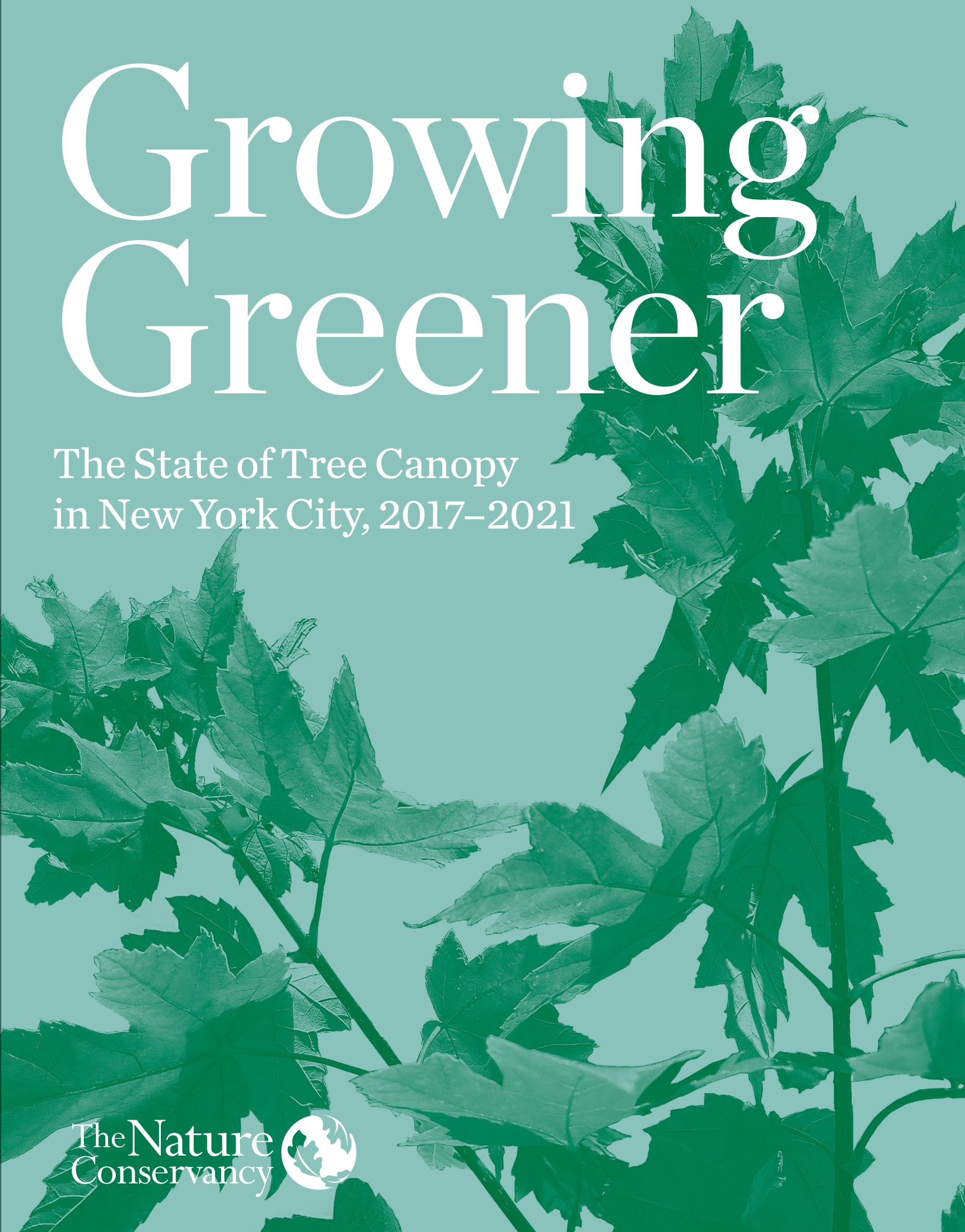
Growing Greener

The State of Tree Canopy in New York City, 2017–2021



The Nature Conservancy

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The State of Tree Canopy in New York City, 2017–2021

Michael L. Treglia
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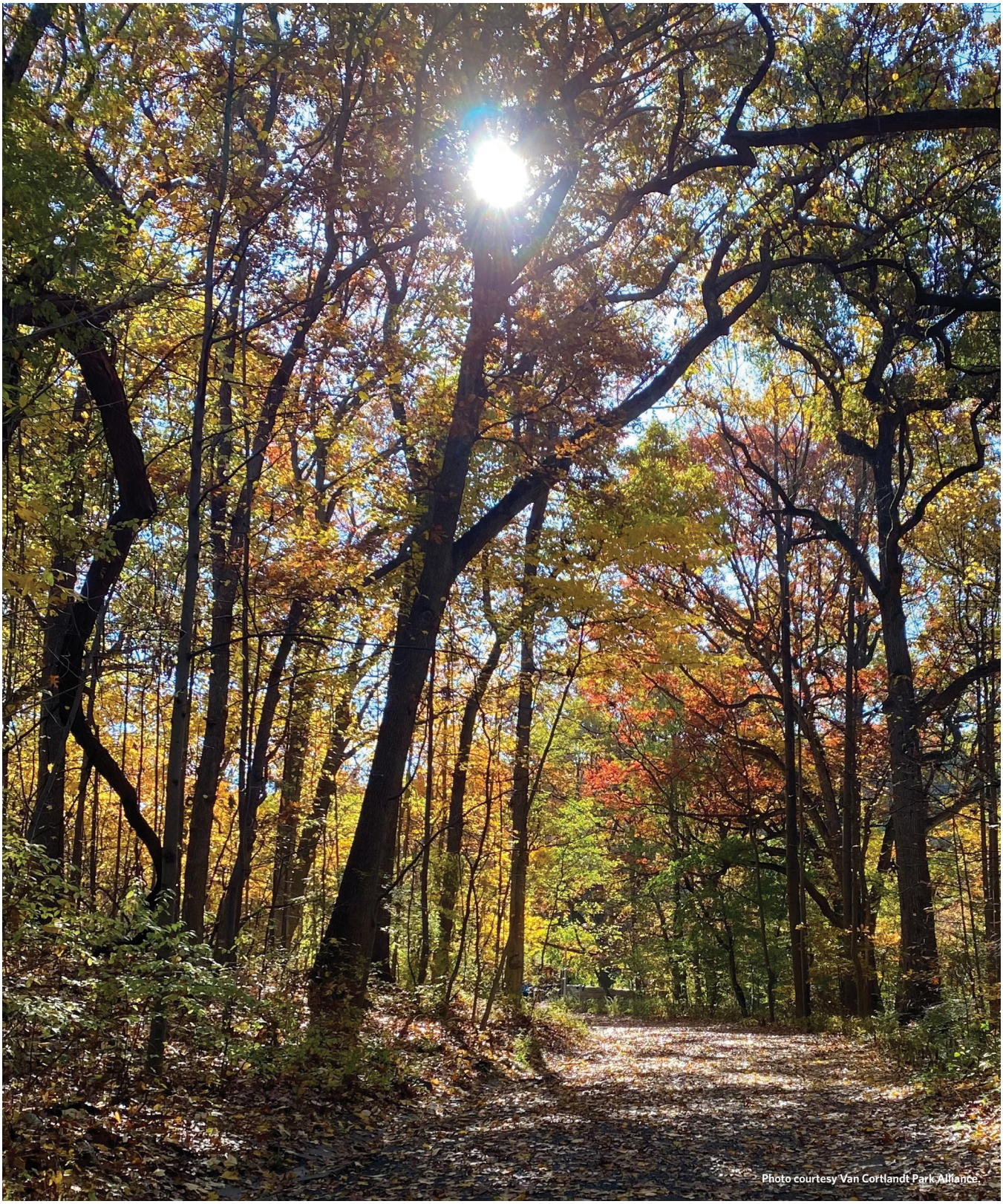
The Nature Conservancy



A path through a forested natural area in Van Cortlandt Park, Bronx

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A tree-lined street in Jackson Heights, Queens

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Executive Summary

The urban forest of New York City includes the trees themselves (over seven million) and the physical and social infrastructure that supports them. It provides numerous benefits, such as reducing air pollution, cooling the city on hot summer days, reducing flooding from stormwater, supporting outdoor recreation, providing space for biodiversity, and offering respite, beauty, and gathering places for New Yorkers. The resource is alive and dynamic, and our collective understanding of it is ever evolving. In *Growing Greener: The State of Tree Canopy in New York City, 2017–2021*, we offer an updated understanding of the NYC urban forest through the lens of tree canopy, or the area of branches and leaves as seen from above. We characterize canopy as of 2021, which is the latest year of available canopy data, describe changes in canopy cover from 2017 to 2021, and build on the findings of *The State of the Urban Forest in New York City* (released in 2021), which offered a snapshot of this resource from both biophysical and social perspectives based largely on canopy data for 2010 and 2017.

Tree canopy is increasingly important in cities to help mitigate challenges such as extreme heat, and our new analyses are all the more relevant given the establishment of the first formal canopy goal for NYC, in Local Law 148 of 2023. This local law stated and codified a goal of "equitably expanding the urban forest to cover 30 percent of land within the city," mandated the creation of the first NYC Urban Forest Plan for the urban forest on public and private property for the next 10 years, and requires the City to collect canopy data at least every five years to monitor canopy cover and track progress toward the goal. Analyses of the latest canopy data and future monitoring efforts can ultimately yield insights into what is working and where, to maintain and increase canopy cover and what challenges need to be overcome.

Canopy cover for the city as a whole increased during 2017–2021, from 22.20% to 23.40%, and the annual rate of increase (0.30% per year) was slightly higher than it was for the only prior period with canopy change data, 2010–2017 (0.26% per year). This is encouraging and suggests that efforts in recent decades to support planting and maintenance are having positive impacts. Canopy cover increased in all general jurisdictional categories (City, State, Federal, and private), and the rate of increase within NYC Parks' jurisdiction (trees on City streets and parks), 2.20%, outpaced the citywide growth. City parks account for 14% of NYC land area, but between high canopy cover on City Parkland and in rights of way (generally from street trees), over half of all tree canopy in the city is within NYC Parks' jurisdiction: 54.23% in 2021, up from 53.53% in 2017.

Private property had the smallest net increase in tree canopy across the city between 2017–2021, only 0.24% overall. There was a net loss of canopy on one- and two-family residential properties, predominately in many parts of Queens. Given the larger canopy gains on other property types and the limited canopy growth on private property, the share of citywide canopy on private property decreased from 35.29% in 2017 to 33.40% in 2021. One- and two-family residential properties, which made up the biggest share of privately owned land and a substantial portion of NYC land area (21.83% of total land area in 2021), was the only land use type with net canopy loss at the citywide scale during 2017–2021. These trends suggest that maintaining canopy on private property, let alone expanding it, may be a challenge and requires concerted attention.

Our analyses indicate that historic patterns of uneven canopy cover across the city largely persist. For example, there

Canopy cover for the city as a whole increased during 2017–2021, from 22.20% to 23.40%, and the annual rate of increase was slightly higher than it was for … 2010–2017. This is encouraging and suggests that efforts in recent decades to support planting and maintenance are having positive impacts.

is largely lower canopy cover in areas where residents tend to be at greater risk for death from extreme heat (based on the Heat Vulnerability Index for NYC developed by the NYC Department of Health and Mental Hygiene), in areas identified by New York State as part of the work of the NYS Climate and Community Protection Act of 2019 as Disadvantaged Communities (DACs), and in areas with lower incomes. These patterns are frequently associated with legacy effects of redlining, as historically redlined areas tended to have lower canopy cover than other parts of the city as of 2021. Interestingly, these same areas generally experienced the largest gains in canopy cover by 2021 relative to the canopy cover in 2017. This may be, in part, a testament to strategic, equity-focused investments in tree planting during the last two decades through programs such as Trees for Public Health, The Million Trees NYC Initiative, and Cool Neighborhoods NYC. Some exceptions to these citywide trends are found at smaller geographic scales. Specifically, we found that at the borough level, in Queens higher heat vulnerability was not associated with greater canopy cover increases, and in Manhattan DACs tended to have higher canopy cover than non-DACs.

New York City's goal of 30% canopy cover was informed by many local advocates, including members of the Forest for All NYC coalition that works to advance the *New York City Urban Forest Agenda* (released in 2021). This *Agenda* includes a goal of achieving at least 30% canopy cover citywide in an equitable way by 2035. If the rate of canopy growth between 2017 and 2021 holds, then the 30% goal would be reached in about 2042. The NYC Mayor's Office of Climate and Environmental Justice published the first ever NYC Urban Forest Plan in April 2026, pursuant to Local Law 148 of 2023. This is the city's first long-term, citywide, coordinated plan to sustain and grow tree canopy. The Plan sets a target of reaching 30% canopy by 2040, which will require an accelerated rate of canopy growth. This can be accomplished by protecting and maintaining existing trees, planting more trees (especially in areas of low canopy), and conducting more monitoring and research.

We estimate that as much as 90% of the tree canopy gained from 2017 to 2021 was from growth of existing trees, rather than from trees that were newly planted during that time. This is even higher than the previous estimate of 87% for 2010 to 2017. This finding reinforces the importance of protecting and caring for the existing trees across the city, especially on private property where there are almost no legal protections or incentives for tree planting, care, or replacement.

Tree planting will be critical to achieve 30% canopy cover. However, the densely built nature of NYC and complexity of land uses pose constraints in terms of where new trees can be planted. Thus, it will be critical to consider how and where to create more opportunities to plant trees and encourage their canopy to grow. Approaches to doing this can include streetscape redesign (e.g., de-paving in some areas) and zoning changes, acknowledging that authentic engagement of local communities and elevating local leadership are vital to ensuring that the multitude of benefits reach all New Yorkers.

Overall, we are seeing encouraging trends. It will take continued commitment and responsiveness to local needs to see a substantially different distribution of canopy in future years. Filling outstanding information gaps in the urban forest can support more holistic planning and adaptive management of the NYC urban forest into the longer term.

Introduction

Species: Callery pear (*Pyrus calleryana*)

CHAPTER 1

Introduction

The urban forest of New York City (NYC) is "a unique, complex, verdant system that includes the more than seven million trees in NYC [estimated as of 2021], and the physical and social infrastructure on which they depend."[1] It offers immense benefits, both tangible and intangible, for people, biodiversity, and environmental quality, and it is entwined in society in complicated ways—including with funding, management, and policies that support it to provide the benefits as fully as possible. The 2021 report *The State of the Urban Forest in New York City* offered a broad perspective of the resource, based on tree canopy data from 2017 (the best available at the time) and the latest research, in combination with new analyses.[1] (Canopy is the area of branches and leaves as seen from above.) While the report characterized the resource as generally healthy in many ways, it also identified several challenges, such as the inequitable distribution of tree canopy across the city and the lack of an overarching, long-term citywide plan to support maintaining trees and expanding canopy (see **Box 1.1**).

As a complex social ecological system, the NYC urban forest is dynamic—it is constantly evolving, and our understanding of it is ever increasing, thanks to insights from new research and data. Given the expanse of the city, new insights tend to be focused geographically or on a subset of the trees (e.g., street trees, natural areas). Citywide datasets on tree canopy, or the area of branches and leaves as seen from above, offer a comprehensive point-in-time picture of the resource across land uses, jurisdictions, and political, administrative, and similar units. Tree canopy is only one of the many dimensions of the urban forest,[1] but changes in canopy over time ultimately reflect the cumulative effects of intentional efforts (e.g., planting, care, protection, and removal of trees; ecological restoration of forested natural areas) and natural factors that affect the resource (e.g., natural regeneration, storms, heat stress, pests, diseases). Multiple time points of such data further offer the ability to understand gains and losses in canopy across the city, the opportunity to evaluate impacts of efforts such as planting and protection initiatives, and information that helps set, refine, and adaptively manage to achieve municipal urban forest goals.

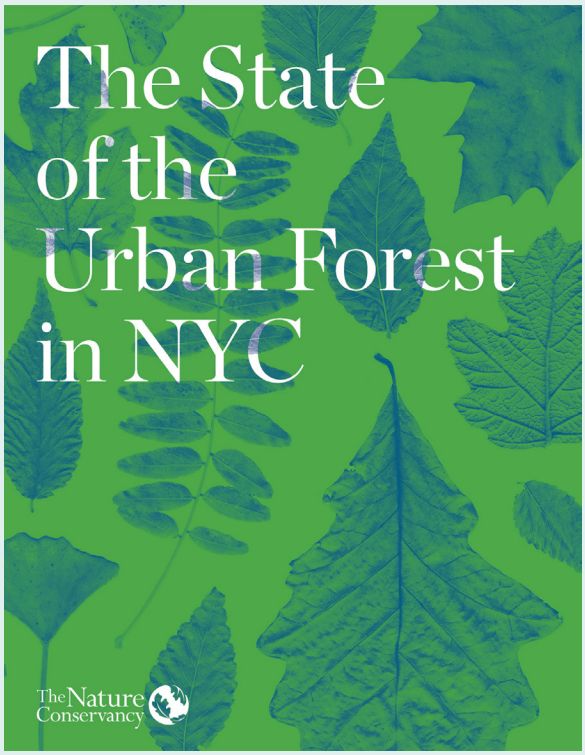
Herein we offer updated insights on tree canopy in NYC based on the latest data, which represent 2021,[2] and how it changed since 2017 and analyses across a suite of geographic units, jurisdictions, land uses, and community characteristics. We followed the same general approaches as *The State of the Urban Forest in New York City* to better support understanding changes over time, while incorporating minor methodological refinements (see Appendix 1 for detailed methods) and new datasets of interest. For example, we expanded our analysis of canopy cover alongside community characteristics to include the Disadvantaged Communities data for New York State[3] that was developed in accordance with the New York Climate Leadership and Community Protection Act of 2019[4] and finalized after *The State of the Urban Forest in New York City* was released.

Recent Advancements for the NYC Urban Forest

In 2023, the City included a goal of achieving 30% canopy citywide alongside other urban forestry-related commitments in the sustainability plan for NYC, *PlaNYC: Getting Sustainability*

BOX 1.1

Key findings from *The State of the Urban Forest in New York City*



The State of the Urban Forest in New York City identified various strengths, challenges, and opportunities of the resource, with some of the key findings as follows:

- Citywide canopy cover increased during 2010–2017, and although historic disparities in canopy across the city persisted, areas with lower canopy in 2010 saw strong gains.
- The trees were characterized as generally healthy in terms of size and age distribution (i.e., many younger ones to replace older ones over time) and represented a wide variety of species and cultivars, with forested natural areas composed primarily of native species.
- The Million Trees NYC Initiative (2007–2017) and Cool Neighborhoods NYC (2017–2021) provided strong investments to plant trees—particularly within NYC Parks' jurisdiction—including street trees and those on City Parkland.
- Over half of the canopy was estimated to be within NYC Parks' jurisdiction, with strong protection for the trees, but most other trees have little to no formal protection.
- Although NYC Parks has rigorous tree care standards, limited and highly variable funding for implementing them posed challenges for implementation from year to year.
- A wide array of engaged individuals and organizations work to understand, care for, and advocate for trees in

Done.[5] Later that year, New York City Council unanimously passed Local Law 135 of 2023,[6] requiring consideration of trees and tree canopy in the subsequent sustainability plans. Local Law 148 of 2023 also unanimously passed, requiring the development of the first-ever NYC Urban Forest Plan (NYC UFP) "with an overall goal of equitably expanding the urban forest canopy to cover 30 percent of land within the city" (up from 22% in 2017), considering both public and private property, and with robust public engagement.[7] The NYC Mayor's Office of Climate and Environmental Justice published the NYC UFP in April 2026.[8] Pursuant to the law, the plan will be updated every 10 years, and tree canopy will be mapped every five years to support tracking of canopy change over time.

Such policy advancements were built on growing support for and organizing around the NYC urban forest. In particular, starting in 2019 The Nature Conservancy convened over 50 key stakeholder organizations to form the NYC Urban Forest Task Force, organizing the groundswell of interest and expertise to develop a coordinated and shared vision for the urban forest.[9] In 2021, the Task Force produced the *New York City Urban Forest Agenda: Toward a Healthy, Resilient, Equitable, and Just New York City* (the *Agenda*). This document

included 12 near-term actions to support the NYC urban forest into the future, spanning realms of planning, investment, managing, and learning about the resource. With the release of the *Agenda*, the Urban Forest Task Force transformed into Forest for All NYC: a diverse coalition that currently includes over 200 member organizations working to advance the *Agenda*, with a vision of "a healthy, biodiverse, robust, accessible, well-understood, and resilient urban forest that justly and equitably delivers its multiple benefits to all residents of New York City and helps the city adapt to and mitigate climate change."

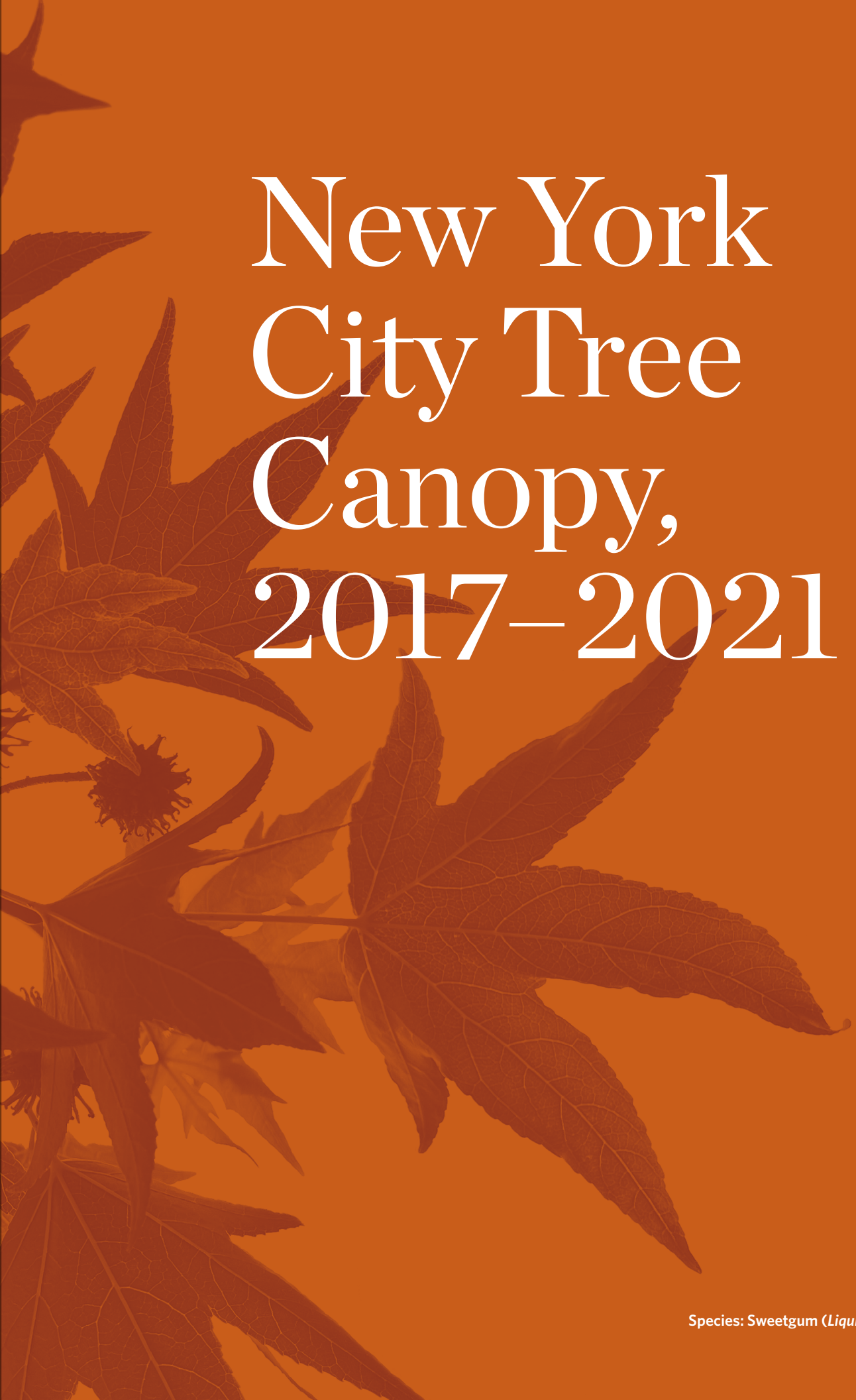
The NYC urban forest is also benefiting from policies and funding from beyond the city. In particular, the federal Inflation Reduction Act of 2022 allocated funding for urban and community forestry in municipalities across the United States, including in NYC, and in 2024, New York State Governor Kathy Hochul announced an initiative to plant 25 million trees across the state, including within NYC, by 2033.[10]

While we offer updated insights about the NYC urban forest through the lens of tree canopy, we also acknowledge that new research on other dimensions of the resource is regularly improving our understanding of it. For example, a study by the Natural Areas Conservancy, which considered NYC and other cities across the country, found that on hot summer days, forested natural areas tend to be cooler than both other types of natural areas and non-natural areas.[11] There has also been social science research yielding insights on how people relate to trees in the context of stewardship activities,[12] and work on the role that ecological "edge effects" play in shaping the structure and species composition of forested natural areas.[13] Further, NYC has been considered alongside other cities and metropolitan areas to better characterize urban forests more broadly, such as in terms of benefits amidst extreme heat[14] and management of the resource.[15] New York City perspectives also contributed importantly to the dialogue around "centering community in urban forestry" to create more just and sustainable cities.[16]

We encourage those interested in the NYC urban forest to review *The State of the Urban Forest in New York City* for information about myriad dimensions of the resource, and to explore studies such as those we reference above for newer and more targeted insights. We acknowledge and appreciate that there is always more work being done to understand different aspects of the NYC urban forest at different points in time. Some examples include work underway like an update of the Ecological Assessment of natural areas by the Natural Areas Conservancy and NYC Parks, and a census of street trees and those in landscaped park areas by NYC Parks. Further, though it is beyond the scope of this report, The Nature Conservancy is updating an analysis of the opportunity to increase tree canopy across the landscape through planting and growth of new trees to help inform planning for the urban forest[17,18] based on newer data including the latest land cover and canopy datasets.

A sample of the natural areas within Pelham Bay Park, in the Bronx

New York City Tree Canopy, 2017–2021



Species: Sweetgum (*Liquidambar styraciflua*)

CHAPTER 2

New York City Tree Canopy, 2017–2021

Tree Canopy Distribution and Change Across the City

The latest data available for NYC show that 45,247 acres, or 23.40% of the city, were covered by tree canopy in 2021. This reflects an increase from 22.20% canopy cover in 2017 and 20.37% in 2010, the first year of comparable data. The rate of change for this most recent time period, 2017–2021, was 0.30% per year—slightly higher than the increase of 0.26% per year during 2010–2017.* (See **Box 2.1** for summary of analyses and Appendix 1 for detailed methods.)

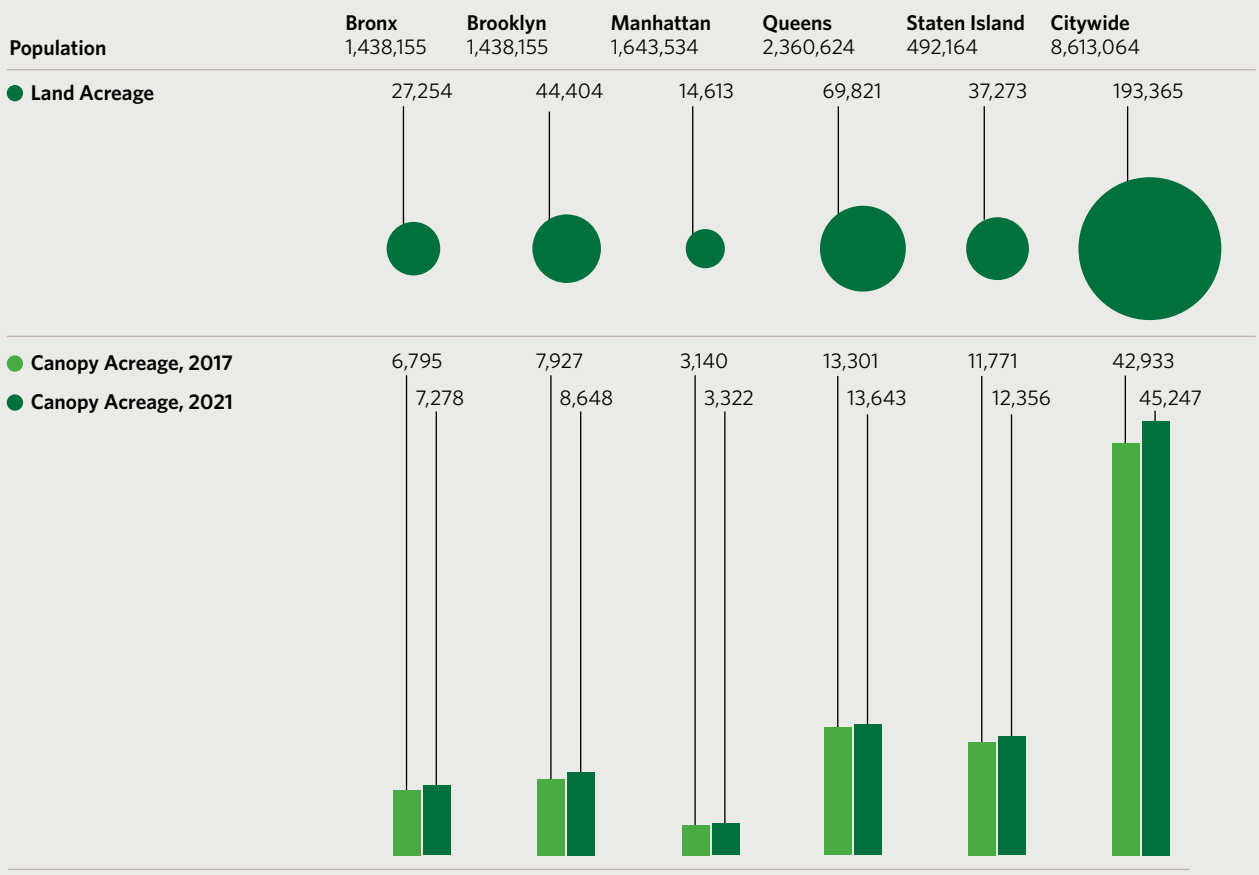
The distribution of tree canopy among the five boroughs in 2021 was similar to that in 2017 (**Table 2.1**), with Staten Island having the highest canopy cover (33.15%) and Brooklyn the least (19.48%). All boroughs had net increases in canopy since 2017, though the net gain was notably smaller in Queens (0.49%) than in the other boroughs (with net gains ranging from 1.25% in Manhattan to 1.77% in the Bronx). With small canopy cover increases in Queens (which is consistent with the trend in 2010–2017) and larger gains in Brooklyn, Queens is poised to become the borough with the lowest canopy cover in the future.

As the largest borough, with just over 36% of NYC land area, Queens accounted for 30.15% of all NYC canopy despite having the second lowest canopy cover. Staten Island serves as a stark contrast, with 19.28% of the citywide land area but 27.31% of all NYC canopy. The Bronx, Brooklyn, and Manhattan each accounted for nearly proportionate amounts of the citywide tree canopy considering their land area. However, with their recent increases in canopy cover, they hold larger shares of the citywide tree canopy than in 2017.

The distribution of tree canopy and how it is changing can look somewhat different depending on the spatial units of analysis (**Figure 2.2**), though some consistent patterns emerged from the data. For example, parts of the city with large parks, cemeteries, and other heavily vegetated spaces generally had among the highest canopy cover, whereas heavily developed areas (e.g., areas with airports, shipping terminals, and a high density of buildings) tended to have the lowest (**Figure 2.2**). And although the specific areas with the greatest gains in canopy cover were unpopulated areas along Jamaica Bay and the eastern shore of Staten Island (both impacted heavily by Superstorm Sandy in 2012), strong gains were generally seen in north-central Brooklyn (e.g., Bushwick and Bedford Stuyvesant), northern Manhattan, and the South Bronx (see **Figure 2.3**). Net decreases in canopy cover during 2017–2021 were exceptions across the city and were mainly seen in eastern Queens and Midtown East Manhattan (**Figure 2.3**).

* The canopy cover datasets for 2017 and 2021 both have an estimated accuracy of 99%. Thus, we present these findings as robust estimates, acknowledging the potential for minor errors due to inherent limitations of the data.

Canopy and Canopy Change by Borough, 2017–2021



	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
Percent Canopy, 2017	24.93%	17.85%	21.49%	19.05%	31.58 %	22.20%
Percent Canopy, 2021	26.70%	19.48%	22.74%	19.54%	33.15%	23.40%
Percentage of NYC Canopy, 2017	15.83%	18.46%	7.31 %	30.98%	27.42%	100.00%
Percentage of NYC Canopy, 2021	16.08%	19.11%	7.34%	30.15%	27.31%	100.00%
Net Change (change in percent canopy), 2017–2021	1.77%	1.62%	1.25%	0.49%	1.57%	1.20%
Relative Change (change compared with canopy in 2017), 2017–2021	7.11%	9.10%	5.81%	2.57%	4.97%	5.39%
Acreage of Canopy Gain, 2017–2021	1,227	1,887	514	2,555	1,805	7,988
Acreage of Canopy Loss, 2017–2021	743	1,166	332	2,213	1,220	5,674
Acreage of No Canopy Change, 2017–2021	6,051	6,761	2,808	642	880	3,253

Data Sources: Land area information derived from Borough Boundaries data (NYC Department of City Planning); Canopy metrics derived from NYC Tree Canopy Change (2017–2021) data (The Nature Conservancy); Population data from U.S. Census Bureau, 2018–2022 American Community Survey (ACS) 5-Year Estimates considering only residential areas based on NYC Neighborhood Tabulation Area data (NYC Depatment of City Planning)

Table 2.1 Detailed statistics about tree canopy and canopy change from 2017 to 2021, by borough and citywide.

BOX 2.1

Understanding Tree Canopy Across Geographies and Jurisdictions of NYC

Quantifying Tree Canopy

Tree canopy (or simply "canopy") is the layer of leaves, branches, and stems that cover the ground when viewed from above. Information about tree canopy presented in this report is based on the most recently available data for NYC, derived primarily from 3D, LiDAR-based data collected in 2021.[2] This dataset is comparable to the 2010 and 2017 tree canopy datasets for NYC,[19,20] and uses the same overall methods (described by MacFaden et al.[21]). In the dataset, tree canopy represents all approximated tree crowns that were delineated from the LiDAR data, where the average height within each tree crown is greater than 8′. These datasets include canopy for the entire NYC landscape, except canopy from trees on rooftops (e.g., in pots or as part of green roofs) due to complexities of mapping rooftop features; NYC green roof data for 2016 (pending updates) indicate that such instances are rare.[22,23]

We present canopy findings as the total area of tree canopy (in acres) or as *(tree) canopy cover*, reflecting the percentage of land area* covered by canopy (e.g., Borough, Community District; additional methodological details are available in Appendix 1). *Net change* in tree canopy is the change in area or percent cover of canopy from one year to another. *Relative change* is the percent change in canopy between two years, relative to the first year of comparison (e.g., relative change for 2017 to 2021 is calculated as: 100 * ([canopy in 2021] – [canopy in 2017])/ [canopy in 2017], and canopy for each year can be in either acreages or percentages).

Breakdowns of Tree Canopy Presented

We characterize canopy and canopy change citywide, by borough, and for the following units (**Figure 2.1**; enlarged reference maps are available in Appendix 2):

- New York City Council Districts, each of which has an elected member of City Council (the boundaries used herein reflect the updates codified in 2023 based on the 2020 decennial census).
- Community Districts, each with an associated Community Board, and a suite of unpopulated areas (Joint Interest Areas) that include airports and large parks that are distinct areas.
- Neighborhood Tabulation Areas (NTAs), which are delineated by the NYC Department of City Planning for planning purposes, as aggregations of census tracts (updated based on decennial Census data), generally distinguishing unpopulated areas (e.g., large parks, cemeteries, airports) from populated ones.

We also discuss the distribution and change in tree canopy across site types, following the same groupings as *The State of the Urban Forest in NYC*, considering a combination of jurisdiction and land uses:

- Canopy on lands under public or government jurisdiction:
  - City (City Parkland, Rights of Way, and Other City-owned)
  - State
  - Federal
- Canopy on privately owned property, in the following land use categories:
  - One- and two-family residential
  - Multifamily (3+) residential (including apartment buildings and mixed commercial/residential)
  - Non-residential developed, including commercial, manufacturing, transportation, utility, and parking facilities
  - Open space and outdoor recreation properties
  - Cemeteries
  - Vacant land

* NYC land area as considered in this report is based on the Borough Boundaries (Clipped to Shoreline) dataset from the NYC Department of City Planning, which excludes the coastal waters of New York City but includes inland water bodies.

Geographic Scales of Analysis

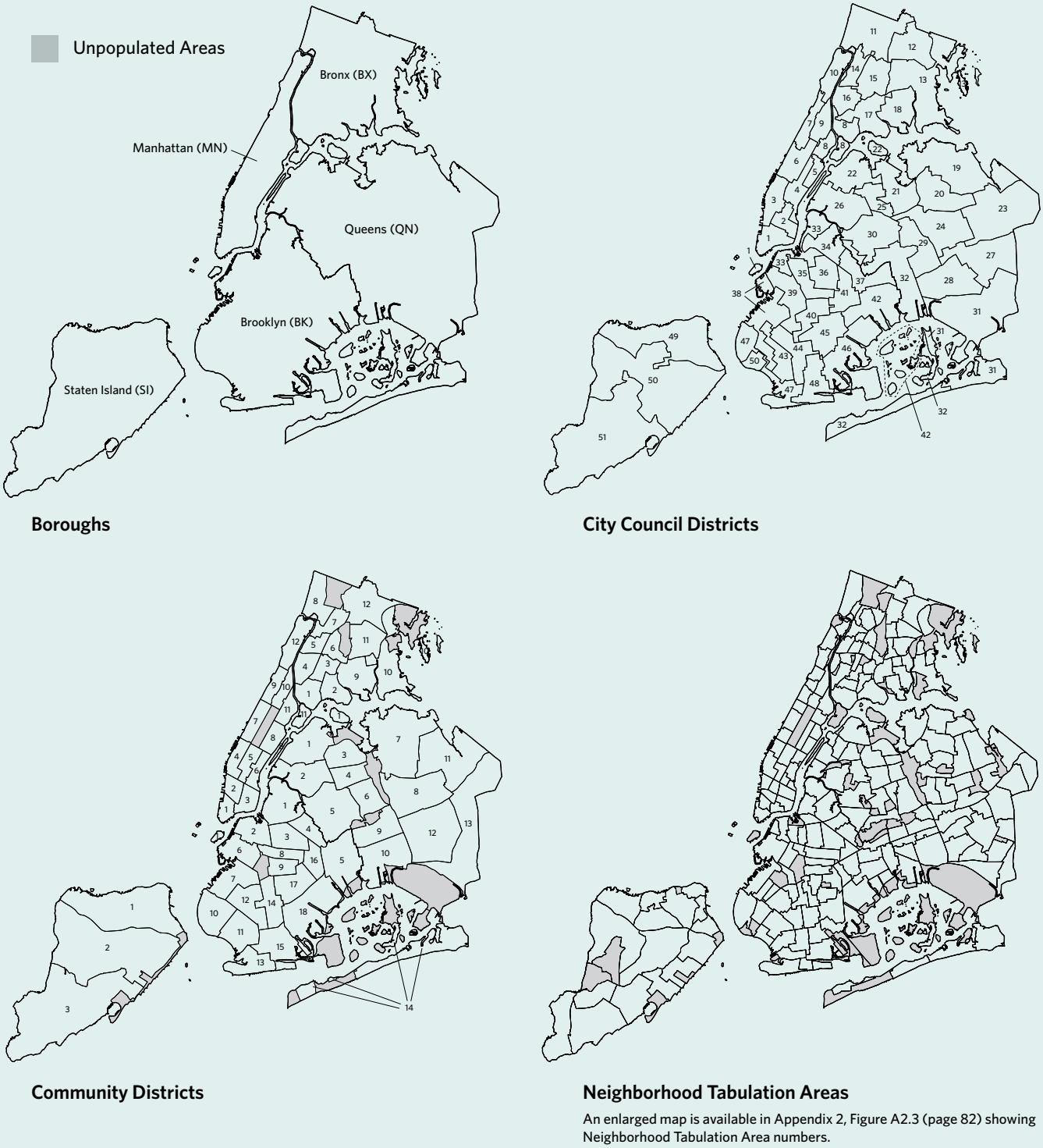


Figure 2.1 Maps of geographic units of analysis used in this report: boroughs, City Council Districts, Community Districts, and Neighborhood Tabulation Areas. Note: for Community Districts and Neighborhood Tabulation Areas numbers restart for each borough.

Neighborhood Tabulation Area-level summaries of canopy change data, in particular, help illustrate the role that parks and other unpopulated spaces can play in supporting local canopy expansion.

The patterns of canopy and canopy change appear similar for City Council and Community Districts, with differences largely stemming from the inclusion of large, unpopulated areas such as large parks and airports in City Council Districts but not Community Districts. Given the similarities, we highlight City Council Districts with the highest and lowest canopy cover below, and include maps of both in **Figure 2.2**.

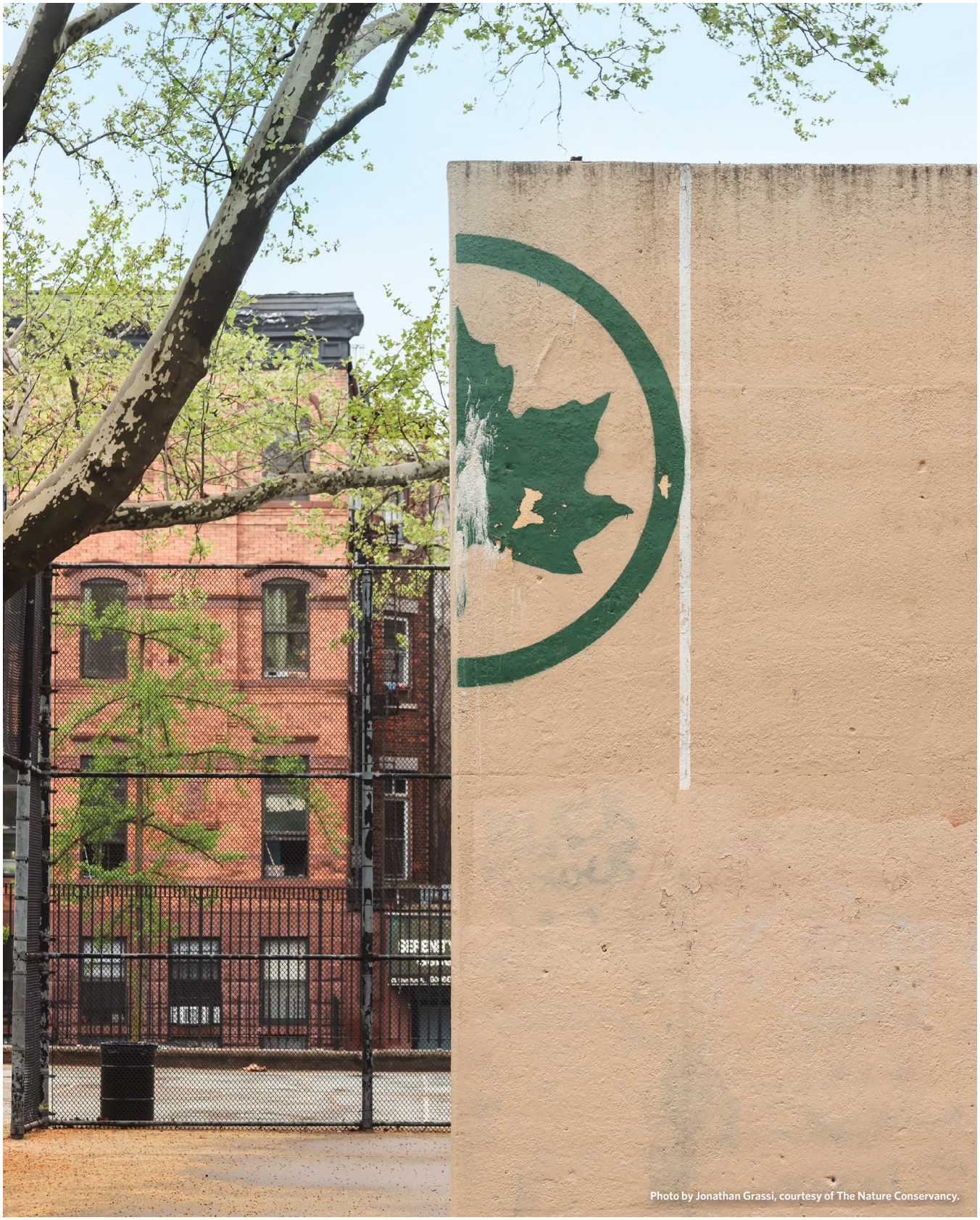
- The five City Council Districts with the highest canopy cover in 2021 were:
  - Council District 11 (northern Bronx, including Van Cortlandt Park; 43.44%)
  - Council District 6 (Upper West Side of Manhattan and Central Park; 36.29%)
  - Council District 51 (southern Staten Island; 35.22%)
  - Council District 10 (northern Manhattan, including Inwood Hill Park; 34.70%)
  - Council District 23 (eastern Queens, including Alley Pond Park; 33.16%).
- The five City Council Districts with the lowest canopy cover were:
  - Council District 31 (southeastern Queens, including JFK Airport and Far Rockaway; 11.05%)
  - Council District 3 (Midtown West in Manhattan; 11.27%)
  - Council District 26 (Long Island City, Sunnyside Queens; 11.69%)
  - Council District 4 (Midtown East; 13.13%)
  - Council District 43 (including Bensonhurst Brooklyn; 13.62%).

While many of these patterns are reinforced when considering the smaller units of Neighborhood Tabulation Areas (NTAs), exceptions stand out at this more granular scale (**Figure 2.2**):

- Although Bronx Community District 8 had the highest canopy cover of all Community Districts in NYC (40.45%), there are clear disparities among the contained NTAs. The large NTA spanning the western portion of this Community District that includes Riverdale and Spuyten Duyvil (BX-0803) had nearly 50% canopy cover, whereas an adjacent NTA containing Kingsbridge and Marble Hill (BX-0802) had only 20.41%.

- The lower-canopy areas of Sunset Park in Brooklyn and the South Bronx have been acknowledged as environmental justice communities[24,25] and are considered Environmental Justice Areas by the City.[26] However, the unpopulated areas of Green-Wood Cemetery in Sunset Park and Claremont Park, Crotona Park, and Soundview Park in the South Bronx all stand out in the NTA-level data as local exceptions with higher canopy cover.

NTA-level summaries of canopy change data, in particular, help illustrate the potential role that parks and other unpopulated open spaces can play in supporting local canopy expansion (**Figure 2.3**). For example, Middle Village Cemetery in Queens, which is about 125 acres in size, experienced a net gain of almost 12 acres, or 10% canopy cover during 2017–2021 (from 21.24% to 30.64%). Soundview Park in the South Bronx also experienced canopy cover increases, from 28.49% in 2010 to 35.41% in 2017 and 44.27% in 2021—a net change of 15.78% over 11 years.



Handball court at Alexander Hamilton Playground in Hamilton Heights, Manhattan

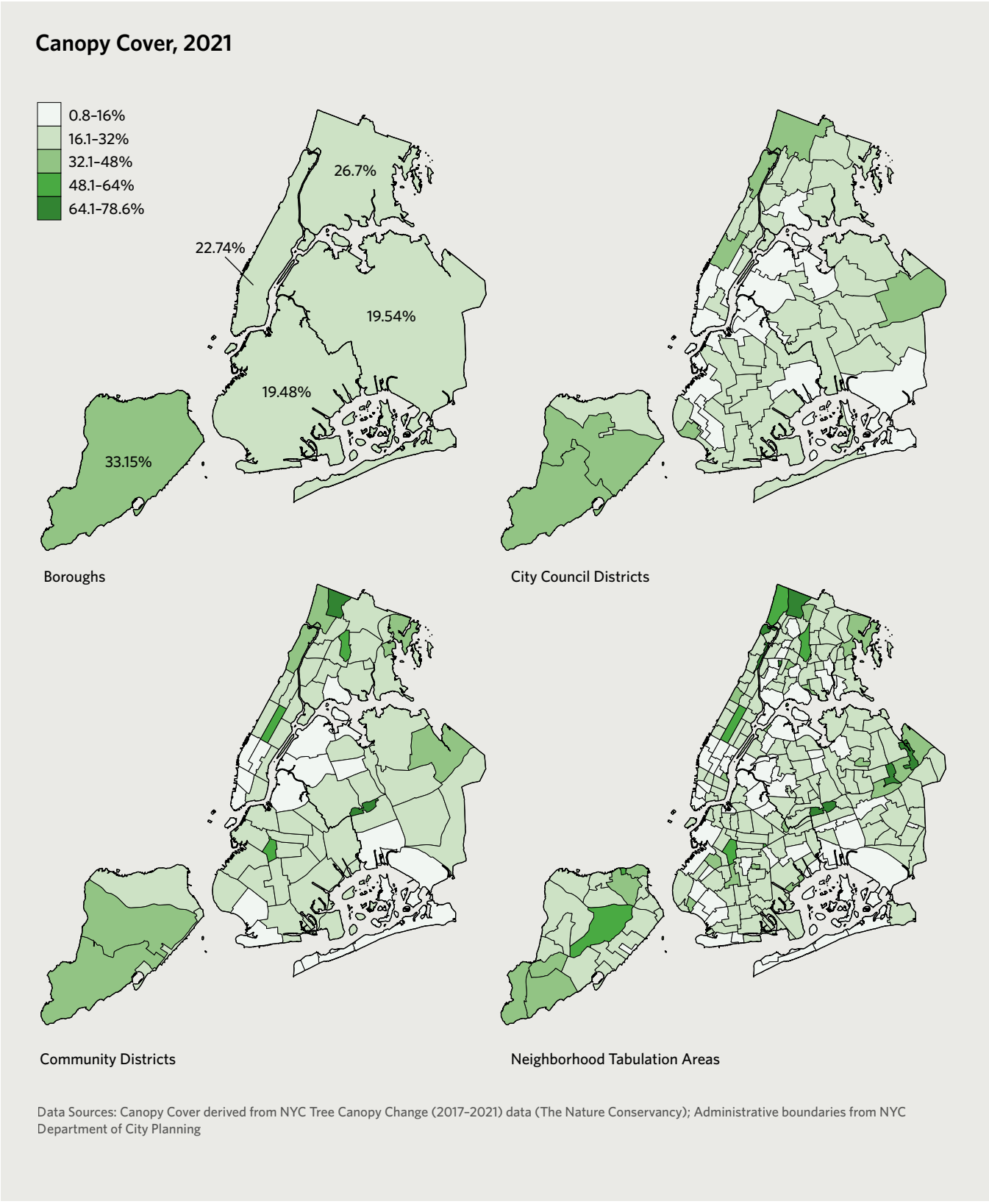
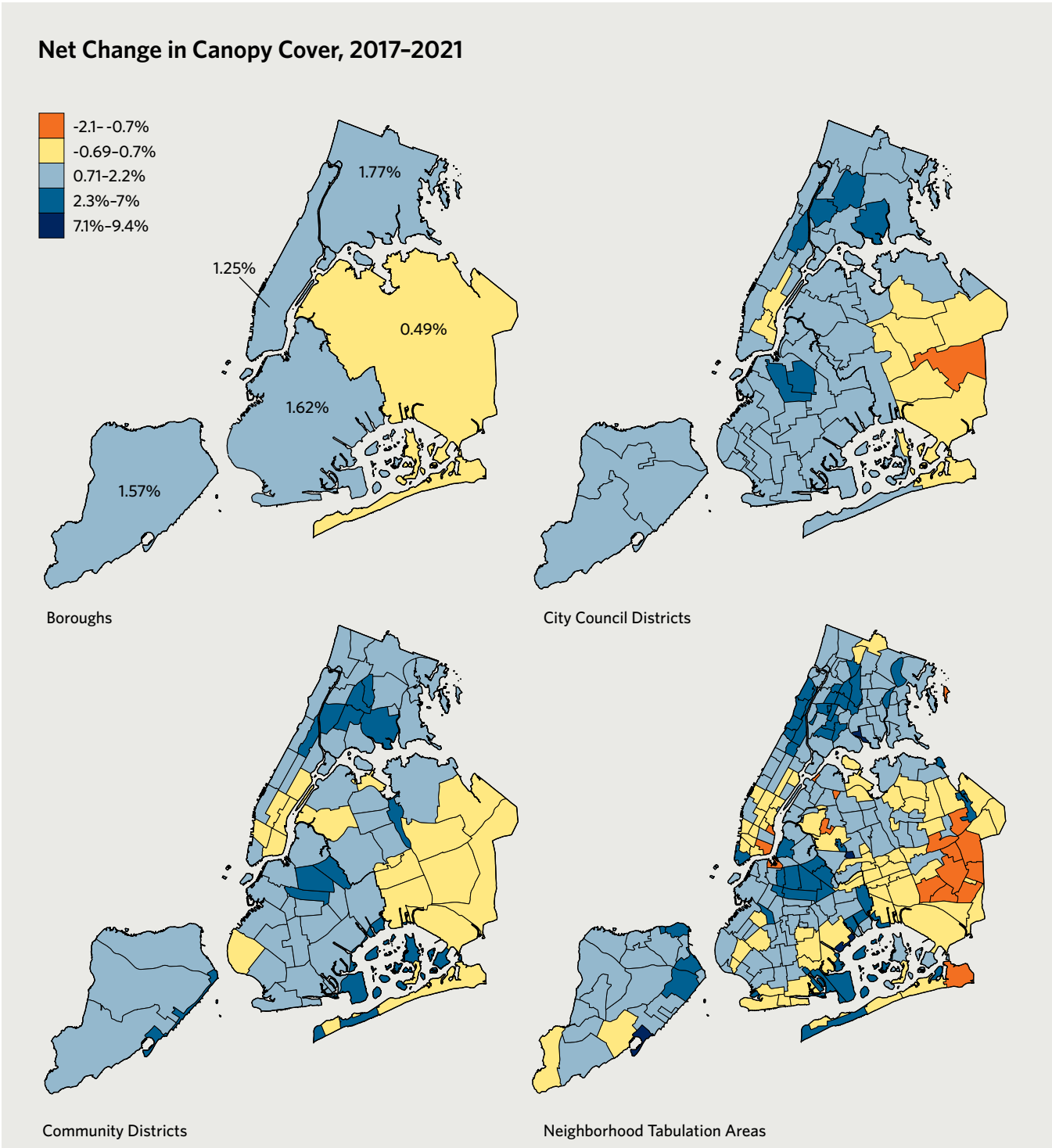


Figure 2.2 Percentage of land area covered by tree canopy as of 2021 by borough, City Council District, Community District, and Neighborhood Tabulation Area. The legend applies to all scales shown.



Note: To support interpretation of the data, the legend excludes the net canopy gain values for one unpopulated Neighborhood Tabulation Area off the eastern shore of Staten Island, made up of Hoffman and Swinburne Islands (13.32%).

Data Sources: Change in Canopy Cover derived from NYC Tree Canopy Change (2017–2021) data (The Nature Conservancy); Administrative boundaries from NYC Department of City Planning

Figure 2.3 Change in percentage of land area covered by canopy during 2017–2021, by borough, City Council District, Community District, and Neighborhood Tabulation Area. The legend applies to all scales shown.

Foggy day in Prospect Park, Brooklyn

Canopy Across Jurisdictions and Land Uses

Considering the distribution of tree canopy in terms of jurisdiction and land ownership is vital for understanding management dynamics of the urban forest. While nearly half of NYC land is privately owned, only about a third of the canopy falls on those properties. In contrast, City lands, primarily made up of rights of way and City Parkland, are 42% of the land area yet account for nearly 60% of all NYC canopy. State and federal entities each make up much smaller, but notable, portions of both the land and canopy in the city. Land area and canopy are summarized by jurisdiction in **Figure 2.4**, with borough- and citywide summaries in **Table 2.2**.*

Publicly Owned Lands

Slightly over half of NYC land area and two-thirds of the tree canopy were under the jurisdiction of City, State, or Federal agencies and public benefit corporations as of 2021 (**Figure 2.4**), and canopy cover increased on all of these jurisdictions within all five boroughs during 2017–2021. Of all tree canopy on City land, 93.86% was in NYC Parks' jurisdiction—this includes the canopy on City Parkland, including natural areas (see **Box 2.2** for further discussion) and landscaped areas, and in rights of way associated with street trees. Further, the canopy cover within NYC Parks' jurisdiction increased 2.20%, outpacing the citywide canopy gains overall by about a percentage point. While property-specific analyses are beyond the scope of this report, we estimate that about 70% of individual NYC Parks properties gained canopy.

The other City-owned properties include various facilities managed by different City agencies, such as public schools

* Though the breakdown of NYC land area by jurisdiction can change (e.g., with real estate transactions), which itself would influence the jurisdictional breakdown of canopy cover, our analyses showed comparable jurisdictional breakdowns of land area to those presented in *The State of the Urban Forest in New York City*. Thus, results related to changes are specifically focused on canopy cover changes within a given jurisdiction.

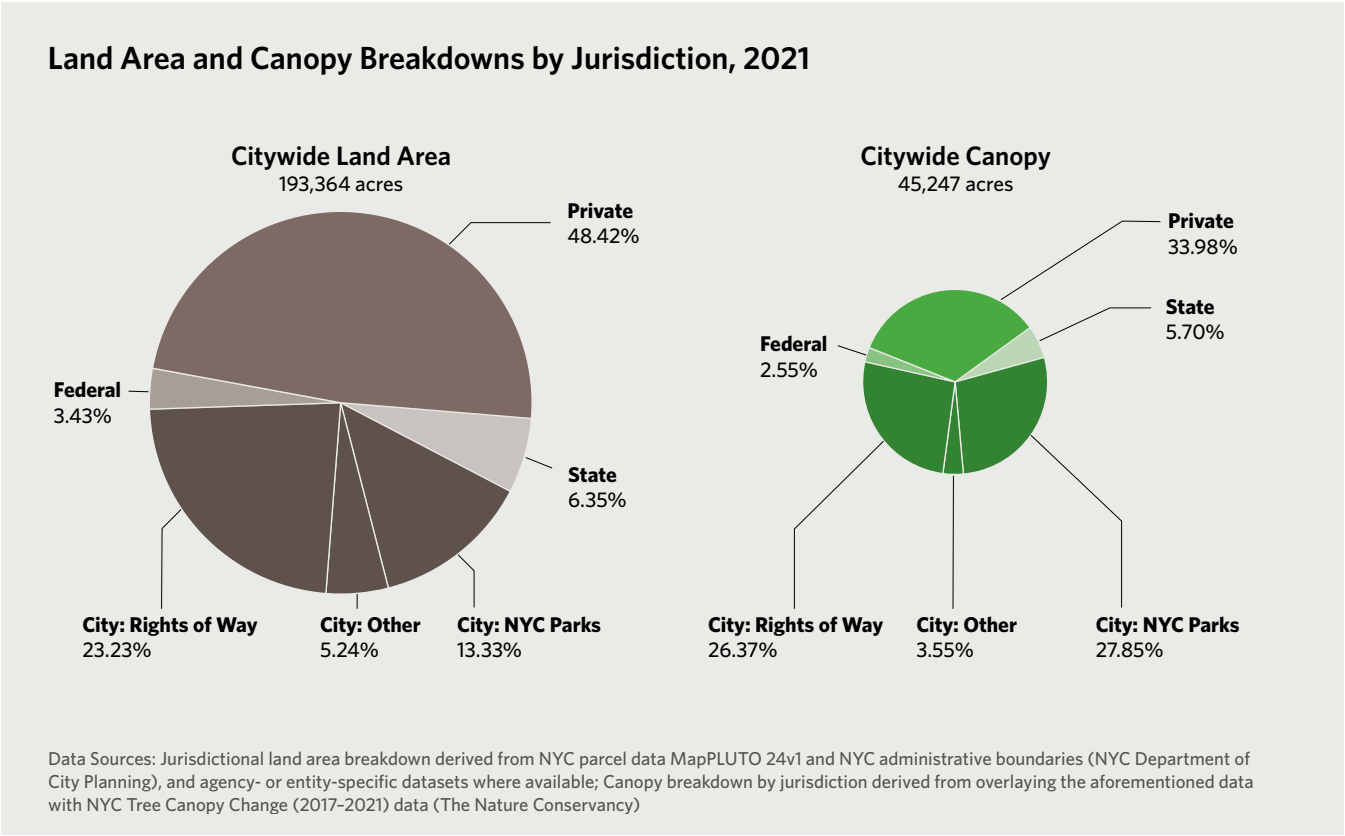


Figure 2.4 Pie charts of land area (left) and canopy (right) by jurisdiction, illustrating that canopy is not distributed across jurisdictions proportionally to the respective land area. Pie chart areas are scaled to total area of land and canopy, respectively.

(associated with the NYC Department of Education) and wastewater resource recovery facilities (NYC Department of Environmental Protection), and combined they accounted for 3.55% of the total canopy in NYC.† Although City-owned property beyond NYC Parks jurisdiction makes up a small portion of overall land area, they can present notable opportunities for increasing canopy in ways that touch down in neighborhoods throughout the city. For example, public K–12 schools are found throughout neighborhoods in all five boroughs, and they accounted for about 2.33% of NYC land area and nearly 2% of all tree canopy in NYC (canopy cover across such properties was 18.17% in 2021, up from 14.72% in 2017).

Almost one-tenth of the land in NYC is under State (6.35%; 12,275 acres) and Federal (3.43%; 6,623 acres) jurisdiction, with a wide range of what properties look like and how they are used. State properties include airports, rail infrastructure, shipping terminals, higher-education facilities and institutions, parks and preserves, and public housing. Federal properties include post offices and office buildings, though almost all land and tree canopy under Federal jurisdiction in NYC is within Gateway National Recreation Area, administered by the National Park Service. As a whole, these properties introduce many different land management approaches and varying degrees of opportunity for more trees and their canopy. Some specific findings about canopy on State and Federal land as of 2021 include:

- State lands accounted for about 5.7% of all tree canopy in NYC, and the overall canopy cover across these lands as of 2021 was 21.00%—up from 19.73% in 2017. New York City Housing Authority (NYCHA) properties accounted for the most canopy of any State entity—about 40% (see **Box 2.3**), followed by the New York State Department of Environmental Conservation and Office of Parks, Recreation, and Historic Preservation, each with about 10% of all canopy on State lands.

† Jurisdictional authority of individual properties for many City, State, and Federal entities is nuanced and difficult to accurately discern from available data for most agencies without publicly available datasets; thus, with few exceptions we do not attempt to offer agency-specific information.

Land Area, Canopy, and Canopy Change by Borough and Jurisdiction, 2017–2021

	Bronx	Brooklyn	Manhattan	Queens	Staten Island	Citywide
City: Rights of Way						
Land Area (acres)	6,458	11,455	3,889	16,570	6,544	44,916
Canopy Cover, 2021	23.60%	27.23%	23.60%	26.21%	31.00%	26.57%
Percent of Total Borough Canopy, 2021	20.95%	36.07%	27.63%	31.83%	16.42%	26.37%
Net Change in Canopy Cover, 2017–2021	3.22%	2.71%	2.54%	0.98%	2.61%	2.11%
City: Parks						
Land Area (acres)	5,922	3,812	2,643	6,433	6,967	25,778
Canopy Cover 2021	53.14%	36.06%	53.05%	43.74%	55.48%	48.89%
Percent of Total Borough Canopy, 2021	43.24%	15.89%	42.21%	20.62%	31.28%	27.85%
Net Change in Canopy Cover, 2017–2021	2.42%	3.04%	1.98%	1.99%	2.38%	2.35%
City: Other						
Land Area (acres)	2,000	2,208	880	2,058	2,995	10,141
Canopy Cover, 2021	10.03%	8.66%	11.76%	15.13%	26.63%	15.82%
Percent of Total Borough Canopy, 2021	2.76%	2.21%	3.12%	2.28%	6.45%	3.55%
Net Canopy Cover Change, 2017–2021	0.67%	1.03%	0.92%	1.62%	1.86%	1.31%
State						
Land Area (acres)	1,139	1,468	1,013	6,491	2,163	12,275
Canopy Cover, 2021	31.08%	34.32%	26.59%	7.39%	44.92%	21.01%
Percent of Total Borough Canopy, 2021	4.87%	5.82%	8.11%	3.52%	7.87%	5.70%
Net Canopy Cover Change, 2017–2021	2.60%	1.50%	0.63%	0.75%	2.33%	1.28%
Federal						
Land Area (acres)	2	2,766	50	2,903	902	6,623
Canopy Cover, 2021	1.82%	17.14%	18.92%	14.59%	27.46%	17.44%
Percent of Total Borough Canopy, 2021	0.00%	5.48%	0.28%	3.11%	2.00%	2.55%
Net Canopy Cover Change, 2017–2021	-0.28%	3.76%	-1.10%	3.07%	5.80%	3.70%
Private						
Land Area (acres)	11,732	22,694	6,137	35,365	17,702	93,631
Canopy Cover, 2021	17.49%	13.15%	10.10%	14.91%	25.11%	16.42%
Percent of Total Borough Canopy, 2021	28.19%	34.52%	18.66%	38.64%	35.98%	33.98%
Net Change in Canopy Cover, 2017–2021	0.76%	0.64%	0.28%	-0.34%	0.51%	0.24%

Data Sources: Jurisdictional land area breakdowns borough and citywide derived from NYC parcel data MapPLUTO 24v1 and NYC administrative boundaries (NYC Department of City Planning), and agency- or entity-specific datasets where available; Canopy breakdown by jurisdiction derived from NYC Tree Canopy Change (2017–2021) data (The Nature Conservancy)

Table 2.2 For City, State, Federal, and Private jurisdictional categories, the land area, canopy cover (2021), share of total canopy (2021), and net change in canopy (2017–2021) by borough and citywide.

BOX 2.2

Tree Canopy in Forested Natural Areas

Many trees of the NYC urban forest are considered on a tree-by-tree basis, including street trees, trees in landscaped parks, those on institutional properties, and trees in the front and back yards of homes. However, the largest number of the trees in NYC are actually estimated to be part of forested natural areas,[27] which are distinct from other portions of the urban forest in terms of biodiversity, tree size and structure, and management.[1,28] Forested natural areas are complex ecosystems that include soil, microorganisms, and myriad species of flora and fauna throughout their various life stages, in addition to the humans who live near, visit, and manage these spaces,[1] and as considered here, are the subset of natural areas more broadly covered by tree canopy. Management of these spaces is typically focused on supporting healthy ecosystems. Although local changes in canopy may relate to the status of the trees in a given forested natural area, a more holistic assessment of the plant community that captures the vertical structure and natural regeneration is necessary to truly assess these spaces and understand management needs. To this end, the Natural Areas Conservancy and NYC Parks are working to update an Ecological Assessment of natural areas within City Parkland.

Natural areas overall account for a large portion of the landscape—nearly 40% of City Parkland (or just over 10,000 acres*) is designated as part of the Forever Wild Program and managed specifically to "protect and preserve the most ecologically valuable lands within the five boroughs." As of 2021, Forever Wild areas had 63.55% canopy cover, up 2.53% from 2017, and gains were seen in all five boroughs. A broader designation of natural spaces for City Parkland that generally includes any areas that are unpaved and not manicured, totaling about 14,000 acres, had 59% canopy cover as of 2021 (an increase from 56.69% in 2017).

Beyond NYC Parks properties, we consider "natural" areas to be undeveloped and unmanicured types delineated in the Ecological Cover Type Map,[29,30] and they can be found within Federal property (e.g., as part of Gateway National Recreation Area), State property (e.g., on NYS Department of Conservation lands), on private property, and on non-NYC Parks City property. Altogether, these non-NYC Parks forested natural areas across the city account for 11,438 acres of NYC land area and had 35.27% canopy cover in 2021—a net increase of 2.49% since 2017, though there some localized losses in all boroughs.

* Calculated based on spatial data for Forever Wild areas, excluding parts of City Parkland that extend into New York Harbor. Official acreage, including those areas, is 12,400. Additional information is available at https://www.nycgovparks.org/greening/nature-preserves.

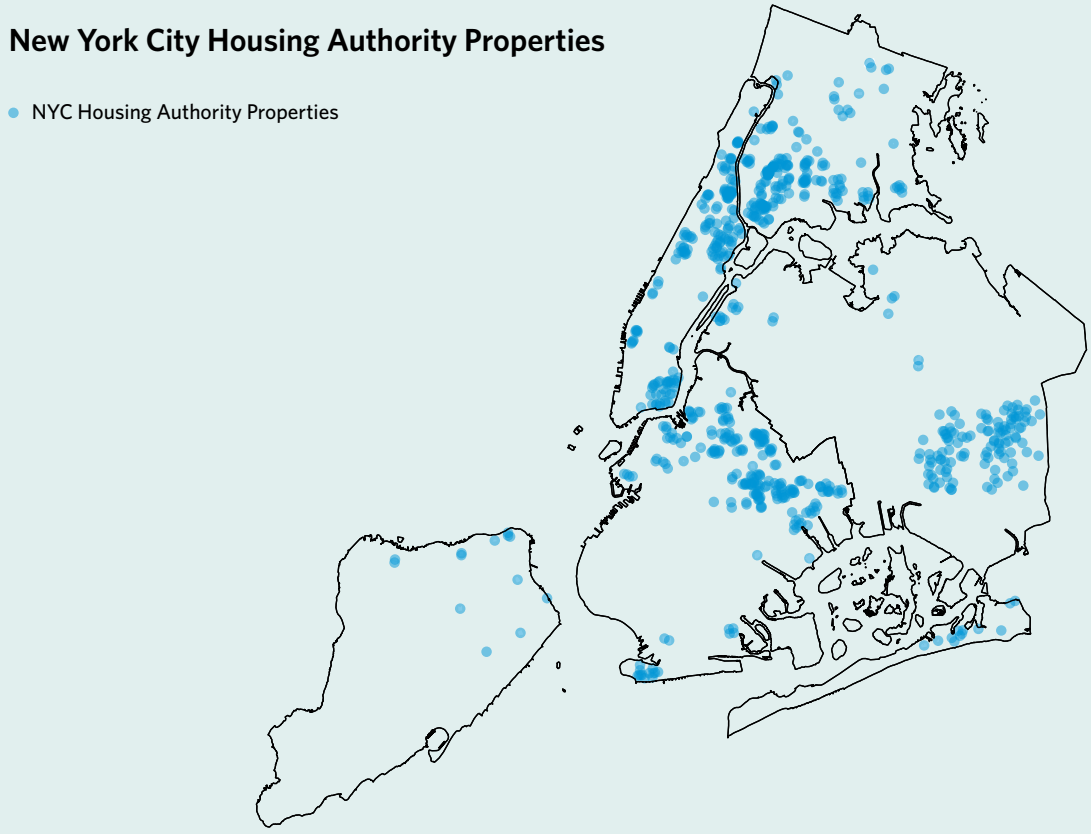
- State lands with more intense development (e.g., including airports, rail infrastructure, and shipping terminals) account for notable land area but had limited tree canopy given the associated land use. For example, Port Authority of New York and New Jersey properties account for just over one third of State land (about 4,500 acres) in NYC, but those lands overall only had 3.58% canopy cover in 2021.
- Other forms of State land tend to have substantial canopy cover. In particular, NYS Department of Environmental Conservation properties accounted for 540 acres of land and had 51.65% canopy cover, and State Parks (run by the NYS Office of Parks, Recreation, and Historic Preservation) had 442 acres with 62.31% canopy cover. Both of these areas, which include forested natural areas, experienced net increases in canopy cover of about 2% since 2017. NYCHA properties, with substantial canopy cover, also saw a general, but nuanced, increase (**Box 2.3**).
- Federal lands accounted for 2.55% of tree canopy in NYC, and these properties experienced a net increase in canopy cover of almost 4% from 2017 to 2021, from 13.74% to 17.44%. Nearly 99% of the canopy on Federal lands, where most of the canopy gains occurred, was within Gateway National Recreation Area. Gateway National Recreation Area includes parts of Brooklyn (Floyd Bennet Field), Queens (parts of the Rockaways and Jamaica Bay), and Staten Island (Fort Wadsworth, Miller Field, and Great Kills Park), and these lands include large natural areas.

BOX 2.3

Tree Canopy on NYC Housing Authority Campuses

The New York City Housing Authority (NYCHA)—a state Public Benefit Corporation—manages about 335 individual properties and nearly 2,400 acres of land distributed throughout the city (**Figure 2.5**), serving as home to over 510,000 residents in over 177,500 apartments.[31] This represents about 1% of the total land area and 2% of the total canopy in the city, substantial amounts for a single entity. Further, as NYCHA provides housing, the trees and canopy on its properties convey benefits to residents and to others who live or work nearby. In recent years, there have been tree inventories on the majority of NYCHA properties, and in some cases a social assessment, done through partnerships with Green City Force, The Nature Conservancy, and the USDA Forest Service.

As of 2021, NYCHA properties had 44.37% canopy cover, up nearly 2% from 2017, and three-quarters of the individual properties had estimated gains during that time. The net losses on individual properties were typically small (and in some cases may have been due to clearing of canopy from around building facades and other maintenance activities). However, some properties, such as Baruch Houses (in Manhattan), and Red Hook East and West (in Brooklyn), experienced more substantial canopy losses as part of capital projects designed to enhance long-term resilience. Notably, for projects such as these where replacing canopy is an important part of completing these projects, the finished results may not be captured in the current dataset depending on the timing of replanting.



Data Sources: New York City Housing Authority property data courtesy of the New York City Housing Authority; Borough boundaries from the NYC Department of City Planning

Figure 2.5 Map showing locations of New York City Housing Authority (NYCHA) properties throughout the city.

New York City Housing Authority Kingsborough complex in Weeksville, Brooklyn

Privately Owned Property

Privately owned property accounted for approximately just under 50% of the land area and 34% of the tree canopy in NYC as of 2021. While canopy cover increased on private property during 2017–2021, the net gain was only 0.24%. Its share of total canopy in NYC went down by about 1% since 2017, largely due to the more substantial canopy cover increases on City-owned property. These spaces vary substantially in appearance and use. They include one- and two-family housing, larger apartment buildings, facilities and institutions (including museums and private universities), cemeteries, commercial and industrial development, and even recreation-focused spaces, such as Little League baseball fields.

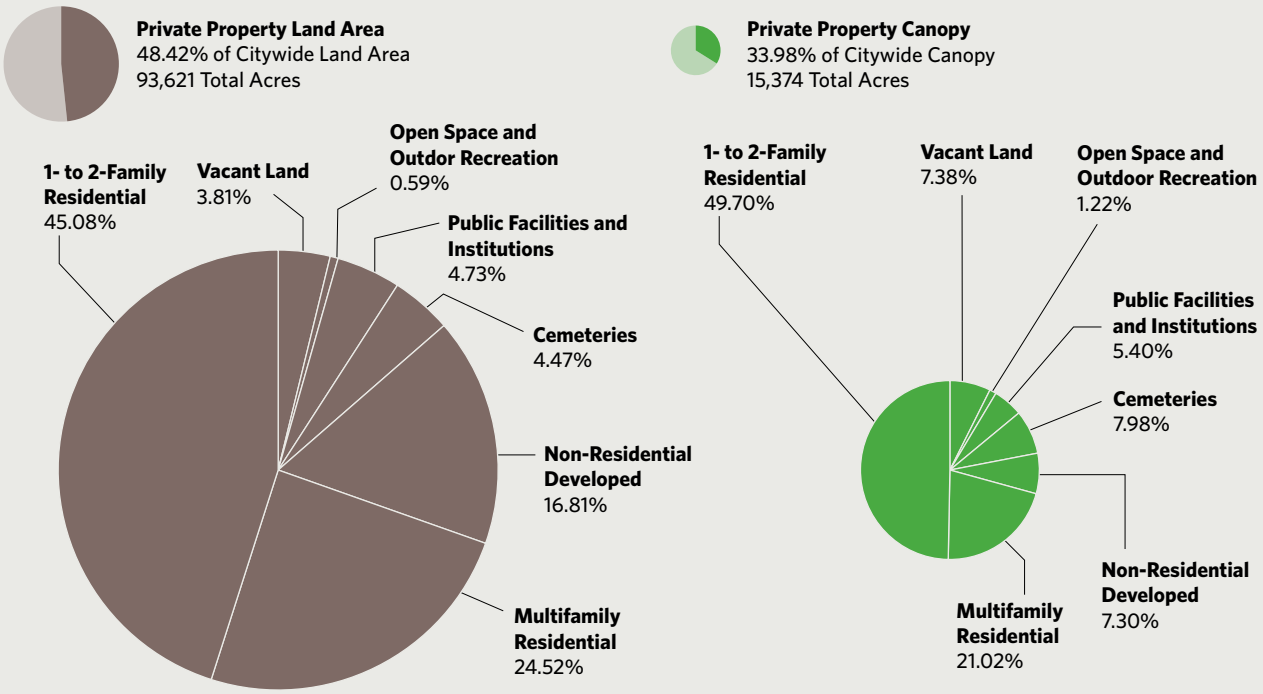
The category of properties with one- and two-family homes accounted for the largest portion of privately owned land in NYC (45.08%) and privately owned canopy (49.70%) by a large margin. The next largest category, multifamily housing, made up about a quarter of the privately owned land area and just over 20% of the canopy. Other developed land uses made up 16.81% of the other privately owned lands, with the remaining categories accounting for less than 5% each, and each of the non-residential categories had less than 10% of the private property canopy (**Figure 2.6**).

Citywide, private one- and two-family residential property was the only site type that experienced an overall decline (of 0.25%) in canopy cover during 2017–2021. By borough, the net losses for this property type specifically occurred in Queens, where these properties account for nearly 30% of the land area and showed a net loss in canopy cover of 0.88%. Queens is also estimated to have had a slight decline in canopy cover (0.02%) for multifamily residential properties, which account for 10% of the borough-wide land area.*

The other boroughs experienced net gains in canopy cover across residential property types, though extremely small ones (**Table 2.3**). For example, on Staten Island, where one- and two-family residential properties account for over 10,000 acres (28.02% of the total land area), the estimated increase in canopy cover on those properties was only 0.01%. In Manhattan, multifamily residential properties account for a quarter of the land area, but the canopy increase on these properties was 0.03%.

* The only category of private property with net canopy loss, beyond one- and two-family residential, at the borough scale during 2017 to 2021 was cemeteries in Manhattan. They showed only an estimated 0.15 acre decrease in canopy; cemeteries as a whole, and in other boroughs, had canopy gains.

Land Area and Canopy Breakdowns across Private Property



Data Sources: Private property land area breakdown derived from NYC parcel data MapPLUTO 24v1 (NYC Department of City Planning); Canopy breakdown for private property derived from NYC Tree Canopy Change (2017–2021) data (The Nature Conservancy)

Figure 2.6 Pie charts of land area (left) and canopy (right) by land use for private property. Land uses are based on property-level data (described in Appendix 1).

Share of Land Area and Net Change in Canopy Cover for Private Residential Properties by Borough, 2017–2021

	One- and Two-Family		Multifamily	
Borough	**Share of Land Area (%)**	**Net Change in Canopy Cover (%)**	**Share of Land Area (%)**	**Net Change in Canopy Cover (%)**
Bronx	13.41%	0.65%	13.27%	0.65%
Brooklyn	19.62%	0.44%	17.47%	0.82%
Manhattan	1.22%	0.04%	25.26%	0.03%
Queens	27.52%	-0.88%	9.77%	-0.02%
Staten Island	28.02%	0.01%	2.87%	1.14%
Citywide	21.83%	-0.25%	11.87%	0.43%

Data Source: Breakdowns of residential property types derived from NYC parcel data MapPLUTO 24v1 (NYC Department of City Planning); Net change in canopy cover derived from NYC Tree Canopy Change (2017–2021) data (The Nature Conservancy)

Table 2.3 Share of total land area for the respective geography and net change in canopy cover (2017–2021) for private one- and two-family and multifamily residential properties, by borough and citywide.

Mature trees as part of the broader landscape at Green-Wood Cemetery in Brooklyn. Cemeteries in NYC play an important role in the management of trees located on private property.

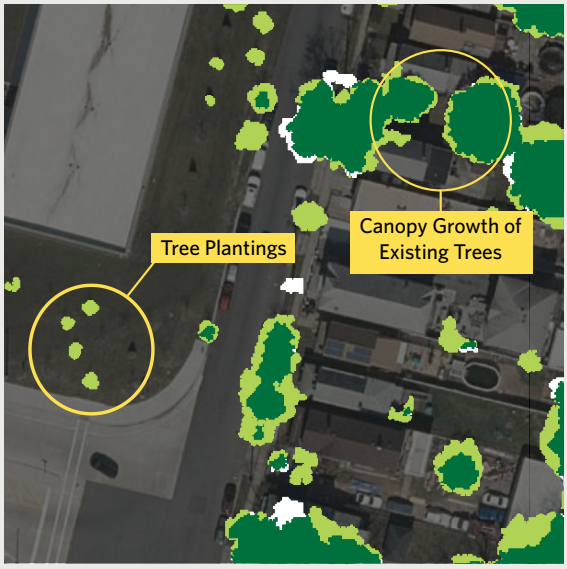
Though most land uses across private property saw canopy gains citywide and in individual boroughs, the gains were consistently small both in terms of acres and percent cover. The highest net gain in canopy cover for privately owned property was 1.14% on vacant lands, which made up only 1.84% of citywide land area. Denser residential properties account for 11.87% of the land area in NYC but only had an increase in canopy cover of 0.43%. Further details are available in Appendix 2.

Drivers of Change

Despite canopy losses in some parts of the city, there was an overall net increase in canopy cover between 2017 and 2021. Canopy gains are associated with either growth of existing trees or planting (and subsequent growth) of new trees. Canopy losses can be more nuanced but are generally associated with felling of trees by people (for myriad reasons, such as landowner preferences, development, infrastructure work, and public safety) or storms, loss of tree branches and leaves due to weather-related factors and health issues (e.g., disease and insect pests), and at least to some degree from pruning.

Discerning drivers of canopy change across the entire city is challenging given available data, particularly for losses, as this requires an understanding of the local context (e.g., was the loss of tree canopy associated with a storm, active removal for development, or another reason?). However, we are able to draw some inferences related to canopy gains by examining whether portions of canopy gained between two time periods were adjacent to pre-existing canopy. In cases where the new canopy was adjacent to pre-existing canopy, it is often attributable to growth of existing trees, or in the case of forested natural areas, possibly from natural regeneration and growth of trees along the periphery of forested areas. In contrast, canopy gains that are not adjacent to pre-existing canopy can

Interpreting Canopy Change Data



Data Sources: Canopy change from NYC Tree Canopy Change (2017–2021) data (The Nature Conservancy); Imagery from 2020 Orthoimagery collection for NYC from the NY Statewide Digital Orthoimagery Program

Figure 2.7 Canopy change, attributable to various factors, seen in the Port Richmond neighborhood of Staten Island, with growth of existing trees and planting of new ones clearly discernible based on canopy change data and aerial imagery.

generally be interpreted as planted trees (**Figure 2.7**). In some instances, trees are planted along or under existing canopy, which contributes to uncertainty in such an analysis, though that tends to be a relative exception.

Analysis of the tree canopy change data based on these assumptions indicates that as much as about 90% of the canopy gained between 2017 and 2021 was associated with growth of existing trees—higher than the 87% previously found for 2010–2017. Thus, protection and consistent stewardship of existing trees alongside tree planting is critical to reaching the goal of 30% canopy cover citywide established in Local Law 148.

Tree planting undoubtedly remains a critical element of urban forest management to add trees to parts of the landscape with low canopy cover, and to ensure a stock of trees whose canopy can replace that of older trees over time. Some of the canopy gains we have seen could be attributed to recent tree planting efforts by the City of New York. We anticipate that some gains we observed across the city are at least partly a legacy of MillionTreesNYC, a City initiative that spanned 2007–2017, which achieved the goal of planting one million trees within 10 years in 2015, two years ahead of schedule. Especially with robust stewardship, they may continue growing for decades to come. The Cool Neighborhoods NYC effort also prioritized new street tree planting in some of the most heat-vulnerable neighborhoods, and we see higher canopy gains estimated from new plantings on rights of way (where street trees are planted) in many of those same areas, such as in parts of central Brooklyn and the South Bronx (**Figure 2.8**).

However, there are limitations to where trees can physically be planted, for example, due to existing underground infrastructure and for street trees to meet the numerous site selection criteria laid out in the *Street Tree Planting Standards for New York City*.[32] Further, new infrastructure could conflict with space for trees. For example, infiltration basins for stormwater management specifically do not include space for trees,[33] Link5G installations require a buffer area around trees and tree beds,[34] and shade from tree canopy can conflict with siting of solar panels. Thus, locations where trees have not or will not be planted given such constraints also shape the distribution of canopy across the landscape.

While it is difficult to robustly discern the amount of canopy loss associated with different drivers, there are various examples of large-scale canopy removals in different contexts of development or construction. For example, parts of Staten Island underwent clearing of land for major development (including residential and warehouses)—and while canopy from any trees planted amidst those developments will replace some of what was lost, the landscape there is

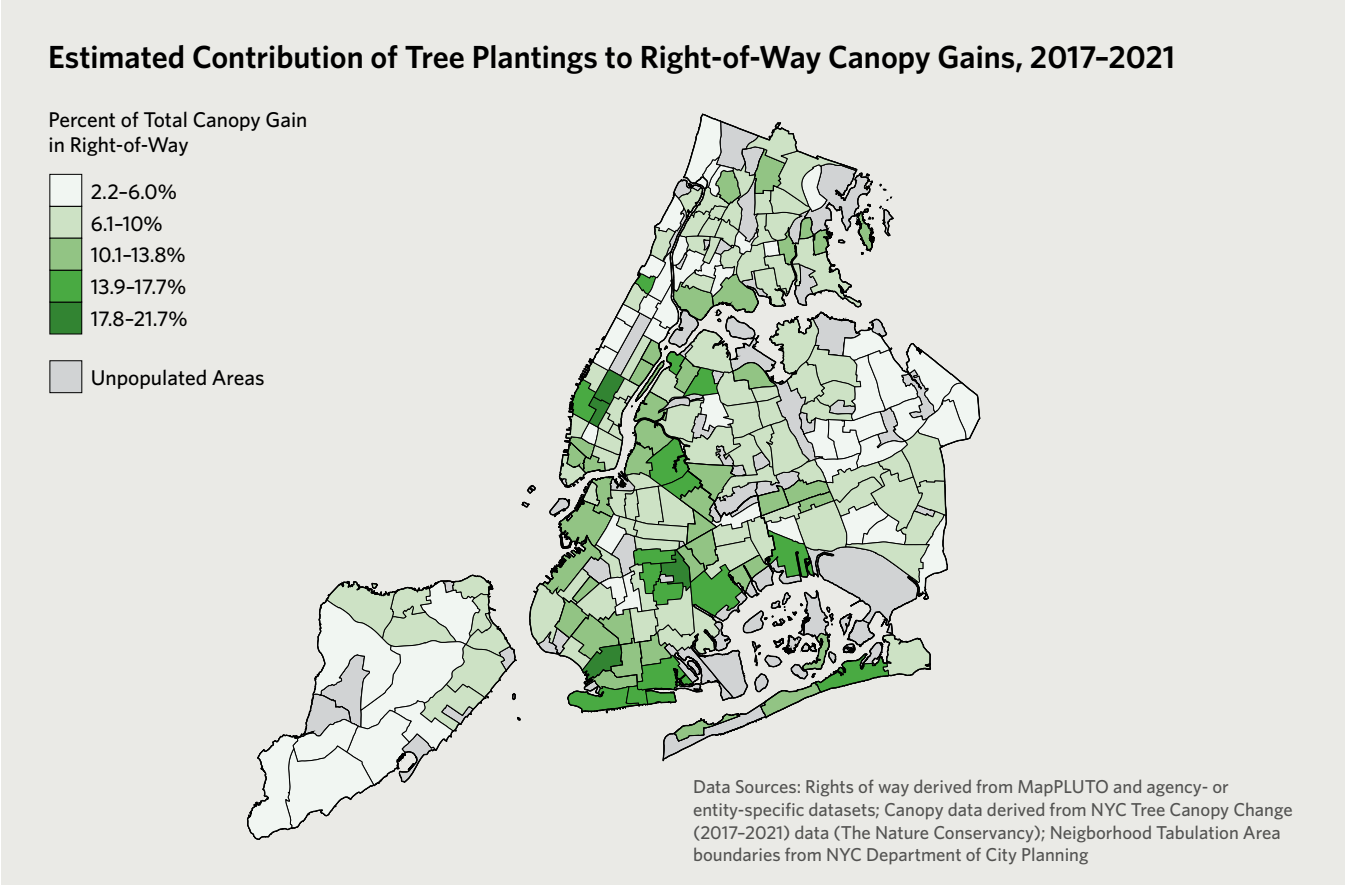


Figure 2.8. Map showing the percentage of right-of-way canopy gains (2017–2021) estimated to be from new tree plantings by Neighborhood Tabulation Area.

meaningfully altered into the future. However, in other cases, as on select NYCHA properties, trees were removed as part of major capital projects, including for long-term infrastructure resiliency efforts, and trees have been or will be intentionally replanted to support replacement of canopy over time. Similarly, while losses on NYC Parks properties were rare, one of the instances of higher loss was at Fairview Park in the Charleston neighborhood of southern Staten Island, which was associated with establishment of active recreation fields. New trees have already been planted at the site to help replace some of that lost canopy. Such projects are a perennial feature in a city as dynamic as New York, with the landscape constantly being reimagined and reshaped for myriad reasons, and thus the urban forest will constantly be changing.

Key Takeaways

- As of 2021, 23.40% of the 193,365 acres of land in New York City was covered by tree canopy.
- Canopy cover for NYC increased 1.2% from 2017 to 2021—a greater gain per year than observed in the previous canopy dataset, from 2010 to 2017.
- The tree canopy managed by NYC Parks (on City Parkland and rights of way) saw some of the strongest canopy increases throughout the city from 2017 to 2021.
- Citywide, privately owned one- and two-family residential property was the only land use and jurisdictional combination that experienced a net decrease in canopy from 2017 to 2021.
- As much as 90% of the canopy gained between 2017 and 2021 was associated with growth of existing trees.

Tree Canopy Disparities Across Communities

Species: Swamp white oak (*Quercus bicolor*)

CHAPTER 3

Tree Canopy Disparities Across Communities

As a social ecological system, the NYC urban forest shapes the lived experience of the millions of New Yorkers who interact with trees daily, and in turn, people shape the urban forest through planning, planting, design, advocacy, investment, love, and care. Yet, studies have documented disparities in access to trees, tree canopy, and the many benefits they provide; in particular, disparities in tree canopy have been associated with socioeconomic variables such as race and income.[35–38] NYC Local Law 148 of 2023[7] states and codifies a goal of "equitably expanding the urban forest canopy cover to 30 percent of land within the city." As the law focuses on equity, this chapter discusses one dimension of equity, the distributional equity of the urban forest, while acknowledging there are many dimensions of equity related to the urban forest.[39]

Distributional equity refers to "how resources, costs, and benefits are allocated or shared amongst people and groups."[40] There is an extensive body of research demonstrating that communities of color and lower-income communities often have limited access to environmental amenities,[41–43] while also bearing a disproportionate burden of environmental harms.[44–46] Although the focus of this report is the urban forest, it is only one of many environmental realms where inequities exist.

Over the last two decades, there have been encouraging developments, including key planting initiatives that were aimed at reducing disparities in canopy cover in NYC. These included Trees for Public Health in the early 2000s, which was then incorporated into the Million Trees NYC Initiative (spanning 2007–2017) and Cool Neighborhoods NYC (2017–2021), plus other work that has built off these efforts.[1,47] In this report we present key findings* from a reassessment of distributional inequities in canopy cover and canopy change based on the latest canopy data (described in Chapter 2) and socioeconomic data from a similar time point. To support tracking changes over time, we follow the general approaches for analysis in *The State of the Urban Forest in New York City*, looking at canopy cover and relative canopy change alongside the following types of community characteristics: socioeconomic status and social vulnerability, susceptibility to impacts of extreme weather and other events, and burden by environmental hazards (e.g., air and water pollution) that can lead to negative health effects of communities (for more details, see **Box 3.1** and Appendix 1). We acknowledge that these metrics are a starting point for examining the intersection of social and economic factors and tree canopy and are imperfect proxies for human experiences.

Tree Canopy and Individual Socioeconomic Variables

Examining socioeconomic variables alongside canopy data can shed light on underlying social and economic factors that might exacerbate the effects of inequities in the distribution of tree canopy and the associated benefits of trees for communities. Socioeconomic data are often used to reflect access to resources and opportunities, or conversely, to identify groups that are vulnerable to negative outcomes based on a lack of resources. For example, the Social Vulnerability Index (SVI)

* Unless otherwise stated, correlations referenced are statistically significant based on $p < 0.05$, and within these, we focus on stronger relationships with the absolute value of the correlation coefficient ≥ 0.20. Full results can be found in the Supplementary Tables in Appendix 2.

BOX 3.1

Metrics and Methods for Analysis

To offer an updated understanding of disparities in tree canopy across communities, we analyzed the latest canopy data alongside established datasets reflecting characteristics of communities. Acknowledging the extensive array of potential datasets and analytical approaches available, we emphasized building on past work of the NYC urban forest to ultimately support our understanding of changes over time. The datasets and methods we used are summarized below, and additional details are available in Appendix 1.

Tree Canopy Metrics

- Canopy cover — The percent of land area covered by tree canopy in 2021.
- Relative canopy change — The change in canopy cover from 2017 to 2021, relative to the canopy cover in 2017.

Community Characteristics Metrics

- The Social Vulnerability Index (SVI), developed by the Centers for Disease Control and Prevention Agency for Toxic Substances and Disease Registry reflects how vulnerable communities are to human suffering and financial loss following a hazardous event.[48] The SVI composite index and thematic sub-indices are based on 16 component variables, including income, race and ethnicity, and others sourced from the U.S. Census Bureau American Community Survey (ACS).
- The NYC Heat Vulnerability Index (HVI), developed by the NYC Department of Health and Mental Hygiene, indicates how susceptible people in certain neighborhoods are to dying from extreme heat. Each residential Neighborhood Tabulation Area (NTA) across the city receives a score from 1 (lowest risk) to 5 (highest risk), based on a combination of socioeconomic, health, and landscape data.[49]
- The Disadvantaged Communities (DAC) criteria, developed by the New York State Climate Justice Working Group, identify DACs at the census tract level based on relative environmental burdens and climate change risks, and population characteristics and health vulnerabilities.[3] The criteria consider 45 indicators to produce thematic component scores (a Burden Score and a Vulnerability Score) and a final Combined Score for final DAC designation.

Methods

- We used nonparametric correlational analyses (Kendall's tau) to examine relationships between canopy metrics and individual ACS variables, HVI scores, and thematic and composite indices for SVI and DAC criteria. We also compared canopy metrics for DAC and non-DAC groups using the Mann-Whitney *U* test.
- We examined relationships between canopy data and community characteristics, both citywide and by borough.
- We primarily considered these data at the scale of NTAs to reflect local nuances while reducing impacts of sampling errors (in the census data) and potential biases from hyperlocal dynamics. The exception was the DAC data and SVI calculated indices, which were only available at the census tract level.
- We considered the canopy data for each NTA plus a quarter mile buffer around the NTA (approximately a five-minute walk) to account for potential access to and benefits of tree canopy beyond the specific areas where people live.

The historic Davis Oak, designated as a Great Tree by NYC Parks, in St. George, Staten Island

is designed to support public health officials and planners in identifying and supporting communities that may be at greatest risk in emergency events such as severe weather, floods, disease outbreaks, or chemical exposure.[50] Its 16 component variables include income, race and ethnicity, and others that have individually been linked to patterns of canopy inequity in other studies.[35,51,52]

Canopy data were not strongly or consistently related to the composite SVI or thematic indices (see the full correlation table in Appendix 2). However, more specific trends were discernable with the component variables of the SVI at the citywide and borough scales.* Of the canopy metrics, we found that relative canopy change from 2017 to 2021 was more consistently related to socioeconomic variables, and we found the following notable trends:

- Age — Citywide, areas with higher proportions of people aged 65 and older saw less relative canopy gain during 2017–2021. Within the boroughs, the relationship was significant in the Bronx, Brooklyn, and Manhattan.
- Race and Ethnicity — Neighborhoods with a higher proportion of people of color** had higher canopy increases from 2017 to 2021 in the Bronx, Manhattan, and Staten Island. However, the relationship was negative in Queens, and there was no significant relationship in Brooklyn.
- Vehicle Ownership — Areas with a higher proportion of households that have no vehicle generally saw greater canopy increases citywide and in the Bronx, Brooklyn, and Queens. This trend generally held in Staten Island, although the correlation was not statistically significant, and there was no strong relationship in Manhattan.†
- Income — Areas with lower per capita income saw greater relative increases in canopy in the Bronx and Staten Island.

Canopy cover was less consistently related to individual variables than relative change in canopy cover. However, one of the more consistent trends was a generally positive relationship between canopy cover and per capita income.

* These data were sourced from the U.S. Census Bureau, 2018–2022 American Community Survey (ACS) 5-Year Estimates. We used this particular dataset because the latest available version of the Social Vulnerability Index is based on these data.

** This variable is synonymous with the Racial & Ethnic Minority Status variable in the Social Vulnerability Index. The variable is calculated as [Total population – White, non-Hispanic population], which is the equivalent of summing the racial and ethnic group estimates.

† The relationship between percent of households with no vehicle and relative canopy change was positive but not statistically significant in Staten Island (tau = 0.35, p = 0.06).

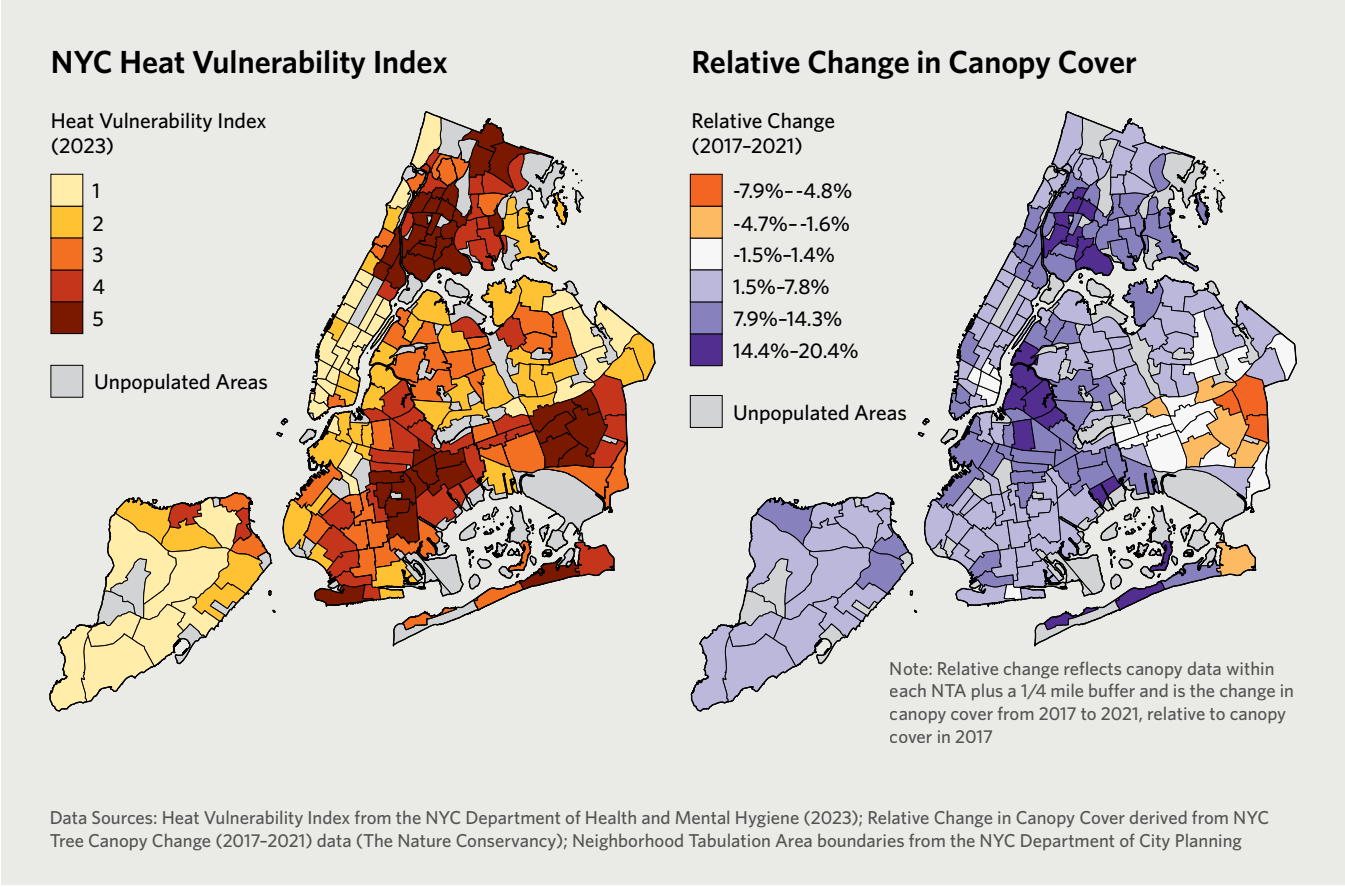


Figure 3.1. Maps of the 2023 NYC Heat Vulnerability Index (left) and relative change in canopy cover (2017–2021) by Neighborhood Tabulation Area (right). The relative change in canopy cover represents the change within each Neighborhood Tabulation Area plus a quarter-mile buffer.

In general, neighborhoods with higher incomes had higher canopy cover, and this pattern overall held true in every borough except for Manhattan.* Unlike the rest of the city, Manhattan neighborhoods with higher income generally had less canopy than those with lower income. There are several nuances that help explain this pattern and contextualize its implications. Lower-income communities in Manhattan do not necessarily have more canopy than lower-income communities in other boroughs so much as higher-income communities in Manhattan likely have exceedingly low canopy compared with other boroughs. Some of the most densely built areas of the city (like Midtown and many areas of downtown) with quite low canopy cover often attract higher-income individuals. It is also important to note that many lower-income communities in Manhattan are associated with NYCHA campuses which have a decades-long history of tree planting (albeit with limited resources to care for those trees).

Tree Canopy and Heat Vulnerability

One of the many benefits of the NYC urban forest is its ability to help cool the city, especially during hot summer days. In NYC, trees are estimated to decrease air temperature by 0.13°F on average and reduce exposure to ultraviolet radiation by an average of 25.1%.[53] However, extreme heat does not affect all New Yorkers equally.[54] According to the NYC

* The relationship between income and canopy cover was generally positive (except in Manhattan). However, the relationship was strong but not statistically significant in the Bronx (tau = 0.22, p = 0.06) and statistically significant but weaker in Queens (tau = 0.17, p = 0.05).

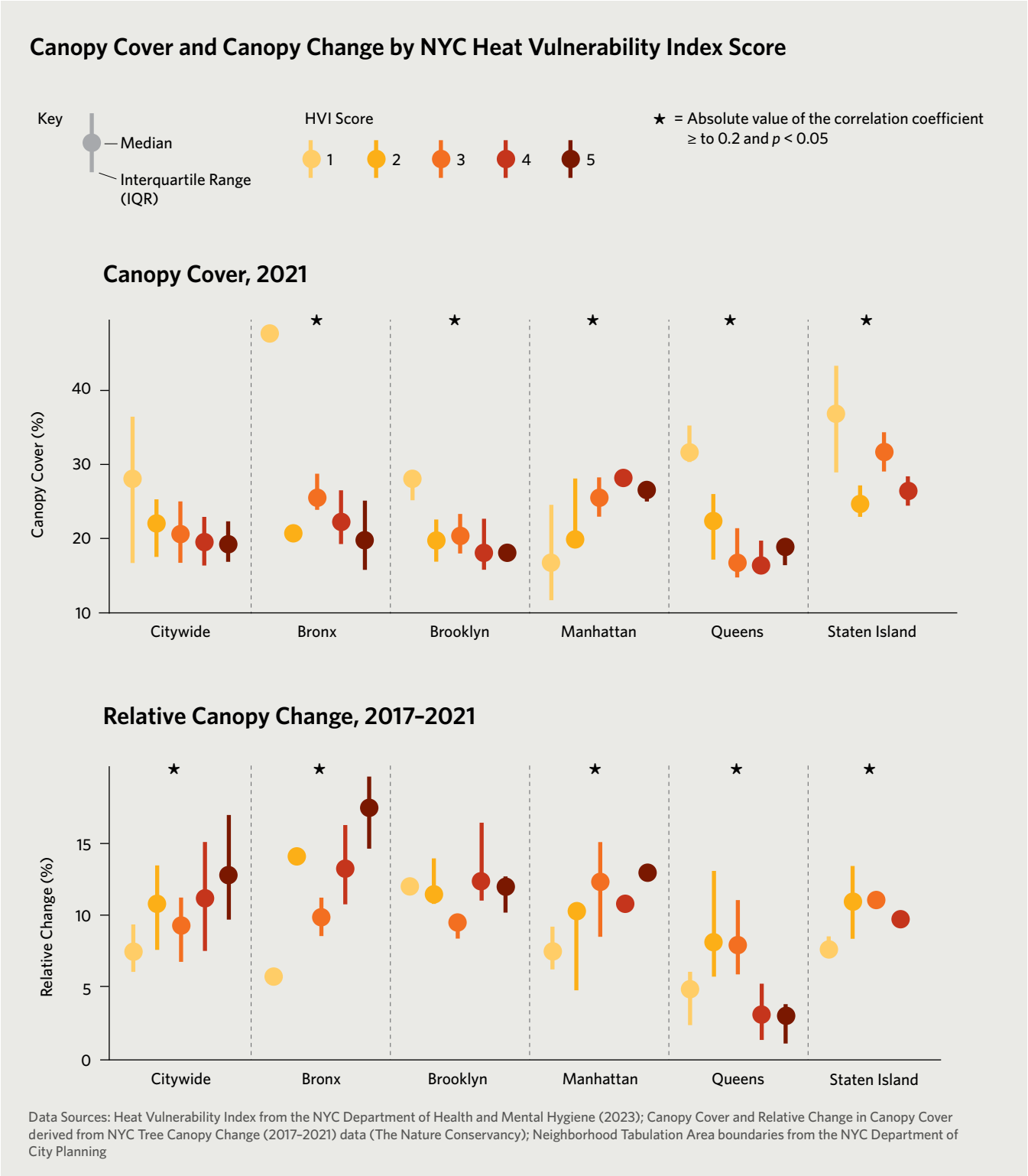


Figure 3.2 Plots illustrating canopy cover (top) and relative change in canopy cover (bottom) for Neighborhood Tabulation Areas by Heat Vulnerability Index (HVI) scores, for each borough and citywide. HVI scores range from 1 (lowest risk) to 5 (highest risk) and indicate susceptibility to adverse health impacts or death due to extreme heat. The dots signify the median and the lines show the interquartile range. The strength and significance of the correlation is indicated at the top of each plot; * = absolute value of the correlation coefficient ≥ to 0.2 and significant at the 0.05 level. Canopy metrics are based on canopy cover and canopy change within each Neighborhood Tabulation Area plus a quarter-mile buffer.

Department of Health and Mental Hygiene, an estimated 525 New Yorkers die each year due to heat, and the heat-stress death rate for Black New Yorkers is two times higher than for white New Yorkers.[55] Given this variability, it stands to reason that communities may be differently impacted by a lack of trees and the accompanying cooling benefits. It is therefore important to consider the distribution of trees alongside spatial variability in heat vulnerability.

The NYC Department of Health and Mental Hygiene developed the Heat Vulnerability Index (HVI) based on an epidemiological study that examined which environmental and social factors increase the risk of death during a heat wave (**Figure 3.1**).[54] It incorporates environmental variables (e.g., local daytime surface temperatures, green space) and social variables (e.g., race and ethnicity, poverty, access to air conditioning) to indicate how susceptible people in certain communities are to dying due to extreme heat, on a scale from 1 (lowest risk) to 5 (highest risk).* It is important to note that while some areas have higher risk than others, every neighborhood has some residents who are at risk for heat-related illness and death.

Higher HVI neighborhoods where people are more susceptible to heat-related death tended to have lower canopy cover in 2021 but greater relative gains in canopy from 2017 to 2021 (**Figure 3.2**). Analyses broken down by borough revealed some exceptions to the citywide trend:

- In Manhattan, the neighborhoods with higher heat vulnerability also tended to be those with higher canopy cover in 2021, which was the opposite of the citywide trend.
- In Brooklyn, there was no significant relationship between HVI scores and relative canopy change from 2017 to 2021.
- In Queens, the relationship between HVI scores and relative canopy change was opposite the citywide trend; the neighborhoods with higher heat vulnerability generally had lower canopy gain from 2017 to 2021. Furthermore, Queens was the only borough to have canopy losses in neighborhoods with the highest heat vulnerability (HVI score of 5). Many of these neighborhoods were in southeastern Queens.

At the NTA-level, canopy loss between 2017 and 2021 was detected in 18 NTAs citywide, and 16 of these were in Queens. Of the 16 NTAs in Queens, 10 were neighborhoods with a HVI score of 4 or 5, where residents were at a greater risk of dying due to extreme heat (a score of 5 indicates the highest risk). This stands in stark contrast to heat vulnerable areas in parts of the southern Bronx that saw some of the highest relative increases in canopy from 2017 to 2021. This further highlights the importance of understanding the array of local conditions that can influence trends of canopy gain and loss.

Tree Canopy and Disadvantaged Communities

Under the New York Climate Leadership and Community Protection Act (Climate Act) of 2019, the Climate Justice Working Group established criteria to designate Disadvantaged Communities (DACs) to "ensure that frontline and otherwise underserved communities benefit from the state's historic transition to cleaner, greener sources of energy, reduced pollution and cleaner air, and economic opportunities."[56] The criteria for identifying DACs and final designations were released in 2023.

Compared with the rest of the state, NYC has more DACs relative to its population size, with almost half of all census tracts in NYC (953 of 2121) delineated as DACs (**Figure 3.3**). Citywide and in three of the five boroughs, NYS-designated DACs had lower canopy cover in 2021 (**Figure 3.4**). Similar to the findings for HVI, the citywide trend was opposite in Manhattan, where DACs were more canopied than non-DACs, and again there was no significant difference in Brooklyn. In a more consistent trend, we found that DACs across the board had higher relative canopy gains from 2017 to 2021 than non-DACs.

Beyond the binary designation of DAC or non-DAC, we considered the relationship between canopy metrics and the Combined Score used for final designation (**Figure 3.5**). The Combined Score reflects the collective environmental burdens, climate change risks, and population and health vulnerabilities of an area.[57] Census tracts with the highest scores were designated as DACs. Citywide and in all boroughs, relative canopy change was positively related to the Combined Score. In general, the higher the Combined Score, the greater the relative gain from 2017 to 2021. A full correlation table is available in Appendix 2 and includes the thematic scores (Burden Score and Vulnerability Score) used to create the Combined Score.

* We used the latest version of the NYC Heat Vulnerability Index available at the time of writing, which was primarily based on U.S. Census Bureau, 2016–2020 American Community Survey (ACS) 5-Year Estimates, with green space data (including tree, grass, and shrub cover) from 2017 NYC land cover, satellite-based temperature data from 2020, and air conditioning prevalence data from 2017.

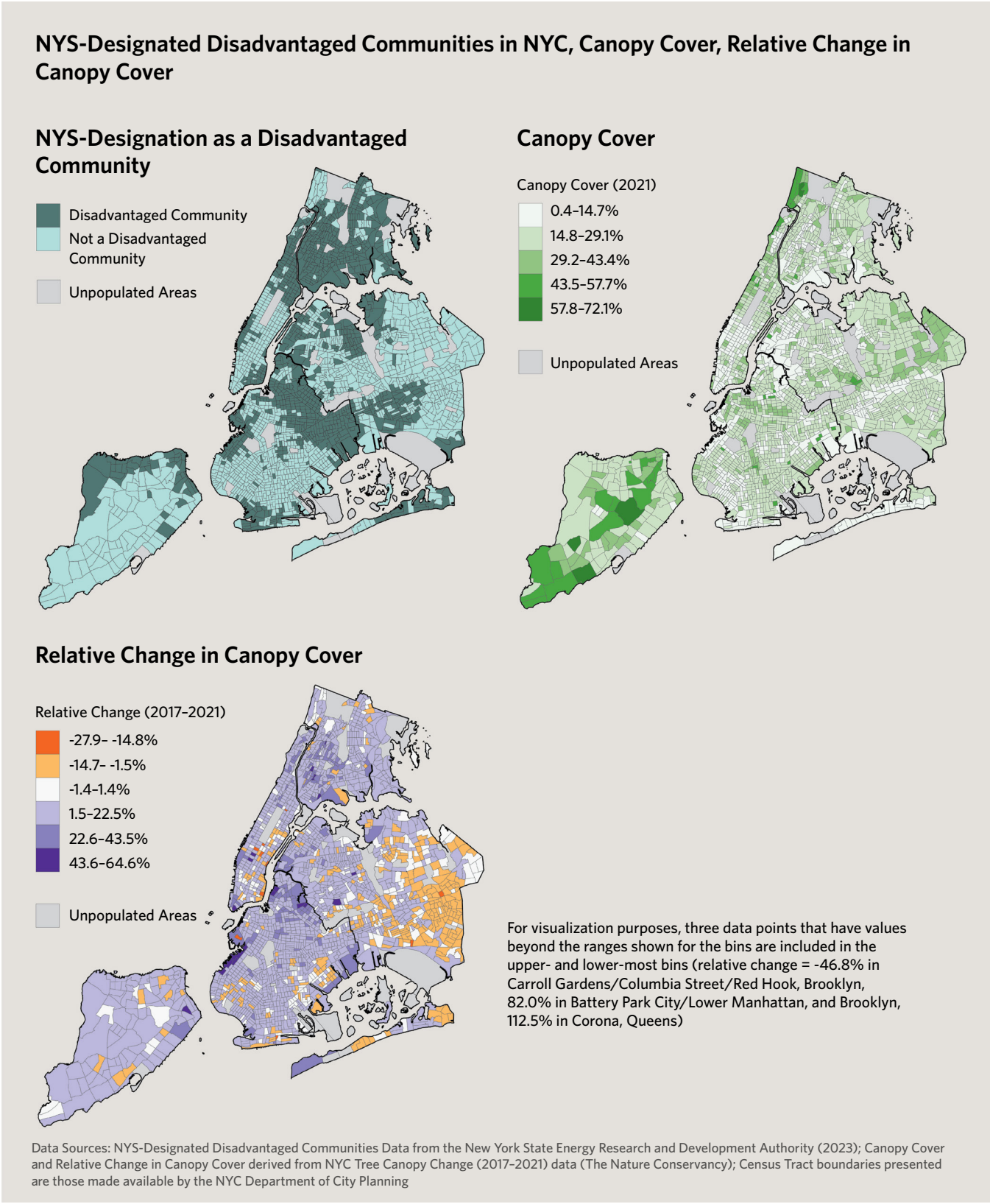
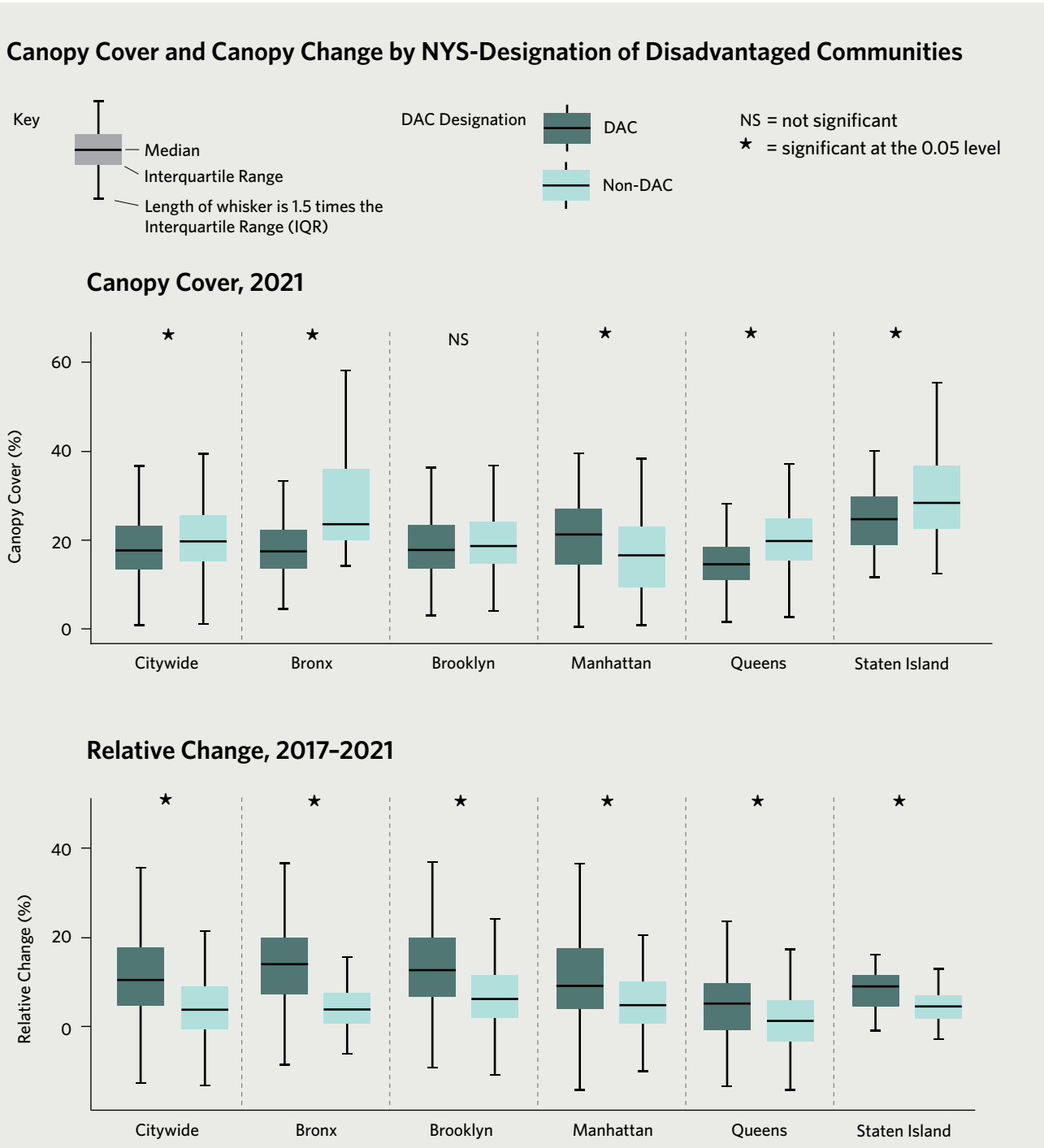


Figure 3.3 Maps depicting NYS-Designated Disadvantaged Communities in NYC (top left), Canopy Cover as of 2021 (top right), and Relative Change in Canopy Cover during 2017–2021 (bottom) by census tract. All data are shown by census tract as delineated from the 2010 Decennial Census, to align with the Disadvantaged Communities data.



Data Sources: NYS-Designated Disadvantaged Communities Data from the New York State Energy Research and Development Authority (2023); Canopy Cover and Relative Change in Canopy Cover derived from NYC Tree Canopy Change (2017–2021) data (The Nature Conservancy); Census Tract boundaries presented are those made avaialble by the NYC Department of City Planning

Figure 3.4 Boxplots depicting the distributions of canopy cover data as of 2021 (top) and relative canopy change data during 2017–2021 (bottom) in NYS-designated Disadvantaged Communities (DACs) and non-DACs, stratified by borough. The significance of the Mann-Whitney *U* test comparing the DAC group with the non-DAC group is indicated at the top of each plot; ns = not significant, * = significant at the 0.05 level.

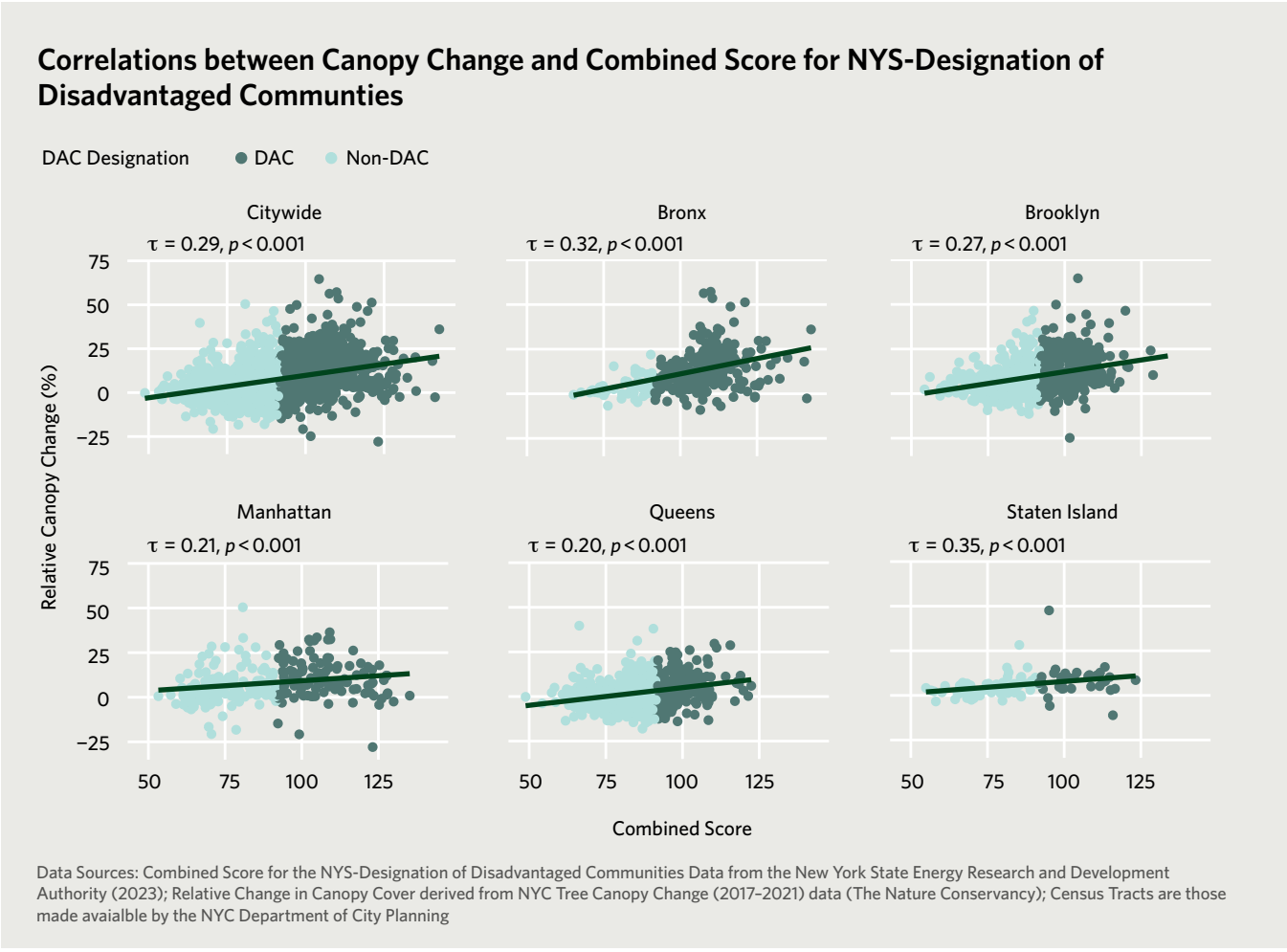


Figure 3.5 Scatterplots illustrating relationships between relative change in canopy cover (2017–2021) and the Combined Score used in NYS-designation of Disadvantaged Communities. Each point represents an individual census tract. Best-fit line, Kendall's tau (correlation coefficient), and *p*-value are displayed where the correlation is significant. For visualization purposes, three outliers are omitted (with relative change values of -46.83%, 82.00%, and 112.50%).

Humans Shaping Tree Canopy Across NYC

Examining the intersection between canopy variables and community characteristics not only provides insight into the effects of canopy disparities on communities, but reveals how human organizing, behavior, and policies shape the distribution of tree canopy. Across the city, historic inequities in the distribution of tree canopy persist, yet many areas that have historically had low canopy cover saw some of the greatest relative increases from 2017 to 2021. While it is outside the scope of this report to interrogate causality or quantify the effects of specific interventions, we can explore ways in which people have and continue to shape the NYC urban forest. We primarily explore legacy effects of a historic policy, while additional exploration of canopy and canopy change alongside other housing characteristics can be found in **Box 3.2**.

The enduring inequities in the NYC urban forest underline the lasting effects of policies like redlining, which impacted the distribution of tree canopy across many cities in the United States, including NYC.[43] Redlining was a scheme for appraising the loan suitability of urban areas, used by the Home Owners' Loan Corporation starting in the 1930s. It used a grading system for potential investments (A = "Best," B = "Still Desirable," C = "Definitely Declining," and D = "Hazardous") and marked "Hazardous" areas in red (hence the term "redlining"). Due to the discriminatory risk assessment underlying these grades, redlined areas were almost always neighborhoods with a high percentage of Black, African American,

BOX 3.2

Tree Canopy and Housing Characteristics

Analyzing canopy data alongside variables describing housing characteristics can help identify factors shaping the distribution of canopy. Building on the earlier exploration of socioeconomic data, we considered U.S. Census Bureau American Community Survey housing type variables (owner occupancy rates and year housing units were built), which have been used in studies exploring urban canopy distribution.[35,51]

- Owner occupancy rates — Citywide, neighborhoods with higher owner occupancy rates (proportion of housing units occupied by the owner) generally had the least canopy gain. The relationship held when stratified by borough, except in Staten Island, where there was no relationship.
- Year built — Neighborhoods with more older buildings (built before 1960) saw less relative gain from 2017 to 2021 in the Bronx, Brooklyn, and Queens. In contrast, areas with a greater proportion of newer buildings (built in 2000 or more recently) generally had greater increases in canopy at the citywide level and in the Bronx and Brooklyn. This trend generally held in Manhattan and Queens, although the correlations were statistically insignificant and weak, respectively.*

Considering these trends for the urban forest can help to identify more specific opportunities to support canopy expansion and protection. More specifically, these two variables point to the impact policies and increased engagement across private and public sectors can have on the future distribution of tree canopy in NYC. For example, finding that areas with higher owner occupancy rates tended to be those with lower canopy gains (and sometimes losses) underscores the need to better understand dynamics on private property and develop strategies that engage private landowners. Property owners generally can do as they wish with trees on their land, as there are almost no regulations or incentives for protecting, planting, restoring, or caring for trees on those properties. Interventions here may be critical to prevent losses that threaten to slow or even reverse trends of canopy growth.

On the other hand, the association between newer buildings and canopy increases may be evidence of the success of zoning regulations. The Street Tree Planning Requirement of 2008 requires street trees to be planted alongside most new construction and buildings with substantial renovations, and there are also laws requiring replacement and restitution of removed or damaged street trees on City-owned property. These variables exemplify the varying patterns found in different parts of the urban forest and the need for tailored solutions that are responsive to differences in local conditions. In some parts of the urban forest, this may call for creative solutions that address impediments, while other parts may benefit from approaches that leverage existing strengths.

* The relationship between percent newer buildings and relative canopy change was generally positive. However, the correlation was strong but not statistically significant in Manhattan (tau = 0.23, $p = 0.065$) and statistically significant but weaker in Queens (tau = 0.17, $p = 0.052$).

Across the city, historic inequities in the distribution of tree canopy persist, yet many areas that have historically had low canopy cover saw some of the greatest relative increases from 2017 to 2021.

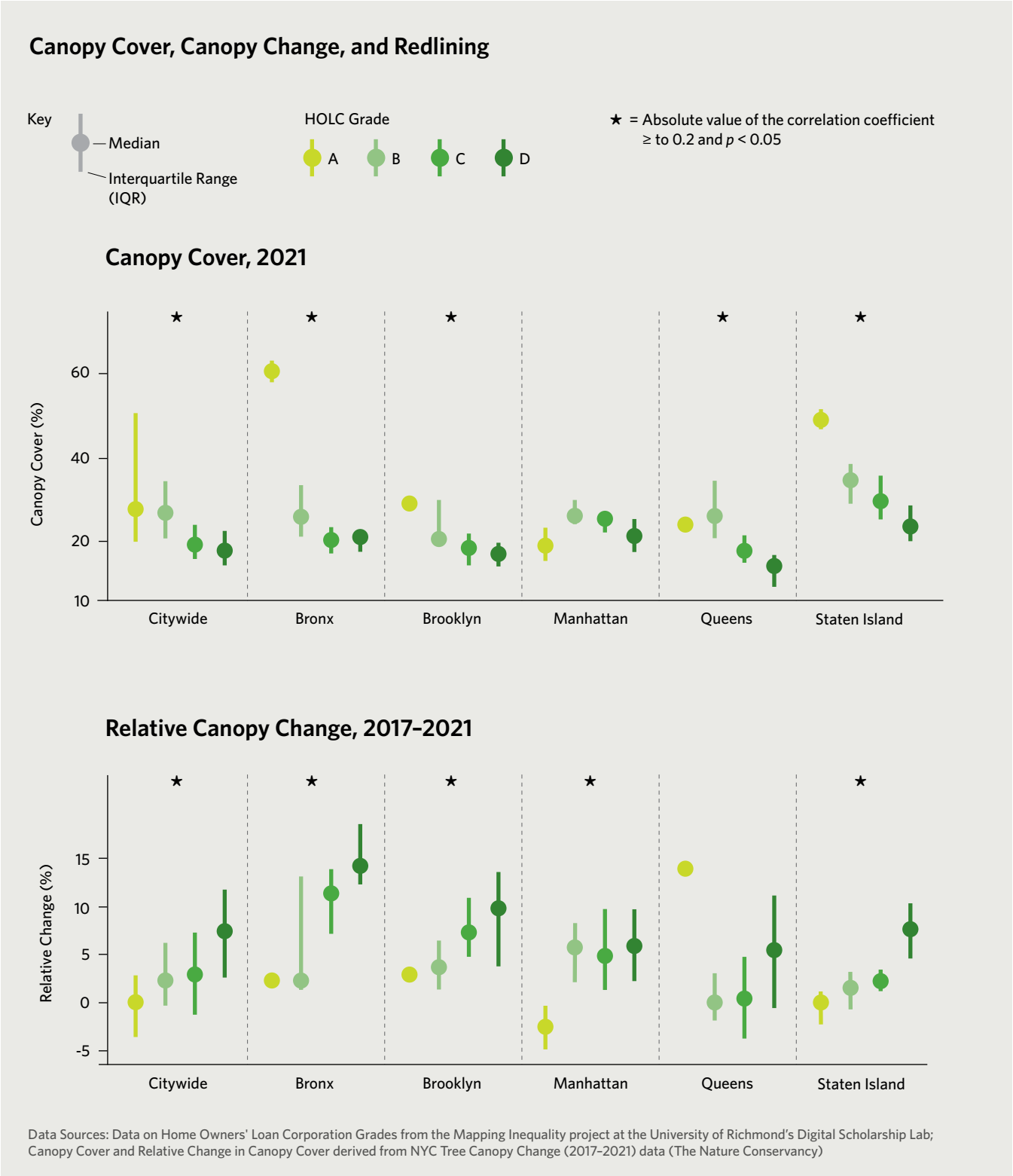


Figure 3.6 Plots illustrating canopy cover (top) and relative change in canopy cover (bottom) for areas assigned grades by the Home Owners' Loan Corporation (HOLC) in the 1930s. Areas given an "A" grade were considered highly suitable for loans, and suitability went down with each grade. Areas that were given a "D" were deemed unsuitable for loans and were referred to as "redlined" areas. The dots signify the median and the lines show the interquartile range. The strength and significance of the correlation is indicated at the top of each plot; * = absolute value of the correlation coefficient ≥ to 0.2 and significant at the 0.05 level.

and Latinx residents and seldom were neighborhoods that were predominantly white.[41,43] By effectively blocking investments in the form of housing loans, redlining not only segregated cities and promoted further discrimination, it also led to poor housing quality because homeowners could not obtain financial assistance from banks to improve or renovate their homes. In many cases, these areas became developed for industrial or manufacturing purposes instead, with associated environmental hazards and often limited green space.

Indeed, the areas of the city deemed "riskier" for investments in the 1930s (C- and D-graded areas) generally had lower canopy cover, even in 2021, than the "safer" A- and B-graded areas (**Figure 3.6**). On the other hand, the same "riskier" neighborhoods generally had greater relative gains in canopy from 2017 to 2021. Exceptions to these citywide trends followed the same pattern as in previous analyses. In Manhattan, C- and D-graded neighborhoods had higher, not lower, canopy cover in 2021. In Queens, the A-graded areas generally saw the greatest relative increases, while B- and C-graded areas were some of the only groups across the city to see relative net decreases in canopy.

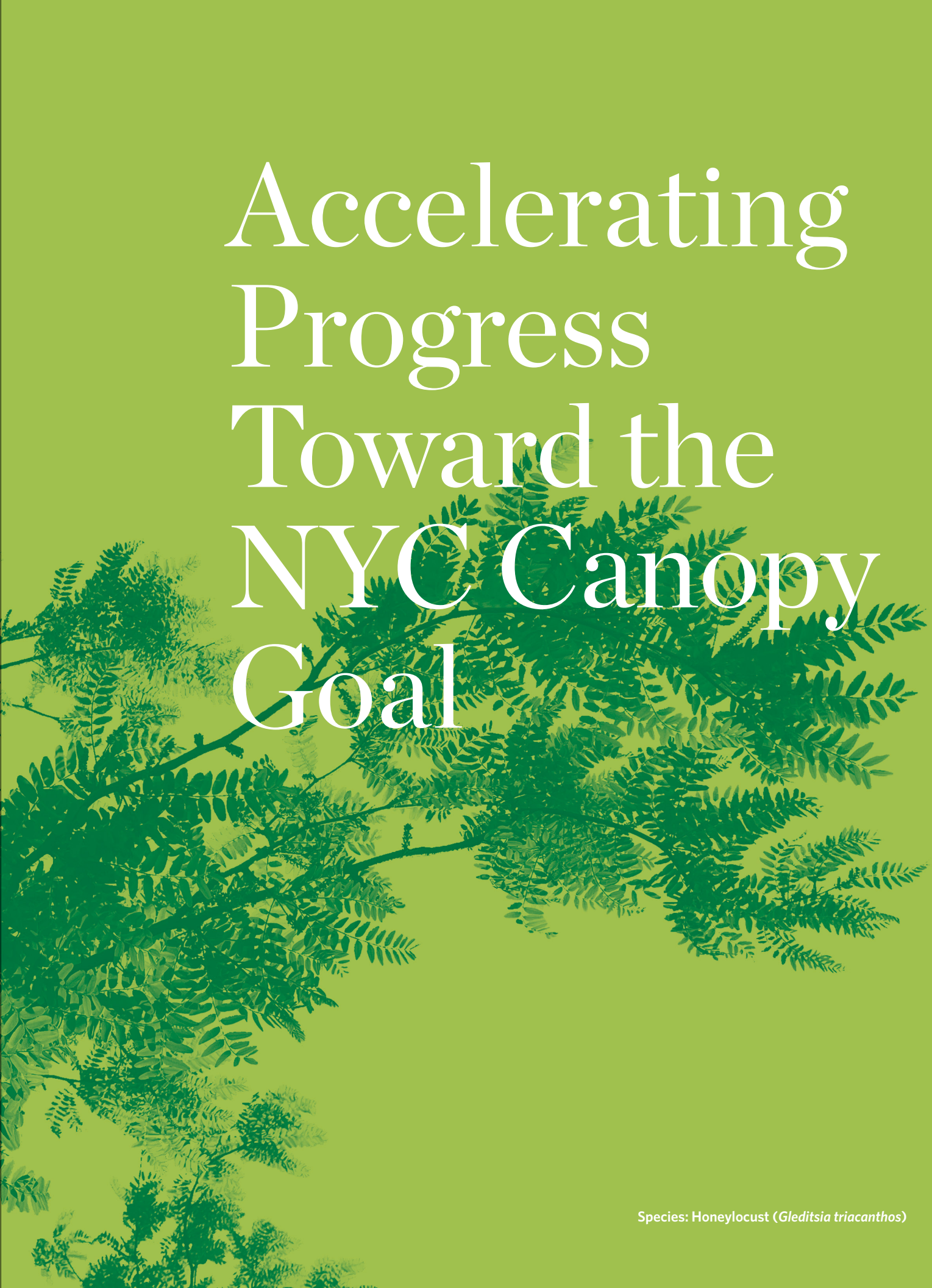
Although inequities persist, there are encouraging indications that targeted efforts over the last couple of decades to reduce inequities in the distribution of canopy are working in many areas of the city. Areas that have historically had relatively low canopy cover, such as previously redlined neighborhoods, are generally seeing the greatest relative increases in canopy. For example, the positive impacts of initiatives such as Cool Neighborhoods NYC, which prioritized planting in more heat-vulnerable areas of the city and ultimately builds on past efforts, such as Trees for Public Health, are underlined by the higher relative canopy growth in some of the most heat vulnerable areas of the city. In addition, NYS-designated DACs as a whole saw greater relative increases in canopy from 2017 to 2021 than non-DACs. Although it is too early to tell what effect the designation itself will have (as it was released in 2023), it will be valuable to track changes in DACs over time given the intent for these areas to benefit from State investments in accordance with the Climate Act.[57] For example, funds available through the New York State Clean Water, Clean Air and Green Jobs Environmental Bond Act of 2022, including for urban and community forestry projects, prioritized investments in DACs and will be an interesting area for assessment with the next set of canopy data.

Volunteers cultivate and add mulch to a street tree bed in Mott Haven, Bronx

Key Takeaways

- More heat-vulnerable neighborhoods (with higher scores on the NYC Heat Vulnerability Index) usually had lower canopy cover than the less heat-vulnerable neighborhoods but saw greater relative increases in canopy from 2017 to 2021.
- As of 2021, NYS-designated Disadvantaged Communities (DACs) generally had less canopy than non-DACs but saw greater relative increases in canopy from 2017 to 2021.
- The legacy effects of redlining are evident, as areas of the city that were deemed "riskier" in the 1930s (receiving grades of "C" and "D" from the Home Owners' Loan Corporation) still had significantly lower canopy cover in 2021 than the "safer" A- and B-graded areas.

Accelerating Progress Toward the NYC Canopy Goal



Species: Honeylocust (*Gleditsia triacanthos*)

CHAPTER 4

Accelerating Progress Toward the NYC Canopy Goal

The latest canopy data for NYC show encouraging trends, with increases in citywide canopy cover from 22.20% to 23.40% during 2017–2021, and with a slightly higher rate of increase (0.30% per year) than during 2010–2017 (0.26% per year). If canopy cover has, and continues to increase at the rate of 0.30% per year, NYC will achieve its goal of 30% canopy cover (stated in Local Law 148 of 2023) by 2042 (**Figure 4.1**). Continued gains at the lower rate of only 0.26% per year would result in NYC achieving the goal by about 2046. However, continued gains, let alone at those rates, are not a given. And both of the aforementioned time horizons are beyond the 2035 goal year for achieving 30% canopy citywide, which was established in the *NYC Urban Forest Agenda* and championed by Forest for All NYC. Achieving 30% canopy by 2035 requires substantial acceleration in canopy expansion, to an average net change of 0.47% per year from 2021 onward —over 50% faster than the rate of change from 2017 to 2021. Further, "equitably expanding canopy"—part of the charge set forth by Local Law 148 of 2023 requires dedicated consideration and likely bigger landscape changes to create more space for trees and tree canopy.[17]

Our finding that most canopy gained in NYC during 2017–2021 was the result of existing tree growth reinforced findings for 2010–2017,[1] and indicate that to see continued canopy gains it is critical to protect the currently standing trees from removal and support their continued growth. Planting additional trees across the landscape is also a key part of expanding canopy, particularly in areas that lack it, as is replacing trees felled due to various factors including storms and disease. Maintaining and accelerating recent rates of canopy gain requires attention to all of these factors. Neglecting them might not only result in slowed canopy gains, but could even result in net losses of trees, their canopy, and the associated benefits, despite the heavy investment over the years from dedicated programs (e.g., MillionTreesNYC, Cool Neighborhoods NYC) and annual routine planting and maintenance funding.[1,47]

Policies, plans, investments, and on-the-ground activities across the landscape (whether or not they are directly related to trees) can have long-term impacts on tree canopy within a city.[58,59] The NYC Urban Forest Plan sets a target of reaching 30% canopy cover equitably by 2040.[8] To support the implementation of the Plan, we build on findings presented in prior chapters, and in other works, to offer reflections on:

- Current Strengths — What appears to be effectively contributing to increases in NYC tree canopy and reducing disparities in it
- Opportunities for Improvement — What existing efforts warrant adjustments to better support increasing tree canopy in NYC
- Data and Information Needs for More Holistic Urban Forest Management — What types of information (e.g., from research and data) are lacking but may be particularly valuable for holistic adaptive management of the NYC urban forest and specifically increasing canopy cover.

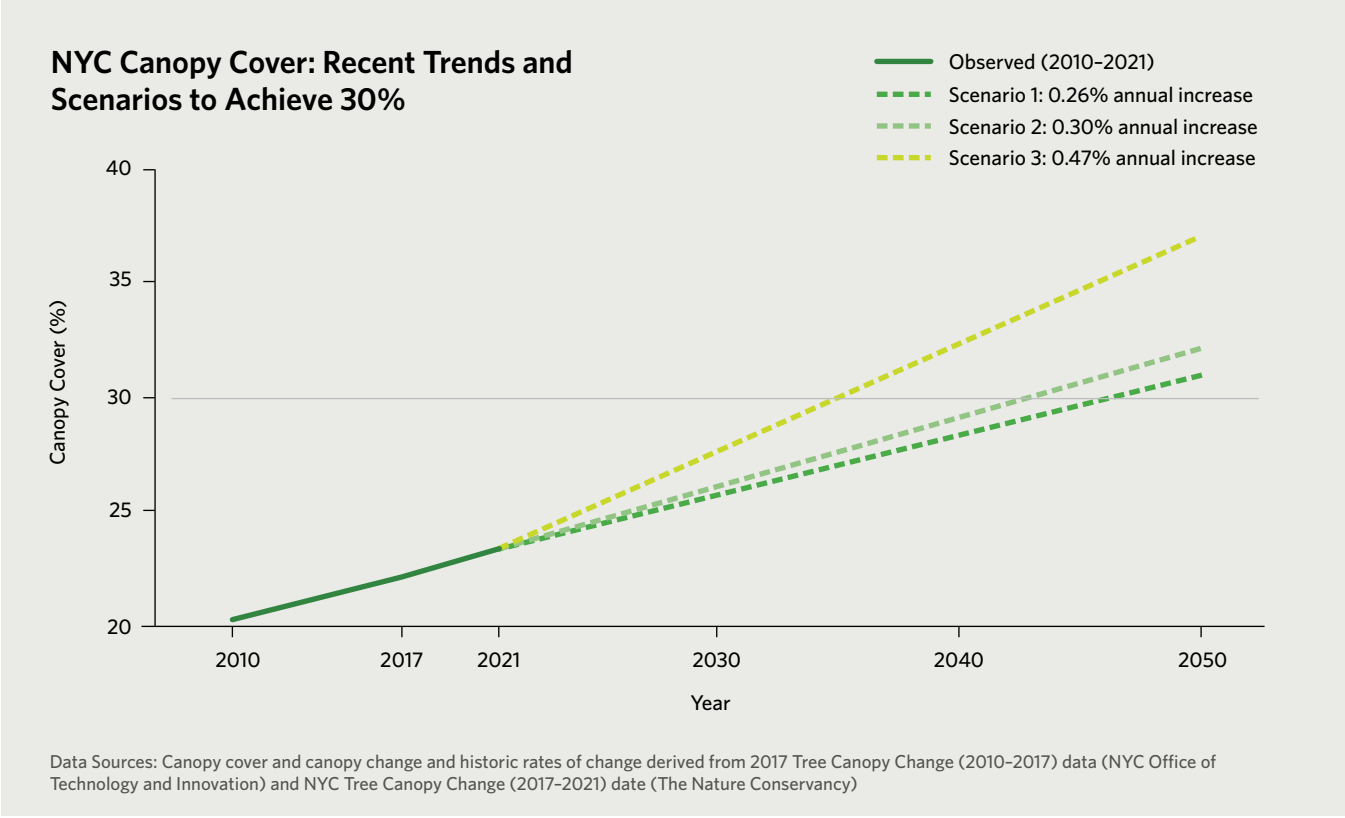


Figure 4.1 Plot illustrating citywide canopy cover for 2010 through 2021, and trajectories to reach 30% under different scenarios. The trajectories assume the citywide rates of change observed for 2010–2017 (Scenario 1) and 2017–2021 (Scenario 2) continue into the future, and illustrate the rate needed to achieve 30% by 2035, per the goal set in the *NYC Urban Forest Agenda* (Scenario 3). Note, the scenarios do not account for differential rates of change or potential limits in opportunity for additional canopy by jurisdiction.

Current Strengths

NYC has a generally healthy system of trees, trending toward resilience. Previous analyses of trees and forested natural areas within the city indicated a healthy size distribution with more smaller trees that can grow to replace older ones over time, a robust diversity of species, and predominance of native species in forested natural areas, albeit to a much smaller degree in the understory.[1,53,60] These findings suggest overall resilience of the suite of trees to stressors such as pests, pathogens, climate change, and extreme weather events, while supporting continued benefits to New Yorkers. Our new findings on canopy change further indicate a generally healthy system of trees, given the net gains in canopy across the five boroughs. Protecting and caring for existing trees is critical in the long term, as is planting new ones that can grow to replace older ones and increase the canopy in different parts of the city.

Trees under NYC Parks' jurisdiction are well characterized and protected. The trees under NYC Parks' jurisdiction—street trees and those on City Parkland—have robust inventories and account for over half of the total citywide canopy, and they are afforded some of greatest protection in the city. Damaging or removing them is subject to fines and criminal charges, and even removal of trees with a permit carries a requirement to replant (not necessarily on site) or pay into a restitution program. We anticipate that these protections, along with care for these trees (including by many volunteers) and generally robust tree-planting efforts by NYC Parks from year to year are a major driver of the substantial canopy cover gains in these spaces during 2017–2021.

Reducing disparities in canopy cover through targeted tree planting efforts. Many parts of the city that had greater gains in canopy are areas that have historically had less canopy cover. These areas often face legacy effects of redlining and are characterized by higher vulnerability to health impacts

BOX 4.1

Growing Support for the NYC Urban Forest

The coordinated efforts of stakeholders are working to overcome challenges and leverage opportunities to support the urban forest. For example, members of Forest for All NYC (founded in 2021) successfully advocated the passage of Local Laws 135 and 148 of 2023 to advance goals laid out in the *NYC Urban Forest Agenda*. Coalition members also organized to establish an annual City of Forest Day, featuring tree care and appreciation events around the city to help New Yorkers engage with the urban forest. The coalition has moved to support urban forestry career opportunities in NYC. In addition, various communication channels within Forest for All NYC support improved sharing of news, events, and information related to the urban forest.

of extreme heat, and/or have been designated by NYS as Disadvantaged Communities. The general trend of greater canopy cover gains in these neighborhoods suggests that targeted investments in tree planting (e.g., as part of Trees for Public Health and Cool Neighborhoods NYC) are indeed yielding geographically focused canopy gains. In particular, this is discernible in the South Bronx and central Brooklyn. Though eastern Queens had targeted plantings and saw gains in canopy cover within NYC Parks' jurisdiction, those appear to have been offset by canopy losses on private property.

There is a rich body of urban forest expertise, research, and data for NYC. LiDAR-based canopy data are the gold standard for monitoring urban tree canopy over time. Though their development for NYC has been sporadic through time, a requirement in Local Law 148 of 2023 to collect and process LiDAR data every five years establishes a predictable timeframe for monitoring canopy changes and progress toward the 30% goal and enables adaptive management. Data and research on other biophysical aspects on the NYC urban forest are also continually expanding; for example, the fourth decadal street tree census is underway, as are the second landscaped park tree inventory for City Parkland and the second Ecological Assessment of forested natural areas. Tree inventories also exist for select properties, such as some cemeteries and New York City Housing Authority campuses (although they are not always publicly available). Additional rich bodies of work have included, but are not limited to, analyses of benefits of the NYC urban forest[53,61] and the NYC Stewardship Mapping and Assessment Project, which has established an understanding of environmental stewardship in NYC.[62] These types of research and monitoring efforts are often developed or led by local researchers with extensive knowledge of the NYC urban forest, and the resulting information can support adaptive management of the resource.

There is growing and coordinated support for the NYC urban forest. There is strong coordination of stakeholders working to support the NYC urban forest through stewardship, research, and advocacy (**Box 4.1**). Key examples include the collaborative development of the *NYC Urban Forest Agenda* and its release in 2021, and the growth of Forest for All NYC, a coalition of over 200 organizations working together to implement the *Agenda* and achieve at least 30% canopy cover by 2035. As part of those efforts, Forest for All NYC members have established an annual event, City of Forest Day, to engage New Yorkers more broadly, and the coalition supports sharing of resources, data, and information. Given the broad and citywide nature of the NYC UFP and the recent requirement specified in Local Law 135 of 2023[6] of the NYC Mayor's Office to consider "the role of trees and the tree canopy" in the long-term sustainability plan released every four years, we anticipate there may be increased focus and coordination on trees among City agencies.

Opportunities for Improvement

Increased and stabilized public funding for trees and canopy under City jurisdiction. Nearly 60% of the canopy falls under the jurisdiction of the City, and almost all of that—about 94%—falls within NYC Parks' jurisdiction. This portion of the urban forest includes over 880,000 individually managed street trees and trees in landscaped portions of City parkland and thousands of acres of forested natural areas across NYC Parks properties, which, in total, account for over 13% of the

Randall's Island Park Alliance leading City of Forest Day participants in a bird walk on Randall's Island, Manhattan

citywide land area.* The remaining 6% of canopy on City property falls on land that is managed and administered by various other public agencies, including the NYC Department of Environmental Protection, the NYC Department of Education, and the Department of Citywide Administrative Services. Although NYC Parks has robust management programs to support the trees within its jurisdiction, the associated funding is highly variable from year to year, and there have been multiple periods of substantial decreases in the last two decades.[1] This can contribute to periodic backlogs of key maintenance activities, such as routine tree pruning, as resources must be prioritized for emergent safety concerns. Establishing a minimum and permanent level of public funding to ensure execution of the management programs would ensure a degree of predictable and consistent care of the trees over time. Particularly as NYC progresses toward 30% canopy cover, an increasingly important dimension will be long-term funding to support a local urban forestry workforce—offering clear career pathways and compensation that is commensurate with the high cost of living in NYC.

Increase planting, protection, and care of trees across jurisdictions. Though over half of tree canopy in NYC is under NYC Parks' jurisdiction, and thus benefits from strong protection and care, trees in most other spaces receive little if any dedicated care or legal protection, making this a notable area for improvement. For example, incentive programs, tree ordinances, and educational outreach about trees and tree care could help protect more trees and enable more planting, replacement, and regular care. Privately owned one- and two-family residential properties, in particular, could benefit from such programs as about 17% of the citywide canopy was over them in 2021. Further, these properties as a whole experienced a net loss in canopy since 2017, and they have

* NYC Parks' website indicates that the agency is responsible for about 30,000 acres, or 14% of the citywide area. That acreage includes portions of City Parks that extend into New York Harbor. In our analyses, we only include land area, and thus for our purposes the total area of City Parkland is 13.33% of the citywide land area.

Mature oak tree in Van Cortlandt Park, Bronx

The increasing frequency, variability, and intensity of extreme weather events pose challenges in managing trees and expanding tree canopy in the long term.

been estimated to have substantial opportunity for more canopy.[17] Given the robust tree care standards used by NYC Parks for the local context, when professional tree care is needed, there is potential to leverage those standards beyond NYC Parks' jurisdiction. There may be natural opportunities for shared standards and even sharing of data systems for tree inventory and management, tree care staff, and other resources, with City agencies and beyond, such as to NYCHA, which are widely distributed and contain a notable portion of tree canopy (2.35%) within the city. This would require appropriate resourcing, but could support more efficient and holistic professional tree care for more of the trees in the city. We also anticipate there are opportunities to better socialize stewardship approaches to ensure that more New Yorkers are equipped with knowledge to correctly carry out some key activities that support increased tree survival and growth rates, such as watering and mulching around trees.

Pursue an array of approaches to support urban forest benefits reaching all New Yorkers. Though the latest data show recent canopy cover gains in many historically low-canopy parts of the city, ensuring that this trend continues and that the vast benefits of trees can reach all New Yorkers depends on finding places for new trees to be planted and for canopy to grow. Estimates of opportunity for more tree canopy found that only leveraging the existing potential spaces to plant trees (including on public and private property) would exacerbate disparities,[17] as many areas with low canopy cover are heavily developed. Given the diversity of land uses across the city, addressing this challenge at scale will likely require multiple approaches. For example, to ensure more space for tree and tree canopy along roads and sidewalks, one approach may be to refine NYC streetscape design standards through revisions to the NYC Street Design Manual.[63] Another approach may be to provide incentives for planting, caring for, and preserving trees to support trees and their canopy on individual properties across the city. Additionally, local laws and adjustments to the NYC Zoning Resolution,[64] can be used to create more spaces for trees and their canopy.

Though the intent of new tree plantings is generally positive, there is potential for unintended negative impacts on local communities. For example, there can be consequences (whether intended or not) of "green gentrification," in which greening contributes to increased costs of living around various types of urban green amenities, and ultimately displacement of residents who tend to be lower income and people of color from the neighborhood.[65,66] There can also be costs (financial and otherwise) associated with trees, such as from injuries and property damage from falling trees and tree branches, from health impacts of allergenic pollen to people, and in caring for the trees and tree beds themselves.[67] Thus, to help all New Yorkers benefit more fully from trees and tree canopy, authentic community engagement between those planning and implementing changes and those experiencing them is invaluable for working through potential concerns,[68] and there is both significant value in and potential for centering community needs, capacities, and priorities in urban forestry.[16]

Embrace strategies that consider the impacts of a changing climate. The increasing frequency, variability, and intensity of extreme weather events pose challenges in managing trees and expanding tree canopy in the long term. Extreme storm events have proved particularly deleterious, as seen in the catastrophic tree loss and associated property damage from Superstorm Sandy (2012) and Tropical Storm Isaias (2020) which felled more than 10,000 and 3,000 trees respectively.[1] Other risks include wildfires and droughts; though they have long been part of the city landscape,[69] the intense development of NYC and the changing climate have created different, modern challenges that require attention. Concerns raised in a 2006 op-ed in the *New York Times*, "New York City's Burning Problem," about wildfire management[70] became even more relevant in November 2024 when, after an extended period of limited rainfall, two acres of the woodland Ravine in Prospect Park burned in a two-alarm fire.[71] With predicted increases in the frequency and severity of storms and heat waves, and a changing climate that can contribute to increased prevalence of tree pests and diseases, there will be a need to plan to ensure that the general makeup of trees that are part

Volunteers conducting stewardship activities in Prospect Park, Brooklyn

of the NYC urban forest is resilient as possible to these shifts. It will also be important to develop effective strategies for wood salvage and reuse of trees that are felled due to climate impacts and other reasons.

Though NYC Parks requires the replacement of trees that are removed, either illegally or as part of permitted work, there are no standards for replacing trees that are felled for other reasons, such as storm damage, pests, and disease.[1] Thus, particularly as trees in NYC face increasingly complex and compounded challenges that sometimes require their removal, it will be critical to develop plans for replacing those trees, and supporting a more resilient urban forest, in the long term. One approach is to establish requirements or incentives for replacement of trees that are felled for the aforementioned reasons—and to select the appropriate species for replacement that are adapted to the current and projected future climate of NYC. Robust work for NYC is already supporting climate-adapted palettes of species, such as the Forest Identification and Restoration Selection Tool from the Natural Areas Conservancy[72] and the intentional planting of species that are not necessarily native to NYC, through the lens of climate adaptation, at Green-Wood Cemetery.

Data and Information Needs for More Holistic Urban Forest Management

Increased frequency of tree canopy data. Particularly for a city as dynamic as New York, even the five-year intervals of LiDAR-based canopy data required by Local Law 148 of 2023 can pose challenges in adapting management of the urban forest to potentially rapidly changing circumstances. As a result, the best characterizations we can offer based on available data and included in this report are functionally four to five years old at the time of writing. Yet, change across the NYC landscape is

a constant; thus more frequent and rapidly available updates to data can help identify, for example, where losses are occurring such that timely interventions could slow or stop them, and where canopy cover is increasing quickly, such that successful practices can be expanded sooner. Though the LiDAR-based data are the most robust way to monitor the urban tree canopy and track progress toward 30% canopy coverage, other approaches can offer useful (if less accurate) information more frequently. Recent advances in using non-LiDAR remote sensing approaches can likely be further developed and leveraged for such insights.[73,74]

Understanding of the urban forest on private property. While some parts of the urban forest are well understood, relatively little is known about trees on private property or about property owners' attitudes, beliefs, and behaviors. At present, there is no citywide tree census that includes trees on private property, and the sheer number and diversity of property owners makes it difficult to robustly characterize almost any aspect of this large portion of the urban forest (e.g., species composition, stewardship efforts). About 33% of the total canopy in NYC is on private property, and recent analysis found that the majority of potential space for new canopy in NYC was on private property.[17] With our limited understanding of the urban forest across private property in NYC, it is difficult to discern the key opportunities or challenges for expanding canopy on these spaces. Thus, filling these information gaps—not only about the trees themselves but about perspectives of those who own and manage the properties—can yield more efficient development of policies and programs for maintaining and expanding canopy across the city.

Comprehensive understanding of trees and forested natural areas across NYC. To complement citywide canopy data, more holistic assessments of the individual trees (i.e., from "stem"-based data) and the forested natural areas ecosystems, across ownership and land-use categories, can support adaptive management of the NYC urban forest. This can help fill data gaps for many non-NYC Parks jurisdictions (e.g., on size and species composition of trees, ecosystem health of forested natural areas, stewardship activities), and even add information such as on tree health across the city. Such work can help guide where in the city (e.g., geographically or across different jurisdictions) efforts are needed to help ensure robust size and species compositions in the long term, to support ecological value and benefits of forested natural areas holistically, and to address emerging tree health concerns. With such information, work can be targeted, for example, to help increase trees of certain sizes or species in different areas (either through direct planting efforts or through partnerships with property owners), and to carry out other necessary management actions. In addition, as the City works toward the goal of 30% canopy cover, such information can yield key insights into potential challenges, which can guide adjustments to the approaches being used to reach the overall goal.

Some forthcoming or anticipated updated assessments that will support a fuller understanding of the condition of the urban forest include: the fourth decadal NYC Street Tree Census led by NYC Parks (taking place 2025–2026); the second ever Ecological Assessment of natural areas, which is underway by the Natural Areas Conservancy and NYC Parks; an updated analysis of the opportunity for more trees and their canopy ("practical canopy") across the city; and an assessment of environmental stewardship across the city, STEW-MAP,[62] which is being planned for 2027. These individual assessments offer invaluable information that can help improve allocation of resources to support a healthy urban forest with increasing canopy cover. If they can be carried out across the city where relevant (e.g., comparable tree inventories for all property types with individually managed trees), and repeated over time, the data can offer a more holistic picture of the urban forest that can ultimately help us surpass the City's goal of 30% canopy cover. With an incredible wealth of existing data from the aforementioned assessments and beyond, there is a rich base of information to support implementation of the NYC UFP, and the requirement of Local Law 148 of 2023 for decadal updates can give tangible time-bound goals for filling the remaining gaps in such information for the next iteration.

Glossary, Acronyms, and References

Glossary

Canopy (tree canopy)	Layer of leaves, branches, and stems of trees that cover the ground when viewed from above. Quantitative measures of canopy, as used in this document, are based on data developed using 3-D remote sensing techniques, in which canopy is mapped as approximated crowns of trees taller than 8'.[75] As used in this report, canopy is presented as total area (in acres) or as the percentage of land area that it covers ('canopy cover').
City Parkland	All lands delineated as NYC Parks' properties within NYC.
Civic stewardship	The work of civic environmental groups that conserve, manage, monitor, transform, educate, and advocate for the local environment—including land, air, water, and systems (such as energy, waste, and food systems).[62]
Disadvantaged Communities	Defined by the New York State Climate Leadership and Community Protection Act (Climate Act) of 2019 as "communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high concentrations of low- and moderate- income households."[57] Criteria for identifying Disadvantaged Communities were developed by the NYS Climate Justice Working Group and final designations were released in 2023.
Distributional equity	This dimension of equity "refers to how resources, costs and benefits are allocated or shared amongst people and groups."[40]
Forested natural areas	A subset of the urban forest that is distinct from street trees, park trees, and trees in more manicured landscapes in terms of biodiversity, size, composition, and management. These are complex ecosystems that include soil, microorganisms, and myriad species of flora and fauna throughout their various life stages, in addition to the humans who live near, visit, and manage these spaces.[76]
Heat Vulnerability Index	A measure of how susceptible people are, at the community level, to dying from extreme heat, on a scale from 1 (lowest risk) to 5 (highest risk). The NYC Heat Vulnerability Index was developed by the NYC Department of Health and Mental Hygiene, based on a combination of socioeconomic, health, and landscape data.
Landscaped park trees	Trees that are actively planted or managed within playgrounds, around picnic areas and athletic fields, around malls and plazas, or along bike paths and other actively programmed areas. Landscaped park trees can exist in parks of various jurisdictions, though portions of this work focus specifically on NYC Parks landscaped park areas given specific data available for these sites.
LiDAR	Acronym for Light Detection and Ranging, which is a remote sensing method that uses light (in the form of a pulsed laser) to measure distances from a sensor and can ultimately yield a 3-D representation. In the context of urban forestry, it is a valuable set of data used to map tree canopy.[77]

Natural areas	Portions of the landscape that are generally unmanicured, often containing vegetation that grew naturally without human intervention, though these areas are sometimes actively planted and managed.
Net canopy change	The difference in total area of canopy or percent of the land area covered by canopy between two focal years.
Pruning	Selectively removing unwanted branches from a tree to improve tree structure, promote tree health, and at times, to resolve conflicts with other infrastructure.
Redlining	A method of lending discrimination that allowed banks and mortgage lenders to reject the loans of borrowers for purchasing or even renovating their homes based on their race or where they lived. This practice, now outlawed in the United States, began in the 1930s when financial institutions would label areas or hazardous neighborhoods that were considered at highest risk in "red."[41]
Relative canopy change	The percentage change in canopy between two time points relative to the first time point of data in the comparison. For example, relative change for 2017 to 2021 is calculated as: 100 * ([Canopy in 2021] – [Canopy in 2017])/[Canopy in 2017].
Rights of way	As used in this report, all areas outside of mapped properties, based on parcel (i.e., tax lot) boundaries and agency-specific property datasets. Tree canopy in rights of way is generally associated with street trees, but can also be from others, such as trees on individual properties where the canopy extends into rights of way, and trees planted along highways.
Social Vulnerability Index	A measure of the degree to which communities are vulnerable to human suffering and financial loss following a hazardous event. It was developed by the Centers for Disease Control and Prevention's Agency for Toxic Substances and Disease Registry using 16 component variables (e.g., income, race and ethnicity) sourced from the U.S. Census Bureau American Community Survey.[48]
Stewardship	Conserving, managing, monitoring, advocating for, or educating the public about local land, air, water, waste, energy, or toxics issues.[47]
Street trees	Trees that are planted along streets, sidewalks, and medians of surface roads, in designated tree beds within the sidewalk or along the curb, or in grass strips between the sidewalk and the curb.
Tree	A woody perennial plant, typically large, with a single well-defined stem carrying a more or less definite crown.[78]
Tree census	A complete inventory of trees that allows for collecting data on individual trees. For example, the decadal Street Tree Census run by NYC Parks records the location, size, species, and condition of all street trees in New York City.[79]
Urban forest	Social ecological system that includes all the trees in NYC and the biological, physical, and social infrastructure on which they depend.

Urban forest plan (specific for NYC)	A long-term citywide plan that, per NYC Local Law 148 of 2023, "identifies strategies and sets goals to protect, care for, and expand the urban forest canopy with an overall goal of equitably expanding the urban forest canopy to cover 30 percent of land within the city."[7] The Plan would consider data relevant to evaluating the distribution, extent, health, and stability of the urban forest; identify causes of tree canopy cover gain or loss; and recommend strategies to remediate any canopy loss, prevent similar losses in the future, and facilitate gains. In addition, the NYC plan is to describe initiatives or programs to be undertaken by the city, and others that are known to be undertaken by other government entities to reach the goals set in the plan. The Plan must also include an outreach strategy to educate property owners and other stakeholders about how to advance goals set in the plan by protecting and increasing the number of trees beyond City jurisdiction. The Mayor's Office of Climate and Environmental Justice published the NYC Urban Forest Plan on April 21, 2026.[8]
Zoning	Laws that limit how land may be used by property owners in order to guide development across neighborhoods and cities. In New York City, zoning regulations address issues such as building shape, affordable housing, walkability, and climate change.[80]

Acronyms

ACS	U.S. Census American Community Survey
DAC	Disadvantaged Community, as defined by the State of New York
HOLC	Home Owners' Loan Corporation
HVI	Heat Vulnerability Index
LiDAR	Light Detection and Ranging
NTA	Neighborhood Tabulation Area
NYC	New York City
NYC Parks	NYC Department of Parks and Recreation
NYC UFP	NYC Urban Forest Plan
NYCHA	NYC Housing Authority
NYS	New York State
SVI	Social Vulnerability Index

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Appendix 1:

Supplementary Methods

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Supplementary Methods

This section describes how analyses were conducted for *Growing Greener: The State of Tree Canopy in New York City, 2017–2021*. This information, annotated for technical users and with supporting code, is available on GitHub at https://github.com/tnc-ny-science/NYC_StateOfUrbanForest_Docs. (Annotated technical information used for *The State of the Urban Forest in New York City* is also archived in that repository.)

All spatial analyses were conducted with data projected in the NY State Plane – Long Island Zone coordinate system (datum NAD83), EPSG code 2263, using feet as the units of measurement. For presentation of results in the report we converted area measurements from square feet to acres (1 acre = 43,560 ft^2).

Analysis of Tree Canopy and Tree Canopy Change Across New York City (Chapter 2)

Datasets used in analysis of tree canopy and tree canopy change across administrative, jurisdictional, and similar units are listed in **Table A1.1**. When referencing specific attributes of individual datasets by name, for concision we follow a convention of DatasetName.FieldName, where "DatasetName" refers to the dataset, and the "FieldName" refers to the column or field. We used the data that were most recent and most appropriate for this work at the beginning of this effort (early 2024).

Analysis of tree canopy and tree canopy change presented in this report primarily leveraged the NYC tree canopy change data for 2017–2021. The dataset delineates canopy across 2017 and 2021 as areas of "loss," "no change," and "gain." Thus, we calculated 2017 canopy data as the combined areas of "loss" and "no change," and 2021 canopy data as combined areas of "no change" and "gain." Canopy cover was calculated as the percent of focal land area (e.g., based on geographic unit, jurisdiction, etc.) covered by tree canopy for the given year, and net changes across years were calculated as the values in 2017 subtracted from the values in 2021 (either in acres of canopy or percent canopy cover). We calculated relative change as the canopy areas in 2017 subtracted from the canopy areas in 2021, divided by the canopy areas in 2017, and multiplied the result by 100 to reflect it as a percentage.

Although the report focuses on the most recent canopy change data available at the time of writing, reflecting data for 2017–2021, we also analyzed canopy change data for 2010–2017, reflected selectively in the text and included in tables available as part of online supplementary materials. Although the two datasets were developed using the same general methodology and serve to robustly allow for analysis of change over time, slight methodological refinements were employed in development of the latest tree canopy/tree canopy change dataset, thus canopy data for 2017 were based on the more recent canopy change data (as areas delineated as having had "no change" and "loss" in canopy during 2017–2021).

Breakdown of Site Types

We developed a holistic data layer that encompassed a broad suite of datasets representing land ownership and jurisdiction, land use, administrative and political boundaries, and biophysical data such as Natural Area types into a single data layer (referred to as the "mashup"). This was done in coordination with staff from the NYC Department of Parks and Recreation (NYC Parks) Environment and Planning Division for consistency in data used across similar efforts, and with contracted support from the University of Vermont Spatial Analysis Lab. Some of the input data are not publicly available and were used with permission or under data-sharing agreements. This mashup ultimately enabled us to describe tree canopy across site types described in the report, based on ownership or jurisdiction, and land use characteristics.

We restricted all analyses to the land area of NYC, based on the dataset of "Borough Boundaries (Clipped to Shoreline)" from the NYC Department of City Planning (DCP). Given different datasets representing the land area of NYC are sometimes used or created by different City agencies (among others), whenever possible, we leveraged datasets that were not restricted to land area, but only considered areas within those borough boundaries for consistency. For example, the version of the Parcels dataset for NYC (MapPLUTO) that is clipped to the shoreline sometimes differs in the representation of the shoreline, thus we used the "unclipped" version of that dataset (in which some parcels extend into NY Harbor) in the mashup, but only considered portions of the parcels within the DCP Borough Boundaries (Clipped to Shoreline) dataset for all analysis and numbers presented in the report.

Land Ownership and Jurisdiction

Though most datasets were used as is, we processed some to better fit our specific purposes or to maximize utility of available datasets. In particular, we worked to refine land ownership and jurisdiction information in MapPLUTO, which captures spatial extent and various attributes of parcels (i.e., tax lots or properties). MapPLUTO offers limited resolution for the OwnerType field, not specifically delimiting State, Federal, or private, tax-exempt entities, and generally for properties not

TABLE A1.1
Data Sources used in Analysis in this Report

Dataset*	Source**
Borough Boundaries (Clipped to Shoreline)	NYC Department of City Planning; https://www.nyc.gov/content/planning/pages/resources/datasets/borough-boundaries
City Council Districts (Water Areas Included)	NYC Department of City Planning; https://www.nyc.gov/content/planning/pages/resources/datasets/city-council
Community District Boundaries (Water Areas Included)	NYC Department of City Planning; https://www.nyc.gov/content/planning/pages/resources/datasets/community-district-tabulation
ECM (Ecological Covertype Map)	The Natural Areas Conservancy; https://naturalareasnyc.org/data-sets-for-download/
Gateway National Recreation Area Boundaries	National Park Service
FacDB (Facilities Database)	NYC Department of City Planning; https://www.nyc.gov/content/planning/pages/resources/datasets/facilities
MapPLUTO - version 24v1 (Tax lot boundaries)	NYC Department of City Planning; https://www.nyc.gov/content/planning/pages/resources/datasets/mappluto-pluto-change
Neighborhood Tabulation Areas - 2010 and 2020 versions	NYC Department of City Planning; https://www.nyc.gov/content/planning/pages/resources/datasets/neighborhood-tabulation
NYC Housing Authority Properties	NYC Housing Authority
NYC Parks Dominant Type Dataset	NYC Department of Parks and Recreation
NYC Parks Forever Wild Area Boundaries	NYC Open Data; https://data.cityofnewyork.us/Environment/NYC-Parks-Forever-Wild/48va-85tp/
NYC Tree Canopy Change – 2010–2017	NYC Open Data; https://data.cityofnewyork.us/Environment/Tree-Canopy-Change-2010-2017-/by9k-vhck
NYC Tree Canopy Change – 2017–2021	The Nature Conservancy; https://zenodo.org/records/14053441
NYS Department of Environmental Conservation Lands (DEC Lands)	NYS GIS Clearinghouse; https://data.gis.ny.gov/datasets/nysdec::nys-dec-lands/about
NYS Historic Sites and Park Boundary (NYS Office of Parks, Recreation, and Historic Preservation)	NYS GIS Clearinghouse; https://data.gis.ny.gov/datasets/nysparks::ny-state-parks-property/about
NYS State-Owned Parcels	NYS GIS Clearinghouse; https://data.gis.ny.gov/datasets/sharegisny::nys-tax-parcels-state-owned/about

* Where available, specific versions of datasets are indicated, and data were generally accessed in Spring 2024.
** In cases where no URL is indicated, datasets were shared by the respective entities and used with permission.

subject to tax (e.g., government-owned properties) ownership information is not necessarily updated. Thus, we developed holistic approximations of ownership based on generalizations we drew from inspecting MapPLUTO data in conjunction with the MapPLUTO data dictionary,* and by leveraging additional data as described below. Our re-classifications of the ownership or jurisdictional information are imperfect due to the nature of the data, but they enabled a clearer breakdown that was sufficient for our intents and purposes. In many cases we are not able to accurately discern granular ownership or jurisdiction such as those of most individual government agencies. These results were primarily leveraged for Chapter 2.

- We classified properties as City-owned where MapPLUTO. OwnerType was City or Mixed (mixed City and Private ownership).
- We classified properties as State-owned where MapPLUTO.OwnerType was Other (reflecting a public authority or the State or Federal government).
- We classified properties as Privately-owned where MapPLUTO.OwnerType was blank, Private, or recorded as a "fully tax exempt" entity.
- We classified properties as Federal where MapPLUTO. OwnerName reflected federal entities (e.g., U.S. Post Office).
- In cases where other datasets seen as generally more reliable overlapped MapPLUTO data, we classified ownership based on the information from those other datasets as detailed below, ordered by priority in case of overlaps (i.e., if multiple datasets overlapped, the determinations listed earlier in the following were given precedence).
  - NYC Parks' Dominant Type dataset represents properties designated and managed as City Parkland, under the jurisdiction of NYC Parks. This dataset delineates each area as "Natural" or "Developed." In some cases, mapped but unbuilt roads adjacent to or within formal properties are included, though these are managed as City Parkland. All land captured in this dataset was assumed to be City-owned, and more specifically within NYC Parks' jurisdiction. Notably, some areas within these datasets are not designated as tax lots but are mapped as City Parkland and were treated as such for all analysis.
  - Based on data representing the boundaries of Gateway National Recreation Area, we considered the associated land as Federal, and National Park Service – Gateway property.
  - NYC Housing Authority Properties were considered State-Owned.
  - Properties in the NYS-owned, NYS Office of Parks, Recreation and Historic Preservation, and NYS Department of Environmental Conservation properties datasets were considered State-owned. Properties in the latter two datasets were assumed to be in the jurisdiction of those agencies, respectively.
  - Lands that were not within any of the aforementioned datasets were considered rights of way. We developed a specific layer depicting these that were included in the mashup.

Land Use

To distill how land is used, we leveraged some of the aforementioned information as well as specific information from MapPLUTO related to land use (MapPLUTO.LandUse) and building class (MapPLUTO.BldgClass), as follows. Rules that applied to all lands within certain categories superseded earlier rules (e.g., NYC Parks properties were considered Parkland, regardless of designations in MapPLUTO). We used information from MapPLUTO as provided, with the following exceptions:

- Properties MapPLUTO.LandUse coded as Multi-Family Walk-Up, Multi-Family Elevator, and Mixed Residential & Commercial Buildings were classified as Multifamily Residential.
- Properties with MapPLUTO.LandUse coded as Commercial & Office, Industrial & Manufacturing, Transportation & Utility, and Parking Facilities, were classified as Non-Residential Developed. A small percentage (0.34%) of tax lots did not have land use information in MapPLUTO. After spot-checking some of those sites with aerial imagery, we grouped them in this category.
- While cemeteries generally have MapPLUTO.LandUse coded as Open Space and Outdoor Recreation, we specifically considered them as cemeteries based on the building class code (MapPLUTO.BldgClass of "Z8").
- For all properties associated with NYC Parks, Gateway National Recreation Area, NYCHA, NYS Department of Environmental Conservation, and NYS Office of Parks, Recreation, and Historic Preservation, we classified the land use to be aligned with the owning or managing entity (e.g., NYC Parks properties were all considered City Parkland).

For select analyses or reporting of numbers (in Chapter 2), we also characterized NYC Public School properties, in aggregate.

* Version used for this report available at https://www1.nyc.gov/assets/planning/download/pdf/data-maps/open-data/pluto_datadictionary.pdf?r=24v1.

To do so we leveraged the Facilities Databased from DCP, considering public schools for which the Facility Subgroup (FacDB.FACSUBGRP) was coded as "PUBLIC K-12 SCHOOLS," and we joined these data to the mashup based on the borough, block, and lot number (BBL).

Analysis of Tree Canopy Disparities Across Communities (Chapter 3)

To offer an updated understanding of distributional disparities in tree canopy across the city, we analyzed the latest canopy data alongside established datasets reflecting characteristics of communities. We followed the general approaches in *The State of the Urban Forest in New York City* to support tracking changes over time. We primarily relied on correlational analysis, specifically Kendall's tau, to examine the relationship between each canopy metric and community characteristic. Whenever possible, we did this with all data together, and with data grouped by borough (full results are available in Appendix 2).

The canopy metrics we considered, computed using the same methods as for Chapter 2, were as follows:

- Canopy cover as of 2021 (%)
- Relative change in canopy from 2017 to 2021

For analyses at the Neighborhood Tabulation Area (NTA) level, we calculated canopy metrics for each NTA buffered by one-quarter mile (clipped to land area) to help capture access to the urban forest and its benefits present in adjacent areas. Based on the boundaries of NTAs, natural areas and large parks or cemeteries, such as Central Park, would otherwise be excluded from analysis. Source datasets for the community characteristics are listed below (**Table A1.2**), followed by additional processing and analysis details.

Tree Canopy and Community Characteristics

The socioeconomic variables we considered as community characteristics for analysis with canopy data were primarily based on the 2022 Social Vulnerability Index (SVI) developed by the U.S. Centers for Disease Control and Prevention – Agency for Toxic Substances and Disease Registry. As in *The State of the Urban Forest in New York City*, this included the combined and thematic SVI scores and the component variables derived from the U.S. Census Bureau American Community Survey (ACS) 5-Year Estimates from 2018–2022. We also included four housing type variables from the ACS, per capita income* sourced from the NYC Department of City Planning, and the 2023 NYC Heat Vulnerability Index (HVI) sourced from the NYC Department of Health and Mental Hygiene.

For all of the ACS-based variables, except for the SVI scores, we aggregated the data for analysis from census tracts to NTAs to reflect local nuances while reducing the impacts of sampling errors and potential biases from hyper-local dynamics. To aggregate the data, we averaged values for the census tracts within the respective NTA, weighted by estimates of the total base population (e.g., total population estimate, total housing unit estimate) in each census tract (see **Table A1.3**). We did not aggregate the SVI combined or thematic scores to the NTA level because they are based on percentile rankings, which may not be accurately maintained when aggregating the data. We restricted the correlational analysis to residential geographies as determined by NTA type.

NYS-Designated Disadvantaged Community Analysis

Acknowledging that NYS-designated Disadvantaged Communities (DACs) face greater environmental burdens and climate risks, we considered canopy metrics alongside final DAC designations and the criteria used to identify DACs, all at the census tract level. We compared canopy cover and relative change in DACs versus non-DACs using two-tailed Mann-Whitney *U* tests (also known as the Wilcoxon rank-sum test), a non-parametric test. We also conducted correlational analysis to examine the relationships between canopy variables and the final Combined Scores used to identify DACs, as well as the component scores used to assess relative environmental burdens and climate change risks (Burden Score) and relative population characteristics and health vulnerabilities (Vulnerability Component Score).

Redlining Analysis

To explore the legacy effects of redlining on canopy distribution and change, we examined the relationships between canopy metrics and historical grades assigned by the Home Owners' Loan Corporation (HOLC) in the 1930s. Data were sourced from the Mapping Inequality project at the University of Richmond's Digital Scholarship Lab. As in *The State of the Urban Forest in New York City*, we calculated canopy metrics constrained to land area for each geographic area that had a HOLC grade. We treated the HOLC grades as ordinal data (ordered from lowest assessed loan risk, Grade A, to the highest, Grade D) and conducted a correlational analysis using Kendall's tau correlation.

* Per capita income is no longer used in the Social Vulnerability Index but was part of the analysis in *The State of the Urban Forest in New York City*.

TABLE A1.2
Data Sources for Chapter 3

Dataset	Abbreviation	Source
Social Vulnerability Index – 2022	SVI	Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry/Geospatial Research, Analysis, and Services Program; https://www.atsdr.cdc.gov/place-health/php/svi/svi-data-documentation-download.html
NYC Heat Vulnerability Index – 2023	HVI	NYC Department of Health and Mental Hygiene; https://a816-dohbesp.nyc.gov/IndicatorPublic/data-explorer/climate/?id=2411
Final Disadvantaged Communities 2023	DAC	New York State Energy Research and Development Authority (NYSERDA); https://data.ny.gov/Energy-Environment/Final-Disadvantaged-Communities-DAC-2023/2e6c-s6fp/about_data
Home Owners' Loan Corporation Boundaries and Grades	HOLC	University of Richmond, Digital Scholarship Lab, Mapping Inequality Project; https://dsl.richmond.edu/panorama/redlining
American Community Survey (ACS) 5-Year Estimate Tables, 2018–2022: • Selected Housing Characteristics • Nativity by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over • Poverty Status in the Past 12 Months	• ACS DP04 • ACS B16005 • ACS S1701	U.S. Census Bureau • https://data.census.gov/table/ACSDP5Y2022.DP04 • https://data.census.gov/table/ACSDT5Y2022.B16005 • https://data.census.gov/table/ACSST5Y2022.S1701
Economic Table for NYC NTAs from 2022 ACS 5-Year Data	NYC Planning	NYC Department of City Planning; https://www.nyc.gov/content/planning/pages/resources/datasets/american-community-survey

TABLE A1.3
Variables and Associated Calculations Used in Chapter 3

Independent Variables	Variable Name or Calculation (Source Data Abbreviations)	Base Variable for Weighted Mean (Source Data Abbreviations)
Percent of People Aged 65 and Older	EP_AGE65 (SVI)	E_TOTPOP (SVI)
Percent of People Aged 17 and Younger	EP_AGE17 (SVI)	E_TOTPOP (SVI)
Percent of People of Color	EP_MINRTY (SVI)	E_TOTPOP (SVI)
Percent of People with Limited English Proficiency	EP_LIMENG (SVI)	B16005_001E (ACS B16005)
Percent of People Below the 150% Poverty Estimate	EP_POV150 (SVI)	S1701_C01_001E (ACS S1701)
Percent of Households with More People than Rooms	EP_CROWD (SVI)	E_HH (SVI)
Percent of Households with No Vehicle	EP_NOVEH (SVI)	E_HH (SVI)
Percent of Households Owner-Occupied	DP04_0046PE (ACS DP04)	DP04_0002E (ACS DP04)
Percent of Housing Units Built Since the Year 2000	DP04_0017PE + DP04_0018PE + DP04_0019PE (ACS DP04)	DP04_0001E (ACS DP04)
Percent of Housing Units Built Between the Years 1960 and 1999	DP04_0020PE + DP04_0021PE + DP04_0022PE + DP04_0023PE (ACS DP04)	DP04_0001E (ACS DP04)
Percent of Housing Units Built Before the Year 1960	DP04_0024PE + DP04_0025PE + DP04_0026PE (ACS DP04)	DP04_0001E (ACS DP04)
Per Capita Income	PerCapIncE (NYC Planning)	N/A
Heat Vulnerability Index Score	Score out of 5 (HVI)	N/A
Combination SVI Theme	SPL_THEMES (SVI)	N/A
Socioeconomic Status - SVI Theme 1	SPL_THEME1 (SVI)	N/A
Household Characteristics - SVI Theme 2	SPL_THEME2 (SVI)	N/A
Racial & Ethnic Minority Status - SVI Theme 3	SPL_THEME3 (SVI)	N/A
Housing Type & Transportation - SVI Theme 4	SPL_THEME4 (SVI)	N/A
Disadvantaged Community (DAC) Designation	DAC_Designation (DAC)	N/A
Combined Score - DAC Criteria	Combined_Score (DAC)	N/A
Burden Score - DAC Criteria	Burden_Score (DAC)	N/A
Vulnerability Score - DAC Criteria	Vulnerability_Score (DAC)	N/A
Home Owners' Loan Corporation (HOLC) Grade	Grade (HOLC)	N/A

Table A1.3 The base variables used to aggregate from census tract to Neighborhood Tabulation Area are included as applicable. "N/A" indicates that the data were analyzed by the same spatial units as the source data. See Table A1.2 for descriptions of the source data.

Appendix 2:

Supplementary Figures and Data Tables

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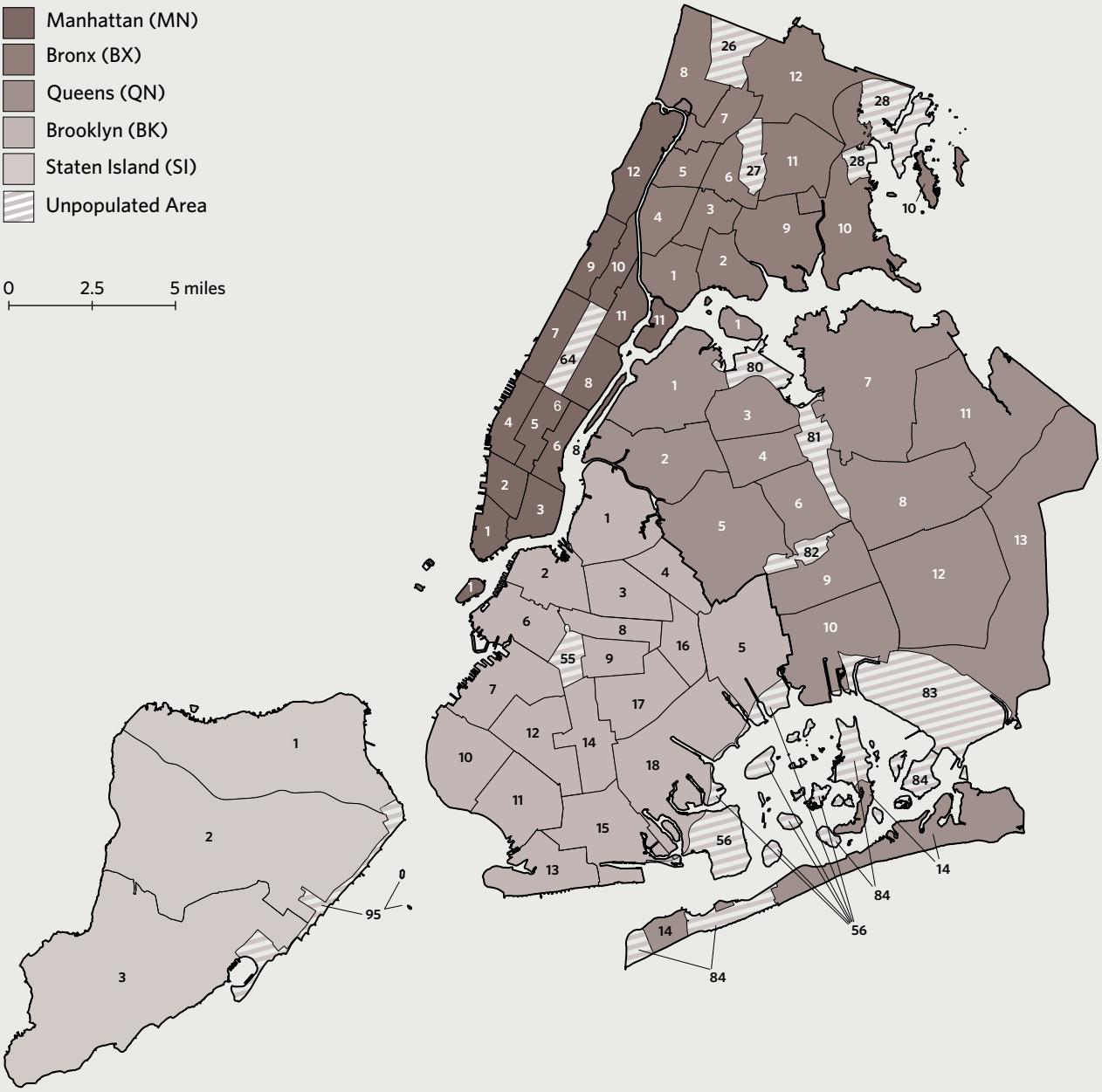
Summary tables (with the addition of 2010 canopy data) as well as other supplementary data tables in this Appendix, are available online at https://zenodo.org/records/20274414

FIGURE A2.1
Community Districts



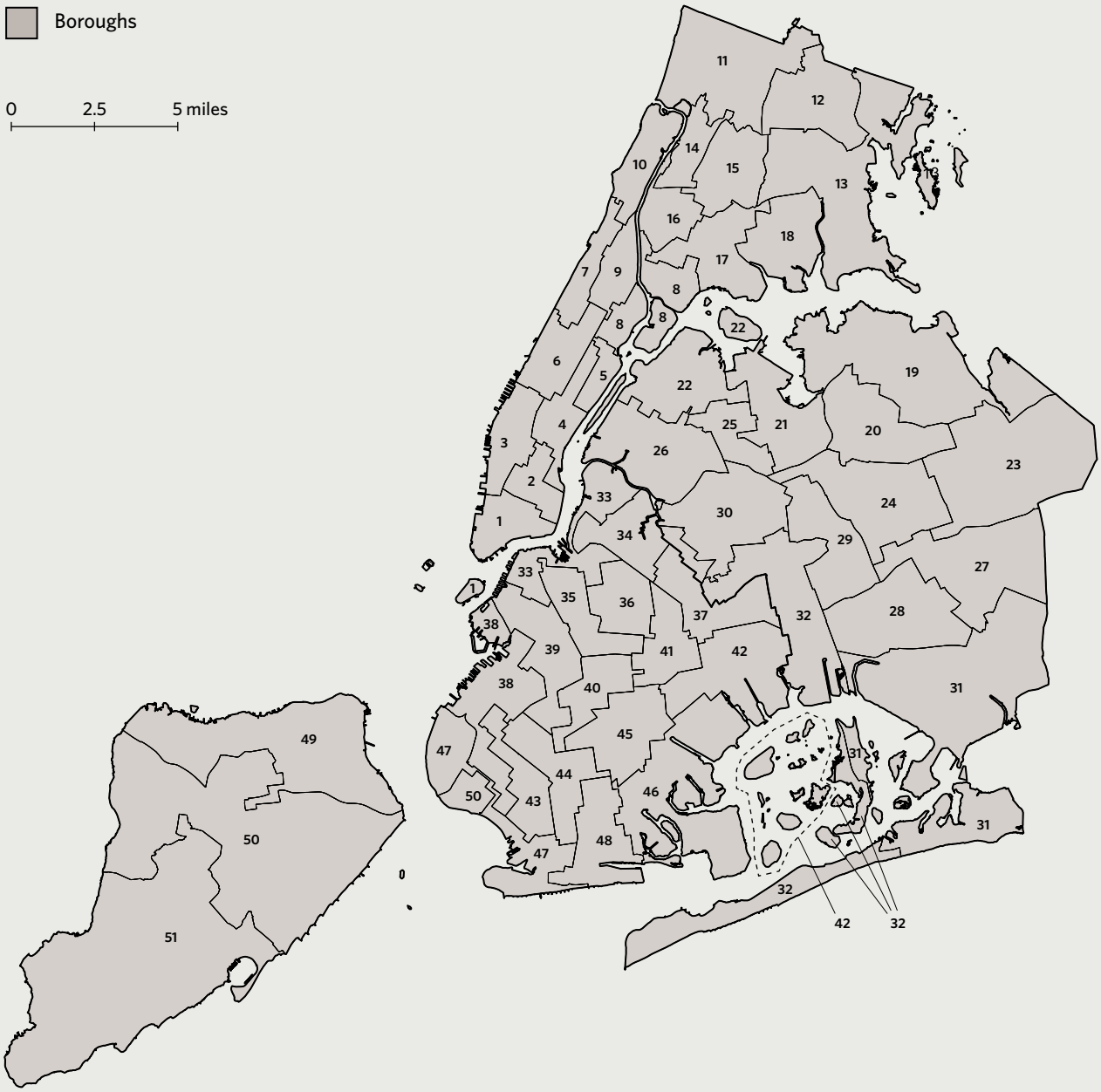
Data Source: NYC Department of City Planning (2024). Boundaries shown are Community District Tabulation Areas, which are close approximations of Community Districts, developed by the Department of City Planning based on aggregating entire 2020 census tracts. Note: In the Key (opposite page and elsewhere in the report, Community Districts are identified as Borough Abbreviation-Number. For example, Community District 1 in Manhattan is represented as MN-01.

Community Districts Key

BX-01 Melrose, Mott Haven, Port Morris
BX-02 Longwood, Hunts Point
BX-03 Morrisania, Crotona Park East
BX-04 Highbridge, Concourse
BX-05 Morris Heights, Mount Hope
BX-06 Tremont, Belmont, West Farms
BX-07 Fordham, Bedford Park, Norwood
BX-08 Riverdale, Kingsbridge, Marble Hill
BX-09 Soundview, Parkchester
BX-10 Co-op City, Throgs Neck
BX-11 Pelham Parkway, Morris Park
BX-12 Wakefield, Williamsbridge, Eastchester
BX-26* Van Cortlandt Park
BX-27* Bronx Park
BX-28* Pelham Bay Park
BK-01 Williamsburg, Greenpoint
BK-02 Downtown Brooklyn, Fort Greene
BK-03 Bedford, Stuyvesant
BK-04 Bushwick
BK-05 East New York, Cypress Hills
BK-06 Park Slope, Carroll Gardens
BK-07 Sunset Park, Windsor Terrace
BK-08 Crown Heights (North)
BK-09 Crown Heights (South)
BK-10 Bay Ridge, Dyker Heights
BK-11 Bensonhurst, Bath Beach
BK-12 Borough Park, Kensington
BK-13 Coney Island, Brighton Beach
BK-14 Flatbush, Midwood
BK-15 Sheepshead Bay, Gravesend (East)
BK-16 Ocean Hill, Brownsville
BK-17 East Flatbush
BK-18 Canarsie, Flatlands
BK-55* Prospect Park
BK-56* Jamaica Bay (West)
MN-01 Financial District, Tribeca
MN-02 Greenwich Village, SoHo
MN-03 Lower East Side, Chinatown
MN-04 Chelsea, Hell's Kitchen
MN-05 Midtown, Flatiron, Union Square
MN-06 East Midtown, Murray Hill
MN-07 Upper West Side
MN-08 Upper East Side, Roosevelt Island
MN-09 Morningside Heights, Hamilton Heights
MN-10 Harlem
MN-11 East Harlem
MN-12 Washington Heights, Inwood
MN-64* Central Park
QN-01 Astoria, Queensbridge
QN-02 Long Island City, Sunnyside, Woodside
QN-03 Jackson Heights, East Elmhurst
QN-04 Elmhurst, Corona
QN-05 Ridgewood, Maspeth, Middle Village
QN-06 Forest Hills, Rego Park
QN-07 Flushing, Murray Hill, Whitestone
QN-08 Fresh Meadows, Hillcrest, Briarwood
QN-09 Kew Gardens, Richmond Hill, Woodhaven
QN-10 South Ozone Park, Howard Beach
QN-11 Auburndale, Bayside, Douglaston
QN-12 Jamaica, St. Albans, Hollis
QN-13 Queens Village, Bellerose, Rosedale
QN-14 The Rockaways
QN-80* LaGuardia Airport
QN-81* Flushing Meadows, Corona Park
QN-82* Forest Park
QN-83* JFK International Airport
QN-84* Jamaica Bay (East)
SI-01 North Shore
SI-02 Mid-Island
SI-03 South Shore
SI-95* Great Kills Park, Fort Wadsworth

*** Indicates a Joint Interest Area - non-residential areas that are large open spaces or airports not part of any Community District**

FIGURE A2.2
City Council Districts



Data Source: NYC Department of City Planning (2024). The List of neighborhoods included in each City Council District are based on the New York City Council District Website, https://council.nyc.gov/districts/

City Council Districts Key

Manhattan

1 Financial District-Battery Park City, Tribeca-Civic Center, The Battery-Governors Island-Ellis Island-Liberty Island, SoHo-Little Italy-Hudson Square, Chinatown-Two Bridges, Lower East Side

2 Greenwich Village, Lower East Side, East Village, Midtown South-Flatiron-Union Square, Gramercy, Murray Hill-Kips Bay

3 Hudson Square, West Village, Chelsea, Hudson Yards, Meatpacking District, Garment District, Times Square, Hell's Kitchen

4 Midtown South-NoMad, Midtown-Times Square, Stuyvesant Town-Peter Cooper Village, Murray Hill-Kips Bay, East Midtown-Turtle Bay, United Nations, Upper East Side-Carnegie Hill

5 Upper East Side (Lenox Hill, Yorkville, Carnegie Hill) and Roosevelt Island

6 Upper West Side, Lincoln Square, Hell's Kitchen, Central Park

7 Upper West Side (Central), Upper West Side-Manhattan Valley, Morningside Heights, Manhattanville-West Harlem, Hamilton Heights-Sugar Hill, Washington Heights (South)

8* Mott Haven-Port Morris, Melrose, Concourse-Concourse Village, Upper East Side-Carnegie Hill, Upper East Side-Yorkville, East Harlem (South), East Harlem (North), Randall's Island

9 Morningside Heights, Manhattanville-West Harlem, Hamilton Heights-Sugar Hill, Harlem (South), Harlem (North), East Harlem (South), East Harlem (North), Upper West Side-Manhattan Valley

10 Washington Heights, Inwood, Marble Hill

Bronx

11 Bedford Park, Norwood, Kingsbridge Heights-Van Cortlandt Village, Kingsbridge, Riverdale-Spuyten Duyvil, Wakefield-Woodlawn, Woodlawn Cemetery, Van Cortlandt Park

12 Williamsbridge-Olinville, Bronxwood, Eastchester-Edenwald-Baychester, Wakefield, Allerton-Parkside, Baychester, The Valley, and Co-op City

13 Bruckner-Bronx River, Throggs Neck-Schuylerville, Pelham Bay-Country Club-City Island, Hart Island, Ferry Point Park-St. Raymond Cemetery, Pelham Parkway-Van Nest, Morris Park, Pelham Bay Park

14 University Heights (South)-Morris Heights, Mount Hope, Fordham Heights, University Heights (North)-Fordham, Bedford Park, Kingsbridge Heights-Van Cortlandt Village, Kingsbridge-Marble Hill

15 Fordham, East Tremont, Belmont, Bathgate, Crotona Park, Mount Eden-Claremont, Mount Hope, West Farms, Bedford Park, Allerton, Bronx Park East

16 Morrisania, Claremont Village-Claremont (East), Concourse-Concourse Village, Highbridge, Mount Eden-Claremont (West), Yankee Stadium-Macombs Dam Park, Claremont Park, University Heights (South)-Morris Heights, University Heights (North)-Fordham

17 Mott Haven-Port Morris, Melrose, Hunts Point, Longwood, North & South Brother Islands, Morrisania, Crotona Park East, Concourse-Concourse Village, West Farms, Soundview-Bruckner-Bronx River

18 Soundview-Bruckner, Soundview-Clason Point, Castle Hill-Unionport, Harding Park, Parkchester, Westchester Square

Queens

19 College Point, Whitestone-Beechhurst, Murray Hill-Broadway Flushing, North Flushing, Auburndale, Bayside, Bay Terrace-Clearview, Fort Totten, Douglaston-Little Neck

20 Flushing, Murray Hill, Queensboro Hill, Fresh Meadows & Mitchell-Linden

21 Astoria (North)-Ditmars-Steinway, Jackson Heights, East Elmhurst, North Corona, Elmhurst, Corona, Rego Park, Flushing-Willets Point, LaGuardia Airport, Flushing Meadows-Corona Park

22 Astoria (North)-Ditmars-Steinway, Old Astoria-Hallets Point, Astoria (Central), Astoria (East)-Woodside (North), Queensbridge-Ravenswood-Dutch Kills, Rikers Island, St. Michael's Cemetery, Astoria Park, Jackson Heights, East Elmhurst, LaGuardia Airport

23 Fresh Meadows, Jamaica Estates-Holliswood, Cunningham Park, Bayside, Douglaston-Little Neck, Oakland Gardens-Hollis Hills, Alley Pond Park, Jamaica, Hollis, Glen Oaks-Floral Park-New Hyde Park, Bellerose, Queens Village, Jamaica

24 Rego Park, Forest Hills, Kew Gardens Hills, Pomonok-Electchester-Hillcrest, Fresh Meadows-Utopia, Jamaica Estates-Holliswood, Jamaica Hills-Briarwood, Mount Hebron & Cedar Grove Cemeteries, Jamaica, Flushing Meadows-Corona Park

25 Jackson Heights, Elmhurst, East Elmhurst, Woodside

26 Astoria (Central), Astoria (East)-Woodside (North), Queensbridge-Ravenswood-Dutch Kills, Sunnyside Yards (North), Long Island City-Hunters Point, Sunnyside, Woodside, Sunnyside Yards (South), Calvary & Mount Zion Cemeteries, Jackson Heights, Elmhurst, Maspeth

27 Jamaica, South Jamaica, Springfield Gardens (North)-Rochdale Village, St. Albans, Hollis, Queens Village, Cambria Heights, Laurelton, Jamaica

28 South Ozone Park, Jamaica, South Jamaica, Baisley Park, Springfield Gardens (North)-Rochdale Village, Springfield Gardens (South)-Brookville

29 Rego Park, Forest Hills, Kew Gardens, Richmond Hill, South Richmond Hill, Ozone Park (North), South Ozone Park

30 Maspeth, Middle Village, Glendale, Elmhurst, Rego Park and parts of Ridgewood

31 Arverne, Brookville, Edgemere, Jamaica (parts), Far Rockaway, Laurelton, Rosedale, Springfield Gardens (parts)

32 Glendale, Forest Park, Ozone Park (North), Woodhaven, Ozone Park, Howard Beach-Lindenwood, Spring Creek Park, Broad Channel, Rockaway Beach, Rockaway Park, Belle Harbor, Neponsit, Roxbury, Jacob Riis Park, Fort Tilden, Breezy Point

Brooklyn

33 Greenpoint, Northside Williamsburg, South Williamsburg, Brooklyn Heights, Downtown Brooklyn, DUMBO, Boerum Hill, Vinegar Hill, Bedford-Stuyvesant, Brooklyn Navy Yard

34** Williamsburg, South Williamsburg, East Williamsburg, Bushwick (West), Bushwick (East), Ridgewood

35 Fort Greene, Clinton Hill, Prospect Heights, Crown Heights

36 Bedford-Stuyvesant (West), Bedford-Stuyvesant (East), Crown Heights (North)

37 Bushwick (West), Bushwick (East), The Evergreens Cemetery, Cypress Hills, East New York (North), East New York-City Line, Highland Park-Cypress Hills Cemeteries (South), Ocean Hill, Brownsville

38 Red Hook and parts of Gowanus, Park Slope, Sunset Park, Borough Park, Dyker Heights, Bensonhurst, and Bath Beach

39 Kensington, Borough Park, Windsor Terrace, Park Slope, Gowanus, Carroll Gardens, Cobble Hill, Boerum Hill, and the Columbia Waterfront

40 Windsor Terrace-South Slope, Crown Heights (South), Prospect Lefferts Gardens-Wingate, Borough Park, Kensington, Mapleton-Midwood (West), Flatbush, Flatbush (West)-Ditmas Park-Parkville, East Flatbush-Erasmus, East Flatbush-Rugby, Prospect Park

41 Bedford-Stuyvesant (East), Crown Heights (North), Lincoln Terrace Park, Crown Heights (South), Prospect Lefferts Gardens-Wingate, Ocean Hill, Brownsville, East Flatbush-Rugby, East Flatbush-Remsen Village

42 East New York, Spring Creek-Starrett City, Brownsville, East Flatbush, Remsen Village, Canarsie

43 Sunset Park (Central), Dyker Heights, Bensonhurst, Bath Beach, Gravesend (West), Sunset Park (East)-Borough Park (West), Borough Park, Mapleton-Midwood (West), Gravesend (East)-Homecrest

44 Borough Park, Flatbush, Gravesend, Mapleton, and Midwood

45 Flatbush, Midwood, East Flatbush, Flatlands, Marine Park, Canarsie

46 Bergen Beach, Canarsie, Flatlands, Georgetown, Gerritsen Beach, Marine Park, Mill Basin, Mill Island, and Sheepshead Bay

47 Bath Beach, Bay Ridge, Coney Island, Dyker Heights, Gravesend, Sea Gate

48 Gravesend (South), Coney Island-Sea Gate, Brighton Beach, Midwood, Gravesend (East)-Homecrest, Madison, Sheepshead Bay-Manhattan Beach-Gerritsen Beach

Staten Island

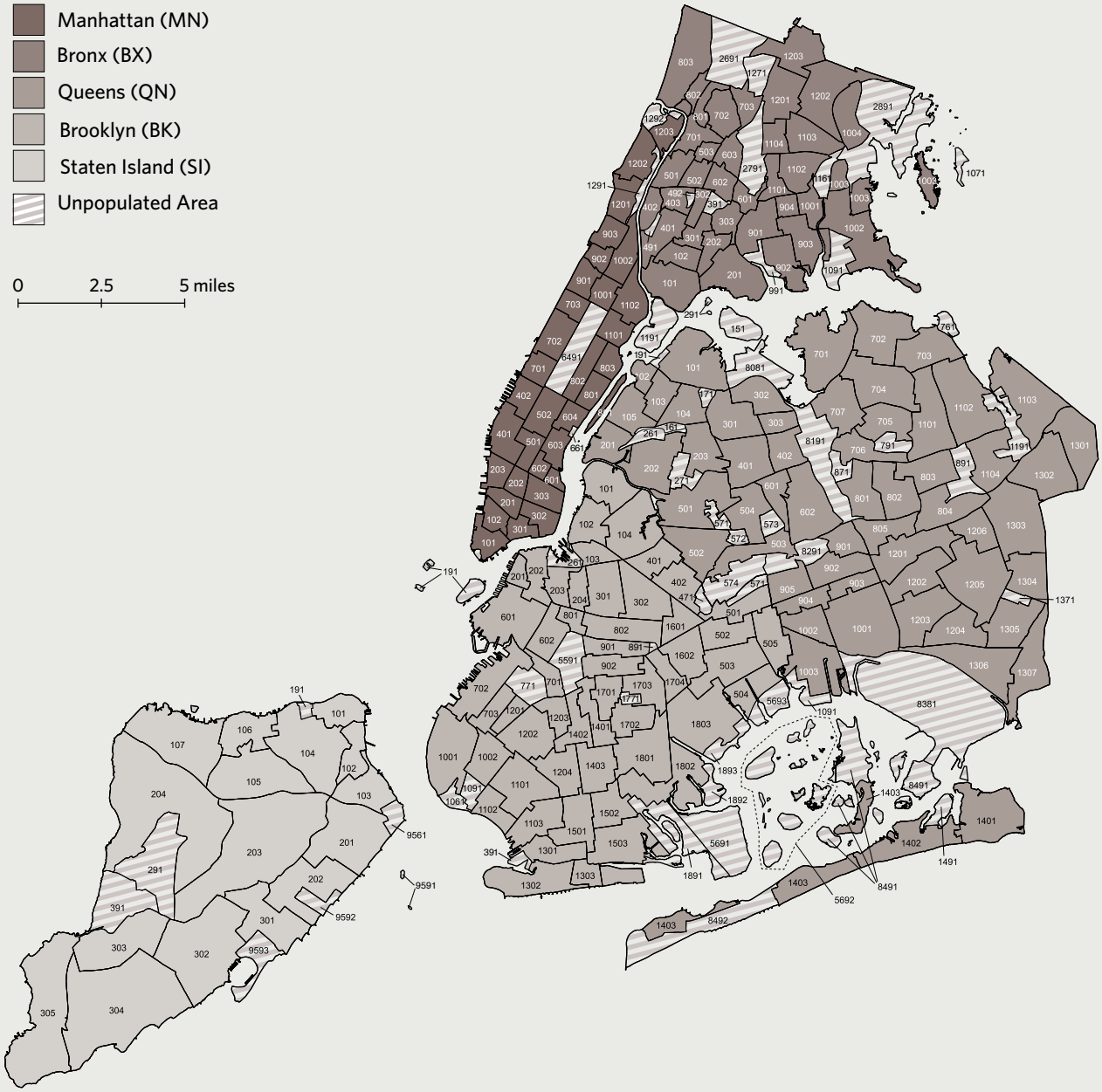
49 St. George-New Brighton, Tompkinsville-Stapleton-Clifton-Fox Hills, Rosebank-Shore Acres-Park Hill, West New Brighton-Silver Lake-Grymes Hill, Westerleigh-Castleton Corners, Port Richmond, Mariner's Harbor-Arlington-Graniteville, Snug Harbor, Todt Hill-Emerson Hill-Manor Heights, Fort Wadsworth

50*** Arrochar, Bath Beach, Bay Ridge, Bay Terrace, Bulls Head, Castleton Corners, Concord, Dongan Hills, Dongan Hills Colony, Dyker Beach Park, Dyker Heights, Egbertville, Emmerson Hill, Fort Hamilton, Fort Wadsworth, Grant City, Grasmere, High Rock, Lighthouse Hill, Midland Beach, New Dorp, Oakwood, Ocean Breeze, Old Town, Richmondtown, South Beach, Todt Hill, Travis, Westerleigh, Willowbrook

51 New Springville-Willowbrook-Bulls Head-Travis, Freshkills Park (North), Oakwood-Richmondtown, Great Kills-Eltingville, Arden Heights-Rossville, Annadale-Huguenot-Prince's Bay-Woodrow, Tottenville-Charleston, Freshkills Park (South), Great Kills Park

*** Includes a portion of the Bronx**
**** Includes a portion of Queens**
***** Includes a portion of Brooklyn**

FIGURE A2.3
Neighborhood Tabulation Areas



Data Source: NYC Department of City Planning (2024). Note: In the Key (opposite page and elsewhere in the report, Community Districts are identified as *Borough Abbreviation-Number*, with numbers always represented as 4-digits.

Neighborhood Tabulation Areas Key

BX-0101 Mott Haven-Port Morris
BX-0102 Melrose
BX-0201 Hunts Point
BX-0202 Longwood
BX-0291* North & South Brother Islands
BX-0301 Morrisania
BX-0302 Claremont Village-Claremont (East)
BX-0303 Crotona Park East
BX-0391* Crotona Park
BX-0401 Concourse-Concourse Village
BX-0402 Highbridge
BX-0403 Mount Eden-Claremont (West)
BX-0491* Yankee Stadium-Macombs Dam Park
BX-0492* Claremont Park
BX-0501 University Heights (South)-Morris Heights
BX-0502 Mount Hope
BX-0503 Fordham Heights
BX-0601 West Farms
BX-0602 Tremont
BX-0603 Belmont
BX-0701 University Heights (North)-Fordham
BX-0702 Bedford Park
BX-0703 Norwood
BX-0801 Kingsbridge Heights-Van Cortlandt Village
BX-0802 Kingsbridge-Marble Hill
BX-0803 Riverdale-Spuyten Duyvil
BX-0901 Soundview-Bruckner-Bronx River
BX-0902 Soundview-Clason Point
BX-0903 Castle Hill-Unionport
BX-0904 Parkchester
BX-0991* Soundview Park
BX-1001 Westchester Square
BX-1002 Throgs Neck-Schuylerville
BX-1003 Pelham Bay-Country Club-City Island
BX-1004 Co-op City
BX-1071* Hart Island
BX-1091* Ferry Point Park-St. Raymond Cemetery
BX-1101 Pelham Parkway-Van Nest
BX-1102 Morris Park
BX-1103 Pelham Gardens
BX-1104 Allerton
BX-1161* Hutchinson Metro Center
BX-1201 Williamsbridge-Olinville
BX-1202 Eastchester-Edenwald-Baychester
BX-1203 Wakefield-Woodlawn
BX-1271* Woodlawn Cemetery
BX-2691* Van Cortlandt Park
BX-2791* Bronx Park
BX-2891* Pelham Bay Park
BK-0101 Greenpoint
BK-0102 Williamsburg
BK-0103 South Williamsburg
BK-0104 East Williamsburg
BK-0201 Brooklyn Heights
BK-0202 Downtown Brooklyn-DUMBO-Boerum Hill
BK-0203 Fort Greene
BK-0204 Clinton Hill
BK-0261* Brooklyn Navy Yard
BK-0301 Bedford-Stuyvesant (West)
BK-0302 Bedford-Stuyvesant (East)
BK-0401 Bushwick (West)
BK-0402 Bushwick (East)
BK-0471* The Evergreens Cemetery
BK-0501 Cypress Hills
BK-0502 East New York (North)
BK-0503 East New York-New Lots
BK-0504 Spring Creek-Starrett City
BK-0505 East New York-City Line
BK-0571* Highland Park-Cypress Hills Cemeteries (South)
BK-0601 Carroll Gardens-Cobble Hill-Gowanus-Red Hook
BK-0602 Park Slope
BK-0701 Windsor Terrace-South Slope
BK-0702 Sunset Park (West)
BK-0703 Sunset Park (Central)
BK-0771* Green-Wood Cemetery
BK-0801 Prospect Heights
BK-0802 Crown Heights (North)
BK-0891* Lincoln Terrace Park
BK-0901 Crown Heights (South)
BK-0902 Prospect Lefferts Gardens-Wingate
BK-1001 Bay Ridge
BK-1002 Dyker Heights
BK-1061* Fort Hamilton
BK-1091* Dyker Beach Park
BK-1101 Bensonhurst
BK-1102 Bath Beach
BK-1103 Gravesend (West)
BK-1201 Sunset Park (East)-Borough Park (West)
BK-1202 Borough Park
BK-1203 Kensington
BK-1204 Mapleton-Midwood (West)
BK-1301 Gravesend (South)
BK-1302 Coney Island-Sea Gate
BK-1303 Brighton Beach
BK-1391* Calvert Vaux Park
BK-1401 Flatbush
BK-1402 Flatbush (West)-Ditmas Park-Parkville
BK-1403 Midwood
BK-1501 Gravesend (East)-Homecrest
BK-1502 Madison
BK-1503 Sheepshead Bay-Manhattan Beach-Gerritsen Beach
BK-1601 Ocean Hill
BK-1602 Brownsville
BK-1701 East Flatbush-Erasmus
BK-1702 East Flatbush-Farragut
BK-1703 East Flatbush-Rugby
BK-1704 East Flatbush-Remsen Village
BK-1771* Holy Cross Cemetery
BK-1801 Flatlands
BK-1802 Marine Park-Mill Basin-Bergen Beach
BK-1803 Canarsie
BK-1891* Marine Park-Plumb Island
BK-1892* McGuire Fields
BK-1893* Canarsie Park & Pier
BK-5591* Prospect Park
BK-5691* Barren Island-Floyd Bennett Field
BK-5692* Jamaica Bay (West)
BK-5693* Shirley Chisholm State Park
MN-0101 Financial District-Battery Park City
MN-0102 Tribeca-Civic Center
MN-0191* The Battery-Governors Island-Ellis Island-Liberty Island
MN-0201 SoHo-Little Italy-Hudson Square
MN-0202 Greenwich Village
MN-0203 West Village
MN-0301 Chinatown-Two Bridges
MN-0302 Lower East Side
MN-0303 East Village
MN-0401 Chelsea-Hudson Yards
MN-0402 Hell's Kitchen
MN-0501 Midtown South-Flatiron-Union Square
MN-0502 Midtown-Times Square
MN-0601 Stuyvesant Town-Peter Cooper Village
MN-0602 Gramercy
MN-0603 Murray Hill-Kips Bay
MN-0604 East Midtown-Turtle Bay
MN-0661* United Nations
MN-0701 Upper West Side-Lincoln Square
MN-0702 Upper West Side (Central)
MN-0703 Upper West Side-Manhattan Valley
MN-0801 Upper East Side-Lenox Hill-Roosevelt Island
MN-0802 Upper East Side-Carnegie Hill
MN-0803 Upper East Side-Yorkville
MN-0901 Morningside Heights
MN-0902 Manhattanville-West Harlem
MN-0903 Hamilton Heights-Sugar Hill
MN-1001 Harlem (South)
MN-1002 Harlem (North)
MN-1101 East Harlem (South)
MN-1102 East Harlem (North)
MN-1191* Randall's Island
MN-1201 Washington Heights (South)
MN-1202 Washington Heights (North)
MN-1203 Inwood
MN-1291* Highbridge Park
MN-1292* Inwood Hill Park
MN-6491* Central Park
QN-0101 Astoria (North)-Ditmars-Steinway
QN-0102 Old Astoria-Hallets Point
QN-0103 Astoria (Central)
QN-0104 Astoria (East)-Woodside (North)
QN-0105 Queensbridge-Ravenswood-Dutch Kills
QN-0151* Rikers Island
QN-0161* Sunnyside Yards (North)
QN-0171* St. Michael's Cemetery
QN-0191* Astoria Park
QN-0201 Long Island City-Hunters Point
QN-0202 Sunnyside
QN-0203 Woodside

QN-0261* Sunnyside Yards (South)
QN-0271* Calvary & Mount Zion Cemeteries
QN-0301 Jackson Heights
QN-0302 East Elmhurst
QN-0303 North Corona
QN-0401 Elmhurst
QN-0402 Corona
QN-0501 Maspeth
QN-0502 Ridgewood
QN-0503 Glendale
QN-0504 Middle Village
QN-0571* Mount Olivet & All Faiths Cemeteries
QN-0572* Middle Village Cemetery
QN-0573* St. John Cemetery
QN-0574* Highland Park-Cypress Hills Cemeteries (North)
QN-0601 Rego Park
QN-0602 Forest Hills
QN-0701 College Point
QN-0702 Whitestone-Beechhurst
QN-0703 Bay Terrace-Clearview
QN-0704 Murray Hill-Broadway Flushing
QN-0705 East Flushing
QN-0706 Queensboro Hill
QN-0707 Flushing-Willets Point
QN-0761* Fort Totten
QN-0791* Kissena Park
QN-0801 Kew Gardens Hills
QN-0802 Pomonok-Electchester-Hillcrest
QN-0803 Fresh Meadows-Utopia
QN-0804 Jamaica Estates-Holliswood
QN-0805 Jamaica Hills-Briarwood
QN-0871* Mount Hebron & Cedar Grove Cemeteries
QN-0891* Cunningham Park
QN-0901 Kew Gardens
QN-0902 Richmond Hill
QN-0903 South Richmond Hill
QN-0904 Ozone Park (North)
QN-0905 Woodhaven
QN-1001 South Ozone Park
QN-1002 Ozone Park
QN-1003 Howard Beach-Lindenwood
QN-1091* Spring Creek Park
QN-1101 Auburndale
QN-1102 Bayside
QN-1103 Douglaston-Little Neck
QN-1104 Oakland Gardens-Hollis Hills
QN-1191* Alley Pond Park
QN-1201 Jamaica
QN-1202 South Jamaica
QN-1203 Baisley Park
QN-1204 Springfield Gardens (North)-Rochdale Village
QN-1205 St. Albans
QN-1206 Hollis
QN-1301 Glen Oaks-Floral Park-New Hyde Park
QN-1302 Bellerose
QN-1303 Queens Village
QN-1304 Cambria Heights
QN-1305 Laurelton
QN-1306 Springfield Gardens (South)-Brookville
QN-1307 Rosedale
QN-1371* Montefiore Cemetery
QN-1401 Far Rockaway-Bayswater
QN-1402 Rockaway Beach-Arverne-Edgemere
QN-1403 Breezy Point-Belle Harbor-Rockaway Park-Broad Channel
QN-1491* Rockaway Community Park
QN-8081* LaGuardia Airport
QN-8191* Flushing Meadows-Corona Park
QN-8291* Forest Park
QN-8381* John F. Kennedy International Airport
QN-8491* Jamaica Bay (East)
QN-8492* Jacob Riis Park-Fort Tilden-Breezy Point Tip
SI-0101 St. George-New Brighton
SI-0102 Tompkinsville-Stapleton-Clifton-Fox Hills
SI-0103 Rosebank-Shore Acres-Park Hill
SI-0104 West New Brighton-Silver Lake-Grymes Hill
SI-0105 Westerleigh-Castleton Corners
SI-0106 Port Richmond
SI-0107 Mariner's Harbor-Arlington-Graniteville
SI-0191* Snug Harbor
SI-0201 Grasmere-Arrochar-South Beach-Dongan Hills
SI-0202 New Dorp-Midland Beach
SI-0203 Todt Hill-Emerson Hill-Lighthouse Hill-Manor Heights
SI-0204 New Springville-Willowbrook-Bulls Head-Travis
SI-0291* Freshkills Park (North)
SI-0301 Oakwood-Richmondtown
SI-0302 Great Kills-Eltingville
SI-0303 Arden Heights-Rossville
SI-0304 Annadale-Huguenot-Prince's Bay-Woodrow
SI-0305 Tottenville-Charleston
SI-0391* Freshkills Park (South)
SI-9561* Fort Wadsworth
SI-9591* Hoffman & Swinburne Islands
SI-9592* Miller Field
SI-9593* Great Kills Park

*** Indicates a non-residential area (e.g., park, airport, cemetery, or other special area)**

Column Name Keys

This Key defines columns presented in subsequent tables in this appendix. Details on how these metrics were computed, where applicable, are provided in Appendix 1.

Columns for Table A2.1 – A2.7

Area (acres): Total land area in acres.

Canopy Loss (acres): Total acreage of tree canopy that was present in 2017, but not in 2021.

Canopy Unchanged (acres): Total acreage of tree canopy that was present in both 2017 and 2021.

Canopy Gain (acres): Total acreage of tree canopy that was present in 2021, but not in 2017.

Canopy Acreage 2017 (acres): Total acreage of tree canopy that was present in 2017.

Canopy Acreage 2021 (acres): Total acreage of tree canopy that was present in 2021.

Net Canopy Change 2017–2021 (acres): Difference in total acreage of canopy from 2017 and 2021.

Canopy Cover 2017 (%): Percent of land area covered by canopy in 2017.

Canopy Cover 2021 (%): Percent of land area covered by canopy in 2021.

Net Canopy Change 2017–2021 (%): Change in the percent of land area covered by canopy from 2017 to 2021.

Relative Canopy Change 2017–2021 (%): Change in total area of tree canopy from 2017 to 2021, relative to the total area of tree canopy in 2017.

Columns for Table A2.8 – A2.12

The following reflect columns with statistical outputs from analyses; column names for the individual variables are characterized in Appendix 1 of this report.

Coef.: Correlation coefficient (Kendall's tau).

***p*-value:** *P*-value for statistical tests.

n: Number of census tracts within each group for the analysis, by geography reflected in the respective row.

Median: Median value for the focal tree canopy metric (canopy cover or relative change) for the group, by geography reflected in the respective row.

Test Statistic: Test statistic for the Mann-Whitney *U* tests conducted to test for differences between groups.

TABLE A2.1
Tree Canopy and Canopy Change by Borough

	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017–2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017–2021 (%)	Relative Canopy Change 2017–2021 (%)
Bronx	27,253.99	743.37	6,051.25	1,226.68	6,794.62	7,277.92	483.31	24.93%	26.70%	1.77%	7.11%
Brooklyn	44,403.80	1,166.04	6,760.72	1,887.40	7,926.76	8,648.12	721.36	17.85%	19.48%	1.62%	9.10%
Manhattan	14,612.50	331.93	2,807.91	514.37	3,139.83	3,322.27	182.44	21.49%	22.74%	1.25%	5.81%
Queens	69,821.38	2,212.84	11,088.20	2,554.75	13,301.04	13,642.95	341.91	19.05%	19.54%	0.49%	2.57%
Staten Island	37,273.25	1,220.20	10,550.42	1,805.23	11,770.62	12,355.65	585.03	31.58%	33.15%	1.57%	4.97%
Citywide	193,364.92	5,674.38	37,258.50	7,988.42	42,932.88	45,246.92	2,314.04	22.20%	23.40%	1.20%	5.39%

TABLE A2.2

Tree Canopy and Canopy Change by Community District

(* indicates unpopulated area)

Community District	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017–2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017–2021 (%)	Relative Canopy Change 2017–2021 (%)
BX-01	1,386.59	28.33	173.60	55.99	201.93	229.60	27.67	14.56%	16.56%	2.00%	13.70%
BX-02	1,418.94	23.71	96.71	44.66	120.42	141.38	20.96	8.49%	9.96%	1.48%	17.40%
BX-03	1,028.38	24.83	183.40	55.12	208.24	238.52	30.28	20.25%	23.19%	2.94%	14.54%
BX-04	1,274.61	28.26	185.22	57.42	213.47	242.63	29.16	16.75%	19.04%	2.29%	13.66%
BX-05	879.64	25.14	117.06	43.38	142.20	160.44	18.23	16.17%	18.24%	2.07%	12.82%
BX-06	979.44	21.91	130.68	48.30	152.59	178.98	26.40	15.58%	18.27%	2.69%	17.30%
BX-07	1,223.87	34.19	196.67	58.10	230.86	254.76	23.91	18.86%	20.82%	1.95%	10.36%
BX-08	2,113.67	86.58	751.78	103.17	838.36	854.95	16.59	39.66%	40.45%	0.79%	1.98%
BX-09	2,623.63	72.78	458.24	136.61	531.02	594.85	63.83	20.24%	22.67%	2.43%	12.02%
BX-10	4,108.54	104.17	589.18	180.88	693.35	770.06	76.71	16.88%	18.74%	1.87%	11.06%
BX-11	2,302.91	74.26	372.57	110.02	446.83	482.59	35.76	19.40%	20.96%	1.55%	8.00%
BX-12	3,556.17	127.99	740.70	167.58	868.69	908.28	39.58	24.43%	25.54%	1.11%	4.56%
BX-26*	1,160.83	19.27	747.76	38.25	767.03	786.01	18.98	66.08%	67.71%	1.64%	2.47%
BX-27*	721.56	22.25	412.51	39.11	434.76	451.62	16.86	60.25%	62.59%	2.34%	3.88%
BX-28*	2,133.59	47.63	900.89	89.22	948.52	990.11	41.59	44.46%	46.41%	1.95%	4.38%
BK-01	3,023.48	49.19	302.75	113.38	351.93	416.13	64.19	11.64%	13.76%	2.12%	18.24%
BK-02	1,821.36	45.02	338.23	77.50	383.26	415.73	32.48	21.04%	22.83%	1.78%	8.47%
BK-03	1,824.19	47.96	359.74	105.85	407.69	465.59	57.89	22.35%	25.52%	3.17%	14.20%
BK-04	1,300.79	30.52	195.27	69.32	225.79	264.59	38.80	17.36%	20.34%	2.98%	17.18%
BK-05	3,569.45	95.92	512.90	152.78	608.82	665.69	56.86	17.06%	18.65%	1.59%	9.34%
BK-06	1,962.85	54.32	280.54	80.39	334.86	360.93	26.07	17.06%	18.39%	1.33%	7.78%
BK-07	2,390.41	57.45	360.92	93.18	418.36	454.10	35.74	17.50%	19.00%	1.49%	8.54%
BK-08	1,046.92	28.91	195.80	54.65	224.71	250.45	25.74	21.46%	23.92%	2.46%	11.46%
BK-09	1,040.30	27.94	155.15	45.57	183.09	200.72	17.62	17.60%	19.29%	1.69%	9.63%
BK-10	2,556.13	70.71	463.05	87.95	533.76	551.00	17.24	20.88%	21.56%	0.67%	3.23%
BK-11	2,369.34	50.22	232.43	75.36	282.66	307.79	25.13	11.93%	12.99%	1.06%	8.89%
BK-12	2,284.80	70.29	343.10	92.53	413.39	435.62	22.23	18.09%	19.07%	0.97%	5.38%
BK-13	2,024.27	44.40	197.04	60.62	241.44	257.66	16.22	11.93%	12.73%	0.80%	6.72%
BK-14	1,886.46	71.65	388.05	95.06	459.70	483.11	23.41	24.37%	25.61%	1.24%	5.09%
BK-15	3,022.24	89.10	431.12	113.71	520.22	544.83	24.61	17.21%	18.03%	0.81%	4.73%
BK-16	1,188.45	30.03	179.17	55.44	209.19	234.60	25.41	17.60%	19.74%	2.14%	12.15%
BK-17	2,153.78	61.26	283.53	85.70	344.79	369.23	24.44	16.01%	17.14%	1.13%	7.09%
BK-18	5,404.16	168.95	870.81	234.11	1,039.76	1,104.91	65.16	19.24%	20.45%	1.21%	6.27%
BK-55*	600.16	14.74	332.20	27.56	346.94	359.76	12.82	57.81%	59.94%	2.14%	3.69%

(Table A2.2 Continued)

Community District	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
BK-56*	2,990.95	57.53	342.25	169.84	399.78	512.09	112.31	13.37%	17.12%	3.75%	28.09%
MN-01	956.99	14.60	112.64	29.56	127.24	142.20	14.96	13.30%	14.86%	1.56%	11.75%
MN-02	863.29	20.33	100.39	23.56	120.72	123.95	3.23	13.98%	14.36%	0.37%	2.68%
MN-03	1,076.21	34.98	202.81	35.61	237.79	238.42	0.63	22.09%	22.15%	0.06%	0.27%
MN-04	1,132.00	16.66	104.07	27.80	120.72	131.87	11.15	10.66%	11.65%	0.98%	9.23%
MN-05	1,005.28	8.12	32.40	10.02	40.52	42.42	1.90	4.03%	4.22%	0.19%	4.69%
MN-06	889.12	25.63	137.81	24.98	163.45	162.79	-0.66	18.38%	18.31%	-0.07%	-0.40%
MN-07	1,220.22	32.87	271.20	47.64	304.07	318.84	14.77	24.92%	26.13%	1.21%	4.86%
MN-08	1,267.56	42.19	195.68	46.70	237.87	242.38	4.51	18.77%	19.12%	0.36%	1.90%
MN-09	961.80	21.57	233.81	41.09	255.38	274.90	19.52	26.55%	28.58%	2.03%	7.64%
MN-10	897.30	20.90	170.93	43.83	191.83	214.76	22.93	21.38%	23.93%	2.56%	11.95%
MN-11	1,518.50	34.27	251.71	61.34	285.98	313.05	27.07	18.83%	20.62%	1.78%	9.46%
MN-12	1,789.82	36.68	545.67	75.33	582.35	621.00	38.65	32.54%	34.70%	2.16%	6.64%
MN-64*	879.53	20.26	425.39	39.77	445.65	465.16	19.51	50.67%	52.89%	2.22%	4.38%
QN-01	3,936.93	93.39	449.51	130.66	542.90	580.18	37.27	13.79%	14.74%	0.95%	6.87%
QN-02	3,213.08	57.31	265.30	79.79	322.61	345.09	22.48	10.04%	10.74%	0.70%	6.97%
QN-03	1,916.34	63.27	280.28	81.73	343.55	362.01	18.46	17.93%	18.89%	0.96%	5.37%
QN-04	1,509.17	42.19	176.60	54.86	218.80	231.46	12.67	14.50%	15.34%	0.84%	5.79%
QN-05	4,830.02	139.05	799.69	196.11	938.74	995.80	57.06	19.44%	20.62%	1.18%	6.08%
QN-06	1,898.58	80.89	407.97	97.11	488.86	505.08	16.22	25.75%	26.60%	0.85%	3.32%
QN-07	7,536.44	262.74	1,289.02	332.27	1,551.76	1,621.29	69.54	20.59%	21.51%	0.92%	4.48%
QN-08	4,764.88	208.07	1,298.01	206.16	1,506.08	1,504.17	-1.91	31.61%	31.57%	-0.04%	-0.13%
QN-09	2,465.07	94.61	368.18	92.54	462.79	460.72	-2.06	18.77%	18.69%	-0.08%	-0.45%
QN-10	3,950.36	113.19	473.32	133.02	586.50	606.33	19.83	14.85%	15.35%	0.50%	3.38%
QN-11	5,977.11	262.04	1,684.99	278.06	1,947.04	1,963.06	16.02	32.57%	32.84%	0.27%	0.82%
QN-12	6,137.11	263.36	910.00	227.81	1,173.36	1,137.81	-35.55	19.12%	18.54%	-0.58%	-3.03%
QN-13	8,045.70	325.67	1,359.22	294.35	1,684.88	1,653.57	-31.31	20.94%	20.55%	-0.39%	-1.86%
QN-14	4,489.83	123.02	310.49	122.52	433.52	433.01	-0.51	9.66%	9.64%	-0.01%	-0.12%
QN-80*	752.47	1.45	17.87	3.95	19.32	21.82	2.50	2.57%	2.90%	0.33%	12.95%
QN-81*	1,091.80	18.53	189.12	44.03	207.65	233.15	25.50	19.02%	21.35%	2.34%	12.28%
QN-82*	556.89	10.61	422.00	13.07	432.61	435.06	2.45	77.68%	78.12%	0.44%	0.57%
QN-83*	4,407.66	14.12	115.30	41.83	129.42	157.13	27.71	2.94%	3.56%	0.63%	21.41%
QN-84*	2,759.09	43.19	280.42	127.23	323.61	407.65	84.04	11.73%	14.77%	3.05%	25.97%
SI-01	8,660.06	345.49	2,068.76	483.94	2,414.25	2,552.70	138.45	27.88%	29.48%	1.60%	5.73%
SI-02	13,579.62	377.79	3,879.43	592.62	4,257.22	4,472.05	214.83	31.35%	32.93%	1.58%	5.05%
SI-03	13,781.66	473.93	4,396.63	641.08	4,870.57	5,037.71	167.15	35.34%	36.55%	1.21%	3.43%
SI-95*	1,251.90	22.99	205.60	87.59	228.59	293.20	64.60	18.26%	23.42%	5.16%	28.26%

TABLE A2.3

Tree Canopy and Canopy Change by City Council District

Council District 2020	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017–2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017–2021 (%)	Relative Canopy Change 2017–2021 (%)
1	1,793.50	31.28	230.73	52.24	262.01	282.97	20.96	14.61%	15.78%	1.17%	8.00%
2	1,109.27	35.52	177.03	35.97	212.54	212.99	0.45	19.16%	19.20%	0.04%	0.21%
3	1,749.12	27.39	156.01	41.19	183.40	197.20	13.80	10.49%	11.27%	0.79%	7.53%
4	1,533.57	37.68	167.03	34.39	204.71	201.43	-3.29	13.35%	13.13%	-0.21%	-1.61%
5	866.67	27.45	142.85	33.74	170.29	176.59	6.29	19.65%	20.38%	0.73%	3.70%
6	1,897.90	45.95	613.72	75.11	659.67	688.83	29.16	34.76%	36.29%	1.54%	4.42%
7	1,266.90	29.04	312.56	51.89	341.60	364.45	22.85	26.96%	28.77%	1.80%	6.69%
8	2,456.18	49.57	344.59	91.89	394.16	436.48	42.32	16.05%	17.77%	1.72%	10.74%
9	1,291.56	30.24	256.42	64.38	286.66	320.80	34.14	22.20%	24.84%	2.64%	11.91%
10	1,767.67	36.85	539.06	74.34	575.91	613.40	37.49	32.58%	34.70%	2.12%	6.51%
11	4,981.36	166.04	1,945.45	218.62	2,111.49	2,164.07	52.58	42.39%	43.44%	1.06%	2.49%
12	3,008.29	93.41	511.28	145.94	604.69	657.22	52.52	20.10%	21.85%	1.75%	8.69%
13	7,537.78	203.04	1,726.02	331.55	1,929.06	2,057.57	128.51	25.59%	27.30%	1.70%	6.66%
14	1,207.20	33.94	180.59	60.19	214.53	240.78	26.25	17.77%	19.95%	2.17%	12.24%
15	2,352.94	62.25	619.56	118.90	681.80	738.46	56.66	28.98%	31.38%	2.41%	8.31%
16	1,425.24	34.73	220.17	67.86	254.90	288.03	33.13	17.88%	20.21%	2.32%	13.00%
17	2,642.64	56.76	268.48	107.61	325.24	376.09	50.85	12.31%	14.23%	1.92%	15.64%
18	2,539.08	69.29	433.25	132.30	502.54	565.54	63.00	19.79%	22.27%	2.48%	12.54%
19	7,684.44	310.73	1,529.14	374.34	1,839.87	1,903.48	63.61	23.94%	24.77%	0.83%	3.46%
20	3,324.92	120.31	592.10	135.94	712.40	728.04	15.64	21.43%	21.90%	0.47%	2.19%
21	3,005.32	61.43	340.86	89.51	402.30	430.37	28.08	13.39%	14.32%	0.93%	6.98%
22	3,452.36	86.52	396.14	119.50	482.66	515.64	32.98	13.98%	14.94%	0.96%	6.83%
23	7,151.53	275.82	2,095.38	274.28	2,371.20	2,369.67	-1.53	33.16%	33.14%	-0.02%	-0.06%
24	4,288.96	177.12	825.67	190.94	1,002.79	1,016.61	13.82	23.38%	23.70%	0.32%	1.38%
25	1,466.06	45.23	211.71	60.43	256.94	272.14	15.20	17.53%	18.56%	1.04%	5.92%
26	3,861.16	67.51	354.44	97.08	421.94	451.52	29.58	10.93%	11.69%	0.77%	7.01%
27	4,839.43	208.58	678.66	171.18	887.24	849.84	-37.40	18.33%	17.56%	-0.77%	-4.21%
28	4,020.66	158.66	591.14	137.08	749.80	728.22	-21.58	18.65%	18.11%	-0.54%	-2.88%
29	2,934.99	122.24	541.03	130.18	663.27	671.21	7.94	22.60%	22.87%	0.27%	1.20%
30	3,873.61	116.95	573.78	168.90	690.73	742.68	51.95	17.83%	19.17%	1.34%	7.52%
31	11,654.15	252.70	990.65	296.96	1,243.36	1,287.62	44.26	10.67%	11.05%	0.38%	3.56%
32	8,233.95	199.76	1,320.26	292.83	1,520.02	1,613.09	93.07	18.46%	19.59%	1.13%	6.12%
33	2,530.14	49.31	288.69	92.92	338.00	381.61	43.61	13.36%	15.08%	1.72%	12.90%
34	2,414.64	45.23	246.74	94.86	291.97	341.60	49.63	12.09%	14.15%	2.06%	17.00%

(Table A2.3 Continued)

Council District 2020	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
35	1,824.89	49.90	385.20	92.91	435.10	478.11	43.01	23.84%	26.20%	2.36%	9.88%
36	1,749.87	46.95	355.16	100.88	402.11	456.03	53.92	22.98%	26.06%	3.08%	13.41%
37	2,319.33	66.78	360.48	109.45	427.26	469.93	42.67	18.42%	20.26%	1.84%	9.99%
38	3,483.40	81.68	411.69	111.13	493.37	522.83	29.46	14.16%	15.01%	0.85%	5.97%
39	2,714.37	75.49	693.25	130.24	768.73	823.48	54.75	28.32%	30.34%	2.02%	7.12%
40	1,691.15	54.93	284.86	78.92	339.79	363.78	23.99	20.09%	21.51%	1.42%	7.06%
41	1,819.84	45.58	293.37	84.55	338.95	377.92	38.97	18.63%	20.77%	2.14%	11.50%
42	4,621.96	92.22	515.64	188.24	607.87	703.88	96.02	13.15%	15.23%	2.08%	15.80%
43	1,732.73	37.99	180.55	55.38	218.54	235.93	17.39	12.61%	13.62%	1.00%	7.96%
44	2,277.22	75.32	359.20	91.57	434.52	450.77	16.25	19.08%	19.79%	0.71%	3.74%
45	2,706.72	93.59	460.40	118.06	553.99	578.46	24.46	20.47%	21.37%	0.90%	4.42%
46	6,372.04	190.24	1,043.29	323.24	1,233.53	1,366.53	133.00	19.36%	21.45%	2.09%	10.78%
47	3,385.66	81.24	458.80	115.64	540.04	574.44	34.40	15.95%	16.97%	1.02%	6.37%
48	2,520.99	76.40	346.49	95.46	422.89	441.95	19.06	16.77%	17.53%	0.76%	4.51%
49	7,582.60	294.93	1,841.60	424.88	2,136.53	2,266.48	129.95	28.18%	29.89%	1.71%	6.08%
50	15,270.85	467.66	4,235.88	687.77	4,703.55	4,923.65	220.11	30.80%	32.24%	1.44%	4.68%
51	15,105.49	473.93	4,606.20	714.46	5,080.12	5,320.66	240.53	33.63%	35.22%	1.59%	4.73%

TABLE A2.4

Tree Canopy and Canopy Change by Neighborhood Tabulation Area

(* indicates unpopulated area)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017–2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017–2021 (%)	Relative Canopy Change 2017–2021 (%)
BX-0101	940.66	17.86	109.44	34.26	127.30	143.70	16.40	13.53%	15.28%	1.74%	12.88%
BX-0102	396.51	9.04	62.43	20.64	71.46	83.07	11.60	18.02%	20.95%	2.93%	16.24%
BX-0201	1,033.94	14.40	41.08	25.40	55.47	66.48	11.00	5.37%	6.43%	1.06%	19.84%
BX-0202	353.19	8.23	42.63	17.16	50.86	59.79	8.93	14.40%	16.93%	2.53%	17.55%
BX-0291*	21.36	0.43	14.14	2.08	14.57	16.21	1.65	68.18%	75.89%	7.72%	11.32%
BX-0301	317.06	8.33	54.38	18.58	62.72	72.97	10.25	19.78%	23.01%	3.23%	16.34%
BX-0302	229.50	4.34	37.00	11.19	41.34	48.18	6.84	18.01%	21.00%	2.98%	16.55%
BX-0303	366.81	10.45	37.82	17.71	48.27	55.53	7.26	13.16%	15.14%	1.98%	15.04%
BX-0391*	145.54	5.35	57.27	8.30	62.62	65.57	2.95	43.03%	45.06%	2.03%	4.72%
BX-0401	608.41	11.67	61.97	24.45	73.64	86.42	12.79	12.10%	14.20%	2.10%	17.36%
BX-0402	299.60	9.25	54.72	13.94	63.97	68.65	4.69	21.35%	22.92%	1.57%	7.33%
BX-0403	312.38	6.12	35.18	13.96	41.30	49.14	7.85	13.22%	15.73%	2.51%	19.00%
BX-0491*	64.48	1.23	8.52	2.69	9.75	11.21	1.46	15.12%	17.39%	2.27%	15.02%
BX-0492*	42.78	1.61	25.46	3.29	27.07	28.75	1.68	63.27%	67.20%	3.93%	6.21%
BX-0501	450.93	14.29	72.71	22.70	87.00	95.41	8.41	19.29%	21.16%	1.86%	9.67%
BX-0502	291.19	6.41	28.83	13.95	35.24	42.78	7.54	12.10%	14.69%	2.59%	21.40%
BX-0503	169.40	3.79	12.48	7.85	16.27	20.34	4.06	9.61%	12.01%	2.40%	24.97%
BX-0601	268.64	5.74	36.83	14.39	42.57	51.22	8.65	15.85%	19.07%	3.22%	20.32%
BX-0602	363.33	8.65	43.37	18.19	52.02	61.57	9.54	14.32%	16.94%	2.63%	18.34%
BX-0603	376.35	8.33	55.77	18.48	64.09	74.25	10.15	17.03%	19.73%	2.70%	15.84%
BX-0701	420.42	13.34	69.70	20.01	83.04	89.72	6.67	19.75%	21.34%	1.59%	8.04%
BX-0702	563.65	14.35	67.96	19.31	82.30	87.27	4.96	14.60%	15.48%	0.88%	6.03%
BX-0703	360.99	10.72	73.80	20.30	84.52	94.10	9.58	23.41%	26.07%	2.65%	11.34%
BX-0801	251.76	9.51	53.86	13.81	63.36	67.67	4.31	25.17%	26.88%	1.71%	6.80%
BX-0802	282.66	9.30	45.53	11.39	54.83	56.92	2.10	19.40%	20.14%	0.74%	3.82%
BX-0803	1,445.89	64.15	640.43	75.75	704.58	716.18	11.60	48.73%	49.53%	0.80%	1.65%
BX-0901	739.39	17.17	110.69	33.48	127.85	144.16	16.31	17.29%	19.50%	2.21%	12.76%
BX-0902	696.04	22.48	144.38	37.53	166.86	181.91	15.06	23.97%	26.14%	2.16%	9.02%
BX-0903	755.23	19.05	86.70	33.32	105.75	120.02	14.27	14.00%	15.89%	1.89%	13.49%
BX-0904	210.85	7.23	51.01	9.71	58.24	60.72	2.47	27.62%	28.80%	1.17%	4.25%
BX-0991*	179.03	3.43	59.95	19.30	63.39	79.25	15.86	35.41%	44.27%	8.86%	25.03%
BX-1001	352.93	8.13	28.02	15.43	36.15	43.46	7.31	10.24%	12.31%	2.07%	20.21%
BX-1002	1,526.14	44.14	239.01	72.09	283.15	311.10	27.95	18.55%	20.38%	1.83%	9.87%
BX-1003	810.77	28.34	120.71	41.71	149.05	162.41	13.37	18.38%	20.03%	1.65%	8.97%

(Table A2.4 Continued)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
BX-1004	667.02	11.50	104.48	31.88	115.97	136.35	20.38	17.39%	20.44%	3.06%	17.57%
BX-1071*	112.61	6.30	22.56	3.93	28.86	26.49	-2.37	25.63%	23.52%	-2.10%	-8.21%
BX-1091*	499.19	4.43	56.32	14.86	60.76	71.19	10.43	12.17%	14.26%	2.09%	17.16%
BX-1101	357.90	11.30	42.62	16.91	53.92	59.53	5.61	15.07%	16.63%	1.57%	10.41%
BX-1102	638.96	23.12	117.26	31.83	140.38	149.09	8.71	21.97%	23.33%	1.36%	6.20%
BX-1103	690.19	28.23	117.30	34.64	145.53	151.95	6.42	21.09%	22.01%	0.93%	4.41%
BX-1104	361.66	10.11	67.58	16.74	77.69	84.32	6.63	21.48%	23.31%	1.83%	8.53%
BX-1161*	279.83	3.14	38.69	10.93	41.83	49.63	7.80	14.95%	17.73%	2.79%	18.64%
BX-1201	832.01	27.92	139.27	41.21	167.19	180.48	13.30	20.09%	21.69%	1.60%	7.95%
BX-1202	1,294.66	42.26	268.47	64.01	310.73	332.48	21.75	24.00%	25.68%	1.68%	7.00%
BX-1203	910.17	34.35	146.04	38.20	180.40	184.24	3.85	19.82%	20.24%	0.42%	2.13%
BX-1271*	410.61	20.82	154.52	19.21	175.34	173.73	-1.61	42.70%	42.31%	-0.39%	-0.92%
BX-2691*	1,162.98	19.32	747.86	38.28	767.18	786.14	18.96	65.97%	67.60%	1.63%	2.47%
BX-2791*	768.10	23.16	440.36	41.60	463.52	481.96	18.44	60.35%	62.75%	2.40%	3.98%
BX-2891*	2,278.63	48.48	909.87	91.20	958.35	1,001.07	42.72	42.06%	43.93%	1.87%	4.46%
BK-0101	662.57	12.33	76.11	32.13	88.44	108.25	19.80	13.35%	16.34%	2.99%	22.39%
BK-0102	349.15	9.17	56.10	15.89	65.27	71.99	6.72	18.69%	20.62%	1.93%	10.30%
BK-0103	1,199.87	15.21	98.12	37.89	113.33	136.01	22.68	9.45%	11.34%	1.89%	20.01%
BK-0104	229.16	8.23	47.26	12.27	55.49	59.53	4.05	24.21%	25.98%	1.77%	7.29%
BK-0201	544.85	10.24	88.68	18.77	98.92	107.45	8.53	18.16%	19.72%	1.57%	8.63%
BK-0202	402.53	10.87	96.40	19.80	107.27	116.20	8.93	26.65%	28.87%	2.22%	8.32%
BK-0203	334.40	8.66	81.88	19.06	90.54	100.94	10.40	27.08%	30.19%	3.11%	11.49%
BK-0204	232.00	5.74	12.64	2.59	18.38	15.23	-3.15	7.92%	6.56%	-1.36%	-17.16%
BK-0261*	847.26	21.04	158.28	50.17	179.32	208.45	29.13	21.17%	24.60%	3.44%	16.24%
BK-0301	947.88	26.31	199.26	54.65	225.57	253.92	28.34	23.80%	26.79%	2.99%	12.57%
BK-0302	531.05	11.04	51.67	28.38	62.71	80.05	17.34	11.81%	15.07%	3.27%	27.65%
BK-0401	641.30	16.80	102.67	36.09	119.47	138.76	19.29	18.63%	21.64%	3.01%	16.15%
BK-0402	128.22	2.68	40.91	4.84	43.59	45.76	2.16	34.00%	35.69%	1.69%	4.96%
BK-0471*	559.66	19.74	80.75	22.88	100.49	103.63	3.14	17.95%	18.52%	0.56%	3.13%
BK-0501	640.66	17.64	77.10	30.44	94.74	107.55	12.81	14.79%	16.79%	2.00%	13.52%
BK-0502	1,066.43	24.76	132.64	35.52	157.40	168.16	10.76	14.76%	15.77%	1.01%	6.84%
BK-0503	621.82	13.18	89.86	27.44	103.03	117.30	14.27	16.57%	18.86%	2.29%	13.85%
BK-0504	723.81	19.63	109.70	36.44	129.33	146.14	16.81	17.87%	20.19%	2.32%	13.00%
BK-0505	185.97	6.80	50.00	6.82	56.80	56.82	0.01	30.54%	30.55%	0.01%	0.02%
BK-0571*	1,396.05	35.73	154.73	50.47	190.46	205.20	14.74	13.64%	14.70%	1.06%	7.74%
BK-0601	592.96	20.02	138.47	32.14	158.49	170.61	12.12	26.73%	28.77%	2.04%	7.65%

(Table A2.4 Continued)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
BK-0602	351.52	9.80	75.14	20.41	84.95	95.55	10.60	24.17%	27.18%	3.02%	12.48%
BK-0701	1,156.54	14.55	78.10	32.49	92.65	110.59	17.94	8.01%	9.56%	1.55%	19.37%
BK-0702	430.54	10.07	66.24	18.11	76.31	84.35	8.04	17.72%	19.59%	1.87%	10.54%
BK-0703	484.43	23.53	153.63	23.10	177.16	176.74	-0.42	36.57%	36.48%	-0.09%	-0.24%
BK-0771*	236.77	6.81	42.85	12.63	49.66	55.48	5.82	20.97%	23.43%	2.46%	11.72%
BK-0801	813.05	21.70	141.35	41.51	163.05	182.86	19.80	20.05%	22.49%	2.44%	12.15%
BK-0802	27.88	0.82	15.05	1.11	15.87	16.16	0.29	56.91%	57.96%	1.05%	1.84%
BK-0891*	460.37	11.78	68.99	19.50	80.77	88.48	7.72	17.54%	19.22%	1.68%	9.55%
BK-0901	551.88	15.70	83.09	25.10	98.78	108.19	9.41	17.90%	19.60%	1.70%	9.52%
BK-0902	1,415.00	43.14	271.90	54.61	315.04	326.51	11.47	22.26%	23.08%	0.81%	3.64%
BK-1001	668.48	17.32	76.99	19.28	94.31	96.27	1.96	14.11%	14.40%	0.29%	2.07%
BK-1002	194.31	3.42	29.75	5.83	33.16	35.57	2.41	17.07%	18.31%	1.24%	7.27%
BK-1061*	229.32	5.70	69.06	6.78	74.76	75.84	1.08	32.60%	33.07%	0.47%	1.44%
BK-1091*	1,116.50	24.49	108.03	34.18	132.52	142.22	9.69	11.87%	12.74%	0.87%	7.32%
BK-1101	471.92	10.55	54.61	16.17	65.15	70.78	5.62	13.81%	15.00%	1.19%	8.63%
BK-1102	776.75	15.35	73.30	25.04	88.65	98.34	9.69	11.41%	12.66%	1.25%	10.93%
BK-1103	269.72	6.14	28.68	9.24	34.83	37.92	3.10	12.91%	14.06%	1.15%	8.89%
BK-1201	929.32	30.28	145.65	35.98	175.93	181.63	5.70	18.93%	19.54%	0.61%	3.24%
BK-1202	401.08	12.32	64.77	18.56	77.10	83.34	6.24	19.22%	20.78%	1.56%	8.09%
BK-1203	719.84	21.92	106.77	29.03	128.69	135.81	7.11	17.88%	18.87%	0.99%	5.53%
BK-1204	593.10	14.12	81.46	18.25	95.58	99.72	4.13	16.12%	16.81%	0.70%	4.32%
BK-1301	1,090.49	23.33	79.73	28.46	103.06	108.19	5.13	9.45%	9.92%	0.47%	4.98%
BK-1302	311.39	7.47	23.62	8.56	31.09	32.18	1.09	9.98%	10.33%	0.35%	3.51%
BK-1303	96.93	1.01	15.82	7.69	16.83	23.51	6.68	17.36%	24.26%	6.89%	39.71%
BK-1391*	551.52	17.61	85.28	24.55	102.89	109.83	6.94	18.66%	19.91%	1.26%	6.74%
BK-1401	525.82	23.75	140.64	30.10	164.39	170.74	6.34	31.26%	32.47%	1.21%	3.86%
BK-1402	739.62	29.95	147.99	38.86	177.94	186.85	8.91	24.06%	25.26%	1.21%	5.01%
BK-1403	800.75	23.23	105.41	30.48	128.64	135.89	7.25	16.06%	16.97%	0.91%	5.64%
BK-1501	628.54	20.66	100.70	27.11	121.36	127.81	6.45	19.31%	20.33%	1.03%	5.31%
BK-1502	1,454.79	41.92	210.82	51.54	252.74	262.36	9.62	17.37%	18.03%	0.66%	3.81%
BK-1503	461.20	11.82	62.21	23.21	74.03	85.42	11.39	16.05%	18.52%	2.47%	15.38%
BK-1601	706.74	18.60	116.71	32.52	135.31	149.24	13.93	19.15%	21.12%	1.97%	10.29%
BK-1602	453.88	13.32	48.28	21.21	61.60	69.50	7.90	13.57%	15.31%	1.74%	12.82%
BK-1701	553.76	18.20	71.82	21.68	90.02	93.51	3.49	16.26%	16.89%	0.63%	3.88%
BK-1702	624.60	16.76	75.29	25.31	92.06	100.61	8.55	14.74%	16.11%	1.37%	9.29%
BK-1703	422.12	9.72	48.90	13.76	58.61	62.65	4.04	13.88%	14.84%	0.96%	6.89%

(Table A2.4 Continued)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
BK-1704	98.18	2.90	35.23	4.00	38.13	39.23	1.10	38.84%	39.96%	1.12%	2.88%
BK-1771*	1,247.41	41.98	199.13	46.18	241.11	245.31	4.20	19.33%	19.67%	0.34%	1.74%
BK-1801	1,351.52	46.96	204.50	49.66	251.46	254.17	2.71	18.61%	18.81%	0.20%	1.08%
BK-1802	1,619.32	55.59	247.27	63.36	302.86	310.63	7.77	18.70%	19.18%	0.48%	2.56%
BK-1803	995.28	22.01	166.05	62.83	188.06	228.88	40.82	18.90%	23.00%	4.10%	21.71%
BK-1891*	243.11	4.46	59.95	11.38	64.41	71.33	6.92	26.50%	29.34%	2.85%	10.74%
BK-1892*	265.20	6.36	58.85	27.69	65.21	86.54	21.33	24.59%	32.63%	8.04%	32.71%
BK-1893*	627.26	14.71	338.39	28.22	353.10	366.61	13.51	56.29%	58.45%	2.15%	3.83%
BK-5591*	1,255.18	33.72	217.63	86.65	251.35	304.28	52.93	20.02%	24.24%	4.22%	21.06%
BK-5691*	912.60	9.77	43.81	45.44	53.57	89.25	35.67	5.87%	9.78%	3.91%	66.58%
BK-5692*	419.76	2.44	5.63	7.85	8.06	13.48	5.41	1.92%	3.21%	1.29%	67.12%
BK-5693*	441.80	4.89	45.10	14.87	50.00	59.97	9.98	11.32%	13.57%	2.26%	19.95%
MN-0101	311.69	4.25	25.15	6.36	29.40	31.51	2.10	9.43%	10.11%	0.67%	7.15%
MN-0102	275.28	6.48	50.14	11.74	56.63	61.88	5.26	20.57%	22.48%	1.91%	9.28%
MN-0191*	296.53	4.00	16.96	5.94	20.95	22.90	1.95	7.07%	7.72%	0.66%	9.29%
MN-0201	243.47	6.58	35.20	6.13	41.79	41.33	-0.46	17.16%	16.98%	-0.19%	-1.09%
MN-0202	328.09	9.78	48.87	11.72	58.66	60.59	1.93	17.88%	18.47%	0.59%	3.29%
MN-0203	264.98	5.00	44.03	6.69	49.03	50.72	1.69	18.50%	19.14%	0.64%	3.45%
MN-0301	378.17	15.52	76.59	11.34	92.11	87.93	-4.18	24.36%	23.25%	-1.10%	-4.54%
MN-0302	435.68	14.48	82.36	17.61	96.84	99.97	3.14	22.23%	22.95%	0.72%	3.24%
MN-0303	681.20	9.77	63.83	18.19	73.60	82.02	8.43	10.80%	12.04%	1.24%	11.45%
MN-0401	422.00	6.30	37.80	9.12	44.09	46.91	2.82	10.45%	11.12%	0.67%	6.39%
MN-0402	341.55	3.04	15.17	4.65	18.21	19.82	1.61	5.33%	5.80%	0.47%	8.82%
MN-0501	563.65	4.44	14.20	4.33	18.64	18.53	-0.11	3.31%	3.29%	-0.02%	-0.57%
MN-0502	128.00	5.47	43.00	3.66	48.47	46.66	-1.82	37.87%	36.45%	-1.42%	-3.75%
MN-0601	172.79	4.33	22.15	4.75	26.47	26.90	0.43	15.32%	15.57%	0.25%	1.61%
MN-0602	362.06	8.87	43.89	9.70	52.77	53.59	0.83	14.57%	14.80%	0.23%	1.57%
MN-0603	301.61	7.36	28.53	7.18	35.89	35.71	-0.18	11.90%	11.84%	-0.06%	-0.50%
MN-0604	25.05	0.24	3.27	0.73	3.52	4.00	0.48	14.04%	15.97%	1.93%	13.72%
MN-0661*	362.66	7.66	50.14	12.96	57.80	63.10	5.30	15.94%	17.40%	1.46%	9.17%
MN-0701	583.35	18.20	140.03	22.34	158.23	162.37	4.14	27.13%	27.83%	0.71%	2.61%
MN-0702	303.04	7.60	83.48	12.83	91.07	96.31	5.23	30.05%	31.78%	1.73%	5.74%
MN-0703	493.59	14.25	76.71	19.00	90.96	95.71	4.75	18.43%	19.39%	0.96%	5.22%
MN-0801	460.64	16.49	61.74	15.42	78.23	77.17	-1.07	16.98%	16.75%	-0.23%	-1.36%
MN-0802	313.25	11.44	57.23	12.27	68.67	69.50	0.83	21.92%	22.19%	0.26%	1.21%
MN-0803	365.54	10.26	116.09	14.28	126.35	130.37	4.02	34.57%	35.67%	1.10%	3.18%

(Table A2.4 Continued)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
MN-0901	246.44	3.92	46.36	9.80	50.28	56.16	5.88	20.40%	22.79%	2.39%	11.70%
MN-0902	366.95	8.08	83.78	17.96	91.86	101.74	9.87	25.03%	27.73%	2.69%	10.75%
MN-0903	331.52	7.99	50.16	16.81	58.15	66.97	8.82	17.54%	20.20%	2.66%	15.17%
MN-1001	546.16	12.20	108.20	25.97	120.40	134.17	13.77	22.04%	24.57%	2.52%	11.43%
MN-1002	382.32	9.52	77.23	16.86	86.75	94.09	7.34	22.69%	24.61%	1.92%	8.46%
MN-1101	599.28	15.09	120.57	27.35	135.66	147.92	12.26	22.64%	24.68%	2.05%	9.04%
MN-1102	538.72	9.68	54.05	17.23	63.74	71.29	7.55	11.83%	13.23%	1.40%	11.85%
MN-1191*	482.71	9.33	87.40	21.07	96.74	108.48	11.74	20.04%	22.47%	2.43%	12.14%
MN-1201	568.72	13.84	154.74	26.67	168.59	181.41	12.82	29.64%	31.90%	2.25%	7.61%
MN-1202	331.44	5.09	46.88	11.49	51.97	58.37	6.40	15.68%	17.61%	1.93%	12.32%
MN-1203	177.97	4.96	106.04	9.57	110.99	115.61	4.62	62.36%	64.96%	2.59%	4.16%
MN-1291*	229.74	3.47	150.61	6.52	154.08	157.13	3.05	67.07%	68.40%	1.33%	1.98%
MN-1292*	879.53	20.26	425.39	39.77	445.65	465.16	19.51	50.67%	52.89%	2.22%	4.38%
MN-6491*	1,338.40	30.75	158.57	47.99	189.32	206.56	17.24	14.15%	15.43%	1.29%	9.11%
QN-0101	254.65	8.88	34.77	11.24	43.65	46.01	2.36	17.14%	18.07%	0.93%	5.42%
QN-0102	484.04	14.13	45.08	21.20	59.21	66.28	7.08	12.23%	13.69%	1.46%	11.95%
QN-0103	597.89	17.62	72.50	26.15	90.12	98.65	8.53	15.07%	16.50%	1.43%	9.47%
QN-0104	636.47	10.99	98.30	18.93	109.30	117.23	7.94	17.17%	18.42%	1.25%	7.26%
QN-0105	416.99	3.87	9.10	2.36	12.97	11.46	-1.51	3.11%	2.75%	-0.36%	-11.65%
QN-0151*	810.88	12.47	72.41	27.47	84.89	99.88	14.99	10.47%	12.32%	1.85%	17.66%
QN-0161*	103.31	1.60	1.48	0.97	3.08	2.46	-0.62	2.98%	2.38%	-0.60%	-20.16%
QN-0171*	100.75	3.22	18.50	2.43	21.72	20.92	-0.79	21.56%	20.77%	-0.79%	-3.66%
QN-0191*	61.41	2.94	27.02	2.00	29.96	29.02	-0.94	48.78%	47.26%	-1.52%	-3.12%
QN-0201	633.50	6.73	28.32	15.15	35.06	43.47	8.42	5.53%	6.86%	1.33%	24.01%
QN-0202	1,095.08	18.97	111.77	26.18	130.74	137.95	7.21	11.94%	12.60%	0.66%	5.52%
QN-0203	756.42	21.79	95.87	28.78	117.67	124.65	6.99	15.56%	16.48%	0.92%	5.94%
QN-0261*	201.57	0.60	3.60	2.54	4.20	6.14	1.94	2.08%	3.04%	0.96%	46.18%
QN-0271*	328.09	7.77	20.43	4.03	28.20	24.46	-3.74	8.59%	7.46%	-1.14%	-13.26%
QN-0301	902.55	28.51	151.18	41.99	179.69	193.18	13.48	19.91%	21.40%	1.49%	7.50%
QN-0302	660.33	23.76	85.94	25.22	109.70	111.16	1.45	16.61%	16.83%	0.22%	1.33%
QN-0303	320.51	10.27	37.07	12.79	47.34	49.87	2.53	14.77%	15.56%	0.79%	5.34%
QN-0401	966.53	28.81	125.47	36.81	154.28	162.27	7.99	15.96%	16.79%	0.83%	5.18%
QN-0402	551.56	13.85	57.01	19.26	70.86	76.27	5.40	12.85%	13.83%	0.98%	7.62%
QN-0501	1,338.78	30.25	117.27	38.63	147.52	155.90	8.38	11.02%	11.65%	0.63%	5.68%
QN-0502	976.84	30.35	126.98	41.13	157.33	168.10	10.77	16.11%	17.21%	1.10%	6.85%
QN-0503	688.85	25.67	104.25	24.10	129.92	128.35	-1.57	18.86%	18.63%	-0.23%	-1.21%

(Table A2.4 Continued)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
QN-0504	802.19	24.80	124.58	35.48	149.38	160.06	10.68	18.62%	19.95%	1.33%	7.15%
QN-0571*	175.45	5.16	39.82	13.71	44.98	53.53	8.55	25.64%	30.51%	4.87%	19.01%
QN-0572*	126.53	2.26	24.62	14.15	26.87	38.77	11.89	21.24%	30.64%	9.40%	44.25%
QN-0573*	200.97	6.28	51.43	6.56	57.72	57.99	0.27	28.72%	28.86%	0.14%	0.47%
QN-0574*	716.87	16.19	202.18	24.58	218.36	226.75	8.39	30.46%	31.63%	1.17%	3.84%
QN-0601	463.58	15.77	79.38	20.59	95.15	99.97	4.82	20.52%	21.56%	1.04%	5.07%
QN-0602	1,330.43	60.18	293.90	72.99	354.08	366.89	12.81	26.61%	27.58%	0.96%	3.62%
QN-0701	1,531.44	40.50	193.31	68.58	233.81	261.89	28.08	15.27%	17.10%	1.83%	12.01%
QN-0702	1,208.39	47.33	200.37	56.38	247.70	256.75	9.05	20.50%	21.25%	0.75%	3.65%
QN-0703	902.56	28.72	191.30	37.72	220.02	229.01	9.00	24.38%	25.37%	1.00%	4.09%
QN-0704	1,295.98	59.07	247.99	63.73	307.06	311.72	4.66	23.69%	24.05%	0.36%	1.52%
QN-0705	726.81	34.94	120.76	30.92	155.70	151.68	-4.03	21.42%	20.87%	-0.55%	-2.59%
QN-0706	606.70	21.31	106.45	31.61	127.76	138.06	10.30	21.06%	22.76%	1.70%	8.06%
QN-0707	884.82	20.01	91.60	23.58	111.62	115.19	3.57	12.61%	13.02%	0.40%	3.20%
QN-0761*	159.72	3.89	37.53	9.12	41.42	46.65	5.23	25.93%	29.21%	3.28%	12.63%
QN-0791*	252.88	8.22	106.78	12.44	115.00	119.22	4.22	45.48%	47.15%	1.67%	3.67%
QN-0801	787.57	29.30	166.60	39.61	195.90	206.21	10.31	24.87%	26.18%	1.31%	5.26%
QN-0802	848.81	35.05	173.39	41.43	208.45	214.83	6.38	24.56%	25.31%	0.75%	3.06%
QN-0803	762.08	37.68	196.64	32.41	234.32	229.05	-5.27	30.75%	30.06%	-0.69%	-2.25%
QN-0804	904.77	60.40	276.32	42.96	336.72	319.28	-17.44	37.22%	35.29%	-1.93%	-5.18%
QN-0805	633.66	26.85	114.32	26.04	141.16	140.35	-0.81	22.28%	22.15%	-0.13%	-0.57%
QN-0871*	211.41	4.77	29.64	4.29	34.41	33.93	-0.48	16.28%	16.05%	-0.23%	-1.39%
QN-0891*	489.09	8.76	312.61	13.56	321.37	326.17	4.80	65.71%	66.69%	0.98%	1.49%
QN-0901	465.68	23.09	125.50	20.84	148.60	146.34	-2.25	31.91%	31.43%	-0.48%	-1.51%
QN-0902	694.90	26.29	88.27	26.73	114.56	114.99	0.43	16.49%	16.55%	0.06%	0.38%
QN-0903	363.85	11.25	36.91	10.92	48.16	47.83	-0.33	13.24%	13.15%	-0.09%	-0.69%
QN-0904	415.23	11.36	47.81	12.74	59.17	60.55	1.37	14.25%	14.58%	0.33%	2.32%
QN-0905	544.71	23.81	87.86	22.25	111.66	110.10	-1.56	20.50%	20.21%	-0.29%	-1.40%
QN-1001	1,878.71	58.52	217.74	54.87	276.26	272.61	-3.65	14.70%	14.51%	-0.19%	-1.32%
QN-1002	576.40	16.95	90.62	20.38	107.56	111.00	3.43	18.66%	19.26%	0.60%	3.19%
QN-1003	1,207.64	32.67	139.47	40.46	172.14	179.93	7.79	14.25%	14.90%	0.65%	4.53%
QN-1091*	272.00	5.36	26.71	16.81	32.07	43.52	11.45	11.79%	16.00%	4.21%	35.70%
QN-1101	1,273.30	52.81	232.30	52.85	285.11	285.15	0.04	22.39%	22.39%	0.00%	0.01%
QN-1102	1,616.39	72.02	380.55	77.01	452.57	457.56	4.99	28.00%	28.31%	0.31%	1.10%
QN-1103	1,564.50	78.69	445.81	75.95	524.50	521.76	-2.74	33.52%	33.35%	-0.18%	-0.52%
QN-1104	909.89	45.86	270.74	38.90	316.60	309.64	-6.96	34.80%	34.03%	-0.77%	-2.20%

(Table A2.4 Continued)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
QN-1191*	599.92	12.64	353.67	32.24	366.31	385.91	19.60	61.06%	64.33%	3.27%	5.35%
QN-1201	1,075.08	22.19	83.34	31.59	105.53	114.93	9.40	9.82%	10.69%	0.87%	8.91%
QN-1202	869.20	37.56	131.93	36.37	169.49	168.30	-1.19	19.50%	19.36%	-0.14%	-0.70%
QN-1203	1,100.75	54.13	184.99	42.05	239.13	227.04	-12.09	21.72%	20.63%	-1.10%	-5.05%
QN-1204	791.19	35.87	153.54	28.74	189.41	182.28	-7.13	23.94%	23.04%	-0.90%	-3.77%
QN-1205	1,705.16	84.33	267.06	68.01	351.39	335.07	-16.32	20.61%	19.65%	-0.96%	-4.64%
QN-1206	561.74	28.13	75.71	19.85	103.83	95.55	-8.28	18.48%	17.01%	-1.47%	-7.97%
QN-1301	1,042.73	39.93	219.37	39.72	259.31	259.09	-0.21	24.87%	24.85%	-0.02%	-0.08%
QN-1302	1,270.02	45.85	303.90	53.95	349.75	357.86	8.11	27.54%	28.18%	0.64%	2.32%
QN-1303	1,599.07	74.08	227.37	49.55	301.46	276.92	-24.53	18.85%	17.32%	-1.53%	-8.14%
QN-1304	759.26	31.73	116.78	25.37	148.50	142.15	-6.36	19.56%	18.72%	-0.84%	-4.28%
QN-1305	914.61	40.90	132.62	33.60	173.52	166.22	-7.30	18.97%	18.17%	-0.80%	-4.21%
QN-1306	1,318.57	52.65	184.18	52.07	236.83	236.25	-0.58	17.96%	17.92%	-0.04%	-0.25%
QN-1307	1,084.37	40.23	178.24	40.01	218.48	218.25	-0.23	20.15%	20.13%	-0.02%	-0.10%
QN-1371*	122.18	2.19	14.85	2.57	17.04	17.43	0.39	13.95%	14.27%	0.32%	2.27%
QN-1401	1,388.32	61.99	183.21	51.07	245.20	234.28	-10.92	17.66%	16.88%	-0.79%	-4.45%
QN-1402	1,159.38	27.05	52.90	30.61	79.95	83.51	3.56	6.90%	7.20%	0.31%	4.45%
QN-1403	1,588.85	33.29	72.97	35.71	106.26	108.67	2.41	6.69%	6.84%	0.15%	2.27%
QN-1491*	205.00	3.27	15.68	9.68	18.95	25.36	6.41	9.24%	12.37%	3.13%	33.85%
QN-8081*	702.30	1.17	3.99	1.91	5.16	5.90	0.74	0.73%	0.84%	0.11%	14.34%
QN-8191*	1,268.17	25.81	238.30	51.05	264.11	289.36	25.25	20.83%	22.82%	1.99%	9.56%
QN-8291*	551.21	9.54	420.16	12.88	429.70	433.04	3.34	77.96%	78.56%	0.61%	0.78%
QN-8381*	4,526.85	14.44	116.87	43.58	131.31	160.45	29.14	2.90%	3.54%	0.64%	22.19%
QN-8491*	1,605.64	14.97	148.52	46.52	163.49	195.04	31.55	10.18%	12.15%	1.97%	19.30%
QN-8492*	1,208.40	25.33	114.83	75.42	140.16	190.25	50.09	11.60%	15.74%	4.15%	35.74%
SI-0101	608.53	25.32	159.25	40.13	184.57	199.38	14.81	30.33%	32.76%	2.43%	8.02%
SI-0102	556.51	25.27	116.42	32.63	141.69	149.05	7.36	25.46%	26.78%	1.32%	5.19%
SI-0103	809.26	28.95	136.78	50.96	165.73	187.74	22.01	20.48%	23.20%	2.72%	13.28%
SI-0104	1,959.62	98.93	638.43	113.12	737.36	751.56	14.19	37.63%	38.35%	0.72%	1.93%
SI-0105	1,756.84	74.15	460.04	95.36	534.19	555.40	21.20	30.41%	31.61%	1.21%	3.97%
SI-0106	831.89	31.34	121.06	44.05	152.41	165.11	12.70	18.32%	19.85%	1.53%	8.34%
SI-0107	2,052.08	58.19	395.97	101.25	454.15	497.22	43.07	22.13%	24.23%	2.10%	9.48%
SI-0191*	86.51	3.33	40.80	6.43	44.13	47.23	3.10	51.01%	54.60%	3.58%	7.02%
SI-0201	1,839.14	64.89	335.89	112.50	400.79	448.39	47.60	21.79%	24.38%	2.59%	11.88%
SI-0202	1,427.51	60.08	235.66	70.54	295.74	306.20	10.46	20.72%	21.45%	0.73%	3.54%
SI-0203	4,277.11	131.34	2,069.14	182.97	2,200.48	2,252.11	51.63	51.45%	52.65%	1.21%	2.35%

(Table A2.4 Continued)

Neighborhood Tabulation Area	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
SI-0204	4,808.17	104.47	1,045.46	194.47	1,149.94	1,239.94	90.00	23.92%	25.79%	1.87%	7.83%
SI-0291*	1,563.87	20.41	218.49	45.41	238.89	263.89	25.00	15.28%	16.87%	1.60%	10.47%
SI-0301	1,284.15	43.46	247.03	62.41	290.49	309.43	18.94	22.62%	24.10%	1.48%	6.52%
SI-0302	2,680.14	114.32	613.78	130.72	728.11	744.50	16.40	27.17%	27.78%	0.61%	2.25%
SI-0303	1,555.88	47.83	550.37	65.76	598.20	616.12	17.93	38.45%	39.60%	1.15%	3.00%
SI-0304	4,142.08	133.24	1,670.82	204.44	1,804.06	1,875.26	71.20	43.55%	45.27%	1.72%	3.95%
SI-0305	2,910.33	123.04	1,138.74	143.22	1,261.78	1,281.96	20.18	43.36%	44.05%	0.69%	1.60%
SI-0391*	1,096.39	11.10	159.49	30.74	170.58	190.23	19.65	15.56%	17.35%	1.79%	11.52%
SI-9561*	226.46	7.75	61.07	11.11	68.82	72.18	3.36	30.39%	31.87%	1.48%	4.88%
SI-9591*	14.59	0.39	3.38	2.33	3.77	5.71	1.94	25.83%	39.15%	13.32%	51.58%
SI-9592*	249.47	1.74	24.38	5.21	26.12	29.59	3.47	10.47%	11.86%	1.39%	13.29%
SI-9593*	536.70	10.65	107.97	59.46	118.61	167.42	48.81	22.10%	31.20%	9.09%	41.15%

TABLE A2.5

Tree Canopy and Canopy Change by Jurisdiction, Citywide and by Borough

Jurisdiction / Borough	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017–2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017–2021 (%)	Relative Canopy Change 2017–2021 (%)
City: NYC Parks											
Bronx	5,921.95	143.67	2,860.51	286.70	3,004.18	3,147.21	143.03	50.73%	53.14%	2.42%	4.76%
Brooklyn	3,812.05	92.64	1,165.90	208.56	1,258.54	1,374.47	115.93	33.01%	36.06%	3.04%	9.21%
Manhattan	2,643.34	68.30	1,281.69	120.53	1,349.99	1,402.22	52.23	51.07%	53.05%	1.98%	3.87%
Queens	6,433.17	155.63	2,530.15	283.58	2,685.79	2,813.74	127.95	41.75%	43.74%	1.99%	4.76%
Staten Island	6,967.15	123.44	3,576.06	289.12	3,699.50	3,865.18	165.68	53.10%	55.48%	2.38%	4.48%
Citywide	25,777.66	583.68	11,414.32	1,188.49	11,998.00	12,602.81	604.81	46.54%	48.89%	2.35%	5.04%
City: Rights of Way											
Bronx	6,458.39	162.94	1,153.74	370.73	1,316.68	1,524.47	207.79	20.39%	23.60%	3.22%	15.78%
Brooklyn	11,455.43	305.65	2,503.58	616.02	2,809.23	3,119.60	310.37	24.52%	27.23%	2.71%	11.05%
Manhattan	3,888.78	103.55	715.37	202.42	818.92	917.78	98.87	21.06%	23.60%	2.54%	12.07%
Queens	16,570.01	587.98	3,592.21	750.19	4,180.18	4,342.40	162.21	25.23%	26.21%	0.98%	3.88%
Staten Island	6,543.80	217.87	1,639.76	388.57	1,857.64	2,028.33	170.70	28.39%	31.00%	2.61%	9.19%
Citywide	44,916.41	1,377.99	9,604.66	2,327.93	10,982.65	11,932.59	949.94	24.45%	26.57%	2.11%	8.65%
City: Other											
Bronx	2,000.12	34.12	152.94	47.59	187.06	200.53	13.46	9.35%	10.03%	0.67%	7.20%
Brooklyn	2,208.15	28.39	140.22	51.02	168.60	191.24	22.64	7.64%	8.66%	1.03%	13.43%
Manhattan	880.41	13.23	82.14	21.36	95.37	103.50	8.13	10.83%	11.76%	0.92%	8.52%
Queens	2,058.03	31.35	246.86	64.60	278.21	311.46	33.25	13.52%	15.13%	1.62%	11.95%
Staten Island	2,994.57	49.52	692.22	105.10	741.74	797.32	55.58	24.77%	26.63%	1.86%	7.49%
Citywide	10,141.30	156.61	1,314.38	289.67	1,470.99	1,604.06	133.06	14.50%	15.82%	1.31%	9.05%
Federal											
Bronx	2.19	0.02	0.03	0.01	0.05	0.04	-0.01	2.10%	1.82%	-0.28%	-13.46%
Brooklyn	2,766.20	52.22	317.98	156.25	370.21	474.23	104.02	13.38%	17.14%	3.76%	28.10%
Manhattan	49.71	1.59	8.36	1.05	9.95	9.41	-0.55	20.02%	18.92%	-1.10%	-5.48%
Queens	2,903.38	44.41	290.24	133.50	334.65	423.74	89.09	11.53%	14.59%	3.07%	26.62%
Staten Island	901.90	18.63	176.78	70.91	195.41	247.69	52.29	21.67%	27.46%	5.80%	26.76%
Citywide	6,623.38	116.87	793.39	361.72	910.27	1,155.11	244.85	13.74%	17.44%	3.70%	26.90%

(Table A2.5 Continued)

Borough	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
New York State											
Bronx	1,139.38	29.11	295.38	58.72	324.49	354.09	29.61	28.48%	31.08%	2.60%	9.12%
Brooklyn	1,467.53	44.23	437.41	66.27	481.64	503.67	22.04	32.82%	34.32%	1.50%	4.58%
Manhattan	1,013.40	28.06	235.01	34.47	263.07	269.48	6.41	25.96%	26.59%	0.63%	2.44%
Queens	6,491.48	62.53	368.39	111.24	430.92	479.64	48.72	6.64%	7.39%	0.75%	11.30%
Staten Island	2,163.49	38.33	883.13	88.75	921.46	971.88	50.42	42.59%	44.92%	2.33%	5.47%
Citywide	12,275.27	202.25	2,219.33	359.44	2,421.58	2,578.77	157.19	19.73%	21.01%	1.28%	6.49%
Private											
Bronx	11,731.96	373.52	1,588.64	462.94	1,962.16	2,051.58	89.42	16.72%	17.49%	0.76%	4.56%
Brooklyn	22,694.44	642.92	2,195.63	789.28	2,838.54	2,984.90	146.36	12.51%	13.15%	0.64%	5.16%
Manhattan	6,136.85	117.20	485.33	134.54	602.53	619.87	17.34	9.82%	10.10%	0.28%	2.88%
Queens	35,365.30	1,330.94	4,060.35	1,211.63	5,391.29	5,271.98	-119.31	15.24%	14.91%	-0.34%	-2.21%
Staten Island	17,702.34	772.41	3,582.47	862.78	4,354.88	4,445.25	90.37	24.60%	25.11%	0.51%	2.08%
Citywide	93,630.89	3,236.98	11,912.42	3,461.16	15,149.39	15,373.58	224.19	16.18%	16.42%	0.24%	1.48%

TABLE A2.6

Tree Canopy and Canopy Change for Site Types on Private Land, Citywide and by Borough

Land Use / Borough	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017–2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017–2021 (%)	Relative Canopy Change 2017–2021 (%)
Cemeteries											
Bronx	542.69	22.27	171.20	23.85	193.48	195.06	1.58	35.65%	35.94%	0.29%	0.82%
Brooklyn	908.87	34.01	255.82	36.66	289.83	292.48	2.64	31.89%	32.18%	0.29%	0.91%
Manhattan	18.46	1.05	8.62	0.90	9.66	9.52	-0.15	52.34%	51.54%	-0.81%	-1.54%
Queens	2,132.66	49.47	396.99	76.37	446.46	473.36	26.90	20.93%	22.20%	1.26%	6.03%
Staten Island	586.94	17.01	226.17	29.53	243.18	255.70	12.51	41.43%	43.56%	2.13%	5.15%
Citywide	4,189.63	123.82	1,058.80	167.30	1,182.61	1,226.10	43.48	28.23%	29.27%	1.04%	3.68%
Non-Residential Developed											
Bronx	2,563.75	33.57	119.99	57.06	153.56	177.04	23.49	5.99%	6.91%	0.92%	15.30%
Brooklyn	3,843.08	31.84	114.00	58.06	145.84	172.07	26.22	3.79%	4.48%	0.68%	17.98%
Manhattan	1,396.77	8.92	29.64	14.39	38.55	44.03	5.47	2.76%	3.15%	0.39%	14.19%
Queens	5,161.51	67.32	238.73	84.62	306.05	323.35	17.30	5.93%	6.26%	0.34%	5.65%
Staten Island	2,777.07	69.26	314.97	91.18	384.23	406.14	21.92	13.84%	14.62%	0.79%	5.70%
Citywide	15,742.19	210.91	817.32	305.31	1,028.23	1,122.63	94.40	6.53%	7.13%	0.60%	9.18%
Open Space and Outdoor Recreation											
Bronx	52.26	1.81	10.25	2.14	12.06	12.39	0.33	23.08%	23.71%	0.63%	2.71%
Brooklyn	75.65	1.92	8.06	3.86	9.97	11.91	1.94	13.18%	15.75%	2.57%	19.46%
Manhattan	40.98	0.76	8.85	1.60	9.62	10.45	0.84	23.46%	25.50%	2.04%	8.69%
Queens	118.19	3.04	13.14	3.46	16.17	16.59	0.42	13.69%	14.04%	0.36%	2.60%
Staten Island	261.78	6.15	126.97	8.51	133.12	135.49	2.36	50.85%	51.76%	0.90%	1.78%
Citywide	548.86	13.68	167.27	19.56	180.95	186.83	5.89	32.97%	34.04%	1.07%	3.25%
Public Facilities and Institutions											
Bronx	896.29	25.12	183.97	37.68	209.09	221.65	12.55	23.33%	24.73%	1.40%	6.00%
Brooklyn	967.05	19.12	82.92	26.47	102.05	109.40	7.35	10.55%	11.31%	0.76%	7.20%
Manhattan	730.40	12.48	78.00	20.55	90.49	98.55	8.07	12.39%	13.49%	1.10%	8.92%
Queens	1,122.08	29.90	137.58	35.93	167.48	173.51	6.03	14.93%	15.46%	0.54%	3.60%
Staten Island	709.33	19.99	194.45	32.32	214.44	226.77	12.33	30.23%	31.97%	1.74%	5.75%
Citywide	4,425.13	106.61	676.93	152.95	783.54	829.88	46.33	17.71%	18.75%	1.05%	5.91%

(Table A2.6 Continued)

Borough	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
One- and Two-Family Residential											
Bronx	3,655.65	162.09	585.43	185.95	747.52	771.39	23.86	20.45%	21.10%	0.65%	3.19%
Brooklyn	8,713.88	331.75	991.39	370.04	1,323.14	1,361.43	38.29	15.18%	15.62%	0.44%	2.89%
Manhattan	178.34	8.47	32.10	8.53	40.57	40.63	0.06	22.75%	22.78%	0.04%	0.16%
Queens	19,213.62	920.68	2,302.90	751.59	3,223.58	3,054.49	-169.09	16.78%	15.90%	-0.88%	-5.25%
Staten Island	10,443.55	547.86	1,863.31	549.38	2,411.17	2,412.69	1.52	23.09%	23.10%	0.01%	0.06%
Citywide	42,205.04	1,970.84	5,775.13	1,865.49	7,745.98	7,640.63	-105.35	18.35%	18.10%	-0.25%	-1.36%
Multifamily Residential											
Bronx	3,617.29	109.62	405.37	133.04	514.99	538.41	23.42	14.24%	14.88%	0.65%	4.55%
Brooklyn	7,755.27	209.73	690.37	273.36	900.10	963.73	63.63	11.61%	12.43%	0.82%	7.07%
Manhattan	3,690.61	83.89	320.62	84.84	404.51	405.46	0.95	10.96%	10.99%	0.03%	0.23%
Queens	6,821.01	228.31	857.21	226.70	1,085.52	1,083.91	-1.61	15.91%	15.89%	-0.02%	-0.15%
Staten Island	1,070.78	38.93	189.54	51.18	228.47	240.72	12.25	21.34%	22.48%	1.14%	5.36%
Citywide	22,954.97	670.48	2,463.10	769.12	3,133.58	3,232.22	98.64	13.65%	14.08%	0.43%	3.15%
Vacant Land											
Bronx	404.03	19.03	112.42	23.22	131.45	135.64	4.19	32.53%	33.57%	1.04%	3.19%
Brooklyn	430.64	14.54	53.07	20.83	67.61	73.90	6.29	15.70%	17.16%	1.46%	9.30%
Manhattan	81.28	1.63	7.50	3.73	9.13	11.24	2.10	11.24%	13.82%	2.59%	23.01%
Queens	796.23	32.22	113.81	32.96	146.03	146.77	0.74	18.34%	18.43%	0.09%	0.51%
Staten Island	1,852.88	73.21	667.07	100.68	740.27	767.75	27.48	39.95%	41.44%	1.48%	3.71%
Citywide	3,565.07	140.63	953.87	181.42	1,094.50	1,135.29	40.79	30.70%	31.84%	1.14%	3.73%

TABLE A2.7

Tree Canopy and Canopy Change for Natural Areas by Site Type and Borough

Jurisdiction* / Borough	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017–2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017–2021 (%)	Relative Canopy Change 2017–2021 (%)
NYC Parks (Forever Wild)											
Bronx	2,300.69	43.20	1,528.95	92.59	1,572.15	1,621.55	49.39	68.33%	70.48%	2.15%	3.14%
Brooklyn	828.40	21.15	272.00	69.45	293.15	341.45	48.30	35.39%	41.22%	5.83%	16.48%
Manhattan	372.77	6.04	335.53	12.84	341.58	348.38	6.80	91.63%	93.46%	1.82%	1.99%
Queens	2,382.50	59.07	1,193.28	116.30	1,252.34	1,309.58	57.24	52.56%	54.97%	2.40%	4.57%
Staten Island	4,399.56	65.99	2,751.48	163.74	2,817.46	2,915.22	97.75	64.04%	66.26%	2.22%	3.47%
Citywide	10,283.91	195.45	6,081.24	454.93	6,276.68	6,536.17	259.48	61.03%	63.56%	2.52%	4.13%
NYC Parks (Dominant Type: Natural)											
Bronx	3,020.71	64.57	1,989.73	132.55	2,054.30	2,122.28	67.98	68.01%	70.26%	2.25%	3.31%
Brooklyn	1,396.78	34.61	484.40	100.13	519.00	584.53	65.53	37.16%	41.85%	4.69%	12.63%
Manhattan	683.28	11.52	471.85	23.53	483.37	495.38	12.01	70.74%	72.50%	1.76%	2.48%
Queens	3,293.38	77.98	1,558.26	141.61	1,636.25	1,699.88	63.63	49.68%	51.61%	1.93%	3.89%
Staten Island	5,879.33	98.68	3,285.43	233.97	3,384.12	3,519.41	135.29	57.56%	59.86%	2.30%	4.00%
Citywide	14,273.49	287.36	7,789.68	631.79	8,077.04	8,421.47	344.43	56.59%	59.00%	2.41%	4.26%
City: Rights of Way											
Bronx	204.64	3.02	30.54	2.33	33.56	32.87	-0.69	16.40%	16.06%	-0.34%	-2.05%
Brooklyn	56.88	1.02	3.01	1.00	4.03	4.01	-0.02	7.08%	7.04%	-0.04%	-0.59%
Manhattan	11.67	0.51	4.41	0.21	4.92	4.62	-0.30	42.16%	39.56%	-2.59%	-6.15%
Queens	332.02	5.69	54.70	7.88	60.39	62.58	2.20	18.19%	18.85%	0.66%	3.64%
Staten Island	579.14	16.60	252.62	26.95	269.22	279.57	10.34	46.49%	48.27%	1.79%	3.84%
Citywide	1,184.36	26.84	345.28	38.36	372.12	383.65	11.52	31.42%	32.39%	0.97%	3.10%
City: Other											
Bronx	139.62	3.65	17.05	1.87	20.70	18.92	-1.78	14.83%	13.55%	-1.27%	-8.58%
Brooklyn	69.09	2.58	7.96	3.09	10.54	11.05	0.51	15.25%	16.00%	0.75%	4.89%
Manhattan	24.99	0.61	4.31	0.29	4.93	4.60	-0.33	19.72%	18.42%	-1.31%	-6.62%
Queens	235.96	4.27	56.30	15.86	60.57	72.16	11.59	25.67%	30.58%	4.91%	19.13%
Staten Island	823.55	20.57	463.51	35.18	484.08	498.69	14.61	58.78%	60.55%	1.77%	3.02%
Citywide	1,293.21	31.69	549.13	56.30	580.82	605.43	24.61	44.91%	46.82%	1.90%	4.24%

(Table A2.7 Continued)

Borough	Area (acres)	Canopy Loss (acres)	Canopy Unchanged (acres)	Canopy Gain (acres)	Canopy Acreage 2017	Canopy Acreage 2021	Net Canopy Change 2017-2021 (acres)	Canopy Cover 2017 (%)	Canopy Cover 2021 (%)	Net Canopy Change 2017-2021 (%)	Relative Canopy Change 2017-2021 (%)
Federal											
Brooklyn	1,690.32	41.93	278.18	134.92	320.10	413.10	93.00	18.94%	24.44%	5.50%	29.05%
Manhattan	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00%	0.00%	0.00%
Queens	2,537.89	40.45	274.91	125.60	315.35	400.50	85.15	12.43%	15.78%	3.36%	27.00%
Staten Island	503.97	10.31	128.09	56.79	138.41	184.88	46.48	27.46%	36.69%	9.22%	33.58%
Citywide	4,732.19	92.69	681.17	317.31	773.86	998.49	224.62	16.35%	21.10%	4.75%	29.03%
New York State											
Bronx	23.51	0.58	12.96	0.69	13.54	13.66	0.12	57.60%	58.10%	0.50%	0.87%
Brooklyn	5.00	0.12	0.85	0.19	0.97	1.04	0.08	19.31%	20.85%	1.54%	7.95%
Manhattan	31.06	0.11	2.54	0.73	2.65	3.27	0.62	8.52%	10.51%	1.99%	23.35%
Queens	352.65	5.39	54.46	21.24	59.86	75.70	15.84	16.97%	21.47%	4.49%	26.47%
Staten Island	956.52	16.97	627.70	32.15	644.68	659.85	15.18	67.40%	68.98%	1.59%	2.35%
Citywide	1,368.74	23.17	698.52	55.00	721.69	753.52	31.83	52.73%	55.05%	2.33%	4.41%
Private											
Bronx	238.89	9.99	124.66	9.45	134.65	134.10	-0.54	56.36%	56.14%	-0.23%	-0.40%
Brooklyn	112.47	1.47	7.99	3.61	9.45	11.59	2.14	8.41%	10.31%	1.90%	22.64%
Manhattan	9.80	0.79	5.92	0.34	6.71	6.26	-0.45	68.49%	63.91%	-4.57%	-6.68%
Queens	317.02	10.35	80.40	12.04	90.75	92.44	1.69	28.63%	29.16%	0.53%	1.87%
Staten Island	2,181.61	103.40	955.97	93.24	1,059.37	1,049.22	-10.16	48.56%	48.09%	-0.47%	-0.96%
Citywide	2,859.78	125.99	1,174.94	118.68	1,300.93	1,293.62	-7.31	45.49%	45.23%	-0.26%	-0.56%

* Natural areas within NYC Parks' Jurisdiction are considered based on both designations of areas as "Forever Wild" and as Natural in the NYC Parks Dominant Type Dataset; in all other areas, Natural Areas are delineated based on the ecological covertype map.

TABLE A2.8
Correlations Between Canopy Metrics and Socioeconomic and Demographic Variables

Correlations are highlighted when the absolute value of the correlation coefficient ≥ 0.2 and *p*-value < 0.05. Strong and significant positive correlation. Strong and significant negative correlation.

	Percent of People Aged 65 and Older		Percent of People Aged 17 and Younger		Percent of People of Color		Percent of People with Limited English Proficiency		Percent of People Below the 150% Poverty Estimate		Per Capita Income	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
Canopy Cover (%) as of 2021												
Bronx	0.15	0.182	-0.20	0.075	-0.26	0.024	-0.15	0.191	-0.15	0.191	0.22	0.060
Brooklyn	-0.08	0.378	0.05	0.597	-0.07	0.485	-0.36	<0.001	-0.24	0.010	0.28	0.003
Manhattan	-0.06	0.650	0.46	0.000	0.17	0.184	0.23	0.065	0.21	0.092	-0.38	0.002
Queens	0.39	<0.001	-0.02	0.814	-0.08	0.346	0.06	0.472	-0.24	0.008	0.17	0.051
Staten Island	0.20	0.280	0.17	0.368	-0.42	0.024	-0.52	0.005	-0.20	0.280	0.48	0.009
Citywide	0.11	0.018	0.05	0.295	-0.06	0.222	-0.07	0.126	-0.07	0.147	0.08	0.091
Relative Canopy Change (2017–2021)												
Bronx	-0.32	0.006	0.39	0.001	0.47	<0.001	0.24	0.039	0.38	0.001	-0.44	<0.001
Brooklyn	-0.43	<0.001	-0.20	0.031	0.14	0.145	-0.18	0.051	0.08	0.382	0.09	0.361
Manhattan	-0.47	<0.001	0.32	0.009	0.36	0.004	0.31	0.011	0.25	0.041	-0.20	0.105
Queens	-0.13	0.152	-0.04	0.680	-0.39	<0.001	0.15	0.098	0.15	0.101	0.10	0.263
Staten Island	-0.23	0.207	-0.33	0.072	0.45	0.015	0.55	0.003	0.33	0.072	-0.42	0.024
Citywide	-0.37	<0.001	0.18	<0.001	0.11	0.018	0.07	0.161	0.32	<0.001	-0.18	<0.001

TABLE A2.9
Correlations Between Canopy Metrics and Housing Type Variables

Correlations are highlighted when the absolute value of the correlation coefficient ≥ 0.2 and *p*-value < 0.05. Strong and significant positive correlation. Strong and significant negative correlation.

	Percent of Households with More People than Rooms		Percent of Households with No Vehicle		Percent of Households Owner-Occupied		Percent of Housing Units Built Since the Year 2000		Percent of Housing Units Built Between the Years 1960 and 1999		Percent of Housing Units Built Before the Year 1960	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
Canopy Cover (%) as of 2021												
Bronx	-0.17	0.136	-0.19	0.094	0.14	0.239	-0.14	0.209	-0.05	0.638	0.06	0.583
Brooklyn	-0.19	0.045	0.06	0.545	0.10	0.286	-0.01	0.884	-0.23	0.017	0.19	0.044
Manhattan	0.28	0.023	-0.25	0.041	-0.25	0.048	-0.35	0.005	-0.24	0.052	0.34	0.006
Queens	-0.18	0.041	-0.30	0.001	0.26	0.004	-0.27	0.002	0.02	0.794	0.14	0.117
Staten Island	-0.27	0.150	-0.28	0.126	0.20	0.280	-0.07	0.719	0.03	0.857	-0.12	0.528
Citywide	-0.14	0.004	-0.16	0.001	0.13	0.005	-0.13	0.007	0.02	0.717	0.05	0.260
Relative Canopy Change (2017–2021)												
Bronx	0.14	0.229	0.42	<0.001	-0.32	0.005	0.36	0.002	0.27	0.017	-0.37	0.001
Brooklyn	-0.30	0.002	0.42	<0.001	-0.40	<0.001	0.49	<0.001	-0.02	0.794	-0.27	0.005
Manhattan	0.32	0.010	0.05	0.697	-0.25	0.044	0.23	0.065	-0.12	0.347	-0.04	0.746
Queens	0.05	0.605	0.24	0.008	-0.28	0.002	0.17	0.052	0.16	0.068	-0.26	0.003
Staten Island	0.30	0.105	0.35	0.059	-0.27	0.150	-0.07	0.719	0.03	0.857	0.08	0.653
Citywide	0.12	0.015	0.29	<0.001	-0.39	<0.001	0.28	<0.001	0.01	0.829	-0.16	0.001

TABLE A2.10

Correlations Between Canopy Metrics and the 2023 NYC Heat Vulnerability Index and 2022 Social Vulnerability Index

Correlations are highlighted when the absolute value of the correlation coefficient ≥ 0.2 and *p*-value < 0.05.

Strong and significant positive correlation

Strong and significant negative correlation

	Heat Vulnerability Index Score		Combination SVI Theme		Socioeconomic Status - SVI Theme 1		Household Characteristics - SVI Theme 2		Racial & Ethnic Minority Status - SVI Theme 3		Housing Type & Transportation - SVI Theme 4	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
Canopy Cover (%) as of 2021												
Bronx	-0.26	0.043	-0.18	<0.001	-0.21	<0.001	-0.08	0.035	-0.17	<0.001	-0.14	<0.001
Brooklyn	-0.23	0.029	-0.12	<0.001	-0.16	<0.001	-0.05	0.026	-0.08	0.001	-0.01	0.554
Manhattan	0.30	0.030	0.18	<0.001	0.13	0.001	0.25	<0.001	0.10	0.012	0.00	0.953
Queens	-0.38	<0.001	-0.15	<0.001	-0.21	<0.001	0.08	0.001	-0.10	<0.001	-0.13	<0.001
Staten Island	-0.40	0.050	-0.09	0.155	-0.14	0.022	-0.07	0.286	-0.17	0.006	0.02	0.786
Citywide	-0.17	0.001	-0.09	<0.001	-0.13	<0.001	0.04	0.009	-0.08	<0.001	-0.07	<0.001
Relative Canopy Change (2017–2021)												
Bronx	0.46	<0.001	0.30	<0.001	0.30	<0.001	0.19	<0.001	0.20	<0.001	0.25	<0.001
Brooklyn	0.01	0.899	0.06	0.015	0.10	<0.001	-0.15	<0.001	0.04	0.134	0.16	<0.001
Manhattan	0.31	0.027	0.19	<0.001	0.22	<0.001	0.09	0.027	0.25	<0.001	0.09	0.024
Queens	-0.22	0.022	0.08	0.002	0.10	<0.001	-0.10	<0.001	-0.21	<0.001	0.20	<0.001
Staten Island	0.42	0.040	0.22	<0.001	0.24	<0.001	0.10	0.105	0.28	<0.001	0.15	0.016
Citywide	0.22	<0.001	0.18	<0.001	0.18	<0.001	0.03	0.035	0.03	0.029	0.24	<0.001

TABLE A2.11

Comparing Canopy Metrics in NYS-Designated Disadvantaged Communities and Non-designated Communities

Group with a statistically larger median

	DACs (Group 1)		Non-DACs (Group 2)		Mann-Whitney *U* Test	
	n	Median	n	Median	Test Statistic	*p*-value
Canopy Cover (%) as of 2021						
Bronx	280	17.61%	51	23.82%	3,244	<0.001
Brooklyn	307	17.98%	443	18.80%	62,646	0.066
Manhattan	119	21.57%	162	16.72%	12,229	<0.001
Queens	211	14.80%	440	19.96%	24,243	<0.001
Staten Island	36	24.89%	72	28.61%	981	0.040
Citywide	953	17.54%	1,168	19.59%	466,169	<0.001
Relative Canopy Change (2017–2021)						
Bronx	280	13.68%	51	3.50%	11,583	<0.001
Brooklyn	307	12.36%	443	5.79%	96,978	<0.001
Manhattan	119	8.82%	162	4.33%	12,825	<0.001
Queens	211	4.79%	440	0.83%	58,510	<0.001
Staten Island	36	8.71%	72	4.19%	1,894	<0.001
Citywide	953	10.16%	1,168	3.47%	793,828	<0.001

TABLE A2.12

Correlations Between Canopy Metrics and Criteria Used to Designate Disadvantaged Communities and Historical Grades from the Home Owners' Loan Corporation

Correlations are highlighted when the absolute value of the correlation coefficient ≥ 0.2 and *p*-value < 0.05.

Strong and significant positive correlation

Strong and significant negative correlation

	Combined Score - DAC Criteria		Burden Score - DAC Criteria		Vulnerability Score - DAC Criteria		Home Owners' Loan Corporation (HOLC) Grade	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
Canopy Cover (%) as of 2021								
Bronx	-0.25	<0.001	-0.15	<0.001	-0.22	<0.001	-0.34	0.005
Brooklyn	-0.10	<0.001	-0.08	0.002	-0.06	0.008	-0.26	0.006
Manhattan	0.20	<0.001	0.02	0.536	0.20	<0.001	-0.10	0.342
Queens	-0.36	<0.001	-0.20	<0.001	-0.25	<0.001	-0.35	<0.001
Staten Island	-0.23	0.001	-0.28	<0.001	-0.19	0.003	-0.41	<0.001
Citywide	-0.12	<0.001	-0.10	<0.001	-0.09	<0.001	-0.26	<0.001
Relative Canopy Change (2017–2021)								
Bronx	0.32	<0.001	0.12	0.001	0.34	<0.001	0.39	0.001
Brooklyn	0.27	<0.001	0.18	<0.001	0.16	<0.001	0.30	0.002
Manhattan	0.21	<0.001	-0.10	0.010	0.23	<0.001	0.26	0.015
Queens	0.20	<0.001	0.38	<0.001	-0.02	0.418	0.15	0.019
Staten Island	0.35	<0.001	0.29	<0.001	0.30	<0.001	0.48	<0.001
Citywide	0.29	<0.001	0.21	<0.001	0.20	<0.001	0.21	<0.001

Canopy in the forested part of Prospect Park, Brooklyn