



RELEAF

MANCHESTER AND CHATEAU

A plan and program to increase tree canopy cover and engagement in the Manchester and Chateau neighborhoods

Steering Committee

Lisa Ceoffe

City Forester, City of Pittsburgh

Matthew Erb

Director of Urban Forestry, Tree Pittsburgh

Stephanie Joy Everett

City Planner, City of Pittsburgh

Joseph Fedor

Environmental Scientist, ALCOSAN

Lisa Freeman

Manchester resident, Growing Together Garden

Carol Gonzalez

Manchester resident

Michelle Jones

Manchester Resident, Page St/Conroy Gardens

Alison Keating

Manchester resident

Jen Kullgren

Community Forester, Tree Pittsburgh

Renee Rosensteel

Manchester resident

Vasilios Scoumis

Principal, Manchester Academic Charter School

Kylie Stackis

SCA Green Cities Fellow, Tree Pittsburgh

Bruce Woods

Supervisor Vegetation Management, Duquesne Light

Michelle Wright

Executive Administrative Assistant, Manchester Citizen Corporation

Acknowledgments

A grand thank you to our steering committee members that provided leadership and feedback throughout the planning process. Your guidance and dedication is very appreciated. This project was made possible through the generous support of the Pittsburgh Foundation.



This picture was taken at a tree planting in Manchester during Fall 2015. This planting continued to green a heavily trafficked corridor to improve air quality, reduce noise, and enhance the local aesthetics. This corridor straddles the border between the Manchester and Chateau neighborhoods. These trees will continue to provide additional benefits to the local community and positively impact future generations.

Table of Contents

- 4 Executive Summary
- 6 What Do We Have? State of the Urban Forest
- 14 What Do We Want? Planning Process and Public Engagement
- 15 How Do We Get There? Recommendations and Implementation
- 16 ReLeaf Manchester: Street Trees
- 20 ReLeaf Manchester: Private Property
- 22 ReLeaf Manchester: Public Property
- 23 ReLeaf Chateau: General Recommendations
- 25 Summary of Recommendations
- 28 How Are We Doing? Evaluation and Monitoring
- 29 References
- 30 Appendix



Tree planting along Chateau Street in Manchester, Fall 2015 (Renee Rosensteel)



Tree planting along the Ohio River and the Three Rivers Heritage Trail, Fall 2010 (Western Pennsylvania Conservancy)

Why create neighborhood-level urban forestry master plans?

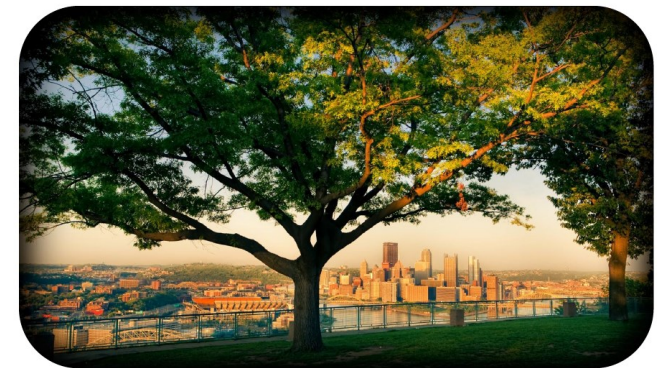
Many of the recommendations in the 2012 City of Pittsburgh Urban Forest Master Plan (read full plan at www.treepittsburgh.org) include increasing tree canopy in lower canopy neighborhoods through connecting and engaging the community. To better work with the unique challenges that exist in Pittsburgh's diverse neighborhoods, Tree Pittsburgh worked with two neighborhoods in 2015 to increase programming in the area and create an urban forest plan specific to the community's needs and vision. Creating a neighborhood-level urban forest master plan allows for a more focused effort into tree canopy distribution and addresses challenges and opportunities at the local level.

Why Manchester and Chateau?

Elevated surface temperature, lower tree canopy cover, and the potential to increase engagement are all factors that influenced this focused planning effort. In 2010, surface temperature was derived from a Landsat satellite thermal image and it showed that Manchester was the hottest neighborhood in the City of Pittsburgh. Pittsburgh's city-wide temperature was measured at 96.6°F, while Manchester was 102.4°F and Chateau was 101.4°F. The urban heat island effect can impact public health and trees can be used as a tool to decrease these impacts. Surface temperature can affect quality of life and can increase the chance of heat-related illness, cardiovascular failure, and even death. [1] Urban heat island impacts are exacerbated by increased impervious surfaces and reduced tree canopy cover.

Manchester and Chateau, once one continuous neighborhood, have some of the lowest tree canopy cover in the City of Pittsburgh. The average Pittsburgh city-wide tree canopy cover is 42%, whereas Chateau has the lowest cover at 5%. Manchester has a current tree canopy cover of 17%. However, within Manchester, the tree canopy cover is not distributed equally. Manchester is primarily residential and Chateau is mostly large commercial and industrial properties. This contrasting land use provides a unique avenue for engaging and partnering with a broad range of stakeholders.

Additionally, Manchester residents have been involved in greening efforts throughout their neighborhood, most recently completing a tree planting along Chateau Street during Fall 2015. There are 15 registered Tree Tenders in Manchester that are actively engaged in planning and implementing tree care events throughout the neighborhood.



PITTSBURGH URBAN FOREST MASTER PLAN
A Road Map for the Effective Management of our Urban Forest

Pittsburgh's **urban forest** is any tree located within Pittsburgh's city limits. This includes park trees, street trees, trees along hillsides, trees in your backyard, and beyond.

Framework

This plan recognizes that the relationship between trees, people, and places is essential. Trees positively affect human health and are valuable assets to our community, providing us with many environmental, economic, and social benefits. The goals and recommendations established in this plan will guide us to achieving our unified vision for Manchester and Chateau’s urban forest, and are stretched beyond the basic tenants of the ‘Right Tree in the Right Place’ concept. We must work together as partners in the urban forest to consider tree choices and locations in light of the overall benefits trees provide and how this can positively influence our city as a whole, while making positive changes at the neighborhood level.

Planning Process

The plan was guided by Tree Pittsburgh, a non-profit environmental organization dedicated to protecting and restoring Pittsburgh’s urban forest through community tree planting and care, education, and advocacy. Tree Pittsburgh worked closely with a local steering committee to understand the opportunities and challenges within Manchester and Chateau. The framework for the process was based on understanding what we have, what we want, how we get there, and how we are doing. This process is referred to as adaptive management and is commonly used for resource planning and management. [2]

What do we have? Since 2005, the City of Pittsburgh, along with many partners began collecting valuable data on Pittsburgh’s urban forest. This section summarizes Manchester and Chateau’s urban forest data obtained from the Urban Tree Canopy Assessment (2011), park tree inventory in low canopy neighborhoods (2013), tree planting efforts (2008-2015), and street tree inventory and management plan (2014).

How are we doing? Monitoring and evaluation are keys to success for the implementation of this plan. Each year, from 2016-2021, Tree Pittsburgh will conduct an assessment on the success of Manchester and Chateau’s ReLeaf program. Adaptations will occur based on the outcomes.



What do we want? The public outreach campaign played a critical role in understanding the needs and interests in Manchester and Chateau. Throughout this process, the public provided integral feedback and helped to refine the plan. Public engagement included community meetings, creating a localized steering committee to guide in the process, and providing feedback to improve and refine the recommendations.

How do we get there? This section is focused on recommendations and implementation strategies. A major outcome of this plan is the overarching program, **ReLeaf Manchester and Chateau**. ReLeaf Manchester and Chateau is comprised of 3 major categories; street trees, private property, and public property. Each focus area has integrated outreach and maintenance efforts.

What Do We Have? State of the Urban Forest

Since 2005, the City of Pittsburgh, along with many partners, began collecting valuable data on Pittsburgh’s urban forest. The following state of Manchester and Chateau’s urban forest summarizes data obtained from the Urban Tree Canopy Assessment (2011), park tree inventory in low canopy neighborhoods (2013), and street tree inventory and management plan (2014).

Urban Tree Canopy Assessment (2011)

Using the USDA Forest Service’s Tree Canopy Assessment Protocols for the City of Pittsburgh, Tree Pittsburgh commissioned an urban tree canopy analysis that was performed based on 2010 data. A tree canopy assessment is the first step in this goal-setting process, providing estimates for the amount of tree canopy currently present in a city, as well as the amount of tree canopy that could theoretically be established.

Manchester’s existing tree canopy cover is 17% and Chateau is 5%, the lowest neighborhood in Pittsburgh (table 1). Possible canopy and plantable space is 37% in Manchester and 47% in Chateau, above Pittsburgh’s average (33%). 18% of Manchester’s possible tree canopy cover falls on public property and 82% exists on private property.

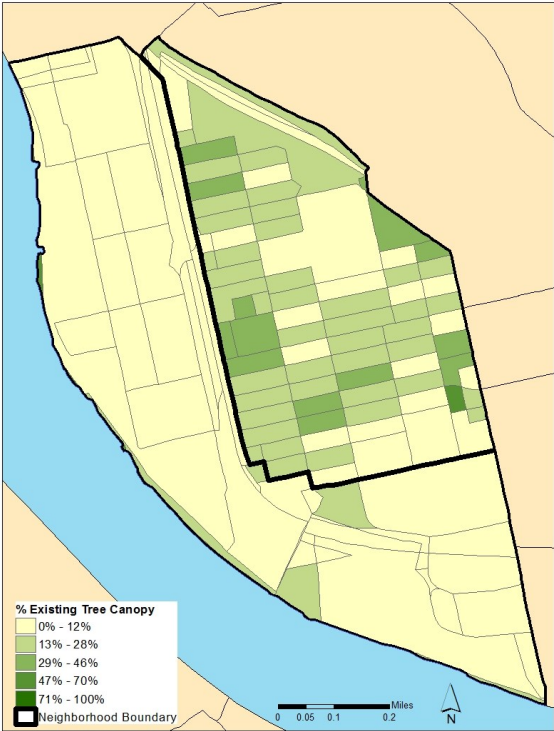


Figure 1. Existing tree canopy cover (census blocks)

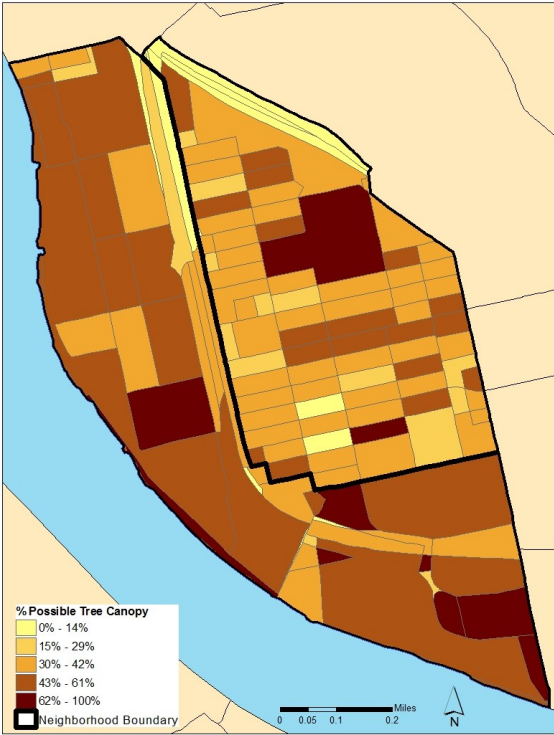


Figure 2. Possible tree canopy cover (census blocks)

	Manchester	Chateau	Pittsburgh Average
Existing Canopy	17%	5%	42%
Possible Canopy	37%	47%	33%

Table 1. Existing and possible tree canopy cover

Existing canopy includes areas that are covered by leaves during the growing season.

Possible canopy includes grass or shrub areas that are theoretically available for the establishment of tree canopy, as well as asphalt or concrete surfaces, excluding roads and buildings.

Surface Temperature and Heat Impacts

Elevated surface temperature, lower tree canopy cover, and the potential to increase engagement are all factors that influenced this focused planning effort. In 2010, surface temperature was derived from a Landsat satellite thermal image and it showed that Manchester was the hottest neighborhood in the City of Pittsburgh (figure 3). Pittsburgh's average temperature was measured at 96.6°F, while Manchester was 102.4°F and Chateau was 101.4°F. This effect is known as the urban heat island and can impact public health. Trees can be used as a tool to decrease these influences.

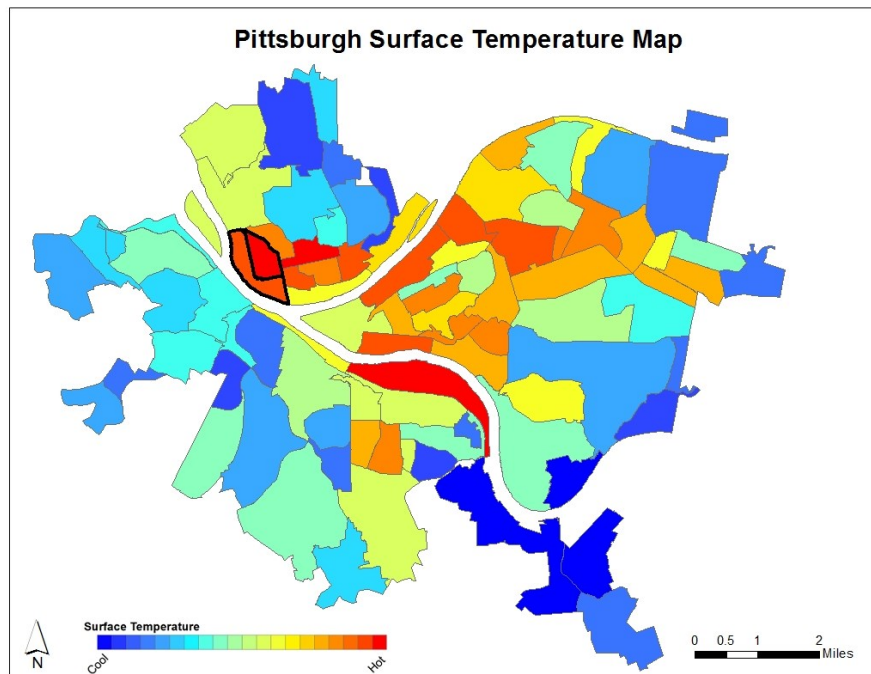


Figure 3. Average surface temperature recorded on September 2, 2010. Surface temperature was derived from a Landsat satellite thermal image. (University of Vermont Spatial Analysis Laboratory)

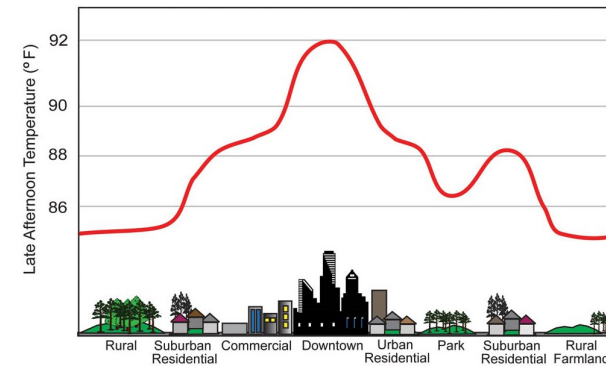


Figure 4. Urban Heat Island profile (U.S. EPA)

Urban heat island impacts are exacerbated by increased impervious surfaces and reduced tree canopy cover (figure 4). Manchester has 55% impervious surfaces, whereas 83% of Chateau is impervious. In Chateau, expansive asphalt parking lots without any surrounding vegetation contribute to the urban heat island effect and add to elevated summer temperatures. Trees can shade parking lots and buildings, reducing the overall temperature by upwards of 9°F[2]. Additionally, elevated temperatures can impair water quality, contribute to air quality problems, and increase the need for air conditioning, thus increasing energy-related emissions.

Surface temperature can impact quality of life and can increase the chance of heat-related illness, cardiovascular failure, and even death. [1] Urban heat islands can exacerbate the impact of heat waves, particularly targeting those with existing health conditions, as well as children and older adults.

Impervious surfaces are mainly artificial surfaces that are covered by impenetrable materials, including roads, sidewalks, driveways, parking lots, and buildings.

Air Quality

Known as “Steel City” or “Smoky City” to many, Pittsburgh has a long history of poor air quality. By the 1940’s, Pittsburgh was dark at all hours of the day due to significant smog and smoke throughout the city (figure 5).

Although Pittsburgh has greatly improved air quality over time, the current pollution problem is among the most serious in the country. Pittsburgh ranks in the dirtiest 10% of monitored urban areas for average annual particle pollution. This not only impacts general air quality, but also has strong correlations with negative health impacts. People residing in Allegheny County have a cancer risk more than twice that of those within surrounding rural areas. [3] In 2014, data collected by Carnegie Mellon University led to maps of different air pollutants (figure 6). Nitrogen dioxide can irritate lungs and lower resistance to respiratory infections. [4]

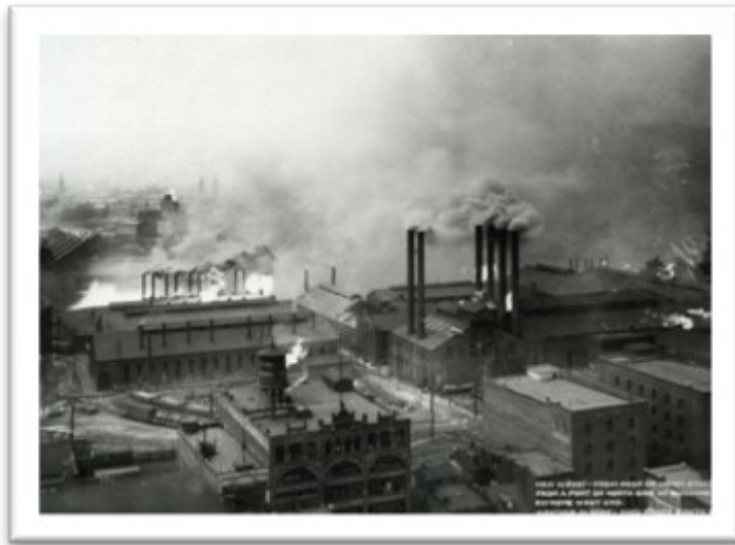


Figure 5. View from Union Station in 1906

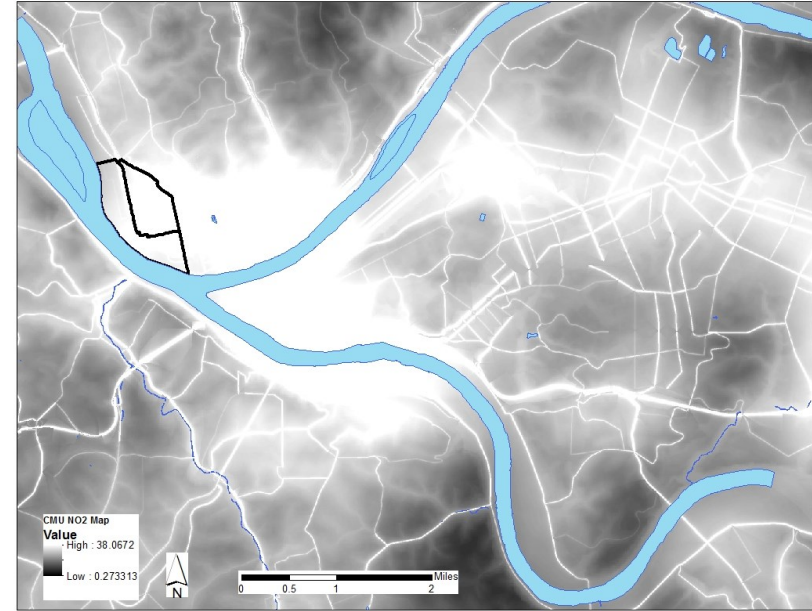


Figure 6. Levels of nitrogen dioxide collected from 2011 to 2014. (Carnegie Mellon University, Dr. Albert Presto)

Planting and maintaining urban forestry resources can be a powerful strategy for reducing air pollution. i-Tree Streets is a computer program developed through the US Forest Service that uses urban forest inventory data to quantify the dollar value for different benefits that street trees provide. [5] According to i-Tree, species that provide the most benefits for air quality include London planetree, black locust, and American elm.

	Manchester	Chateau	City-wide average
Annual street tree air quality benefits	\$2,779; 458 lbs pollutants	\$539; 90 lbs pollutants	\$2,810

Table 2. Calculated annual benefits from street trees in Manchester and Chateau.

Stormwater and Trees

One goal of Pittsburgh’s Urban Forest Master Plan is to incorporate urban forestry practices into the City’s stormwater management plan. As in many older cities, most of Pittsburgh’s sewers are combined, meaning that stormwater and sewage are conveyed in the same pipes to the wastewater treatment plant. Rain and snowmelt often cause these sewers to overflow, releasing untreated sewage into the rivers. Manchester and Chateau’s sewers overflow to the Ohio River at several outfall points (table 3). The image in the lower right shows the underground combined sewer pipes that lead to outfalls O-36 (figure 7). One low cost intervention to reduce overflows could include planting more trees. Trees can control stormwater by capturing and storing rainfall, thus reducing the peak of a rain event and decreasing overflow rates.

Combined Sewer Outfall	Outfall Location	Annual Overflow Frequency (number of activations)	Annual Overflow Duration (hours per year)	Annual Overflow Volume (million gallons)
O-29	Superior Ave	2	2	0.0455
O-30	Island Ave	0	0	0
O-31	Preble Ave	6	4	0.196
O-32	Branchport St & Preble Ave	30	60	10.7
O-33	Preble Ave	31	95	19.3
O-34	Columbus Ave & Preble Ave	51	165	38.1
O-35	N Franklin St & Preble Ave	11	17	0.394
O-36	Liverpool St & Oxline St	30	53	4.57
O-37	Pennsylvania St & Preble Ave	8	9	0.641
O-38	W. N. Avenue & Preble Ave	24	31	9.61
O-39	Kroll Dr	27	52	6.71
O-40	N. Point Dr	4	2	0.127
O-41	N. Point Dr	53	160	13.6
O-43	N. Shore Dr	8	2	0.389

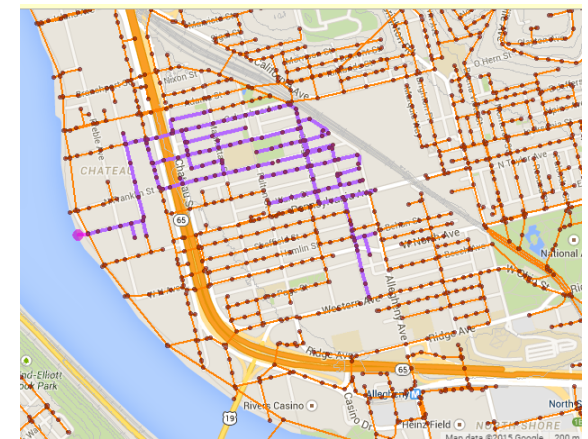


Figure 7. Pipes colored in purple are part of the O-36 sewershed

Stormwater is water from precipitation that flows across the ground and pavement when it rains or when snow and ice melt. Stormwater can soak into the soil, be held on the surface and evaporate, or runoff and end up in nearby water bodies.

Table 3. ALCOSAN Wet Weather Plan, Section 4—Hydrologic and Hydraulic Characterization [6]

Park Tree Resource Structure (2013)

In 2013, the Pittsburgh Shade Tree Commission facilitated a park tree resource inventory to understand the structure and condition of the trees in smaller parks throughout Pittsburgh. The priority of this project was to inventory parks in lower canopy neighborhoods. Three parks or playgrounds were surveyed in Manchester – Manchester Park, Manchester Playground, and McKnight Playground. Within these three parks, surveyors collected data on 96 trees. Using i-Tree Design, canopy projections and estimated benefits can help to understand the value of existing trees.

According to the OpenSpacePGH Plan, three parks in Manchester were evaluated to determine future uses. Below are the outcomes connected to the OpenSpacePGH planning effort. [7]

Park	OpenSpacePGH Recommendation	Number of trees
Manchester Park	Redevelop at \$\$	57
Manchester Playground	Redevelop at \$\$	17
McKnight Playground	Redevelop at \$	22

Table 4. Recommendations for Manchester parks in OPENSAPCEPGH

Note: \$ = \$2 million or less, \$\$ = \$2 million to \$8 million, \$\$\$ = 8 million+

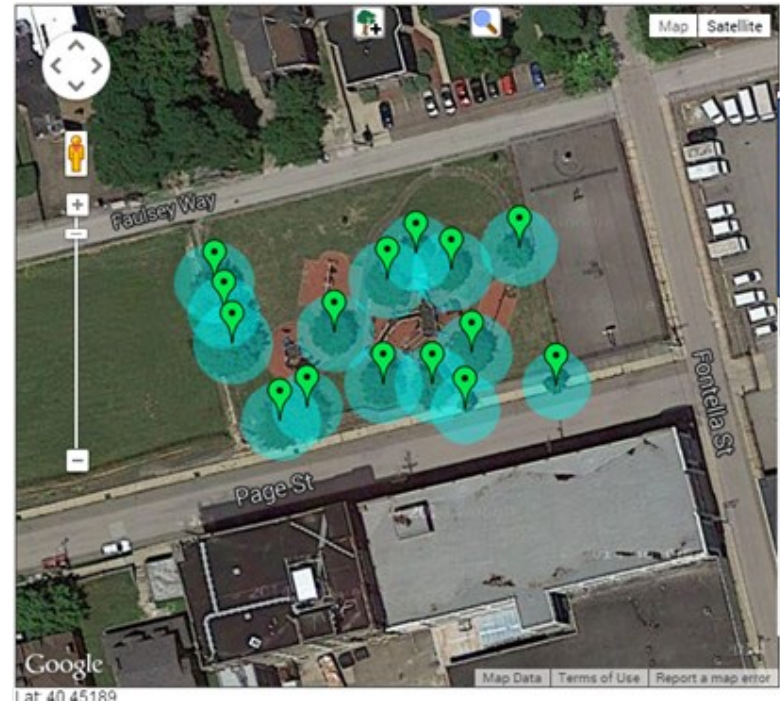


Figure 8. Projected canopy growth in 50 years for existing trees in McKnight playground

	Current	50 years
Stormwater (gallons of rainfall intercepted)	\$97, (12,097)	\$11,310, (1,413,768)
Air Quality	\$11	\$1,330
Carbon Dioxide (lbs of atmospheric CO2 removed)	\$8, (1,759)	\$556, (57,285)
Total Tree Benefits	\$116.58	\$13,197

Table 5. Current annual benefits and projected cumulative benefits for trees at McKnight playground

TreeVitalize Trees (2008-2015)

TreeVitalize is a public-private partnership to help restore tree cover, educate citizens about planting trees as an act of caring for our environment, and build capacity among local governments to understand, protect, and restore their urban trees. TreeVitalize is a partnership between the Allegheny County Parks, City of Pittsburgh, Pennsylvania Department of Conservation and Natural Resources, Tree Pittsburgh, and the Western Pennsylvania Conservancy. [8]

Between 2008 and Fall 2015, 179 trees have been planted in Manchester and Chateau. Thirty-two different species were planted with the most common being serviceberry (*Amelanchier spp.*) (13%), sawtooth oak (*Quercus acutissima*) (10%), crabapple (*Malus spp.*) (9%), white spruce (*Picea glauca*) (7%) and blue spruce (*Picea pungens*) (7%).

It is important to note that unlike gray infrastructure which declines in value after installation, green infrastructure increases in value. Annual benefits will increase with an aging urban forest if proper maintenance continues.



Figure 9. Trees planted along Chateau St. during Fall 2014

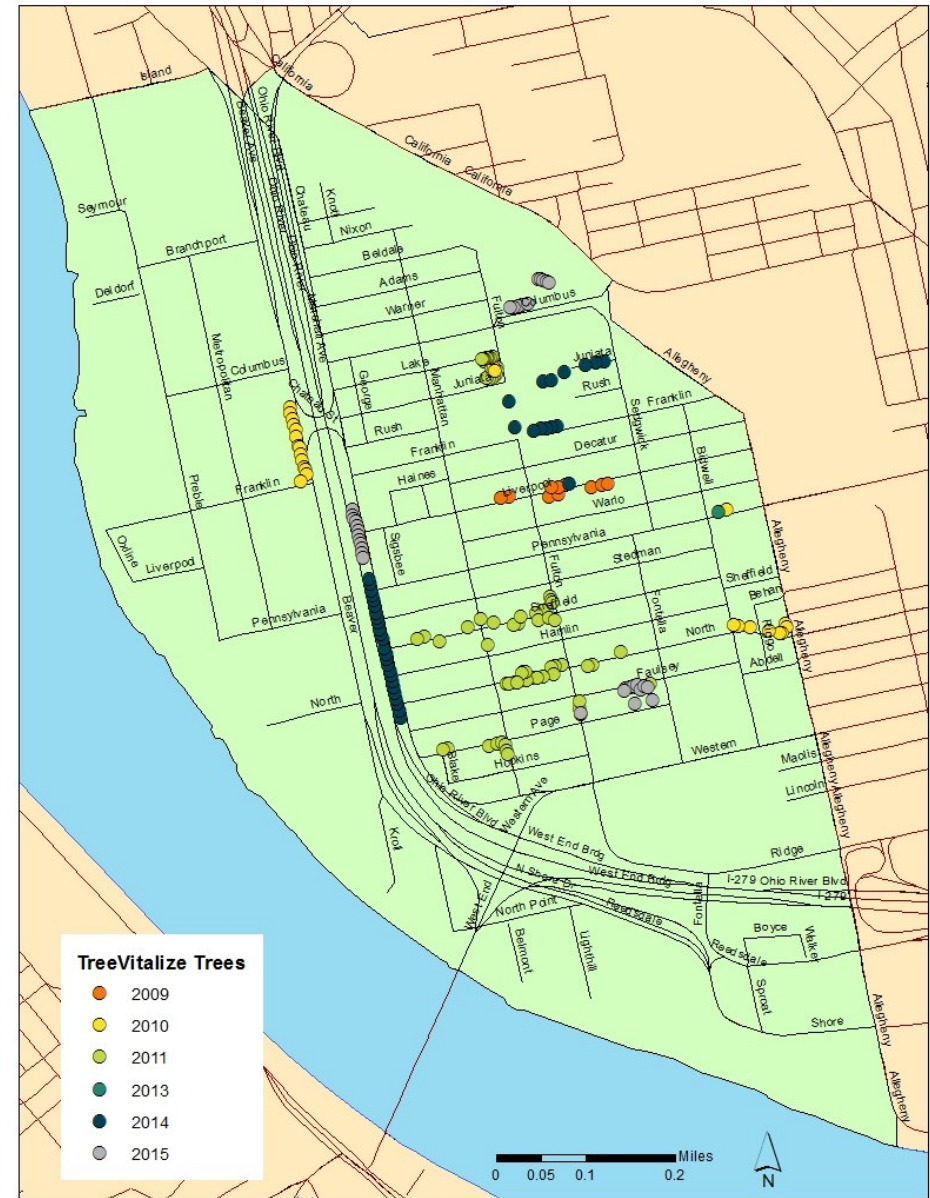


Figure 10. Trees planted in Manchester and Chateau through the TreeVitalize program

Street Tree Resource Structure (2014)

In 2005, the Pittsburgh Shade Tree Commission released the first City of Pittsburgh Street Tree Inventory and Management Plan for the trees in the public right-of-way. In 2014, the City of Pittsburgh completed another complete street tree inventory to update this data.

Data collected in 2005 captured 513 street trees in Manchester and 89 in Chateau (table 7). In 2014, there were 582 street trees inventoried throughout Manchester and 232 trees were recorded in Chateau. Pittsburgh’s city average is one street tree for every 11 residents (average across US is one tree for every three residents). [9] Based on the 2010 population (2,130), Manchester had one tree for every 3.7 residents (2014). It is important to note that tree canopy cover is much lower than Pittsburgh’s average, even though many more trees are being planted and the trees are not equitably distributed throughout the neighborhood.

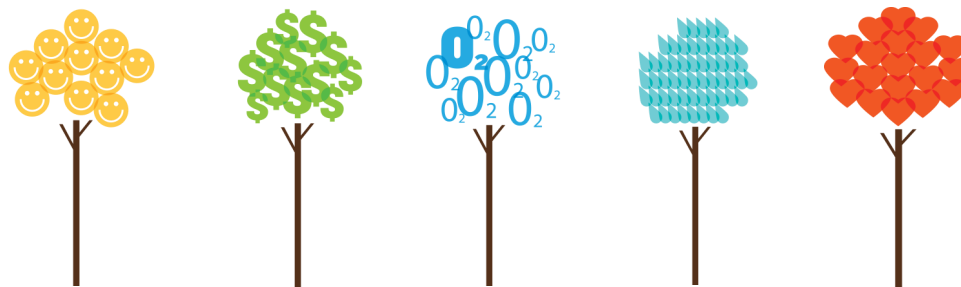
	Manchester	Chateau
Street Trees (2005)	513	89
Street Trees (2014)*	582	232
TreeVitalize Trees Planted	132	14

Table 7. Summary of street trees (*includes TreeVitalize trees)

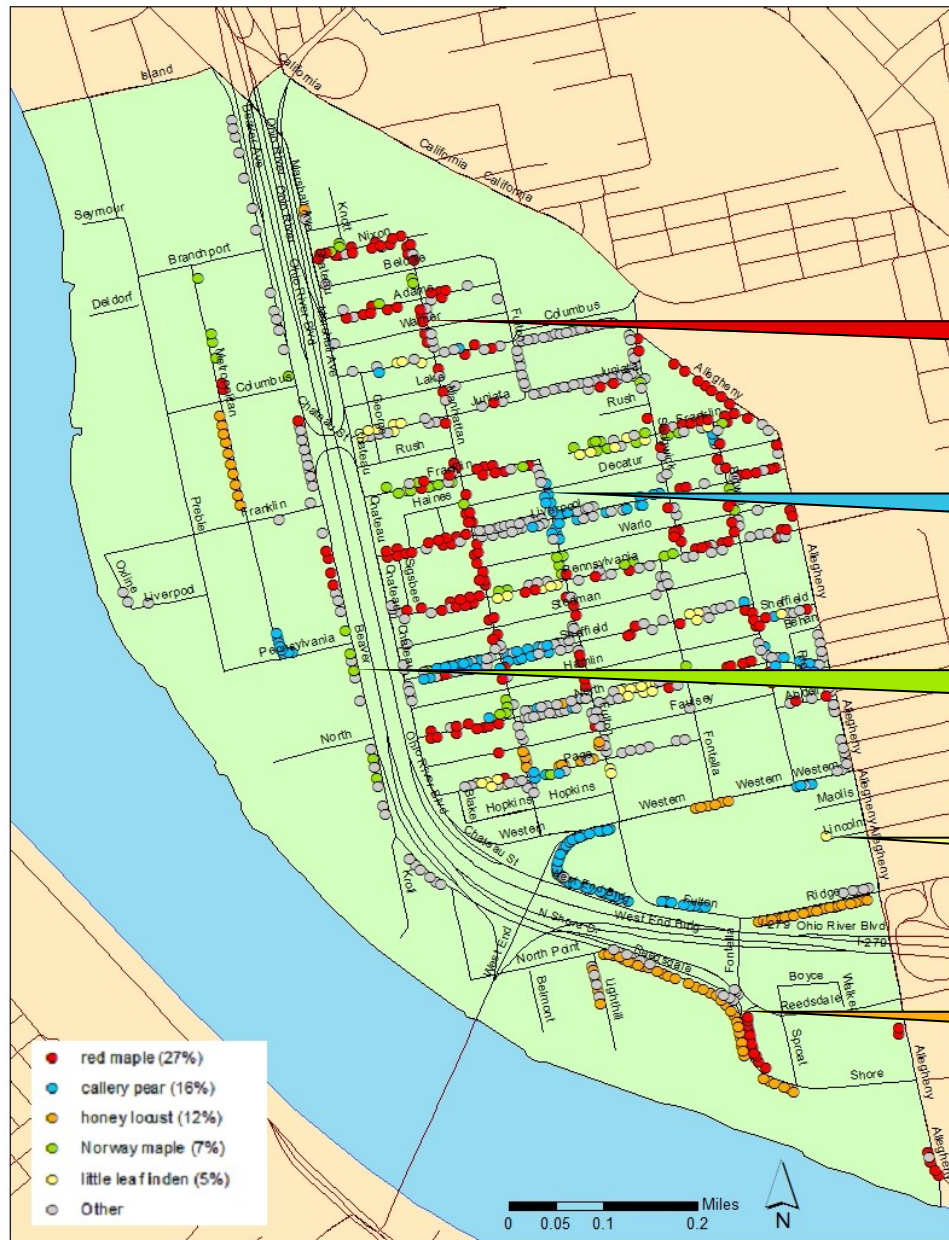
	Manchester	Chateau
Total Annual Benefits	\$61,183	\$13,391
Greenhouse Gas Benefits	\$346; 104,961 lbs CO ₂	\$69; 20,967 lbs CO ₂
Water Benefits	\$3,695; 461,901 gallons	\$656; 82,026 gallons
Energy Benefits	\$22,475; 33,972 kWh	\$4,375; 6,248 kWh
Air Quality Benefits	\$2,779; 458 lbs pollutants	\$539; 90 lbs pollutants
Property Benefits	\$31,888; 52,998 leaf surface area (ft ²)	\$7,751; 12,882 leaf surface area (ft ²)

Table 6. i-Tree annual benefits from street trees

Using i-Tree Streets, the summary of benefits for all street trees in Manchester and Chateau neighborhoods were calculated. i-Tree Streets is a program developed through the US Forest Service that uses urban forest inventory data to quantify the dollar value for different benefits that street trees provide. The calculated benefits from street trees in Manchester and Chateau is **\$74,574** annually.



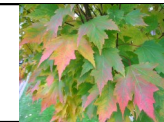
What Do We Have? State of the Urban Forest



Species Diversity

This figure graphically represents the top five most common street trees in Manchester and Chateau based on a street tree inventory conducted in 2014. Maples account for over 30% of the street trees. Standard diversity recommendations for urban tree populations state that no single genus should represent more than 20% of the population. It is important to note that both Norway maple and callery pear are non-native, invasive species.

Red Maple
Acer rubrum
221 trees (27%)



Callery pear
Pyrus calleryana
134 trees (16%)



Norway maple
Acer platanoides
59 trees (7%)



Little leaf linden
Tilia cordata
43 trees (5%)



Honey Locust
Gleditsia triacanthos
97 trees (12%)



Figure 11. Manchester and Chateau street trees inventoried in 2014

What Do We Want? Planning Process and Public Engagement

The public outreach campaign played a critical role in understanding the needs and interests of Manchester residents. Throughout this process, the public was integrated into many aspects to gather feedback and refine interests. Public engagement included hosting community meetings, creating a localized steering committee to guide the process, and gathering feedback throughout the planning process to integrate neighborhood interests.

Community Meetings

Tree Pittsburgh hosted three community meetings with themes that included the state of Manchester and Chateau's urban forest, recommendations, and implementation. Over 60 people participated in the three community meetings and public feedback was gathered during each step of the plan. During interactive sessions, public attendees were asked to give input on locations where they would like to see more trees, recommendations to prioritize, and future implementation projects. Each community meeting was hosted at Manchester Citizens Corporation, and Tree Pittsburgh worked with a local outreach firm, Jackson/Clark Partners, to flyer the neighborhood. This helped spread the word about the meetings, in addition to neighborhood newsletters, posters, and informal conversations.

Steering Committee

To guide the internal review of the plan, a thirteen-member steering committee was formed. Members included representatives from the neighborhood, Manchester Citizens Corporation, Manchester Greening, Forestry Division of the Department of Public Works, City Planning, ALCOSAN, Duquesne Light, and Tree Pittsburgh. The steering committee has been instrumental in guiding the process and giving input as to opportunities and challenges in the neighborhood. Future meetings with the steering committee will be necessary to focus on plan implementation and neighborhood outreach.



First community meeting, held at the Manchester Citizens Corporation



Program Vision

Driven by an engaged and informed community and supported by non-profit organizations, city agencies, and private property owners, Manchester's urban forest will be better maintained and equitably grown over the next five years to increase social, environmental, economic, and public health benefits trees provide.*

* Manchester's urban forest includes all trees in the neighborhood - park trees, yard trees, street trees, and vacant lot trees.



Program Goals

- 1) Provide a strategic vision to increase and enhance the current tree canopy throughout Manchester.
- 2) Encourage education about the benefits of trees and create a neighborhood culture that values these benefits.
- 3) Encourage public and private participation in urban forest management through stewardship and community participation.
- 4) Empower neighborhood organizations to develop projects and programs to plant, maintain, and protect trees.
- 5) Promote species diversity and ensure tree benefits for future generations through a sustainable planting program.

ACTIONS:

Street Trees

1. *Address sidewalk damage.* In 2014, the City of Pittsburgh finished a complete street tree inventory. From the data collection, there are 582 street tree locations in Manchester. Of those 582 street tree locations, 145 trees have surrounding sidewalk damage of lifting half an inch or more. Additionally, many sidewalks in Manchester are red brick and roots have heaved the material, causing uneven and dangerous walking surface. Many residents are unaware of the process on how to replace sidewalks. Tree Pittsburgh will work with the City and local residents to outline the step-by-step process on how to replace sidewalks with proper permits while maintaining and improving tree health. Tree Pittsburgh will also work with neighbors, Manchester Citizens Corporation, and City officials to outline creative funding sources to incentivize homeowners that want to replace their damaged sidewalk and protect or replace their street tree. We will also assist when neighbors organize together and want to systematically replace sidewalks as an entire block approach. This should reduce overall cost and will promote efficiency for the City Forestry Division.



Common sidewalk damage throughout Manchester



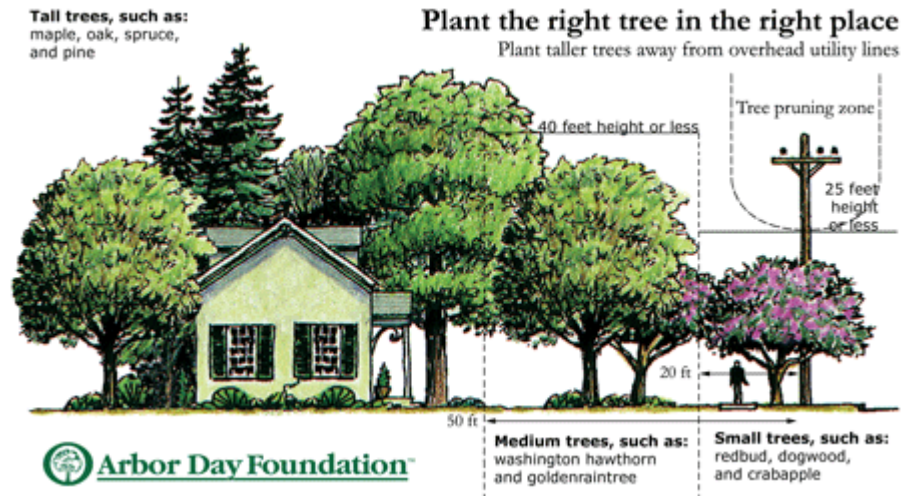
Concrete and red brick sidewalk construction in Manchester

2. Educate homeowners about the 'right tree in the right place'.

Seventy percent of the existing canopy cover in Manchester is on residential private property. Many Manchester parcels are large and have space to plant a tree. The majority of tree planting to date has been focused on areas within the right-of-way, along the street. To increase overall canopy cover and connect more residents with trees, it is important to plant in both the public right-of-way and on private residential property. The 'Right Tree in the Right Place' concept will be stressed through this program. Careful planning can avoid problems in the future. Consider overhead utilities, underground utilities, distance from buildings, as well as the tree height, canopy spread, form/shape, growth rate, soil, amount of sunlight, and spacing from other trees. For more details and examples of trees throughout Manchester, visit the [Manchester Tree Guide: Neighborhood Trees 2015](#). This document was produced by Tree Pittsburgh and can serve as a guide for those that are interested in planting trees throughout Manchester.



Example of sidewalk deconstructed and existing stump/root system



Right Tree in the Right Place diagram (Arbor Day Foundation)

3. *Manage current condition of street trees throughout Manchester.* Work with City Forestry and neighborhood residents to identify trees that should be protected, removed, or replaced. From the 2014 street tree inventory, recommendations were made to remove 69 street trees in Manchester and 26 stumps along the street. During July 2015, the City Forestry division began removing hazardous trees throughout Manchester. Tree Pittsburgh and Manchester Citizens Corporation will work to communicate forestry efforts with residents throughout Manchester and facilitate replacing streets trees when possible. A more localized effort will increase efficiency for the City Forestry department and will focus to reduce localized hazards.

4. *Plant and maintain trees at neighborhood gateways.* Work with Manchester residents to prioritize and plant around gateways into the neighborhood. Gateway locations into Manchester include:

- A. **Columbus Avenue.** This entry point is the connection between Manchester and the California-Kirkbride neighborhood. Manchester Park borders Columbus Avenue and many new trees have been planted around the newer housing development, Columbus Square.
- B. **Chateau Street.** Vehicular traffic along Chateau Street is fast and heavy during rush hour. In Fall 2014, evergreens were planted in the right-of-way between 65 and Chateau Street. This planting should continue with community support and tree care.
- C. **Pennsylvania Avenue and Allegheny Avenue.** This intersection divides California-Kirkbride and Manchester. This point of entry has mixed land uses including residential, light industrial, and commercial.
- D. **North Avenue and Allegheny Avenue.** North Avenue is a corridor that connects to Central Northside and Allegheny West. Trees have been planted on the 1000 block and 1300 block of North Avenue.
- E. **Western Avenue and Allegheny Avenue.** This intersection is the connection between Heinz Field, Carnegie Science Center, Rivers Casino, and Manchester. It is heavily trafficked and is not pedestrian friendly.



Gateway points into Manchester and major interior corridor streets (Manchester Neighborhood Transformation Initiative, Manchester Citizens Corporation).

5. *Increase number of Tree Tenders.* Provide a Tree Tender course in Manchester to increase engagement. By offering a Tree Tender Course in Manchester, more residents can become certified Tree Tenders and attend pruning workshops. A continued, sustained volunteer effort is necessary to increase stewardship throughout the neighborhood and provide the structural pruning necessary for young trees. There are currently 15 registered Tree Tenders in Manchester. For these registered Tree Tenders, advanced training opportunities should be incorporated to continue and sustain engagement.

6. *Host 3 Pruning Workshops per year.* Small tree pruning is essential for improved structure and overall health. Each recently planted tree should be pruned twice in the first five years of its life. Tree Pittsburgh suggests pruning systematically to conduct structural pruning on recently planted street trees. Trees should be pruned during year 2 or 3 and again during year 4 or 5. Tree Pittsburgh will strategize with local Tree Tenders to determine what trees need to be pruned for each Pruning Workshop. Public street trees may only be pruned by residents after a permit is issued or if they have taken the Tree Tender Course and are participating in a Pruning Workshop with Tree Pittsburgh.



7. *Host 3 Mulching Parties per year.* Weeding and mulching trees helps improve overall tree health by reducing competition, retaining moisture, insulating from temperatures extremes, preventing lawn mower or weed wacker damage, and many more benefits. Mulching Parties should focus on tree pit maintenance along residential streets. Encourage Tree Tenders to propose Mulching Parties in their neighborhood in areas that need extra assistance. Tree Pittsburgh will work with larger groups in the neighborhood to supplement resident efforts. Tree care prior to important neighborhood events, including the Manchester Community Block Party and Manchester House and Garden Tour, can help beautify the streets throughout the neighborhood.



Private Property Programs

1. *Create a program to green “small streets”,* also known to many as alleyways. Every other street that spans from east to west in Manchester is a small street. Many residents utilize these streets to drive through the neighborhood. To improve the aesthetics and increase stewardship along these streets, areas can be targeted to plant trees in adjacent parcels. These streets include Faulsey Way, Hamlin Street, Warlo Street, Decatur Street, Rush Street, Lake Street, and Warner Street. A targeted program could include door knocking and educating about the value of trees along the small streets.
2. *Develop a neighborhood fruit tree orchard with supplemental education programs.* Manchester is a neighborhood with three existing community gardens (see pictures below). Many residents are interested in food production and community building through growing vegetables. A low maintenance fruit tree orchard can increase the capacity of food production in the neighborhood and act as a space for learning and developing skills. Education opportunities would focus on proper planting techniques, fruit tree care and maintenance, as well as proper fruit tree pruning.
3. *Plant and maintain trees at churches or vacant lots.* Community spaces are important in Manchester and many vacant lots have already been converted into usable green space. There is an active Manchester Greening group that is transforming vacant lots into food and native plant gardens.



Manchester Growing Together Garden



Shelby's Corner Native Plant Garden



Page Street Sensory Garden

ReLeaf Manchester: Private Property

4. *Support diversity goals in the City of Pittsburgh Urban Forest Master Plan.* From the 2014 street tree inventory, maples comprise more than 30% of the tree population in Manchester. Additionally, callery pear is above the recommended species diversity goals at 16%. Recommendations include choosing performance-based planting strategies geared towards improving specific benefits, such as planting conifers to improve air quality through year-round particulate matter removal. Additionally, no single tree species should represent more than 10% of the population, no single genus should represent more than 20% of the population, and no single family should represent 30% of the population.
5. *Create a myTree program (private property subsidized tree planting)* to encourage homeowners to plant trees on their property. Working in partnership with Manchester Greening and Manchester Citizens Corporation, Tree Pittsburgh will provide subsidized trees to be planted by residents on their private property. Each spring, 30-40 trees will be supplied to interested residents. Homeowners will fill out a form that will determine the best tree to plant on their property, depending on available space and desired benefits. Tree Pittsburgh and a local neighborhood group will determine the pick-up location and the homeowner can come to a centralized site on a predetermined date, pick up a tree and plant it themselves. There will be a tree menu to choose from when ordering online and guideline information about planting the 'Right Tree in the Right Place'. Residents will order the trees ahead of time online and the stock will be smaller containerized species from Tree Pittsburgh's seedling nursery. Tree Pittsburgh will conduct targeted outreach efforts based on parcel data that determines if there is enough space for a tree on private property.

Possible species for a Manchester specific myTree program:



pawpaw



sweetbay magnolia



Turkish filbert hazelnut



amur maackia



carolina silverbell



Blackgum



Public Property Programs:

1. *Increase species diversity within local parks.* In 2013, small park trees were inventoried in low canopy neighborhoods throughout Pittsburgh. Manchester Park, located in the northern corner of the neighborhood, has a total of 47 trees and all are red maples (*Acer rubrum*), planted at the same time. In Fall 2015, Tree Pittsburgh planted 10 TreeVitalize trees to increase species diversity, buffer the park from the railroad, and provide shade along the sidewalk. To enhance and protect the existing canopy, future park planning efforts should include continuing to diversify tree species and systematically replace trees to increase age diversity.
2. *Identify opportunities to plant trees on vacant lots.* Manchester is a neighborhood with over 300 vacant parcels. Some of these parcels are government owned (ie. City of Pittsburgh, Urban Redevelopment Authority, Pittsburgh Housing Authority) and many are privately owned. Tree Pittsburgh will analyze which properties have plantable space and engage with property owners to discuss the benefits of planting trees on their property. Future land use decisions will be taken into account to understand the lifespan of the plantable space and the community use.
3. *Increase youth programing opportunities and partner with schools to plant trees.* Manchester has three different schools; Manchester PreK-8, Manchester Academic Charter School, and Conroy Education Center. Tree Pittsburgh will work with the leadership and facilities personnel to develop planting plans and educational resources for teachers to use in the classroom. Additionally, a student led work crew would be an asset to the community. Tree Pittsburgh will explore opportunities to partner with existing organizations in Manchester to increase structured programming for Manchester's youth.



Vacant lots in Manchester and Chateau



Surrounding outdoor space at Manchester PreK-8

ReLeaf Chateau: Street Trees

1. *Determine potential locations for street trees.* In 2014, all street trees were inventoried in Chateau. In 2005, there were 89 trees, where as in 2014 there were 232 street trees. The area of Chateau is 246 acres which equates to less than 1 tree per acre. There is very limited additional tree canopy cover outside of street trees.
2. *Focus on greenways to the Three Rivers Heritage Trail.* The recreational trail that passes through Chateau along the Ohio River has an estimated 44,000+ users annually. [10] Significant previous planting efforts have included community tree plantings along the entire Three River Heritage Trail system throughout Pittsburgh. Over 800 people work in Chateau on a daily basis and many walk from their place of employment down the trail system. By focusing planting street trees along the roads that cross from east to west in the neighborhood, access to green space can increase.



Volunteers planting trees along the Ohio River and Three Rivers Heritage Trail



PennDOT Right-of-way along Beaver Avenue in Chateau

3. *Plant and maintain trees along Beaver Avenue.* Community-led efforts have planted forty trees along Chateau Street in Manchester. As this planting continues, the greening efforts could be mirrored on the other side of highway 65. This planting would work with Chateau business owners to plant and maintain this corridor, as well as install a sustainable irrigation source.
4. *Work with local organizations to host maintenance events.* With many large business organizations in Chateau, outreach efforts can connect employees with tree planting and care events. Mulching Parties and beautification projects can help catalyze changes in a neighborhood, create connections between organizations, and improve overall tree health.
5. *Host a Tree Tenders Course geared towards business owners.* This class would focus on the benefits that trees provide, as well as business owner specifics for increasing tree canopy cover throughout the neighborhood.

ReLeaf Chateau: Private Property

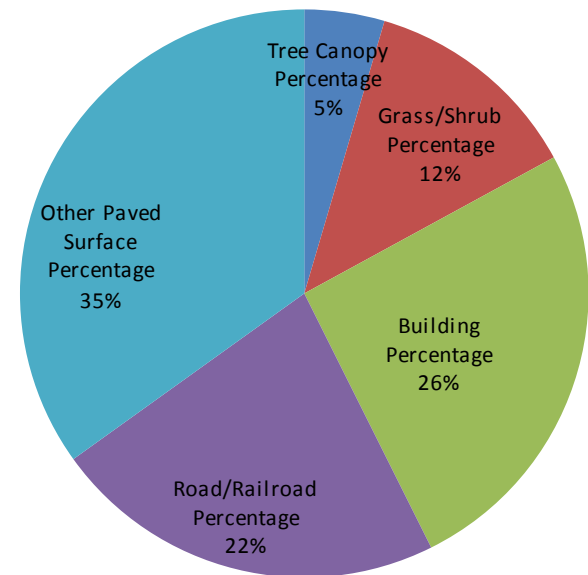
1. *Identify underutilized private property and partner with property owners to plant and maintain trees.* Tree Pittsburgh will work to identify and have conversations around the benefits of trees in Chateau and the current urban heat island and air quality impacts.
2. *Control invasive species and restore the riverbank along the Ohio River in Chateau.* Most of the riverbank in this area has moderate to steep slopes and all canopy gaps are completely covered in invasive Japanese knotweed. Restoration efforts would improve and stabilize the hillside, reduce erosion during flooding events, increase biodiversity, and increase tree canopy cover. These efforts must be paired with intensive maintenance efforts to continuously control Japanese knotweed.
3. *Plant trees around and within parking lots to reduce the urban heat island.* Eighty-three percent of Chateau is impervious surfaces, with parking lots making up 35% of the neighborhood. Almost all of these parking lots have no trees surrounding or within these spaces. Parking lots without trees increase stormwater runoff, retain heat, and evaporate more gasoline from cars that are not shaded.



Vacant seven acre parcel in Chateau likely to be developed



Tree planting along Beaver Avenue in Fall 2010



Chateau Land Use Types

ReLeaf Manchester: Implementation Summary

Category	Recommendation	Timeline	Budget	Responsibility
Street Trees	Address sidewalk damage	Nov. 2015—ongoing	\$\$\$	City of Pittsburgh, MCC, Tree Pittsburgh
Street Trees	Educate homeowners about the ‘Right Tree in the Right Place’	Spring 2016	\$	Tree Pittsburgh
Street Trees	Manage current condition of street trees throughout Manchester	Fall 2015, Winter 2015	\$\$\$	City of Pittsburgh Forestry Division
Street Trees	Plant and maintain trees at neighborhood gateways	Fall 2016, new project each planting season	\$\$\$	Neighborhood residents
Street Trees	Increase number of Tree Tenders	Summer 2015, ongoing	\$	Tree Pittsburgh
Street Trees	Host 3 Pruning Workshops per year	annually	\$	Tree Tenders, Tree Pittsburgh
Street Trees	Host 3 Mulching Parties per year	annually	\$	Neighborhood volunteers, Tree Pittsburgh
Private Property	Create a program to green “small streets”	Spring 2016	\$	MCC, neighborhood residents
Private Property	Develop a neighborhood fruit tree orchard with supplemental education programs	Winter 2015—fruit tree workshop	\$\$	Manchester Academic Charter School, Tree Pittsburgh
Private Property	Plant and maintain trees at churches or vacant lots	Fall 2016	\$\$	Property owners, churches, neighborhood residents

\$ = Low cost (less than \$5,000), \$\$ = Medium cost (\$5,000-\$15,000), \$\$\$ = High cost (greater than \$15,000)

ReLeaf Manchester: Implementation Summary

Category	Recommendation	Timeline	Budget	Responsibility
Private Property	Support diversity goals in the City of Pittsburgh Urban Forest Master Plan	ongoing	\$	Tree Pittsburgh
Private Property	Create a myTree program (private property subsidized tree planting program)	Spring 2016	\$	MCC, Tree Pittsburgh
Public Property	Increase species diversity within local parks	ongoing	\$	Neighborhood residents, Tree Pittsburgh
Public Property	Identify opportunities to plant trees on vacant lots	Spring 2016	\$\$	Neighborhood residents
Public Property	Increase youth programming opportunities and partner with schools to plant trees	Ongoing, school planting Spring 2016	\$\$	Manchester Youth Development Program, Manchester Academic Charter School, Manchester Pittsburgh K-8, Tree Pittsburgh

\$ = Low cost (less than \$5,000), \$\$ = Medium cost (\$5,000-\$15,000), \$\$\$ = High cost (greater than \$15,000)

ReLeaf Chateau: Implementation Summary

Category	Recommendation	Timeline	Budget	Responsibility
Street trees	Determine potential locations for street trees and plant in appropriate sites	ongoing	\$\$	Property owners, TreeVitalize
Street trees	Focus on targeting greenways to the Three Rivers Heritage Trail	ongoing	\$\$	Property owners, TreeVitalize
Street trees	Plant and maintain trees along Beaver Avenue	Fall 2016	\$\$	PennDOT, Tree Pittsburgh
Street trees	Work with local organizations to host maintenance events.	ongoing	\$	Friends of the Riverfront, Tree Pittsburgh, employers in Chateau
Street trees	Host a Tree Tenders Course geared towards business owners.	Summer 2016	\$	Tree Pittsburgh
Private property	Identify underutilized private property and partner with property owners to plant and maintain trees.	Spring 2016	\$	Tree Pittsburgh, Manchester residents, business owners
Private property	Control invasive species and restore the riverbank along the Ohio River in Chateau.	ongoing	\$\$\$	Friends of the Riverfront, Tree Pittsburgh, volunteers groups
Private Property	Plant trees around and within parking lots to reduce the urban heat island.	ongoing	\$\$\$	Property owners, Tree Pittsburgh

\$ = Low cost (less than \$5,000), \$\$ = Medium cost (\$5,000-\$15,000), \$\$\$ = High cost (greater than \$15,000)

How Are We Doing? Evaluation and Monitoring

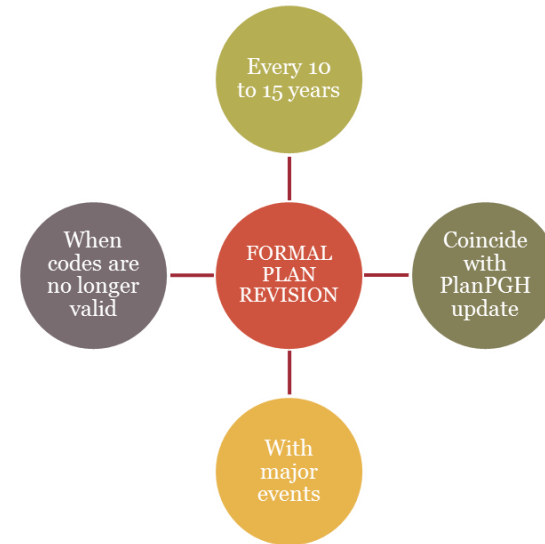
From the Pittsburgh Urban Forest Master Plan, monitoring, analyzing, and revising are keystones towards keeping a dynamic management approach. A recommendation from the City-wide master plan is to prepare and distribute a 'state of the urban forest' report to the public every 5 to 10 years. A formal plan revision will take place if any of the following changes occur (see figure to right).

Each year, from 2016-2021, Tree Pittsburgh will conduct an assessment on the success of Manchester and Chateau's ReLeaf program. This plan has a fairly short time horizon of five years. Reassessment will occur after five years to determine if the organized efforts are successful. At that point, a complete evaluation and additional recommendations will be made to continue the ReLeaf Manchester and Chateau program.

Tree Pittsburgh will include various metrics in an annual report, including but not limited to:

- number of trees planted
- survival rates
- overall tree canopy cover change
- tree canopy cover change by land type
- number of Tree Tenders
- number of trees pruned
- number of trees mulched and weeded
- assessment of annual tree benefits

Additionally, an annual report will be created to evaluate progress and inform the community about program successes. To continue coordination and momentum of the neighborhood level effort, the steering committee will meet twice annually to work through opportunities and challenges.



What Do We Have? State of the Urban Forest

1. Kovats, R., Hajat, S. 2008. Heat Stress and Public Health: a critical review. Annual Review of Public Health. <http://www.ncbi.nlm.nih.gov/pubmed/18031221>
2. Kurn, D., S. Bretz, B. Huang, and H. Akbari. 1994. The Potential for Reducing Urban Air Temperatures and Energy Consumption through Vegetative Cooling. ACEEE Summer Study on Energy Efficiency in Buildings, American Council for an Energy Efficient Economy. Pacific Grove, CA.
3. Michanowicz, D., Ferrar, K., Malone, S., Kelso, M., Kriesky, J., Fabisiak, J. 2013. Pittsburgh Regional Environmental Threats Analysis (PRETA) Report. Center for Healthy Environments and Communities. University of Pittsburgh.
4. Nitrogen Dioxide (NO₂) <http://www.epa.gov/airtrends/aqtrnd95/no2.html>
5. US Forest Service. 2008. i-Tree STRATUM application. Pacific Southwest Research Station, Center for Urban Forest Research. <http://www.itreetools.org> and <http://www.fs.fed.us/psw/programs/cufr>
6. ALCOSAN Wet Weather Plan. 2013. Section 4—Hydrologic and Hydraulic Characterization. <http://www.alcosan.org/Portals/o/Wet%20Weather%20Plan/Section%204.5%20thru%204.10.pdf>
7. OPENSOURCEPGH. 2013. City of Pittsburgh—Department of City Planning. <http://planpgh.com/openspacepgh/>
8. TreeVitalize Pittsburgh. <http://waterlandlife.org/216/treevitalize/>
9. McPherson EG, Rowntree RA. 1989. Using structural measures to compare twenty two U.S. street tree populations. Land J 8:13-23.
10. Knock, 2015. Three Rivers Heritage Trail 2014 User Survey and Economic Impact Analysis. <http://friendsoftheriverfront.org/wp-content/uploads/2015/03/Three-Rivers-Heritage-Trail-Users-SurveyLORES.pdf>

Diversity Goals

Tree Pittsburgh has adopted standard diversity recommendations for urban tree populations and established the following goals for the distribution of species in our urban forest:

- No single tree species should represent more than 10% of the population.
- No single genus should represent more than 20% of the population.
- No single family should represent 30% of the population.

Currently, Pittsburgh’s street tree population has four species exceeding these thresholds. Therefore, the use of any species and/or cultivar of maple (*Acer*) should be avoided whenever possible or represent no more than 5% of the trees used on any given planting project. Hedge maple (*Acer campestre*) is excluded from this limit.

Goal	Recommendation
10%	• No single species should make up more than 10% of a planting/population.
20%	• No single genus should make up more than 20% of a planting/population.
5%	• Maple (<i>Acer</i>) may not comprise more than 5% of any given planting project.
25%	• ALB host species may not exceed 25% for any given planting project.
20%	• Any non-street tree planting project is recommended to have at least 20% of the species be conifers.
10%	• Any street tree planting project should have 10% of the species be conifers.

Trees Restricted From Use on Public Planting Projects

Restricted Species	Common Name	Variety
<i>Acer platanoides</i>	Norway maple	Any cultivar
<i>Castanea</i> spp.	chestnut	Any species or cultivar or hybrid
<i>Fraxinus</i> spp.	ash	Any species or cultivar
<i>Juglans</i> spp.	walnut	Any species or cultivar
<i>Pyrus calleryana</i>	callery pear	Any species or cultivar or hybrid
<i>Quercus</i> Sect. <i>Loba-tae</i>	red oak	Any species or cultivar or hybrid
<i>Tilia cordata</i>	little-leaf linden	Any species or cultivar or hybrid
<i>Tsuga canadensis</i>	eastern hemlock	Any species or cultivar or hybrid
<i>Ulmus americana</i>	American elm	straight species and variety ‘Liberty’
<i>Ulmus</i> x ‘Frontier’	frontier hybrid elm	

Moratorium and Restriction

The urban forest is currently compromised by the presence of several existing pests, diseases, and other invasive threats or nuisances. To promote improved diversity, the following species should be restricted against use on planting projects. This list is subject to change based on future information about invasive, structural, and insect and disease resistance characteristics of species/cultivars and is intended to be reviewed annually. The species listed below may be planted for urban forestry research purposes only.

Appendix: Manchester Tree Planting/Canopy Goals

In order to convert tree canopy goals into the number of trees to plant annually, Tree Pittsburgh multiplied the number of potential canopy acres for each land use type by 100, the average density of trees per acre. Current and potential canopy cover percentages were calculated by dividing the current tree canopy and potential tree canopy by total area for land use type. Annual tree planting goals take in to account the realities of volunteer planting efforts.

Land Use Category	Current Canopy Cover (%)	Potential Canopy Cover (%)	Potential Tree Canopy (Acres)	Number of possible trees to plant	Canopy cover goal (%)	Annual Tree planting goal (#)
Commercial	7.64%	40.27%	6.29	629	25%	20-40
Government	17.25%	58.61%	13.04	1,304	50%	50-100
Industrial	0.67%	27.59%	1.34	134	20%	20-40
Residential	21.19%	49.08%	34.48	3,448	40%	100-300
Utilities	6.43%	2.47%	0.37	37	8%	NA
Other	13.76%	32.79%	0.82	82	30%	10-20
Total						230-500

Appendix: Chateau Tree Planting/Canopy Goals

In order to convert tree canopy goals into the number of trees to plant annually, Tree Pittsburgh multiplied the number of potential canopy acres for each land use type by 100, the average density of trees per acre. Current and potential canopy cover percentages were calculated by dividing the current tree canopy and potential tree canopy by total area for land use type. Annual tree planting goals take in to account the realities of volunteer planting efforts.

Land Use Category	Current Canopy Cover (%)	Potential Canopy Cover (%)	Potential Tree Canopy (Acres)	Number of possible trees to plant	Canopy cover goal (%)	Annual Tree planting goal (#)
Commercial	3.84%	59.08%	59.51	5,951	20%	20-200
Government	6.43%	55.60%	14.95	1,495	40%	50-100
Industrial	0.87%	28.71%	6.42	642	20%	20-100
Residential	7.63%	64.96%	0.82	82	30%	10-20
Utilities	0.39%	59.26%	9.20	920	20%	20-100
Other	0.15%	48.13%	1.07	107	35%	10-20
Total						130-540