Worcester Stakeholder Report
HERO 2025

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1 Introduction

The northeast of the United States is experiencing increased frequency and severity of extreme heat (Winter et al., 2019) and severe weather (Henny et al., 2023) that is exacerbated by financial and social challenges (Nordgren et al., 2016). Cities are especially vulnerable to climate change due to their high population density and grey infrastructure (Bulkeley and Tuts, 2013). Urban trees can increase resilience by providing cooling services as well as absorbing excess runoff (Spangler et al., 2019). Urban forests reduced heat by 8 - 12 degrees Celsius in central Europe (Schwaab et al., 2021) and they have also been hypothesized to improve stormwater management during severe weather (Berland et al., 2017)

Socioeconomic variables play an important role in urban tree planting programs success as the urban forest is a socioecological system (Roman et al., 2018; Vogt, 2024). Residents often prefer trees for aesthetic reasons, not for the heat mitigation or stormwater runoff control (Conway, 2016). Many residents don't want trees because of the additional maintenance as well as concerns around green gentrification (Riedman et al., 2022; Planas-Carbonell et al., 2023; Smart et al. *in review*). In an investigation of a state-led tree planting program in Worcester, MA, Smart et al. (*in review*) found that barriers to tree planting in environmental justice neighborhoods were lack of space, distrust of maintenance by city government from prior experiences, as well as limited time and energy for trees. Foresters also described frustration with tree planting due to absentee or hard to reach landowners who were not interested in planting a tree (Smart et al., *in review*). Tree planting in Worcester by the state of Massachusetts has been successful, with residential trees experiencing 94.9% annual survivorship in the first 5 years after planting (Nelson et al., 2025).

Tree planting on commercial properties creates a different set of challenges to tree planting on residential land. Residents are not the only private property owners where tree planting can take place in cities; businesses and landlords are important because they can provide valuable areas for tree planting. There is little research on commercial business preferences and attitudes towards tree planting around or on their property although street trees around businesses have been shown to positively impact consumer behavior (Wolf, 2005). Property owners who lease their buildings are also an understudied stakeholder with large amounts of control over trees in cities. This issue has long been an issue with the equity of urban tree planting programs - an analysis of a residential tree planting program in Milwaukee in 2002 that found 89% of the residents who adopted a tree were homeowners (Perkins et al., 2004). More research is desperately needed to understand the attitudes and perspectives of businesses and property owners (Koeser et al., 2016).

Research Objectives

Our main objectives were to characterize property/business owners' perceptions of urban tree planting, identify barriers to planting programs, and ways to overcome them. We ultimately aim to enable data-driven decision-making by urban foresters to benefit the effectiveness of city-wide tree planting or maintenance strategies. This analysis centered two specific neighborhoods of the city of Worcester including Green Island and Main South. These neighborhoods are made up of census block groups designated as environmental justice areas and were thus deemed as justifiable areas of interest.

To achieve our goals, we spoke to property and business owners, a group that is typically hard to reach in green initiative work, focusing on characterizing their perception of urban tree planting, how they identified the relationship between curb appeal and tree presence, and what barriers prevented them from planting on their properties. In order to enable data-driven decision-making by urban foresters, we also analyzed interviewee recommendations on ways to overcome those barriers.

Key Questions

1. What are the major reasons business/property owners do or do not want to accept trees?
2. Do business/property owners perceive any relationship between trees and the economic success of their storefront/property?
3. How does willingness to participate in planting programs vary between property owners and business owners?

2 Study Area

Worcester, Massachusetts is approximately 38.46 sq miles and home to 211,286 people. The city has a population that is ~50% minority groups, more than double the % minority of the entire state of Massachusetts. The median household income of the city is ~$68,000. We centered our study in the Green Island and Main South neighborhoods of Worcester. Using the data constituent block groups that make up these neighborhoods we estimated socioeconomic variables and demographics reported in the Table 2.1 below.

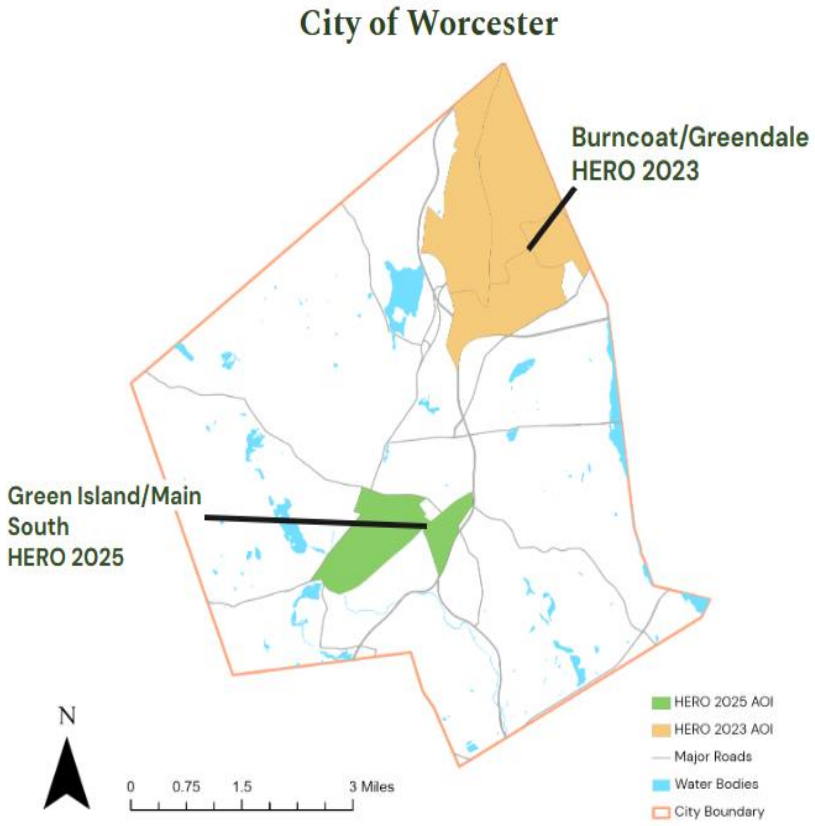

Figure 2.1. Study area map for the city of Worcester, highlighting areas of the city that the HERO team has worked in before.

Demographics	Main South	Green Island	Worcester	Massachusetts
Population	19,616	2,490	211,286	7,136,171
Median Household Income	$30,622	$38,215	$67,544	$101,341
% Minority	73%	64%	49%	21%

Table 2.1. Socioeconomic and racial demographics summary for Worcester, Green Island, Main South, and the state of Massachusetts as a whole.

Green Island and Main South are two residential and commercial neighborhoods in Worcester. Green Island contains Worcester Public Market, Polar Park, and the Canal District. Main South notably is home to Clark University and its neighboring University Park, which is circled in red on Figure 2.2. The citywide average was 93 degrees Fahrenheit, nearly ten degrees cooler than the averages of Main South (101 F) and Green Island (102 F) during that time. This highlights a need for investment in tree canopy or other green infrastructure to mitigate this heat inequity.

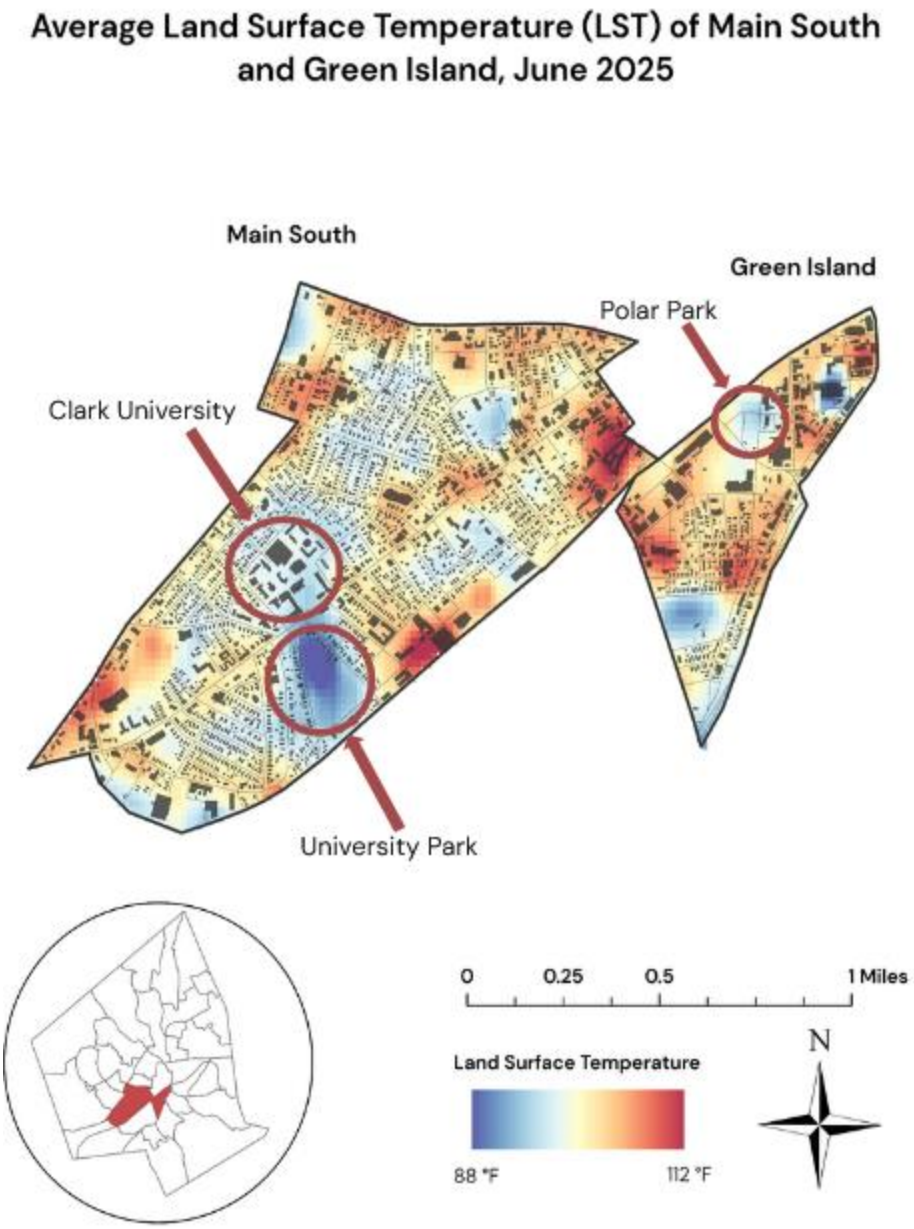

Figure 2.2. Average land surface temperature in June 2025 in the Worcester neighborhoods of Main South and Green Island. Clark University, University Park, and Polar Park are circled. Imagery gathered from Landsat 8, Level II, Collection II Imagery at a 30m spatial resolution.

3 Methods

We completed a total of 24 interviews. 21 interviews were with property and business owners in Main South and Green Island while the remaining 3 were with neighborhood community partners Main South CDC and the Green Island Residents' Group.

Of the 21 business/property owners, 18 were the successful results of canvassing in Green Island and Main South and 3 were arranged via outreach to contacts. While surveying, we first outlined the commercial zone of Main South and Green Island, and canvassed parcels with businesses. Ultimately, we canvassed 5 streets within the 2 neighborhoods, as outlined in Figure 3.1. The streets we canvassed in Main South were Main Street, Chandler Street, and Park Avenue while the streets in Green Island were Millbury Street, Green Street, and Water Street.

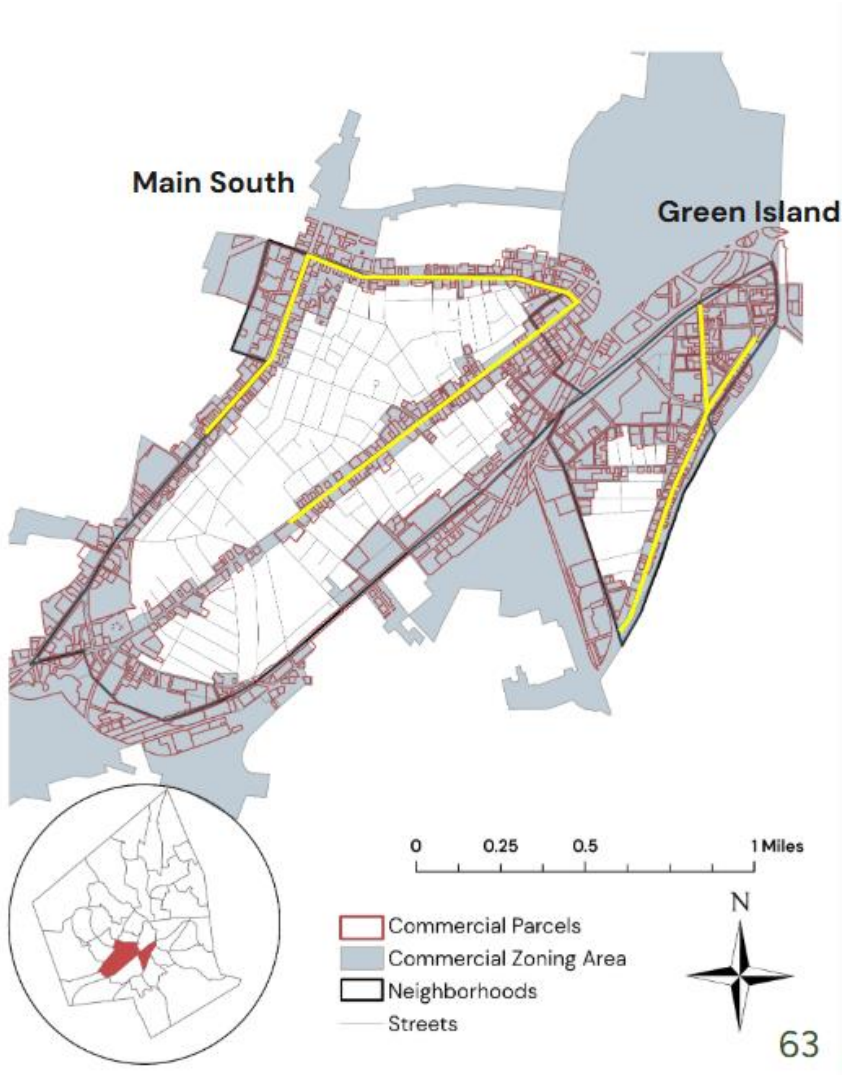

Figure 3.1: Map of sites in Green Island and Main South that were canvassed for business/property owner interviews. Commercial parcels outlined in red were all sites of attempted interviews, and streets outlined in yellow were canvassed by HERO fellows.

4 Results

We organized our results into primary and sub-themes to organize our and quantify perceptions surrounding city tree planting. Here we will break interview participants into groups based on their answers to better understand the distribution of opinions across different actor groups.

Interview distribution

Of the 24 interviews in Worcester, the highest percentage makeup was of business owners, as they are more readily available to the public via storefronts. Some of our interviewees were business owners that owned their properties; while others owned commercial property as well as were business owners in a storefront they leased, making them both property and business owners; these individuals are double counted in Figure 4.1 as they exist in both demographics of interest. We interviewed a wide array of business types listed in Table 4.1. We ultimately found greater success reaching business owners. Property owners, especially those who only owned commercial property and were not business owners– for example, landlords– were remarkably hard to contact.

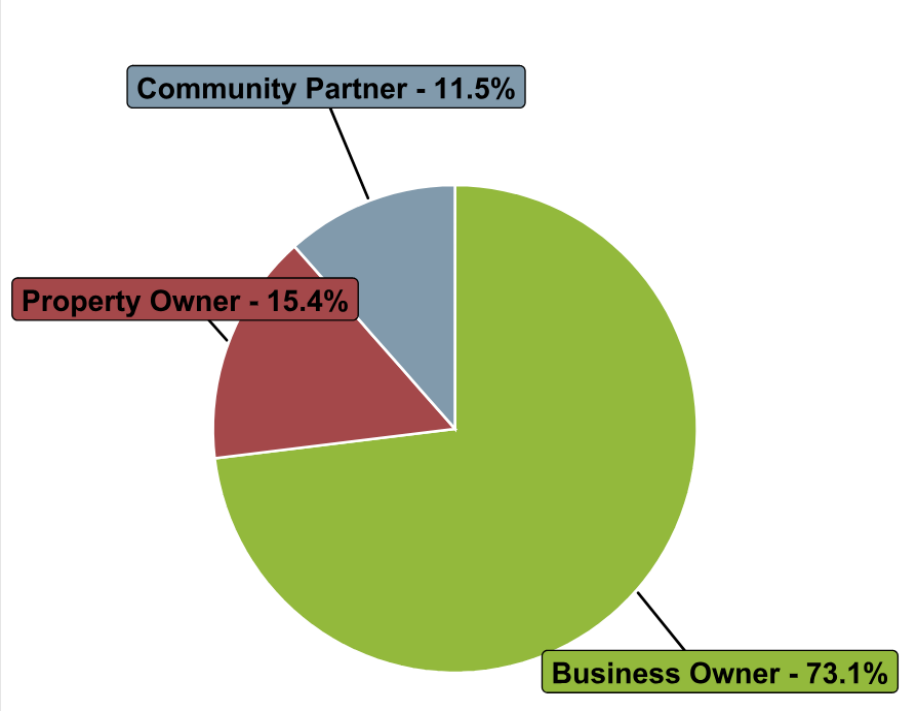

Figure 4.1: Pie chart displaying the distribution of Worcester respondents. 3 respondents appear twice in the chart as property and business owners due to owning their storefront property or owning commercial property somewhere else in the neighborhood.

Business	Number present
Restaurant	5
Hair salon	3
Auto	2
Grocery	2
Retail	2
Laundromat	1

Real estate	1
Convenience store	1
Church	1
Landscaping	1

Table 4.1: Table showing the different business types present in the business owner sample, as well as the amount of each type.

Lessee vs Lessor Tree Perceptions

Interested lessor Owns property, **expressed interest** in planting. **20%**	**Interested lessee** **No agency** over property decision, **expressed interest** in planting. **65%**
Uninterested lessor Owns property, **not open** to planting. **15%**	**Uninterested lessee** **No agency** over property, **not open** to planting. **5%**

Table 4.2: Table depicting sampled property and business owners' levels of interest in tree planting.

Interviewees were separated into percentages in Table 4.2 based on control of their property and their receptiveness to planting on it. Those who were inclined to participate in planting programs, regardless of whether it was realistically feasible for them to actually plant on their property, were designated as "interested". Those who were not inclined to participate in planting programs, regardless of how possible it was for them to plant on their property, were designated as "uninterested". "Lessors" were respondents with agency over the land use of their properties, and "lessees" were respondents without -or with little agency over property.

We found interested lessees to be our most interested demographic. Overall, more respondents were interested than uninterested. Our percentage of interested lessors was relatively high, when compared with the fact that lessees often cited difficulties in reaching their landlords when speaking about the possibility of planting trees. This may be because HERO's Worcester sample is relatively small, and lessors who are more interested in tree initiatives may also be more interested in speaking to researchers, effectively skewing the sample.

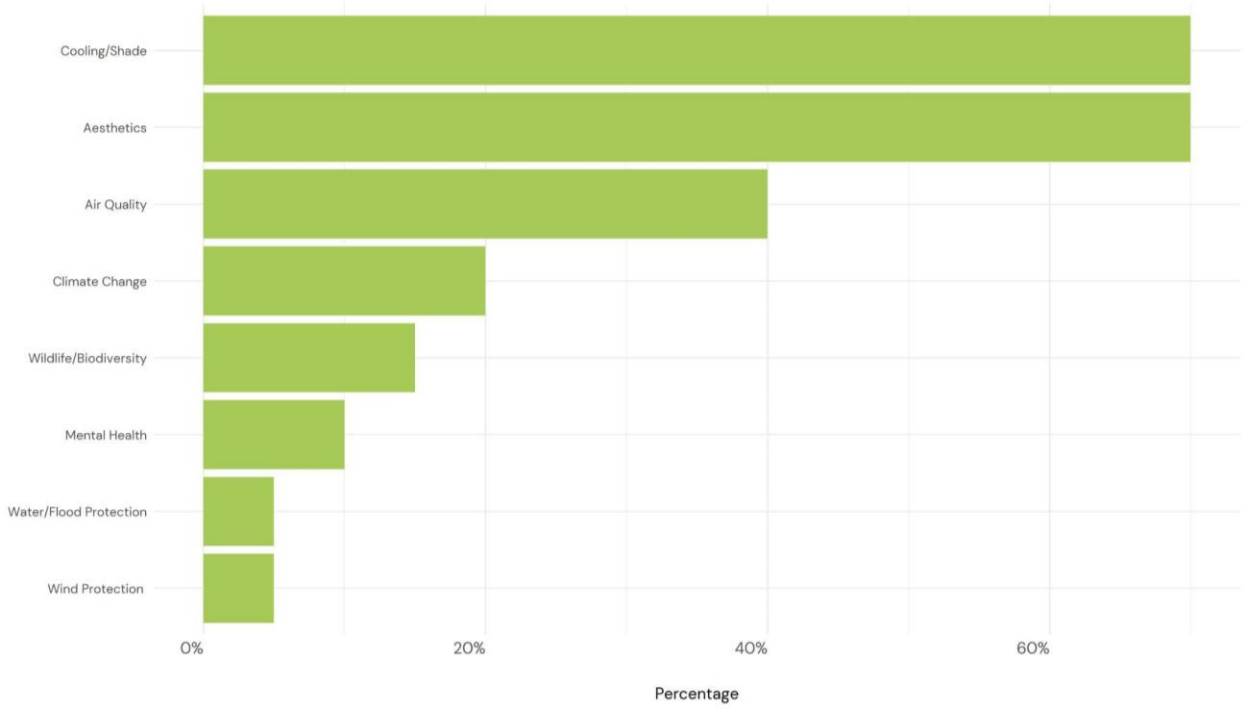

Figure 4.2: Horizontal bar chart of tree benefits mentioned by Worcester respondents. Listed benefits are on the y axis, and the percentage of respondents who mentioned each are on the x axis.

Leominster and Worcester interviewees, despite demographic differences, cited much the same benefits when asked what benefits they perceive trees to provide. Worcester respondents listed cooling and shade (70%), aesthetics (70%) as the top two benefits and air quality (40%) as the third most mentioned benefit. Respondents mention that "trees [...] can reduce the temperature, [...] keeping homes and neighborhoods cooler", that ""[m]ore trees will help keep the pollution down."

Worcester interviewees viewed their relationships with trees in an economical fashion that Leominster interviewees were not as likely to share. Most Leominster interviewees were homeowners, not business owners, and HERO did not ask Worcester interviewees extensively about their home owning status. Worcester interviewees were expected to perceive trees in an economic fashion that Leominster respondents may lack due to the demographic differences.

Most respondents believed that trees could benefit the curb appeal of their properties, and 60% of respondents answered positively when asked if tax incentives would encourage tree planting. No interviewee could not name a benefit that a tree provided, even if they were not receptive to planting initiatives. Even if they could not or would not plant on their property, 70% of interviewees said Worcester is benefited by more trees instead of less.

Perceived Barriers

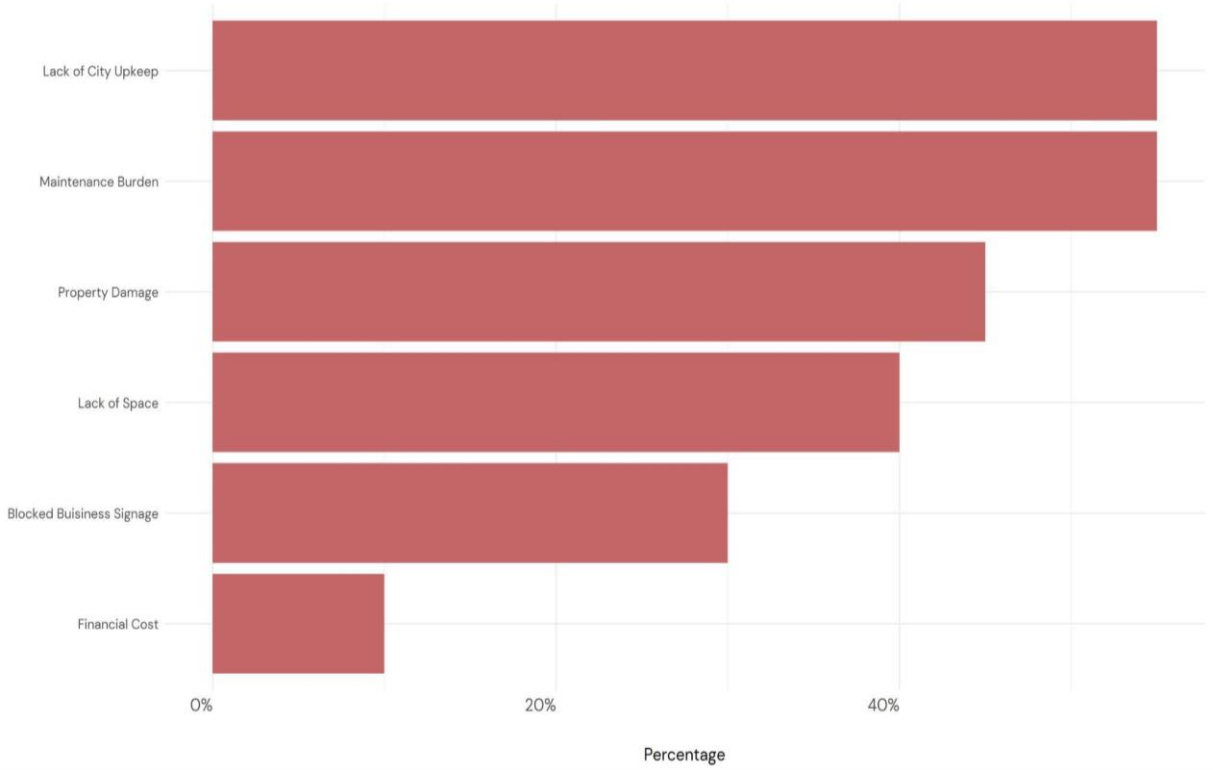

Figure 4.3: Horizontal bar chart of barriers tree planting mentioned by Worcester respondents. Listed barriers are on the y axis, and the percentage of respondents who mentioned each are on the x axis.

Barriers varied between Leominster and Worcester. Respondents in both cities listed personal maintenance tasks as a top barrier to tree planting. As referenced in Figure 4.3, Worcester's top three barriers were lack of city upkeep, maintenance burden, and property damage. Lack of city upkeep and maintenance burden were tied as the most listed barrier, each being mentioned by residents respectively 55% of the time. 45% of respondents mentioned property damage. As described by an interviewee, lack of city upkeep is a perception of public plantings that are "not always [...] cared for" and "[n]ot always watered", discouraging respondents to plant trees on their properties or participate in greening initiatives. Respondents stressed that the upkeep of trees that the city has agency over, like street trees or trees in maintained greenspaces like parks, that are unpruned or unweeded, should be prioritized over planting more trees.

For some interviewees, despite recognizing the benefits that trees provided on their properties, barriers that discouraged business success were more important. Business owners cited that trees limited accessibility via roots disrupting the structure of sidewalks and parking lots, that canopies covered signage, and trees provided shade for unhoused populations in the neighborhood, discouraging business. In Green Island particularly, mature trees with large root

systems and large canopies meant nowhere to pave for more parking spaces. This was mentioned especially by businesses around Polar Park, where parking spaces were a prioritized asset of many owners.

50% of interviewees did not have enough space on their properties to participate in planting initiatives, regardless of if they had interest. One interviewee, despite expressing interest in tree planting, added that “[t]here's not much room to have trees here, just not the space, we physically don't have the space for it” on the property that they rented. 40% of interviewees expressed interest but did not have agency over their property to plant, with many lessees stating that contacting the property owner was a main obstacle. When speaking about agency over planting, one respondent said that they did not have the option to be interested or uninterested in tree planting initiatives, because “the building belongs to [the landlord]. I just rent it. So I've been here 39 years, so they never put a tree as long as I've been here”. 75% of interviewees had not heard of the GGC program, the Green Worcester Plan, or other green initiatives.

Table 4.3: Table with interviewee quotes in response to how the city could alleviate tree planting barriers

Funding	“Discretionary funds, it's something [that] makes the neighborhoods look a little more appealing.”
Marketing	“There's so much opportunity for governments to be better at marketing, [...] having something more interactive than the dry, bland flyers that […] say ‘free trees’.”
City-specific initiatives	“It's not super practical to convince homeowners to plant trees [..] on their own property throughout the city, but if the city can take initiative and plant 5,000 trees in one footprint, you're getting a lot of value there.”
Neighborhood consultation	“If there was a section within the planning division that really worked with groups such as the Community Development Corporation to implement and support strategic neighborhood -based plans”
Supportive services	“If they have people who come in once in while to clean around and do a little bit of maintenance, that would be nice.”
Policy enforcement	“If the city recognizes it needs vegetation and trees […] then it needs to enforce that through planning regulations.”

Interviewee Recommendations

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When asked what the city could do to help remove those barriers to plant, interviewees answered diversely. Broadly, their responses fell into the categories outlined in Table 4.3. “Funding” included answers that mentioned tax incentives, discretionary funding, and fiscal policies initiated at the municipal level that would provide a financial benefit to planting trees. “Marketing” included responses that believed planting initiatives could be boosted by contemporary marketing strategies in more personal forms like canvassing or digital forms like social media. “City-specific initiatives” included interviewee responses that preferred planting initiatives to be limited to city property, believing this to be efficient. “Neighborhood consultation” included responses focusing on communication at the local level. “Supportive services” included recommendations of city teams that would conduct maintenance in neighborhoods with high concentrations of public trees. “Policy enforcement” included

recommendations of planting legislation that is passed and enforced by the city, specifically via planning regulations for development.

5 Discussion

We found that there was a general lack of awareness among property and business owners of Worcester's tree planting initiatives. When asked about benefits of trees, interviewees identified cooling or shade (70%), aesthetics (70%), air quality (40%), and climate change mitigation (20%). The largest barriers of tree planting identified were a perceived lack of city upkeep (55%), maintenance (55%), and potential property damage (45%). The largest motivations for tree planting identified among respondents are curb appeal and a potential policy or tax incentive. Notably, almost all participants inherently recognized the values of trees even when they did not feel their space was appropriate for greening.

There were several challenges that made it more difficult to collect data. We initially attempted to schedule interviews and focus groups by phone banking from a list that we created of Worcester businesses and land owners. This proved to be unsuccessful because we called 80 businesses but were not able to conduct any interviews from those calls. The lack of response from phone banking pushed us to canvas around Main South and Green Island. Going into business and talking to the owners was much more successful. However, we also faced the challenge of scheduling people for a focus group. Most of the business owners we interviewed were open to doing an on the spot interview but did not want to commit to a scheduled focus group. After all our extensive contacting and canvassing, we still were not able to conduct a focus group. We had a couple confirmed contacts, but they were still unable to make it the day of. This proves the difficulties of reaching out to and gathering the opinions of these groups.

We also ran into the challenge of finding and reaching out to property owners for interviews. This is reflected in the number of property owners we were able to interview (n=7), only 4 of which were exclusively commercial property owners, and that our focus group was unsuccessful. We also reached out to the Worcester Property Owners' Association without success. Landlords remain a transient stakeholder groups via our methods for interview engagement, which aligns with other work that identifies renters as a minority populations that that experience inequities in tree benefits (Perkins et al. 2004)

The process of finding contacts and participants took longer than the time we had allotted for it. After we conducted most of our data and were beginning to analyze it, we were given a contact list from a Worcester community partner that we interviewed at the very end of our data collection time frame. This contact list contained business and property owners that were interested in tree planting initiatives. Due to the amount of time we had left, we were not able to contact anyone from this list. If future research continues, it would be best to allot a larger time frame for obtaining interviewee contacts. Also, working more extensively with community partners and getting contacts through them could increase our success in conducting focus groups.

From the property owners and lessees interviewed, lessees were generally more open to planting. If tree planting initiatives were to progress in Main South and Green Island, interviewees mentioned several recommendations such as improved program marketing, planting on city property, a focus on neighborhood input, tree maintenance support, and enforcement of policies. In summary, our work in Worcester concluded that despite very real challenges, overwhelmingly pro-tree. 85% of respondents want a tree and are open to tree initiatives, even if barriers prevent them from planting or participating.

While interviewing, we found that 40% of respondents were interested in planting trees on their properties, but did not have enough agency over their properties to participate in a tree planting initiative. 85% of all interviewees, however, were receptive to tree planting initiatives. The majority of our Worcester sample would participate in tree planting on their properties. Our most receptive sample was interested lessees, who typically have little or no control over planting decisions on their properties. In neighborhoods with similar home ownership percentages to Green Island and Main South, with a similar residential/commercial breakdown, creating more space for urban trees in public spaces may be more efficient than relying on initiatives that involve private property ownership.

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