CLEVELAND TREE PLAN:

2020 TREE CANOPY PROGRESS REPORT

2020

CLEVELAND
TREE COALITION

Acknowledgments

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EXECUTIVE SUMMARY

The Cleveland Tree Plan, released in 2015, provided recommendations and actions to (1) recognize trees as critical infrastructure; (2) reverse the trend in canopy loss; and (3) assume full stewardship of the tree infrastructure in the City of Cleveland. This 2020 Tree Canopy Progress Report:

- Reviews progress in implementing the 2015 Cleveland Tree Plan.
- Utilizes the 2019 Cuyahoga County Urban Tree Canopy Assessment data to evaluate the current state of Cleveland's urban forest and highlight changes in tree canopy between 2011 and 2017.
- Updates calculations on the benefits of Cleveland's urban forest based on the most recent models and research.
- Updates the socio-economic and public health framework for neighborhood canopy action.
- Provides new recommendations to help reverse the canopy loss trend in Cleveland.

Key Findings

- The Cleveland Tree Coalition's (CTC) membership has grown from 5 to **over 40 members** since 2015.
- The organizations that make up the CTC Executive Committee are working together to identify solutions to Cleveland's canopy challenges.
- Cleveland **lost 5% of its tree canopy cover** from 2011 to 2017 continuing the trend in canopy loss. If this trend continues the city's tree canopy cover will fall to 14.8% by 2040, well below canopy levels of other cities in the region.
- The 5% loss in tree canopy has led to a **6.3% reduction** (over $3.1 million) in cumulative tree benefits.
- Tree canopy in Cleveland currently provides **$11.4 million in quantifiable services** to the community each year - or $29.40 per person.
- To meet the canopy cover goal of 30% by 2040 would require the **planting and successful establishment of 28,400 trees per year.**
- Awareness of the connection between healthy canopy and a thriving community is at an all time high, as evidenced by investments made by the City of Cleveland, Cuyahoga County and other partners in revitalizing tree canopy cover.

VISION:
Through partnership, Cleveland will once again be known as the Forest City. Residents from every neighborhood in Cleveland will experience the many benefits of our urban forest that increase resilience, health prosperity and overall quality of life.
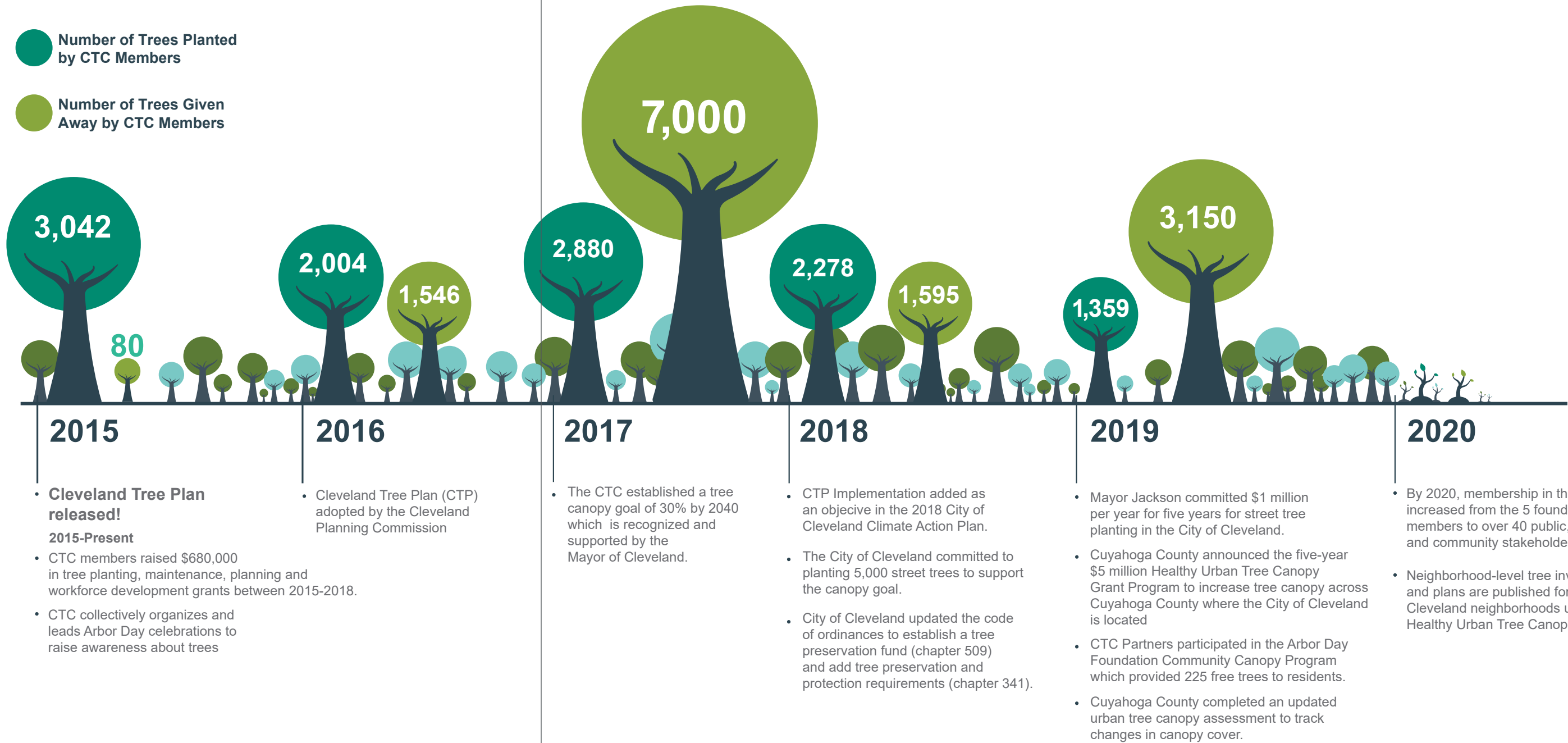*- 2015 Cleveland Tree Plan*

INTRODUCTION

The City of Cleveland, once nicknamed the *Forest City,* has lost more than half of its tree canopy cover over the last 75 years. This loss has reduced the environmental, economic and social benefits trees provide, impacting the quality of life and health of Cleveland's residents. In 2015 the Cleveland Tree Plan (CTP) was released, which recognized this loss and the important role that trees play in the city's revitalization. The plan serves as a roadmap to rebuild Cleveland's urban forest through partnership, and it establishes a unified vision, goals and actions to achieve it.

The original plan was developed in partnership with five organizations: Western Reserve Land Conservancy, Holden Arboretum, LAND studio, Cleveland Neighborhood Progress and the City of Cleveland, and was informed by an inclusive group of stakeholders collectively known today as the Cleveland Tree Coalition.

The CTP has served as a catalyst for action. In less than 5 years, the Cleveland Tree Coalition has grown to over 40 organizations that are working to support, improve and grow Cleveland's urban forest. The purpose of the 2020 Tree Canopy Progress report is to recognize the accomplishments and actions since the plan's adoption and to highlight the work that still needs to be done to bring back the *Forest City.*

* The 2019 Cuyahoga County Tree Canopy Assessment Report was paid for with funds provided by Cleveland Neighborhood Progress, the Cuyahoga County Office of Sustainability, Holden Forests & Gardens, Western Reserve Land Conservancy, with substantial in-kind contributions from the Cuyahoga County Planning Commission, Cleveland Metroparks, and the Northeast Ohio Regional Sewer District.

Number of Trees Planted by CTC Members

Number of Trees Given Away by CTC Members

3,042 — 80 — 2,004 — 1,546 — 2,880 — 7,000 — 2,278 — 1,595 — 1,359 — 3,150

2015
- **Cleveland Tree Plan released!**
  2015-Present
- CTC members raised $680,000 in tree planting, maintenance, planning and workforce development grants between 2015-2018.
- CTC collectively organizes and leads Arbor Day celebrations to raise awareness about trees

2016
- Cleveland Tree Plan (CTP) adopted by the Cleveland Planning Commission

2017
- The CTC established a tree canopy goal of 30% by 2040 which is recognized and supported by the Mayor of Cleveland.

2018
- CTP Implementation added as an objecive in the 2018 City of Cleveland Climate Action Plan.
- The City of Cleveland committed to planting 5,000 street trees to support the canopy goal.
- City of Cleveland updated the code of ordinances to establish a tree preservation fund (chapter 509) and add tree preservation and protection requirements (chapter 341).

2019
- Mayor Jackson committed $1 million per year for five years for street tree planting in the City of Cleveland.
- Cuyahoga County announced the five-year $5 million Healthy Urban Tree Canopy Grant Program to increase tree canopy across Cuyahoga County where the City of Cleveland is located
- CTC Partners participated in the Arbor Day Foundation Community Canopy Program which provided 225 free trees to residents.
- Cuyahoga County completed an updated urban tree canopy assessment to track changes in canopy cover.

2020
- By 2020, membership in the Tree Coalition increased from the 5 founding members to over 40 public, private and community stakeholders.
- Neighborhood-level tree inventories and plans are published for four Cleveland neighborhoods under the Healthy Urban Tree Canopy Grant Program.

TREE CANOPY PROGRESS 2020

The Tree Canopy Progress report is based on information from:

- 2019 Cuyahoga County Tree Canopy Assessment Report[1]
- Cuyahoga County Climate Change Vulnerability Assessment[2]
- Cleveland Neighborhood Progress Progress Index[3]
- Center for Disease Control and Prevention 500 Cities: Local Data for Better Health Project[4]
- USDA Forest Service i-Tree Canopy version 7.0[5]
- United States Environmental Protection Agency Environmental Benefits Mapping and Analysis Program (BenMap)[6]
- Cleveland Tree Coalition's Reforesting the Forest City: The Cleveland Tree Canopy Goal (2018)[7].
- Reports and unpublished data from the Cleveland Tree Coalition.

An Explanation of Years

2019 Cuyahoga County Tree Canopy Assessment is based on aerial imagery from 2017. This report refers to 2019 when discussing the urban tree canopy report published by Cuyahoga County Planning Commission and 2017 when referring to the canopy data that the report is based upon.

2013 Cuyahoga County Tree Canopy Assessment is based on aerial imagery from 2011 and is the basis for the 2015 Cleveland Tree Plan. This report will refer to 2013 when discussing the report published by Cuyahoga County Planning Commission and 2011 when referring to the canopy data that the report is based upon.

1. Cuyahoga County Planning Commission - Urban Tree Canopy Assessment Update (2019). Accessed: https://www.countyplanning.us/projects/urban-tree-canopy-assessment-update
2. Cuyahoga County Planning Commission - Climate Change Vulnerability Assessment. Accessed: https://www.arcgis.com/apps/webappviewer/index.html?id=7154ce92af264bedbeb4a70c61991e0a
3. Cleveland Neighborhood Progress - Progress Index Cleveland. Accessed: http://progressindexcle.org/#/intro?location_uuid=f0a0cb35-8976-45ed-8643-db23bc800246&expand_everything=undefined
4. Center of Disease Control and Prevention - 500 Cities: Local Data for Better Health. Accessed: https://www.cdc.gov/500cities/index.htm
5. i-Tree Canopy. Accessed: https://canopy.itreetools.org/
6. United States Environmental Protection Agency Environmental Benefits Mapping and Analysis Program. Accessed: https://www.epa.gov/benmap
7. Cleveland Tree Coalition. 2018. Reforesting the Forest City: The Cleveland Tree Canopy Goal. 28 pp. Accessed: http://www.clevelandtrees.org/wp-content/uploads/2018/04/Cleveland-Tree-Canopy-Goal-April-2018.pdf

Tree Canopy Cover Trend

The trend in tree canopy cover loss seen in Cleveland over the last 75 years is still continuing today. Since 2000, Cleveland's tree canopy cover has been steadily declining, and the most recent Cuyahoga County Tree Canopy Assessment report (2019) shows this trend continuing (Figure 1). The report found that the city had lost 449 acres (5%) of its tree canopy cover during the study period 2011-2017, or an average loss of 75 acres per year. If that trend continues, Cleveland's tree canopy cover is projected to fall to 14.8% by 2040.

Figure 1. Cleveland Tree Canopy Cover Loss, 2000-2040 (measured and projected)

Tree Benefits: Environmental, Ecosystem & Health

Cleveland's trees and urban forest provide essential environmental and ecological services to the community, including:

- removing ozone from the air and helping to improve air quality and the negative public health effects caused by air pollution
- storing carbon and reducing the amount of carbon that returns to the atmosphere as a greenhouse gas
- shading and cooling streets and buildings mitigating the urban heat island effect and reducing the use of air conditioning
- intercepting and absorbing stormwater, which reduces erosion and the amount of water that needs to be managed and treated after a rain event, and can reduce flooding
- improving water quality by filtering and removing pollutants
- providing homes, food and shelter for wildlife

These services provide value to Cleveland, with some that are quantifiable while others are more qualitative in nature. Tree canopy in Cleveland currently provides $11.4 million in quantifiable services to residents each year; a value of $29.40 per person (capita). Table 1 on the following page shows a comparison of tree canopy benefits based on the data from the 2011 and 2017 urban tree canopy assessments. The 5% loss in tree canopy cover between the two canopy studies has led to a **6.3% reduction** (over $3.1 million) in cumulative tree benefits.

Cleveland's tree canopy was also analyzed using the US Environmental Protection Agency's Environmental Benefits Mapping and Analysis Program (BenMAP) which estimates the health and economic impacts of changes in air pollution. BenMAP estimates that Cleveland's current tree canopy accounts for 598 *fewer* incidents of adverse respiratory health impacts and hospital visits each year, valued at $108,105 per year. The 2011 tree canopy accounted for 1,031 fewer adverse health incidents per year. Table 2 provides a comparison of adverse health incidents avoided by tree canopy in Cleveland 2011 to 2017.
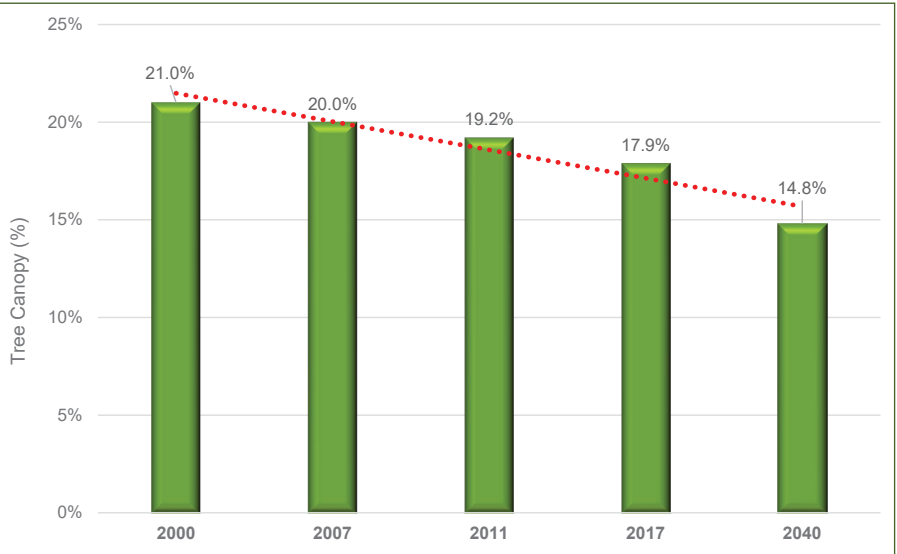
Table 1. Comparison of Environmental Benefits Provided by Cleveland Tree Canopy, 2011-2017

BENEFIT	2011			2017		
	Quantity	Unit	Value	Quantity	Unit	Value
STORMWATER: Reduction of Runoff	334,164,178	gallons	$2,004,985	307,726,776 ▼	gallons	$1,810,357 ▼
ENERGY: Savings from Avoided Cooling	31,859,973	kWhs	$3,504,638	30,136,314 ▼	kWhs	$3,315,293 ▼
PROPERTY: Increase in Property Values	-	$	$4,469,333	-	$	$3,697,576 ▼
AIR: Carbon Monoxide (CO) Removed	11,962	lbs.	$7,978	11,200 ▼	lbs.	$7,448 ▼
AIR: Nitrogen Dioxide (NO2) Removed	109,736	lbs.	$32,656	102,817 ▼	lbs.	$30,493 ▼
AIR: Ozone (O3) Removed	463,143	lbs.	$1,174,945	433,999 ▼	lbs.	$1,097,149 ▼
AIR: Sulfur Dioxide (SO2) Removed	51,261	lbs.	$7,172	48,017 ▼	lbs	6,694 ▼
AIR: Dust, Soot, Other Particles Removed (Particulate Matter, PM10)	141,578	lbs.	$443,727	132,662 ▼	lbs	414,341 ▼
CARBON: Sequestered	48,291	tons	$1,122,972	45,252 ▼	tons	$1,051,844 ▼
Total Annual Benefits			**$12,768,406**	**Total Annual Benefits**		**$11,431,195 ▼**
CARBON: Storage Over Canopy's Lifetime (not an annual benefit)	1,212,633	tons	$28,201,978	1,136,345 ▼	tons	$26,415,769 ▼
Total Benefits Overall			**$40,970,384**	**Total Benefits Overall**		**$37,846,964 ▼**

To make an accurate comparison of urban tree canopy benefit changes between the data from both the 2013 and 2019 Cuyahoga County Urban Tree Canopy assessments have been analyzed using i-Tree Canopy Version 7.0 (2020).

▼ = Loss in Benefit / ▲ = Increase in Benefit

Table 2. Comparison of adverse health incidents avoided due to Cleveland tree canopy, 2011-2017

Adverse Health Incidents Avoided	2011		2017	
	Incidents Avoided / Year	Value	Incidents Avoided / Year	Value
Respiratory Symptoms	532	$ 45,640	443 ▼	$ 42,544 ▼
Bronchitis (acute & chronic)	0.4	$ 35,521	0.2 ▼	$ 19,038 ▼
Acute Myocardial Infarction (heart attack)	0.1	$ 11,762	0.1	$ 6,008 ▼
Hospital Visits (Emergency / Hospital Admissions)	3.4	$ 62,257	2 ▼	$ 33,867 ▼
Asthma Exacerbation	495	$ 40,995	153 ▼	$ 12,656 ▼
Mortality	0.86	$ 6,656,299	0.5 ▼	$ 3,565,375 ▼
School Loss Days	146	$ 14,358	77 ▼	$ 7,530 ▼
Work Loss Days	26	$ 4,460	13 ▼	$ 2,171 ▼
Total	1204	$ 6,871,292	688 ▼	$ 3,689,189 ▼
Total	**1204**	**$6,871,292**	**688 ▼**	**$3,689,189 ▼**

Air Quality

Trees serve an important function in improving air quality, reducing air pollutants and helping ameliorate the public health effects of air pollution. Trees intercept and filter particulate matter from the air, including dust, ash, pollen, and smoke. They absorb harmful gaseous pollutants like ozone (O_3), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2); and reduce O_3 formation by shading surfaces and reducing air temperatures.

The 2019 American Lung Association State of Air report gave Cuyahoga County an "F" grade for ozone based on 2018 data.[1] The Northeast Ohio Areawide Coordinating Agency's 2019 Air Quality Trends report noted there were 13 days that exceeded the National Ambient Air Quality Standards in 2018.[2] In removing particulate matter and reducing ozone levels, trees provide a critical public health service to Cleveland residents.

Overall City

The 2015 Cleveland Tree Plan reported that the city's urban forest:

- removed 777,680 pounds of air pollutants, not including carbon dioxide (CO_2), every year, (Annual Value: $1.7 million).

Today, Cleveland's urban forest

- removes approximately 729,000 pounds of air pollutants each year—a **7% loss in air quality benefits compared to 2011 tree canopy benefits** (Annual Value: $1.5 million).

Neighborhood

Citywide, Cleveland's tree canopy provides $4.00 in air quality benefits per person (per capita) each year. Figure 2 displays the annual air quality benefits and Table 3 shows the per capita air quality benefits provided by the tree canopy in each of Cleveland's 34 neighborhoods based on the neighborhood's population. The table is color-coded based on whether the neighborhood is above (green), near/at (yellow), or below (red) the citywide per capita air quality benefit ($4.00). Tree planting and care activities should be focused on neighborhoods where canopy cover is below the neighborhood average, highlighted red in the table.
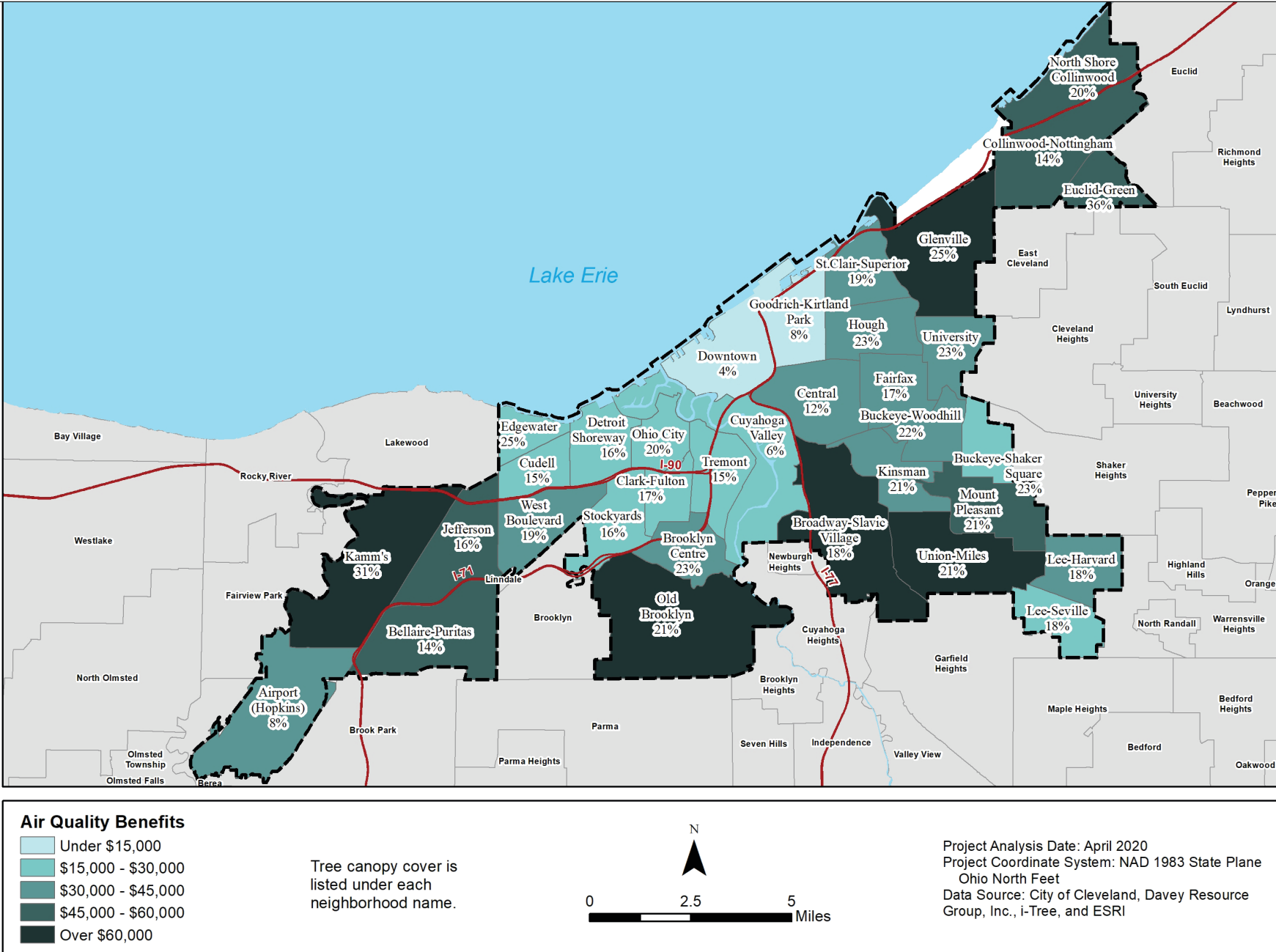
[1] American Lung Association. State of the Air 2019. Accessed at: http://www.stateoftheair.org/city-rankings/states/ohio/cuyahoga.html.

[2] Northeast Ohio Areawide Coordinating Agency. April 2020. 2019 Air Quality Trends Report. Accessed at: https://www.noaca.org/regional-planning/air-quality-planning/air-quality-trends-reports

NEIGHBORHOOD DATA	Canopy Cover (2017)	Air Quality Per Capita Benefit Value ($)
Bellaire-Puritas	14%	$3.70
Broadway-Slavic Village	18%	$4.20
Brooklyn Centre	23%	$3.99
Buckeye-Shaker Square	23%	$2.68
Buckeye-Woodhill	23%	$4.90
Central	12%	$2.65
Clark-Fulton	17%	$2.24
Collinwood-Nottingham	13%	$4.55
Cudell	15%	$1.78
Cuyahoga Valley	5%	$25.49
Detroit Shoreway	16%	$2.49
Downtown	4%	$1.04
Edgewater	25%	$3.41
Euclid-Green	35%	$8.76
Fairfax	17%	$5.92
Glenville	25%	$4.50
Goodrich-Kirtland Pk	8%	$3.55
Hopkins (Airport)	8%	$108.61
Hough	23%	$4.00
Jefferson	16%	$2.63
Kamm's	30%	$6.63
Kinsman	21%	$6.27
Lee-Harvard	18%	$3.03
Lee-Seville	18%	$7.04
Mount Pleasant	21%	$3.38
North Shore Collinwood	20%	$3.19
Ohio City	20%	$2.97
Old Brooklyn	21%	$4.12
St.Clair-Superior	19%	$5.99
Stockyards	16%	$3.11
Tremont	15%	$3.57
Union-Miles	21%	$4.30
University	23%	$4.97
West Boulevard	19%	$2.08
Below Average Neighborhood Tree Canopy Cover (18%)	Below City Per Capita Air Quality Benefit Value ($4.00)	
At or Near Average Neighborhood Tree Canopy Cover (18%)	At or Near City Per Capita Air Quality Benefit Value ($4.00)	
Above Average Neighborhood Tree Canopy Cover (18%)	Above City Per Capita Air Quality Benefit Value ($4.00)	

Table 3. Air Quality Benefits by Cleveland Neighborhood

Figure 2: Cleveland, Ohio - Annual Air Quality Benefits

Air Quality Benefits
- Under $15,000
- $15,000 - $30,000
- $30,000 - $45,000
- $45,000 - $60,000
- Over $60,000

Tree canopy cover is listed under each neighborhood name.

Project Analysis Date: April 2020
Project Coordinate System: NAD 1983 State Plane Ohio North Feet
Data Source: City of Cleveland, Davey Resource Group, Inc., i-Tree, and ESRI

Carbon Sequestration and Storage

Urban trees directly reduce greenhouse gases (GHGs), acting as a sink for carbon dioxide (CO_2). They absorb (sequester) atmospheric carbon and store excess carbon as biomass (e.g. trunk, branches, leaves, roots) during photosynthesis. By shading buildings, trees also indirectly reduce CO_2 by lowering the demand for heating and air conditioning, thereby reducing the emissions associated with electric power generation and natural gas consumption.

Overall City

The 2015 Cleveland Tree Plan reported that:

- Tree leaves absorbed (sequestered) over 48,200 tons of carbon each year (Annual Value: $1.2 million).
- Over their lifetime, Cleveland's trees stored over 1.2 million tons of carbon in their branches and trunk (Lifetime Value: $28 million)

Today, Cleveland's trees:

- Sequester over 45,252 tons of carbon each year (Annual Value: $1.1 million)
- Store 1.1 million tons of carbon in their branches and trunk over their lifetime (Lifetime Value: $26.4 million).
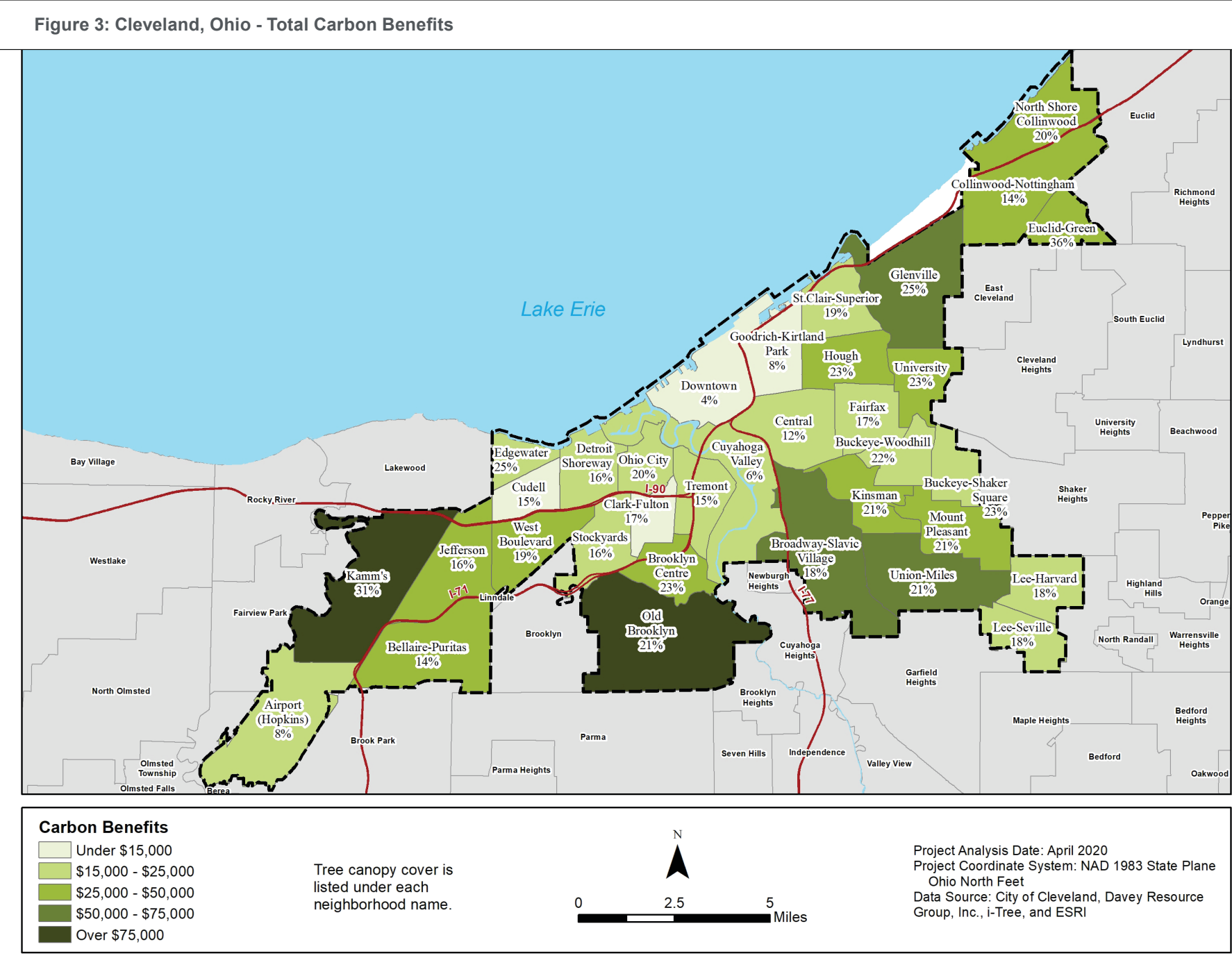
The **6% loss in total carbon benefits** by Cleveland's trees from 2011-2017 (the period between tree canopy assessments) may lead to an increase in the amount of CO_2 in the atmosphere and influence the number of high heat days in Cleveland impacting resident's health. Planting and preserving trees can help reverse this trend and increase the carbon sequestration and storage benefits of Cleveland's urban forest.

Neighborhood

Citywide, Cleveland's tree canopy provides $70.62 in total carbon benefits which includes both the value of the carbon that trees absorb (sequester) each year and the amount of carbon stored over the lifetime of the tree. Figure 3 shows annual carbon benefits and Table 4 displays the per capita total carbon benefits provided by the tree canopy in each of Cleveland's 34 neighborhoods. The table is color-coded based on whether the neighborhood is above (green), at (yellow), or below (red) the citywide per capita carbon benefit. Neighborhoods that would benefit the most from tree planting to improve carbon sequestration and storage are those that highlighted red for both canopy cover and carbon benefit.

NEIGHBORHOOD DATA	Canopy Cover (2017)	Carbon Per Capita Benefit Value ($)
Bellaire-Puritas	14%	$65.32
Broadway-Slavic Village	18%	$74.05
Brooklyn Centre	23%	$70.38
Buckeye-Shaker Square	23%	$47.38
Buckeye-Woodhill	23%	$86.48
Central	12%	$46.82
Clark-Fulton	17%	$39.47
Collinwood-Nottingham	13%	$80.34
Cudell	15%	$31.42
Cuyahoga Valley	5%	$449.88
Detroit Shoreway	16%	$43.94
Downtown	4%	$18.36
Edgewater	25%	$60.17
Euclid-Green	35%	$154.59
Fairfax	17%	$104.54
Glenville	25%	$79.46
Goodrich-Kirtland Pk	8%	$62.69
Hopkins (Airport)	8%	$1,917.05
Hough	23%	$70.59
Jefferson	16%	$46.44
Kamm's	30%	$117.11
Kinsman	21%	$110.60
Lee-Harvard	18%	$53.56
Lee-Seville	18%	$124.32
Mount Pleasant	21%	$59.57
North Shore Collinwood	20%	$56.31
Ohio City	20%	$52.34
Old Brooklyn	21%	$72.79
St.Clair-Superior	19%	$105.66
Stockyards	16%	$54.98
Tremont	15%	$62.98
Union-Miles	21%	$75.85
University	23%	$87.80
West Boulevard	19%	$36.73
Below Average Neighborhood Tree Canopy Cover (18%)	Below City Per Capita Total Carbon Benefit Value ($70.62)	
At or Near Average Neighborhood Tree Canopy Cover (18%)	At or Near City Per Capita Total Carbon Benefit Value ($70.62)	
Above Average Neighborhood Tree Canopy Cover (18%)	Above City Per Capita Total Carbon Benefit Value ($70.62)	

Table 4. Total Carbon Benefits by Cleveland Neighborhood

Figure 3: Cleveland, Ohio - Total Carbon Benefits

Carbon Benefits
- Under $15,000
- $15,000 - $25,000
- $25,000 - $50,000
- $50,000 - $75,000
- Over $75,000

Tree canopy cover is listed under each neighborhood name.

Project Analysis Date: April 2020
Project Coordinate System: NAD 1983 State Plane Ohio North Feet
Data Source: City of Cleveland, Davey Resource Group, Inc., i-Tree, and ESRI

Stormwater and Pollutions Assessment

Planting and maintaining healthy trees in and adjacent to rights-of-way provides a unique opportunity to increase the effectiveness of gray and green stormwater systems. Existing stormwater management systems are not always adequate to accommodate runoff; when a system is overtaxed, peak flows can back up stormwater, cause flooding, and contribute to combined sewer overflows. Where existing systems are challenged by common stormwater events embedding trees into stormwater control practices like bioretention areas, tree pits, raingardens, or Silva Cells can help to improve functional capacity.

Overall City

The 2015 Cleveland Tree Plan reported that the city's urban forest:

- reduced the amount of stormwater runoff by over 334 million gallons each year (Annual value: $2 million).

Today, Cleveland's urban forest

- annually reduces the amount of stormwater runoff by nearly 308 million gallons, (Annual Value: $1.8 million). **That is a 10% reduction in the amount of stormwater captured and absorbed by Cleveland's trees between 2011-2017. Meaning our sewer systems must contend with an additional 26 million gallons of stormwater run-off per year—which is equal to the amount of water in 40 Olympic-sized swimming pools!**

Neighborhood

Citywide, Cleveland's tree canopy provides $4.65 in stormwater benefits per person each year. Figure 4 shows the annual stormwater benefits evaluation and Table 5 shows the per capita stormwater benefits provided by tree canopy in each of Cleveland's neighborhoods. The table is color-coded based on whether the neighborhood is above (green), near/at (yellow), or below (red) the citywide per capita stormwater benefit ($4.65). To target efforts on improving the quantity and quality of stormwater runoff in Cleveland, tree planting and care activities should be focused on neighborhoods that are highlighted red for both canopy cover and stormwater per capita benefit.

NEIGHBORHOOD DATA	Canopy Cover (2017)	Stormwater Per Capita Benefit Value ($)
Bellaire-Puritas	14%	$4.31
Broadway-Slavic Village	18%	$4.88
Brooklyn Centre	23%	$4.64
Buckeye-Shaker Square	23%	$3.12
Buckeye-Woodhill	23%	$5.70
Central	12%	$3.09
Clark-Fulton	17%	$2.60
Collinwood-Nottingham	13%	$5.30
Cudell	15%	$2.07
Cuyahoga Valley	5%	$29.65
Detroit Shoreway	16%	$2.90
Downtown	4%	$1.21
Edgewater	25%	$3.97
Euclid-Green	35%	$10.19
Fairfax	17%	$6.89
Glenville	25%	$5.24
Goodrich-Kirtland Pk	8%	$4.13
Hopkins (Airport)	8%	$126.35
Hough	23%	$4.65
Jefferson	16%	$3.06
Kamm's	30%	$7.72
Kinsman	21%	$7.29
Lee-Harvard	18%	$3.53
Lee-Seville	18%	$8.19
Mount Pleasant	21%	$3.93
North Shore Collinwood	20%	$3.71
Ohio City	20%	$3.45
Old Brooklyn	21%	$4.80
St.Clair-Superior	19%	$6.96
Stockyards	16%	$3.62
Tremont	15%	$4.15
Union-Miles	21%	$5.00
University	23%	$5.79
West Boulevard	19%	$2.42
Below Average Neighborhood Tree Canopy Cover (18%)	Below City Per Capita Total Stormwater Benefit Value ($4.65)	
At or Near Average Neighborhood Tree Canopy Cover (18%)	At or Near City Per Capita Total Stormwater Benefit Value ($4.65)	
Above Average Neighborhood Tree Canopy Cover (18%)	Above City Per Capita Total Stormwater Benefit Value ($4.65)	

Table 5. Stormwater Benefits by Cleveland Neighborhood

Figure 4: Cleveland, Ohio - Annual Stormwater Benefits
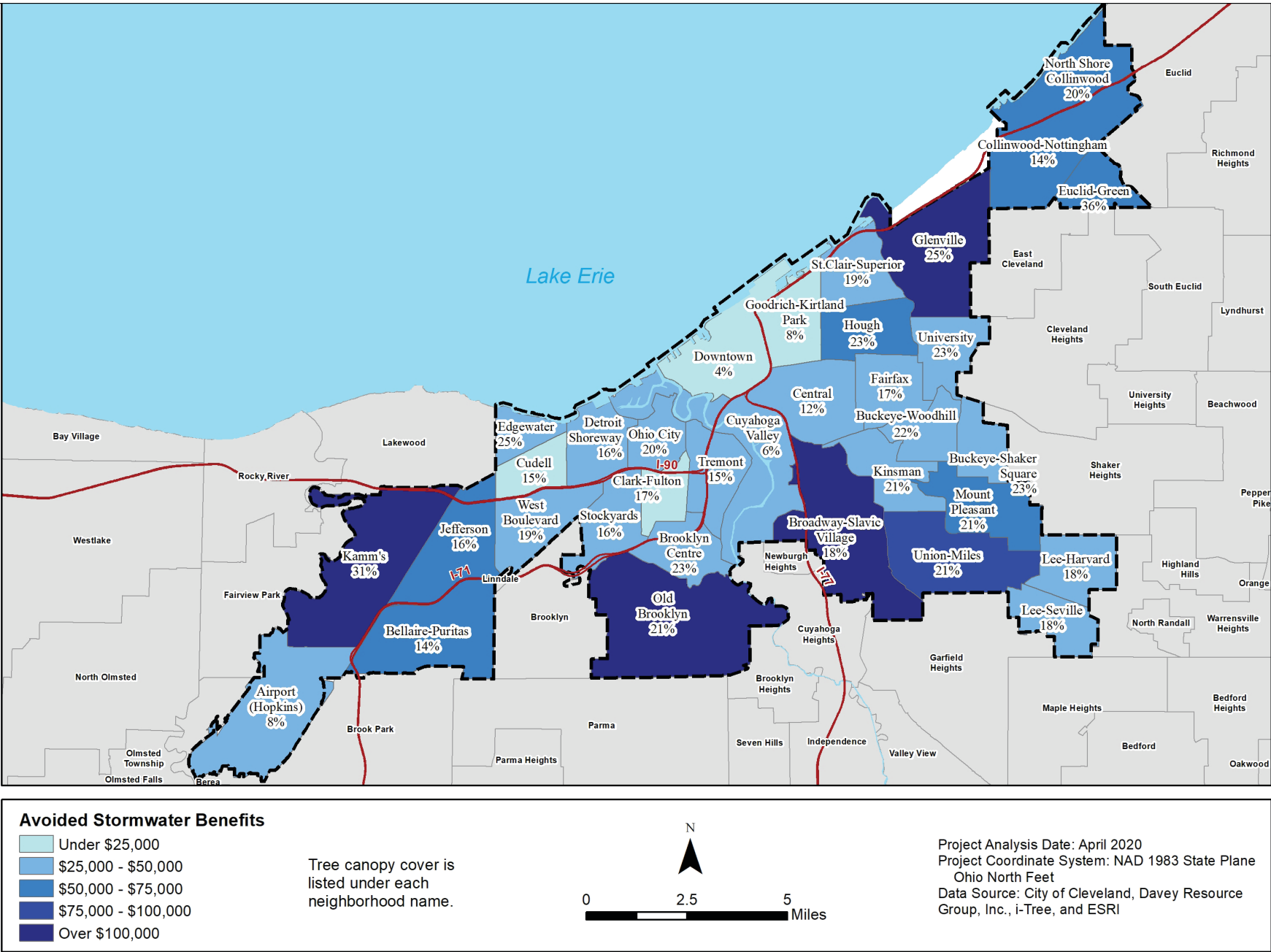
Socio-Economic Factors and Tree Canopy

Trees provide important benefits in a city: they filter our air and water, increase property values, and improve mental and physical health. The distribution and rate of change of tree canopy varies across the city due to weather, climate, disease, economics, and development. Historically in Cleveland, areas with lower income and/or higher proportions of Black residents and residents of color have generally had lower tree canopy cover due to disinvestment. This variability leads to an inequitable distribution of tree canopy cover, meaning neighborhoods with lower tree canopy receive fewer benefits. Comparing social equity factors (like income, age, diseases, population density, etc.) and the distribution of tree canopy across the city can help prioritize tree planting and care in neighborhoods with fewer trees that can stand to benefit the most from additional trees and tree care.

Figure 5 shows the rates of cardiovascular disease and Figure 6 displays the rates of asthma by Cleveland neighborhood. Table 6 on the following pages provide tree canopy cover along with statistics for population and several social-economic and health factors. Neighborhoods that would benefit the most from tree planting to help build stronger, more vibrant communities and address health impacts are highlighted red based on tree canopy and two or more socio-economic/health factors.
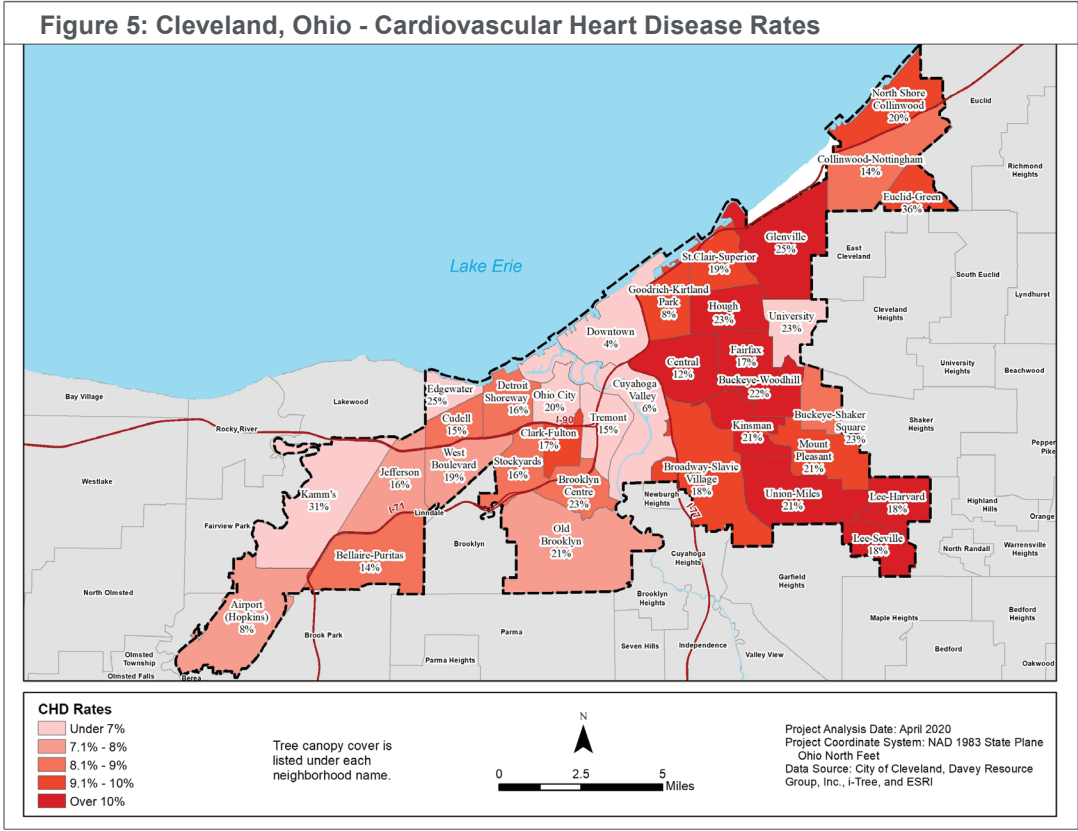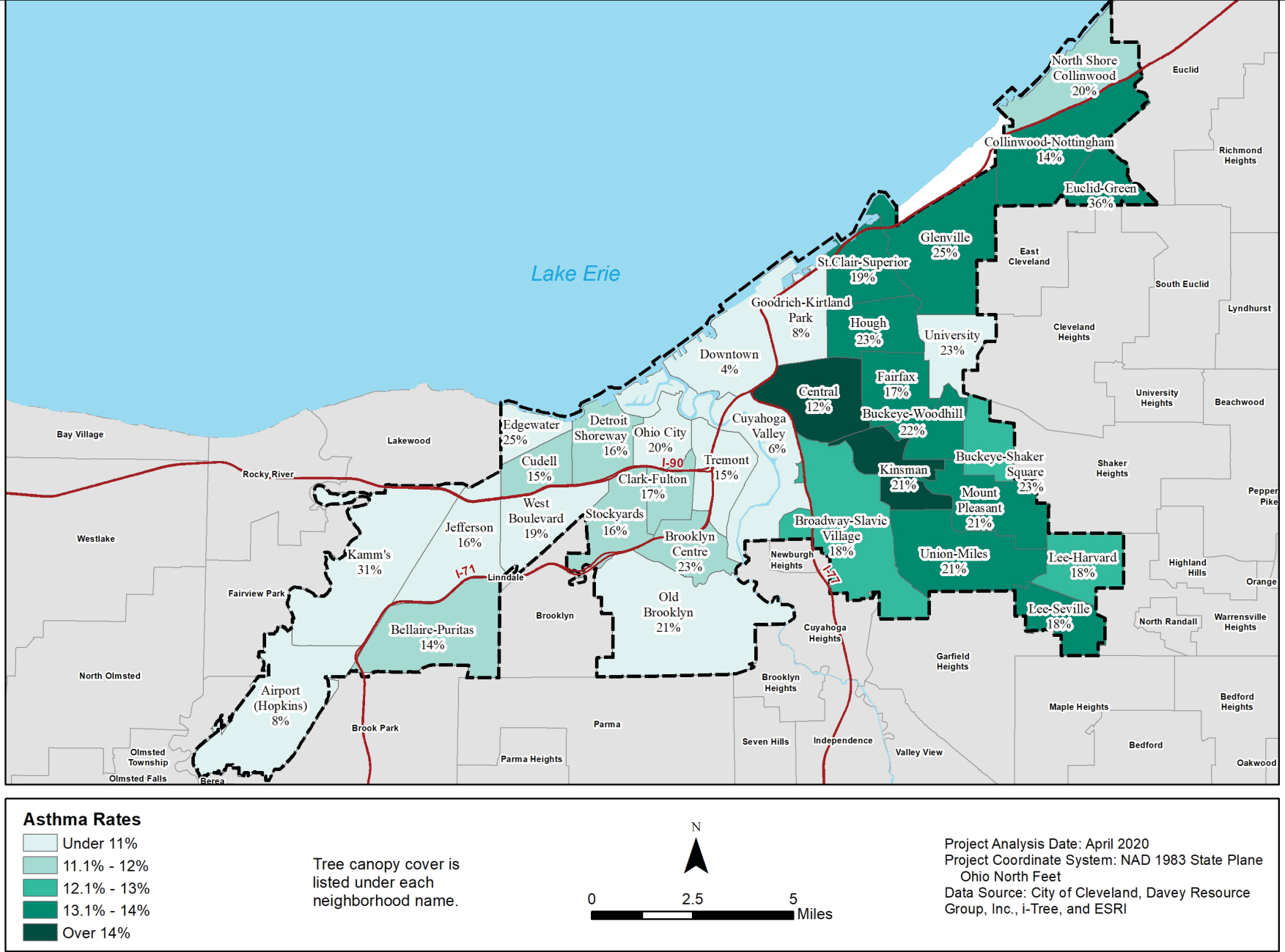

Figure 5: Cleveland, Ohio - Cardiovascular Heart Disease Rates

Figure 6: Cleveland, Ohio - Asthma Rates

Table 6. Tree Canopy Cover and Socio-Economic Factors by Cleveland Neighborhood

High Need / Moderate Need / Low Need

NEIGHBORHOODS	Population Density (pp per sq mi)	% Populations of Color	% Elderly Population	Population with Asthma (Avg. 12%)	Cardiovascular Disease (Avg. 9%)	2017 Canopy Cover (Average 18%)	% Of Workforce Unemployed (Avg. 15%)	Child Poverty Rate (Avg. 29%)	% of Population with less than high school education (Avg. 22%)	Median Household Income (Avg. $30,201)
Bellaire-Puritas	5,099	40%	13%	11%	9%	14%	12%	24%	21%	$35,655
Broadway-Slavic Village	4,604	57%	10%	13%	9%	18%	20%	33%	24%	$24,422
Brooklyn Centre	8,174	39%	8%	11%	8%	23%	14%	31%	29%	$31,414
Buckeye-Shaker Square	9,804	85%	18%	12%	8%	23%	18%	21%	14%	$33,767
Buckeye-Woodhill	7,490	93%	18%	13%	10%	23%	24%	40%	25%	$18,319
Central	5,309	93%	7%	15%	11%	12%	36%	59%	31%	$7,731
Clark-Fulton	10,692	41%	9%	11%	9%	17%	16%	41%	36%	$22,498
Collinwood-Nottingham	4,024	89%	12%	13%	9%	13%	22%	29%	22%	$22,350
Cudell	11,093	51%	8%	12%	8%	15%	16%	36%	27%	$28,222
Cuyahoga Valley	1,172	53%	6%	10%	5%	5%	14%	20%	23%	$28,348
Detroit Shoreway	6,807	35%	10%	11%	9%	16%	9%	32%	27%	$29,800
Downtown	4,292	48%	4%	10%	5%	4%	9%	21%	18%	$38,535
Edgewater	8,459	38%	13%	9%	6%	25%	4%	13%	10%	$44,994
Euclid-Green	4,633	96%	18%	13%	9%	35%	8%	23%	13%	$24,499
Fairfax	2,432	97%	19%	14%	12%	17%	22%	28%	30%	$24,646
Glenville	6,132	98%	16%	13%	10%	25%	24%	34%	21%	$23,303
Goodrich-Kirtland Pk	2,500	63%	14%	10%	9%	8%	8%	26%	29%	$27,281
Hopkins (Airport)	1,238	34%	12%	11%	7%	8%	12%	32%	15%	$39,310
Hough	7,047	95%	16%	14%	12%	23%	26%	36%	28%	$23,880
Jefferson	5,910	31%	12%	11%	8%	16%	11%	23%	23%	$38,497
Kamm's	4,114	14%	15%	9%	6%	30%	6%	8%	10%	$53,063
Kinsman	3,834	98%	13%	14%	11%	21%	30%	52%	21%	$14,451
Lee-Harvard	6,460	98%	26%	12%	11%	18%	16%	23%	17%	$40,612
Lee-Seville	3,867	98%	22%	13%	11%	18%	12%	19%	18%	$26,821
Mount Pleasant	6,493	99%	18%	13%	10%	21%	18%	24%	19%	$22,627
North Shore Collinwood	6,142	66%	19%	12%	10%	20%	12%	28%	16%	$33,894
Ohio City	5,169	29%	11%	10%	7%	20%	8%	32%	16%	$48,094
Old Brooklyn	5,566	24%	13%	10%	8%	21%	9%	16%	18%	$40,833
St.Clair-Superior	3,457	84%	11%	14%	10%	19%	25%	38%	29%	$19,143
Stockyards	5,141	33%	9%	12%	9%	16%	12%	32%	37%	$25,296
Tremont	2,559	20%	7%	10%	7%	15%	8%	21%	16%	$50,834
Union-Miles	4,061	97%	18%	13%	10%	21%	20%	26%	21%	$24,434
University	4,579	37%	10%	10%	5%	23%	9%	28%	14%	$25,632
West Boulevard	8,842	37%	8%	11%	7%	19%	13%	25%	23%	$33,619

Tree Canopy by Neighborhood

At the neighborhood level, changes in tree canopy cover ranged from a 3% increase to a 15% decrease between 2011 and 2017. Of Cleveland's 34 neighborhoods, 30 of them had a decrease in canopy cover, while 4 neighborhoods had an increase.

The average tree canopy cover across Cleveland neighborhoods in 2019 was 18%. Twenty neighborhoods are at or above 18% tree canopy cover; while 14 neighborhoods are below 18% (Figure 7). The annual per capita benefits trees provide is $29.39 (excluding carbon storage value which is not an annual benefit).

To address inequities in neighborhood canopy cover, tree preservation, planting and care activities should be prioritized on both public and private property in neighborhoods that are below the average neighborhood canopy cover of 18% (Table 7 and Figure 8 on page 20).

W. 50th Street Green Ash. (Photo credit: Sandra Albro)

NEIGHBORHOOD DATA	Canopy Cover (2017)	Total Annual Per Capita Benefit Value ($)
Bellaire-Puritas	14%	$28.15
Broadway-Slavic Village	18%	$33.05
Brooklyn Centre	23%	$27.45
Buckeye-Shaker Square	23%	$21.93
Buckeye-Woodhill	23%	$34.90
Central	12%	$13.86
Clark-Fulton	17%	$19.77
Collinwood-Nottingham	13%	$32.52
Cudell	15%	$15.40
Cuyahoga Valley	5%	$96.08
Detroit Shoreway	16%	$19.46
Downtown	4%	$3.94
Edgewater	25%	$24.89
Euclid-Green	35%	$71.82
Fairfax	17%	$44.27
Glenville	25%	$38.36
Goodrich-Kirtland Pk	8%	$17.79
Hopkins (Airport)	8%	$501.14
Hough	23%	$29.38
Jefferson	16%	$24.94
Kamm's	30%	$43.16
Kinsman	21%	$41.34
Lee-Harvard	18%	$27.59
Lee-Seville	18%	$55.77
Mount Pleasant	21%	$29.35
North Shore Collinwood	20%	$23.40
Ohio City	20%	$18.85
Old Brooklyn	21%	$29.99
St.Clair-Superior	19%	$41.70
Stockyards	16%	$23.55
Tremont	15%	$23.27
Union-Miles	21%	$37.93
University	23%	$21.88
West Boulevard	19%	$18.33
Below Average Neighborhood Tree Canopy Cover (18%)	Below City Per Capita Total Annual Tree Benefit Value ($29.39)	
At or Near Average Neighborhood Tree Canopy Cover (18%)	At or Near City Per Capita Annual Tree Benefit Value ($29.39)	
Above Average Neighborhood Tree Canopy Cover (18%)	Above City Per Capita Annual Tree Benefit Value ($29.39)	

Table 7. Tree Canopy Cover by Cleveland Neighborhood

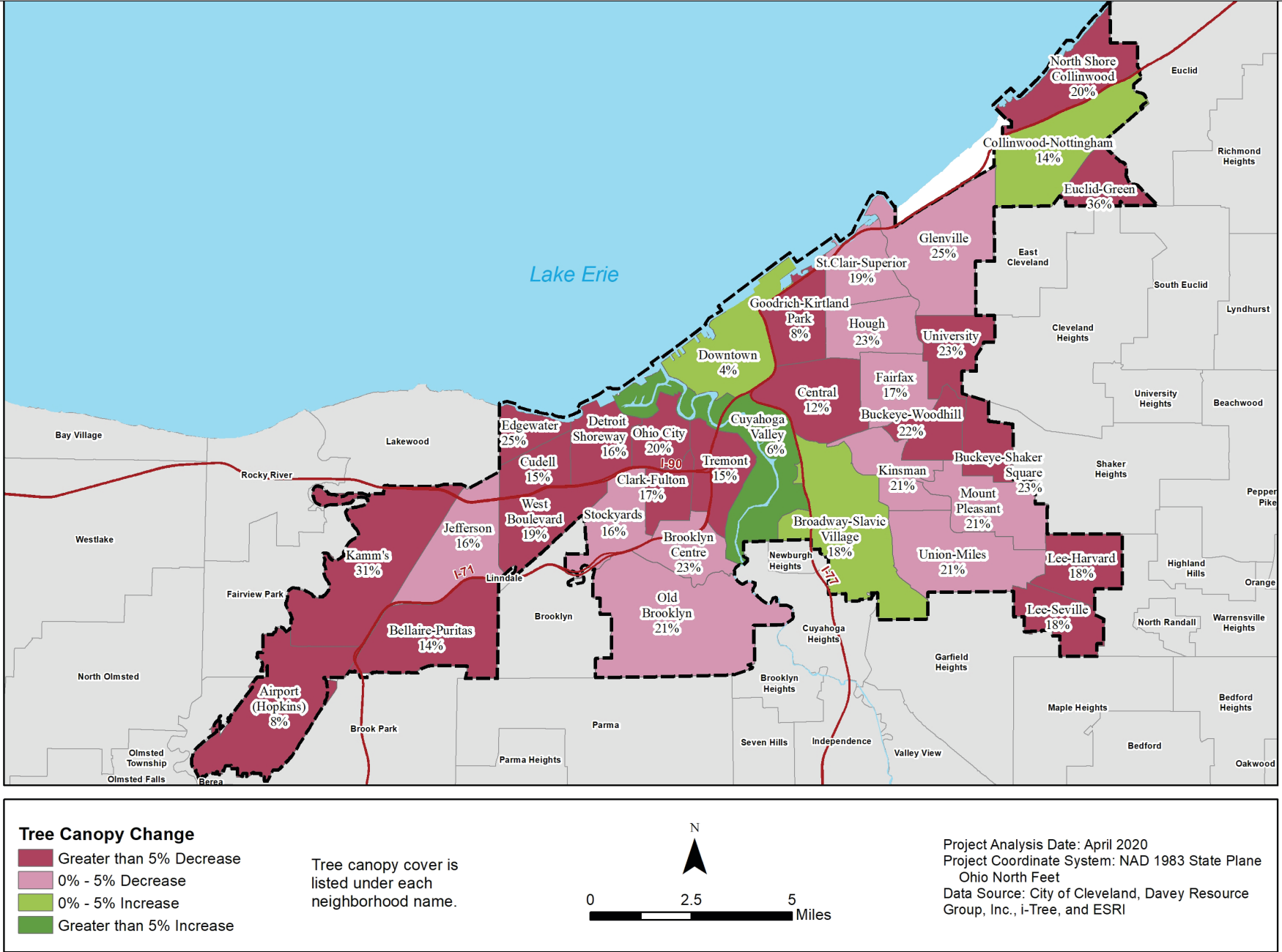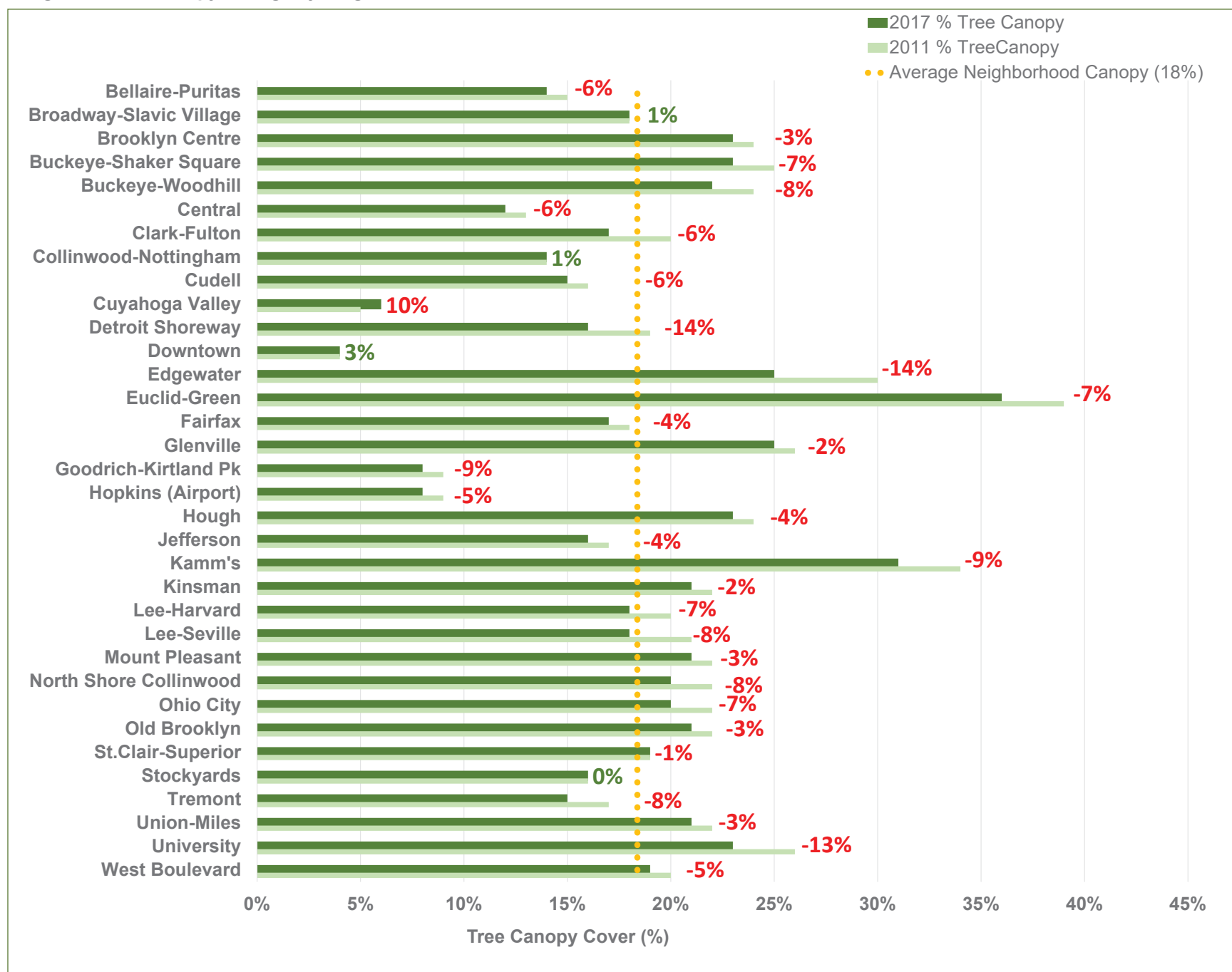**Figure 7: Cleveland, Ohio - Tree Canopy Change**

Tree Canopy Change

- Greater than 5% Decrease
- 0% - 5% Decrease
- 0% - 5% Increase
- Greater than 5% Increase

Tree canopy cover is listed under each neighborhood name.

Project Analysis Date: April 2020
Project Coordinate System: NAD 1983 State Plane Ohio North Feet
Data Source: City of Cleveland, Davey Resource Group, Inc., i-Tree, and ESRI

Figure 8. Tree Canopy Change by Neighborhood, 2011 vs. 2017

Legend:
- 2017 % Tree Canopy
- 2011 % TreeCanopy
- Average Neighborhood Canopy (18%)

Neighborhood	Change
Bellaire-Puritas	-6%
Broadway-Slavic Village	1%
Brooklyn Centre	-3%
Buckeye-Shaker Square	-7%
Buckeye-Woodhill	-8%
Central	-6%
Clark-Fulton	-6%
Collinwood-Nottingham	1%
Cudell	-6%
Cuyahoga Valley	10%
Detroit Shoreway	-14%
Downtown	3%
Edgewater	-14%
Euclid-Green	-7%
Fairfax	-4%
Glenville	-2%
Goodrich-Kirtland Pk	-9%
Hopkins (Airport)	-5%
Hough	-4%
Jefferson	-4%
Kamm's	-9%
Kinsman	-2%
Lee-Harvard	-7%
Lee-Seville	-8%
Mount Pleasant	-3%
North Shore Collinwood	-8%
Ohio City	-7%
Old Brooklyn	-3%
St.Clair-Superior	-1%
Stockyards	0%
Tremont	-8%
Union-Miles	-3%
University	-13%
West Boulevard	-5%

Tree Canopy Cover (%)

THE FUTURE

The 2015 Cleveland Tree Plan established a path forward to improve and expand the city's tree canopy. The new urban tree canopy information for Cleveland provides an opportunity to revisit the Plan's goals and recommended action steps and identify recommendations for future action to stop the loss in canopy cover.

"If you can only plant one tree, plant it in a city."

- Dr. David Nowak, U.S. Forest Service Researcher

CTP Goal One: Recognize trees as critical community infrastructure

Action 1: Establish a unified voice, formalize partnerships

Action 2: Develop an outreach and engagement strategy

Action 3: Develop and implement a funding plan

The growth and development of the Cleveland Tree Coalition has helped to establish a unified voice around the critical role trees play in Cleveland.

Goal One Recommendations

Use CTC's voice to:

- **Communicate & Share Cleveland Tree Data.**
  - o Use tree data and information to fuel the Cleveland community's understanding, engagement and involvement in improving and growing Cleveland's tree canopy.
  - o Share city-specific tree benefit information and research to help the community understand how increased tree canopy can help improve their health and quality of life.

Cleveland Tree Plan in Action!

Identifying Funding Needs

As a next phase in implementing the Cleveland Tree Plan, the Cleveland Tree Coalition Executive Committee has drafted a work plan that can help direct fundraising and future action. The work plan outlines a regional, large-scale approach to tree canopy expansion and preservation with the goal of building equity and climate resilience for all residents.

Moving forward CTP Action Items 1, 2 & 3.

CTP Goal Two: Reverse the trend of canopy loss

Action 7: Establish a canopy goal, plan for canopy updates

Action 8: Institute policy changes supportive of urban forestry

Action 9: Plant with a purpose: trees for neighborhood equity

The CTC established an ambitious goal of 30% canopy cover by 2040. However to achieve this goal will require the successful planting and establishment of over 26,000 trees per year, and the preservation and care of the existing tree canopy over the next 20 years.

Goal Two Recommendations

- **Reframe the canopy goal.**
  - o Explore opportunities to reframe and refine Cleveland's canopy goal to better engage, build support and set achievable targets (see p. 26 - Reframing the Canopy Goal)
- **Plan for successful tree establishment.**
  - o Develop an establishment plan for each tree planting project. The plan should identify the tasks required for successful tree establishment (e.g. watering, mulching), resources required to accomplish tasks, length of establishment period and parties responsible for implementing tasks.
- **Establish guidelines and processes for the Tree Preservation Fund.**
  - o Develop processes and guidelines for assessing, accepting and utilizing fines and penalties that are collected in the City of Cleveland Tree Preservation Fund (Ordinance 1121 -18; Chapters 341 and 509 of City of Cleveland's Code of Ordinances).
  - o Review fines and penalties in Chapter 509 of Cleveland City Code to ensure penalties align with other city ordinances.
- **Understand tree planting refusals.**
  - o Prioritizing tree planting in neighborhoods with low tree canopy cover helps towards achieving an equitable distribution of canopy across the city, however, not all residents want trees. Identify why residents may refuse to have a new street tree planted and develop strategies/solutions to address concerns.
- **Focus on Private Property.**
  - o Focusing efforts on tree planting and maintenance on private property can provide easier opportunities for growing Cleveland's tree canopy.

CTP Goal Three: Assume full stewardship for the tree infrastructure

Action 4: Complete a comprehensive inventory

Action 5: Develop and implement a management plan for city-owned trees

Action 6: Undergo an operational review of city

The City of Cleveland has made a commitment to growing the city street tree population through tree planting, the next step to assuming full stewardship is completing a comprehensive inventory, developing a management plan and completing a forestry operations review. A tree inventory is the foundation of a city's urban forestry program; it provides crucial information on the resources and support needed to sustainably plan, manage and care for it. The street tree inventories underway in MidTown, Detroit Shoreway and other neighborhoods are a great start in providing neighborhood-level tree inventory data. The City is evaluating options for utilizing this data and other strategies to complete a comprehensive public tree inventory.

Goal Three Recommendations

- **Conduct a comprehensive street tree and planting site inventory.** Secure funding; and release bid/request for proposal for City street tree and planting site inventory.

- **Expand partnerships around public tree stewardship.** Deepen relationships and expand partnerships by sharing information about the needs of Cleveland's public trees. Identify opportunities where other organizations and CTC members can assist the City of Cleveland in meeting tree management and planting needs.

Cleveland Tree Plan in Action!

MidTown Tree Inventory Project

In spring 2020 a tree inventory project began in the MidTown neighborhood. The project will collect data on over 3,500 existing trees, planting sites, and stumps, and develop a comprehensive management plan.

The comprehensive management plan will include:
- an analysis and summary of the tree inventory data
- maintenance recommendations and a five-year projected tree maintenance and planting budget
- i-Tree assessment measuring the benefits of the neighborhoods trees
- Neighborhood planting strategy including planting maps, tree species list and proper tree planting and establishment techniques

The project is anticipated to be completed by fall 2020 at a cost of $25,000.

Moving forward CTP Action Items:
- **Action 3:** Develop and implement a funding plan
- **Action 4:** Complete a comprehensive inventory
- **Action 5:** Develop and implement a management plan for city-owned trees
- **Action 9:** Plant with a purpose: trees for neighborhood equity

REFRAMING THE CANOPY GOAL

Periodically reviewing a tree canopy goal provides an opportunity to measure progress and identify successes or challenges in achieving the goal. With the information from the 2020 Tree Canopy Progress report and 2019 Cuyahoga County Urban Tree Canopy Assessment, this section provides an overview of the current canopy goal and provides alternatives to how Cleveland could reframe or revise it in the future.

Establishment & Progress: 30% by 2040

In 2017, the Cleveland Tree Coalition established a two part tree canopy goal to implement Action #7 of the Cleveland Tree Plan, "*Establish a canopy goal and plan for canopy updates.*" In establishing the canopy goal, the CTC looked to create a goal that was aligned with industry standards; realistic; in line with goals set by other cities; yielded measurable results and beneficial outcomes and was customizable to meet the needs and realities of its neighborhoods.

New Data, Improved Information

The 2015 Cleveland Tree Plan **estimated** that Cleveland was **losing 97 acres of canopy** (6,400) trees per year.

The 2017 Cuyahoga County urban tree canopy data found that Cleveland is **actually losing 75 acres of tree canopy** (4,950 trees per year) due to natural mortality not caused by a specific event or pest. This canopy trend is anticipated to continue at a similar pace into the future. The new data allows tree canopy models to more precisely predict future tree canopy scenarios.

Canopy Goal Part One: Plant 50,000 trees by 2020

Part One of the tree canopy goal was established to reverse Cleveland's trend in tree canopy loss. At the time the goal was established it was estimated the city was losing 6,400 trees (97 acres) per year due to old age, disease, development, neglect, storms and other causes. To reverse the trend would require the planting and preservation of twice as many trees as were lost per year or 12,800 trees.
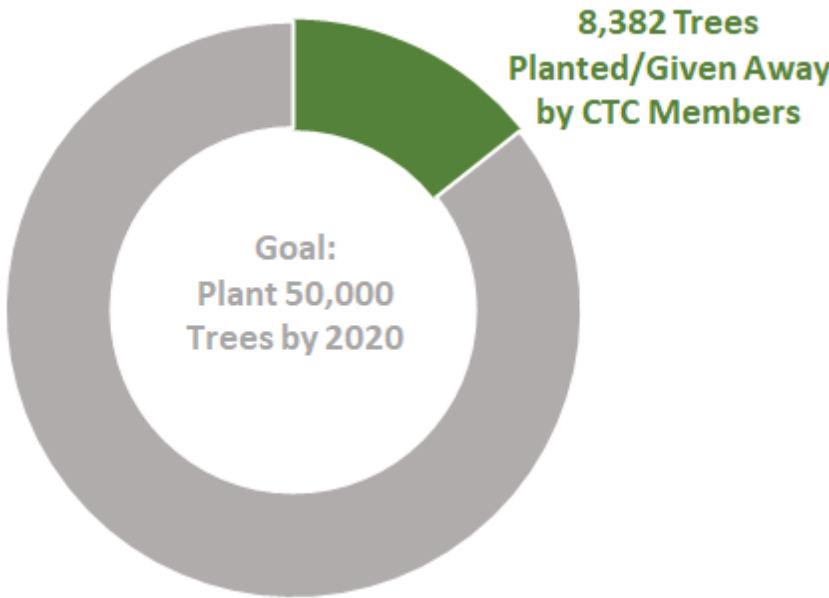
To kick-start the reverse the trend effort, a goal to plant 50,000 trees by 2020 was established. In total, CTC members planted or gave away 8,382 trees in 2018 and 2019. While the number of trees planted by businesses and residents during this period is unknown, it is likely that collective action fell short of reaching the goal of planting 50,000 trees by 2020. The CTC should identify the limitations and challenges that led to this planting goal not being met, and develop solutions for how to move forward and help reverse the canopy loss trend.

Project Up Tree Planting (Photo credit: Bob Perkoski)

Canopy Goal Part Two: Grow urban tree canopy to 30% by 2040

Part Two established a city-wide goal to grow canopy cover from 19% to 30% by 2040 through tree preservation and tree planting. With the initial commitment established in Part One of planting 50,000 trees by 2020, to achieve Part Two would require planting an additional 24,000 trees per year from 2020-2030, which would allow the trees to grow into 30% canopy cover by 2040. With the 2019 Cuyahoga County Urban Tree Canopy Assessment data showing a decline in tree canopy cover, progress on this goal has not yet been achieved.

8,382 Trees Planted/Given Away by CTC Members

Goal: Plant 50,000 Trees by 2020

EXPLORING CANOPY GOAL SCENARIOS

Five canopy goal scenarios were explored to examine the impact different strategies would have on Cleveland's tree canopy cover (Figures 9 and 10 on the following pages). The scenarios were developed based on issues and opportunities identified during the review of the current canopy goal.

Issues

- The 30% by 2040 goal was set based on limited data and information.
- A standard method of collecting tree planting data from CTC members and non-Coalition stakeholders is currently not in place. Information is provided on a voluntary basis, and is not inclusive of all the tree planting being done in Cleveland.

Opportunities

- The new urban tree canopy assessment provides updated data and information to more accurately predict future tree canopy scenarios based on actual historic trends and not estimates.
- Momentum and action from the CTC members can help to refine planting data and ensure that all trees planted are counted.
- Recent commitments in funding can have a significant impact on improving and increasing tree canopy if the commitments come to full fruition.

CANOPY GOAL SCENARIO	Tree Planting Per Year
Scenario 1: Current Canopy Trend. Explores changes in canopy cover If no changes are made to current actions.	2,300
Scenario 2: No Net Loss. Examines how planting to replace the annual rate of canopy loss in Cleveland (75 acres) will impact canopy cover.	5,255
Scenario 3: Reverse the Trend. Analyzes how reversing the trend from canopy loss to canopy gain will impact tree canopy cover.	11,575
Scenario 4: CTC Members and City of Cleveland Tree Planting. Examines the impact that increased and extended tree planting efforts can have on Cleveland Tree Canopy cover	14,900
Scenario 5: 30% by 2040. Identifies the significant increase in Tree planting needed to achieve the current canopy goal of 30% by 2040	28,500

The scenarios include the number of trees that would need to be planted each year beginning in 2021 and estimated costs. All of the Scenarios account for the current tree canopy mortality and the mortality rate of newly planted trees (see Canopy Goal Scenario Model).

Understanding the implications of these scenarios and the resources needed to implement them can help inform the strategies the CTC and the broader Cleveland community choose to use in growing Cleveland's tree canopy. For example, to meet the current canopy cover goal of 30% by 2040 would require a substantial investment to plant and successfully establish 28,400 trees per year. A more achievable near-term goal is to reverse the trend of canopy loss.

Canopy Goal Scenario Model

The canopy goal scenario model used the following inputs and assumptions to determine the projected canopy change, number of trees to be planted and costs to achieve each goal scenario.

Trees Per Acre

- 66 trees
  - Based on the number of medium-sized canopy trees with a 30-foot canopy spread fit on one acre.

Mortality Rate*

- Natural Annual Mortality Rate: 0.84% (75 acres per year)
- City of Cleveland Tree Planting: 4.4%
- CTP Member Plantings: 6.5%
- CTP Member Seedling Giveaway: 25%

CTC Member Tree Planting

CTC Member tree planting is based on an average of 2,300 trees planted per year in total by all CTC members. This does not include the average 2,700 tree seedlings given away by members each year.

- Scenarios assume that CTC Member tree plantings will continue to occur at the current yearly average.

Tree Planting Costs

- City of Cleveland Tree Planting: $500/tree (City estimate)
  - Based on average cost provided by the City of Cleveland for a tree planting contractor to purchase and plant a 1.75-2.25" balled and bulapped tree in the city right-of-way
- CTC Member Plantings/Additional New Tree Planting: $287.50/tree
  - Based on an average estimated cost which includes tree purchase, supplies, planting and CTC Member time to plan, administer and coordinate planting activities. The average cost takes into consideration the variety of tree sizes CTC Members plant and giveaway, from seedlings ($2/tree) to 2" caliper B&B trees ($500/tree).

*Mortality Rates were established based on the following sources:

Analysis of canopy loss between 2011 and 2017 based on Cuyahoga County urban tree canopy assessment data

Hibert et al, Urban Tree Mortality: A Literature Review. Arboriculture and Urban Forestry 45(5), September 2019 - p 167-200

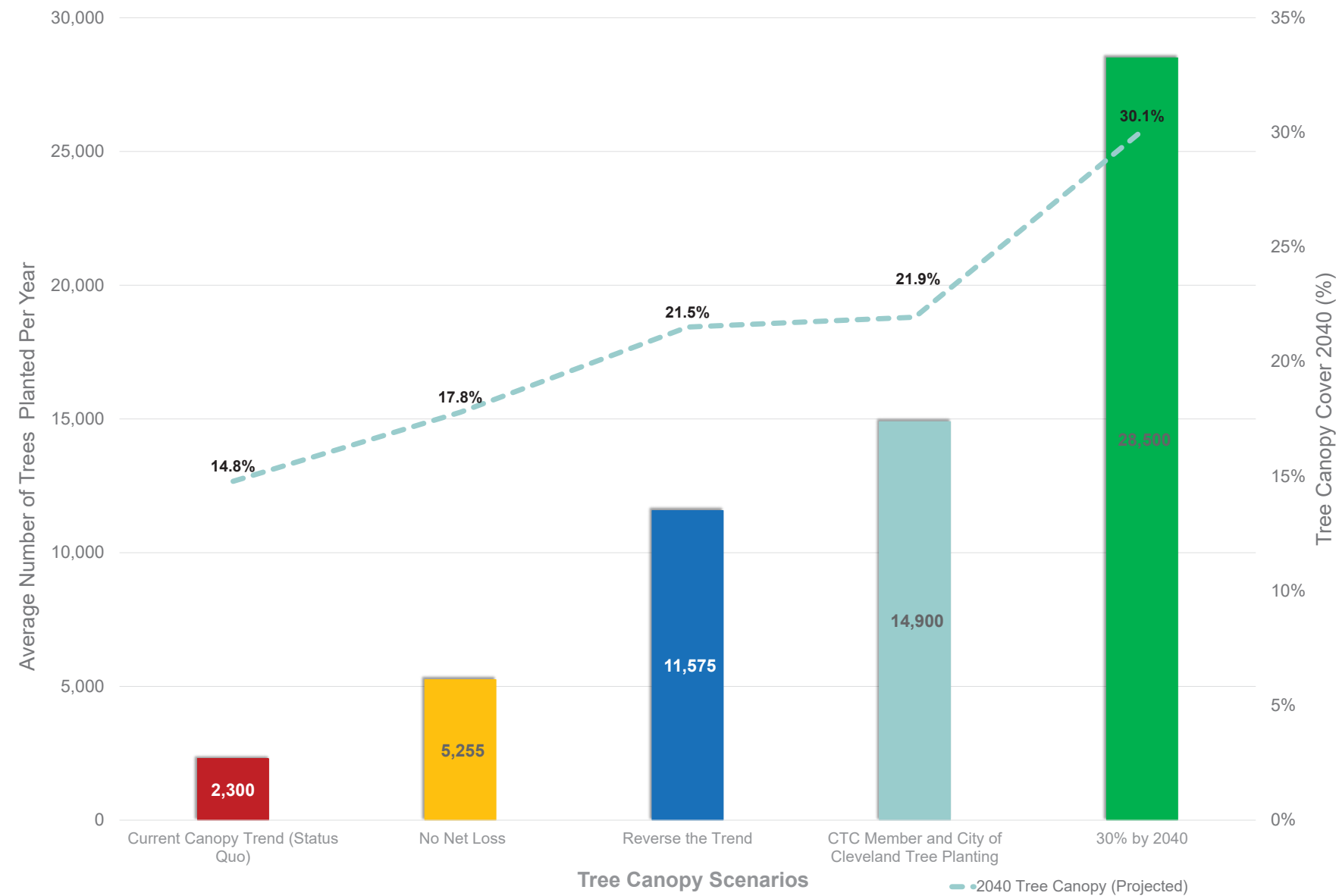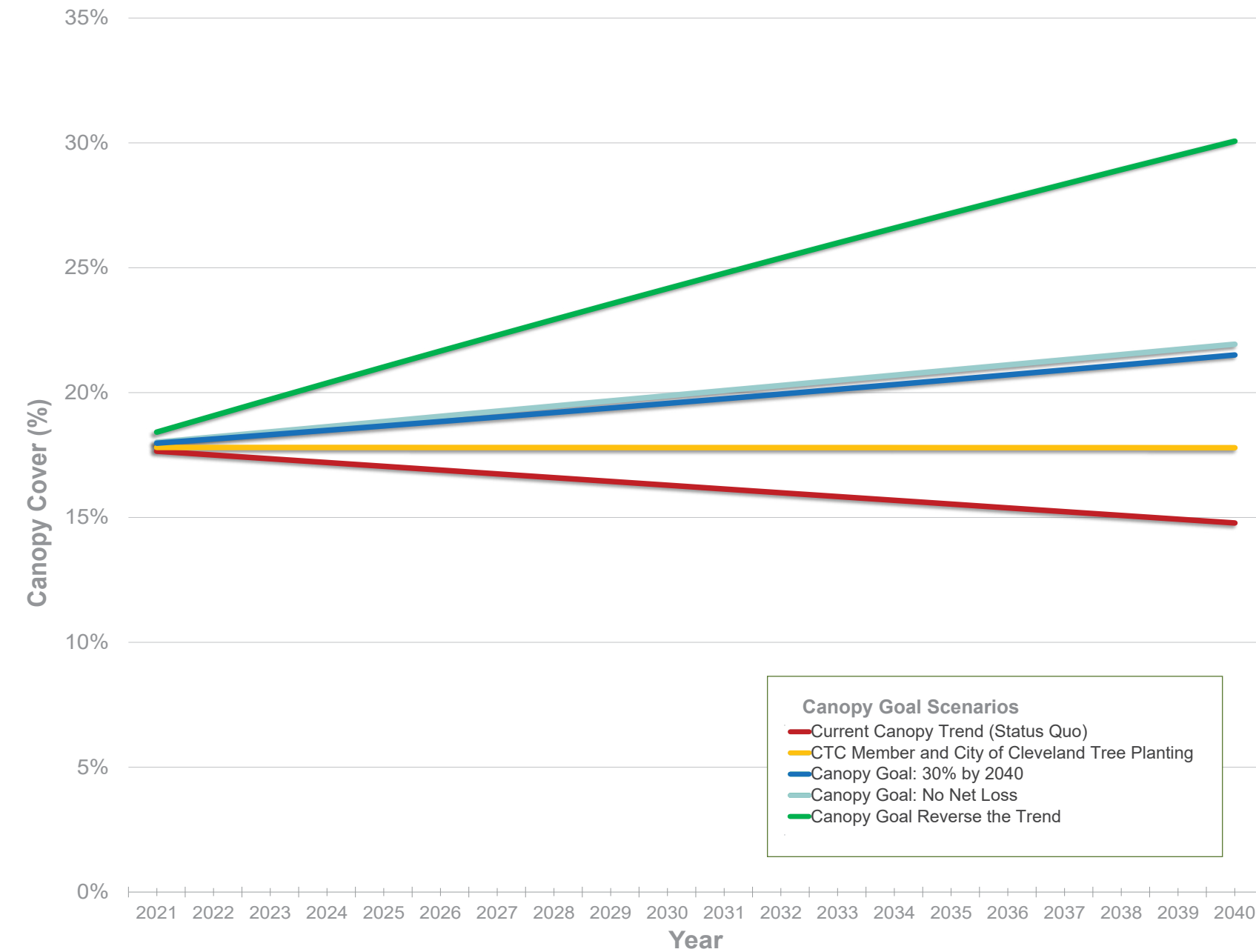**Figure 9. New Trees Planted Per Year between 2020-2040 to Achieve Canopy Goals**

Figure 10. Canopy Goal Scenarios

SCENARIO 1: Current Canopy Trend (Status Quo)

Trees Planted/Year: 2,300

Total Cost/Year: $661,250

Tree Canopy Cover 2040: 14.8%

The Current Canopy Trend scenario finds that Cleveland's tree canopy is projected to fall to 14.8% by 2040, if no changes are made to current actions. The annual tree planting by CTC members (avg. 2,300) does not make up for the annual 75 acre loss in tree canopy (est. 4,950 trees).

This scenario is not without its costs—tree benefits will continue to decrease, and CTC members will spend an estimated $661,250 to plant at current levels.
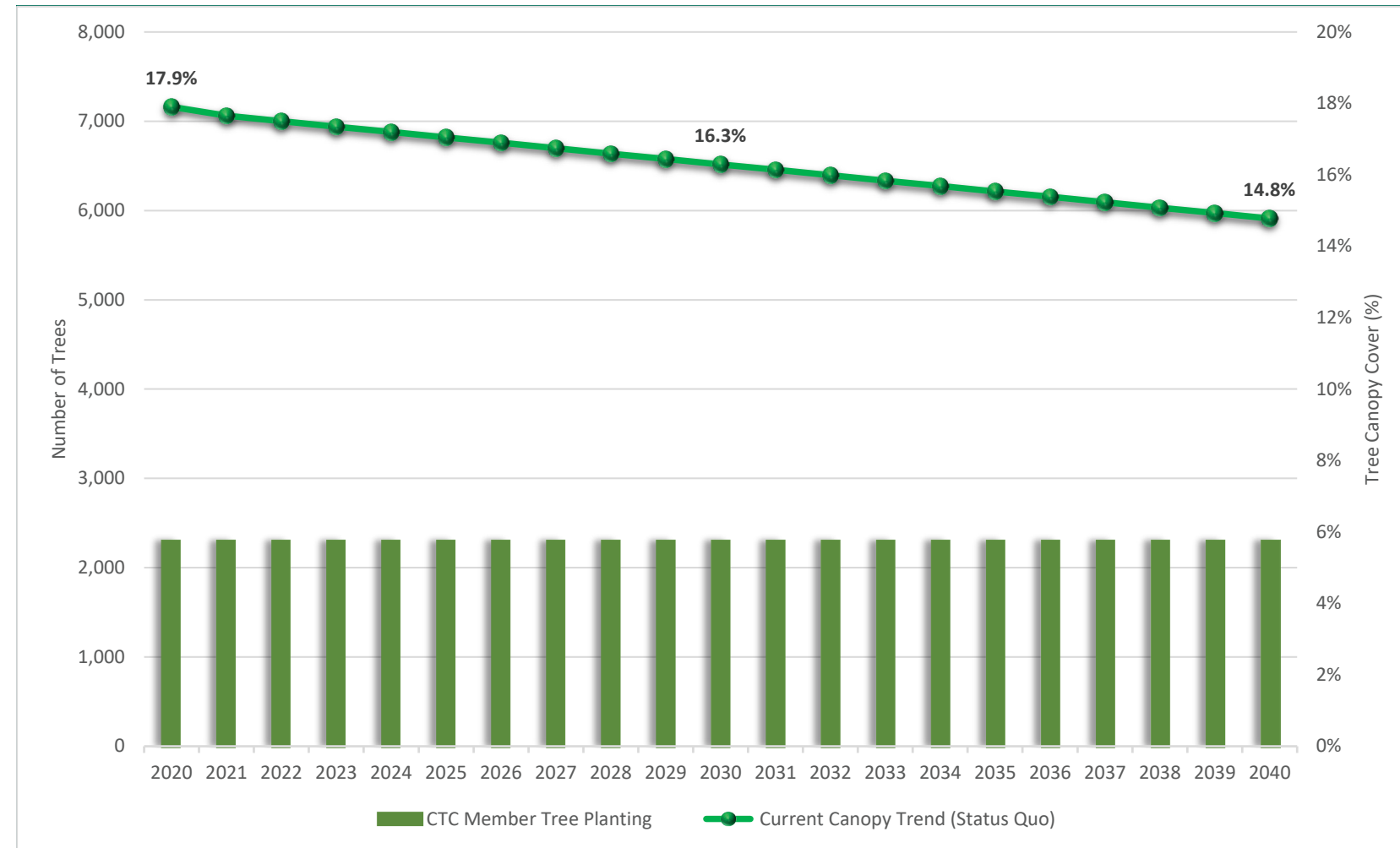

SCENARIO 2: No Net Loss

Total Trees Planted/Year: 5,255

Total Cost/Year: $1,723,313

Tree Canopy Cover 2040: 17.9%

The No Net Loss scenario focuses on stopping the canopy loss trend by maintaining Cleveland's canopy cover at 17.9%. Through this scenario, the number of trees planted is based on replacing the 75 acres of canopy lost each year to old age, disease, development, neglect, storms, and other causes. The scenario includes the City of Cleveland's 10-year $1 million tree planting commitment - estimated at 2,000 trees planted per year.
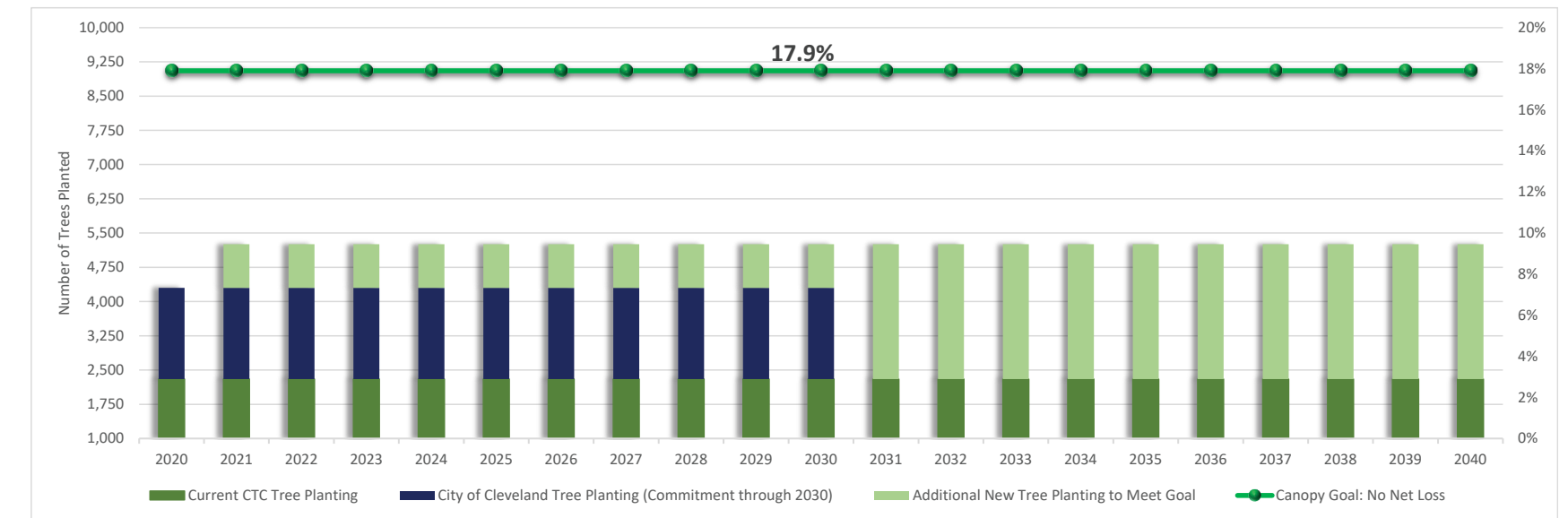
SCENARIO 3: Reverse the Trend

Trees Planted/Year: 11,575

Total Cost/Year: $3,540,313

Tree Canopy Cover 2040: 21.7%

"Reverse the Trend" is one of the three goals of the Cleveland Tree Plan. This scenario looks at what would actually be needed to reverse Cleveland's canopy trend from canopy loss to canopy gain. The number of trees planted is based on planting 150 canopy acres/year or 75 acres to replace what is lost each year and 75 acres to grow the canopy. The scenario includes the City of Cleveland's 10-year $1 million tree planting commitment - estimated at 2,000 trees per year
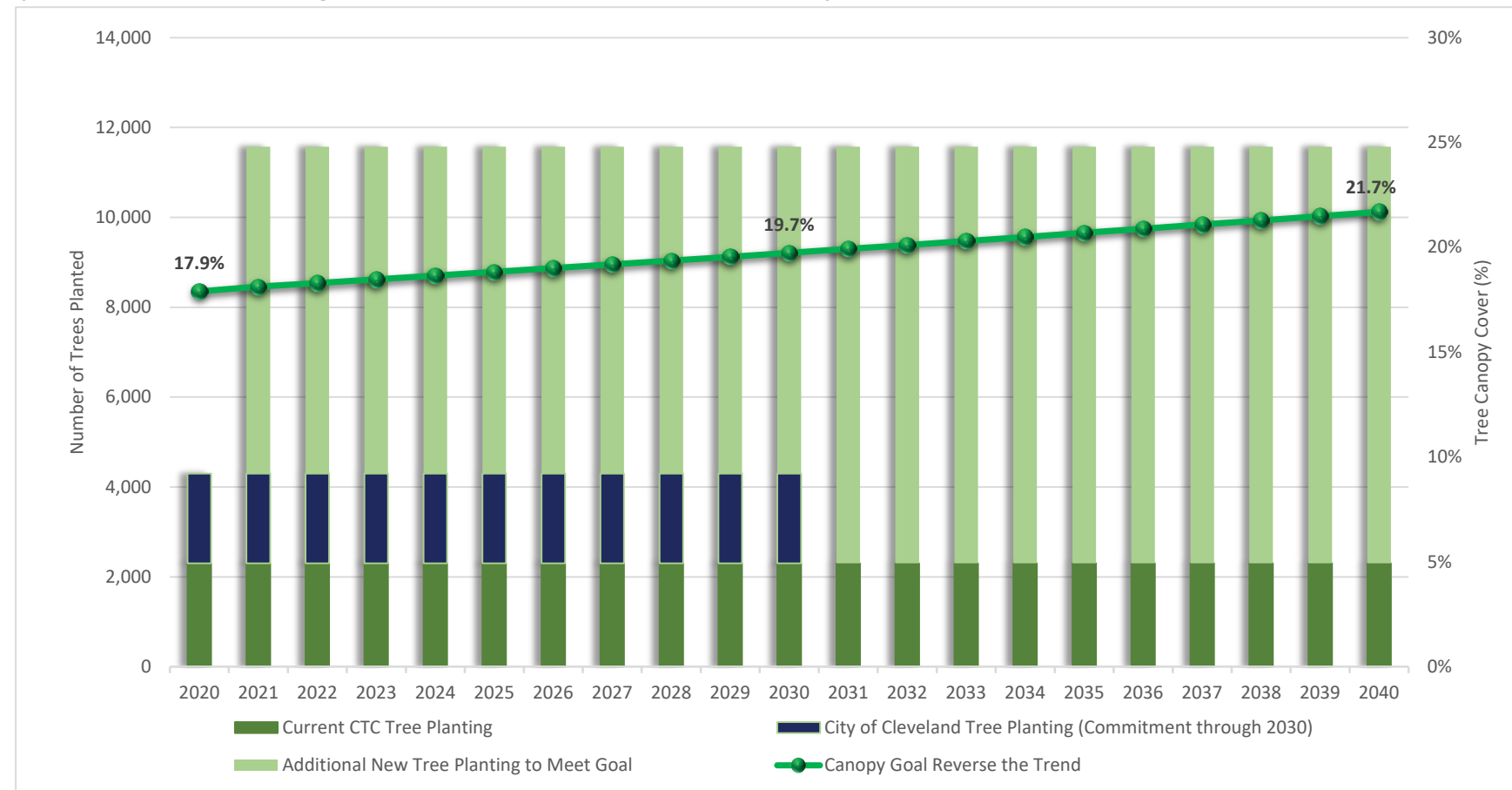
## SCENARIO 4: CTC Members and City of Cleveland Tree Planting

Trees Planted/Year: 14,900

Total Cost/Year: $4,708,750

Tree Canopy Cover 2040: 21.9%

This scenario explores how increases in tree planting by the City of Cleveland and the CTC Members will impact tree canopy cover. The scenario assumes that the City of Cleveland's $1M street tree planting funding is extended past the initial 10 year commitment.
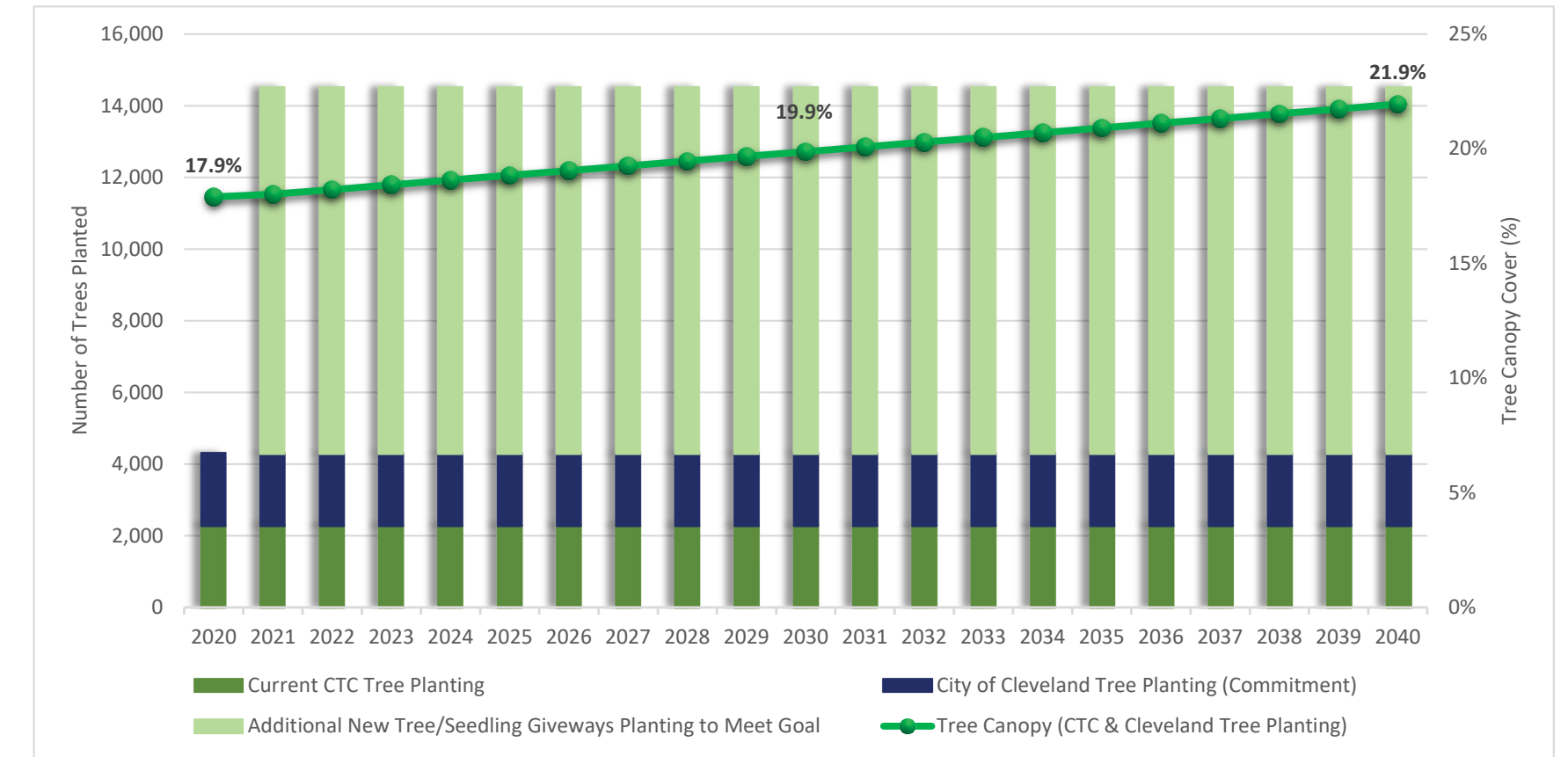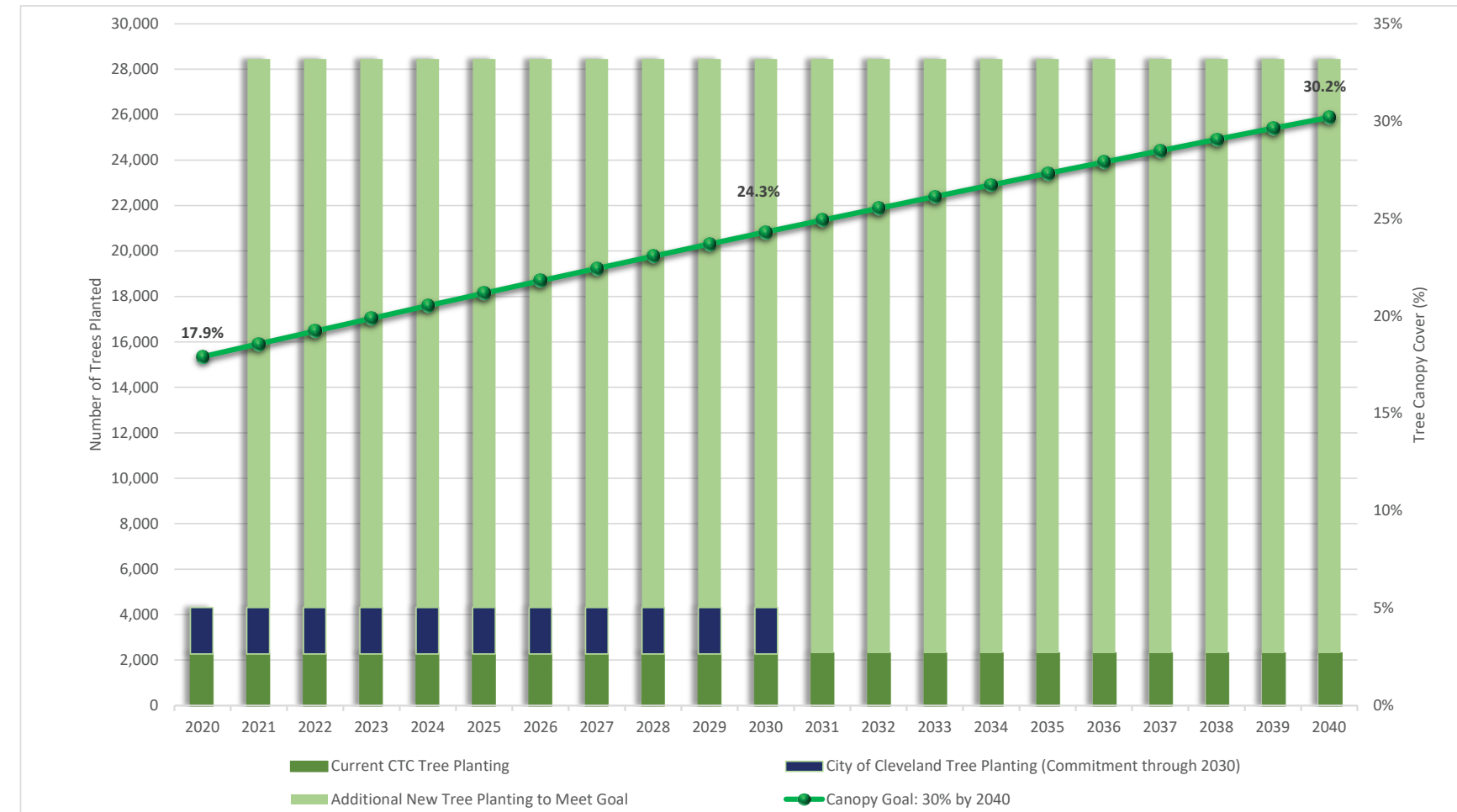
SCENARIO 5: 30% Canopy Cover by 2040

Trees Planted/Year: 28,500
Cost/Year: $8,620,000
Tree Canopy Cover 2040: 30%

To achieve Cleveland's current canopy goal of 30% by 2040 will require planting approximately 28,500 trees/year beginning in 2021. The estimated cost to implement this scenario is $8,620,000/year and includes the City of Cleveland's 10-year $1 million tree planting commitment - estimated at 2,000 trees per year.

Legend:
- Current CTC Tree Planting
- City of Cleveland Tree Planting (Commitment through 2030)
- Additional New Tree Planting to Meet Goal
- Canopy Goal: 30% by 2040

Discussion: Reframing the Goal—Canopy Goal Scenarios

These scenarios are provided to give context to the current goal and to help show the level of planting and investment required to impact Cleveland's current tree canopy trend. The 30% canopy goal is attainable but not at the current level of tree planting; significant increases in tree planting, especially on private property, are needed if the goal is to be reached by 2040. Establishing a tree canopy goal is challenging; however, periodically reviewing the goal against new data and measuring progress, like this report has done, are important in understanding if the goal is right for the city or if it should be reframed to better meet community conditions. Cleveland's current 30% tree canopy goal may be better re-framed as the city's long-term **canopy vision** that is not tied to a particular year; and then establishing short-term targets, such as reversing the trend of canopy loss, that can be achieved while CTC Members are ramping up tree planting to meet the canopy vision.

While the scenarios provide examples of targets, there are many ways that Cleveland can establish short-term targets to meet the goal of reversing the trend in canopy loss and working towards achieving the long-term canopy vision, including:

Tree canopy by neighborhood

- This metric establishes a neighborhood tree canopy target (e.g. every neighborhood in Cleveland should have a minimum of 18% tree canopy cover).

Tree benefit per capita

- Sets a tree benefit per capita target that each neighborhood would strive to achieve (e.g. achieve a tree benefit per capita of $29.40 or greater in each Cleveland neighborhood)

Establishing canopy targets by land use type

- Establishes tree canopy targets by land use type (e.g. commercial areas should achieve 25% canopy cover).

Earth Day 2018: Tree Planting
(Photo credit: Sonny Ali)

CONCLUSION

> "Our goals can only be reached through a vehicle of a plan, which we must fervently believe, and upon which we must vigorously act. There is no other route to success."
>
> *- Pablo Picasso*

The 2015 Cleveland Tree Plan has served as a catalyst in building momentum around improving and growing Cleveland's tree canopy. While this report provides a sobering assessment of the state of Cleveland's urban tree canopy five years after the Plan's release, it highlights the urgency that *now is the time* to "vigorously act" upon the recommendations and actions in the Plan and this report, to bring the Forest City back to Cleveland.

To do this will require *everyone's* effort, from Cleveland Tree Coalition (CTC) members to residents to businesses. Planting, caring and preserving trees on private and public property are activities everyone can participate in to help reverse the trend in canopy loss. Information in this report should be used to identify areas most in need of canopy cover to focus these efforts on.

For these activities to be successful will require strategic investment to expand and maintain the public tree resource; awareness and neighborhood engagement to help improve residential tree preservation and planting; and other private landowners joining the CTC to explore ways to positively impact Cleveland's tree canopy.

The CTC is building resources to help Clevelanders:

- learn more about tree planting, care, and maintenance;
- make a plan to plant and care for trees on your property;
- log your tree planting efforts; and
- support community tree initiatives.

To learn more about the CTC, its members and the initiatives we are working on visit:

www.ClevelandTrees.org or https://www.facebook.com/cletrees.

APPENDIX A: PURPOSEFUL PLANTING REVISITED

The Cleveland Tree Plan provided Table 1 in Appendix B to help implement **Action #9: Plant with a Purpose for Neighborhood Equity.** The table has been revised based on data from the 2019 urban tree canopy assessment report and the Cuyahoga County Climate Change Vulnerability Assessment.

The areas highlighted in red in the table are high need for tree canopy, yellow is moderate need and green is low need. Neighborhoods that would benefit the most from tree planting, preservation and care to help build healthier, stronger and more vibrant communities are those highlighted in red based on tree canopy and two or more other factors.

	High Need										

NEIGHBORHOODS	Population Density (pp per sq mi)	% Populations of Color	% Elderly Population	% Canopy Cover (2017)	Potential Tree Canopy	AIR QUALITY Per Capita Benefit by Value ($)	CARBON BENEFIT Per Capita Benefit by Value ($)	STORMWATER Per Capita Benefit by Value ($)**	ENERGY Per Capita Benefit by Value ($)	URBAN HEAT ISLAND (% of area 2F or more above average)	Population with Asthma	Cardiovascular Disease	% of Workforce Unemployed (Avg. 15%)	Child Poverty Rate (Avg. 29%)	% of Population with less than high school education (Avg. 22%)	Median Household Income (avg. $30,201)
Bellaire-Puritas	5,099	40%	13%	14%	57%	$3.70	$65.32	$4.31	$7.96	16%	11%	9%	12%	24%	21%	$35,655
Broadway-Slavic Village	4,604	57%	10%	18%	54%	$4.20	$74.05	$4.88	$9.52	25%	13%	9%	20%	33%	24%	$24,422
Brooklyn Centre	8,174	39%	8%	23%	50%	$3.99	$70.38	$4.64	$8.32	27%	11%	8%	14%	31%	29%	$31,414
Buckeye-Shaker Square	9,804	85%	18%	23%	47%	$2.68	$47.38	$3.12	$5.71	8%	12%	8%	18%	21%	14%	$33,767
Buckeye-Woodhill	7,490	93%	18%	22%	55%	$4.90	$86.48	$5.70	$7.11	8%	13%	10%	24%	40%	25%	$18,319
Central	5,309	93%	7%	12%	59%	$2.65	$46.82	$3.09	$1.00	54%	15%	11%	36%	59%	31%	$7,731
Clark-Fulton	10,692	41%	9%	17%	49%	$2.24	$39.47	$2.60	$7.68	33%	11%	9%	16%	41%	36%	$22,498
Collinwood-Nottingham	4,024	89%	12%	13%	57%	$4.55	$80.34	$5.30	$7.46	31%	13%	9%	22%	29%	22%	$22,350
Cudell	11,093	51%	8%	15%	49%	$1.78	$31.42	$2.07	$5.23	37%	12%	8%	16%	36%	27%	$28,222
Cuyahoga Valley	1,172	53%	6%	5%	65%	$25.49	$449.88	$29.65	$5.67	15%	10%	5%	14%	20%	23%	$28,348
Detroit Shoreway	6,807	35%	10%	16%	51%	$2.49	$43.94	$2.90	$6.21	24%	11%	9%	9%	32%	27%	$29,800
Downtown	4,292	48%	4%	4%	60%	$1.04	$18.36	$1.21	$0.03	37%	10%	5%	9%	21%	18%	$38,535
Edgewater	8,459	38%	13%	25%	48%	$3.41	$60.17	$3.97	$5.67	20%	9%	6%	4%	13%	10%	$44,994
Euclid-Green	4,633	96%	18%	35%	43%	$8.76	$154.59	$10.19	$13.15	14%	13%	9%	8%	23%	13%	$24,499
Fairfax	2,432	97%	19%	17%	55%	$5.92	$104.54	$6.89	$9.68	11%	14%	12%	22%	28%	30%	$24,646
Glenville	6,132	98%	16%	25%	49%	$4.50	$79.46	$5.24	$12.66	12%	13%	10%	24%	34%	21%	$23,303
Goodrich-Kirtland Pk	2,500	63%	14%	8%	49%	$3.55	$62.69	$4.13	$2.16	76%	10%	9%	8%	26%	29%	$27,281
Hopkins (Airport)	1,238	34%	12%	8%	69%	$108.61	$1,917.05	$126.35	$75.00	14%	11%	7%	12%	32%	15%	$39,310
Hough	7,047	95%	16%	23%	51%	$4.00	$70.59	$4.65	$8.87	16%	14%	12%	26%	36%	28%	$23,880
Jefferson	5,910	31%	12%	16%	51%	$2.63	$46.44	$3.06	$10.79	39%	11%	8%	11%	23%	23%	$38,497
Kamm's	4,114	14%	15%	30%	47%	$6.63	$117.11	$7.72	$11.55	9%	9%	6%	6%	8%	10%	$53,063
Kinsman	3,834	98%	13%	21%	57%	$6.27	$110.60	$7.29	$9.01	10%	14%	11%	30%	52%	21%	$14,451
Lee-Harvard	6,460	98%	26%	18%	57%	$3.03	$53.56	$3.53	$11.58	6%	12%	11%	16%	23%	17%	$40,612
Lee-Seville	3,867	98%	22%	18%	60%	$7.04	$124.32	$8.19	$16.49	5%	13%	11%	12%	19%	18%	$26,821
Mount Pleasant	6,493	99%	18%	21%	53%	$3.38	$59.57	$3.93	$10.32	6%	13%	10%	18%	24%	19%	$22,627
North Shore Collinwood	6,142	66%	19%	20%	52%	$3.19	$56.31	$3.71	$6.63	9%	12%	10%	12%	28%	16%	$33,894
Ohio City	5,169	29%	11%	20%	44%	$2.97	$52.34	$3.45	$5.19	23%	10%	7%	8%	32%	16%	$48,094
Old Brooklyn	5,566	24%	13%	21%	53%	$4.12	$72.79	$4.80	$9.69	15%	10%	8%	9%	16%	18%	$40,833
St.Clair-Superior	3,457	84%	11%	19%	54%	$5.99	$105.66	$6.96	$12.51	23%	14%	10%	25%	38%	29%	$19,143
Stockyards	5,141	33%	9%	16%	53%	$3.11	$54.98	$3.62	$7.32	20%	12%	9%	12%	32%	37%	$25,296
Tremont	2,559	20%	7%	15%	47%	$3.57	$62.98	$4.15	$4.19	29%	10%	7%	8%	21%	16%	$50,824
Union-Miles	4,061	97%	18%	21%	48%	$4.30	$75.85	$5.00	$14.05	9%	13%	10%	20%	26%	21%	$24,434
University	4,579	37%	10%	23%	54%	$4.97	$87.80	$5.79	$2.01	16%	10%	5%	9%	28%	14%	$25,632
West Boulevard	8,842	37%	8%	19%	55%	$2.08	$36.73	$2.42	$7.06	16%	11%	7%	13%	25%	23%	$33,619

Legend: High Need / Moderate Need / Low Need

*Environmental benefits provided by i-Tree Canopy Version 7.0 (2020).

**To maximize the stormwater benefits of trees—they should have a healthy, well maintained canopy and be utilized in stormwater control practices like bioretention areas, tree pits, raingardens or Silva Cells.