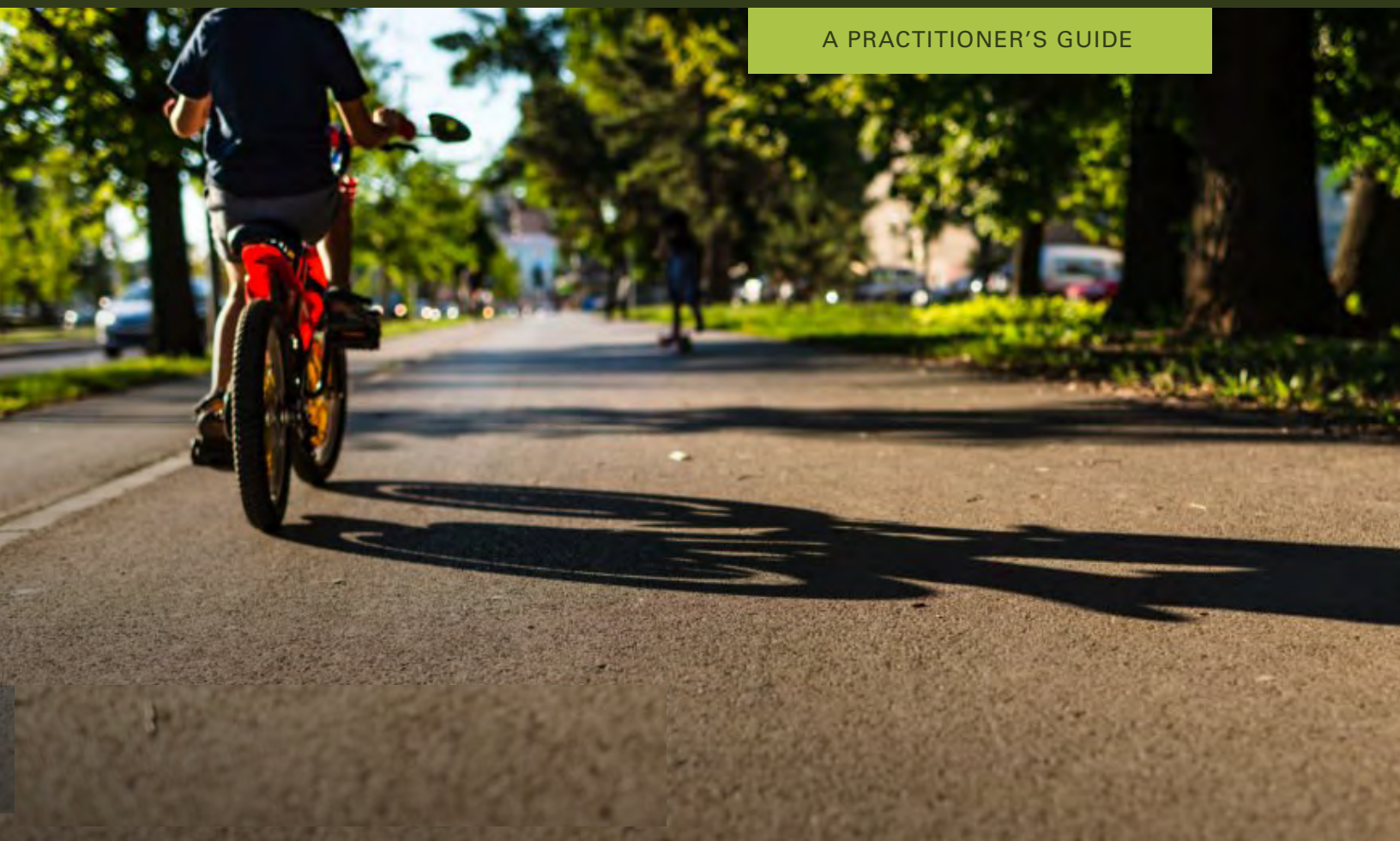
Equitable and Community-Centered Urban Tree Planting

A PRACTITIONER'S GUIDE



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EXECUTIVE SUMMARY

Trees provide a variety of ecological, health-related, and economic benefits to urban communities, but those benefits are not always enjoyed by everyone. As more cities around the world invest in tree planting programs, it is critical to ensure that these programs and outcomes are community centered and accessible to diverse populations. But advancing outcomes that benefit everyone in urban greening has been difficult for many reasons.

In some historically disinvested communities, where legacies of exclusion and neglect have persisted, negative perceptions of trees and tree-planting organizations can make progress difficult. Broader unintended consequences of greening initiatives, such as green gentrification, also raise concerns among many local residents. In this guide, we examine the causes of inequities in tree-planting and explore potential solutions through an environmental justice (EJ) framework focused on distributive, procedural, and recognition justice.

To do this, our team of researchers at North Carolina State University, in partnership with university, government agency, and non-governmental collaborators across the United States conducted a project from 2020-2023 to understand the social and cultural factors influencing urban greening initiatives. To explore these themes, we used a combination of literature review, national surveys and focus groups with urban and community forestry professionals, and a local case study of public perspective regarding urban tree-planting in Louisville, KY.

Through the combination of our results and conclusions from previous studies, we have identified effective practices, along with specific actions, to guide tree planting efforts in diverse urban communities. The recommendations for practitioners hoping to maximize social equity in tree planting initiatives include the following…

Recommendations to Maximize Social Equity in Tree Planting Initiatives

01

Prioritize equitable tree planting in addition to efficient tree planting.

In many cases, the success of a tree-planting initiative is measured based on the number of trees planted. But this emphasis on efficiency and ecological benefits can be at the expense of equity and distributive justice, particularly when social factors are not adequately considered in the planning process. Integration and consideration of social factors can take more time, but it typically leads to more sustainable outcomes for a broader array of communities..

Potential actions include completing EJ trainings to better understand key dimensions and expanding programs to include renters and other marginalized groups.

02

Seek community input and actively engage local residents in tree planting efforts.

The key to effectively achieving procedural justice is to ensure that community voices are included in planning and decision-making processes. Historically, many tree-planting programs have progressed without adequate public input, fueling animosity and conflict. By inviting community input early and throughout in the process, practitioners can ensure they are greening with, not just within communities.

Potential actions include creating local advisory boards, increasing buy-in through community events, and facilitating conversations in priority neighborhoods.

03

Build trust with residents by intentionally documenting and integrating their values and needs related to trees.

In historically disinvested communities, residents may express a lack of trust in institutions that plant and care for trees. This is problematic because successful collaborative management of natural resources relies on trust, particularly in underserved areas. One important way to build trust with residents is to intentionally document their values and needs related to trees, and then design programs around those values and needs.

Potential actions include fostering open and transparent communication to gather diverse perspectives and integrating these "tree stories" into management and decision making processes.

04

Identify barriers to tree planting success and allocate or secure resources to overcome them.

Urban and community forestry professionals must realize that not everyone feels the same way about trees. This is a key component of recognition justice often overlooked in urban tree-planting efforts. Perceptions of trees can stem from geographic context, diverse cultural values, different legacies and historical connections to the land, and power disparities commonly associated with conservation efforts. In many communities, trees are a lower priority than more pressing needs such as food security or transportation equity.

Potential actions include encouraging community reflections on tree-planting initiatives and the social benefits of trees, providing resources related to tree care, and initiating community-driven tree stewardship programs.

05

Create collaborative tree maintenance and stewardship programs with community partners to ensure tree survival and health in the long-term.

Concerns about maintenance issues were the top reason Louisville residents cited for turning down free tree plantings on their property. In historically disinvested neighborhoods, costs for maintaining trees–including removal of hazardous and/or dead trees–can be prohibitive. Collaborative tree stewardship programs can minimize these concerns and increase acceptance of new planting, helping to lower the cost of tree maintenance for low-income and otherwise marginalized communities.

Potential actions include working with existing networks (e.g., Treesilience) to create a grassroots tree stewardship program.

06

Form partnerships with local governments, community organizations, non-profits, and businesses to plan, implement, and evaluate tree planting and stewardship efforts.

Because urban greening is a complex process with many positive and negative consequences to consider, no organization can effectively do this work in isolation. Partnerships empower stakeholders and increase investment across different segments of the community that can build capacity. If a tree-planting organization does not represent the communities it serves, then strategic partnerships can help to bridge those gaps and create a strong sense of diversity and inclusion.

Potential actions include strategically partnering with diverse organizations (including NGOs, government agencies and businesses) to achieve mutual goals and leveraging those partnerships to increase funding and create sustainable volunteer programs.

07

Continue to work with communities and monitor success—in terms of ecological AND social outcomes–after trees are planted.

Many tree-planting organizations excel at getting trees in the ground in neighborhoods that need them. Unfortunately, enthusiasm and funding often wane after the initial push of a tree planting effort, leaving communities to pick up the pieces as tree survival rates decline and maintenance problems escalate. Overcoming the challenge of caring for and maintaining urban trees over time is critical—particularly when the cost of stewardship falls on local residents.

Potential actions include developing and monitoring a variety of EJ-inspired measures of success to ensure that long-term goals are being met.

SECTION ONE

LAYING THE GROUNDWORK FOR EQUITABLE GREENING

Why plant trees in cities?

Ecological Benefits

Trees provide a variety of ecological benefits such as temperature regulation, improved air and water quality, stormwater filtration, erosion control, and wildlife habitats [1,2,3,4]. They can also mitigate effects of climate change by reducing the impacts of heat waves and droughts and sequestering carbon [4,5], helping cities adapt to environmental change and enhancing climate resilience.

Health & Social Benefits

Trees can beautify human-dominated landscapes and provide a sense of privacy, while also bringing communities together and enhancing human health and well-being [6,7,8,9]. Some research suggests trees can reduce crime in cities [10]. Proximity to trees can also contribute to emotional fulfillment and stress recovery [11,12].

Economic Benefits

Trees provide unique economic benefits such as increased property values and enhanced urban food production, as well as products made from reclaimed urban wood [8,13,14]. Given all of these factors, cities around the world are increasingly motivated to expand and invest in tree planting programs [5].

Urban trees benefit communities in multiple ways. Yet, despite the growing enthusiasm for tree planting around the world, these efforts often experience challenges. In many cases, trees are not as warmly received by urban residents as they are by the people and organizations who lead tree planting initiatives [15].

For example, people may believe the negative impacts generated by trees—such as maintenance costs and property damage—outweigh any potential benefits [16,17]. Some researchers have also pointed out common pitfalls of tree planting efforts—such as long-term funding constraints and the need for ongoing tree care and maintenance [18].

As a result, despite the benefits that trees provide, tree planting initiatives often face a variety of social challenges. In the remainder of this guide, we explore some of those challenges and how they might be addressed.

Inequities in Tree Planting and Greening

Trees are often seen as a "universal good" because of the environmental and social benefits they provide [19]. Although everyone should be able to benefit from trees, many neighborhoods do not experience equal access to healthy trees and other forms of greenspace [20]. These inequities exist for a variety of reasons [21], and they can be exacerbated if tree planting plans and policies do not adequately account for both historical factors and contemporary forces that shape urban landscapes (Figure 1).

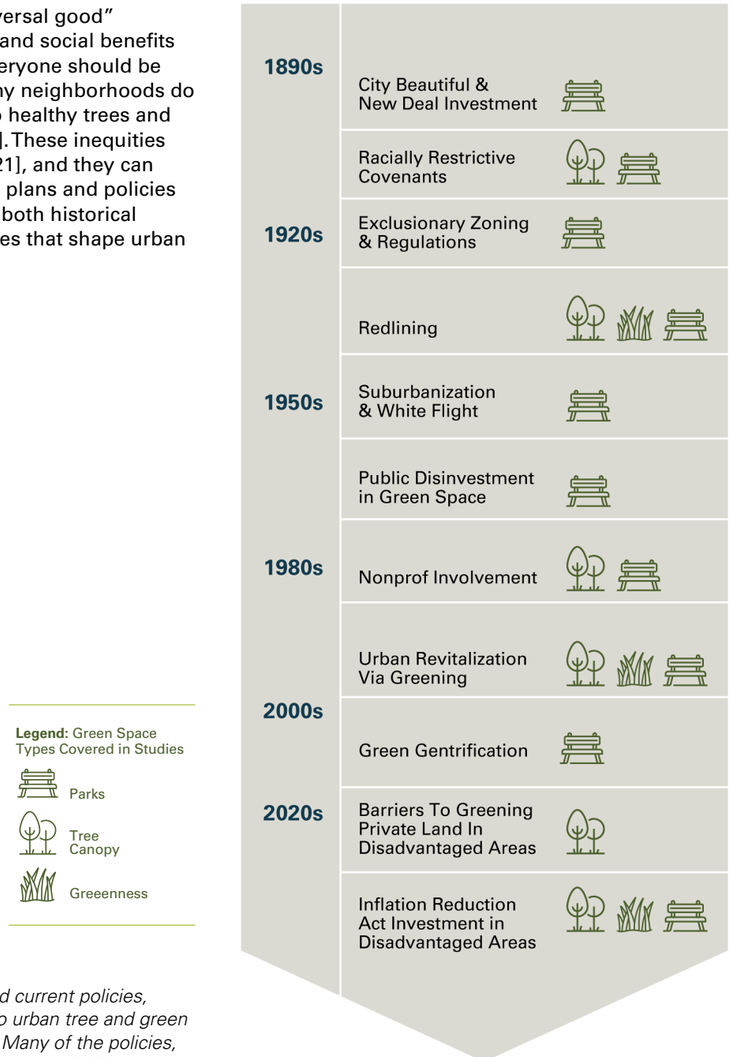


Figure 1. Summary of historical and current policies, plans, and practices contributing to urban tree and green space inequities in the U.S. cities. Many of the policies, practices, and forces that emerged before 2000 continue to influence the provision of urban greenspace today. Adapted from Osei Owusu & Rigolon 2024 [21].

Redlining and "White Flight"

Redlining was a discriminatory housing practice from the 1930s that consisted of denying mortgages, loans, and other financial assistance to residents due to their race and/or ethnicity [22]. It was used throughout the United States to segregate minority communities to areas linked to poverty and environmental hazards—directly contributing to environmental injustices [23]. Redlining coincided with "The Great Migration" of over 6 million African Americans from the southern U.S. to other parts of the country to escape racism and seek jobs and educational opportunities in industrial cities between 1910-1970 [24]. In response, mostly upper-class, high-status white residents left the city and relocated to the suburbs–a phenomenon known as "white flight"- resulting in a reduced tax base and indirectly contributing to further deterioration of the social and physical environment in the central cities [25].

Although the Fair Housing Act in 1968 prohibited redlining, the consequences of this policy and "white flight" to the suburbs continue to have lasting effects in many neighborhoods and deprive many urban residents of access to healthy and safe trees, parks, and the benefits that nature provides [26]. For example, research shows historically redlined neighborhoods today have, on average, about half the tree canopy coverage as their wealthier counterparts [27]. Proactive and strategic policies are needed to combat the legacy of redlining and "white flight" and redress past injustices. Even after redlining ended, other racially restrictive forms of housing policy kept city neighborhoods segregated by race, deepening inequalities in urban environments. [28].

Climate Change

As the impacts of climate change intensify, there is an urgent need to adapt and address rising temperatures, extreme weather events, and other related challenges in cities. Urban heat islands pose a serious threat to residents due to the high concentration of buildings, pavement, and metallic surfaces that absorb and retain heat [29]. This causes increased risk of air pollution, high energy costs, and heat-related illnesses or mortality—effects that are more pronounced in historically redlined neighborhoods [30]. The concept of climate justice acknowledges that climate change can have disproportionately harmful social, economic, and public health impacts within these historically disinvested communities [31]. Many cities have turned to tree planting initiatives to combat climate injustices by increasing canopy coverage and enhancing the ecosystem services that trees provide (e.g., air quality, flood management, wildlife habitat), ultimately building climate resilience in the face of global change. [32]. However, tree planting initiatives meant to provide these benefits can also bring about negative consequences as well.

Green Gentrification

If not managed properly, a well-intentioned effort to improve neighborhoods through greening can bring rise to green gentrification. Green gentrification is the process whereby current residents are displaced by more affluent individuals when a neighborhood's natural amenities (e.g., trees, trails, parks) change, boosting property values and limiting affordable housing [33]. When gentrification causes property values and taxes to rise, original residents may be forced to leave. Therefore, in cases where environmental enhancements such as tree planting are successful, they may ultimately exclude the populations who need them the most [34]. Acknowledging the ways in which green gentrification can fuel disproportionate access to green space is crucial when engaging in tree planting to help communities in need.

Addressing Inequities: The Environmental Justice Framework

As we search for solutions to problems of inequitable greening, one tool may be particularly helpful. **The Environmental Justice (EJ) Framework links environmental issues to social factors such as race, class, and gender** [35].

The dimensions of EJ explain not only the need for fair distribution of environmental goods and benefits (i.e., distributive justice), but also acknowledge how communities experience or value these natural resources (i.e., recognition justice) and the ways in which communities can engage in decision-making processes (i.e., procedural justice)[35].

The EJ framework (Figure 2) is one that policy makers and practitioners can incorporate when planning, initiating, and evaluating their urban greening efforts, and it is described in more detail to the right.

Figure 2. The three dimensions of the Environmental Justice Framework

1. Distributive Justice

Do communities have equal access to healthy trees and the environmental services they provide?

Distributive justice focuses on the objective and quantitative measurements of inequities across communities and is typically the EJ dimension most people consider first [19,35]. It examines how environmental resources and opportunities are allocated across a landscape, describing who benefits and who is burdened [36]. But it's not just about where trees are located. Research has also shown that green spaces in working-class and lower-income neighborhoods have historically been have historically been under-maintained, of lower quality, and smaller in comparison with those in more affluent neighborhoods [37].

Many tools have been developed to describe and address these disparities. For example, the Tree Equity Score developed by American Forests can help organizations understand distributive justice of trees in the communities they serve. While this dimension helps to illuminate disparities and facilitate efforts to rectify disproportionate distribution of resources, other dimensions can help to address the root causes of these problems.

2. Procedural Justice

Are all groups meaningfully included and represented in decision making processes?

Procedural justice establishes the need for equitable access to decision-making processes that promote fairness—especially for people who are historically marginalized, such as Black, Indigenous, and People of Color (BIPOC) and low-income communities [19]. This dimension examines how institutions determine who participates and has the power to make decisions [3]. It ensures that all relevant voices are included and engaged in planning processes, and that their priorities are integrated into decision making. This can foster the creation of social networks and social capital while building trust.

Rather than opting for a one-size-fits-all solution that rarely works across a range of diverse neighborhoods, efforts that are co-produced with community members can provide new perspectives and values that contribute to the long-term success of a tree-planting initiative [38]. This also encourages the community members to feel more invested in the success of an initiative.

3. Recognition Justice

Do people feel like they belong in a place? Are their values recognized?

The communities that tree-planting organizations serve are diverse, and so are their perspectives regarding urban trees. Recognition justice emphasizes a sense of place and belonging by recognizing unique geographic, cultural, and community identities [35]. This dimension acknowledges diversity between and among groups to best represent their local histories, values, wants and needs [19].

For example, while some view trees as assets, many residents may be less aware of ecosystem services (i.e., benefits) and more familiar with the problems that trees generate on their property (e.g., maintenance costs)[16,39]. Practitioners should avoid making assumptions and instead seek ways to enhance inclusion and empowerment by aligning tree-planting efforts with local values and preferences.

SECTION TWO

RECOMMENDATIONS FOR TREE PLANTING SUCCESS

Volunteers from Louisville Grows plant trees to restore urban green spaces, with one participant wearing a Lorax costume, bringing Dr. Seuss's message to life by "speaking for the trees" through action.

Research can help us understand how to effectively integrate EJ principles into urban tree planting efforts. From 2020 to 2023, our team at NC State University collaborated with universities, government agencies, and NGOs across the United States to study challenges and opportunities related to equitable urban greening.

Funded by the U.S. Forest Service's National Urban and Community Forestry Grant program, the project used a variety of research methods to understand the social and cultural factors influencing the success of urban greening interventions. **See the Appendices in this Guide for more details about the research methods and key findings that informed the recommendations described below.**

Based on our review of the tree-planting literature and the evidence we collected from practitioners and diverse residents at multiple scales, we identified several recommendations for public (governmental) and non-governmental organizations hoping to engage in more equitable tree planting practices. Other studies have outlined ways to increase the success of tree-planting efforts [40,41,42], but few studies have focused directly on the integration of social equity and EJ concerns throughout the process [43]. We hope the recommendations that follow, developed with insights with Fair Forests Consulting, help urban and community forest professionals achieve their equitable greening goals while fostering distributive, procedural, and recognition justice.

RECOMMENDATION

01

Prioritize equitable tree planting in addition to efficient tree planting.

In many cases, the success of a tree-planting initiative is measured based on the number of trees planted or the ecological benefits generated [44]. Those goals, coupled with funding constraints and grant timelines, often force organizations to prioritize efficient tree-planting in "easy-to-plant" areas. But this can be at the expense of equity and distributive justice, particularly when social factors are not adequately considered in the planning process [41]. Integration and consideration of social factors can take more time, but it typically leads to more sustainable outcomes—particularly in areas where tree planting has been challenging in the past."

Potential Actions:

1. **Consider joining the Alliance for Community Trees to have access to their Environmental Justice training series, facilitated by Fair Forests Consulting.** Lessons include "developing an action plan and measuring success," and "building trust to advance urban and community forestry."

2. **Expand programs to include renters and rental property owners/managers to reduce socioeconomic gaps in canopy coverage.** Urban forestry departments and NGOs can facilitate dialogue between renters and property owners to increase renter involvement in tree planting and stewardship programs. Consider using this questionnaire to help engage with renters and property owners/managers in dialogue about tree planting.

3. **If large-scale, private land plantings are not possible, then try smaller-scale efforts along road medians, sidewalks, and right-of-ways where trees are needed the most.** Collectively, these smaller planting efforts can make a big difference in neighborhoods with low canopy coverage.

Seek community input and actively engage local residents in tree planting efforts.

RECOMMENDATION

02

The key to effectively achieving procedural justice is to ensure that community voices are included in planning and decision-making processes [19]. Historically, many tree-planting programs have progressed without adequate public input, fueling animosity and conflict [15]. When input is available, if often comes from higher-income, outspoken homeowners who live in areas where higher tree canopy coverage already exists. These problems become worse when urban and community forestry professionals make assumptions about what all residents need and want based on input from a few. [41,45]. By inviting community input from diverse voices early and throughout in the process, practitioners can ensure they are greening with, not just within communities.

Potential Actions:

1. **Engage local advisory boards** to guide the process and facilitate community interactions. But keep in mind that individual-level engagement and interactions when planting are important too.

2. **Increase buy-in** through community meetings, volunteer events, tree care workshops, and door-to-door canvassing. Work with groups like homeowners' associations where applicable. When scheduling events, consider hosting them at different times to accommodate the variable preferences and needs of different stakeholder groups (for example: people who might require childcare, people who might work on weekends, etc.)

3. **Host walks in priority neighborhoods** and ask residents about their thoughts and feelings regarding trees in the area, including what they like, what they would like to see improved in the future, as well as how they can help. Consider using this observation form as a template to create a survey that can be distributed electronically (e.g. via a QR code advertised on flyers, newsletters, and social media groups for the neighborhood) or paper copies given to people by volunteers who lead the walks.

RECOMMENDATION

03

Build trust with residents by intentionally documenting and integrating their values and needs related to trees.

In historically disinvested communities, residents may express a lack of trust in institutions that plant and care for trees such as city government departments or urban forestry non-profit organizations [46]. This is problematic because successful collaborative management of natural resources relies on trust, particularly in underserved areas [47]. In the case of urban forestry, to grow and sustain a more equitable tree canopy requires collaboration between residents and institutions that plant and care for trees locally. One important way to build trust with residents is to intentionally document their values and needs related to trees, and then design programs around those values and needs. Enduring trust can also help organizations respond and recover when tree-planting efforts do not go as planned.

Potential Actions:

1. **Use open and transparent communication,** both in person and on social media, to build trust and overcome barriers caused by historical disinvestment or neglect. Consider using this "Tree Tales" template agenda and set of interview questions to facilitate events in priority neighborhoods that gather residents' perspectives on trees and what they would like for the future.
2. **Access the** "Stories of Trees" Toolkit**,** a guide to designing, producing, and evaluating public story-sharing projects about urban trees. And make sure residents' stories are integrated into decision making processes.

RECOMMENDATION

04

Identify barriers to tree planting success and allocate or secure resources to overcome them.

Urban and community forestry professionals must realize that not everyone feels the same way about trees. This is a key component of recognition justice often overlooked in urban tree-planting efforts. Perceptions of trees can stem from geographic context (e.g., areas susceptible to severe storms), diverse cultural values, different legacies and historical connections to the land, and power disparities commonly associated with conservation efforts [19]. In many communities, trees are a lower priority than more pressing needs such as food security or transportation equity [32,45]. These conflicting—or potentially synergistic—priorities should be taken into account when planning and implementing tree-planting programs.

Potential Actions:

1. **Account for diverse community perspectives** when planning tree-planting initiatives, ensuring that no one is overlooked. Consider using a Community Walk-around Reflection sheet to look for a range of businesses and organizations to engage with in priority neighborhoods.
2. **Engage local communities to highlight the social benefits of trees,** such as improved human health and enhanced community character [9]. Utilize concrete evidence/data that explain the benefits of trees. Examples of tree benefits are described in many places by organizations such as American Forests and TreePeople.
3. **Provide resources to increase access to trees and knowledge about tree care.** For example, the Arbor Day Foundation has a useful website about Tree Care and Maintenance. In communities with limited resources, organizations need to devise a plan for tree stewardship that does not impose significant time or financial burdens on local residents [48].
4. **Consider starting a program like** TreeKeepers**, implemented by Openlands in Chicago, which trains tree ambassadors to care for urban trees.**

RECOMMENDATION

05

Create collaborative tree maintenance and stewardship programs with community partners to ensure tree survival and health in the long-term.

In Louisville, concerns about maintenance issues were the top reason residents cited for turning down free tree plantings on their property. In historically disinvested neighborhoods, costs for maintaining trees–including removal of hazardous and/or dead trees–can be prohibitive [49]. To address these concerns and increase acceptance of new tree plantings, it will be necessary to create collaborative tree stewardship programs that help lower the cost of tree maintenance for low-income and otherwise marginalized communities.

Potential Actions:

1. **Read Arbor Day's guide to "Creating a Grassroots Tree Captain Program for Planting Trees in Yards,"** to learn how to best engage local residents in tree planting as well as organizing long-term stewardship, ultimately helping to achieve maintenance goals.

2. **Contact the organizations involved with the Treesilience program,** which provides tree removal services for hazardous and/or dead trees on private property in low income neighborhoods, to get their advice about dealing with persistent tree maintenance challenges. The program has been piloted in Chicago, Illinois and St. Louis, Missouri. For every tree removed, two new trees are planted. To help implement Treesilience in communities, nonprofit partners lead career exploration and workforce development programs designed to improve access to career opportunities within the green industry.

RECOMMENDATION

06

Form partnerships with local governments, community organizations, non-profits, and businesses to plan, implement, and evaluate tree planting and stewardship efforts.

Because urban greening is a complex process with many positive and negative consequences to consider, no organization can effectively do this work in isolation. Partnerships empower stakeholders and increase investment across different segments of the community that can build capacity for success [45]. If a tree-planting organization does not represent the communities it serves, then strategic partnerships can help to bridge those gaps and create a strong sense of engagement and inclusion.

Potential Actions:

1. **NGOs with expertise in tree-planting logistics can still benefit from relationships with other partners** that foster access to critical resources. For example, partnerships with other community organizations can help sustain a volunteer base that is critical to the success of most tree-planting programs, both as trees are planted and when maintenance needs arise after planting [50,51]. This article: "Examining Motivations and Recruitment Strategies for Urban Forestry Volunteers," provides more information about how to successfully recruit volunteers for tree planting and stewardship.

2. **Partnerships with municipal governments and local businesses can generate funding** to support both initial plantings and ongoing tree stewardship and maintenance [32,41,42]. If a volunteer event is upcoming, consider providing a pre-volunteering questionnaire to ensure that all involved have a positive experience and want to continue the partnership in the future.

3. **If possible, engage youth in the tree care process.** Programs like the Youth Conservation Corps helps incentivize community engagement at an early age while developing an ethic of environmental stewardship and civic responsibility.

4. **Review the Vibrant Cities Lab website, including their Urban Forestry Roadmap,** to identify strategies for building successful coalitions that lead to long-term success.

RECOMMENDATION

07

Continue to work with communities and monitor success—in terms of ecological AND social outcomes—after trees are planted.

Many tree-planting organizations excel at getting trees in the ground in neighborhoods that need them. Unfortunately, enthusiasm and funding often wane after the initial push of a tree planting effort, leaving communities to pick up the pieces as tree survival rates decline and maintenance problems escalate. Studies have documented the challenge of caring for and maintaining urban trees over time—particularly when the cost of stewardship falls on local residents [32,41,42,52]. Monitoring and evaluation of tree-planting programs, including both the ecological outcomes (e.g., tree growth/survival) and the social outcomes (e.g., impacts on human health and communities), should continue long after initial plantings take root.

Potential Actions:

1. **Don't discount or overlook the post-planting stage.** These later stages may be the most important for the real (and perceived) success of a tree planting initiative, ultimately creating lasting impacts on the natural and social landscape of communities that last for generations. Account for these long-term outcomes in initial funding and planning strategies to ensure that community needs and maintenance are supported well into the future. Consider using the worksheet "Environmental Justice Metrics of Success" to create measures of success that reflect community needs and priorities. Also consider tracking changes in both environmental and community health indicators over time.

These recommendations—which incorporate all of the key dimensions of EJ—can inform deeper conversations about equity in urban tree-planting. Urban and community forestry professionals in both the public (governmental) and non-governmental sectors should adapt these principles and practices as needed to align with local contexts, recognizing the unique nuances and cultural complexities of the communities they serve. When it is not possible to integrate all of these recommendations into a single program or project, organizations that embrace at least some of them are more likely to experience enhanced community engagement and tree-planting success. As social justice becomes an increasingly important consideration in urban greening efforts, more work is needed to understand how to better provide equitable access to trees and healthy urban environments. To help put these principles into practice, the infographic (Figure 3) below highlights the key recommendations at a glance.

Figure 3. Recommendations to maximize social equity in tree planting initiatives.

SECTION THREE

NEXT STEPS FOR RESEARCH + PRACTICE

Trees can undoubtedly transform communities, but how do we ensure that transformation is positive?

The Inflation Reduction Act (IRA) of 2022 paved the way for a historic investment in urban forests and the systems that support them (Figure 4). While the future of IRA-funded programs remains uncertain, bipartisan projects that focus on tree planting and maintenance in historically disinvested communities will likely remain priorities given their capacity to mitigate extreme heat, boost climate resilience, and improve human health.

As new projects emerge and expand, organizations should consider key questions raised in this guide:

- **How should the success of a tree-planting effort be defined?** Conventional measures of success include the number of trees planted or increases in canopy coverage, but what other social considerations should be factored in to ensure equity goals are met? Possible metrics include the proportion of residents in priority neighborhoods who report satisfaction with or positive connections to an urban forestry program. Broader, long-term outcomes might include tree survival, ecosystem enhancements, and human health impacts.
- **How do public perceptions of trees differ across contexts?** What values, beliefs, attitudes, and cultural norms shape acceptance and support for trees? Do renters and homeowners perceive trees differently?
- **How do we effectively communicate the benefits of urban trees?** What themes resonate across different audiences? How can messaging better align with community needs and priorities?
- **What makes tree-planting initiatives successful?** Which program models—free-tree giveaways, public vs. private land plantings, etc.—yield the best results in tree survival, health, and community engagement? What kinds of experimental studies could help identify best practices?
- **What community engagement strategies are most effective?** Do in-person outreach methods work better than passive approaches? How does the effectiveness of engagement strategies (e.g., community meetings, advisory boards, door-to-door canvassing, social media) vary across cultural contexts?
- **How can we build stronger cross-sector collaborations?** Who are the key partners in advancing equitable tree-planting goals, and what strategies foster lasting partnerships?
- **How do we embed social equity in organizational decisions?** What internal and external challenges must be addressed to ensure positive outcomes across diverse communities, considering all dimensions of environmental justice?

By thoughtfully addressing these questions, organizations can maximize the long-term benefits of tree-planting efforts and create more resilient, equitable communities.

Investment Priorities for Urban Greening Projects that Support Local Communities

Investments from the Inflation Reduction Act of 2022 will fund hundreds of projects to support communities in greatest need.

Tree Planting & Maintenance
Support the planting, monitoring, and long-term maintenance of trees, including those on public and private land.

Restoration & Resilience
Support climate-adapted tree plantings, nursery production, and strategies to boost resilience to natural disasters.

Workforce Development
Create living-wage jobs in green industries and expand career pathways in urban forestry and arboriculture.

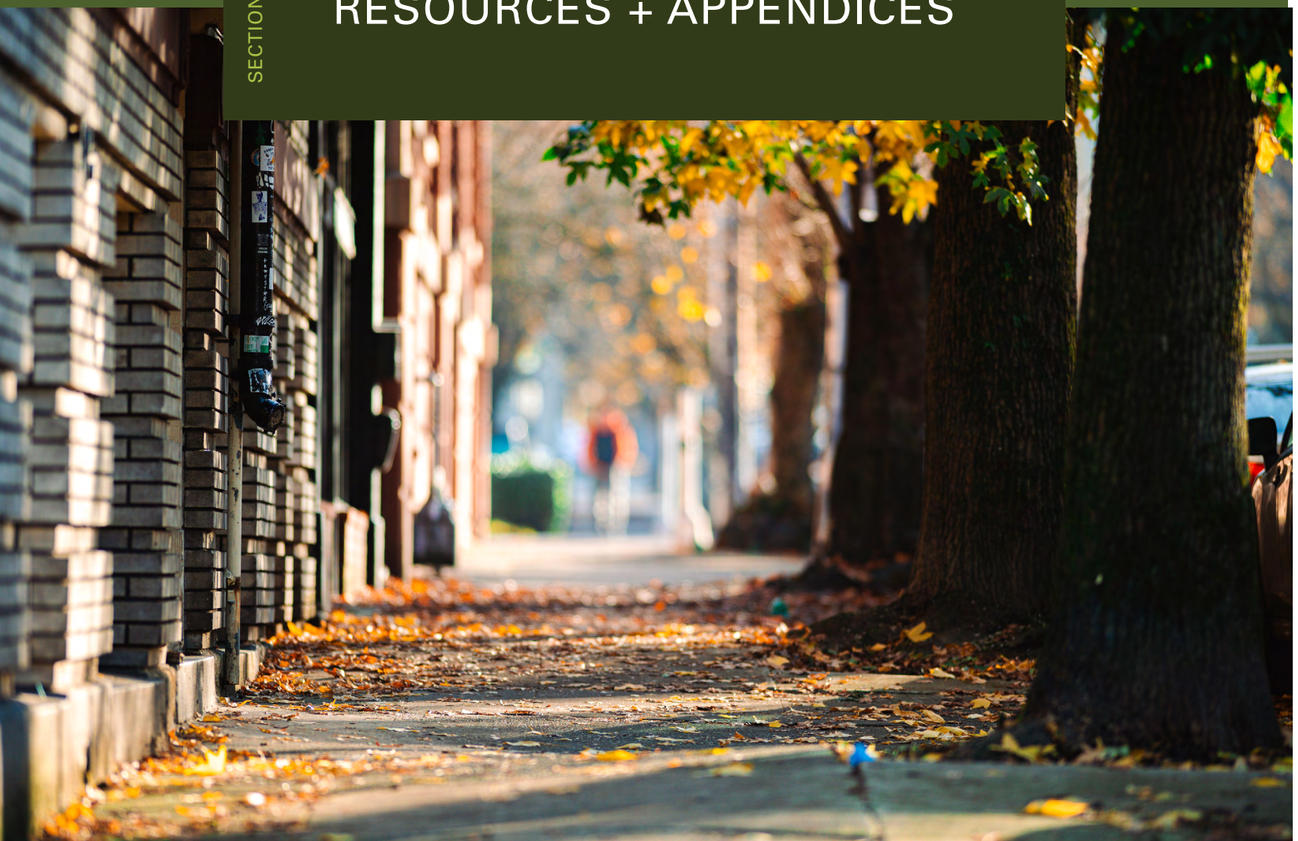
Extreme Heat
Support tree planting and long-term care to mitigate rising temperatures in growing metropolitan areas.

Community Engagement
Empower communities to improve local conditions through urban forestry planning.

Figure 4. Summary of goals associated with the U.S. Forest Service-sponsored Urban and Community Forestry grant programs (funded by the Inflation Reduction Act of 2022) designed to provide equitable access to trees, nature, and the benefits they provide. Image adapted from a U.S. Forest Service fact sheet. While the future of IRA funding remains uncertain, the core areas described here remain high bipartisan priorities for cities across the United States.

SECTION FOUR

RESOURCES + APPENDICES



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APPENDIX 1

Goals and Methods of National Study on Equitable Urban Greening

Research can help us understand how to effectively integrate EJ principles into urban tree planting efforts. From 2020 to 2023, our research team at NC State University collaborated with universities, government agencies, and NGOs across the United States to study challenges and opportunities related to equitable urban greening. Funded by the U.S. Forest Service's National Urban and Community Forestry Grant program, the project used a variety of research methods to understand the social and cultural factors influencing the success of urban greening interventions (Table A1-1).

At the national scale, we conducted surveys (n = 90 respondents) and focus groups (n = 14 participants) with urban and community forestry professionals from various sectors across more than 30 different states (Figure A1-1). Of the 90 respondents who completed a significant portion of the survey, 46 worked for local NGOs, 31 for municipalities (typically as municipal foresters or arborists), and 13 for federal or state agencies involved in urban and community forestry. A similar distribution of organizational and demographic diversity was seen among focus group participants.

At a more localized level, we conducted a case study in Louisville, KY, the site of the Green Heart Louisville project—a large-scale urban greening effort aimed at creating healthier neighborhoods by encouraging tree planting to mitigate air pollution and promote cardiovascular health. Local data collection included surveys (n = 18 respondents) and interviews (n = 5 participants) with selected community leaders across the city, plus resident interactions (n = 1,060) and surveys (n = 387 respondents) across diverse neighborhoods. All resident interactions and surveys were conducted in partnership with the tree-planting NGO Louisville Grows, and tended to focus on neighborhoods in the Green Heart Louisville study area, though a few additional neighborhoods that experienced tree planting programs were included as well.

Key findings from our project are outlined in the following sections, along with lessons and insights about equitable tree planting from other sources. By using EJ principles and integrating information across multiple sources and scales, our project aimed to identify strategies to promote greening with communities, not just within communities.

AIMS	METHODS
1. Synthesize current state of knowledge regarding public support for urban greening across diverse communities.	Literature review across disciplines
2. Identify factors associated with tree-planting program success.	Surveys of residents; Spatial analysis; National focus groups
3. Examine public perceptions of urban trees and relationships between trees, health, and neighborhood change.	Surveys of residents; Surveys and focus groups with community leaders; Social media data analysis
4. Define and share best practices to promote a national community of practice focused on equitable and inclusive urban greening.	National surveys and focus groups (NGOs, municipal arborists, federal/state forestry professionals, EJ groups)

Table A1-1. Summary of equitable urban greening project aims and corresponding research methods.

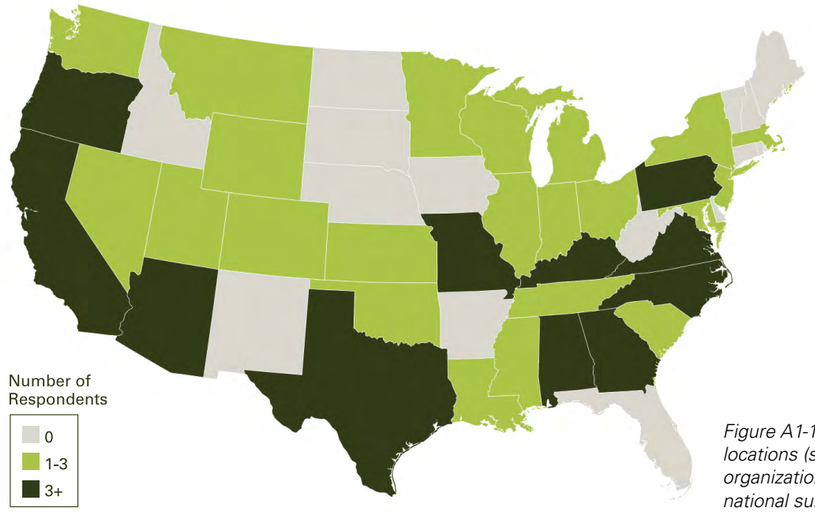

Figure A1-1. Map showing locations (states) of tree-planting organizations who participated in the national survey and focus groups.

APPENDIX 2

PRACTITIONERS' PERSPECTIVES: TREE PLANTING CHALLENGES & OPPORTUNITIES

Tree Planting Priorities

Practitioners engaged in urban and community forestry are increasingly aware of the equity challenges associated with planting trees [1,2,3,4]. However, addressing these challenges has proven difficult. A review of recent Urban Forestry Management Plans found that mentions of environmental justice were often brief and lacking substance [5]. Most efforts to combat inequities in tree planting have historically focused on distributive justice, particularly increasing tree canopy coverage [6,7]. Planting trees in areas with low canopy coverage is undoubtedly important because it provides these underserved areas with access to a variety of critical benefits and ecosystem services [8]. However, increasing canopy coverage across the urban landscape is just one of many criteria that should be considered when planting trees.

Our surveys and conversations with urban forestry professionals revealed varying factors that determined priorities for tree planting, depending on who was planting. As expected, the top priority for both NGOs and governmental organizations was mitigating low canopy cover (Table A2-1). NGOs also placed high emphasis on socio-demographic factors such as household income and race/ethnicity, but government agencies placed a lower priority on these factors. Health issues such as poor air quality were also greater concerns for NGOs. The only factor rated similarly across sectors was responding to municipal priorities (which may or may not include social justice concerns). Hazard mitigation such as reducing heat stress or improving stormwater management were also cited as reasons for planting trees.

Table A2-1. Importance of various factors in determining tree planting priorities, as listed by urban and community forestry professionals working for non-governmental organizations (NGOs) and municipal or state government agencies.

FACTOR	NGOS (N = 46)	MUNICIPAL/STATE AGENCY (N = 44)
	% Very Important	% Very Important
Low canopy coverage	66.7%	55.0%
Low household income	60.6%	25.0%
Large racial/ ethnic minority population	60.6%	20.0%
Low air quality (or high air pollution)	42.4%	20.0%
Identified as priority area by city	48.5%	45.0%
High asthma rates	36.4%	15.0%
Natural disaster areas	18.8%	20.0%

Mean ratings are on scale from 1=Not at all important to 5=Very important. Other priorities not listed here included heat inequity, stormwater and water quality considerations, tree pest areas, and municipal leadership.

Perspectives on Impact

Urban and community forestry professionals expressed a variety of perspectives regarding the perceived value of their tree planting initiatives. **Most touted the benefits trees provide—both for the local environment and local residents.**

"As a tree organization, we know that trees really are a solution for so many of the problems. There's such a big human health connection with trees."

"We certainly see the value of tree-planting because I don't need to tell you that it has multiple benefits, right? We are steadfast and convinced that trees would provide them. Shade, air quality purification, all of that…"

"People aren't going to get into urban forestry and then not like it. I haven't seen it. As far as residents, I think everyone appreciates it."

Other practitioners acknowledged tradeoffs, albeit not as frequently, in cases where tree plantings did not align perfectly with community priorities (or assumptions about community priorities) or situations where greening might fuel unintended consequences.

"Some neighborhoods objectively need trees. They have a low tree canopy and in low-income parts of the city, but we've never planted trees in those neighborhoods because trees aren't a priority for them. They have prioritized other things and trees aren't on that list."

"In certain communities, trees fall at the bottom of the list. They don't want to rake the leaves. They don't want to have to do these things because their mind is so oriented on just 'how do I fulfill my basic needs? What are my transportation needs, what are my food needs? What are my housing needs?' So we have to help the community and see how trees can be a solution—a larger solution."

"Trees are not the answer to everything, but they can be an answer to a lot of things.

Tree Planting Challenges

Urban and community forestry professionals face a number of challenges in their work. The success of urban greening depends on more than just planting trees; it requires long-term commitment and support from individuals and organizations across urban communities [3]. Whether focusing on general urban forest management [9] or specific tree-planting initiatives [10,11], persistent problems impact the success of these efforts. These issues range from financial and human resource constraints to outreach and communication struggles to long-term tree stewardship and survival [3].

In our conversations with urban and community forestry professionals, several key obstacles emerged (Table A2-2). Some challenges are internal to organizations and focus on agency staffing and culture. Other challenges are external to the organization and focus on establishing meaningful connections with local communities. To address these challenges, agencies must work to recognize community needs and priorities to determine if, and how, tree-planting might align with those priorities [12].

Although some tree-planting organizations struggle to effectively engage communities, many are connecting with stakeholders in a variety of ways [13]. In our study, more than 80% of local NGO and municipal forestry professionals said they regularly engaged with residents, volunteers, community leaders, and elected officials. This engagement reflects growth within the realm of procedural justice though, notably, these efforts did not necessarily target historically marginalized communities. Strategies for community engagement, and the frequency of use for these strategies, varied across NGO and governmental sectors. Social media engagement was the highest across both groups (>81% did this sometimes or often), followed by hosting and attending community meetings (>57%). While government respondents were more likely to attend council meetings, NGO respondents were more likely to engage in door-to-door canvassing. Newsletters, tree-planting trainings, and other public events were also used as engagement strategies. The efficacy of these various strategies is not well documented, but there are clearly many different ways that urban and community forestry professionals might consider engaging with diverse stakeholders.

Social Equity Challenges

Despite a growing emphasis on social equity within organizations and tree-planting initiatives [1,2,3,4], progress remains slow. In our study, 51.6% of respondents claimed social equity was being well or very well integrated when deciding where to plant trees, but only 25.4% claimed social equity was being well or very well integrated into procedures for engaging with the community. Local NGO respondents were significantly more likely than government agency respondents to report effective integration of social equity into both tree planting and community engagement practices (Figure A2-1).

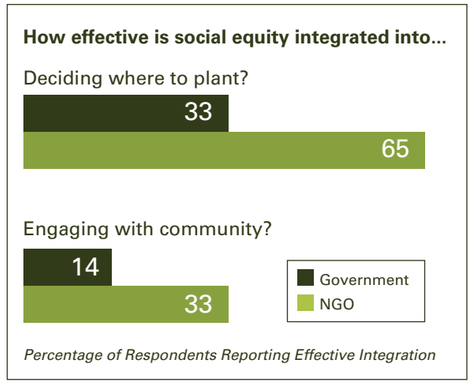

Figure A2-1. Efficacy of social equity integration into various aspects of the tree-planting process, reported by NGO and government professionals.

As one practitioner put it:

"I would say social equity is a consideration, but it's not our primary job."

The challenges expressed by practitioners at multiple levels highlight how much work is still needed to make urban tree-planting and greening more socially just [6].

OBSTACLE	DESCRIPTION	EXAMPLE QUOTES
Challenge of recruiting new participants	Practitioners acknowledged the lack of diverse representation in current engagement strategies and within their organization(s). People who are directly impacted by tree planting should be able to provide insights and advocate for themselves. Programs should strive to connect with new and different audiences.	"The people who will come are the usual suspects." "We want social, economic, and ecological equity, but if we don't have the people in the room to advise us and speak for themselves, we are at a loss." "We are all white folks and college educated. If we are not diverse as a group, we don't appeal as much to a diverse population here." "I've been having encouraging conversations with my supervisor, with our acting state forester about building out at least bilingual if not multi-lingual capacity within our agency because I think that's an important part of reaching some of the communities that we historically haven't been able to engage."
Lack of adequate staff or volunteers	Many organizations face a shortage of staff and volunteers for tree planting initiatives. This gap could hinder efforts to engage communities meaningfully and may not meet the needs required to achieve equity.	"We needed to have volunteers and staff support. Communities wanted to make sure that we weren't just these busy body people that were going to show up and put a few trees in and go away." "We need more diversity and representation from the neighborhood's we serve."
Struggles with long-term tree stewardship	For long-term success, practitioners should seek sustained commitment and financial support from staff and volunteers. This increases tree retention and survival, while also enabling organizations to build trust and achieve a lasting impact while avoiding conflicts/risks to residents.	"One of the biggest obstacles is getting funders to understand that you have to build in the cost for maintenance and engagement. They think just planting trees is it." "Trees are expensive to maintain… People don't want to deal with that and may not have the resources. The actual cost of maintenance falls on the property owner. If the city tells you that you have to plant, prune, or remove a tree and you don't do it—You'll get fined."
Challenge of connecting with communities	Education strategies alone often fail to connect with communities or motivate them to embrace tree planting, and solely presenting scientific evidence can be counterproductive. Effective engagement requires a two-way conversation to understand a community's values and experiences, though many practitioners cling to the "tell them what to think" approach	"We're trying to figure out how to change the narrative about trees. I think data-driven science will help convince some of those people." "People not necessarily wanting to believe the science associated with what trees can do. When you start talking about the benefits—Sometimes that goes in one ear and out the other." "One thing that we're learning is that there are individual neighborhood identities. There's all these factors, right? Did you grow up with a garden? Do you see trees as a nuisance? Look at all the leaves? People see trash and I see mulch. A lot of it is perspective."

Table A2-2. Key obstacles to tree planting described by urban and community forestry professionals.

APPENDIX 2

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APPENDIX 3

PUBLIC PERSPECTIVES: TREE PLANTING CHALLENGES & OPPORTUNITIES

Public Perceptions of Trees

Many studies have explored why residents do or do not want trees on their property [1,2,3]. Some communities support greening initiatives for their ecosystem and health benefits [4,5], while others oppose tree planting when their needs aren't considered and maintenance falls on residents [3,6]. These concerns are often heightened in historically underserved communities of color [1,7].

In our Louisville, KY, study, about 37.5% of residents who were approached accepted a free tree. Acceptance rates were lower in historically Black neighborhoods than in mixed-income, mixed-race areas (32.1% vs. 39.7%). Rates were highest among White residents, women, and those who had lived in the neighborhood for less than 10 years.

People's reasons for accepting or rejecting trees varied, but the most common themes included aesthetics, air quality, and cooling benefits on the positive side, and maintenance concerns or lack of space on the negative (Figure A3-1).

Overall, 77.9% of respondents felt tree benefits outweighed costs, while only 6.7% felt the opposite. White residents were slightly more likely than Black or Hispanic residents to see benefits as greater than costs. These patterns align with research showing that barriers to participation are amplified in low-income communities of color, which face decades of disinvestment and disproportionate tree disservices [3,7].

Figure A3-1. Different reasons that residents in Louisville, KY, chose to either accept or reject a free tree planted on their property. Residents could select multiple reasons for accepting or rejecting a tree.

Public Perceptions of Tree-planting Organizations

While many urban residents see the value of trees and understand their benefits [5], albeit with some costs, their beliefs about tree-planting organizations and tree-planting itself vary [3,8]. Opposition to tree-planting is often strongest in historically disinvested neighborhoods, where residents feel excluded from decision-making and burdened with maintenance costs [1,7,9]. Concerns also escalate when urban greening is linked to gentrification, which threatens community character [10]. In our conversations with local leaders in Louisville, many of the same themes emerged:

Many local leaders recognized the hard work being done by tree-planting organizations and appreciated their efforts to engage in partnerships to support communities.

"Tree planting can improve the quality of life—beauty, health, privacy."

"It just makes it feel cozier and more welcoming—like a nicer neighborhood."

"I really do value that there are not only one, but several groups and government leaders who are helping with these initiatives."

"I've seen some initiatives where they asked people to come out to canvass to explain to neighbors what's going on. I do think overall they try to make the neighbors aware and get their buy in."

Local leaders noted that current efforts are rarely enough, citing many concerns related to recognition and procedural justice—such as calls for greater inclusion, stronger voices in decision making, and frustration about the transfer of responsibilities to local residents.

"Just because you weren't educated at a university doesn't mean that your opinion isn't valid. That's something I really wish more people with decision making power would take to heart, because there's some great ideas that people have"

"You're planting trees that give shade, but if they die before then—you're putting a lot of personal responsibility on people that didn't actually want it in the first place."

Not all local leaders made explicit connections between tree-planting and gentrification, but fears about neighborhood change dominated many conversations about equitable futures.

"It [more trees] might help the neighborhood feel nicer, but that could also attract more developers"

"The people that live next to that house can't afford to live here anymore. You can imagine how it feels to be one of the most historic black neighborhoods in the city and have murals go up with beer, cheese, pretzels, and a bunch of white people. It's what somebody who lives in the suburbs thinks would be best for the neighborhood in order to increase property values"

APPENDIX 3

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