation that the city is considering and hearing from organizers how they see this legislation being a tool for community-led development. While this legislation may seem indirectly connected to environmental justice and green space, I see its potential impact on land acquisition and development, which is connected to environmental justice and green space. Being an embedded learner helped me grasp a more holistic understanding of my three research themes.

This fieldwork approach also grounded my "desktop theory" ideas in reality. For example, at one point, I was considering using neighborhood vision plans as a knowledge source for the type of neighborhoods residents want to create. As a graduate of the Baltimore Planning Academy, which is offered by the Baltimore City Department of Planning to train residents to be planning advocates for their neighborhoods, I was familiar with vision plans as a tool. From my understanding, neighborhoods are encouraged to develop vision plans as a document they can use to advocate for funding and neighborhood development. As I was seeking a way to connect with neighborhoods, vision plans seemed like an opportunity to understand the type of environment residents want their neighborhoods to be, including the type of green spaces they want to include. I'm referring to this as a desktop theory because

it is something I thought of and could investigate from my desk, using these publicly available documents. Soon after sharing this idea with my advisor, who mentioned caution about considering these a genuine product of the community (which I agreed with but was trying to give the benefit of the doubt), I attended a community meeting where my advisor's caution was validated. A resident brought up their neighborhood vision plan during this specific meeting and mentioned how flawed the development process was; they said the neighborhood residents voted in favor but saw it as totally out of touch. Since this person was referring to a vision plan I was considering using as part of my desktop theory, I was disappointed but also thankful that I was present at this meeting to be able to hear this comment. My desktop theory was not acted on after this interaction.

Limitations of the "embedded learning" approach

Since this approach was accidentally stumbled upon because of its similarity to my learning style, I did not make use of methodological practices that would reduce heavy bias. To understand a topic or issue, I engaged in a variety of activities, and I think the main limitation of my approach was who I connected with. Or, maybe more importantly, who I did not. As I discussed earlier, I made some initial decisions based on my identity and the stigma of research as extractive. I did not think it was appropriate to show up in spaces without some sort of connection or invitation. It would be suspicious for me to, say, show up at a neighborhood meeting where I hadn't been invited and that wasn't for my neighborhood. For example, I only started attending a specific working group meeting after it was brought to my attention by a

"content expert". A caveat to this was public meetings that were meant for a wide audience, like City Council committee meetings. Because of this, my learning could be biased, and I accept this critique.

I also question the ethics of this approach. By not outwardly naming my connection to research, I felt more welcome in a space, but I was also not being transparent. Did the lack of transparency make my involvement extractive? I attempted to counteract this internal qualm by anonymizing my activities in this text, particularly if they are activities at the city or neighborhood level. Frankly, these are communities where I live – as "just" a city resident - and engage. Some of the activities were with spaces and in places I had never engaged with before, and I consider these a part of my personal and professional network now. In the next section, I'm going to connect this ethical question back to the continuum of community engagement, which I introduced at the beginning of this chapter, and reflect on where I landed.

Moving toward community engagement

Using the continuum of community engagement as a way to understand how researchers and community members engage around research, I am disappointed by where I think I landed. The descriptions for Community informed unfortunately feel most aligned to my research involvement and activity level. These descriptions leave me thinking I was an extractive researcher after all, since a community event I attended may not know they're informing my research 'ear hustle'. I agree that

embedded learning should be considered far down the continuum of community-engaged research, in the direction of non-engagement, and maybe even lands off the continuum. So where should the process of embedded learning belong as part of a research practice?

While the approach of "embedded learning" should not be considered community-engaged research, I would present it as a stepping stone researchers can take in preparation for community-engaged research. Of course, ethical considerations are still important, even in preparation for research. Ethical considerations are important because engagement is a commitment to multiple communities. I have mainly been focusing on engagement as a commitment to communities outside of academia, and the stigma of being a transient graduate student. But engagement as a commitment to your academic community is something that I think is worth lifting up. I see my commitment to engagement manifesting as how my actions in the community reflect on the institution I represent. I also see my commitment to engagement manifesting in how I support and challenge my peers as we approach community-engaged research. Finally, my commitment to engagement manifests in how I actively work to make connections across research communities (within my department, across departments, and ideally across institutions) so we are a united research community that is working together, not disjointed and duplicative. I think this connection across our research communities can show a genuine commitment by researchers that we actually do want to work together to address challenges in Baltimore communities.

Summary

The purpose of this chapter was to address research methodology, review outcomes of the embedded learning process, and discuss limitations of this method. This chapter also included background on the ethics that I used to settle on my methodology. I also confront the fact that embedded learning may not fall on the continuum of community-engaged research but could be considered a stepping stone in preparation for future community-engaged research if ethical considerations are taken into account. This chapter closes with a call for commitment to engagement that manifests not just outside the research community but within it. Community groups outside of academia may perceive researcher approaches with less wariness if they experience less disjointedness in research efforts; a united research community can show a commitment by researchers to try to reduce or eliminate challenges in Baltimore communities. In the final chapter, I will provide a brief summary of everything that was covered in the prior chapters and will also reflect on how my three themes (green space, funding, and environmental justice) have come together through this research process. I will then give some simple recommendations for actions that residents can take at the city/local or state level to support intersectional solutions.

Chapter 4: Conclusion

I came into this research knowing my themes of interest but was unclear about specific research questions. Overall, my biggest source of curiosity has been understanding the landscape of green space in Baltimore neighborhoods, funding opportunities and gaps, and environmental justice policy implications. This interest developed through my appreciation of urban green space, awareness of increased funding availability, concern about green gentrification, and overall commitment to environmental justice in neighborhoods by cultivating healthy environments to live, work, and play. Using embedded learning methods, I was able to connect across multiple communities that worked on a variety of themes and levels and pulled knowledge learned together to understand how these themes overlap in Baltimore, MD. With climate change and social justice being the challenges of our time, I sought to understand systems for change that encompassed these two burdens that weigh on neighborhood communities in Baltimore.

Revisiting chapters

In the first chapter, I introduced urban greening as a concept and environmental justice issue and used the Baltimore Green Network Plan to illustrate how green space development is promoted as a move toward justice. I transitioned to talking about urban greening outcomes, including benefits and disservices, before bringing

the focus back to neighborhoods experiences with greening projects. From there, I gave a brief history of disinvestment and demolition in Baltimore's Black neighborhoods to provide context for the current state of neighborhoods in Baltimore and why park space may be perceived as a bandage trying to cover up a larger injustice. The chapter closes with a discussion of who the urban greening actors are implementing projects today, what the funding streams are for urban greening projects, and how that funding is distributed. My goal in this chapter was to set the context for urban greening in Baltimore, who defines urban greening, and how, and whether, neighborhood communities consider urban greening projects as viable strategies for righting an environmental injustice.

The second chapter explores environmental justice, both as a movement and as an issue of policy. I explained both the historic and current context of how environmental justice is defined and translated into policy at the state and federal level. Within those policies I also sought to identify ways that urban greening was positioned. Over time, map screening tools have become more ubiquitous to environmental justice efforts and I specifically discuss two environmental justice screening tools, the Climate & Economic Justice Screening Tool (CEJST) and the MDE EJ Screening Tool, that are currently holding power in policy. I review multiple aspects of their development and application including how they implement policy, how they use indicators to identify spaces and places, and how greening and proxies for greening are incorporated into the tools. I closed the chapter by ground-truthing the tools in Baltimore to evaluate the inclusion of indicators within the tools. My goal

in this chapter was to provide policy history and current context for environmental justice screening tools and highlight how the tools identify areas in Baltimore.

In the third chapter, I address my qualitative research methodology, review the outcomes of the research process, and discuss the limitations of my method. This section also included additional background on how my research ethics influenced the methodology that I ultimately used. The chapter closes with a discussion of how embedded learning can be used as stepping stones on the path toward community-engaged research, but should not be confused with community-engaged research itself. My goal in this chapter is to emphasize the value of relationships in community-engaged research and our commitment as researchers not just to the communities we are embedded in for our research but also to our colleague community. Community groups outside of academia may perceive researcher approaches with less wariness if they experience less disjointedness in research efforts developed through a more united research community that shows researchers are actively interested in reducing or eliminating challenges in Baltimore communities.

I will be sharing opportunities for action in this final chapter that have come to my attention through my research process. I challenged myself, as part of my research process, to step outside of environmental circles and into adjacent circles to broaden my perspective on neighborhood green space, funding, and environmental justice. As a self-identified environmentalist, I'm interested in creating stronger connections

across mainstream environmental groups that have traditionally viewed issues through the lens of protection of nature and natural resources and social justice groups that view issues through the lens of supporting people and justice (see Image 6).

Image 6: Cartoon depicting the disconnect between environmental justice groups and mainstream environmental groups. This cartoon was originally drawn in the 1990s, but the challenge it captures continues in the present. (Drawn by Mark Gutierrez and originally printed in "We Speak For Ourselves", Alston 1990)

How can this disconnection be overcome? The actions I share in this chapter are intended to strengthen developing connections across advocating for the environment

and social justice in Baltimore. I want to acknowledge that I do not know all the positive work already being done in this space across Baltimore, and I have been most involved in places and groups near where I live.

Opportunities for action: City & neighborhood level

Support neighborhood housing to center community green space development

One way to counteract the perception of urban green space development as a band-aide for actual neighborhood investment is to support neighborhood housing. When I asked urban greening actors if they had concerns about their projects leading to green gentrification, some responded with examples of positive experiences they had when they were invited into neighborhoods that were also organizing around resident-led housing development. The Johnston Square neighborhood was specifically mentioned by multiple urban greening actors as a method of implementing green space projects that was perceived as reducing the threat of green gentrification. This perception could come from the fact that the neighborhood association is actively working on getting vacant homes rebuilt alongside the investment of community assets, like green spaces. Connecting green space development alongside housing development is not a new concept, but the intentionality of inviting greening implementers in to fulfill community-led visions is important for both project success and sustainability over time. I commend urban greening implementers who are already acting in this space and speak to the value of this approach.

Organizing neighborhood residents around housing interests is going to be important preparation with current city-wide efforts to invest at scale to reclaim vacant homes. With recent legislative wins for the BUILD One Baltimore Now! campaign, an organizing effort led by Baltimoreans United in Leadership Development (BUILD), there is a real opportunity for dedicated funding to address Baltimore's vacant housing at scale using a whole-blocks approach to redeveloping vacant homes in neighborhoods. This is an approach that has been piloted in east Baltimore neighborhoods, like Johnston Square, where community-leadership is a key part of approach success. Neighborhoods that are organized and have a plan for addressing housing issues where they live will be primed to benefit from this city-wide organizing effort. I urge urban green space advocates to see the potential for neighborhood revitalization from this campaign as not just encompassing housing but could domino into other neighborhood spaces like green space development if advocates are engaged.

For Baltimore residents, simple ways I have used to get informed on neighborhood housing include researching whether your neighborhood has a current housing plan or other neighborhood plan and attending neighborhood association meetings and/or related working groups focused on housing issues. This action is a call for those who are vested in green space development to ask themselves how advocating for housing can intersect with their green space advocacy.

Support land control & protection for neighborhood green space

Another issue related to neighborhood green space shared with me, and experienced personally, highlights the challenges around land control and protection. Many neighborhood green spaces are developed on city-owned properties through programs like Adopt-A-Lot, where residents can apply to adopt and improve properties to make them a community asset (BC-DHCD 2020). The challenge comes from the fact that these properties are still eligible for being sold or used for alternative purposes by the city, at which point residents lose access to the property (Miller 2022). This lack of control and protection does not align with the discourse around urban green spaces being a long-term investment adding to city-wide green infrastructure. Options for gaining land control and protection can include purchasing the land outright, working with the City to move an adopt-a-lot property off the more active sales list, or getting the lot protected under a land trust. These options vary in their level of protection, costs, and burden on local residents.

Because of this concern I started paying attention to organizing events related to land control and protection. One of the current efforts I see as having potential to positively impact land control and protection include the Campaign for Community Control organizing around land banking legislation for Baltimore City. Lank banking is a method of acquiring vacant lots and properties to make them accessible for redevelopment. The Campaign for Community Control is organizing to ensure the land banking legislation is designed so that Baltimore's properties are redeveloped for the best interest of community members according to community identified priorities

(Campaign for Community Control, n.d.). This campaign came out of a coalition building effort led by Fight Blight Bmore that, after convenings on multiple topics related to property issues and tools, centered around community control of land (Fight Blight Bmore 2023). Land banks can own properties, and stipulations can be put in place as to how properties can be acquired which can help with prioritizing community identified priorities being taken into account. Communities could advocate for specific vacant lots that could become available through the land bank to be prioritized for neighborhood green space.

An additional current effort I see has having potential to positively impact land control and protection include the Greenspace Equity Program, which will be launched in 2025 and is being led by the Maryland Department of National Resources. This will be a grant program specifically meant to support "community greenspace", like gardens, open space, woodland, parks, trails, and urban farms, in overburdened or underserved communities – both of which are highly represented in Baltimore. A variety of groups will be eligible for this funding, including land trusts, nongovernmental organizations located or already working in specified communities, and county or municipal agencies. The opportunity for this program to preserve, create and enhance community greenspace, by working with land trusts is a method for ensuring long-term sustainability. Land trust is a method of protecting land for a specific use that benefits the neighboring community and is a method for community to control how land is used. The Greenspace Equity Program will also require any land developed or improved using grant funding to be operated and maintained for

public use by the grant recipient for at least 15 years; this sets the intent of the program that any land receiving funding, whether or not it is part of a land trust, is protected as community greenspace for a set period of time. This program has the potential to support the development and protection of green spaces in Baltimore, and some proactive neighborhood education and organizing could lead to green space development and protection alongside housing investment, connecting with the previous action.

For Baltimore residents, simple ways you can get involved in advocating for land control and protection include reading relevant legislation (City Council Bill# 23-0363 – Land Bank Authority and General Assembly HB503 – Natural Resources – Greenspace Equity Program - Establishment), reaching out to City Council bill sponsors to ask for more information on how you can support this legislation, connecting with the Campaign for Community Control for educational resources and advocating opportunities, and making connections now with local land trusts (like the Charm City Land Trust and Baltimore Green Space) to create relationships and discuss possible partnerships related to the upcoming roll-out of the Greenspace Equity Program grant. This action is a call for those who are vested in green space development to ask themselves how ensuring green space longevity aligns with their green space advocacy.

Advocate for green space maintenance funding as a commitment to long-term success

A third issue related to neighborhood green space where action can be taken is related to green space maintenance and funding. Recent news coverage of urban tree planting funded by the Urban and Community Forestry Program, which as I mentioned earlier is associated with the Justice40 Initiative, includes statements that aligns with the discourse of greening as an infrastructure (Skirble 2024). Urban greening actors stated a want for "Baltimore residents to value tree cover as critical infrastructure like utilities and roads" and federal funders say they expect not only more trees in the ground, but also strategies for maintaining them (Skirble 2024). This alignment of funding with discourse around green spaces as an infrastructure investment creates a unique opportunity for communities who are benefiting from the projects.

This unique opportunity is that, at least for this specific funding opportunity, organizations are expected to provide maintenance as part of their work. And I think it is important that residents who live in communities where these projects are happening hold organizations to account for their maintenance commitment. For this specific project type, which is tree planting, I would even advocate for maintenance to be the prioritized action organizations take before planting new trees. Prioritizing maintenance would acknowledge voiced concerns that tree plantings become a burden on residents and show an investment in the longevity of all green infrastructure in a neighborhood, not just new green infrastructure.

This action is a call for those interested in accountability for green infrastructure discourse to ask how calling for different prioritization in greening funding spending aligns with respecting residents past experiences and concerns. As a Baltimore City resident, I plan to write an op-ed about the importance of prioritizing green space maintenance to show commitment to the discourse of green infrastructure.

Opportunities for action: State level

Request Justice40 Initiative funding tracking by state agencies to increase accountability

An opportunity for action at the state level is to request Justice40 Initiative funding tracking to increase accountability. As mentioned in Chapter 2, federal funding can be challenging to track because of methods for funding distribution. One of these methods is programs giving funding to states, and states distributing the funding, also known as formula funding. Because of this, I think there is opportunity for advocacy at the state level for Justice40 Initiative funding tracking and reporting. Actually, during a 2023 panel titled "Agency Report Back on Justice40 in the State of Maryland" that included representatives from state agencies under the Moore-Miller administration, statements were made by representatives about their intent in tracking funding from Justice40. By advocating for transparency about where Justice40 Initiative funding is being distributed at the state level, residents can show an understanding of the intent of the funding and hold state agencies to account in achieving that intent.

I would advocate for residents to connect with the Commission for Environmental Justice and Sustainable Communities as one option for requesting information on state Justice40 Initiative funding. This commission is charged with advising the State government agencies on environmental justice, which I think would give it standing to request publicly available reports giving details on Justice40 Initiative funding being distributed across Maryland. While the funding is connected to federal policies, which may be outside the commission's jurisdiction, making a request to support analyzing the effectiveness of the policy to address issues of environmental justice and sustainable communities does seem to fall under the commission's charge. The commission holds regular virtual meetings and includes on its agenda a time for public comment that could be used to present a request.

Advocate policy language that combines key indicators for environmental justice communities

Another opportunity for action is related to the way current environmental justice terms are used in Maryland policies. As I mentioned in Chapter 2, environmental justice advocates call for socio-economic and demographic indicators to be overlaid with environmental or other associated burdens, to identify areas that may be experiencing environmental injustice. While Maryland law includes definitions for overburdened and underserved communities, which environmental justice advocates call to be overlaid in screening tools, law language actually doesn't require this be done. This means that areas that are experiencing both overburdened and underserved

are not prioritized over areas that are singularly overburdened or underserved. I see this as a flaw in the use of the definitions that does not align with identifying environmental justice communities.

This action calls for Maryland residents to be cognizant of how the definitions for overburdened and underserved are being used in Maryland law and advocating to prioritize areas where the definitions overlap spatially; using AND language and not OR language. When these definitions are included in Maryland legislation, residents have the ability to ask sponsors clarifying questions as to why they are including specific language. In these situations, I would also encourage a dialogue with advocating organizations to understand their interpretation on the use of this language and whether they want to advocate for AND rather than OR language.

Why a call to action

I want to take a moment to point out that most of the actions I outlined above are not a check-the-box solution. These are not a single task that can be completed and will lead to instant results and success. That is because this is the reality of organizing and making changes in our society; it relies on people consistently showing up, speaking out, and following up. Sonia Eaddy, an organizer for over 20 years in the Baltimore Poppleton neighborhood, captured the essence of this in a recently published quote referring to ongoing organizing for community-influenced development: “This is something that people have to understand […] You are your own savior.” (Miller

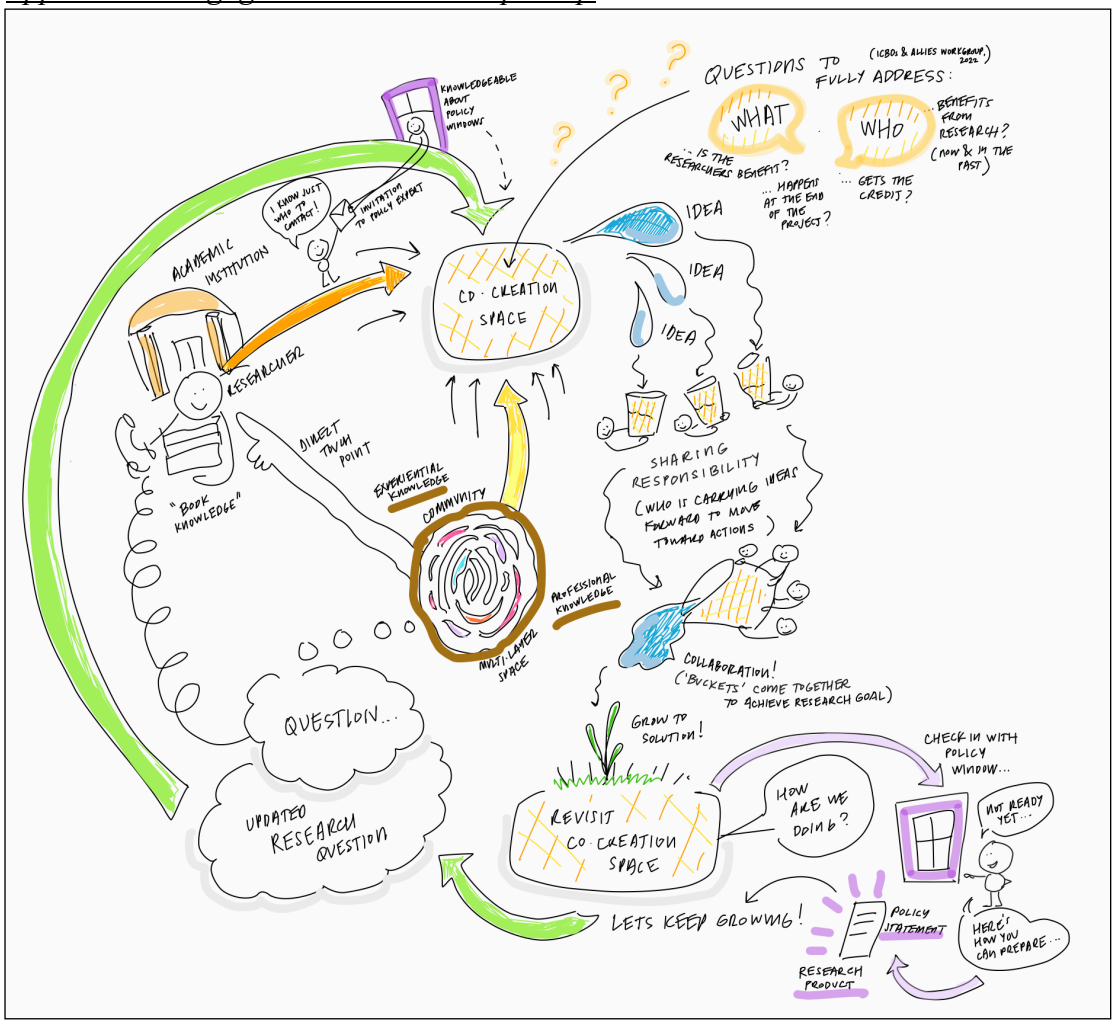
2024) While we live during a transformational time for environmental justice, advocates know that work still needs to be done to make transformations happen. That is what this quote captures for me and what inspires me to invest my time and energy in the actions I've outlined above.

Rethinking planting money

Revisiting the Green Network Plan and the planned pilot projects that have yet to be realized, I contemplate if this could be because green space, funding, and environmental justice were not truly united. With climate change and social justice being the crises of our time, merging these three themes together would be a commitment to addressing these challenges together, and not as separate challenges that happen to overlap. In addition to ensuring recent environmental justice funding opportunities benefit the intended communities, we also need to be investing in advocating for changing systems so that investments we make have long-term sustainability. In Baltimore this could look like advocating for land ownership and protection of green spaces alongside investment for vacant redevelopment into housing. I'm excited by the call from environmental justice leaders that we live during a transformational time; this research attempts to realize, call out, and make connections across systems to grasp at that funding falling from the sky and plant it in places and spaces where it is intended.

Appendices

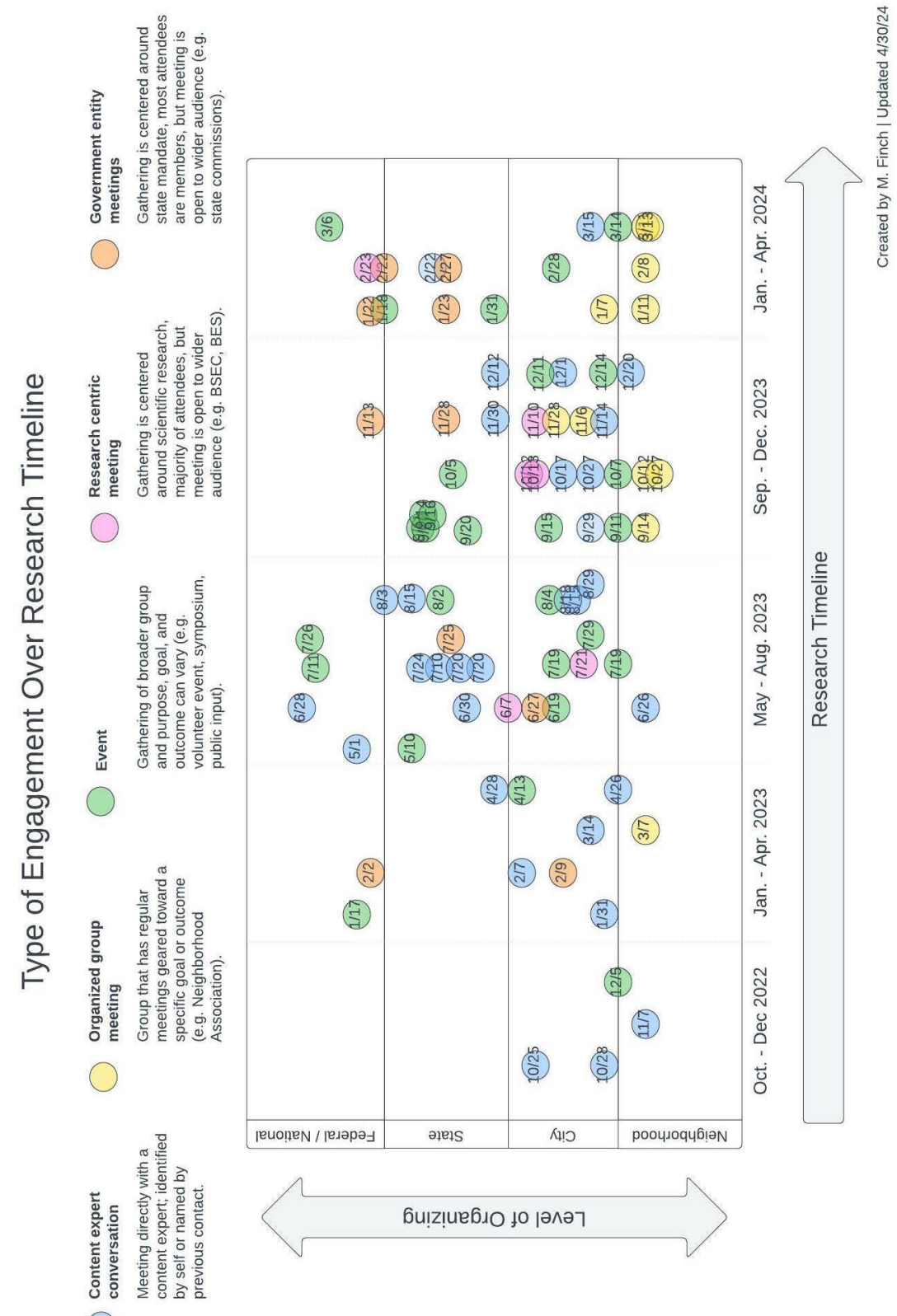
Appendix A: Engaged Research Concept Map



This Engaged Research Concept Map was developed through an iterative process during the ICARE "Engaged Research in the Environmental Sector" and is meant to capture an engaged, co-produced research process. My concept map illustrates research coming from and revolving around a center point, which is a multi-layered community space with lots of knowledge types. Researchers with book knowledge connect with a community group about a question and these two groups move to a co-creation stage where they work together to develop research questions. These questions are used to develop ideas that the research group can use to answer the research questions. Responsibility is shared amongst all research team members to carry different ideas forward to answer research questions, and all members of the group come back together to collaborate as part of the research process. When everyone returns to the co-creation space, they can check in on how they are doing and make changes as-needed to ensure they are reaching the agreed upon goals, or shift goals if there is a need for change. There should be regular check in with policy windows to see if a research product could inform policy action, which can be supported by a policy professional working on a similar topics. Once original

goals are reached, the research team may decide that they want to update research questions and continue this iterative process.

Appendix B: Community Engagement Timeline

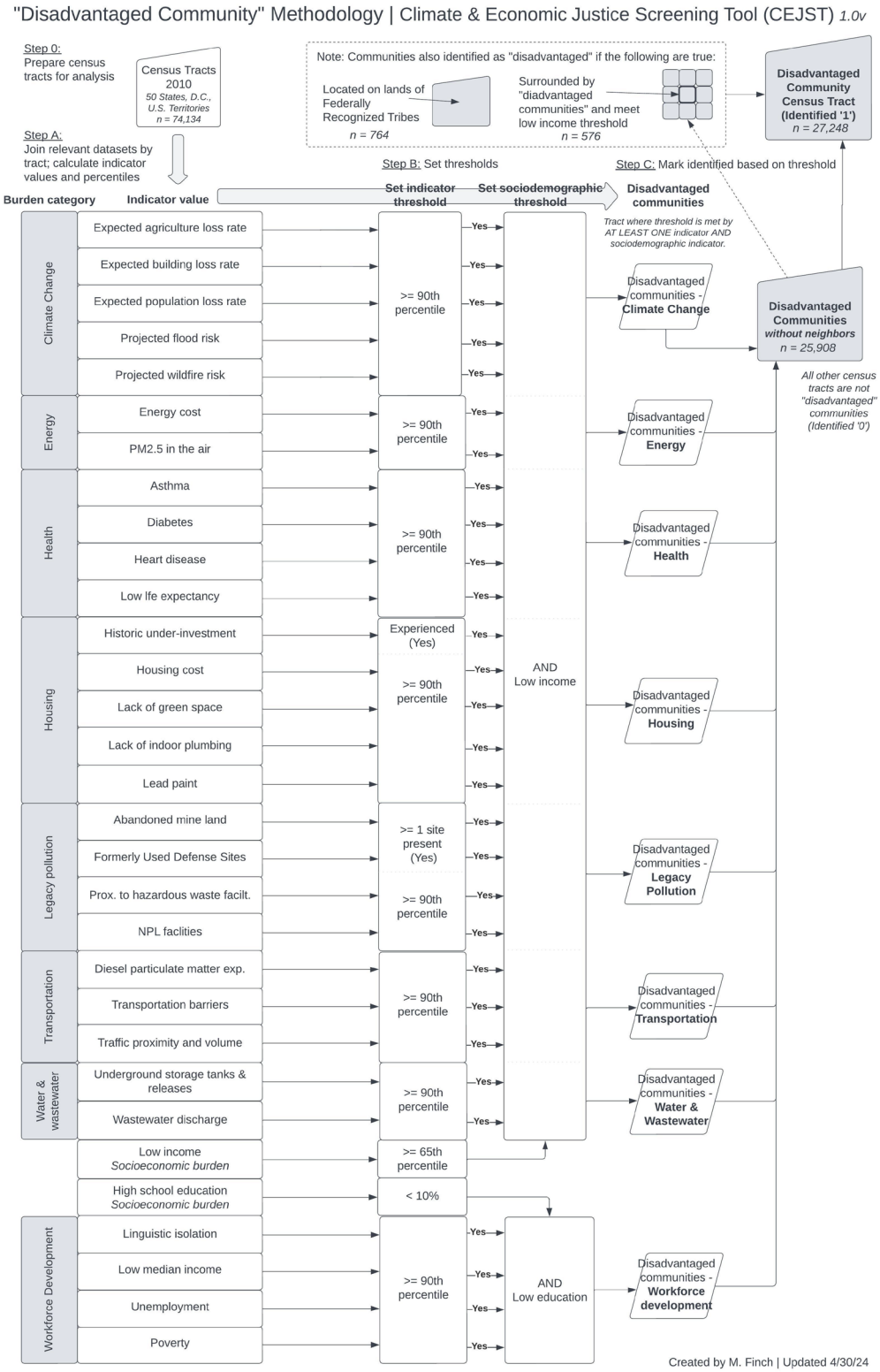


Appendix C: Environmental Justice & Policy Timeline

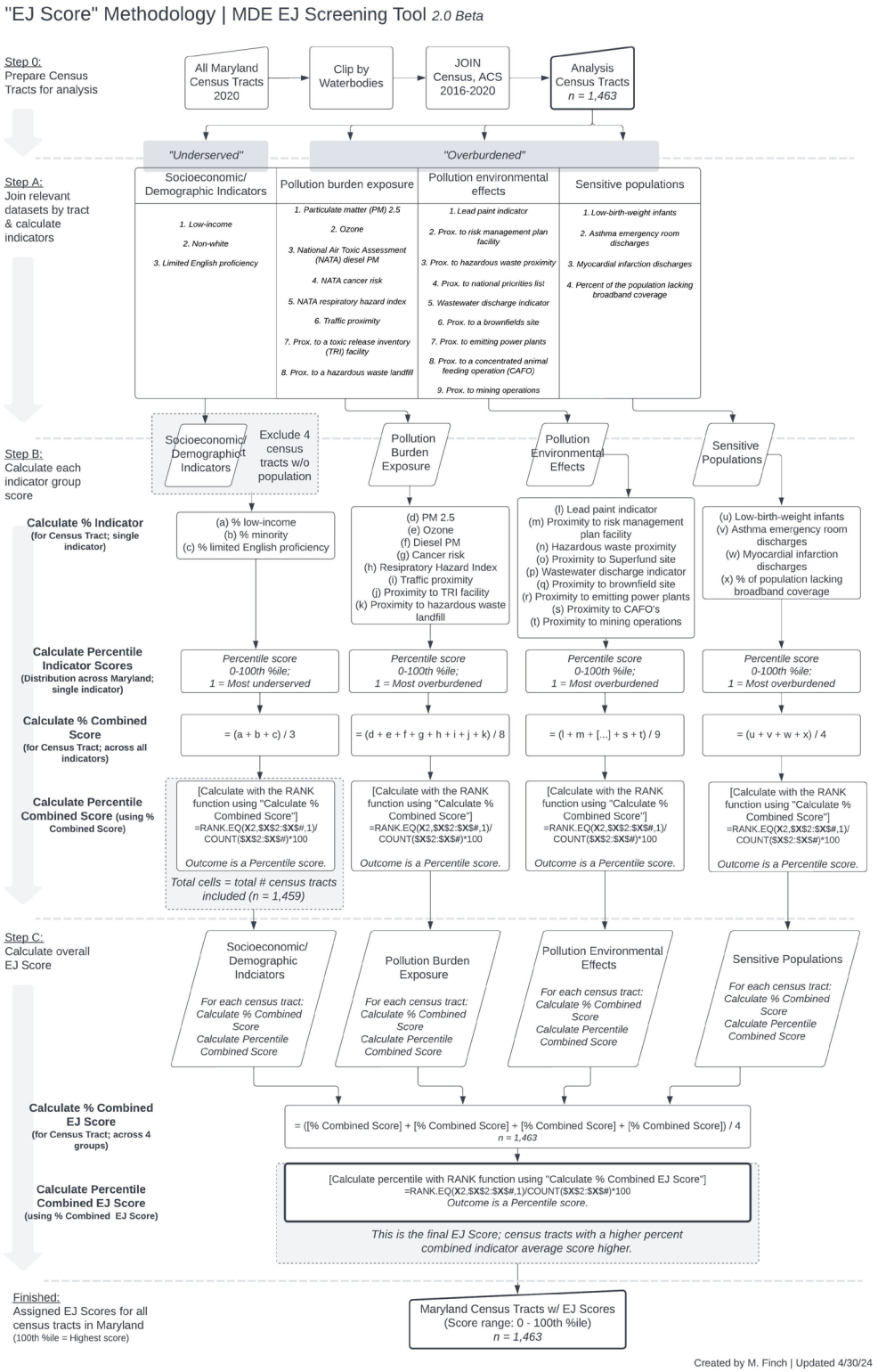
Environmental [In]Justice Timeline / Milestones				
Year	**Environmental Justice Movement**	**Federal Government**	**Maryland State Government**	**Environmental Justice Screening Tools**
1937		Federal Housing Administration creates a mortgage assistance program that excludes Black and African American citizens. **Home Owners' Loan Corporation (HOLC) "security" map developed to designate urban areas "risky"** for investment enable racial discrimination; code designated areas with large proportion of Black residents as risky for investment.		
1964		**Civil Rights Act of 1964 - Title VI** which prohibits discrimination on the basis of race, color, or national original in any program or activity that receives Fedreal funds or other Federal financial assistance.		
1965		**Voting Rights Act of 1965**		
1966				
1968		**Fair Housing Act of 1968** - Prohibited several discriminatory practices with housing		
1969				
1970		**National Environmental Policy Act (NEPA)** enacted; requires federal agencies to assess the environmental effects of proposed actions prior to making decisions (environmental, social, and economic)		
1982	Warren County residents protest NC decision to dump soil contaminated with cancer-causing chemicals (PCBs) in a landfill located in a Black farming community; protests were held every day for six weeks to block trucks and more then 500 people were arrested. Dumping moved forward dispite protests.			
1983		**General Accounting Office investigation report** on socioeconomic and racial composition of communities living near four major landfills in the southern U.S.		
1987	**United Church of Christ Racial Justice Commission report - Toxic Wastes and Race report** - Finds that race to be the most signfiicant variable in predicting the locations of hazardous waste facilities; first national study to correlate waste facility siting and race.			UCC report includes map.
1988		**Fair Housing Act of 1968 - Amended**		
1989				
1990	**"Michigan Coalition" held first meting on Environmental Justice with EPA Administer William Reilly** - First of four meetings. **Letter to 'Big 10' environmmental organizations calling on them to dialogue with activists of color** - makes demands to address environmental crisis impacting communities of color and to hire people of color on their staffs and boards of directors.			
1991	**First People of Color Environmental Leadership Summit** in D.C.; 17 principles of environmental justice developed and adopted. Broadened EJM beyond antitoxics to include issues of public health, worker safety, land use, transportaiton, housing, resource allocation and community empowerment.			
1992		**Environmental Justice Act of 1992** - Introduced in the Senate; related to information access and disignating Environmental High Impact Areas to counties with high weight of toxic chemicals present. **EPA publishes *Enviornmental Equity: Reducing Risks for All Communities*** - One of the first EPA reports to acknowledge environmental disparities by race and class. **EPA Office of Environmental Equity** established by President George H.W. Bush (later to become the Office of Environmental Justice)		

1993		**Environmental Justice Act - Redrafted and reintroduced** - Included identifying areas of high impact from toxic chemicals, clear enforcement initiatives, community participation requirements, and a report on identificaiton and prevention of human impact related to toxic chemicals. **National Environmental Justice Advisory Council (NEJAC)** established; includes 25 members and provides independent advice and recommendations for environmental justice issues to the EPA		
1994	University of Massachusetts issues study, funded by Waste Management Inc., challenging siting demographics. *This study triggers the first wave of attacks on environmental justice and challenges people of color having higher impact from pollution facilities.*	**President Clinton signs EO 12898 - "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"**; formalized "environmental justice" as a term in the federal government, requires federal agencies to develop EJ strategies, and established Interagency Working Group on EJ. Specifically mentions "minority populations and low income populations" in EO language.		
1995	Environmental Justice Fund was founded by six networks to promote the creation of alternative funding strategies to suport grassroots EJ organizing.			
1996				
1997		**President Clinton issues EO 13045 protecting Children from Environmental Health and Safety Risk.**	**HB1350** - Established MD Advisory Council on Environmental Justice (MACEJ); short term council to conduct EJ study and provide recommendations to General Assembly	
1998		**EPA's Office of Civil Rights (OCR) issues its *Interim Guidance for Investigating Title VI Civil Rights Complaints*** - Provided a framework for processing environmental discriminiation complaints.		
1999			**MACEJ delivers report on study with recommendations to Governor & General Assembly**; commission is disbanded per language in establishment.	
2000				
2001	U.N. Commission on Human Rights lists living free of polluiton as a basic human right.		**EO 01.01.2001.01** (Gov. Glendening)establishes the Commission on Environmental Justice and Sustainable Communities (CEJSC) for 3 years (may be extended additional 3 yrs.)	
2002	**CA voters pass Proposition 40, the largest resource bond in United States history**, which provides billions in fundin for parks, clean water and clean air, with unprecendented level of support among communities of color and low income.			
2003		**U.S. Commission on Civil Rights (USCCR) held hearings and release a report on enviornmental justice** - Released report (*Not in My Backyard: Executive Order and Title VI as tools for Achieving Environmental Justice*) that concluded that minority and low-income communities are most often exposed to multiple pollutants from multiple sources and there is no policy on cumulative risk when assessing risk.	**HB970** - Commission on Environmental Justice and Sustainable Communities - Codified the commission in MD law.	
2004	Warren County landfill PCB detoxification process, started in the mid-to-late 1990s, official completed; in all, the cost to detoxify was $17.1 million.	**EPA evaluation report by the Office of Inspector - *EPA Needs to Consistently Implement the Intent of the Executive Order on Environmental Justice*** - General found agency not meeting the directive of EO12898; main concerns included no nationally consistent definition of disproportionate impact. **NEJAC voiced concern for standardized definition and inclusion of low-income groups**; standardization considered a threat to cumulative impacts.		
2005	Hurricane Katrina hits New Orleans exacerbates decards of environmental injustices in the Deep South and New Orleans. Toxic chemical and oil spills, urban landfills developed for volume of debris.	**U.S. Government Accountability Office report, *Environmental Justice: EPA Should Devote More Attention to Environmental Justice When Developing Clean Air Rules*** - criticized EPA for handling environmental justice issues when drafting clean air rules; EPA proposed excluding race as a factor in identifying and prioritizing populations that may be disadvantaged by the agencies policies.		**EPA Environmental Justice Strategic Enforcement Assessment Tool (EJSEAT)** released internally in the mid-2000's; calcuated score that ranked census tracks for "environmental justice potential"

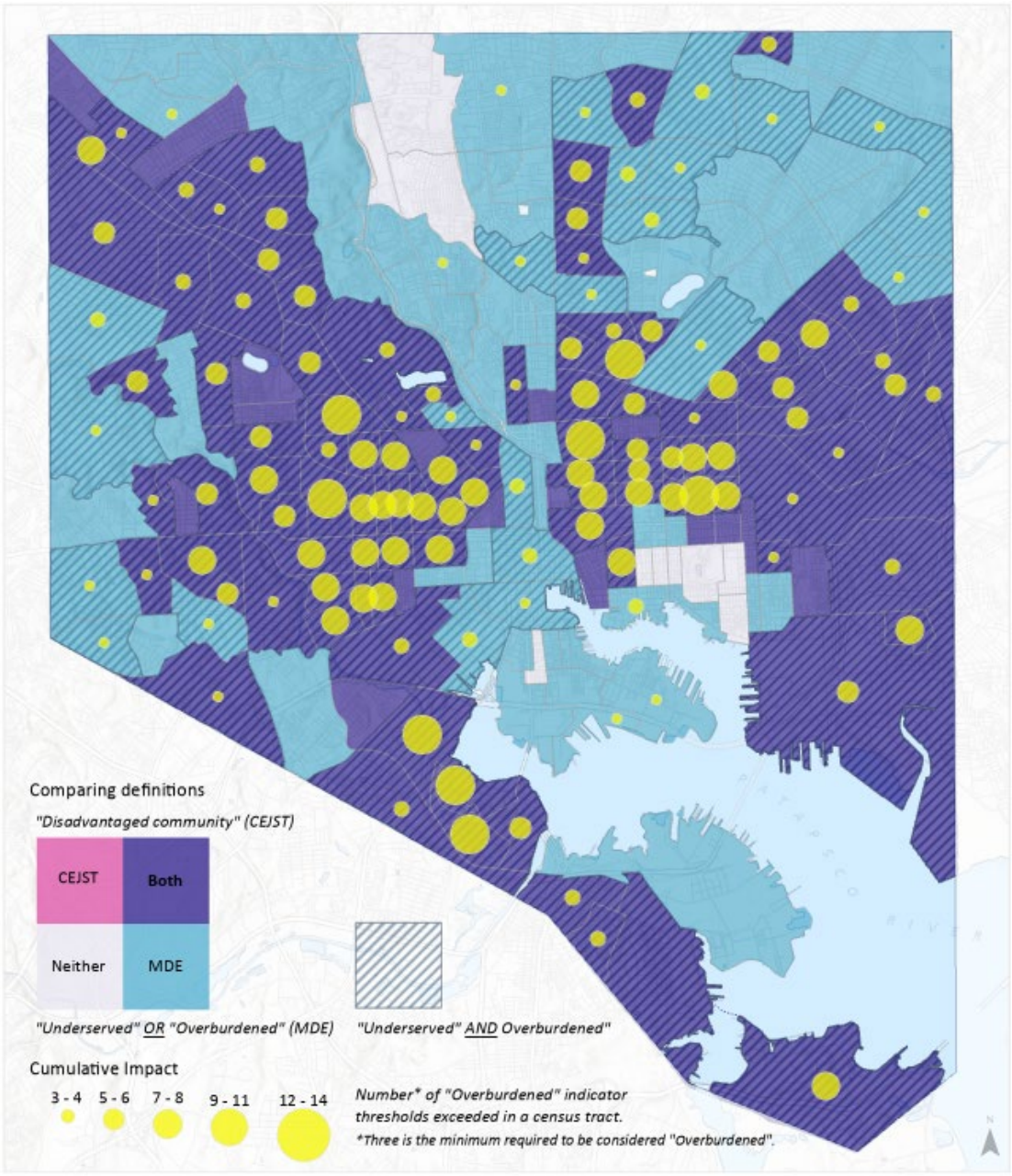
Appendix D: Climate & Economic Justice Screening Tool Methodology



Appendix E: MDE Environmental Justice (EJ) Screening Tool Methodology



Appendix F: Comparing CEJST & MDE EJ Screening Tool and Definitions



This map compares and critiques EJ screening tool definitions (CEJST and MDE) in Baltimore. Census tract fill colors represents whether an area is selected by one, both, or neither of the tools using policy definitions. Yellow circles represent the cumulative impact of environmental burden on census tracts by summarizing MDE overburdened indicators by census tract. Hatch fill represents areas that are both underserved and overburdened, according to MDE, which includes both sociodemographic and environmental indicators defined in Maryland's codified law. Environmental justice advocates call for the overlay of sociodemographic indicators and environmental indicators and to identify areas of

environmental injustice and that cumulative impacts be used to prioritize areas for investment. (Created by M. Finch; Data source: USDS, MDE, USGS, Open Baltimore, Esri)

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