URBAN FOREST

MASTER PLAN

ROCHESTER, MINNESOTA

NOVEMBER | 2023

Adopted by Rochester City Council on 11-20-2023

CITY OF ROCHESTER MINNESOTA

PLANIT GEO™ mapping a greener future

(This page left intentionally blank)

URBAN FOREST

MASTER PLAN

ROCHESTER, MINNESOTA

ACKNOWLEDGMENTS

- The City of Rochester, MN Contributors -
Citizens of Rochester
City Council
Rochester Parks and Forestry Division
City of Rochester Supporting Departments and Offices
Rochester Area Builders Association

CITY OF ROCHESTER MINNESOTA

PLANIT GEO™ mapping a greener future

Cover photo source: RNeighbors
All other photos unless noted are from the City of Rochester, MN

(This page left intentionally blank)

A VISION FOR ROCHESTER'S URBAN FOREST

Healthy Trees, Healthy City: Our City's trees, forests, and other natural resources are recognized as integral to sustaining life and health for all City residents. A healthy, thriving, and sustainable urban forest is a community priority, to be thoughtfully managed and cared for by partnerships between the City and its residents to maximize public safety and benefits that include a thriving ecosystem, vibrant economy, and livable communities shared by all who live, work, and play in Rochester.

ROCHESTER URBAN FOREST MASTER PLAN MISSION STATEMENT

The City of Rochester, in partnership with the community and urban forestry consultants, completed this Urban Forest Master Plan in 2021. This plan is a guide to maintain, protect, and enhance Rochester's already extensive tree canopy cover resource and the multitude of associated benefits. The Urban Forest Master Plan extends beyond maintenance and operational guidance to include a variety of long-term goals, strategies, and priorities to achieve optimal levels of urban forest management, sustainability, and equity in a comprehensive and systematic manner. Achieving the goals set forth in this plan requires a shared commitment and partnership between the City and its community to sustain a thriving urban forest providing benefits to Rochester's environment, economy, and well-being for future generations.

(This page left intentionally blank)

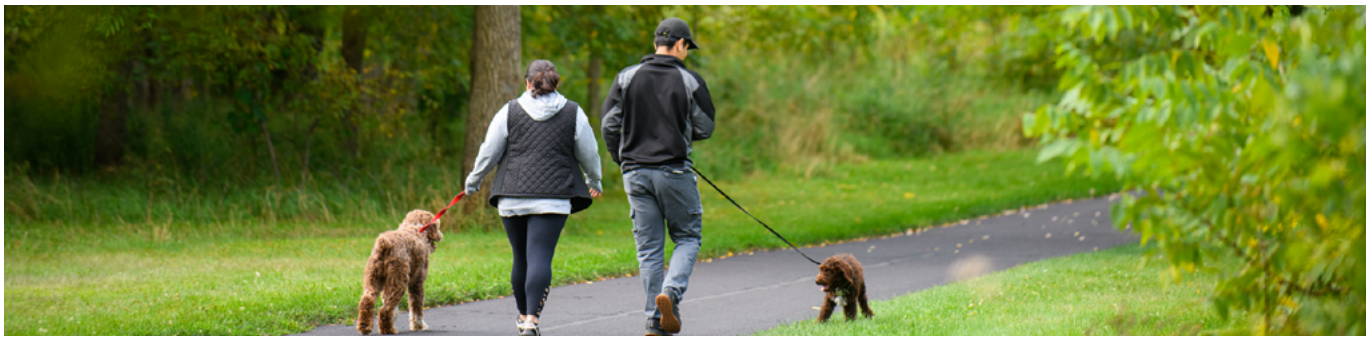
TABLE OF
CONTENTS

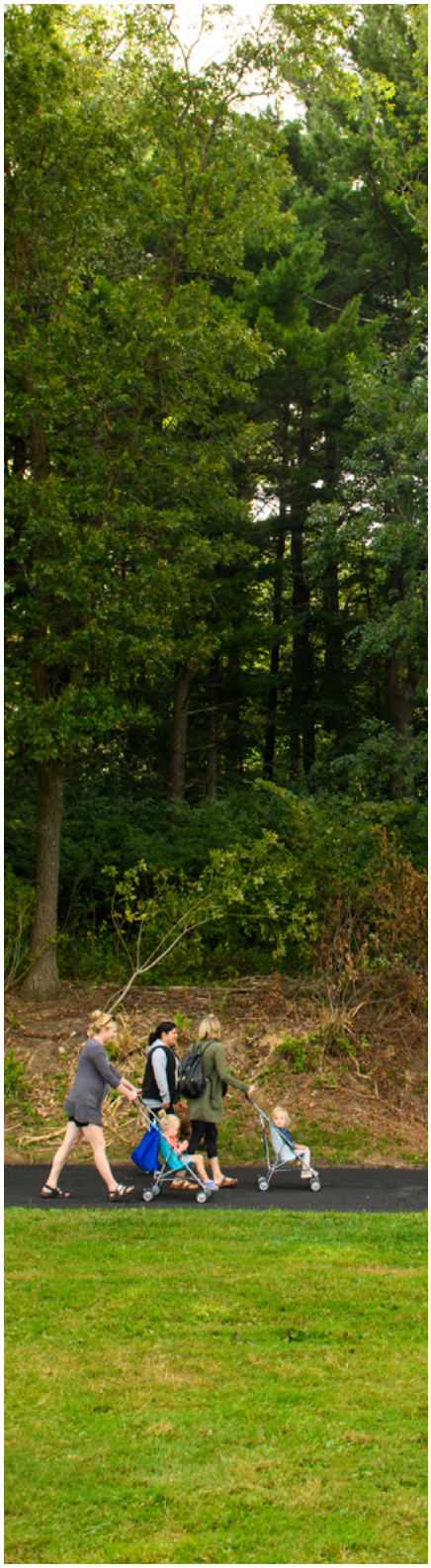
B APPENDICES

LIST OF TABLES

LIST OF FIGURES

(This page left intentionally blank)





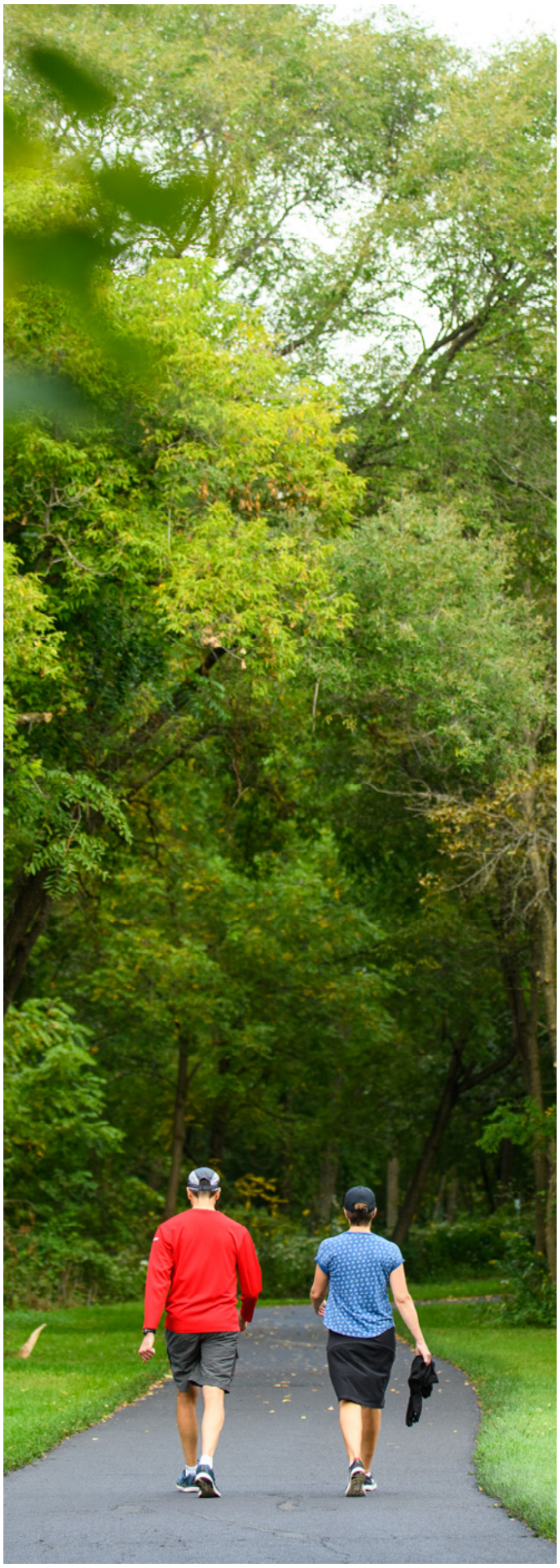
HEALTHY TREES, HEALTHY CITY

ROCHESTER PARKS & RECREATION
GO. PLAY. EXPLORE.

PLANIT GEO
mapping a greener future

2023 Urban Forest Master Plan

EXECUTIVE SUMMARY



PLANNING PROCESS

Prior to the development of the City of Rochester, Minnesota's Urban Forest Master Plan ("the plan"), the City's Parks and Forestry Division's City Forester and supporting staff worked with City departments, partners, and the community to identify the needs of the urban forest.

To inform the plan, traditional and non-conventional stakeholder engagement was conducted through virtual community meetings, public surveys, City website and social media channels; questionnaires to key groups such as the Rochester Area Builders Association and Rochester Public Utilities; and listening sessions with key City staff.

Feedback received through these efforts was used to produce a draft plan with a shared vision for the urban forest. The team then shared draft goals, strategies, and actions with members of the Parks and Forestry Division, key stakeholders, and the citizens of Rochester to ensure initial input was captured accurately.

Input received informed action priorities and the context in the plan to provide technical guidance for City Parks and Forestry while being relevant, accessible, and tangible to the community.

ROCHESTER'S URBAN FOREST TODAY

The residents of the City of Rochester ("the City", "Rochester") care about the place where they live, work, and recreate. Among the many things that make the City special is its physical environment—the urban forest—consisting of tree-lined streets, abundant parks, natural areas, trees in parking lots and framing buildings, flowering trees in spring, fall color, trees with swings in backyards, and trees edging streams and ponds cooling the waters for aquatic life. One of the most important responsibilities is to protect these resources and ensure that Rochester will always be a beautiful, healthy, and livable city, long into the future.

The City of Rochester has a vibrant urban forest that continues to be created, modified, and removed primarily by people, and sustaining it will require ongoing human intervention. The goal of this intervention is a sustainable urban forest— an urban forest that optimizes the benefits of trees while meeting established safety and economic goals. Achieving this requires robust management, diverse funding, adequate staffing, effective policies, and maintenance actions consistent with best practices.

The urban forest offers many benefits, some of which are directly identifiable and quantifiable, and others that are experienced. Recognition of the role urban forests play in improving human health and well-being in addition to being critical climate change mitigators continues to increase. A 2020 study of the Citywide urban forest cover found that this living infrastructure shades nearly 28 percent of the community and provides economic, environmental, and aesthetic benefits: $65.6 million in air quality improvements, carbon sequestration, and carbon storage services alone, and the prevention of nearly 133 million gallons of stormwater runoff annually. A 2018 study determined the ecosystem services and benefits of the 41,000+ public trees (boulevards and parks) totaled nearly $1.3 million annually. Most notably, the boulevard tree population prevents over 26.5 million gallons of stormwater runoff annually by intercepting rainfall. The function and structure of the inventoried tree population results in a replacement value of over $11.2 million as of 2015. The City's legacy of trees continues to grow and caring for this asset is an important part of maintaining a sustainable, and vibrant city.

The presence of trees in an urban environment must be balanced with other Citywide goals such as property rights, growth management, transportation,

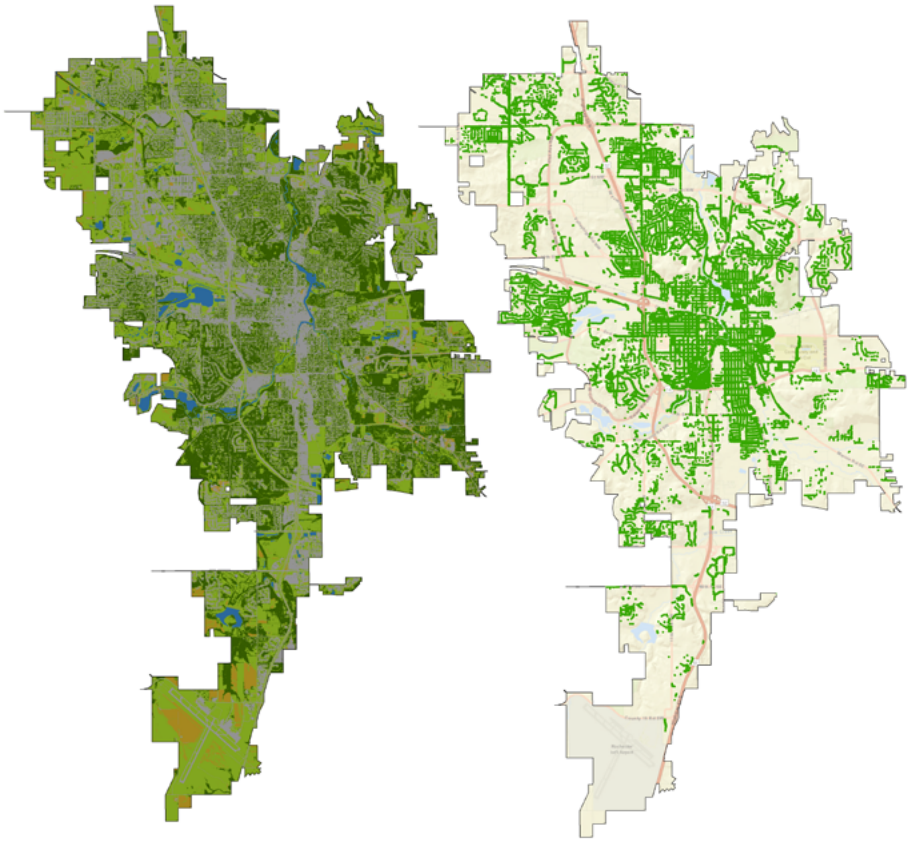
economic development, urban design, and the goals of property owners. A significant challenge faced by Rochester's urban forest is climate change. Trees both mitigate climate change and are affected by climate change. They absorb carbon dioxide and produce oxygen, but the changing weather (increased temperatures, frequent flooding, shortened lake freeze-thaw periods, and severe storms) has negative impacts on tree health, making them more susceptible to disease and pests.

Trees also face issues as cities grow and change. The world is undergoing an enormous surge of urban population growth, with more than half of all people now living in towns and cities (United Nations Population Fund). Specifically, the City of Rochester is growing at a rate of 1.56 percent annually and its population has increased by 14.93 percent since the 2010 census (U.S. Census Bureau). While nature may seem far from the urban environment, research increasingly shows that it plays a critical role in the lives of city residents. The urban forest supports the health and well-being of the people, offering benefits like stress reduction and opportunities for social connection. A growing body of scientific evidence suggests contact with nature provides a multitude of health benefits and may be an important factor in disease prevention and health promotion for people who live in urban areas. A healthy and thriving urban forest supports these benefits and aligns with the Destination Medical Center's (DMC) initiative to secure the Mayo Clinic's and the City's status as a global medical destination. Achieving the goals of both the DMC and urban forest management requires cohesive planning and coordination that will benefit the community as a whole.

MANAGING THE URBAN FOREST

The City of Rochester has a diversity of existing policies, programs, regulations, and incentives that are used to manage Rochester's urban forest. Four City departments engaged in Rochester's urban forest planning effort; each bring important expertise, perspective, and resources to this commitment—to the tune of nine City staff and nearly $1.4 million dollars (2020) to manage over 100,000 public trees. The City urban forestry team within the Parks and Forestry Division plants and cares for boulevard trees, provides free trees for residents, protects and restores forested parklands, manages public property trees on over 3,900 acres, regulates the removal of trees, and promotes stewardship of the urban forest. Interdepartmental coordination is essential for effective management and consistent delivery of urban forestry programs.

Rochester's urban forest is a diverse ecosystem consisting of young and mature trees of varying species, function, and associated benefits.



86
UNIQUE PUBLIC TREE SPECIES

62%
OF PUBLIC TREES IN GOOD CONDITION

28%
of the city is covered by tree canopy

Over 57,000
public trees inventoried

56%
of public trees are 1 to 8 inches in diameter

PLANNING THE URBAN FOREST

The planning process consisted of two phases; the needs assessment summarized in the Phase 1 Research Summary and Phase 2 goals and actions in the Urban Forest Master Plan. The first phase establishes a baseline from which short- and long-term strategies can be developed and monitored over time. The needs of the urban forest and the programs that manage it were evaluated through an audit of existing conditions and operations to establish a baseline from which progress can be measured. This diligent approach to Rochester's urban forest management gauges the City's readiness and available resources to achieve optimal levels of urban forest management and sustainability. Through this phased approach, a comprehensive understanding was gathered of the urban forest, the programs that manage it, and the community that benefits from and shapes it to inform strategic goals and actions.

The main tenets of this Plan focus on ensuring public safety, increasing operational efficiencies, facilitating short- and long-term sustainable urban forest planning, validating budgets and programs, ensuring equitable distribution of green resources and services, and standardizing methodology for asset management of the urban forest.

The Urban Forest Master Plan adheres to the following guiding principles:

- Recognize that the trees of the urban forest are more than aesthetic enhancements.
- Recognize trees as the backbone of the urban ecosystem and an essential part of the community's green infrastructure.
- Promote the health and growth of the urban forest by following scientifically established best management practices for tree selection, planting, watering, and pruning.
- Promote a robust urban forest through policies and practices that reduce its vulnerability to known diseases or pest infestations, and future threats, including the anticipated effects of climate change.
- Engage in a continuous process of long-range planning for the growth and maintenance of the urban forest.
- Promote public appreciation of the urban forest through educational outreach programs.
- Support local businesses, institutions, organizations, and individuals in their efforts to grow and maintain the urban forest through community education.
- Proceed in a manner that is inclusive and transparent.

URBAN FOREST MASTER PLAN GOALS

The City's project team consisting of Parks and Forestry Division staff and urban forestry consultants developed a set of diverse, comprehensive goals to guide urban forestry work. These goals were informed by an inclusive engagement process with the community and stakeholders undertaken throughout the planning process. The results of these efforts are a series of urban forestry goals to address the resource, the programs, and the people and are not listed by any particular priority or order.

1

TREE MANAGEMENT POLICY (MP):

Urban forest policies are the foundation for preserving the environmental benefits, management, and the character of Rochester's urban forest.

2

CAPACITY, TRAINING, AND AUTHORITY (CT):

Rochester has the capacity and expertise to provide optimal levels of service for sound urban forest management.

3

BUDGET AND FUNDING (BF):

City resources enable comprehensive urban forest management for the preservation and enhancement of tree benefits.

4

ASSESSMENTS AND PLANS (AP):

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

5

COMMUNITY ENGAGEMENT (CE):

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

6

GREEN ASSET MANAGEMENT (GA):

Rochester proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

STRATEGIC ACTIONS

The following series of strategic actions to achieve urban forestry goals are not listed by any particular priority or order.

1

TREE MANAGEMENT POLICY (MP):

Strategic actions for collaboration, strengthening of policies, sustaining canopy, achieving planting targets, and stewardship of the resource.

2

CAPACITY, TRAINING, AND AUTHORITY (CT):

Strategic actions for collaboration, planning, training, certification, and optimal service levels.

3

BUDGET AND FUNDING (BF):

Strategic actions for sustained funding to manage the urban forest, strengthen programs that manage it, and adjust to reflect changes.

4

ASSESSMENTS AND PLANS (AP):

Strategic actions to assess and effectively plan the current and future urban forest.

5

COMMUNITY ENGAGEMENT (CE):

Strategic actions for community outreach, engagement, partnerships, and recognition.

6

GREEN ASSET MANAGEMENT (GA):

Strategic actions for urban forest maintenance, removals, achieving canopy goals, managing risk, and growing a sustainable urban forest.

ACTION AGENDA

The action agenda outlines the steps that the City of Rochester and community partners will take to implement the Urban Forest Master Plan. The action agenda was informed by the inclusive engagement process consisting of key stakeholders and the public at large. Departmental workplans will provide additional details on those aspects of the urban forest that each department can manage. For example, the Parks and Forestry Division manages trees along the boulevards in the rights-of-way while Rochester Public Utilities has primary responsibility for the maintenance of trees within proximity to service lines.

City government will continue to perform key ongoing, urban forestry work including:

- Planting trees throughout Rochester and complying with the City's tree-related policies.
- Developing plans and strategies to manage the urban forest on City of Rochester natural landscapes and properties.
- Removing invasive plants from Rochester's forested areas.
- Coordinating departmental work and collaborating on urban forestry Citywide efforts.
- Updating initiatives and regulations in support of our Rochester's urban forest.

The actions in the following tables build on the ongoing work and will be the focus of this Plan for implementation in the next five years. Note, the comprehensive list of Plan actions are provided in the Action Framework section. Successful completion of all actions in this Plan will require additional staffing and resources that should be secured using the supporting studies in the Appendix.

URBAN FOREST MASTER PLAN PRIORITY ACTION AGENDA

ACTION #	ACTION	RATIONALE	DEPT. LEAD*
TREE MANAGEMENT POLICY PRIORITY ACTIONS			
MP.01	Align resources and planning efforts across City departments and partners to meet common goals and improve efficiencies. For example, adopt infrastructure policies that provide for optimal tree growth on all City projects with best practices and solutions such as Silva Cells, adequate soil volumes, and structural soils.	Partnerships and coordination enable efficient achievement of shared goals.	**PRD**, PWD, CDD, RPU
MP.03	Prepare a document to recommend changes to tree-related code and ordinances based on recommendations in Appendix C of the Urban Forest Master Plan (UFMP). Align with the Unified Development Code updates as feasible.	Effective ordinances ensure long-term urban forest sustainability.	**PRD**, PWD, CDD
MP.04	Establish tiers of achievable tree canopy goals and tree planting targets Citywide, by zoning or land use type, neighborhood, Ward Precinct, and/or Forestry Management Unit (FMU). Use Appendix A in the Urban Forest Master Plan as guidance.	Equal access to green spaces and an equitable distribution of tree canopy provides social, economic, and environmental benefits.	**PRD**, PWD, CDD
MP.05	Update tree-related manuals (Land Development Manual), standards, and best practices based on recommendations in Appendix C of the UFMP and as changes occur. Support the updates to the LDM as part of the Unified Development Code.	Clear and consistent guidelines ensure long-term urban forest sustainability.	**PRD**, PWD, CDD
MP.06	Evaluate the feasibility of establishing a Heritage Tree Ordinance. Align efforts with the postponed Tree Preservation Ordinance (proposed) or the Unified Development Code process. See Appendix C of the UFMP as an example.	Protecting significant trees retains community culture and urban forest characteristics and benefits.	PRD
MP.07	Support established tree canopy goals with effective tree preservation policies.	Effective policies ensure long-term urban forest sustainability.	**PRD**, PWD, CDD

URBAN FOREST MASTER PLAN PRIORITY ACTION AGENDA (CONTINUED)

ACTION #	ACTION	RATIONALE	DEPT. LEAD*
CAPACITY, TRAINING, AND AUTHORITY PRIORITY ACTIONS			
CT.01	Establish an urban forestry working group with regular meetings to monitor progress of implementing actions. Finalize lead implementers.	Coordinating implementation of the UFMP enables success.	PRD
CT.02	Utilize a continuous improvement framework to improve operational workflows in urban forest management.	As cities grow and change, workflows will adapt.	**PRD**, PWD, CDD
CT.04	Ensure tree-related operations are represented by staff with industry credentials such as International Society of Arboriculture (ISA) Certified Arborist and Tree Risk Assessment Qualification (TRAQ) either directly through the department or supporting department.	Staff training reduces costs and improves production, safety, levels of service, and the urban forest.	**PRD**, PWD, CDD, RPU
BUDGET AND FUNDING PRIORITY ACTIONS			
BF.05	Support natural areas management and planning funded by the Parks Referendum.	Goals of the referendum align with UFMP goals.	**PRD**, PWD, CDD
BF.08	Use inventory data, the Emerald Ash Borer (EAB) Plan, the 2021 Urban Forest Master Plan, and other resources to secure the necessary budget to implement EAB treatment and control measures.	Adequate funding to maintain a healthy urban forest benefits the community.	PRD
BF.10	Establish a dedicated, sustained funding source beyond the current departmental budget for urban forestry operations to increase the level of service to meet the community's high standards. Use Appendix D as guidance.	Funding that is diversified, sustained, and dedicated will enable long-term success.	PRD
ASSESSMENT AND PLANNING PRIORITY ACTIONS			
AP.01	Maintain an inventory of public boulevard trees and update as maintenance and new plantings occur. Encourage partners to manage a current inventory of utility trees.	Inventories inform maintenance, resource needs, planting, and ecosystem benefits.	**PRD**, RPU
AP.02	Maintain an inventory of trees in maintained areas of public parks and facility properties.	Inventories inform maintenance, resource needs, planting, and ecosystem benefits.	PRD
AP.04	Use the ISA protocols established in Action GA.08 when conducting risk tree assessments deemed a priority or imminent need. See Appendix F for guidance.	Consistent assessments using industry best practices reduces risk and improves public perception.	**PRD**, PWD, CDD
AP.06	Complete an urban forest audit using similar criteria as the 2020 audit completed for the UFMP to evaluate improvements in urban forest management and adapt strategies.	Evaluations enable adaptive management.	**PRD**, PWD, CDD
AP.08	Utilize Appendix E in the UFMP to develop a Master Tree Planting Plan Citywide and by neighborhood or FMU.	A strategic plan for planting can achieve canopy goals, sustainability, and equity.	**PRD**, PWD, CDD
AP.11	Based on the outcomes of the bi-annual urban forest audit, available resources, industry technology and research, and data, modify existing actions and develop new actions to continue to achieve goals of the 2021 UFMP.	Updates to actions applies adaptive management and improves decision making based on observable outcomes.	PRD
AP.14	Use the 2020 Tree Canopy Assessment and natural properties, wetlands, and Flood Control Reservoir Sites data to establish high-value conservation City-owned areas. Consider slopes, tree species and age diversity, wildlife, pollinators, and water quality, among others.	These areas offer unique opportunities for canopy preservation, expansion, biodiversity, benefits, and ecosystems.	PRD
AP.15	Establish plans for the conservation and preservation of high priority areas such as natural properties, wetlands, and Flood Control Reservoir Sites identified in Action AP.14.	These areas offer unique opportunities for canopy preservation, expansion, biodiversity, benefits, and ecosystems and constitute an urban forest.	**PRD**, PWD

URBAN FOREST MASTER PLAN PRIORITY ACTION AGENDA (CONTINUED)

ACTION #	ACTION	RATIONALE	DEPT. LEAD*
COMMUNITY ENGAGEMENT PRIORITY ACTIONS			
CE.04	Continue to engage neighborhoods with volunteer tree planting events. Prioritize areas with lower urban tree canopy and other considerations such as underserved communities using the 2020 Tree Canopy Assessment (TCA) and other datasets such as the Sustainability Office's air quality data.	A community that participates in stewardship take ownership and provide support.	PRD
CE.06	Continue to track and annually report urban forestry activities of all partners to apply to budget change requests and continue to maintain Arbor Day Tree City USA designation. Strive to achieve more Arbor Day Growth Awards and Sterling status (2013).	A city must demonstrate that it cares about its urban forest.	PRD
CE.07	Support volunteer training opportunities as feasible.	A community that participates in stewardship take ownership and provide support.	PRD
CE.09	Continue to strengthen partnerships with civic groups, Homeowners' Associations, volunteers, institutions, internal, City Council, neighborhoods, improvement districts, and non-conventional organizations.	Partnerships enable efficient achievement of shared goals.	**PRD**, PWD, CDD
CE.15	Develop strategies to remove barriers to participation for all community members. Barriers to address include ADA communications compliance, internet availability, language, cultures, location, transportation, etc.	A community that participates in stewardship take ownership and provide support.	**PRD**, PWD, CDD
GREEN ASSET MANAGEMENT PRIORITY ACTIONS			
GA.02	Maintain the current maintenance regimen by conducting annual large tree routine pruning (~7,000 trees annually), young tree training, and other tree maintenance activities based on available resources. Adjust as changes occur as a result of GA.01.	A well managed urban forest is sustainable, resilient, lower risk, and beneficial.	PRD
GA.08	Strengthen protocols and threshold criteria for routine and impromptu public tree risk assessments.	Consistent assessments using industry best practices reduces risk and improves public perception.	**PRD**, PWD, CDD
GA.09	Align tree planting and canopy goals with watershed goals, green stormwater infrastructure plans, sustainability goals (Sustainability and Resiliency Action Plan), emerald ash borer replacement trees, and other planning efforts by providing technical assistance for the goals of water conservation, stormwater management, improved water quality.	Partnerships and coordination enable efficient achievement of shared goals.	**PRD**, PWD, CDD

*PRD = Parks and Recreation Department; PWD = Public Works Department; CDD = Community Development Department; RPU = Rochester Public Utilities. **Bold** indicates lead implementer followed by supporters.

City departments will continue to support urban forestry efforts with available funding. Even though some of the action items below could help expedite the recovery of our most vulnerable communities, the urban forestry planning team is aware of the challenging times ahead. As economic recovery takes place and additional funding becomes available, the urban forestry planning team recommends that new funding be prioritized toward the following efforts:

1. Ongoing funding for tree and natural area crews to maintain the urban forest.
2. Continuing to perform urban forest assessments to inform management.
3. Leverage existing efforts such as Destination Medical Center to achieve common goals.

URBAN FOREST

MASTER PLAN

EXECUTIVE SUMMARY

HEALTHY TREES, HEALTHY CITY

ROCHESTER PARKS & RECREATION
GO. PLAY. EXPLORE.

PLANIT GEO™
mapping a greener future

INTRODUCTION

ROCHESTER URBAN FOREST MASTER PLAN MISSION STATEMENT

The City of Rochester, in partnership with the community and urban forestry consultants, completed this Urban Forest Master Plan in 2021. This plan is a guide to maintain, protect, and enhance Rochester's already extensive tree canopy cover resource and the multitude of associated benefits. The Urban Forest Master Plan extends beyond maintenance and operational guidance to include a variety of long-term goals, strategies, and priorities to achieve optimal levels of urban forest management, sustainability, and equity in a comprehensive and systematic manner. Achieving the goals set forth in this plan requires a shared commitment and partnership between the City and its community to sustain a thriving urban forest providing benefits to Rochester's environment, economy, and well-being for future generations.

THE VISION FOR ROCHESTER'S URBAN FOREST

Healthy Trees, Healthy City: Our City's trees, forests, and other natural resources are recognized as integral to sustaining life and health for all City residents. A healthy, thriving, and sustainable urban forest is a community priority, to be thoughtfully managed and cared for by partnerships between the City and its residents to maximize public safety and benefits that include a thriving ecosystem, vibrant economy, and livable communities shared by all who live, work, and play in Rochester.

PLAN PURPOSE

Many city planning and management actions, especially those that occur during redevelopment, have a large impact on the character and condition of the urban forest. A thriving and well-maintained public tree population provides a wide variety of benefits to the community. A healthy urban forest contributes to the economic vitality of Rochester, provides environmental stability, and provides a better quality of life. Care for the natural environment by the City, contractors, citizens, and volunteers is necessary to maintain and enhance the quality and benefits of the urban forest to which all residents are entitled.

To help ensure Rochester's urban forest will continue to prosper, the City has developed this long-term Urban Forest Master Plan ("Plan") to account for the needs of trees in the urban environment. To develop and maintain desired urban forest resource and program conditions, necessary management actions need to be executed in a timely manner. This Plan provides actions for management to maximize the benefits of the urban forest within the confines of available resources. This approach is implemented to successfully:

- Establish a baseline assessment of the urban forest resource, resources for management, and the community engagement framework.
- Provide analyses of urban forest management criteria to assist City Forestry in achieving greater levels of service.
- Provide the criteria for achieving goals of sustainable urban forest management in a phased approach based on available resources.
- Be a living document by providing the framework and guidance for adaptive management.

The Guiding Principles of the Urban Forest Master Plan

The Urban Forest Master Plan will adhere to the following guiding principles:

- Recognize that the trees of the urban forest are more than aesthetic enhancements.
- Recognize trees as the backbone of the urban ecosystem and an essential part of the community's green infrastructure.
- Promote the health and growth of the urban forest by following scientifically established best management practices for tree selection, planting, watering, and pruning.
- Promote a robust urban forest through policies and practices that reduce its vulnerability to known diseases or pest infestations, and future threats, including the anticipated effects of climate change.
- Engage in a continuous process of long-range planning for the growth and maintenance of the urban forest.
- Promote public appreciation of the urban forest through educational outreach programs.
- Support local businesses, institutions, organizations, and individuals in their efforts to grow and maintain the urban forest through community education.
- Proceed in a manner that is inclusive and transparent.

BACKGROUND

The trees throughout Rochester are an asset that bring value and benefits to the community. The City, with the implementation of this Urban Forest Master Plan, recognizes this asset and is working to ensure it continues bringing value and benefits to its residents for generations to come. The urban forest provides environmental benefits, adds to property values, and contributes to an enhanced quality of life for all of Rochester's residents, and implementation of this Urban Forest Master Plan is a tremendous opportunity to reinforce the City's dedication to preserving this important asset.

As is the case in cities around the world, the trees that make up Rochester's urban forest suffer from the difficulty of growing in harsh urban environments. Stressors such as pests and diseases, the current changing climate, air and water pollution, compacted soils, limited growing spaces, and limited resources are all factors to consider when planning for the healthy growth of an urban forest. To overcome such rigorous conditions for the City's trees and reap the benefits of these valuable assets, the care of the urban forest must be strategically and efficiently planned and cared for.

This Urban Forest Master Plan aims to obtain adequate tree management levels and garner support through staffing, funding, the community, and policy. Adequate tree management includes efficient and effective tree care, bolstered tree plantings to maintain age and species diversity in the public tree population, the equitable preservation and enhancement of canopy coverage Citywide to enhance the character and aesthetics of neighborhoods, and exemplary stewardship of the forest from all who live and work in Rochester. The Urban Forest Master Plan must be regarded as both a long-range policy guide and a living document that will respond to changing conditions over its life. It requires a close partnership between policy makers, staff, and the community. Adoption of this Urban Forest Master Plan enables the City to accomplish these objectives.

DEFINING THE URBAN FOREST

> "Urban forestry can be defined as the art, science, and technology of managing trees and forest resources in and around community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide to society."
> **HELMS, 1998**

Any inhabited area that has trees and vegetation is considered a community forest, though more urbanized communities often refer to this resource as an urban forest. Based on Rochester's population density, tree population, and the public interaction with and received benefits from trees, Rochester's resource is referred interchangeably as an urban and community forest in this Plan. The Urban Forest Master Plan focuses on the City-owned trees in public rights-of-way and parks, but also has implications for the trees on private property and attention to these are addressed through the Canopy Analysis as well as community outreach and education efforts.

The concept of urban and community forest management developed in the 1960s out of the death and devastation of the elm tree population throughout the United States due to Dutch Elm disease. The discipline of urban forestry strongly advocates for species and age diversity in a city's tree population so that the elm tree devastation of the 1960s does not happen again. Unfortunately, native and invasive pests and diseases continue to spread.

During the last three decades, urban forestry has evolved as researchers and practitioners learn more about the structure and function of trees and their unique role in providing environmental, economic, and social benefits to urban areas. Urban forestry provides each of these benefits in differing circumstances—as infrastructure, as part of design and development, and as efficient and productive providers of economic development.

Residents traditionally have indicated that they consider the trees in the community a priority. In urban environments, street and park trees are sometimes the only day-to-day interaction with nature that many residents may enjoy. As Rochester continues to grow, the urban forest needs a strong advocate. This will happen with the education and support of the City's constituency, staff, and elected officials via an approved urban forest master plan. The urban forest is unique in the array of benefits it provides to the community, and a plan will effectively collect and showcase these values.

While a plan is useful in helping educate and ensure future viability, it also will set up useful parameters for the daily operations and care of the urban forest. A fresh look at all urban forestry-related policies currently in place will bring into focus what is necessary for day-to-day activities to ensure long-term viability and safety of the urban forest.

BENEFITS OF THE URBAN FOREST

The quality of life of the citizens in any community depends on the urban forest, as trees make a vital and affordable contribution to the sense of community, pedestrian-friendly neighborhoods, energy savings, and air quality. Rochester's Parks and Forestry Division is critical to meeting the City's commitment to climate change mitigation and adaptation, carbon sequestration, stormwater reduction, wildlife habitat enhancement, and water conservation. Trees are one of the few infrastructure investments that, if properly maintained, will grow in value over time.

Note: The following data was derived from the Alliance for Community Trees.

Reduce Stress and Improve the Quality of Life

Neighborhoods with generous canopies of trees are good for public health. Greater contact with natural environments correlates with lower levels of stress, improving performance. Students' concentration levels go up when they are able to look out onto a green landscape. Studies show that children with attention deficit disorder function better after activities in green settings. A green environment impacts worker productivity. Workers without views of nature from their desks claimed 23% more sick days than workers with views of nature. Residents of areas with the highest levels of greenery were 3 times as likely to be physically active and 40% less likely to be overweight than residents living in the least green settings.

Rochester has grown to be a community that values its role in providing exceptional services and improved human health for its residents. It spawned the world-renowned Mayo Clinic, home to those leading the way in life science discoveries and health care innovations. Rochester is known as the go-to city for healing, it is where developers are building an epicenter fueled by economic boom and dramatic growth, where entrepreneurs come to find their place and discover the next big thing, and where outdoor lovers go to recreate. The Destination Medical Center (DMC) initiative, in a sense, is at the forefront of these opportunities. The DMC's innovative economic development initiative will secure the Mayo Clinic's and the City's status as a global medical destination. Within the DMC plans are objectives aligned with the goals of a healthy and expansive urban forest—one of which seeks to "create the optimal experience for patients, visitors, and community residents." The collaboration between City planners, developers, DMC managers, and the community will enhance the physical health, mental wellness, and general well-being of those in Rochester while achieving goals of the urban forest ("Healthy Trees, Healthy City"), the DMC, and other partner initiatives.

Clean the Air and Breathe Easier

Shade trees reduce pollution and return oxygen to the atmosphere. In addition to carbon dioxide, trees' leaves or needles absorb pollutants, such as ozone, nitrogen dioxide, sulfur dioxide, and some particulate matter.

Save Energy and Lower Energy Costs for Buildings

As natural screens, trees can insulate homes and businesses from extreme temperatures, keep properties cool, and reduce air conditioning utility bills. A 20 percent canopy of deciduous trees over a house results in annual cooling savings of 8 to 18 percent and annual heating savings of 2 to 8 percent. By planting shade trees on sunny exposures, residents and businesses can save up to 50 percent on hot-day energy bills.

Positively Influence Climate to Ensure Sustainability

Trees absorb carbon dioxide and store carbon in wood, which helps to reduce greenhouse gases. Carbon emissions from vehicles, industries, and power plants are a primary contributor to increased air temperatures in metropolitan areas. Trees in the United States store 700 million tons of carbon valued at $14 billion with an annual carbon sequestration rate of 22.8 million tons per year valued at $460 million annually.

Reduce the Need for Street Maintenance

Shaded streets last longer and require far less pavement maintenance, reducing long- term costs. Canopy diminishes pavement fatigue, cracking, rutting, and other damage. A study from University of California at Davis found that 20 percent shade cover on a street improves pavement condition by 11 percent, which is a 60 percent savings for resurfacing over 30 years.

Raise Property Values

Trees are sound investments, for businesses and residents alike, and their value increases as they grow. Sustainable landscapes can increase property values up to 37 percent. The value of trees appreciates over time, because the benefits grow as they do. For businesses, trees have added value, including higher revenues. Shoppers seek out leafy promenades that frame storefronts. Research shows that shoppers spend more—between 9 and 12 percent more—on products in tree-lined business districts.

Conserve Water and Soil

A tree's fibrous roots, extending into the soil, are premier pollution filtration and soil erosion prevention systems. Intensely urbanized areas are covered with a large number of impermeable surfaces. In contrast to an impervious hardscape, a healthy urban forest can reduce annual storm water runoff up to 7 percent. Highly efficient trees also utilize or absorb toxic substances such as lead, zinc, copper, and biological contaminants. One study estimated that eliminating the need for additional local stormwater filtration systems would result in savings exceeding $2 billion.

Cooler Pavement Diminishes Urban Heat Islands

Broad canopy trees lower temperatures by shading buildings, asphalt, and concrete. They deflect radiation from the sun and release moisture into the air. The urban heat island effect is the resulting higher temperature of areas dominated by buildings, roads, and sidewalks. Cities are often 5° to 10°F hotter than undeveloped areas, because hot pavement and buildings have replaced cool vegetated land. In addition, high temperatures increase the volatility of automobile oil and oil within the asphalt itself, releasing the fumes into the atmosphere. Shade trees can reduce asphalt temperatures by as much as 36°F, which diminishes the fumes and improves air quality.

Protect Wildlife and Restore Ecosystems

Planting and protecting trees can provide habitat for hundreds of birds and small animals. Urbanization and the destruction of valuable ecosystems have led to the decline of many of species. Adding trees, particularly native trees, provides valuable habitat for wildlife.

Build Safe Communities and Decrease Crime

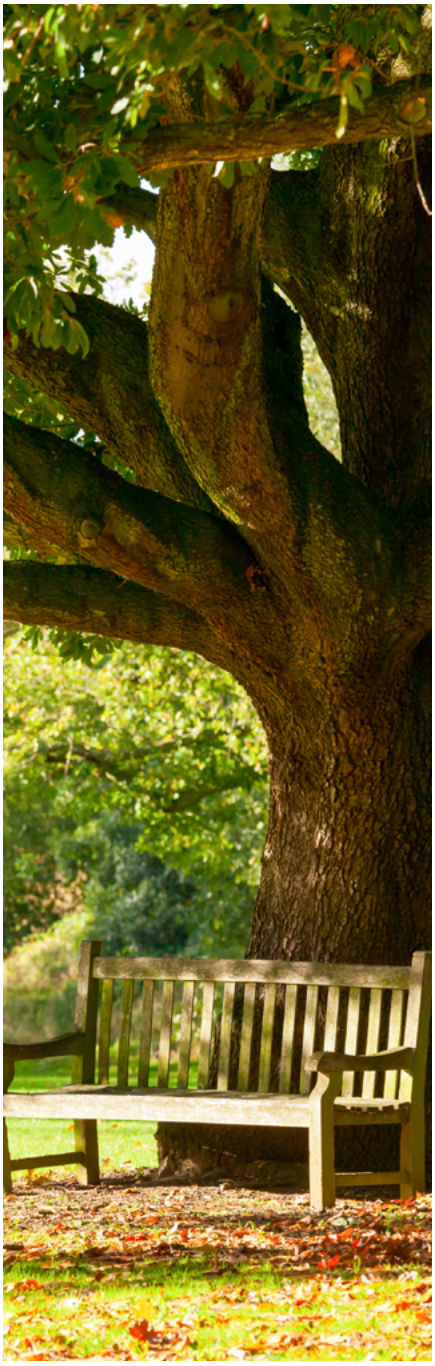
Police and crime prevention experts agree that trees and landscaping cut the incidence of theft, vandalism, and violence by enhancing campus neighborhoods. Thriving trees on well-maintained streets indicate pride of ownership. Public housing residents with nearby trees and natural landscapes reported 25 percent fewer acts of domestic aggression and violence. Apartment buildings with high levels of greenery had 52 percent fewer crimes than those without any trees. Buildings with medium amounts of greenery had 42 percent fewer crimes.

Calm Traffic and Make Neighborhoods Safer and Quieter

People drive more slowly and carefully through tree-lined streets, because trees create the illusion of narrower streets. One study found a 46 percent decrease in crash rates across urban arterial and highway sites after landscape improvements were installed. The presence of trees in a suburban landscape reduced the cruising speed of drivers by an average of 3 miles per hour. Faster drivers and slower drivers both drove at decreased speeds in the presence of trees. Trees reduce noise pollution, buffering as much as half of urban noise. By absorbing sounds, a belt of trees 100 feet wide and 50 feet tall can reduce highway noise by 6 to 10 decibels. Buffers composed of trees and shrubs can reduce 50 percent of noise.

KEY ISSUES FACING URBAN FORESTS

The City of Rochester has a unique urban form and character. Its size, layout, and development density influence the landscape and has created a charming and livable city. Rochester's citizens show pride in their city, and their neighborhoods are well cared for. The City's climate is ideal for a wide range of plants and boulevard trees and many of the City's streets and landscapes exhibit a unique and rich planting character. Some of the City's historic neighborhoods and its newest developments have a rich urban forest that illustrates Rochester's potential to be a tree-filled city guided by a strategic plan.



Cities around the world, and specifically in southern Minnesota face dramatically intensifying extreme weather and climate impacts including drought, frequent storms, flooding, and an increase in sustained high temperatures. In many instances, these impacts are already exceeding the designed capacity of city infrastructure to protect the health and safety of residents, businesses, and neighborhoods, which in turn threatens the fiscal viability of cities and regions. Urban trees can play a significant role in making cities resilient to weather and climate extremes, and in protecting human and ecosystem health and safety. To do so, trees must be consciously selected, planted and managed as the central component of an urban forest where individual trees are managed as part of a greater system with the purpose of improving the urban environment and enhancing benefits.

Yet the ability of urban trees and urban forests to achieve desired benefits is often drastically limited due to poor maintenance and management stemming from insufficient municipal budgets, lacking urban forest management systems and programs, limited training of tree care professionals, and a lack of enforcement of tree-management best practices to support tree health. Consequently, long-term tree health is compromised in many cities, resulting in limiting the beneficial functions of trees, leaving trees more susceptible to pests and disease, and leading to premature tree death. The impact of this is compounded for disadvantaged communities. As stated by Jad Daley, president and CEO of American Forests, "The single greatest threat from climate change to people in cities is extreme heat."

In turn, urban trees face multiple challenges to surviving and thriving. Trees that die years prematurely will not create the root systems and canopies

needed to reach their benefit potential and maximize their return on investment. Planting and maintaining an urban forest that exists in concert with other green infrastructure must include management by trained individuals, the use of tree inventory data, an understanding of baseline conditions and forecasted environmental changes, collaboration among departments to mainstream urban forest management, a community with a shared vision for the urban forest, and a roadmap for management provided in a plan.

These issues are exacerbated in disadvantaged areas of communities with limited resources. The City needs a comprehensive plan to preserve and expand the urban forest which results in an equitable distribution of tree canopy, associated benefits, and urban forestry opportunities. The City, its partners, and the community support a plan for the urban forest that sustains the resource and provides benefits to all who live, work, and recreate in the City.

To address these challenges, the Urban Forest Master Plan offers Rochester an opportunity to study, evaluate, and plan for improving urban forest management toward the goal of supporting human and ecosystem health and well-being. The urgency of protecting the urban forest has risen sharply as drought, pests, disease, climate impacts and budget cuts lead to rapidly rising tree mortality. To address and reverse tree die-off and the loss of ecosystem benefits, Rochester needs a robust system of professional management and public access to support resident engagement in care and expansion of the urban forest.

When making improvements to the urban forest, efforts should be prioritized to improve environmental justice, equity, access, and levels of service for underserved and vulnerable areas. These considerations may include additional tree plantings for an equitable distribution of urban forest cover and benefits, intensive tree management, diverse outreach approaches, and unique stewardship programs.

Rochester's Urban Forest Master Plan is a crucial planning effort to build a more sustainable resource, a healthy community, and progression towards carbon neutrality. Tree planting is one of the few tangible actions the City can directly take to address non-source specific pollution in Rochester and this master plan supports strategic planning for continued plantings resulting in long-lasting benefits.

This strategic plan for Rochester's urban forest strengthens City Code, policies, ordinances, standards, practices, and procedures; analyzes staffing structures and authority; identifies opportunities for sustained and diversified funding; provides guidance for routine and systematic inventories and assessments; identifies tree maintenance efficiencies and planting/canopy goals and priorities; addresses storm, disaster, and risk management needs; strengthens community outreach, education, and engagement; among other core urban forest management elements.

ROCHESTER'S URBAN FORESTRY BACKGROUND

Rochester is the third largest city in Minnesota and the largest outside of the Minneapolis-St Paul Metro area, with an estimated population of almost 119,000 (2019). Designated as a "Purple Heart City" and "City of Compassion" in 2017, it is clear that the city of Rochester cares about the well-being of its residents and the implementation of this Urban Forest Master Plan helps to solidify that commitment.

Located in the southeastern portion of Minnesota along the south fork of the Zumbro River, a tributary of the Mississippi River, Rochester was founded in 1854 and is the Olmstead County seat. The Zumbro River Watershed is situated in the Driftless Area, a region that escaped the effects of glaciation and is characterized by steep ridges covered in forests and valleys carved deep into the underlying bedrock. This region of Minnesota is known for its natural beauty and agricultural history, with the areas surrounding the city still being utilized primarily for agriculture. Rochester is directly tied to its natural environment and the City and its residents value these assets. As such, the City is focused on preserving the natural environment while supporting sustainability throu gh a range of strategies such as growing and improving the health of the urban forest canopy.

The City has an extensive parks system comprising more than 3,900 acres of park land across 100 individual park areas. It is the responsibility of the City Parks and Recreation Department's Parks and Forestry Division to maintain over 100,000 trees within these parks as well as trees along boulevards and other public properties within the City. Rochester's Parks and Forestry Division is also responsible for tree ordinance enforcement and permitting relating to new tree planting and boulevard tree maintenance. In addition to the Parks and Recreation Department's Parks and Forestry Division, the Park Board oversees its operations and administers the enforcement of city tree ordinances.

While it is the City's responsibility for tree care activities on public property, the preservation and growth of Citywide urban forest canopy should be the concern of both the City and the community residents. This plan will serve as a guiding document for the City to effectively and efficiently manage its urban forest, enabling the city to proactively manage its urban forest and provide a roadmap for the success of these efforts. With this assessment of the City's urban forest program, this Urban Forest Master Plan is developed to provide recommendations for staffing levels, tree maintenance priorities, strengthened tree management and preservation best practices and ordinances, an improved tree planting and planning process, and enhanced community engagement and stewardship.

Rochester has been recognized as a Tree City USA community for 39 years and has shown a dedication to maintaining and caring for their urban forest through their planting efforts and the care of their trees. Implementation of this Urban Forest Master Plan will only help to solidify this recognition and complement ongoing City efforts while achieving goals of a thriving, healthy, and sustainable urban forest.

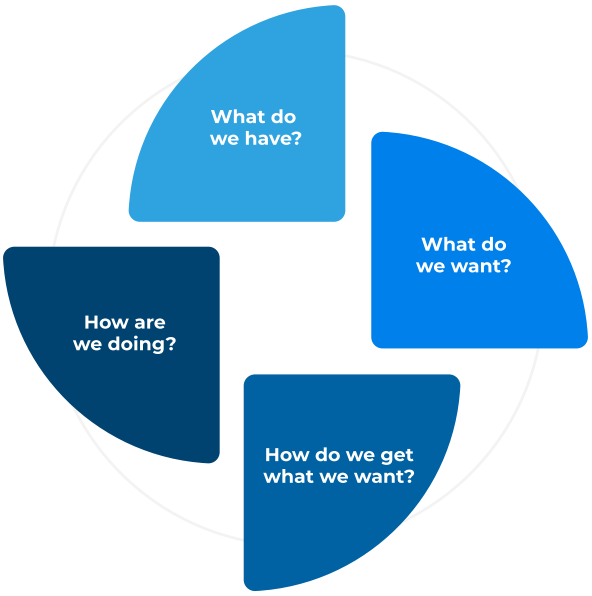
MASTER PLANNING PROCESS

PLANNING APPROACH

The purpose of the Urban Forest Master Plan is to answer the fundamental components of adaptive management: what do we have, what do we want, how do we get what we want, and how are we doing. Developing the plan required input from City staff, stakeholders, residents, data sources, thoughtful analysis, a coordinated vision, and time.

What do we have?

The first step of the process is to complete a baseline assessment of the urban forest, the resources to manage it, and the people that influence and benefit from it. The six planning elements completed in Phase 1 as part of the Research Summary provide the foundation for setting goals and measuring progress.



What do we want?

The plan is shaped by knowing what the urban forest needs, what the staff require to manage it, and what the community wants. This was informed by community meetings, public surveys, City staff interviews, and development of the goal and action framework.

How do we get what we want?

The goal, action, and target framework lay out the road map to achieve a shared vision that supports the needs of all members of the community.

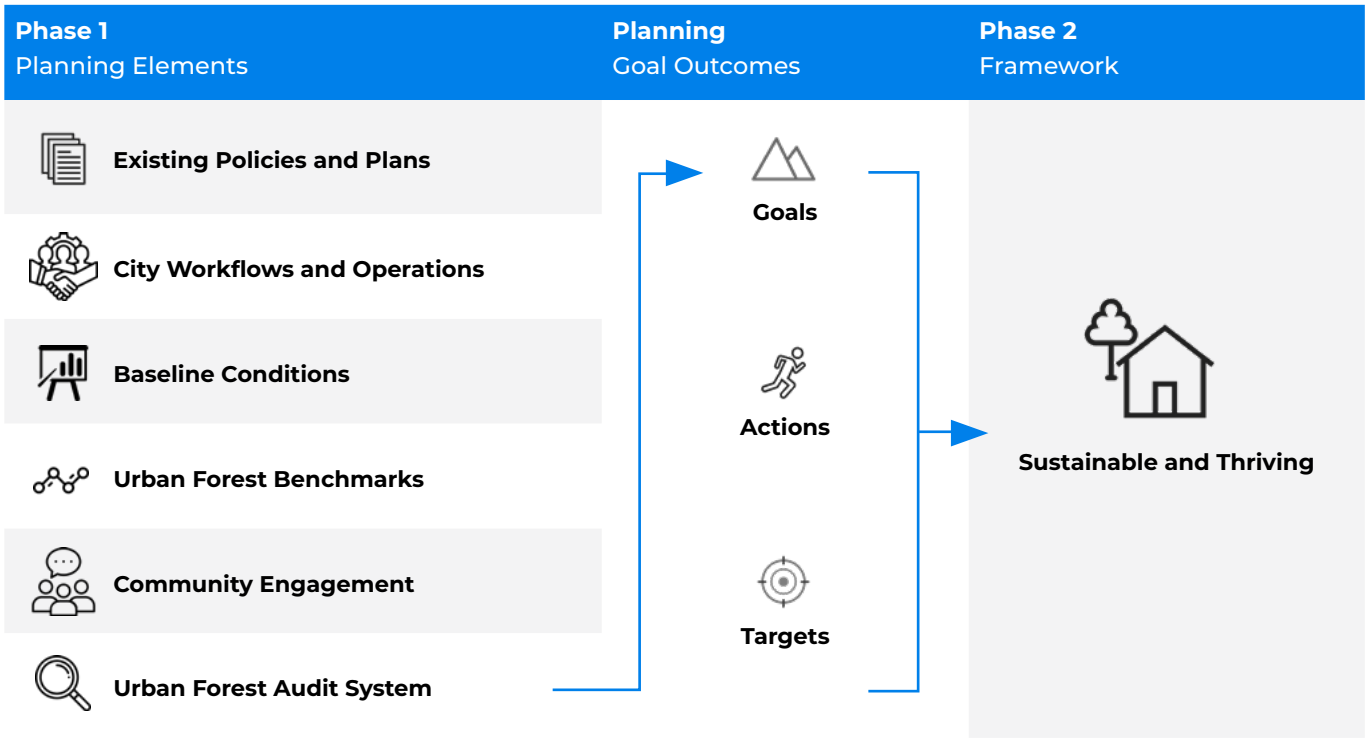
How are we doing?

The City needs to continually monitor progress towards the vision and goals. The Urban Forest Master Plan includes guidance for implementing actions and the responsible department(s) or stakeholder(s) to lead the effort. The planning approach for this Plan provides the framework for continual monitoring and evaluation of efforts through the use of the U.S. Forest Service's Urban Forest Audit System. Updates to this audit will inform any necessary changes to strategies and actions in an adaptive management approach.

PHASE 1 APPROACH

The systematic evaluation of the City of Rochester's urban forest management processes, resources, staffing, structure, and policies was conducted by completing the six planning elements as part of Phase 1: 1) Existing Policies and Plans, 2) City Workflows and Operations, 3) Baseline Conditions, 4) Urban Forest Benchmarks, 5) Community Engagement, and 6) Urban Forest Audit System. The City's project team evaluated the outcomes and findings of these planning elements and the urban forestry consultants revised these based on feedback to provide a comprehensive analysis that informs the baseline assessment and recommendations for Phase 2, the Urban Forest Master Plan. The following section provides a summary of these findings.

Figure 1. Framework of the Urban Forest Master Plan



PHASE 2 APPROACH

Understanding the benefits and functions of the urban forest, the City has developed this Urban Forest Master Plan.

> "Without a plan, the governments and individuals responsible for taking care of an urban forest will not be effective in meeting the true needs of the trees and the community. A plan establishes a clear set of priorities and objectives related to the goal of maintaining a productive and beneficial community forest."
> **AMERICAN PUBLIC WORKS ASSOCIATION, 2007**

The optimal approach to managing an urban forest is to develop an organized, proactive program using information to set goals and measure progress. This information can be utilized to establish priorities, plan strategically, draft cost-effective budgets, and ultimately minimize the need for costly, reactive solutions to crises or urgent risk mitigation. Based on the results of the **Phase 1 Research Summary**, incremental steps to achieve these improvements were developed that can be applied as the City continues to progress.

The goals of the Urban Forest Master Plan focus on preserving, maintaining, and enhancing the urban forest to ultimately benefit the residents of Rochester. The framework for this Plan supports the urban forestry vision:

"Healthy Trees, Healthy City": Our City's trees, forests, and other natural resources are recognized as integral to sustaining life and health for all City residents. A healthy, thriving, and sustainable urban forest is a community priority, to be thoughtfully managed and cared for by partnerships between the City and its residents to maximize public safety and benefits that include a thriving ecosystem, vibrant economy, improved human health, and livable communities shared by all who live, work, and play in Rochester."

Goals

Goals supporting the urban forest vision are provided based on strengths and opportunities identified during the development of the Phase 1 Research Summary. Each goal is supported by actions and targets the City and partners will use to attain the goal.

Actions

Actions are Specific, Measurable, Achievable, Relevant, and Time-bound to be implemented to acquire the goals of each planning theme. These actions include recommended timeframes or "target year(s)" beginning upon plan adoption and the lead department or partner(s) for implementation. Each action is rated based on the priority, level of effort and/or resources required, and the efficacy of the action.

Targets

Targets are performance standards and measurable values of specific indicators that enable monitoring of the actions to determine attainment of the actions and goals.

Evaluation

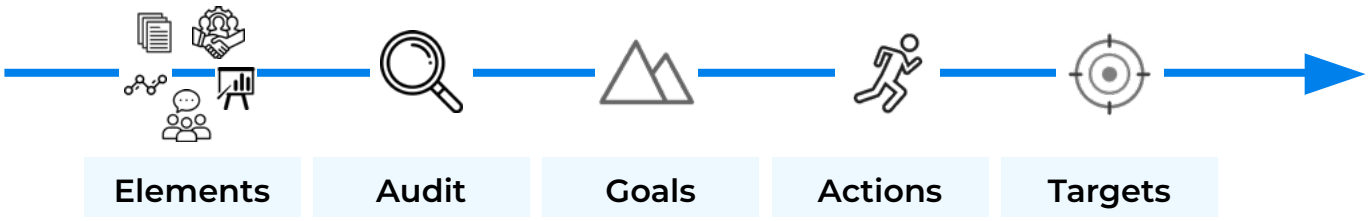
Using the Urban Forest Audit System described in the Phase 1 Research Summary and the Plan targets, implementation progress and success can be evaluated and annually reported. The evaluation using the audit provides the information necessary for adaptive management.

Co-benefits of Plan Implementation

Each action is accompanied by a graphic depiction of co-benefits, illustrating added value that comes with achieving that action and respective goal. For example, a neighborhood with dense tree canopied streets and landscape may have cooler summer temperatures that lead to fewer heat illnesses reported. Each action impacts four different co-benefits at various levels; the greatest relative level of impact is indicated by the presence of one or more of the following graphics in the Plan's action tables:

- *Community* – actions that engage the public.
- *Equity* – opportunities to satisfy essential needs and achieve full potential.
- *Human Health* – provides physical benefits to local residents.
- *Natural Environment* – benefits of air quality, water quality, and habitat.

GOAL AND ACTION FRAMEWORK



WHAT DO WE HAVE AND WHAT DO WE WANT?

EXISTING POLICIES AND PLANS FINDINGS

The purpose of this element is to gauge the City's commitment and readiness for urban forest sustainability. Measuring alignment of existing policies and plans ensures a strong connection among the programs that manage the urban forest and the projects and initiatives that support them. Proper alignment of urban forestry program recommendations reduces the risk of wasting resources and enables success of key projects that support urban forestry goals. Plans cannot live in isolation, therefore, cross-examining various plans and documents brings to light any projects or initiatives that are a misplacement of resources and time.

39 documents and resources were reviewed and indexed as part of the information discovery process and a total of 287 references to urban forestry were identified. These documents included:

Primary Documents

- **Rochester Comprehensive Plan**: The City's official policy guide for future development-related decisions. This plan examines existing conditions in Rochester and provides a picture of how the community wishes to develop over the next several years. The plan touches on human health, natural beauty, and other aspects related to urban forestry.
- **Parks and Recreation System Plan**: This plan's importance stems from the organizational layout of Rochester's Parks and Forestry Division. It discusses existing conditions, trends, visions, and implementation steps. Urban forest specifics include accessibility to shade trees, greening of City parks, recommended plantings, and coordination with the Urban Forest Master Plan.

- **City Code of Ordinances**: Chapters 9-4, 9-17, and Section 6-2-1 of the Rochester City Code address tree responsibilities, permitting, encroachments, nuisances, inspections, abatement, liability, and other urban forestry related issues.
- **Destination Medical Center Plan**: The purpose of this plan is to foster direct strategic investment to position Mayo Clinic and Rochester as the world premier destination medical center and center for health. The plan outlines development goals, and highlights human health as a cornerstone for Rochester's continued growth.
- **Parks and Parkway Maintenance Budget (2020)**: This approved budget provides insights on typical employee numbers as well as levels of spending on urban forestry activities and details acres managed, trees removed, trees pruned, and other specifics.

Supporting Documents

- Emerald Ash Borer (EAB) Strategic Plan
- Approved Boulevard Tree List
- Tree Planting Specification Plates
- Dutch Elm Disease (DED) Pamphlet
- Right-of-Way (ROW) Encroachment Guide
- Tree Planting Permit Application
- Boulevard Tree Work Application
- Natural Landscape Permit Application
- Commercial Tree Work License Application

CITY WORKFLOWS AND OPERATIONS FINDINGS

To gather an understanding of the departments and programs managing and influencing the public trees in Rochester, a series of meetings were held in 2020. Over a dozen different departments or offices were represented at the meetings and a total of 24 City staff members participated. The primary departments or offices represented include:

1. Parks and Forestry Division (PF)
2. Department of Public Works (PW)
3. Community Development (CD)

Over the course of these meetings, recurring issues and resource needs were identified. The following provides an overview of these trends that supported the development of this Plan:

Table 1. Summary of the City staff meetings

MEETING THEMES	RECURRING NEEDS
A) Landscape and Maintenance	• Add codes/polices to resolve tree/sidewalk conflicts. Incorporate the use of Silva Cells, root barriers, etc. • Address citizen concerns of adjacent homeowners being responsible for sidewalk maintenance. • Request additional funding for special provisions for sidewalk repair/replacement and tree preservation/ planting. • Provide recommendations on acceptable risk assessment thresholds to City leadership for guidance regarding safety procedures and liability. • Request additional staff/funding for EAB and DED management.
B) City Code and Policies	• The program could be supported by documentation of ISA Best Management Practices (BMPs) and American National Standards Institute's (ANSI) Standards and standard operating procedures (SOP). • Forestry and RPU Memorandum of Understanding (MOU) or Standard Operating Procedure (SOP). • Revise current draft of Tree Protection Ordinance and formally incorporate into City Code. • Add minimum tree planting site conditions – soil quality, planting volume, etc. – to City Code. • Reduce pruning rotation from current 20-year cycle to industry recommended 7-year cycle, less reactionary management and more proactive grid/circuit/FMU pruning.
C) Planning, Design, and Development	• Clarify existing structural soils requirements. • Require a timeline of required tree survival when planted in development projects. • Add resources/expertise to Community Development Department for reviewing project site tree inspections. • Consider adding budget for City-sponsored tree plantings.
D) Data and Information Technology	• Complete city-wide tree inventory and create a plan to update regularly. • Receive training on PlanIT Geo's TreePlotter CANOPY software application. Consider a public access portal for relaying urban forest information and benefits to residents.
E) Community Outreach and Education	• Utilize RNeighbors to get the word out about the 2020 urban tree canopy (UTC) assessment data. • Connect the Youth Commission with the Tree Preservation Initiative. • EAB messaging and proper tree care guidance for property owners. • Relate the benefits of trees on mental health and the restorative effects of urban and rural forests to residents. • Focus efforts on telling the urban forestry story better – including trees on private property.

BASELINE CONDITIONS FINDINGS

To identify the existing conditions of the urban forest from which goals and actions can be measured, an analysis of existing tree-related datasets was completed as part of the evaluation process. These datasets included the 2020 Urban Tree Canopy Assessment (UTC) as well on data gathered from the ongoing City-wide tree inventory.

2020 Urban Tree Canopy Assessment

In 2020, Rochester's Citywide urban tree canopy (UTC) was assessed for a better understanding of the extent of trees and available planting space, not just within City-maintained areas, but in all land uses. Using high resolution aerial imagery from the USDA's National Aerial Imagery Program (NAIP) for Minnesota, remote sensing and GIS techniques were used to map and measure land cover types across several geographic scales. The intent of this assessment was to analyze canopy and other land cover metrics in developing an Urban Forest Master Plan for the City of Rochester. The complete analysis and summary is provided in the Phase 1 Research Summary.

Table 2. Overview of the 2020 UTC

Rochester Land Cover	Total Area	Tree Canopy	Non-Canopy Vegetation	Impervious Surfaces	Soil & Dry Vegetaion	Water
Acres	35,677	9,786	13,935	10,043	1,126	787
% of Total	100%	27% (28% when excluding water)	39%	28%	3%	2%

Ongoing Public Boulevard Tree Inventory

In 2020, existing public boulevard tree survey data (available for roughly 57,000 of Rochester's estimated 100,000 trees) was used to assess tree abundance, distribution, composition, size classes, and functional benefit. The urban forestry consultants for this Plan analyzed the datasets to confirm the findings and these findings are summarized below to inform Plan recommendations. An overview of ecosystem services and benefits is provided in the following section. The complete analysis and summary is provided in the Phase 1 Research Summary.

Table 3. Overview of the 2020 public boulevard tree analysis

57,235	Public trees	**86**	Unique tree species
62%	Good condition	**3%**	Poor condition
89	Marked for removal	**14**	Forest Management Units
9%	Norway Maple trees	**9%**	Green Ash trees
2,937	Trees require pruning	**176**	Trees with utility conflicts
56%	Trees in the 0-8"-inch class	**6%**	Trees in the >24"-inch class

URBAN FOREST BENCHMARKS FINDINGS

The following summary provides an overview of the urban forest benchmarking results based on the analysis of two datasets; Arbor Day Foundation's 2019 Tree City USA database (method 1) and the Municipal Tree Care and Management in the United States – a 2014 Urban and Community Forestry Census of Tree Activities by R. Hauer and W. Peterson method 2. The complete analysis and summary is provided in the Phase 1 Research Summary.

Table 4. Summary of method 1 benchmarking research results

2019 Tree City USA - Rochester		2019 Tree City USA - Regional	
$1.55M	Tree management budget	**$1.27M**	Average budget
$16.19	Per capita forestry budget	**$11.41**	Average per capita budget
$701k	Tree maintenance budget	**$344k**	Average maintenance budget
$245k	Tree planting/care budget	**$182k**	Average planting/care budget
4,665	Trees pruned	**3,381**	Average trees pruned
1,007	Trees removed	**1,069**	Average trees removed
1,505	Trees Planted	**1,050**	Average trees planted

Table 5. Summary of method 2 benchmarking research results

2014 Census - Rochester		2014 Census - Population Group	
$1.55M	Forestry program budget	**$1.37M**	Average forestry budget
0.55%	Of total budget for forestry	**0.48%**	Average forestry budget compared to total budget
100k	Estimated public trees	**73k**	Average count of public trees
$13.32	Budget per capita	**$9.05**	Average budget per capita
0.85	Public trees per capita	**0.51**	Average public trees per capita
11k	Public trees per staff	**13k**	Average public trees per staff
3.5k	Acres of parks and open space	**1.3k**	Average acres of parks and open space

COMMUNITY ENGAGEMENT FINDINGS

A series of 33 questions directly related to Rochester's existing urban forest, resources, management, and perception were drafted and shared online via the City's communications channels and over 400 City residents responded. Following the web surveys, public meetings were conducted online to share the UFMP process, framework, and next steps. Citizen feedback was incorporated into various aspects of recommendations, goals, and observations in the UFMP. Selected questions from the surveys and a brief synopsis of observations are included below. The complete analysis and summary is provided in the Phase 1 Research Summary.

Table 6. Overview of public survey results

40	Total responses
48%	Think urban forest health has declined in the last 10 years
38%	Said tree maintenance and hazard trees are the most urgent issue
30%	Unsure of who manages ROW trees
87%	Considered reduced air pollution/better air quality the most appreciated benefit of trees
61%	Feel that current tree risk management is good
67%	Said the City is not pruning enough trees annually
70%	Feel that trees positively impact community physical and mental health
80%	Feel there should be more canopy coverage
77%	Think the City is doing fair to good when it comes to managing public trees
67%	Feel the City is not planting enough trees
76%	Support a City-wide Canopy Goal
80%	Were most interested in ensuring young tree survival
50%	Desire community orchards and fruit gleaning
61%	Believe the City is understaffed for proper management of the urban forest
82%	Support a tree preservation ordinance

Top Trends in Survey Comments

- Increasing canopy coverage
- Dealing with EAB
- Increasing tree plantings
- Leveraging the eco-benefits of trees (heat island reduction, stormwater infiltration)
- Concerns regarding trees and sidewalk damage
- Support for a tree preservation ordinance
- Support for woody debris recycling/reuse
- Improvements in urban forest equity
- Addition of urban forestry staff/funding
- Creation of a City-wide canopy goal
- Education and training

URBAN FOREST AUDIT SYSTEM

To develop this Plan, over 40 documents, plans, and resources were gathered and reviewed by applying the U.S. Forest Service's Urban Forest Sustainability and Management Audit's Discovery Matrix. This matrix includes a total of 11 urban forest categories, each containing a multitude of supporting elements. All resources were reviewed to identify references regarding each of the categories and supporting elements. There are a total 287 instances where the 40+ resources reference the 11 categories and supporting elements. The number of resources referencing elements of urban forest sustainability and management demonstrate Rochester's readiness for changes driven by this Plan. Recommendations in this Plan align with components of these supporting resources. For a complete list of categories, elements, and supporting resources, see the Research Summary.

Based on the analysis of findings from the Phase 1 planning elements and audit, **Rochester scored a 78 percent** in terms of urban forest sustainability and management as defined by the U.S. Forest Service, partners, and planning consultants. The City of Rochester scored relatively high when compared to other urban forestry audits completed by the consultants for other communities of similar size. Overall, the City scored highest in the Professional Capacity and Training, Green Asset Evaluation, Decision and Management Authority, Community, Disaster Planning, Standards and Best Management Practices, and Inventory categories — all of which are above 75 percent. The Urban Forest Master Plan provides the guidance to maintain these strengths and to address shortcomings as opportunities.

The summary of this evaluation is provided in the Urban Forest Audit section of the Research Summary. Based on the audit of 126 subcategories (11 primary categories), Rochester is achieving "Adopted Common Practice" for 86 (67 percent) of these. 28 subcategories (22 percent) are "In Development". Applying the multipliers of 2 for Adopted Practice and 1 for In Development results in a total score of 200 out of 258 possible points, or 78 percent (detailed in the following table).

Table 7. Outcomes of the urban forest auditing process for Rochester

#	DESCRIPTION	SOC* (% ACHIEVED)	BASE** (% ACHIEVED)	OVERALL RATING	OVERALL (% ACHIEVED)
1	Management Policy, Ordinances	75%	50%	14	50%
2	Professional Capacity and Training	100%	NA	18	100%
3	Funding and Accounting	100%	NA	9	75%
4	Decision, Management Authority	100%	100%	7	88%
5	Inventories	NA	63%	20	77%
6	Urban Forest Management Plans	NA	50%	14	58%
7	Risk Management	75%	100%	13	72%
8	Disaster Planning	NA	83%	11	79%
9	Standards and BMPs***	100%	81%	51	85%
10	Community	100%	NA	24	80%
11	Green Asset Evaluation	NA	NA	19	95%
TOTAL		**93%**	**75%**	**200**	**78%**

**Standard of Care (SOC) elements represent the minimum group of urban forestry management "best practices" that a municipality should consider for implementation. SOC refers to the degree of prudence and caution required of an individual who is under a duty of care (i.e., legal obligation of the controlling authority, owner, or manager) to minimize risk. Neither state, regional, nor national minimum management components have been established for SOC but these are interim recommendations for consideration. (NA = not applicable)*

***Base Practices (BP) elements represent additional urban forest management activities or components that may effectively expand a program beyond the SOC group (see footnote above). These elements are typically precursors to other "non-core" elements in the category. (NA = not applicable)*

****Best Management Practices (BMPs)*

SUMMARY OF FINDINGS

Table 8. Conclusions from the planning elements integrated into the Urban Forest Master Plan

ELEMENT	CONCLUSION
1) Existing Policies and Plans	The City has a strong framework of policies and plans that allude to or reference urban forestry, but a strategic Urban Forest Master Plan is needed to connect these elements. The City should implement actions in this Plan to update policies and inform existing and ongoing City plans.
2) City Workflows and Operations	Multiple City departments support the development of more refined City Code and SOPs for ongoing urban forestry operations and management. More cohesive planning and management will improve efficiencies, provide support, and improve the levels of service provided to City residents. Departments currently coordinate tree maintenance in parks and streetscapes effectively within the constraints of resources, though some room for upgraded communication exists between the Parks and Forestry Division and RPU.
3) Baseline Conditions	The City has several tree-related datasets to support the Urban Forest Master Plan, but should consider a regular and comprehensive inventory of boulevard trees and trees in parks or other public areas. The City public tree population would benefit from increased species and age diversity driven by a strategic planting and management as outlined in the Plan, with an added long-term city-wide canopy goal.
4) Urban Forest Benchmarks	The City should evaluate its staffing levels and responsibilities to better manage the public tree population at levels consistent with industry standards and cities of similar population size, especially given the challenges posed by EAB and DED. The budget for urban forest management should align with the recommended actions in this Plan. Rochester should also consider developing a science-based citywide tree canopy goal, a common urban forestry benchmark, from which progress can be measured.
5) Community Engagement	The City's residents expressed the importance of increased tree plantings and more "touch time" with existing trees in order to maximize economic, and social benefits provided by the urban forest. Residents support a healthy and resilient urban forest maintained through proper planting, species selection, invasive management, tree maintenance, and stewardship opportunities.
6) Urban forest Audit System	Overall, the City scored **78 percent** based on the U.S. Forest Service's Urban Forest Audit system that evaluates 11 categories of urban forest management and sustainability. A relatively high scoring was anticipated since the City is taking purposeful steps in elevating their urban forest management program. Implementation of actions in this Plan will maintain strengths and improve shortcomings. Frequent auditing exercises should be conducted to measure progress and adjust strategies in an adaptive management approach.

HOW DO WE GET
WHAT WE WANT?

Results from five planning elements were used to complete the Urban Forest Audit of Rochester's urban forest and the programs that manage it. With this process, the City's strengths and opportunities were systematically evaluated to inform the Plan's urban forestry goals, actions, and evaluation criteria for adaptive management. The goals in the Plan are a result of this evaluation and are consistent with the categories in the Urban Forest Audit system. These goals systematically identify how the City will achieve desired outcomes.

Table 9. Goals for Rochester's urban forest

GOAL THEME	AUDIT SCORE*	GOAL DESCRIPTION
Tree Management Policy (MP)	50%	Urban forest policies are the foundation for preserving the environmental benefits, management, and the character of Rochester's urban forest.
Capacity, Training, and Authority (CT)	100% 88%	Rochester has the capacity and expertise to provide optimal levels of service for sound urban forest management.
Budget and Funding (BF)	75%	City resources enable comprehensive urban forest management for the preservation and enhancement of tree benefits.
Assessments and Plans (AP)	77% 58%	A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.
Community Engagement (CE)	80%	Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.
Green Asset Management (GA)	82% avg.	Rochester proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

**Based on the 2021 evaluation of Rochester's urban forestry asset, programs, and community framework. Green Asset Management includes the Risk Management (72%), Disaster Planning (79%), and Green Asset Management (95%) audit categories— an average of 82%*

CITY OF ROCHESTER URBAN FORESTRY GOALS

The following series of urban forestry goals to address the resource, the programs, and the people and are not listed by any particular priority or order.

1

TREE MANAGEMENT POLICY (MP):

Urban forest policies are the foundation for preserving the environmental benefits, management, and the character of Rochester's urban forest.

2

CAPACITY, TRAINING, AND AUTHORITY (CT):

Rochester has the capacity and expertise to provide optimal levels of service for sound urban forest management.

3

BUDGET AND FUNDING (BF):

City resources enable comprehensive urban forest management for the preservation and enhancement of tree benefits.

4

ASSESSMENTS AND PLANS (AP):

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

5

COMMUNITY ENGAGEMENT (CE):

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

6

GREEN ASSET MANAGEMENT (GA):

Rochester proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

Action Framework

Table 10. Framework and description of urban forestry actions

PRIORITY	EFFORT	ACTION # & ORDER	ACTION DESCRIPTION	CO-BENEFITS**	LEAD* & TARGET YEAR
1-3 ranking of action importance indicated by cell color (3 cells = highest priority)	1-3 ranking of resources required indicated by cell color (3 cells = highest level of effort)	Action number with a reference to the Urban Forest Audit categories. Number to indicate overall order of implementation	Description of the action for the respective goal	Additional benefits to Rochester. Up to 3 dots (“●”) possible. More dots, greater impact. C=Community, H= Human Health E=Equity N=Natural Environment	Implementer lead and collaborator. Calendar year(s) to implement

**Lead: PRD = Parks and Recreation Department; PWD = Public Works Department; CDD = Community Development Department; RPU = Rochester Public Utilities*

***Co-benefits: C = Community; H = Human Health; E = Equity; N = Natural Environment*

Table 11. Example framework of the urban forestry actions

PRIORITY	EFFORT	ACTION # ORDER	TREE MANAGEMENT POLICY (MP) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		**MP.01** 20	Align resources and planning efforts across City departments and partners to meet common goals and improve efficiencies. For example, adopt in-frastructure policies that provide for optimal tree growth on all City projects with best practices and solutions such as Silva Cells, adequate soil volumes, and structural soils.		**PRD**, PWD, CDD, RPU Annually

GOAL 1

TREE MANAGEMENT POLICY (MP)

Urban forest policies are the foundation for preserving the environmental benefits, management, and the character of Rochester's urban forest.

URBAN FOREST AUDIT:

Management Policy and Ordinances at 50% Attainment (2021)
Standards and Best Management Practices at 85% Attainment (2021)

STRENGTHS:

Chapter 9.4 of City Code describes the City authority to manage boulevard and other public trees. It describes the abutting property owner's responsibility, restrictions, and permitting requirements. The City is consolidating all development-related regulations into a single resource through the Unified Development Code (UDC) effort to regulate land development in Rochester. The zoning requirements within this regulation supports the protection and growth of the urban forest. Supporting this effort is a draft Tree Preservation Ordinance (TPO) for consideration in future planning. The current Land Development Manual describes the requirements for tree planting and preservation.

The City has a strong framework of standards and best practices in place including planting and protection specifications, structural soil guidelines, approved boulevard tree lists, right-of-way encroachment guides, permitting guidance, proper tree care guidance, and construction and design standards.

OPPORTUNITIES:

Establish tree canopy goals Citywide and include planting targets at a finer scale such as neighborhoods, Forestry Management Units, Census Blocks, and/or Zoning. Align these goals with planning efforts such as Destination Medical Center, stormwater, and sustainability. Continue to engage in the policy updates such as the UDC and TPO efforts. All efforts should support a "no-net-loss" strategy through proper tree preservation.

It is recommended Parks and Forestry compile all tree-related standards and best practices into a single resource such as a manual for City staff, contractors, and property owners. The City would advance in this audit category by including existing resources as well as statements of necessary industry standards (e.g., ANSI and ISA), proper tree selection to support species and age diversity, and tree risk assessment protocols in the manual.

PURPOSE:

- Support: An urban forestry program implementing actions without the appropriate support from policy and ordinances is at risk of using resources and time inefficiently and may lack the enforcement necessary for permanent improvements. A weak or outdated framework of policy and ordinances for urban forest management jeopardizes the success of key projects that support this Plan.

- Connections: Alignment of policy and ordinances ensures a strong connection among the urban forestry program's high-level strategic goals, and the projects and initiatives that support these goals.

- Holistic: Programs cannot live in isolation. Therefore, cross-examining and aligning various plans, policies, and ordinances brings to light any projects or initiatives that are a misplacement of resources.

TREE MANAGEMENT POLICY (MP) ACTIONS

Table 12. Goal 1, Tree Management Policy Actions

PRIORITY	EFFORT	ACTION # ORDER	TREE MANAGEMENT POLICY (MP) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		MP.01 20	Align resources and planning efforts across City departments and partners to meet common goals and improve efficiencies. For example, adopt infrastructure policies that provide for optimal tree growth on all City projects with best practices and solutions such as Silva Cells, adequate soil volumes, and structural soils.	C H E N	**PRD**, PWD, CDD, RPU Annually
		MP.02 30	Tree managing staff should engage in City department planning such as updates to the City's comprehensive plan, Rochester Public Utilities Vegetation Management Plan, and the Sustainability and Resiliency Action Plan led by the Sustainability Task Force.	C H E N	**PRD**, PWD, CDD Annually
		MP.03 41	Prepare a document to recommend changes to tree-related code and ordinances based on recommendations in Appendix C of the Urban Forest Master Plan (UFMP). Align with the Unified Development Code updates as feasible.	C H E N	**PRD**, PWD, CDD 2022
		MP.04 46	Establish tiers of achievable tree canopy goals and tree planting targets Citywide, by zoning or land use type, neighborhood, Ward Precinct, and/or Forestry Management Unit (FMU). Use Appendix A in the Urban Forest Master Plan as guidance.	C H E N	**PRD**, PWD, CDD 2022
		MP.05 58	Update tree-related manuals (Land Development Manual), standards, and best practices based on recommendations in Appendix C of the UFMP and as changes occur. Support the updates to the LDM as part of the Unified Development Code.	C H E N	**PRD**, PWD, CDD 2023
		MP.06 59	Evaluate the feasibility of establishing a Heritage Tree Ordinance. Align efforts with the postponed Tree Preservation Ordinance (proposed) or the Unified Development Code process. See Appendix C of the UFMP as an example.	C H E N	**PRD** 2024
		MP.07 62	Support established tree canopy goals with effective tree preservation policies.	C H E N	**PRD**, PWD, CDD 2024
		MP.08 63	Update tree-related policies and procedures (SOPs) based on recommendations in Appendix C of the Urban Forest Master Plan UFMP). Action supports action CT.10.	C H E N	**PRD**, PWD, CDD 2024
		MP.09 79	Consolidate tree-related policies, guidelines, best practices, and standards into a tree manual for planners, developers, homeowners, and tree care companies. See Appendix G in the UFMP as an example.	C H E N	**PRD**, PWD, CDD 2027

TREE MANAGEMENT POLICY (MP) TARGETS

Table 13. Goal 1, Tree Management Policy Action Targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
All entities, resources, and planning efforts identified (Year 1)	Regular meetings between departments and partners improves outcomes and efficiencies (Year 5)	Goals of participating partners are achieved (Year 10)
Tree management staff represented at relevant planning meetings (Year 1)	Tree management staff represented at relevant planning meetings (Year 5)	Urban forestry is integrated into all relevant City and partner planning efforts (Year 10)
Recommendations in the UFMP are refined (Year 1)	A document is prepared detailing necessary amendments (Year 1)	**Changes to Code and ordinances approved and enacted (Year 2)**
Recommendations in the UFMP are refined and canopy goals are finalized (Year 1)	**A reassessment of tree canopy shows an increase in canopy aligned with canopy goals (Year 10)**	Achievement of local and Citywide canopy goals (Year 20)
Recommendations in the UFMP are refined (Year 1)	A document is prepared detailing necessary amendments (Year 1)	**Changes to manuals, standards, and practices are approved and implemented (Year 3)**
Model Heritage Tree Ordinances are compiled (Year 1)	Draft Heritage Tree Ordinance guidelines are developed (Year 3)	**Feasibility report prepared and a decision is made (Year 4)**
Recommendations in the UFMP are refined (Year 1)	A document is prepared detailing necessary amendments (Year 1)	**Changes to policies and procedures are approved and implemented (Year 4)**
Recommendations in the UFMP are refined (Year 1)	A document is prepared detailing necessary amendments (Year 1)	**Changes to policies and procedures are approved and implemented (Year 4)**
Updates to Code, manuals, standards, and policies are completed (Year 4)	A draft manual is prepared for each sector (Year 6)	**Manuals are prepared and distributed to all sectors (Year 7)**

(This page left intentionally blank)

GOAL 2

CAPACITY, TRAINING, AUTHORITY (CT)

Rochester has the capacity and expertise to provide optimal levels of service for sound urban forest management.

URBAN FOREST AUDIT:
Capacity and Training at 100% Attainment (2021)
Authority at 88% Attainment (2021)

STRENGTHS:
The Parks and Forestry Division has a robust team of certified, qualified, and trained staff for the management of the urban forest. Supporting this team is the framework established to utilize certified consultants and contractors as needed. City staff maintain certifications and continue to expand skillsets and offer trainings and presentations relating to the City's urban forest.

The staffing structure in place allows for clear communications and authority with efforts supported by partners such as RNeighbors and the City's Park Board serving as the Tree Board.

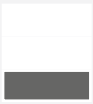
OPPORTUNITIES:
Continue to support in-house and outsourced training for staff as it relates to tree maintenance, safety, risk, and other needs. The Parks and Forestry Division should update Standard Operating Procedures (SOPs) as changes occur such as increasing staffing to support a public tree pruning rotation recommended in industry standards and this Plan.

PURPOSE:

- Quality: The complexity of urban forests requires adept personnel for its appropriate care, growth, and resiliency. A city with quality staff reduces the variance of quality in service.
- Efficiency: A city with adequate staffing levels who are appropriately trained can meet the needs of the community timely and effectively. Staff with an understanding and training in processes affecting the urban forest can align efforts to achieve common goals.
- Safety: Safe practice of arboriculture and urban forestry is critical for city staff, contractors, and the public to reduce the potential risk of public hazards.
- Service: This Plan evaluates potential program structures levels for increased tree maintenance responsibilities in public areas to achieve targets of improved urban forest health through proper and routine tree maintenance.

CAPACITY, TRAINING, AUTHORITY (CT) ACTIONS

Table 14. Goal 2, Capacity, Training, Authority Actions

PRIORITY	EFFORT	ACTION # ORDER	CAPACITY, TRAINING, AUTHORITY (CT) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		**CT.01** 1	Establish an urban forestry working group with regular meetings to monitor progress of implementing actions. Finalize lead implementers.	● ● ● ● ● ● ● ● C H E N	**PRD** 2021
		**CT.02** 14	Utilize a continuous improvement framework to improve operational workflows in urban forest management.	● ● ● ● ● ● ● ● C H E N	**PRD**, PWD, CDD Annually
		**CT.03** 15	Continue to provide, at minimum, annual in-house or consultant training on tree care safety and first aid.	● ● ● ● ● ● ● ● C H E N	**PRD**, PWD, CDD Annually
		**CT.04** 25	Ensure tree-related operations are represented by staff with industry credentials such as International Society of Arboriculture (ISA) Certified Arborist and Tree Risk Assessment Qualification (TRAQ) either directly through the department or supporting department.	● ● ● ● ● ● ● ● C H E N	**PRD**, PWD, CDD, RPU Annually
		**CT.05** 26	Provide or support training to departments involved in the tree permitting processes, plan reviews, tree inspections, project design, and construction. ISA Certified Arborists within the department or supporting department should be involved with these processes.	● ● ● ● ● ● ● ● C H E N	**PRD**, PWD, CDD Annually
		**CT.06** 38	Stay current with industry research, science, and technology through various platforms. An example includes management of current and potential exotic tree pest and disease threats.	● ● ● ● ● ● ● ● C H E N	**PRD**, PWD, CDD Annually

CAPACITY, TRAINING, AUTHORITY (CT) TARGETS

Table 15. Goal 2, Capacity, Training, Authority Action Targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
Potential departments, partners, and sectors necessary for implementation of the UFMP identified (Year 1)	All necessary members join the workgroup (Year 1)	**Meeting framework and responsibilities established (Year 1)**
UFMP actions to improve efficiencies begin to be implemented (Year 1)	**Regular meetings between departments and partners identify changes in workflows and resource needs (Year 1)**	The framework shows improvements in workflows, efficiency, efficacy, and communications (Year 5)
Training needs are identified (Year 1)	**Annual training meets the needs of City staff (Year 1)**	Annual training meets the needs of City staff and a measurable decrease in preventable incidents is observed (Year 5)
Required certifications and qualifications for tree management staff identified (Year 1)	**Staff maintain certifications, qualifications, and licenses (Year 1)**	Staff maintain certifications, qualifications, and licenses (Year 10)
Training needs are identified (Year 1)	**Annual training meets the needs of City staff (Year 1)**	Annual training meets the needs of City staff (Year 10)
A framework for acquiring necessary information is established (Year 1)	**Tree management staff attend relevant conferences, webinars, and trainings (Year 1)**	Tree management staff attend relevant conferences, webinars, and trainings (Year 10)

CAPACITY, TRAINING, AUTHORITY (CT) ACTIONS

Table 14 continued

PRIORITY	EFFORT	ACTION # ORDER	CAPACITY, TRAINING, AUTHORITY (CT) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		**CT.07** 43	Determine the necessary staff required to maintain the public boulevard tree population across the City by utilizing Appendix H in the UFMP.	C H E N	**PRD** 2022
		**CT.08** 44	Determine the necessary staff required to maintain the public park tree population across the City by utilizing Appendix H in the UFMP.	C H E N	**PRD** 2022
		**CT.09** 45	Evaluate staffing resources required to effectively plant trees aligned with canopy goals and provide post-planting care.	C H E N	**PRD**, PWD, CDD 2022
		**CT.10** 61	Strengthen Standard Operating Procedures (SOPs), protocols, and communications as they relate to tree management activities among City department, partners (e.g., Homeowners' Associations, utilities), and contractors. Action supports action MP.08.	C H E N	**PRD**, PWD, CDD 2024
		**CT.11** 64	Evaluate the roles and responsibilities of the Boards and Commissions influencing urban forestry. Include considerations for a separate Tree Board, Commission, or Advisory Council.	C H E N	**PRD** 2024
		**CT.12** 77	Secure adequate staffing required to monitor, inspect, and enforce tree requirements for commercial development. Consider the Parks and Recreation Department taking on this responsibility by utilizing Appendix H in the UFMP.	C H E N	**CDD**, PRD, PWD 2026

CAPACITY, TRAINING, AUTHORITY (CT) TARGETS

Table 15 continued

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
An analysis of the tree inventory and UFMP provides the recommended staffing levels (Year 1)	**A budget proposal is prepared detailing the necessary staff (Year 2)**	The City has the staff and resources to manage the public tree population on a recommended rotation (Year 5)
An analysis of the tree inventory and UFMP provides the recommended staffing levels (Year 1)	**A budget proposal is prepared detailing the necessary staff (Year 2)**	The City has the staff and resources to manage the public tree population on a recommended rotation (Year 5
Canopy goals and planting targets are established (Year 2)	**An analysis of the required staff necessary to plant and maintain new trees to meet canopy goals is prepared (Year 2)**	A budget proposal is prepared detailing the necessary staff (Year 4)
All entities involved in the planting and care of trees are identified (Year 1)	Analyze current responsibilities and agreements (Year 2)	**Necessary SOPs completed (Year 4)**
All entities involved in urban forestry are identified (Year 2)	Analyze current responsibilities and charters (Year 3)	**A City entity(s) represents the needs of the urban forest (Year 4)**
An analysis of workflows and demands identifies the staffing levels necessary (Year 2)	A budget proposal is prepared detailing the necessary staff (Year 4)	**The City has the staff and resources to manage tree-related requirements of commercial development (Year 6)**

(This page left intentionally blank)

GOAL 3

BUDGET AND FUNDING (BF)

City resources enable comprehensive urban forest management for the preservation and enhancement of tree benefits.

URBAN FOREST AUDIT:
Funding and Accounting at 75% Attainment of the Category Elements (not budget) (2021)

STRENGTHS:
The City annually budgets for urban forest management and has a contingency budget process in place for tree pests and diseases such as emerald ash borer (EAB) and reforestation through RNeighborwoods. Parks and Forestry utilize partners to leverage resources and continues to seek funding opportunities to maintain and enhance the urban forest.

OPPORTUNITIES:
The 2014 census of urban forestry programs across the U.S. determined the average budget per public tree (boulevards, parks, maintained natural areas) to be $37.50. Specifically, for Rochester's population group (100,000 to 249,999 people), the average is $44.85 budget per public tree annually (Hauer et al. 2014 page 17). Based on Rochester's 2020 budget for urban forestry, the Parks and Forestry Division has $13.76 budgeted per public tree (100,000+ trees) and an average of $13.03 over the last six years (2015-2020). Compared to the 2014 census, Rochester has a deficit of approximately $24.50 per public tree, annually, on average.

Parks and Forestry understands the need to improve the pruning rotation of public trees but to do so, the City would need to allocate additional resources. In addition, the City continues to manage emerald ash borer through the EAB Plan but does not have enough funding to fully implement. The measurement of budget per public tree is an initial analysis that can be utilized to garner this support. Therefore, continual inventories of public trees and analysis of urban forest structure, condition, maintenance needs, and other attributes is necessary to inform budget proposals.

PURPOSE:

- Effectiveness: Appropriate funding levels for urban forestry allow better implementation of this Plan and daily operations resulting in a higher level of service to the community.
- Equity: More resources equate to additional levels of service, particularly to historically underserved and lower-income areas.
- Accountability: Appropriate accounting of management activities and accounting of the urban forest itself enable adequate funding that is performance- and attribute-based.

BUDGET AND FUNDING (BF) ACTIONS

Table 16. Goal 3, Budget and Funding Actions

PRIORITY	EFFORT	ACTION # ORDER	BUDGET AND FUNDING (BF) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		BF.01 8	Continue to budget for annual public tree inventory collection and data management equipment needs for the upcoming budget planning sessions.	C H E N	**PRD** Annually
		BF.02 23	Continue to seek and acquire funding and technical assistance from organizations such as the Minnesota State Department of Natural Resources, U.S. Forest Service, University of Minnesota Extension, and others.	C H E N	**PRD** Annually
		BF.03 24	Use the data from the Assessments and Plans actions (i.e., tree maintenance needs, tree planting needs, ecosystem services) to support budget and funding increases aligned with resource needs and actions in the UFMP.	C H E N	**PRD** Annually
		BF.04 32	Develop an annual education and training budget for tree management staff that supports attending CEU accrediting seminars, workshops, and conferences each year. Consider the Tree Care Industry Association's Certified Treecare Safety Professional accreditation.	C H E N	**PRD** Annually
		BF.05 39	Support natural areas management and planning funded by the Parks Referendum.	C H E N	**PRD**, PWD, CDD 2021
		BF.06 48	Based on the exploration of funding opportunities provided in the UFMP, develop a sustained funding report that details the opportunities and approaches for sustained, dedicated, and diversified funding. An example includes a pest control fee. Use Appendix D as guidance.	C H E N	**PRD** 2022
		BF.07 55	Use the guidance provided in the UFMP to build a business case for the funding required to manage 100,000+ boulevard, public property (e.g., parks) trees located on 3,900 acres, and new trees as a result of canopy goals.	C H E N	**PRD** 2023
		BF.08 60	Use inventory data, the Emerald Ash Borer (EAB) Plan, the 2021 Urban Forest Master Plan, and other resources to secure the necessary budget to implement EAB treatment and control measures.	C H E N	**PRD** 2024
		BF.09 69	Continue to secure short-term funding within CIP to manage emergency response for tree damage after storm events, including debris management.	C H E N	**PRD** 2025
		BF.10 82	Establish a dedicated, sustained funding source beyond the current departmental budget for urban forestry operations to increase the level of service to meet the community's high standards. Use Appendix D as guidance.	C H E N	**CDD** 2030

BUDGET AND FUNDING (BF) TARGETS

Table 17. Goal 3, Budget and Funding Action Targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
All boulevard and park trees are inventoried in at least one FMU per year, data managed in system (Year 1)	All boulevard and park trees are inventoried in at least one FMU per year, data managed in system (Year 1)	All boulevard and park trees are inventoried in at least one FMU per year, data managed in system (Year 1)
Resources of partners are utilized (Year 1)	**Grant application submitted and approved for a project such as tree planting, planning, inventory (Year 2)**	Grant application submitted and approved for a project such as tree planting, planning, inventory (Year 3)
Tree inventory data and supporting information is utilized to establish annual budget (Year 1)	Tree inventory data and supporting information is utilized to establish annual budget (Year 1)	The program budget reflects the needs identified in the tree inventory, canopy assessment, and other resources (Year 5)
An assessment of training needs supports budget planning (Year 1)	**All tree management staff retain certifications, licenses, and qualifications (Year 2)**	All staff associated with urban forest management are certified and/or appropriately trained (Year 10)
Urban forest priorities provided in the UFMP support planning and budget discussions (Year 1)	**Allocation of funding appropriately represents the needs of the urban forest (Year 1)**	The funding continues to represent the needs of a growing and changing urban forest (Year 5)
The feasibility of funding mechanisms provided in the UFMP are further refined and strategies are developed (Year 1)	**The sustained funding report is completed (Year 2)**	Strategies in the sustained funding report are implemented (Year 3)
New inventory data is utilized to update the pruning rotation analysis provided in the UFMP (Year 1)	The analysis of deferred maintenance and the savings acquired from recommended rotational pruning is refined and communicated to departments (Year 2)	**A business case demonstrates the costs of deferred maintenance and the savings acquired from recommended rotational pruning (Year 3)**
Funding mechanisms provided in the UFMP and in the sustained funding report are explored for EAB Plan implementation (Year 1)	Updates to the EAB Plan are completed and a budget proposal is prepared (Year 3)	**The budget is secured to implement the EAB Plan in its entirety (Year 4)**
The urban forest is analyzed to identify priorities, at-risk areas, and concentrations of concern (Year 2)	The feasibility of funding mechanisms provided in the UFMP are further refined and strategies are developed (Year 3)	**Mechanisms for emergency funding and contracts for storm response are secured (Year 5)**
Tree inventory and canopy data along with supporting information is utilized to identify any budget shortfalls (Year 5)	Strategies in the sustained funding report are fully implemented (Year 8)	**A dedicated, sustained funding source is established that represents the needs of the urban forest, service levels, and community (Year 10)**

(This page left intentionally blank)

GOAL 4

ASSESSMENT AND PLANS (AP)

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

URBAN FOREST AUDIT:
Inventories at 77% Attainment (2021)
Urban Forest Management Plans at 58% Attainment (2021)

STRENGTHS:
Parks and Forestry utilize resources to continually inventory approximately 1-2 Forestry Management Units (FMU) per year and the data is maintained in a City asset management program. The data is managed to prioritize tree maintenance and removals and to report the associated ecosystem services and benefits of the inventoried trees. In addition, maintenance records are tracked in the asset program. Trees are incorporated into stormwater management and appropriately tracked. Recently, the City completed a high-resolution land cover assessment to understand existing tree canopy and opportunities to plant trees across public and private boundaries. This data provides a baseline assessment of the Citywide urban forest resource from which growth and change can be measured. Findings can be cross-examined with City policies, community outreach, and management efforts to determine effectiveness and necessary changes.

The City has multiple plans influencing the urban forest from the Parks and Recreation Master Plan, Emerald Ash Borer Plan, Approved Boulevard Trees, Destination Medical Center Development Plan, Complete Streets Policy, Downtown Master Plan, and other plans. This Urban Forest Master Plan will align efforts and increase future rankings of this audit category.

OPPORTUNITIES:
Implementation of this Urban Forest Master Plan will strengthen Rochester in terms of the assessment and plans audit category. Parks and Forestry should consider providing technical support to partners such as campuses, corporations, and other entities in establishing and maintaining tree inventories supported by a management and planting plan.

PURPOSE:

- Informed Management: An inventory of Rochester's valuable assets—public trees—provides the data for informed management and resource decisions.
- Measured: An understanding of the population of trees provides baseline information from which progress and change resulting from this Plan and an urban forestry program can be measured for adaptive management.
- Value: The inventory of public trees provides information that can be used to quantify the ecosystem services and benefits provided to Rochester's residents, environment, and economy.
- Inclusivity: The urban forest is comprised of public and private trees spanning a multitude of ecosystems and land uses. Plans for tree across these landscapes ensures all aspects of urban forestry are included in a cohesive, strategic manner.

ASSESSMENTS AND PLANS (AP) ACTIONS

Table 18. Goal 4, Assessments and Plans Actions

PRIORITY	EFFORT	ACTION # ORDER	ASSESSMENTS AND PLANS (AP) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		AP.01 2	Maintain an inventory of public boulevard trees and update as maintenance and new plantings occur. Encourage partners to manage a current inventory of utility trees.	● ● ● ● C H E N	**PRD**, RPU Annually
		AP.02 3	Maintain an inventory of trees in maintained areas of public parks and facility properties.	● ● ● ● ● C H E N	**PRD** Annually
		AP.03 4	Monitor tree loss and gain through annual tree removal and planting permit reporting. Track all City-led tree plantings and tree plantings conducted by partners. Utilize tree inventory software and/or city asset management program.	● ● ● ● ● C H E N	**PRD** Annually
		AP.04 21	Use the ISA protocols established in Action GA.08 when conducting risk tree assessments deemed a priority or imminent need. See Appendix F for guidance.	● ● ● ● C H E N	**PRD**, PWD, CDD Annually
		AP.05 22	Continue to implement the City' Emerald Ash Borer (EAB) Plan and update with new data, research, and resources.	● ● ● ● C H E N	**PRD** Annually
		AP.06 49	Complete an urban forest audit using similar criteria as the 2020 audit completed for the UFMP to evaluate improvements in urban forest management and adapt strategies.	● ● ● ● ● ● ● ● C H E N	**PRD**, PWD, CDD Bi-annually
		AP.07 50	Quantify the ecosystem benefits and appropriate appraisal values of public trees to conduct a cost-benefit analyses of public trees. This informs maintenance recommendations, program structure, and raises public awareness of the urban forest benefits.	● ● ● ● ● C H E N	**PRD** Bi-annually
		AP.08 52	Utilize Appendix E in the UFMP to develop a Master Tree Planting Plan Citywide and by neighborhood or Forestry Management Unit (FMU).	● ● ● ● ● ● ● ● C H E N	**PRD**, PWD, CDD 2023

ASSESSMENTS AND PLANS (AP) TARGETS

Table 19. Goal 4, Assessments and Plans Action Targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
Database updated to reflect changes to the public tree population (Year 1)	**All boulevard trees are inventoried in at least one FMU per year (Year 2)**	All FMUs are inventoried and data is up-to-date (Year 10)
Database updated to reflect changes to the public tree population (Year 1)	**All public park and property trees in maintained areas are inventoried in at least one FMU per year (Year 2)**	All public park and property trees are inventoried and data is up-to-date (Year 10)
A system is established to methodically and routinely gather tree planting and removal data (Year 1)	Tree planting and removal data from all partners is integrated into the City's asset system (Year 2)	**All tree planting and removal data from the City and partners is accurately maintained (Year 5)**
Risk assessment thresholds and protocols are established (Year 2)	**A routine risk assessment process is implemented (Year 2)**	A reduction in service requests relating to tree risks and hazards is observed (Year 5)
The EAB actions are strengthened with information from the UFMP (Year 1)	EAB action targets are achieved within the recommended timeframe (Year 3)	All designated treatment and removal public ash trees are completed or in progress (Year 5)
A team to complete the updated audit is established (Year 1)	**The first City-led urban forest audit is completed (Year 2)**	An urban forest audit is routinely conducted (Year 4)
The public tree inventory is current to the extent possible (Year 1)	**The ecosystem services and benefits of the public tree population is understood (Year 2)**	Ecosystem services and benefits of the public tree population are routinely updated based on inventory data and industry research (Year 4)
Tree canopy goals Citywide and by planning boundary are established (Year 2)	public tree species and age diversity is analyzed. planting space provided in the 2020 TCA (Year 3)	**A Master Tree Planting Plan is developed (Year 3)**

ASSESSMENTS AND PLANS (AP) ACTIONS CONTINUED

Table 18 continued

PRIORITY	EFFORT	ACTION # ORDER	ASSESSMENTS AND PLANS (AP) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		AP.09 53	Support academic institutions, corporations, healthcare facilities, and Homeowners' Associations (HOAs) or planned communities in a technical and educational capacity to develop urban forest management plans.	C H E N	**PRD** 2023
		AP.10 54	Support academic institutions, corporations, healthcare facilities, and Homeowners' Associations (HOAs) or planned communities in a technical and educational capacity to develop urban forest inventories.	C H E N	**PRD** 2023
		AP.11 66	Based on the outcomes of the bi-annual urban forest audit, available resources, industry technology and research, and data, modify existing actions and develop new actions to continue to achieve goals of the 2021 UFMP.	C H E N	**PRD** 2025
		AP.12 67	Utilize Appendix F to develop a Trees and Construction Operations Plan for alternative solutions to public trees and infrastructure/construction conflicts.	C H E N	**PRD**, PWD, CDD 2025
		AP.13 70	Strengthen storm and disaster preparations, mitigations, and recovery strategies, protocols, and mechanisms.	C H E N	**PRD**, PWD, CDD 2025
		AP.14 73	Use the 2020 Tree Canopy Assessment (TCA) and natural properties, wetlands, and Flood Control Reservoir Sites data to establish high-value conservation City-owned areas. Consider slopes, tree species and age diversity, wildlife, pollinators, and water quality, among others.	C H E N	**PRD** 2026
		AP.15 74	Establish plans for the conservation and preservation of high priority areas such as natural properties, wetlands, and Flood Control Reservoir Sites identified in Action AP.14.	C H E N	**PRD**, PWD 2027
		AP.16 80	Complete a comprehensive high-resolution Tree Canopy Assessment (TCA) update using industry recommended protocols.	C H E N	**PRD** 2030

ASSESSMENTS AND PLANS (AP) TARGETS CONTINUED

Table 19 continued

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
Key entities identified for strategic outreach (Year 1)	**One subarea urban forest management plan is completed (Year 3)**	At least one new subarea urban forest management plan is completed annually (Year 4)
Key entities identified for strategic outreach (Year 1)	**One subarea urban forest inventory is completed (Year 3)**	At least one new subarea urban forest inventory is completed annually (Year 4)
An assessment of UFMP actions and targets achieved is completed (Year 3)	Updated actions for the UFMP are drafted (Year 4)	**The UFMP has updated actions and targets (Year 5)**
A strategy to identify alternative solutions to hardscape conflicts is established (Year 3)	Alternative solutions to public tree and hardscape conflicts are approved as City BMPs (Year 4)	**A Trees and Construction Operations Plan is completed (Year 5)**
Resources to support storm and disaster management are gathered (Year 3)	Changes to storm and disaster procedures are drafted (Year 4)	**Procedures for urban forest storm management is formalized in a written document (Year 5)**
Criteria for high priority conservation and preservation areas is established (Year 2)	The TCA and other datasets are supported by feedback from City departments and the community to identify priority areas (Year 4)	**The TCA and other datasets are utilized to develop conservation and preservation priority tiers (Year 6)**
The highest priority areas are identified, acquisition, planning, and management options explored (Year 4)	Establish the budget and approach to develop a plan for high-value and priority areas (Year 6)	**Active acquisition and/or management of high-value and priority conservation and preservation areas as feasible (Year 7)**
A budget is prepared and approved for the TCA (Year 6)	An RFP is prepared and consultant selected to complete a TCA (Year 8)	**An updated TCA is completed (Year 10)**

(This page left intentionally blank)

GOAL 5

COMMUNITY ENGAGEMENT (CE)

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

URBAN FOREST AUDIT:
Community at 80% Attainment (2021)

STRENGTHS:
Parks and Forestry utilizes partners to achieve shared goals for the urban forest and to engage the community. The City website contains ample information about the benefits of the urban forest and importance of proper care and tree selection. The City utilizes a multitude of mediums for outreach and education and maintain communications through social media. The City has achieved 38 accreditations as a Tree City USA community from the Arbor Day Foundation in addition to 10 Growth Awards resulting in the prestigious recognition as a Sterling Community in 2013.

OPPORTUNITIES:
The Parks and Forestry Division could benefit from a designated volunteer coordinator to oversee urban forestry outreach and community education and engagement though the City has substantial resources in this department. Parks and Forestry should share the outcomes of this Plan with the community through multiple platforms and continue to engage the citizens by conducting routine surveys and sharing updates on Plan implementation progress. It is important to continue to remove barriers to encourage participation in activities and feedback opportunities for all City demographics, cultures, and neighborhoods. Existing and potential partnerships should represent all neighborhoods and the Parks and Forestry Division should continue to track volunteer metrics. To encourage additional support, the City should consider a public platform for displaying the location, character, and benefits of the public trees inventoried, similar to the urban tree canopy (UTC) software program provided as part of the 2020 UTC Assessment project. This public-facing tool could be the platform for launching a Significant or Heritage Tree Program that provides the location and attributes of the City's distinguished trees.

PURPOSE:

- Inclusivity: Residential property contains a large portion of the City's total tree canopy cover. Sustaining Rochester's urban forest requires residential collaboration and feedback and fostering long-term relationships to improve outcomes.
- Transparency: Program and funding transparency are essential in building resilient community partnerships.
- Resourcefulness: Public participation and insight provide resourceful and impactful urban forest program growth.
- Community: Active participation in nature-related efforts foster community pride and ownership, and breaks down walls, helping bring communities closer together as they become closer to nature.

COMMUNITY ENGAGEMENT (CE) ACTIONS

Table 20. Goal 5, Community Engagement Actions

PRIORITY	EFFORT	ACTION # ORDER	COMMUNITY ENGAGEMENT (CE) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		CE.01 5	Formalize clear and consistent design and language for urban forestry outreach materials.	C H E N	**PRD**, PWD, CDD 2021
		CE.02 6	Update the City's website and materials based on information from the UFMP.	C H E N	**PRD** 2021
		CE.03 7	At minimum, share quarterly informative urban forestry and tree-related content to a social media, City website, and other communication platforms. Align efforts with Actions CE.01 and CE.05 for a community outreach strategy.	C H E N	**PRD** Quarterly
		CE.04 9	Continue to engage neighborhoods with volunteer tree planting events. Prioritize areas with lower urban tree canopy and other considerations such as underserved communities using the 2020 Tree Canopy Assessment (TCA) and other datasets such as the Sustainability Office's air quality data.	C H E N	**PRD** Annually
		CE.05 10	Coordinate the outreach strategy as a Citywide initiative rather than a departmental effort.	C H E N	**PRD**, PWD, CDD 2021
		CE.06 11	Continue to track and annually report urban forestry activities of all partners to apply to budget change requests and continue to maintain Arbor Day Tree City USA designation. Strive to achieve more Arbor Day Growth Awards and Sterling status (2013).	C H E N	**PRD** Annually
		CE.07 12	Support volunteer training opportunities as feasible.	C H E N	**PRD** Annually

COMMUNITY ENGAGEMENT (CE) TARGETS

Table 21. Goal 5, Community Engagement Action Targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
Information from the UFMP is compiled and outreach strategies are drafted (Year 1)	UFMP outreach strategies are coordinated with other City departments and efforts (Year 1)	**A community outreach plan clearly defines the messaging and approaches (Year 1)**
Information in the UFMP is compiled and aligned with the community outreach plan (Year 1)	Information is provided to City communications staff and partners for launching and distributing content (Year 1)	**The City's and partners' websites and materials contain UFMP information consistent with approved design and messaging (Year 1)**
Urban forestry information relevant to the season and events is shared on various platforms (Q1)	**Urban forestry information relevant to the season and events is shared on various platforms (Q2)**	**Urban forestry information relevant to the season and events is shared on various platforms (Q3)**
Utilize the TCA to identify priority planting neighborhoods and areas (Year 1)	**Annual tree planting events are well attended and support UFMP goals and actions (Year 2)**	The Master Tree Planting Plan informs priority areas and tree species and all neighborhoods engaged (Year 10)
Meet with City departments and partners to develop the community outreach plan (Year 1)	**Urban forest outreach and education aligns with other City and partner initiatives, messaging, and events (Year 2)**	Urban forest outreach and education integrated into all applicable initiatives, messaging, and events (Year 10)
Receive Tree City USA recognition (Year 1)	Receive Tree City USA and Growth Award recognition annually (Year 5)	Receive Tree City USA recognition and Sterling status (Year 10)
Training needs are identified with City partners (Year 1)	**At least one City or partner-led volunteer training activity is implemented (Year 2)**	Partners representing all City neighborhoods complete at least one volunteer training annually (Year 10)

COMMUNITY ENGAGEMENT (CE) ACTIONS CONTINUED

Table 20 continued

PRIORITY	EFFORT	ACTION # ORDER	COMMUNITY ENGAGEMENT (CE) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		CE.08 13	Continue to provide information regarding unauthorized tree plantings, invasives, and management of volunteer trees.	C H E N	**PRD**, PWD, CDD Annually
		CE.09 31	Continue to strengthen partnerships with civic groups, Homeowners' Associations, volunteers, institutions, internal, City Council, neighborhoods, improvement districts, and non-conventional organizations.	C H E N	**PRD**, PWD, CDD Annually
		CE.10 33	Diversify the types of volunteers using outreach and education about the benefits and importance of trees. Utilize partnerships with neighborhood organizations. See Appendix I in the UFMP for examples and guidance.	C H E N	**PRD** Annually
		CE.11 34	Provide education to the broad public and within focus areas (via materials, workshops, etc.) about tree maintenance responsibilities and proper young tree care of private trees as funding allows.	C H E N	**PRD**, PWD, CDD Annually
		CE.12 35	Work with environmental non-profit organizations and other partners to provide resources and annual training regarding tree pest and disease management as well as invasive species management. Provide resources to private landholders on an as-needed basis.	C H E N	**PRD** Annually
		CE.13 36	As funding permits, provide information and educational workshops and materials about the proper tree species for given sites and conditions. Utilize Rochester Public Utilities' Plugged In newsletter.	C H E N	**PRD**, PWD, CDD Annually
		CE.14 37	As funding permits, conduct annual urban forestry events, or partner events—especially involving youth—relating to tree planting and pruning to increase capacity for the care of public trees led by citizen tree stewards (e.g., RNeighbors Forest Fest and Citizen Pruners).	C H E N	**PRD** Annually

COMMUNITY ENGAGEMENT (CE) TARGETS CONTINUED

Table 21 continued

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
Information is gathered and aligned with the community outreach strategy (Year 1)	**Information and resources are shared annually (Year 1)**	A park tree inventory and sample of forested and open space areas shows a decline in invasive species (Year 10)
A network of existing and potential partners is identified using the UFMP and community outreach plan (Year 1)	**A diverse network of partners existing with clear communications and roles defined (Year 2)**	A diverse network of partners exists representing all City neighborhoods, demographics, and cultures (Year 10)
The Tree Inventory Fact Sheet is distributed across neighborhoods on multiple platforms (Year 1)	**The network of partners increases the diversity and count of volunteers (Year 2)**	Annual volunteer reports show representation of all City neighborhoods, demographics, and cultures (Year 10)
Information is gathered and aligned with the community outreach strategy (Year 1)	**Spring and fall RNeighbors Citizen Pruner and Forester trainings completed (Year 2)**	Observations show a decrease in tree malpractices on viewable private property (Year 10)
Information and resources regarding EAB are shared and more available to the public (Year 1)	**Information and resources regarding EAB and other tree pests and diseases are shared with the public (Year 2)**	RNeighbors spring and fall trainings or other City or partner-led workshops include training on pest and disease management (Year 3)
Information is gathered and aligned with the community outreach strategy (Year 1)	**City manuals and websites are updated with recommended tree species and guidance (Year 2)**	RNeighbors and other City or partner-led workshops include information about tree species and site selection (Year 4)
A list of existing and potential City and partner events is organized (Year 1)	**RNeighbors spring and fall trainings are completed (Year 2)**	Citizen Foresters and Pruners represent all neighborhoods (Year 5)

(This page left intentionally blank)

GOAL 6

GREEN ASSET MANAGEMENT (GA)

Rochester proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

URBAN FOREST AUDIT:

Green Asset Management at 95% Attainment (2021)
Risk Management at 72% Attainment (2021)
Disaster Planning at 79% Attainment (2021)

STRENGTHS:

Parks and Forestry maintain the public tree population for public safety, tree health, and urban forest resiliency through proactive maintenance, more plantings than removals, tree pest and disease management, and adherence to industry best practices and standards. Through these efforts, the public tree population inventoried is in healthy condition overall (72 percent), planted in the appropriate locations, and is relatively diverse—no tree species is over 10 percent in abundance and only maples (*Acer*) exceed the recommended genus threshold of 20 percent with a total of 22 percent. The public tree population contains 56 unique genera, contributing to the diversity.

Tree management staff are qualified to conduct tree risk assessments (ISA TRAQ), complete annual level 1 risk assessments (ANSI A300), maintain records, and prioritize mitigation. The City actively discourages the planting of invasives and encourages management of existing invasives. The City's emergency manager provides trainings in disaster planning and the City Forester and other staff frequently attend FEMA and NIMS emergency management trainings.

OPPORTUNITIES:

The City should continue to encourage the use of alternative solutions to tree and sidewalk conflicts such as structural soils and stay current with tree maintenance best practices and standards. Parks and Forestry currently maintain the public tree population on a 20-year rotation. Research indicates a rotation of approximately seven years results in reduced long-term costs and improves public safety and tree health. Tree planting should align with other programs, canopy goals, planting targets, and goals of diversity and resiliency.

The City should consider developing a plan to manage risk by addressing tree pests and diseases, climate change, storm response, and disaster planning on the City and county level.

PURPOSE:

- Efficiency: Alignment of operations improves workflows, encourages resourcefulness, and reduces conflicts. Routine systematic tree maintenance reduces surges of maintenance and removal demands, identifies issues before they become more expensive, and optimizes available time and resources.

- Safety: Appropriate management of green assets reduces the risk of tree failures as well as person and property damage. Utilizing industry standards and best practices reduces on-the-job incidents to the extent possible.

- Sustainability: Managing urban forests as City assets will support stormwater management, climate resiliency, and human health goals. Appropriate maintenance and planting will support a healthy, long-lived urban tree canopy equitably distributed across a city.

- Proactive: Routine maintenance reduces future costs. Planting the urban forest with the appropriate species also reduces future costs, conflicts, and climate change impacts.

GREEN ASSET MANAGEMENT (GA) ACTIONS

Table 22. Goal 6, Green Asset Management Actions

PRIORITY	EFFORT	ACTION # ORDER	GREEN ASSET MANAGEMENT (GA) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		GA.01 16	Prioritize young and large tree maintenance based on updated inventory data and resources.	C H E N	**PRD** Annually
		GA.02 17	Maintain the current maintenance regimen by conducting annual large tree routine pruning (~7,000 trees annually), young tree training, and other tree maintenance activities based on available resources. Adjust as changes occur as a result of GA.01.	C H E N	**PRD** Annually
		GA.03 18	Continue to prioritize and complete necessary public tree removals utilizing in-house and contractor protocols and ash (*Fraxinus*) tree removal recommendations in the City's Emerald Ash Borer (EAB) Plan.	C H E N	**PRD** Annually
		GA.04 19	Use Citywide tree inventory data and best available science for long-term planning and management of existing and future tree pests and diseases impacting the City's urban forest. Consider new research and guidance such as the 5% tree genera diversity rule (Ball, 2015).	C H E N	**PRD** Annually
		GA.05 27	Coordinate with other City departments to maximize the number of trees planted through Capital Improvement Program and stormwater management projects. Establish procedures for replacing damaged trees during infrastructure replacement projects.	C H E N	**PRD**, PWD, CDD Annually
		GA.06 28	Educate and train City staff to adhere to Best Management Practices for the maintenance of all diseased/infested City trees.	C H E N	**PRD** Annually
		GA.07 29	Annually revisit contract specifications and in-house policies and directives to ensure that tree care operations adhere to current industry standards, including ANSI A300 Standards for Tree Care Operations, ANSI Z133.1-2012 for Arboricultural Operations Safety Requirements, and ISA Series Best Management Practices (BMPs). Include Rochester Public Utilities and other relevant organizations.	C H E N	**PRD**, RPU Annually

GREEN ASSET MANAGEMENT (GA) TARGETS

Table 23. Goal 6, Green Asset Management Action Targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
Service requests and maintenance continue to be prioritized by the City Forester and Urban Forestry Program (Year 1)	Service requests and routine maintenance continue to be prioritized by the City Forester and Urban Forestry Program (Year 2)	All public young trees receive proper training and established trees are maintained on a recommended rotation (Year 10)
7,000 public trees are pruned (Year 1)	7,000 public trees are pruned (Year 2)	All public young trees receive proper training and established trees are maintained on a recommended rotation (Year 10)
Service requests and tree removals continue to be prioritized by the City Forester and Urban Forestry Program (Year 1)	Service requests and tree removals continue to be prioritized by the City Forester and Urban Forestry Program (Year 2)	All non-treated public ash trees are removed and a reduction in necessary removals overall is observed (Year 10)
Tree inventory data is analyzed and cross-examined with industry research (Year 1)	The EAB Plan continues to be implemented and a strategy for managing other susceptible tree species is established (Year 5)	The public tree population is resilient to existing and potential tree pests and diseases (Year 10)
Regular meetings to identify opportunities to collaborate (Year 1)	Trees effectively integrated into all City projects where feasible (Year 5)	A shared commitment achieves local and Citywide tree canopy goals (Year 10)
Annual training or resources shared with pertinent staff (Year 1)	Annual training or resources shared with pertinent staff (Year 5)	The spread of disease or pests caused by removals and pruning is negligible (Year 10)
In-house and contractor specifications meet ANSI, ISA, and OSHA standards (Year 1)	In-house and contractor specifications meet ANSI, ISA, and OSHA standards (Year 5)	Observations show a decrease in tree malpractices on public and private property (Year 10)

GREEN ASSET MANAGEMENT (GA) ACTIONS CONTINUED

Table 22 continued

PRIORITY	EFFORT	ACTION # ORDER	GREEN ASSET MANAGEMENT (GA) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		GA.08 40	Strengthen protocols and threshold criteria for routine and impromptu public tree risk assessments.	C H E N	**PRD**, PWD, CDD 2022
		GA.09 57	Align tree planting and canopy goals with watershed goals, green stormwater infrastructure plans, sustainability goals (Sustainability and Resiliency Action Plan), emerald ash borer replacement trees, and other planning efforts by providing technical assistance for the goals of water conservation, stormwater management, improved water quality.	C H E N	**PRD**, PWD, CDD 2023
		GA.10 68	Update maintenance regimen (number of park and boulevard trees pruned annually) by evaluating inventory data, program structure, available resources, and demands. Utilize outcomes of Actions CT.07-09.	C H E N	**PRD** 2025
		GA.11 71	Explore the economic viability of establishing a City-owned wood and brush facility. Implement Action GA.13 if feasible.	C H E N	**PRD**, PWD, CDD 2025
		GA.12 72	Explore the cost effectiveness and safe use of utilizing urban forest biomass in (natural) playgrounds and other City properties.	C H E N	**PRD** 2025
		GA.13 75	Develop a more strategic approach to tree species and site selection to ensure the resilience and optimize ecosystem service provision of Rochester's urban forest.	C H E N	**PRD**, PWD, CDD 2026
		GA.14 76	Update the suitable tree list based on the tree inventory, climate change projections, site suitability, drought tolerance, ecosystem services, tree canopy goals, among other factors.	C H E N	**PRD**, PWD, CDD 2026
		GA.15 81	Use the results of an updated high-resolution Tree Canopy Assessment (TCA) to prioritize tree plantings based on low existing tree cover and enhancing benefits provided by trees.	C H E N	**PRD** 2030

GREEN ASSET MANAGEMENT (GA) TARGETS CONTINUED

Table 23 continued

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
Existing protocols and industry recommendations are compiled (Year 1)	**Protocols and risk assessment criteria updated, documented, and distributed (Year 2)**	Inventories show a reduction in tree risk, less service requests, and improved public perception (Year 10)
Applicable plans, partners, and initiatives identified (Year 1)	**Tree canopy goals are established and integrated into City plans and efforts (Year 2)**	A shared commitment achieves local and Citywide tree canopy goals (Year 20)
An analysis of the tree inventory and UFMP provides the recommended staffing levels (Year 1)	A budget proposal is prepared detailing the necessary staff (Year 2)	**The City has the staff and resources to manage the public tree population on a recommended rotation (Year 5)**
Annual and forecasted debris amounts and costs of disposal are identified (Year 3)	Estimated costs of an in-house facility is obtained (Year 4)	**A decision for in-house or outsourced debris management is made (Year 5)**
Annual and forecasted debris amounts and costs of disposal are identified, risks identified (Year 5)	Craftsmen and processing partners identified and agreements obtained (Year 6)	Installation of first nature playground accessory (Year 7)
An analysis of the tree inventory and UFMP informs changes to the tree species planting palette (Year 2)	Tree planting aligns with canopy, resiliency, and ecosystem services goals (Year 4)	**Tree planting aligns with canopy, resiliency, and ecosystem services goals (Year 6)**
An analysis of the tree inventory and UFMP informs changes to the tree species planting palette (Year 2)	Updated draft of the tree species list is completed (Year 4)	**The updated tree species list is integrated into City projects, partner projects, policies, and manuals (Year 6)**
Scope of Work established (Year 7)	RFP released and consultant selected (Year 8)	**TCA completed, canopy goals are updated, and tree plantings are prioritized (Year 10)**

(This page left intentionally blank)

HOW ARE WE DOING?

IMPLEMENTATION GUIDANCE

The framework of the goals and actions in the Urban Forest Master Plan provides the City of Rochester with the means to measure progress and adapt to an everchanging environment and availability of resources. Each of the six goals align with the U.S. Forest Service's Urban Forest Audit System and the actions are intended to guide the City towards improvements in ranking for each of the 126 elements within the 11 categories of urban forest management. As actions are implemented, the City may conduct new iterations of the Urban Forest Audit to gauge success, evaluate progress, and adjust accordingly.

As part of the project, an interactive worksheet of goals, actions, and targets was provided to enable the City's implementers to sort actions by order, priority, effort, goal theme, implementation year, and other action attributes. It is recommended the City establish an urban forestry working group to manage Plan implementation and monitoring. This team should coordinate the implementation of actions with the respective partners or collaborators. For the Plan, actions were provided by goal theme though the City may find it advantageous to view the actions by recommended order, priority, level of effort, or target year.

MONITORING PLAN

This Urban Forest Master Plan will be updated and revised periodically to reflect changes in the urban forest resource structure and function, to incorporate changes in industry standards, to consider community response, and to measure the progress of the urban forest partners in implementing the recommendations and reaching the established goals. This process should be implemented by the City Project Team or the Urban Forest Working Group (UFMP Action CT.01) using the Evaluate, Monitor, Report, and Revise methodology.

Knowing how the City of Rochester and its partners are doing will require a continual process of evaluation. This section presents examples of how to monitor, analyze, and revise the Plan, which will keep stakeholders informed of the status of the urban forest program. To monitor progress toward implementing the Plan recommendations, an evaluation similar to the U.S. Forest Service's Urban Forest Audit conducted to develop the initial Plan should be completed. This evaluation will identify progress and shortfalls compared to the baseline audit.

In addition, a report card could be created based on outcomes of the audit and distributed to the public every two to three years. This will measure the progress toward implementing the Plan recommendations. The following example provides a suggested reporting structure to measure success toward accomplishing each goal. Other indicators to measure progress may need to be developed to ensure a thorough and accurate evaluation.

Evaluate

The Urban Forest Audit System provides a framework for routine evaluations of the urban forest, the programs that manage it, and the community that shapes and benefits from it. The Phase 1 Research Summary to this Urban Forest Master Plan provides the guidance for completing the audit. It is recommended the City Project Team or the Urban Forest Working Group complete a bi-annual audit to inform any alterations to actions and strategies.

This audit system consists of 11 categories of urban forest management, sustainability, and community. Within the 11 categories are approximately 130 elements. Each element was ranked or scored based on the consultants' evaluations in 2021 for the Urban Forest Master Plan. The City Project team or Urban Forest Working Group should complete an update to this ranking bi-annually to inform Plan reporting, monitoring, and revision as described in the following sections.

Monitor

Measuring accomplishment of the actions will require ongoing analysis. The outcomes of the Urban Forest Audit System in the "Evaluate" section can be used to monitor change over time. These benchmark values should be tracked, and a state of the urban forest report should be prepared and distributed to the public every 5 to 10 years. Analysis may include an updated boulevard tree inventory, i-Tree benefits analyses, or urban tree canopy assessments. The state of the urban forest report should include the benchmark values as reported in the Plan and the Urban Forest Audit System as of 2021, so that the City can measure and compare changes to the urban forest. The report should reflect changes to the audit system that are measured.

Rochester's Urban Forest Benchmark Values

Table 24. Rochester's urban forest benchmark values

URBAN TREE CANOPY (UTC) COVER (2020)	
UTC	28%
Recommended Canopy Goal	35% by 2035
Total Number of Trees to Plant	86,000 (6,000 trees per year)
ESTIMATED TREE COUNT	
Total Public Trees Managed	100,000+
Public Boulevard Trees (inventoried)	51,600
Total Public Trees (boulevards, parks, natural areas)	Unknown
TREE SPECIES DIVERSITY (SPECIES EXCEEDING 10%)	
Public Trees (2020)	None (Norway maple and green ash at 9%)
TREE BENEFITS	
Citywide	2020: $66 million (annual)
Inventoried Public Trees	2018: $1.3 million (annual)
TREE AND BUDGET DISTRIBUTION	
Public Tress per Capita	0.85
Budget per Capita	$15.68
Budget per Public Tree	$18.34
Total Public (managed) Trees per Staff	11,111
MANAGEMENT ACTIVITIES (2019)	
Public Trees Pruned	4,665
Public Trees Removed	1,007
Public Trees Planted	1,505
Number of Volunteers and/or Hours	1,115 hours
URBAN FOREST AUDIT SYSTEM (TOTAL SCORE OF 2021: 78%)	
Management Policy and Ordinances	50%
Professional Capacity and Training	100%
Funding and Accounting	75%
Decision and Management Authority	88%
Inventories	77%
Urban Forest Management Plans	58%
Risk Management	72%
Disaster Planning	79%
Standards and Best Management Practices	85%
Community	80%
Green Asset Evaluation	95%

REPORT

Based on the evaluation of Plan implementation progress, the City Project Team or Urban Forest Working Group should track, record, and report on the metrics described below that are measures or indicators of success for each goal and supporting actions. Note, the series of urban forestry goals to address the resource, the programs, and the people and are not listed by any particular priority or order.

Table 25. Evaluation, monitoring, and reporting techniques to achieve the urban forestry goals

1	**TREE MANAGEMENT POLICY (MP):** Urban forest policies are the foundation for preserving the environmental benefits, management, and the character of Rochester's urban forest. • List existing and potential partners. • List all City and partner-led planning efforts. • Describe related planning efforts. • List opportunities to align efforts with Destination Medical Center. • Establish a Citywide canopy goal and local planting targets. • List recommended changes to City Code, policies, and manuals. • List audit score and actions/targets achieved, ongoing, and not started.
2	**CAPACITY, TRAINING, AND AUTHORITY (CT):** Rochester has the capacity and expertise to provide optimal levels of service for sound urban forest management. • List the team members assemble to implement and monitor the Plan. • List the existing staff and supporting departments and partners. • Describe existing and needed certifications, qualifications, and training. • Describe changes in levels of service based on citizen service requests. • Report the number of unattended tree maintenance and service requests. • Report the number trees preserved and planted through development. • List audit score and actions/targets achieved, ongoing, and not started.
3	**BUDGET AND FUNDING (BF):** City resources enable comprehensive urban forest management for the preservation and enhancement of tree benefits. • Report the proportion of public trees to tree management staff. • Report the proportion of budget to the total public tree population. • Report the proportion of public trees to the City population. • Report the number of volunteer hours. • Report the number of trainings and conferences attended. • List the unfunded urban forestry needs. • Report the budget, partner funding, permit revenue, and donations. • List audit score and actions/targets achieved, ongoing, and not started.

4

ASSESSMENTS AND PLANS (AP):

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

- Report the number of trees inventoried.
- Report the number of public trees planted and removed.
- Report the number of trees assessed for risk.
- Report the progress of the Emerald Ash Borer Plan.
- Report the value of the entire urban forest and public tree population.
- List the priority planting areas, canopy goals, and recommended species.
- Report the assessment and planning efforts of partners.
- Describe the high-value conservation and preservation areas.
- List audit score and actions/targets achieved, ongoing, and not started.

5

COMMUNITY ENGAGEMENT (CE):

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

- List the existing and potential outreach platforms and initiatives.
- List existing and potential partners.
- Report the number of planting events and trees planted.
- Report the history of Tree City USA and supporting awards.
- Report the number of volunteers, events, and volunteer hours.
- Report the number of private tree plantings as feasible.
- Report the number of trainings, workshops, and attendees.
- Report the results of public surveys.
- Recognize exemplary urban forest stewards.
- List audit score and actions/targets achieved, ongoing, and not started.

6

GREEN ASSET MANAGEMENT (GA):

Rochester proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

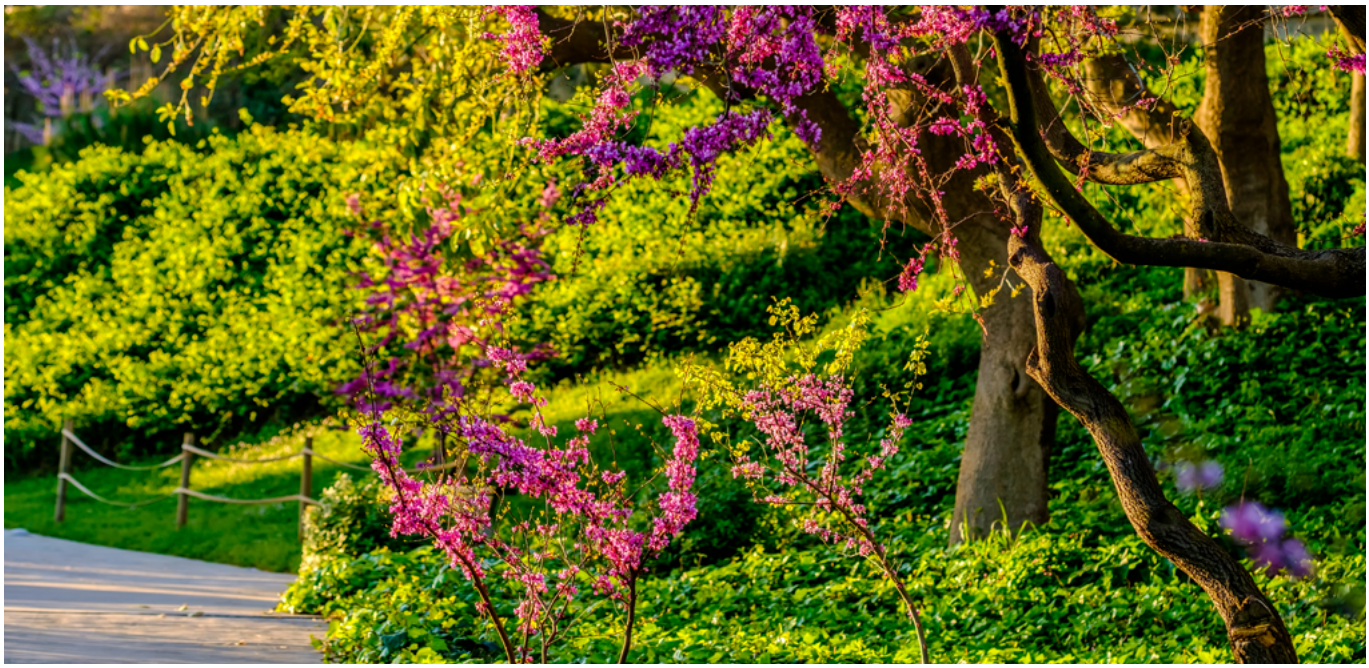
- Report the number of public trees pruned, removed, and planted.
- Report the number of trees managed for pests and diseases.
- Report the number of trees planted in stormwater management projects.
- Report progress towards canopy goals and tree planting targets.
- Report the volume of woody biomass utilized.
- Report the condition, structure, and diversity of the public trees.
- List audit score and actions/targets achieved, ongoing, and not started.

REVISE

Completion of this Plan is the first step towards meeting the vision for Rochester's urban forest. Continual monitoring, analysis, and reporting will help to keep urban forest partners involved and focused on accomplishing the actions. Plans are typically revised every 10 to 15 years; however, the Plan will need formal revision to respond and adapt to changes as they develop. Formal revision of the Plan should coincide with the update of the City's Comprehensive Plan, Parks and Recreation System Plan, Destination Medical Center Plan, and other relevant planning efforts. Recommendations and goals of each should be compared. Revisions to the Plan should occur with major events, such as newly discovered pests or diseases, changes in program budget and resources, or significant changes to industry standards or legal codes.

Figure 2. Example of the plan implementation, evaluation, and revision process

ACT AND REPORT	EVALUATE AND REVISE	ACT AND REPORT	EVALUATE AND REVISE
Years 1-5	*Year 5*	*Years 6-10*	*Year 10*
Annual Action Plans and Reports	Urban Forest Audit and Plan Amendments	Annual Action Plans and Reports	Urban Forest Audit and Plan Update
Monthly Activities and Annual Report	Updated Benchmarks and P lan Actions	Monthly Activities and Annual Report	Updated Benchmarks and Plan Actions



URBAN FOREST MASTER
PLAN CONCLUSION

Trees are an integral part of the community and the ecological systems in which they exist. They provide significant economic, social, and ecological benefits, such as carbon sequestration, reduction of urban heat islands, energy savings, reduction of stormwater runoff, improvement of water quality, enhancement of human health and wellness, and increase the value of properties. Planting and maintaining trees help Rochester become more sustainable and reduce the negative impacts on the ecosystem from urban development. Trees are as necessary as water, infrastructure, and energy to sustaining healthy communities. The health of the urban forest is directly linked to the health of the region.

The goal framework in Rochester's Urban Forest Master Plan is based on outcomes of the audit system and in alignment with existing plans to allow the City to incrementally implement actions, effectively monitor progress, and efficiently adapt in an everchanging environment. Successful implementation of actions in this Plan will bring Rochester to a higher level of service that is more equitably distributed across the City resulting in a sustainable and thriving urban forest that benefits all residents and future generations— ultimately achieving the Plan vision:

"Healthy Trees, Healthy City: Our City's trees, forests, and other natural resources are recognized as integral to sustaining life and health for all City residents. A healthy, thriving, and sustainable urban forest should be a community priority, to be thoughtfully managed and cared for by partnerships between the City and its residents to maximize public safety and benefits that include a thriving ecosystem, vibrant economy, improved human health, and livable communities shared by all who live, work, and play in Rochester."

James Clark, emphasizes the importance of an Urban Forest Master Plan in A Model of Urban Forest Sustainability (1997):

> **"Urban trees and forests are considered integral to the sustainability of cities as a whole. Yet, sustainable urban forests are not born, they are made. They do not arise at random, but result from a community wide commitment to their creation and management."**
> **JAMES CLARK, 1997**

As stated in this quote, an effective urban forestry program supported by the City's passion for the natural environment will lead Rochester to a more sustainable and thriving urban forest.


Altec

(This page left intentionally blank)

APPENDICES

APPENDIX A. TREE CANOPY GOAL SETTING

(UFMP Action MP.04)

In 2020, the City of Rochester completed a high-resolution Tree Canopy Assessment (TCA)—often referred to as an Urban Tree Canopy (UTC) assessment— for a baseline assessment of the Citywide urban forest across all boundaries. Detailed in the Research Summary, this assessment identifies the extent of land cover types such as tree canopy, vegetative plantable space (grass or turf), impervious surfaces (parking lots, driveways, sidewalks), and other types.

To guide urban forestry efforts and raise awareness, communities with this data often set tree canopy cover goals based on the existing tree canopy cover amount and the aim to provide an equitable distribution of canopy cover and associated benefits. For Rochester, consultants closely examined the assessment data and other datasets to establish recommended tree canopy goal tiers and a Citywide canopy goal. These goals are attainable through partnerships and actions described in the Urban Forest Master Plan. Appendix B provides tree planting prioritization studies to support implementation of the tree canopy goals. Progress towards these canopy goals should be tracked, measured, and shared to guide urban forest management and maintain community interest and support.

Across the U.S. cities are setting goals— some based on careful study of current canopy, community needs, and availability of planting space, other base their goals on the principle that more trees are better than fewer, set ambitious campaign goals, then work to mobilize efforts to meet it. Generally, the U.S. Forest Service recommends canopy cover of 40-60 percent in midwestern communities and in 1997, the American Forests organization established a benchmark of 40 percent after analyzing the tree canopy in dozens of cities from 1992 to 1997 and working closely with the research community. While incredibly valuable and groundbreaking at the time, technology and research have significantly evolved over the past 20 years, leading to a consensus that more nuanced approaches to canopy goal setting are necessary. Supporting this statement, U.S. Forest Service Research Forester Greg McPherson of the Pacific Southwest Research Station adds, “Tree canopy cover targets are difficult to specify broadly because the opportunities to create canopy are highly variable among cities, even within a climatic region or land use class.”

Tree canopy targets are best developed for specific cities and should consider constraints to creating canopy such as:

- Development densities (i.e., dense development patterns with more impervious surfaces have less opportunity for cover);
- Land use patterns (i.e., residential areas may have more opportunity for canopy than commercial areas, but canopy cover tends to be less in residential areas of disadvantaged communities versus wealthy ones);
- Ordinances (i.e., parking lot shade ordinances promote cover over some impervious areas); and
- Climate (i.e., canopy cover in desert cities is often less than tropical cities).

Within those parameters, quantifiable data can be used so a tree canopy goal achieves specific objectives, such as reaching the canopy percentage necessary to reduce urban heat island temperatures to a specific range, or to reduce stormwater runoff by a projected amount. According to a national analysis by U.S. Forest Service researchers, a **40-60 percent urban tree canopy is attainable under ideal conditions in forested states**. Twenty percent in grassland cities and 15 percent in desert cities are realistic baseline targets, with higher percentages possible through greater investment and prioritization.

It is important to note, however, that urban tree canopy percentage is just one of many criteria to consider. A robust tree canopy comprised of largely invasive species, for example, is not a healthy urban forest. Age and species diversity, condition of trees and equitable distribution across income levels, to name a few, should also be considered (Leahy, American Forests, 2017).

Citywide and Zoning Type Tree Canopy Goals

The following presents the proposed canopy goals though the City and partners should evaluate and refine these for approval by staff and City Council.

For the City of Rochester, the development of canopy goals was driven by tree canopy cover data, benchmarking research, analysis of existing and potential resources, City input, and community feedback.

Using this integrated approach, the City of Rochester's ambitious and achievable goal is **35 percent tree canopy cover by 2035**. To achieve this, the City must increase canopy by seven percent, **up from 28 percent**, and plant approximately 6,000 trees annually or a total of 84,000 trees. These trees would collectively grow the canopy throughout the City to an area equivalent to nearly 1,800 football fields and would provide additional ecosystem services and benefits in the amount of approximately $950,000 annually. These calculations and estimates are based on industry research and practices though there are some assumptions including;

- A no-net-loss strategy, meaning the number of trees removed on private property or through development are replaced.
- Trees that mature into large canopy-bearing trees are planted wherever feasible. Calculations use an average tree canopy diameter of 40 feet equating to a surface area of 1,257 square feet.
- Includes City-led, partner, volunteer, and private tree plantings. In this study and canopy goal scenario, it is recommended the City plant 60 percent of the necessary trees or approximately 3,600 trees per year.
- Assumes a potential for young tree mortality post-planting.

The following provides the calculated process of establishing the canopy goal for Rochester:

The amount of tree canopy cover and available planting space was analyzed by City Zoning Type. A percentage of total possible planting area (vegetative and impervious) to be planted was assigned to each Zoning Type based on the total amount of plantable space, the existing canopy, limitations of the Zoning Type, available resources, and other City needs. This approach realizes the unique opportunities, limitations, extent, resources, and characteristics found among various city zoning classes. A canopy goal and planting targets must not be a standardized across the City, they should be specific to the area. This method was applied and summarized in the following table.

Table 26. Possible planting targets by Zoning Type

ZONING TYPE	ABBR.	TOTAL POSSIBLE PLANTING AREA (%)	% OF TOTAL POSSIBLE PLANTING AREA TO BE PLANTED
Low Intensity Mixed Commercial Industrial	M3	79%	20%
Mixed Commercial-Industrial	M1	49%	20%
Industrial	M2	37%	20%
Central Development Core	CDC-CBD	4%	15%
Central Development Core	CDC-MED	10%	10%
Central Development Core	CDC-RES	12%	10%
Central Development Core	CDC-FR	9%	10%
Pedestrian Oriented Restricted Commercial	B2	38%	33%
General Commercial	B4	39%	25%
Restricted Commercial	B1	91%	25%
Residential Commercial	B5	28%	33%

Table 26 continued

ZONING TYPE	ABBR.	TOTAL POSSIBLE PLANTING AREA (%)	% OF TOTAL POSSIBLE PLANTING AREA TO BE PLANTED
Mixed Single Family	R1	35%	10%
Mixed Single Family Extra	R1X	41%	15%
Mixed Single Family Overlay	R-Sa	18%	5%
Low Density Residential	R2	43%	24%
Low Density Residential Extra	R2X	24%	33%
Medium Density Residential	R3	37%	25%
High Density Residential	R4	16%	10%
Mixed Redevelopment	MRD	45%	25%
Planned Unit Development	PUD	25%	33%
Special District	SD	54%	33%
Mixed use	TODCorr	21%	33%
Mixed use	TODNode	20%	33%
Holding Zone	H	82%	50%
Interim Zone	I	27%	15%
Agriculture	AG	42%	6%

Using the City's TreePlotter CANOPY software application, GIS, and Microsoft Excel, the number of trees required to achieve the planting target was calculated based on total land area of the Zoning Type, existing tree canopy percent and acreage, total available planting area, and plantable space target. To calculate total added benefits, the U.S. Forest Service's i-Tree research and suite of tools was utilized. The following table summarizes the results of this approach.

Table 27. Tree canopy goals and planting targets by Zoning Type

ABBR.	TOTAL POSSIBLE PLANTING AREA (%)	% OF TOTAL POSSIBLE PLANTING AREA TO BE PLANTED	TREE CANOPY GOAL	NO. TREES TO REACH GOAL	ANNUAL ADDED ECOSYSTEM BENEFITS
Industrial					
M3	79%	20%	18%	514	$5,829
M1	49%	20%	16%	15,002	$170,126
M2	37%	20%	19%	3,031	$34,372
			Sub-total	**18,547**	**$210,326**
Downtown					
CDC-CBD	4%	15%	6%	14	$164
CDC-MED	10%	10%	12%	48	$549
CDC-RES	12%	10%	16%	20	$222
CDC-FR	9%	10%	9%	23	$266
			Sub-total	**106**	**$1,202**

Table 27. continued

ABBR.	TOTAL POSSIBLE PLANTING AREA (%)	% OF TOTAL POSSIBLE PLANTING AREA TO BE PLANTED	TREE CANOPY GOAL	NO. TREES TO REACH GOAL	ANNUAL ADDED ECOSYSTEM BENEFITS
Commercial					
B2	38%	33%	18%	101	$1,142
B4	39%	25%	18%	5,588	$63,372
B1	91%	25%	38%	2,151	$24,390
B5	28%	33%	42%	66	$745
			Sub-total	**7,906**	**$89,649**
Residential					
R1	35%	10%	41%	20,663	$234,313
R1X	41%	15%	40%	2,626	$29,775
R-Sa	18%	5%	72%	217	$2,459
R2	43%	24%	32%	5,460	$61,918
R2X	24%	33%	40%	990	$11,221
R3	37%	25%	30%	3,677	$41,692
R4	16%	10%	22%	26	$299
			Sub-total	**33,658**	**$381,677**
Planned Development					
MRD	45%	25%	33%	2,502	$28,369
PUD	25%	33%	32%	2,279	$25,845
			Sub-total	**4,781**	**$54,214**
Special District					
SD	54%	33%	38%	11,173	$126,697
			Sub-total	**11,173**	**$126,697**
Mixed Use					
TODCorr	21%	33%	24%	1,263	$14,324
TODNode	20%	33%	12%	569	$6,456
			Sub-total	**1,832**	**$20,780**
Holding Zones					
HI	82%	50%	57%	2,423	$27,475
I	27%	15%	70%	415	$4,703
			Sub-total	**2,838**	**$32,177**
Agriculture					
AG	42%	6%	40%	459	$5,207
			Sub-total	**459**	**$5,207**
TOTAL				**81,299**	**$921,929**

Citywide and Forestry Management Unit Tree Canopy Goals

Figure 3. Existing tree canopy and canopy goals by FMU

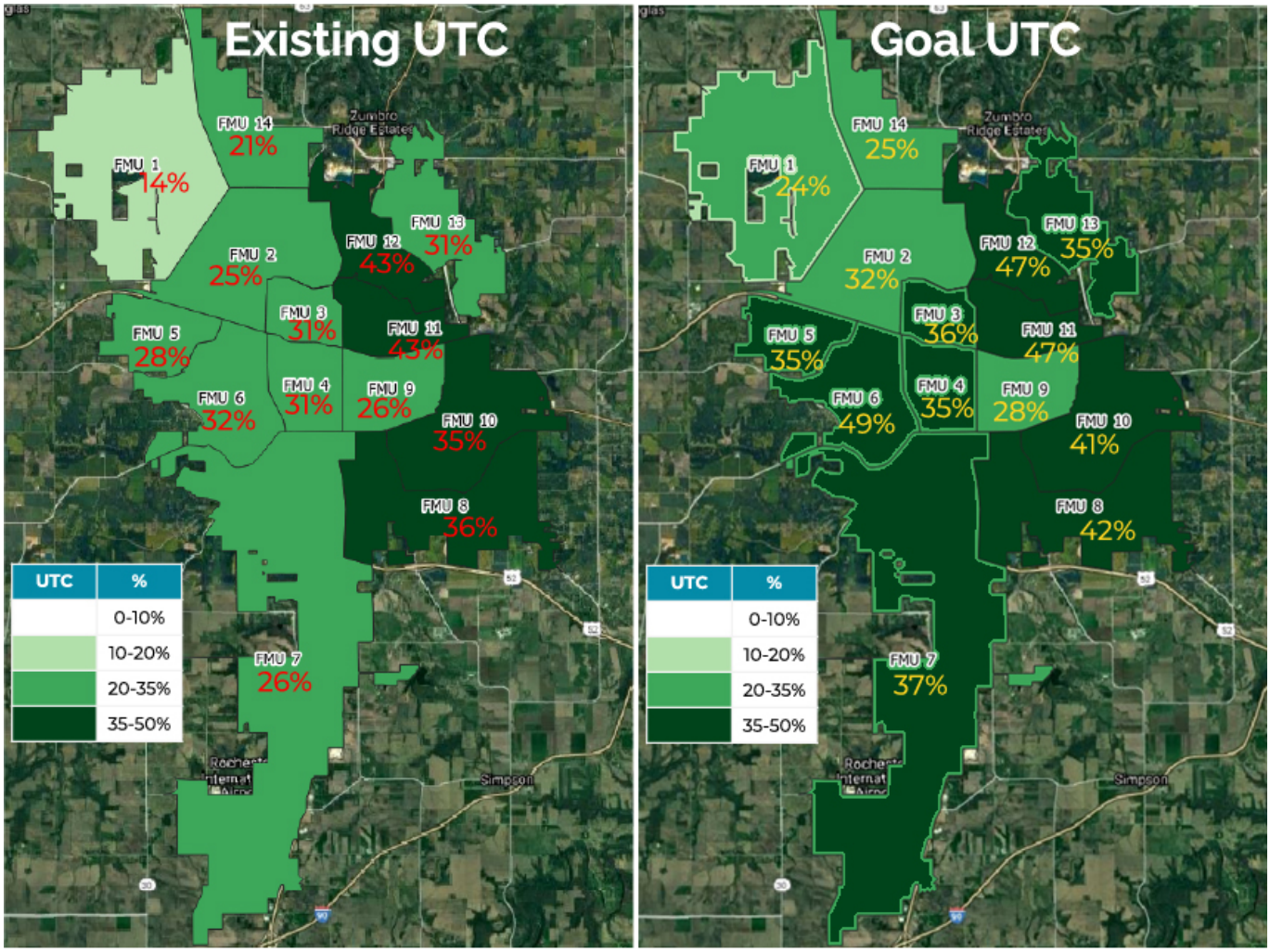


Table 28. Example approach to setting canopy and planting goals by Forestry Management Unit (FMU)

FMU	TOTAL POSSIBLE PLANTING AREA (PPA) (%)	% OF TOTAL PPA TO BE PLANTED	TREE CANOPY GOAL (EXISTING %)	NO. TREES TO REACH GOAL	ANNUAL ADDED ECOSYSTEM BENEFITS
FMU 1	50%	20%	24% (14%)	15,900	$180,305
FMU 2	34%	20%	32% (25%)	6,724	$76,255
FMU 3	24%	20%	36% (31%)	1,248	$14,156
FMU 4	20%	20%	35% (31%)	1,513	$17,158
FMU5	34%	20%	35% (28%)	2,527	$28,652
FMU 6	36%	20%	39% (32%)	4,769	$54,080
FMU 7	43%	25%	37% (26%)	33,409	$378,863
FMU 8	37%	15%	42% (36%)	6,022	$68,285
FMU 9	26%	10%	28% (26%)	1,129	$12,798
FMU 10	36%	15%	41% (35%)	4,576	$51,891
FMU 11	26%	15%	47% (43%)	1,408	$15,966
FMU 12	29%	15%	47% (43%)	2,106	$23,883
FMU 13	38%	10%	35% (31%)	2,664	$30,206
FMU 14	41%	10%	25% (21%)	2,601	$29,498
TOTAL				**86,596**	**$981,996**

Another approach to canopy goal setting and implementation is to evaluate existing tree cover and available planting space by Forestry Management Unit (FMU). According to the 2020 Tree Canopy Assessment, the 14 FMUs range in tree cover from 14 to 43 percent. By evaluating the total possible planting area (PPA) and applying a percentage of PPA to stock with tree canopy, canopy goals can be established by FMU. The figure and tables above provide an example approach to canopy goal setting by FMU. In this scenario, a total of 86,596 trees (similar to the Zoning Type canopy goals) are necessary to achieve a Citywide canopy goal of 35 percent.

APPENDIX B. TREE PLANTING PRIORITIZATION

(UFMP Action MP.04, AP.08, CE.04, GA.09)

Once the City finalizes local and Citywide tree canopy goals, it is recommended to establish priority areas based on a variety of themes and community needs. Themes may include ownership type (public and private), areas of low existing tree canopy, and greatest amount of available planting space while other themes may address air quality, stormwater reduction and water quality. Others may evaluate opportunities to address disadvantaged areas, densely populated regions, and human health factors such as asthma cases, median age, and mental health. In any planting prioritization scenario, the scale may include U.S. Census Bureau Census Blocks, Zoning Type, Wards and Precincts, Forestry Management Units, and Citywide.

Using the 2020 Tree Canopy Assessment (TCA) and the City's TreePlotter CANOPY software application, a series of recommended prioritization techniques is provided.

- Wards and Precincts with the most opportunity. This approach may include areas with less than the average Citywide tree canopy cover (28 percent) and greater than average total possible planting area (38 percent).

- Census Blocks where trees can mitigate air quality issues. Street and rights-of-way corridors typically have higher concentrations of particulate matter. Trees can be planted along roads to absorb vehicle exhaust and reduce pollution. This layer highlights the percent of road area. Higher concentrations of road surfaces may indicate poor air quality.

- Tree planting in Census Blocks to reduce stormwater runoff. Trees can be integrated to help manage stormwater, specifically when targeting impervious surfaces. This indicator uses available planting area on impervious surfaces and available planting areas within 100 feet of all surface water bodies.

- Tree planting in underserved or disadvantaged Census Blocks. Tree canopy is positively correlated with higher median income. Planting trees in lower income communities can support environmental equity. This indicator shows the percentage of residents living below the poverty level.

- Tree plantings to offset population density. Larger numbers of people will benefit from the ecosystem services that increased tree canopy coverage can provide.

- Tree plantings to improve human health. Trees clean the air that we breathe, filter the water that we drink, and can lower stress levels, in turn, improving public health. Planting trees can be a cost-effective way of improving a city's overall public health. Health reports with information about the reported asthma cases and mental health concerns can be utilized to target tree planting efforts.

Figure 4. Wards and precincts with less than average tree canopy and higher than average planting space.

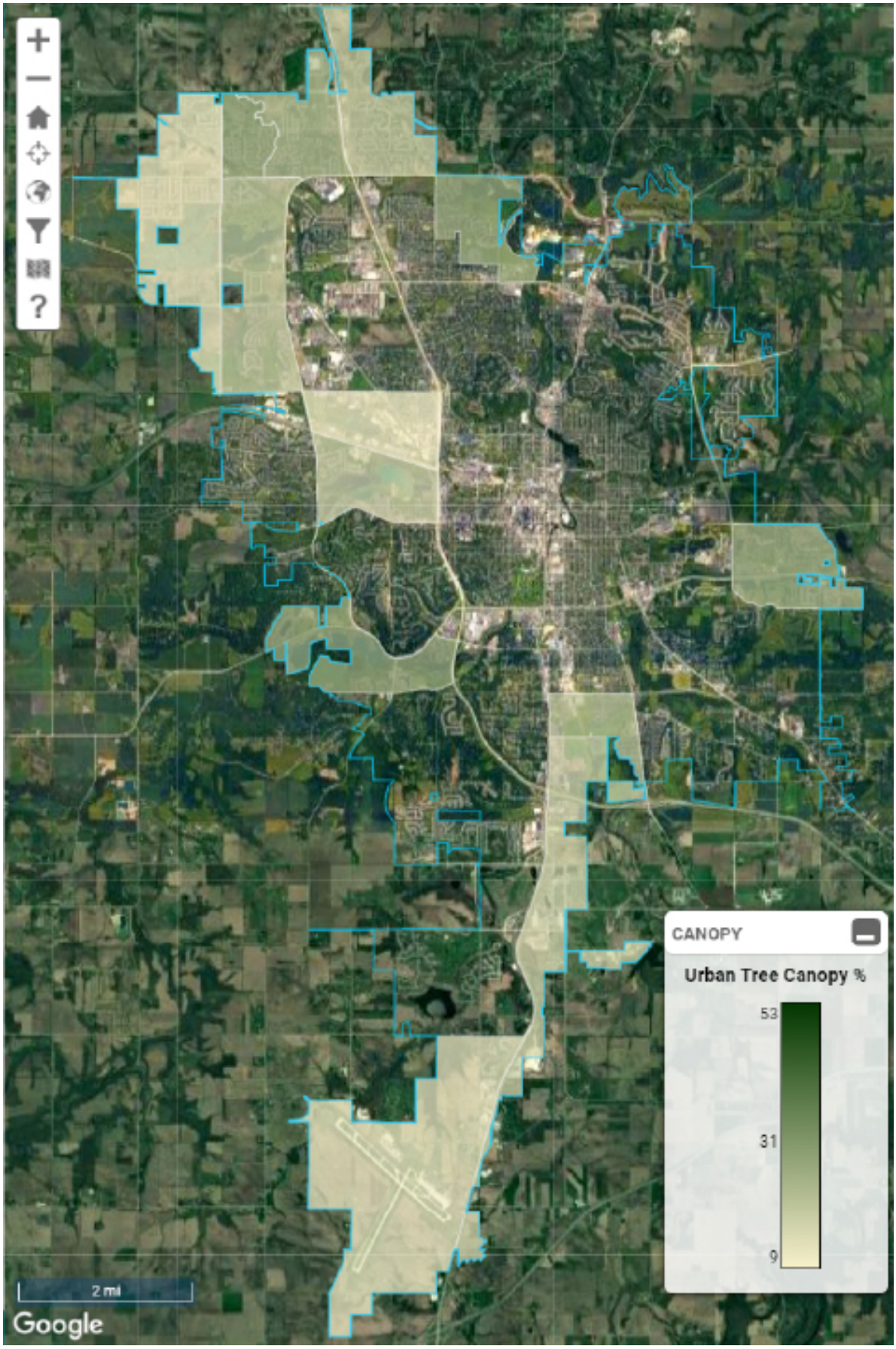


Figure 5. Tree planting in Census Blocks to improve air quality

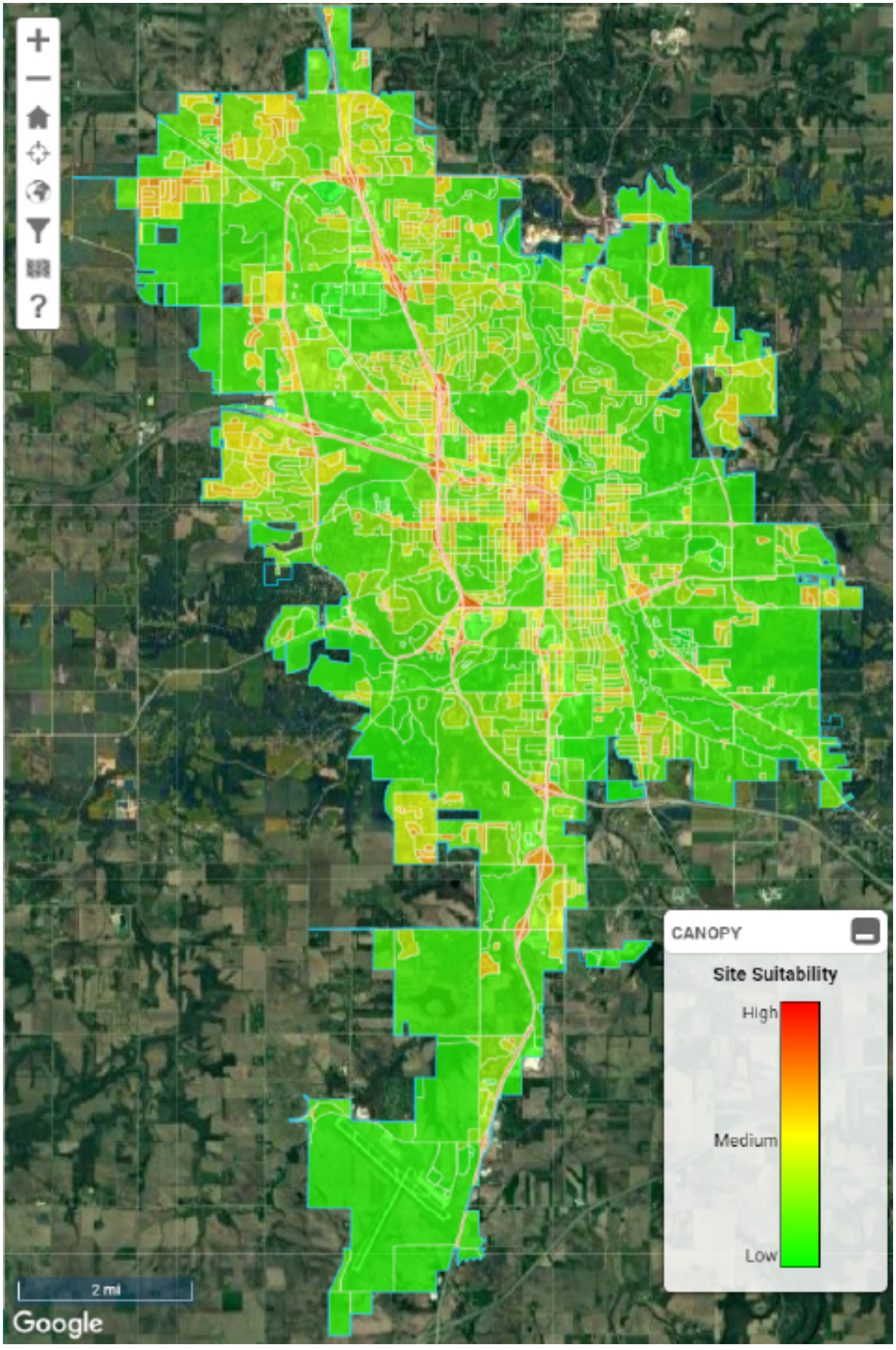


Figure 6. Tree planting in Census Blocks to reduce stormwater runoff

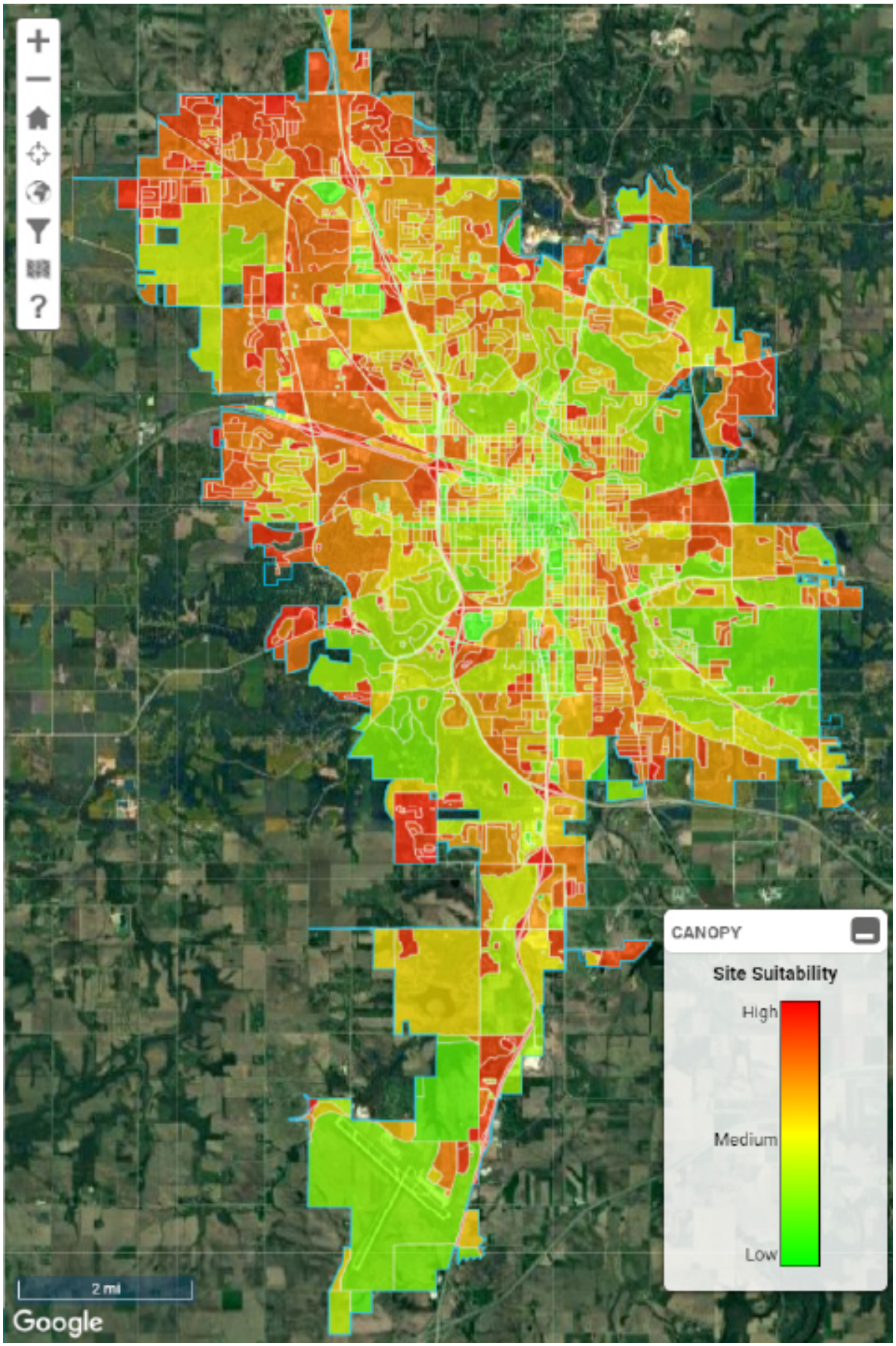


Figure 7. Tree planting in Census Blocks to address underserved populations

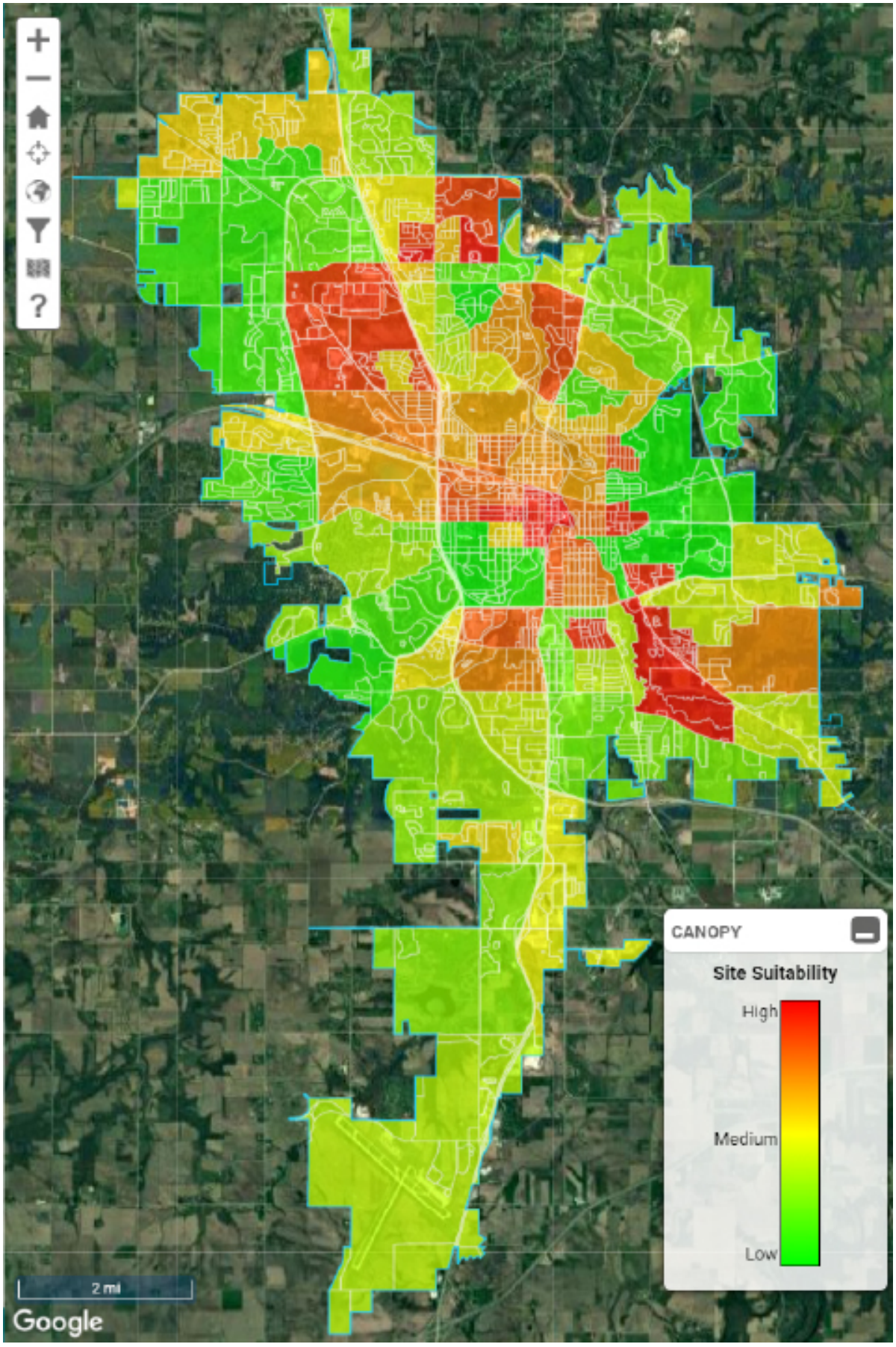


Figure 8. Tree planting in Census Blocks to address population density

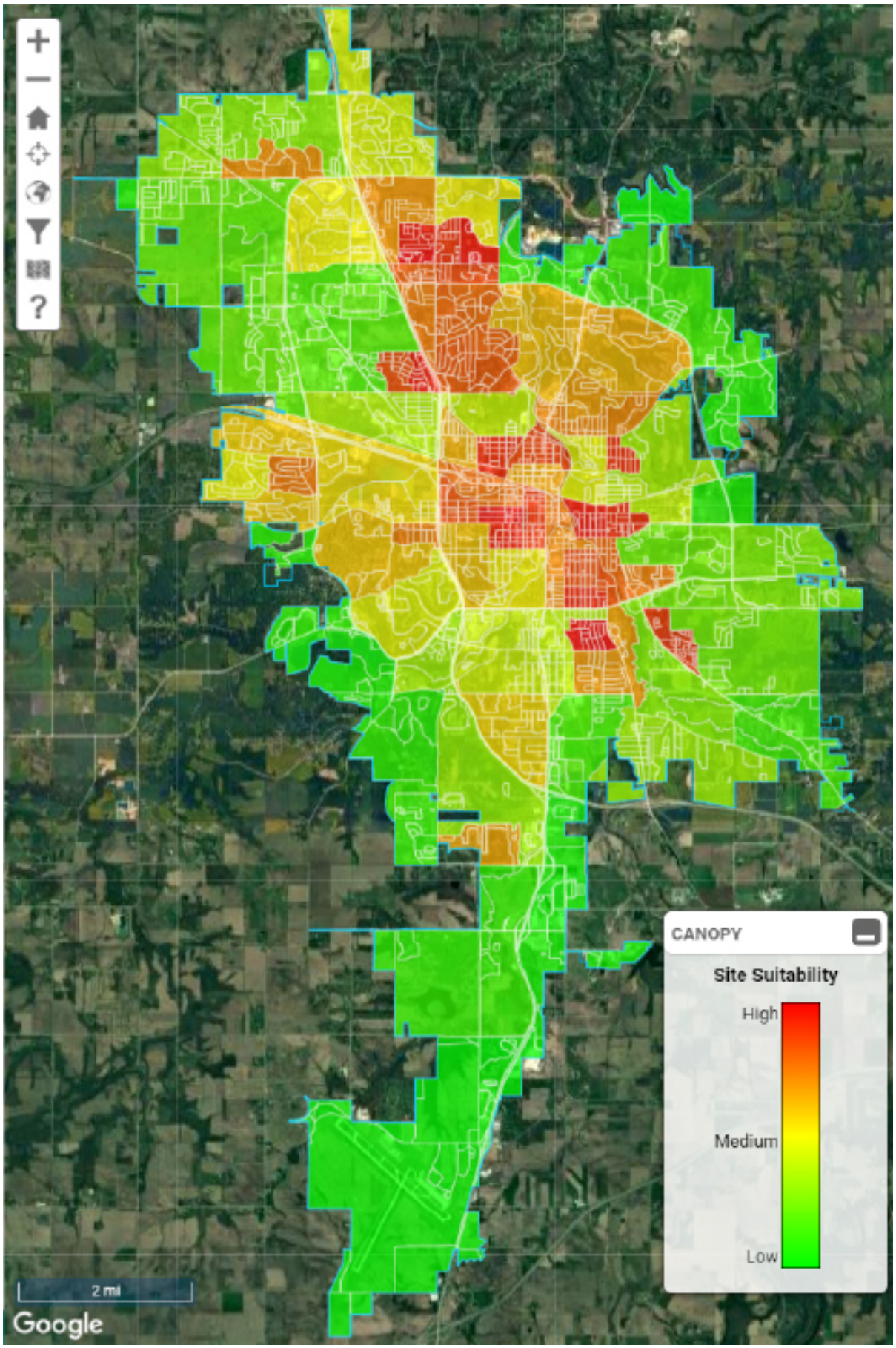


Figure 9. Tree planting in Census Blocks to address concentrations of asthma cases

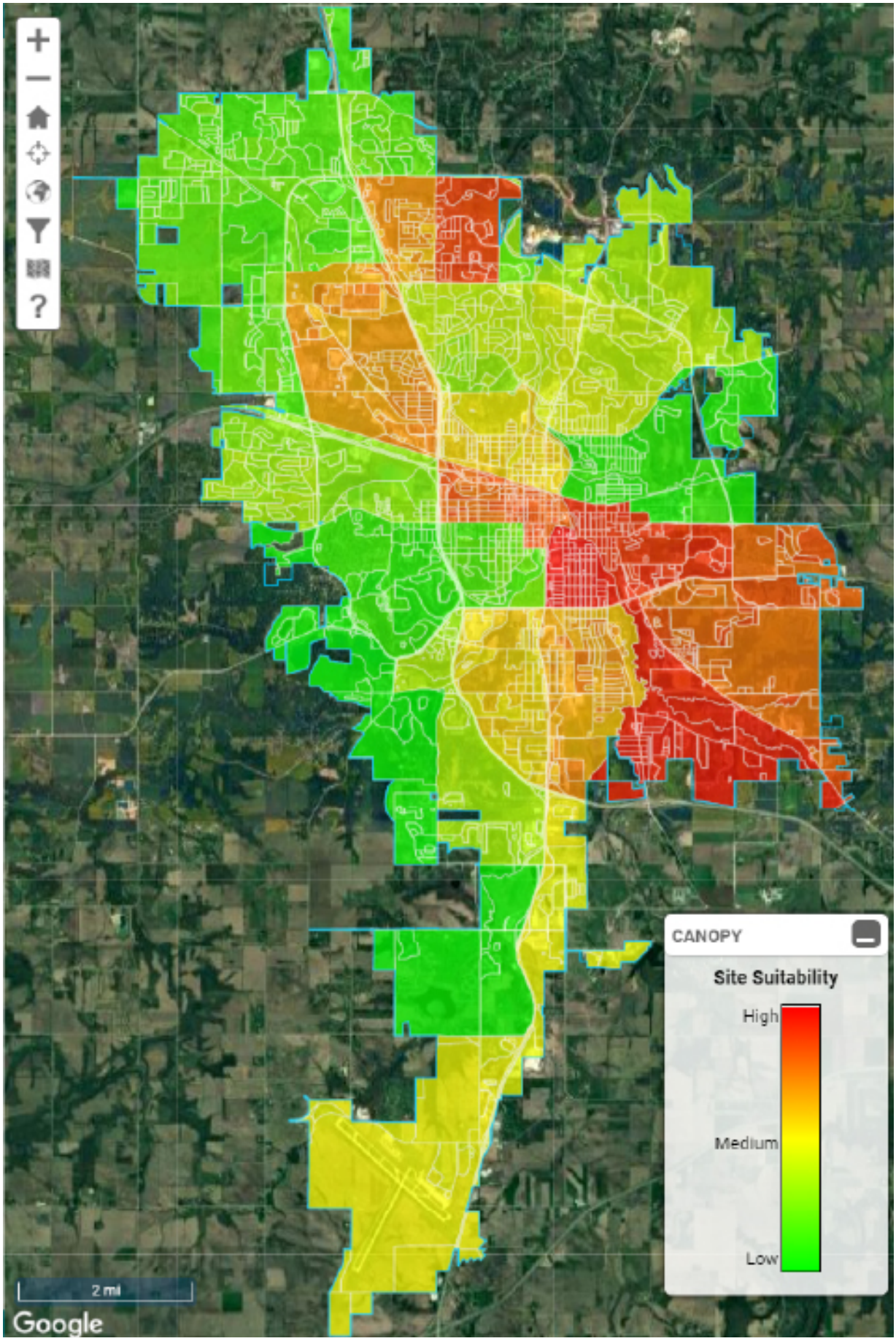


Figure 10. Tree planting in Census Blocks to improve mental health

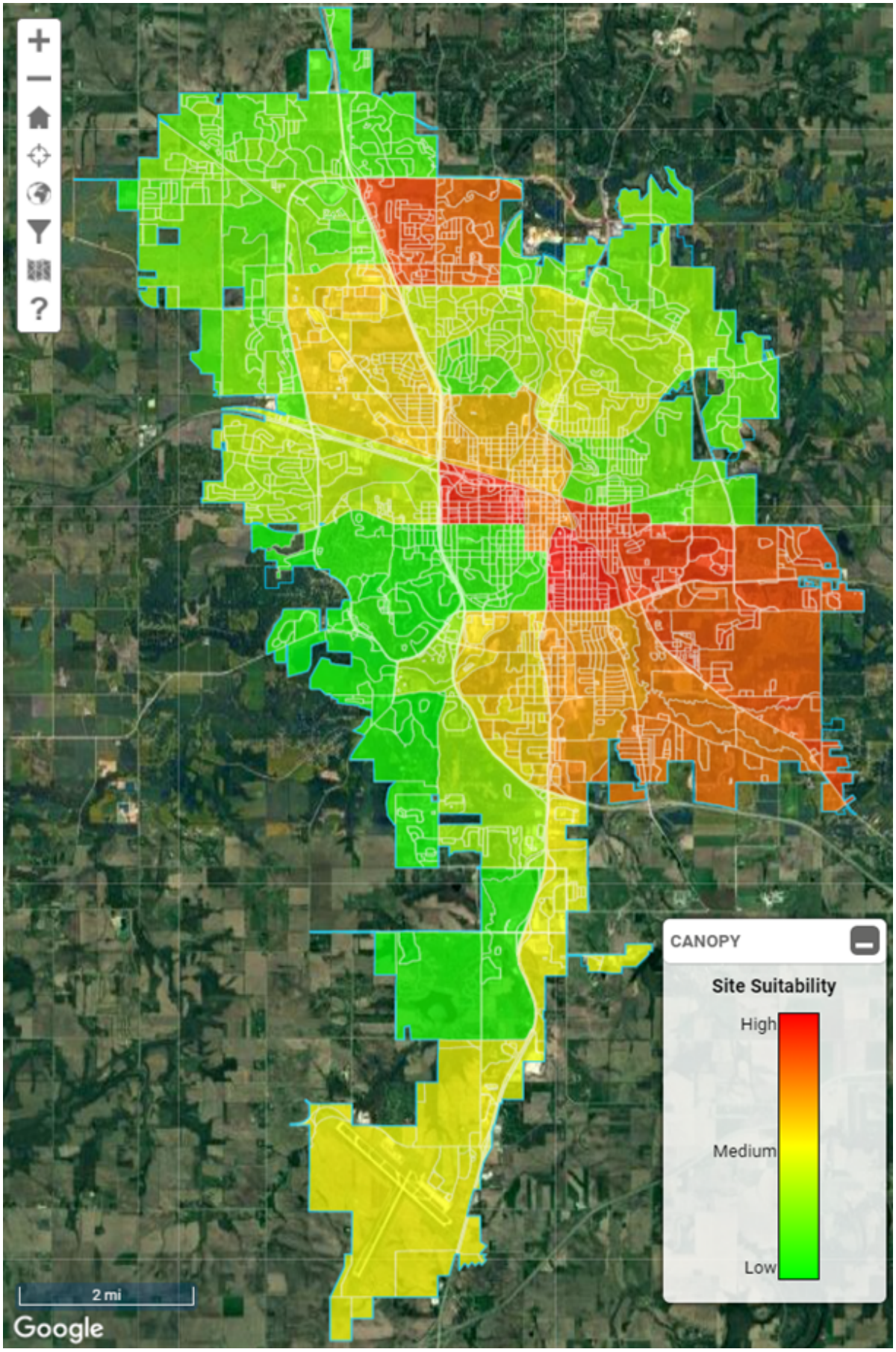


Figure 11. Planting opportunities in the rights-of-way

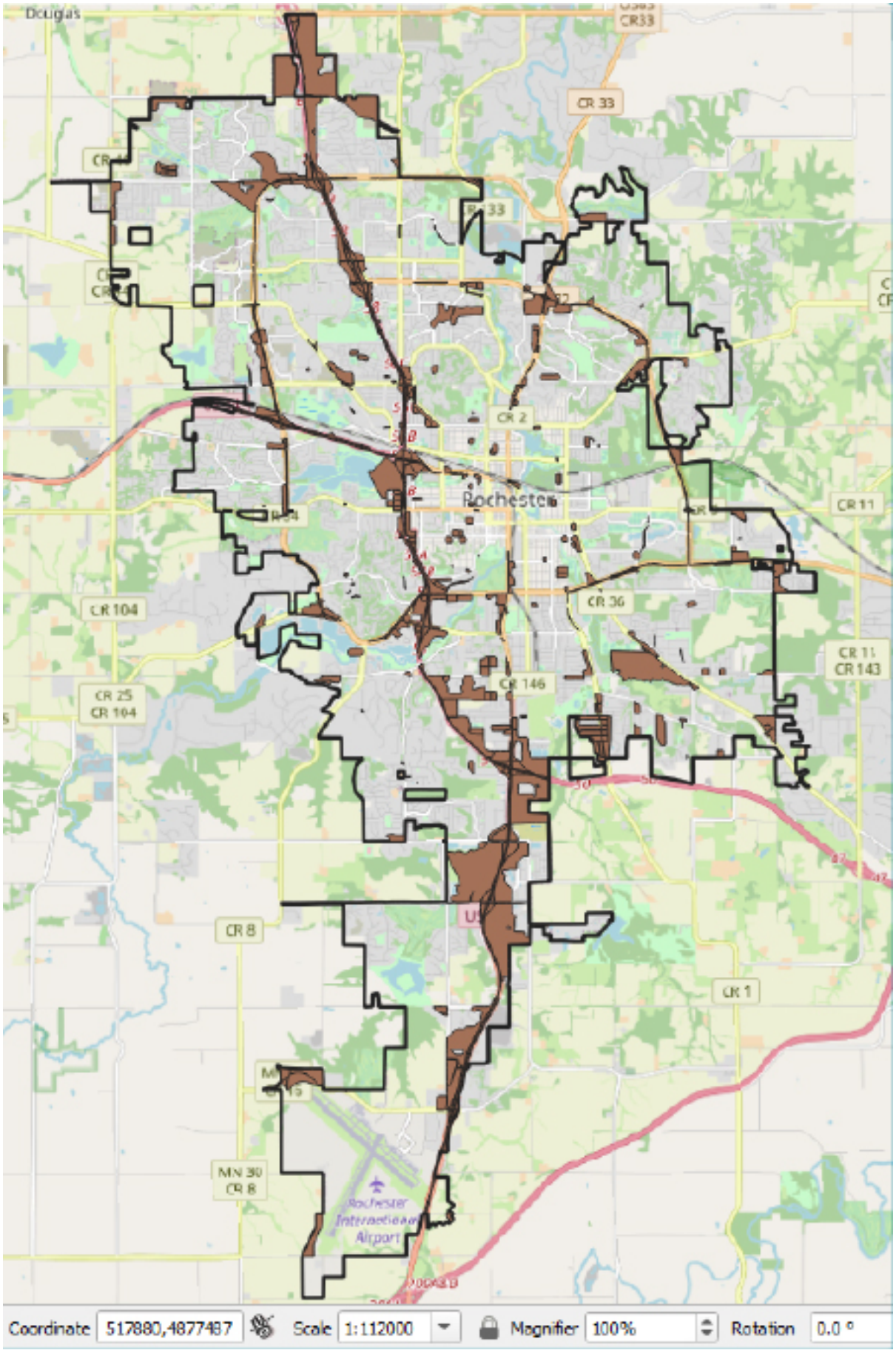


Figure 12. Planting priority composite showing high priority Census Blocks

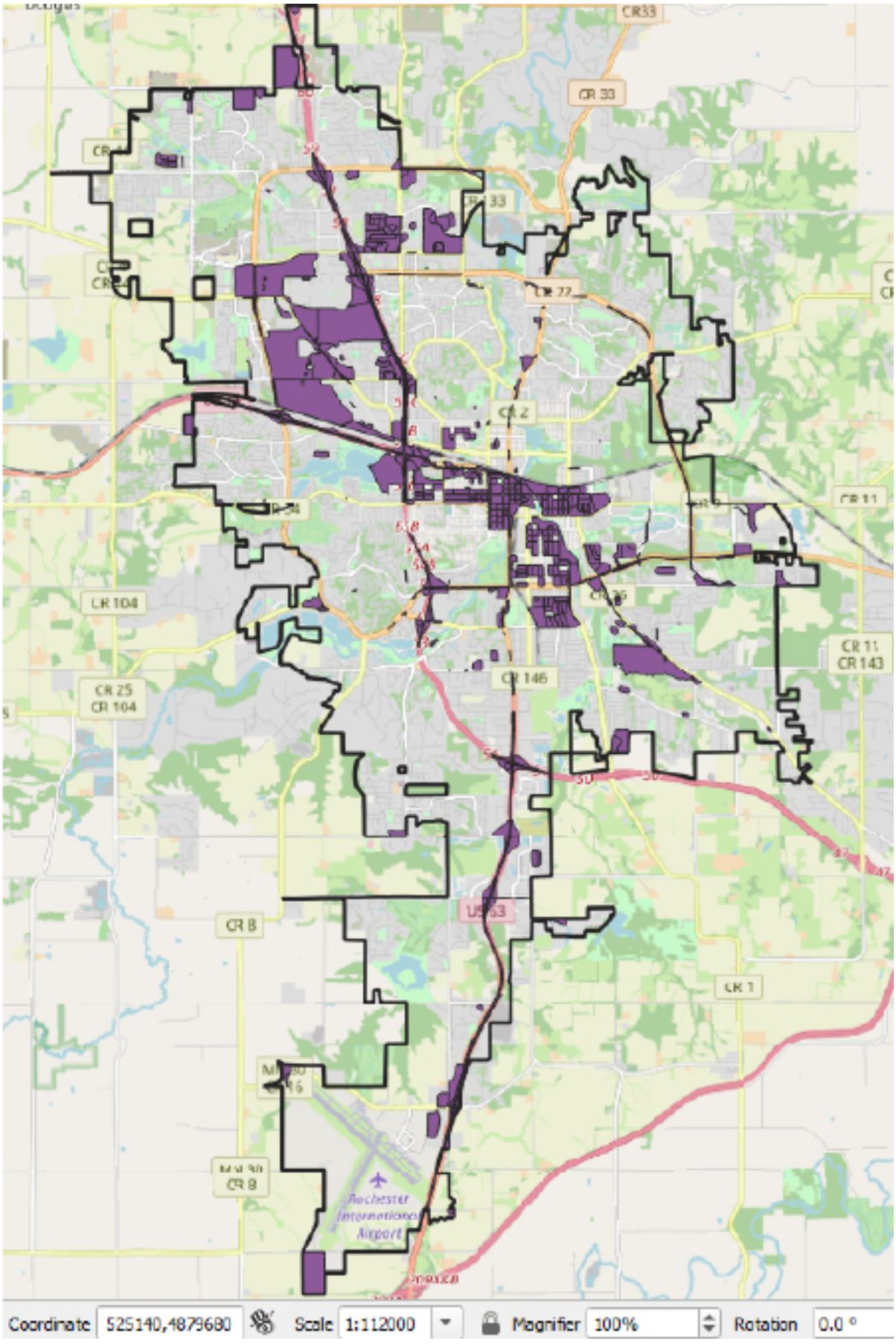


Figure 13. Priority Census blocks with the greatest amount of planting space

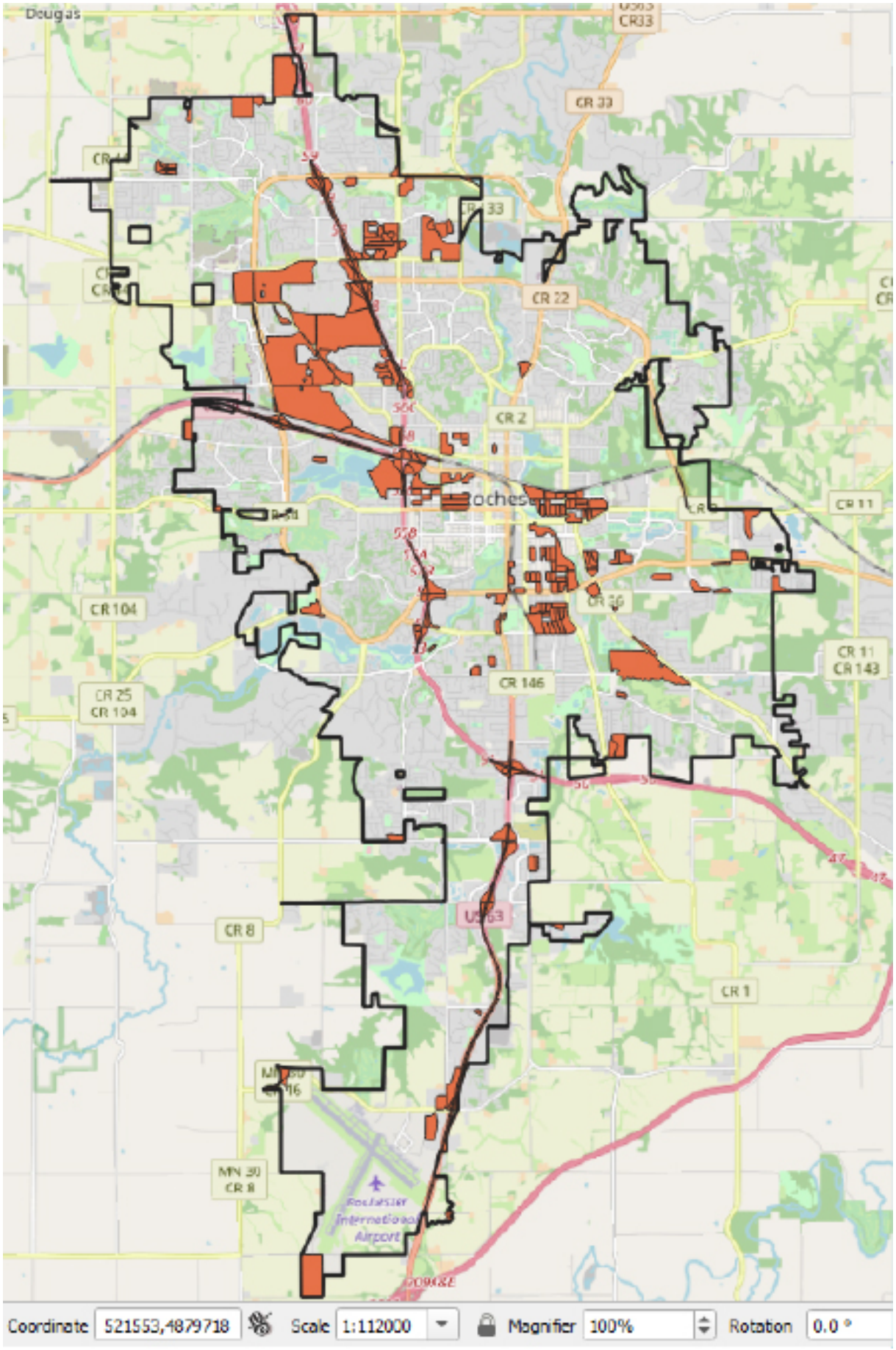


Figure 14. Example planting space in a priority Census Block

Priority Census Blocks with more than average acres of planting space (6.4 acres) and less than average existing canopy (14%)

(23 of 257 priority Census Blocks)

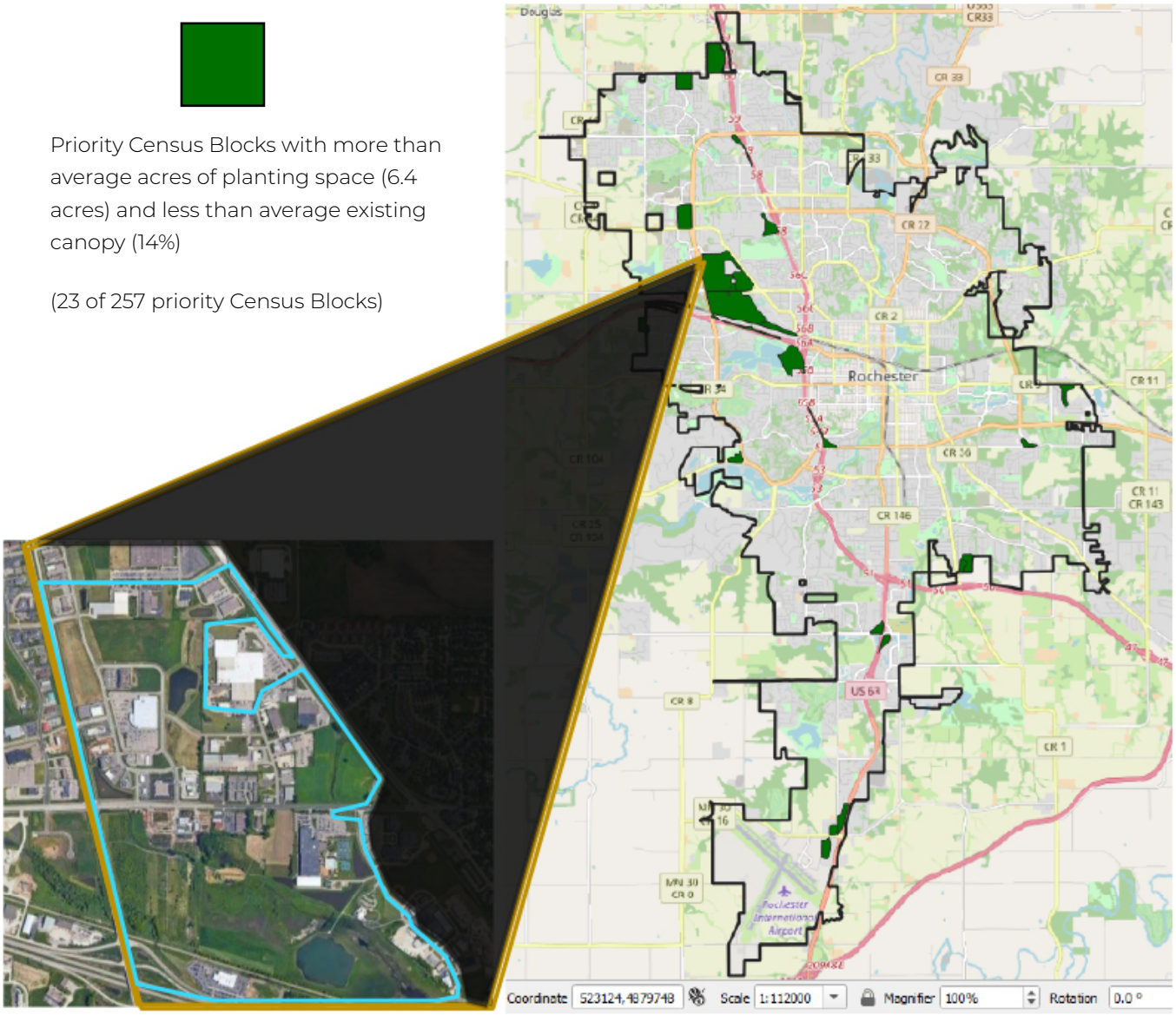


Table 29. Example tree planting prioritization and canopy goal setting

CENSUS BLOCK #	ZONING	OVERALL PRIORITY SCORE	% OF PPA+ PLANTED FOR UTC GOAL	EXISTING UTC* %	CANOPY GOAL**	TREES NEEDED
4044	B2: Pedestrian Oriented Restricted Commercial	4.3	40%	2.6%	18%	257
1064	B4/M1: General Commercial / Mixed Commercial-Industrial	5.0	25%	0.0%	15%	67
2017	B4/M1: General Commercial/Mixed Commercial-Industrial	5.1	25%	3.0%	20%	86
4108	B4/M1: General Commercial / Mixed Commercial-Industrial	4.1	25%	2.4%	13%	100
1047	B4: General Commercial	4.2	25%	0.6%	18%	344
4020	B4: General Commercial	4.5	25%	1.7%	22%	91
2005	M1/M2: Mixed Commercial-Industrial/ Industrial	5.0	25%	0.0%	13%	74
2042	M1: Mixed Commercial-Industrial	4.2	25%	10.7%	22%	102
4026	M1: Mixed Commercial-Industrial	4.1	25%	1.3%	20%	168
4005	M1: Mixed Commercial-Industrial	4.1	25%	0.4%	17%	453
4030	M2: Industrial	4.3	10%	2.8%	7%	246
4052	M2: Industrial	4.5	10%	11.0%	18%	60
2023	R1/M1: Residential/Mixed Commercial-Industrial	4.3	30%	6.4%	27%	1,442
2023	R1/R2: Residential/Low Density Residential	4.2	40%	6.8%	26%	146
2025	R1/R3: Residential/ Medium Density Residential	4.1	35%	7.4%	27%	286
1034	R1: Residential	4.3	40%	8.5%	37%	143
2040	R1: Residential	4.4	40%	12.5%	38%	93
2041	R1: Residential	4.2	40%	8.2%	35%	210
4049	R1X: Residential	4.3	40%	0.6%	25%	336
2063	R3: Medium Density Residential	4.8	33%	5.1%	31%	101
3002	ROW: Right-of-Way	5.0	20%	0.9%	14%	50
3018	ROW: Right-of-Way	4.3	20%	5.4%	14%	50
3022	SD: Special District	4.3	25%	1.8%	23%	107
TOTAL TREES NEEDED						**5,112**

+ PPA = Possible Planting Area

** UTC = Urban Tree Canopy*

*** Canopy goals by Zoning Type in priority Census Blocks are simulation only*

APPENDIX C. CITY CODE REVIEW AND RECOMMENDATIONS

(UFMP Action MP.03, MP.05, MP.06, MP.08)

Chapter 9-4. – Trees

(addition) Purpose

This Chapter is enacted in recognition of the following facts:

A. Among the features that contribute to the attractiveness and livability of the City of Rochester are its trees, both indigenous and introduced, growing as single specimens, in clusters, or in woodland situations. These trees have significant psychological and tangible benefits for both residents and visitors to the City.

B. Trees contribute to the visual framework of the City by providing scale, color, silhouette and mass. Trees contribute beneficially to the climate of the City by reducing heat buildup and providing shade, moisture, and wind control. Trees contribute to the protection of other natural resources by providing erosion control for the soil, oxygen for the air and habitat for wildlife. Trees contribute to the economy of the City by increasing and sustaining property values. Trees reduce the cost of stormwater systems by increasing the water retention capacity of soils. Trees provide screens and buffers to separate land uses, are often landmarks of the City's history, and are a critical element of nature in the midst of an urban setting.

C. The City's trees collectively constitute an urban forest, and removals or additions of even a single tree can negatively or positively affect the urban forest and the City as a whole. The loss or removal of a tree from one location in the City's urban forest can often be at least partially mitigated by planting a replacement tree or replacement trees in the same or a different location. However, the negative effect of the loss or removal of a mature tree may in some cases take generations to fully mitigate by the planting of immature replacement trees.

D. For all these reasons, it is the purpose of this Chapter, and in the interest of the public health, safety and welfare of the people of the City of Rochester, while recognizing private rights to develop and use property in a manner not prejudicial to the public interest, to protect and preserve trees by regulating their removal and damage to them; to prevent unnecessary tree loss and damage; to minimize environmental damage from improper tree removal or pruning; to encourage or, when appropriate, to require tree replacement plantings; to effectively enforce tree preservation regulations; and to promote the appreciation and understanding of trees.

Chapter 9-4. – Trees

(addition) Heritage Trees

A. Purpose: In the passage of the ordinance codified in this chapter, the city recognizes that trees contribute in many important ways to the health, safety, and welfare of all of Rochester's citizens. Besides their aesthetic benefits, trees offer windbreaks, provide erosion control, act as filters for airborne pollutants, release oxygen, and provide a habitat for birds and other wildlife. All trees perform these functions for the lands on which they occur. The city recognizes, however, that trees of significant size and maturity often perform these functions for all people living in their vicinity. They are key elements in a living system whose boundaries do not conform to the legal boundaries of private property. They are part of the natural heritage of all of Sonoma's citizens upon which the continued health and welfare of the community depends. Also part of such valued natural heritage are other trees, not necessarily as large, which form an important element of the community's history.

B. Heritage Trees Defined: As used in this chapter, "heritage tree" means a tree or group of trees specifically designated by official act of the [Park Board] that:

(1) The tree or group of trees has historical significance or has taken on the aura of historical appeal; or

(2) The tree or group of trees is mutually dependent upon each other for survival; or

(3) The tree or group of trees is considered an outstanding specimen of its species; or

(4) The tree or group of trees is the size of 50 inches or more in diameter measured at 24 inches above natural grade; and

(5) The tree or group of trees has been recommended as such by the [Park Board] and dedicated and accepted by the city council of Rochester.

(6) For the purpose of subsection C of this section, an outstanding specimen is a tree which has been determined by the [Park Board] [heritage tree committee] to be healthy, has attained maturity and is well formed. Any tree designated as a heritage tree may by identified with a marker or by any other means as determined by the [Park Board].

C. Heritage Tree Dedication.

(1) [Park Board]'s [heritage tree committee] shall make a recommendation to the commission whether a tree, which meets the definitions under (Heritage Trees Defined), has a significant historical or horticultural value to the city to warrant its dedication as a heritage tree. Not all trees which meet the definition under (Heritage Trees Defined) will be significant, and the [Park Board] shall weigh the cost of maintenance against the value of the tree(s) as a Rochester landmark in determining whether a tree should be dedicated as a heritage tree. The [Park Board] shall not recommend acceptance of dedication of a proposed heritage tree until at least six months (182 calendar days) has elapsed from the time the proposed dedication is taken under consideration by the [Park Board].

(2) Upon the recommendation of the [Park Board] that a tree(s) meets the criteria of a heritage tree and should be dedicated as such, the owner of the tree(s) may dedicate the tree(s) to the city, if he or she also dedicates right of access for maintenance and protection, and the dedication is accepted by resolution of the city council. Dedication shall be subject to such conditions as the council considers proper in the case.

D. Removal and Damaging of Heritage Trees Prohibited.

(1) It is unlawful for any person to break, injure, deface, mutilate, kill or destroy any heritage tree or set fire or permit any fire to burn where such fire or the heat thereof will injure any portion of a heritage tree, or to cause or permit any wire charged with electricity to come into contact therewith, or to allow any gas, liquid, or solid substance which is harmful to such trees to come in contact with their leaves.

(2) It is unlawful and it is prohibited for any person other than the duly authorized representative to place, apply, attach or keep attached to any such heritage tree any wire, rope, sign, paint, or any other substance, structure, thing or device of any kind or nature whatsoever until a written permit to do so has first been obtained from the [Park Board].

E. Designated Historical Trees.

(1) In those cases in which the city and property owner cannot reach an agreement for the dedication of a proposed heritage tree, or where the city finds that a tree's historical importance is outweighed by its

dedication and maintenance costs, the city's [Park Board] may declare such a tree a designated historical tree.

(2) The purpose of such identification is to recognize and locate trees of historical significance in the city. Such identification as a designated historical tree is not intended nor shall it restrict the owner of such property where the tree shall occur from any normal exercise of his property rights that are recognized under law.

(3) Such identification shall include the marking of designated historical trees on maps of the historic preservation combining district and on a master heritage and historical tree map to be prepared and maintained by the city [Parks and Forestry Division]. Identification shall also include written notification to the property owner of such designation and, if so ordered by the [Park Board] and accepted by the property owner, a physical marker may be placed on or near a designated historical tree.

F. Penalties.

(1) Any person violating any of the provisions of this chapter or failing to comply with them shall upon conviction thereof be punished by a fine not to exceed [$500.00], or by imprisonment not to exceed six months, or both such fine and imprisonment.

Zoning Ordinance and Land Development Manual

The Zoning Ordinance is schedule for update as part of the City's Unified Development Code (UDC) effort. The timing of this Urban Forest Master Plan does not align with the UDC timeline though updates to the UDC should incorporate content from the Urban Forest Master Plan. The UDC may adjust certain provisions that impact this Urban Forest Master Plan.

General guidelines for updates to the UDC include:

- Addition of the solutions provided in the Trees and Hardscape Conflicts Solution Workbook (Appendix F).
- Incorporation of urban tree canopy goals and planting targets (see Appendix A and Appendix B).
- Expansion of boulevard planting widths in reconstruction projects.
- Creation of the Tree Preservation Ordinance (draft proposed in January 2020).
- Considerations for variance criteria as it relates to buffer requirements and limited space for trees.
- Requirement of root barriers in narrow boulevards.
- Guidelines for watering trees for development projects.
- Long-term tree survival supported by implementing Best Management Practices, monitoring, and protection of the Critical Root Zone (CRZ).

APPENDIX D. FUNDING MECHANISMS

(UFMP Action BF.06, BF.10)

Table 30. Financing options for Rochester's urban forest management programs

FINANCING OPTIONS	ATTRIBUTES	PROCESS	OPPORTUNITIES	CHALLENGES
FEASIBLE OPTIONS				
Special Assessment Districts	Special assessment for landscaping, open space improvements, acquisition, and maintenance.	City agency / property owners initiate via petition, City agency administers; based on benefits calculated in engineer's report; >50% of property owners in proposed district must approve via (mail) ballot.	Citywide district possible for all street trees; individual districts more feasible in areas with many trees, high maintenance needs, and/or political support.	Typically funds more than just street trees.
Parcel Tax	Assessment levied independent of property value, can be equal amount per parcel or dependent on lot size.	2/3 of voters (not just property owners) must approve via election ballot.	Tax can be directly related to program costs; maintenance taxes deductible for property owners.	2/3 voter approval; potential competition from other services (e.g. schools); flat tax distributes cost inequitably.
General Obligation (GO) Bond	Low-interest load for capital projects; repaid by levying tax revenue.	2/3 voter approval required.	Frequently used tool in municipal government.	Funding providing for set period; maintenance ineligible for funding.
Stormwater Utility	Urban forests mitigate storm-water runoff. A portion of the stormwater management fee can be earmarked for urban forestry.	Rochester has a stormwater fee that is collected from every developed property parcel in the City to support the stormwater management program.	Additional funding to urban forestry and incentive to property owners to plant trees as a Best Management Practice under the Stormwater Utility Fee Credit Program.	Planting trees is not included in the City's Stormwater Utility Fee Credit Manual.
Partnerships	Non-profits, corporate partners, grant funding; for tree planting and establishment.	Various, depends on City's processes.	Decrease costs, increase capacity, develop a tree steward organization and program.	Union resistance, sustainable funding stream required.

FINANCING OPTIONS	ATTRIBUTES	PROCESS	OPPORTUNITIES	CHALLENGES
ADDITIONAL OPTIONS				
Pest Control Fee	A fee for forestry related services such as pest control and replanting.	A forestry fee specific to pest control added to the public service utility billing as a levy.	Opportunity to offset costs of managing and recovering from emerald ash borer and other tree pests and diseases.	Increased fee may require voter approval. The City must analyze pest control costs to establish the appropriate fee amount.
Tree Work and Land Development Permit Fees	An increase in fees for registered tree care companies, the Tree Work Permit Application, and development fees (Zoning Ordinance 60.170).	City assesses the actual costs of managing permits, reviews and inspections and applies an applicable fee. Updates to City ordinances may be required.	Additional fees may be directly applied to urban forest management.	Increasing the fees may require election ballots and/or updates to City ordinances (Zoning Ordinance 60.170).
General Fund	City's primary funding pool for wide range of municipal services.	Annual budget via City's legislative process.	History of funding for tree planting and establishment.	Not a guaranteed source or amount of funding; funds at risk if budget shortfalls arise.
Carbon Offsets	A cap-and-trade program in Rochester would create a cap on greenhouse gas emissions trading options.	MN Climate Action continues advocate for a state Carbon Investment Fund program. The City should be involved in designing project (i.e. tree planting) requirements and tracking.	Cap and trade systems like California's can provide economic incentive to drive more "natural climate solutions." An example in MN is the Blandin Paper Company's large-scale carbon offset program.	A large quantity of trees must be planted to qualify as a carbon offset and the trees must be properly managed to ensure long-term survival and carbon storage.
Parking Benefit District (PBD)	Revenue from parking meters for range of right-of-way improvements and maintenance.	Enacted via local ordinance specifying boundaries, rates, use of funds; City administers with input from advisory committee.	No ballot approval required; visitors bear burden over residents; revenue can be expended beyond district boundaries.	Adjustments will need to be made based to the agency overseeing excess meter revenue; typically funds more than trees.

APPENDIX E. GUIDANCE FOR A STREET TREE MASTER PLAN

(UFMP Action AP.08)

Tree planting is critical to the health and longevity of Rochester's urban forest. However, tree planting should be methodically planned with a specific purpose in mind. One of the best ways to do this is to define and adopt an official planting strategy to be included in a Street Tree Master Plan, aligned with the Urban Forest Master Plan. The first step in developing a planting strategy is to define the goals. Often times, this goal aligns with a citywide tree canopy cover goal and the timeframe to achieve it. A planting strategy is crucial to urban forest sustainability and should be based on data, available resources, partnerships, and community input. Some of the more common goals that define a planting strategy include:

- **Equitable Distribution.** With this goal, priority of planting is given to areas determined to be the most in need based on the goal of an even distribution of benefits trees provide to all residents. Beyond equal distribution, an area "in-need" is determined locally and can be a combination of priorities or focused on one specific priority.

- **Areas of Predicted Future Canopy Loss.** Older neighborhoods with a more established tree canopy can anticipate significant losses in future years. One method to planning future planting efforts is to target these replanting areas now to aid in a less drastic succession of trees over time.

- **Benefits-Based Plantings.** Areas that have a specific issue like poor air or water quality, or a large percentage of older residents sensitive to heat stress, may work to plant trees based on the anticipated benefits in years to come.

- **Regular, Methodical Planting in Concert with Cyclical Tree Care Efforts.** Planting may be most effective if it follows the City's inventory, and pruning and removal cycle of care. Regular methodical planting can also be considered a worthy goal.

- **Species Diversity.** Planting strategies should not only identify where to plant but also what is being planted. Species diversity in Rochester is currently an issue, with a high level of maple (*Acer*) species. A policy on this issue should be included in the strategy.

- **Partners in Planting.** Rochester's planting strategy should also include who is doing the planting. This work can be done by City partners, neighborhood groups, developers, and other interested parties, thus allowing the City to focus on specialized care (pruning, removals, assessments).

Suggested policies on planting are provided in Rochester's Urban Forest Master Plan and emphasize that every tree the City removes must be replaced, and to ensure that annual inventory work includes cataloging future planting sites, and expediting tree planting work as planting funds become available. Further analysis of the 2020 Urban Tree Canopy Assessment is also recommended to analyze the impact of development. Results of that analysis will further define an effective planting program.

Larger trees provide more services to the community. They intercept more stormwater, remove more air pollution, provide more energy savings, and sequester more carbon. However, it is important to understand that this increase in services is exponential. For this reason, preservation of large trees should be a higher priority for communities than planting alone.

Rochester's vision for the urban forest should be to maintain and enhance the services trees provide to residents. Therefore, prioritizing care for existing trees (over planting new trees) is critical for a healthy community.

APPENDIX F. TREES AND HARDSCAPE CONFLICTS SOLUTION WORKBOOK

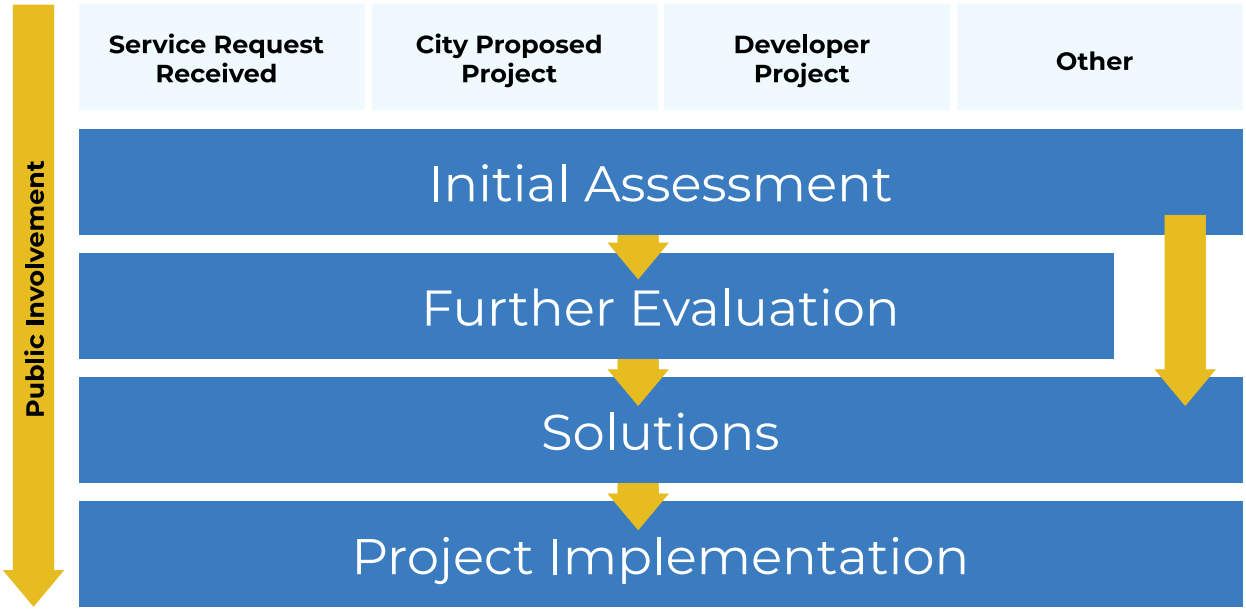
(UFMP Action AP.08)

Decision Matrix

The development of Rochester's Urban Forest Master Plan identified the need to clarify the decision process to address tree and sidewalk or construction conflicts. A clear decision matrix can help to reduce inter- and inner-department uncertainty and establish or adhere to consistency and fairness. The City's departments have standard operating procedures and checklists for evaluating conflicts at a project site, but these traditionally have not been available to the public. To make the decision process around the retention or removal of trees more transparent and consistent, a clarified process, decision matrix, and solution toolkit should be developed to highlight the key decision points.

Proposed Decision Matrix for Tree and Construction/Sidewalk Conflicts

Figure 15. Proposed decision matrix for tree and construction conflicts



Initial Assessment

The following applies to tree removal requests and proposed projects.

The initial assessment of trees, sidewalks (or other infrastructure), and site at the service request location or project location provides consistency and predictability by collecting the appropriate information. It is recommended to have Parks and Forestry involved in the initial assessment process and/or a City staff member with an International Society of Arboriculture Certified Arborist accreditation.

- Tree Preservation Potential. What is the tree quality or health, and is it worth preserving? Is the tree part of the City's Significant Tree Program (if applicable)?
- Tree Mitigation Exploration. If the request to remove the tree is a result of infrastructure damage and the tree exhibits poor health or vigor, can the tree's health or vigor be mitigated by any means other than removal?
- Public Safety Risk. Is the tree a potential hazard that cannot be mitigated by any means other than removal? This includes any tree or tree part that poses a high risk of damage to persons or property located in public places. Use the International Society of Arboriculture's tree risk evaluation standards.

- Initial Assessment Timing. It is recommended that the initial assessment be conducted within 3-4 weeks of receiving a service request for removal. If the assessment is required due to a proposed project, the assessment should occur no later than 30% design or equivalent of design effort (e.g., during the Environmental Assessment period).

- Tracking. Consider tracking service requests in the City's Elements software or similar program.

For an example Initial Assessment Checklist, see the Example Initial Assessment Checklist further below.

Initial Tree Decision

If the tree removal request was made due to the condition of the tree or other reason not relating to the damage or impediment of infrastructure such as sidewalk, the City Forester or representative may conduct the initial tree decision. If infrastructure is part of the assessment and/or the tree removal request was initiated for a proposed project, the City Engineer or appropriate staff should also be part of the initial tree decision. The appropriate staff will visit the tree and/or proposed project location and assess the tree (and sidewalk, if applicable) conditions. The following actions will result from the assessment:

- Remove Tree. The tree removal request was made not as a result of the tree impacting or damaging infrastructure and the tree is identified as unhealthy or unsafe with no remediation possible.

  - Remove the tree and consider the "no net loss" policy of replacing the tree. Some cities implement a 2:1 replacement to removal ratio. The replacement policy should be based on City Code, the Zoning Ordinance, and the Land Development Manual. Replacement of trees can occur on site, same street, or City-approved location. A fee in-lieu should also be considered as an option as described in City Code.

  - Removal of the tree should be prioritized based on other work orders, the risk assessment of the tree, and other factors.

  - The service request, decision, work order, tree information, and tree removal information should be tracked in the City's Elements software or similar program.

- Retain Tree. Based on the assessment, the tree is not in decline or the issues can be remediated. Alternatively, if the tree in question is part of a Significant or Heritage Tree Program, the tree may be preserved depending on the tree condition and presence of hazards or risks as described in the City policies and manuals.

  - Document the decision, inform the property owner or project developer.

  - Conduct the remediation activity to the tree if needed.

  - Prioritize and track this information in Elements or similar program.

  - Conduct follow-ups with the property owner and monitor the tree if necessary.

- Remove Tree and Replace Sidewalk. The service request or proposed project identifies a tree that is causing sidewalk conflicts and the tree has been deemed unhealthy and no remediation is possible. The City should reference City Code as to what is defined as unhealthy or hazardous.

  - Remove the tree and consider the "no net loss" policy of replacing the tree. Some cities implement a 2:1 replacement to removal ratio. The requirement to replace the tree will be the City and City Forester's discretion. The replacement policy should be based on City Code, the Zoning Ordinance, and the Land Development Manual. Replacement of trees can occur on site, same street, or City-approved location. A fee in-lieu should also be considered as an option as described in City Code.

- Removal of the tree should be prioritized based on other work orders, the risk assessment of the tree, and other factors.

- The service request, decision, work order, tree information, and tree removal information should be tracked in the City's tree inventory software or similar program.

- Replace the sidewalk using appropriate design standards and materials and consider designing according to standards that will protect any replacement trees and provide ample soil volume and root space for the new or existing trees.

- Retain Tree and Maintain Sidewalk. A tree in question is in conflict with infrastructure and the assessment determined that the tree is to be retained and the infrastructure (i.e., sidewalk) is to be corrected. The sidewalk will be of standard width and a tree pit of standard width (at minimum) can be installed or retained.

  - Coordinate with the adjacent property owner the timing and approach for maintaining the sidewalk. Some cities offer incentives or funding to support sidewalk maintenance when the issue causing the sidewalk damage has been identified to be caused by a City-owned right-of-way tree. Be sure to inform the property owner of alternative sidewalk amendments such as width reduction, alternative materials, among other solutions.

  - If any root pruning is needed to amend the sidewalk, Parks and Forestry and/or a Certified Arborist hired by the property owner or a certified consultant/contractor hired by the City should evaluate to determine the appropriate root pruning, branch pruning, soil amendments, and other maintenance required.

  - Documentation in Elements or similar software as stated before is recommended.

- Evaluate Tree and/or Sidewalk Further. During the initial tree decision, it is not appropriate for extensive explorations of pavement, soils, or tree root systems. There are limitations to the initial assessment and decision. The purpose of the initial assessment is to identify where these future actions are required so that the appropriate schedule and funding can be determined.

  - Documentation in Elements or similar software as stated before is recommended.

Further Evaluation

The team conducting further evaluation may include an arborist, landscape architect, engineer, or other professionals with expertise relevant to the project details and situation. In addition to collecting information about the trees and infrastructure (i.e., sidewalk) the following additional items may be considered:

Level of impact, future risks, cost/benefit, anticipated sidewalk maintenance if the tree is kept, public/environmental benefit, community values, policy guidance, neighborhood context, historic districts, planned construction, funding forecasts.

Solutions

The following best practices and approaches are provided as examples. The City should review and update these as new or improved practices and materials emerge.

- If Tree Removed, Obtain Valuation. If the tree must be removed, the City should provide guidelines to replace the removed tree. Guidelines should be based on City Code, the Zoning Ordinance, and the Land Development Manual. Ideally, the tree would be replaced at the same location if the site is suitable for trees in the first place. If not possible, the City should have a procedure in place for the relocation of replacement trees.

- If Tree is Retained, Determine Management Approach. Since the initial assessment offered the opportunity to closely examine the tree and the site, future management approaches and decisions should be discussed and documented. These include future tree replacement species for when the tree does over mature and decline or conduct corrective actions to provide clearance for pedestrians, vehicles, utilities, and signs.

- Identify Potential Sidewalk Solutions. The Alternative Solutions Toolkit Overview section provides information and resources regarding sidewalk solution options. Information gathered during the initial assessment and subsequent site visits will support the selection of options that should be presented to the property owner, developer, or City staff to ensure goals of sidewalk repair and tree preservation are kept.

- Identify Opportunities to Improve Conditions for New Trees. When trees are planted by the City, the appropriate tree species for the location should be determined and the City should adhere to best practices in site and tree pit preparation to provide enough soil volume to support tree root growth and minimize future pavement damage by roots. If a tree is being planted at or near where the tree removal request was made, an evaluation of why the request was made should be considered. This may include such things as inadequate soil volume, insufficient growing space, tree leaf litter, messy fruit, poor structure, allergies, screening of shade-intolerant garden or landscape vegetation, or a combination of factors.

Project Implementation

Whether the sidewalk repair is occurring at a location where the tree is retained or removed, the sidewalk must adhere to the Americans with Disabilities Act (ADA) requirements and City standards and is the responsibility of the adjacent property owner. Tree repaving projects, curb and gutter repairs, and other Capital Projects should also adhere to this evaluation process. All matters relating to the removal or remediation of the tree will be conducted by the City unless the responsibility of tree maintenance in public rights-of-way changes. Regarding tree maintenance, mitigation, or removal, the City should involve the public by:

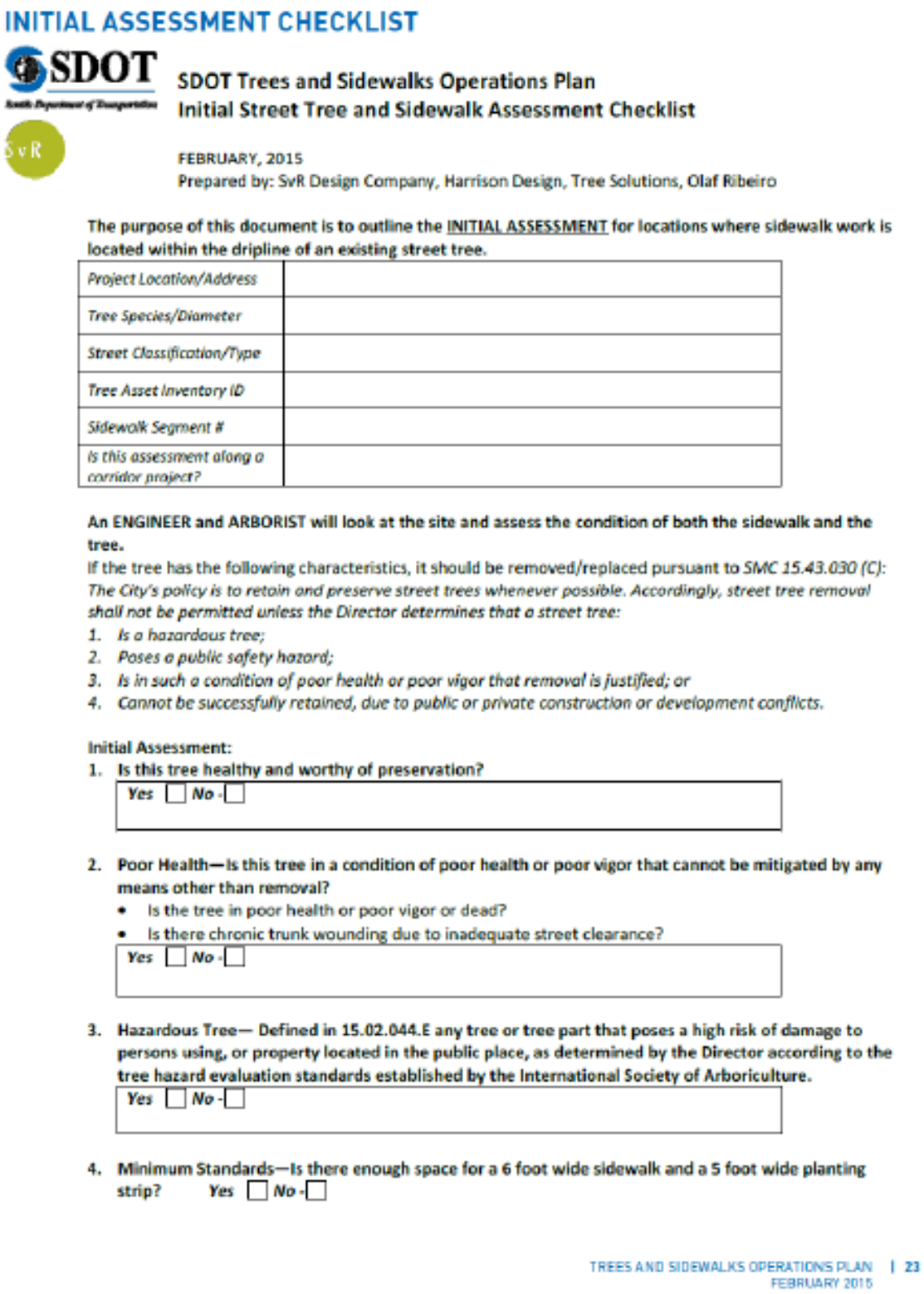
- Providing a public notice prior to the initial tree assessment.

- Share the results of the initial assessment.

- Share the solution decision.

Example Initial Assessment Checklist for Tree Conflicts

This resource can be adapted for the City of Rochester to make decisions regarding tree removals and tree and hardscape (i.e., sidewalks) conflicts.



INITIAL ASSESSMENT CHECKLIST

SDOT

SvR

SDOT Trees and Sidewalks Operations Plan
Initial Street Tree and Sidewalk Assessment Checklist

FEBRUARY, 2015
Prepared by: SvR Design Company, Harrison Design, Tree Solutions, Olaf Ribeiro

The purpose of this document is to outline the INITIAL ASSESSMENT for locations where sidewalk work is located within the dripline of an existing street tree.

Project Location/Address	
Tree Species/Diameter	
Street Classification/Type	
Tree Asset Inventory ID	
Sidewalk Segment #	
Is this assessment along a corridor project?	

An ENGINEER and ARBORIST will look at the site and assess the condition of both the sidewalk and the tree.
If the tree has the following characteristics, it should be removed/replaced pursuant to *SMC 15.43.030 (C): The City's policy is to retain and preserve street trees whenever possible. Accordingly, street tree removal shall not be permitted unless the Director determines that a street tree:*

1. *Is a hazardous tree;*
2. *Poses a public safety hazard;*
3. *Is in such a condition of poor health or poor vigor that removal is justified; or*
4. *Cannot be successfully retained, due to public or private construction or development conflicts.*

Initial Assessment:

1. **Is this tree healthy and worthy of preservation?**
   Yes ☐ *No* ☐
2. **Poor Health—Is this tree in a condition of poor health or poor vigor that cannot be mitigated by any means other than removal?**
   - Is the tree in poor health or poor vigor or dead?
   - Is there chronic trunk wounding due to inadequate street clearance?

   Yes ☐ *No* ☐
3. **Hazardous Tree— Defined in 15.02.044.E any tree or tree part that poses a high risk of damage to persons using, or property located in the public place, as determined by the Director according to the tree hazard evaluation standards established by the International Society of Arboriculture.**
   Yes ☐ *No* ☐
4. **Minimum Standards—Is there enough space for a 6 foot wide sidewalk and a 5 foot wide planting strip?** *Yes* ☐ *No* ☐

TREES AND SIDEWALKS OPERATIONS PLAN | 23
FEBRUARY 2015

Alternative Solutions Toolkit Overview

MATERIAL

PAVING AND OTHER SURFACE MATERIALS

These materials can be used to create a walkable surface or to delineate space for people and/or the tree.

DESIGN

INFRASTRUCTURE-BASED DESIGN SOLUTIONS

These design considerations can be employed to support a tree and/or sidewalk.

ROOT

ROOTZONE-BASED MATERIALS

These tools can support tree health and guide tree growth below ground.

TREE

TREE-BASED SOLUTIONS

These solutions are focused on tree selection and tree maintenance.

Table 31. Description of possible alternative solutions for tree and construction conflicts.

TOOL TYPE	TOOLS	PRO-ACTIVE	RESPON-SIVE	COST	EXPECTED USEFUL LIFE MONTH/YEAR/DECADE/CENTURY
Material	**Paving and Other Surface Materials**				
	Asphalt	**P**	**R**	$-$$$	**M** **Y** **D** C
	Expansion Joints	**P**	**R**	$	**M** **Y** D C
	Pavers	**P**	**R**	$$-$$$	**M** **Y** **D** C
	Pervious Concrete	**P**	**R**	$$$-$$$$	**M** **Y** **D** C
	Reinforced or Thicker Slab	**P**	**R**	$$-$$$	**M** **Y** **D** C
	Rockery / Wall	**P**	R	$$-$$$$	**M** **Y** **D** C
	Beveling	P	**R**	$-$$	**M** **Y** D C
	Porous Asphalt	**P**	**R**	$-$$$	**M** **Y** **D** C
	Shims	P	**R**	$	**M** **Y** D C
	Tree Guards and Tree Rails	**P**	**R**	$$-$$$	**M** **Y** **D** C
	Decomposed Granite	**P**	**R**	$-$$	**M** **Y** D C
	Mudjacking (Concrete Leveling)	P	**R**	$$-$$$$	**M** **Y** **D** C
Design	**Infrastructure-Based Design Solutions**				
	Monolithic Sidewalk	**P**	**R**	$$$	**M** **Y** **D** **C**
	Pavement Thickness	P	**R**	$$$	**M** **Y** **D** C
	Tree Pit Sizing	**P**	**R**	$	**M** **Y** **D** C
	Bridging	P	**R**	$$$$	**M** **Y** **D** C
	Curb Bulbs	**P**	**R**	$$$-$$$$	**M** **Y** **D** **C**
	Curb Realignment	**P**	**R**	$$$-$$$$	**M** **Y** **D** **C**
	Curving or Offset Sidewalk	**P**	**R**	$$-$$$	**M** **Y** **D** **C**
	Easement	**P**	**R**	$-$$$	**M** **Y** **D** **C**
	Suspended Pavement Systems	**P**	R	$$$-$$$$	**M** **Y** **D** C
	Lowered Sites	**P**	R	$$$-$$$$	**M** **Y** **D** C
	Soil Volume	**P**	**R**	$-$$$	**M** **Y** **D** **C**

TOOL TYPE	TOOLS	PRO-ACTIVE	RESPON-SIVE	COST	EXPECTED USEFUL LIFE MONTH/YEAR/DECADE/CENTURY
Root	**Rootzone-Based Materials**				
	Mulch	**P**	**R**	$	**M** **Y** D C
	Root Barriers	**P**	**R**	$	**M** **Y** **D** C
	Continuous Trenches	**P**	**R**	$$$	**M** **Y** **D** C
	Foam Underlay	**P**	**R**	$-$$	**M** **Y** D C
	Modified Gravel Layer	**P**	**R**	$	**M** **Y** **D** C
	Root Paths	**P**	R	$-$$	**M** **Y** **D** C
	Soil Modification	**P**	**R**	$-$$	**M** **Y** **D** C
	Steel Plates	P	**R**	$$-$$$	**M** **Y** **D** C
	Structural Soils	**P**	R	$$-$$$	**M** **Y** **D** C
	Subsurface Aeration / Irration	**P**	**R**	$$	**M** **Y** D C
Tree	**Tree-Based Solutions**				
	City Forestry Street Tree List	**P**	R	$	**M** **Y** **D** C
	Corrective Pruning	**P**	**R**	$-$$	**M** **Y** D C
	Root Pruning	P	**R**	$-$$	**M** **Y** D C

*General cost notes:

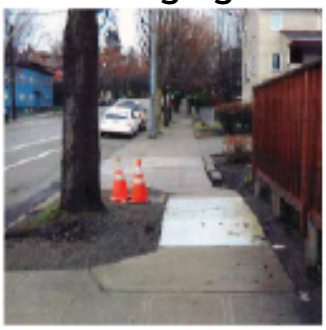
- Sidewalk material costs, when given in linear feet, assume 6-foot sidewalk width
- Costs are planning-level costs and will vary for actual construction
- Costs do not include design, permitting, or other “soft” costs
- Costs not included in tool costs but which would be necessary with use of some solutions include:
  - Drainage structure and connection
  - Curb ramps

Figure 16. Example of alternative solutions for tree and construction conflicts

Decomposed Granite

Mudjacking

Bridging



Bulbouts

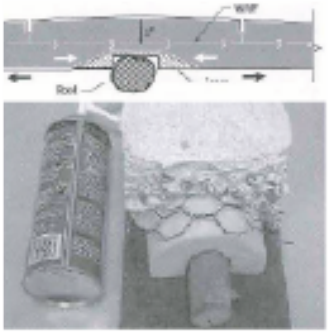
Curb Realignment

Easement

Suspended Pavement

Root Barriers

Foam Underlay



Mod. Gravel Layer

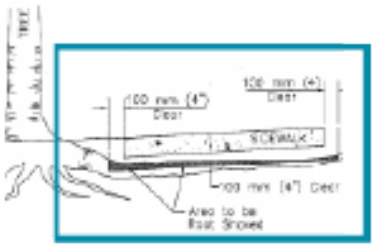
Structural Soils

Root Paths

Corrective Pruning

Root Pruning

Root Shaving

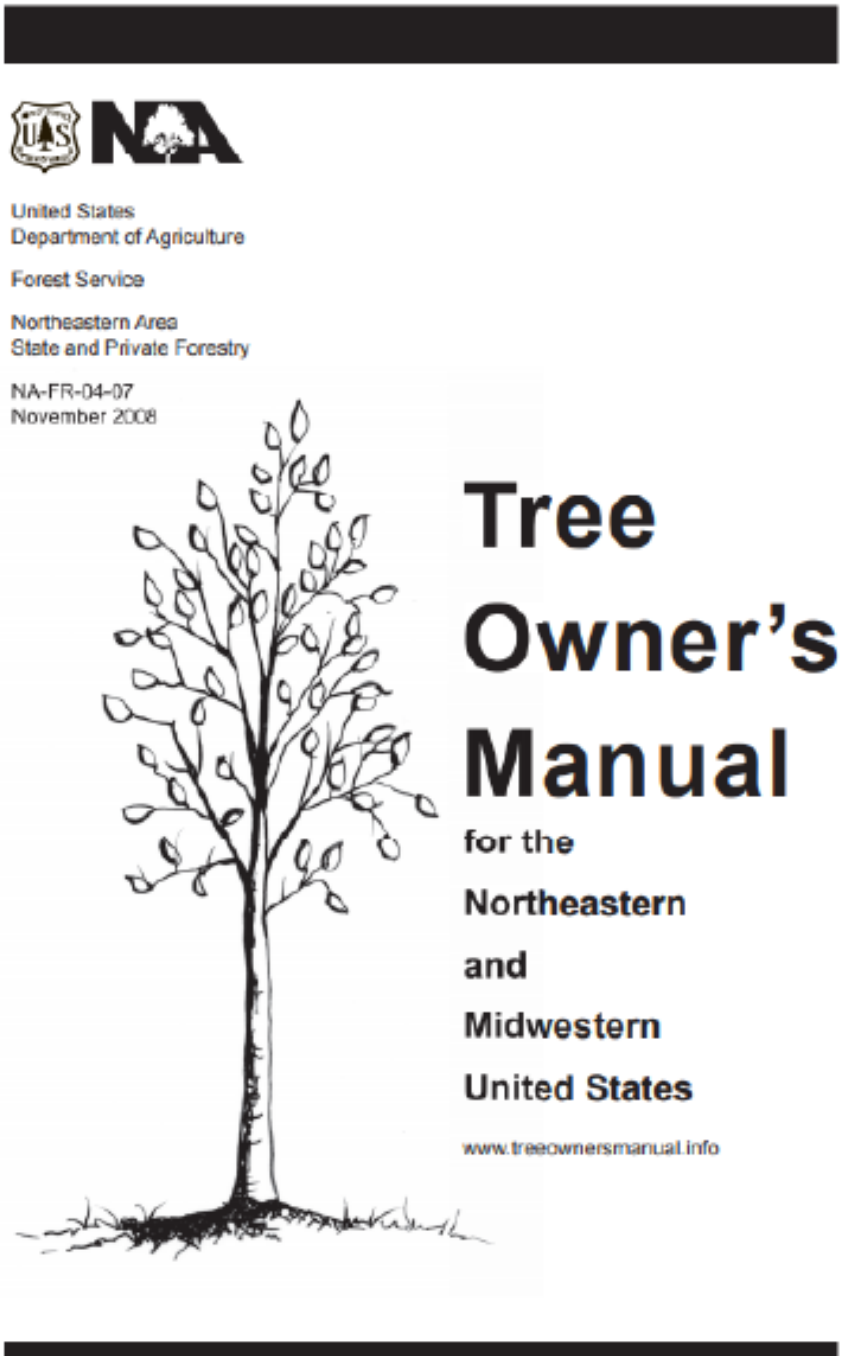


Source of Material Examples & Images:

APPENDIX G. TREE MAINTENANCE MANUAL GUIDANCE

(UFMP Action MP.09)

Incorporate content from the following resource into a Rochester-specific manual for homeowners, tree care companies, and developers. Consider partnering with organizations such as RNeighbors and others to provide resources that benefit the City's urban forest on all lands— both public and private. Include references to City ordinances, policies, and manuals specific to the urban forest.



View resource at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5368392.pdf

APPENDIX H. STAFFING RECOMMENDATIONS

(UFMP Action CT.07, CT.08, CT.09, CT.12)

Overview

The following provides an overview of the existing staffing structure and the recommended structure for the management of the existing public tree population (100,000 trees). It also describes the structure for a future public tree population if the tree canopy goal of 35 percent (84,000 total new trees) is pursued. This assumes that the planting of trees to achieve the canopy goal is a shared effort between the City, its partners, and the community. For this study, a scenario of 60 percent of the canopy goal plantings (50,400 trees) are done by the City.

Table 32. Current and potential tree canopy and respective public tree population counts

Current Tree Canopy %	28%
Current Public Tree Population	100,000 trees
Canopy Goals	35%
Canopy Goal Timeline	14 years
Trees to Plant	84,000 trees
City Contribution to Goal (60% of plantings)	50,400 trees
Total Trees to Plant per Year	6,000 trees per year
City Trees to Plant per Year (60% of plantings)	3,600 trees per year
Total Public Tree Population (new)	150,400 trees

Based on the numbers above, an assessment of the number of trees to prune currently and the estimated number upon achieving the canopy goal can be calculated to determine the staffing demands. Currently, the City is operating on a 21-year pruning rotation, pruning approximately 4,700 trees per year with an arborist crew of 7 staff.

Tree Maintenance Regimen and Staffing Structures for Existing Trees

The following table provides a summary of the current maintenance structure along with the recommended structure and pruning rotation for the current public tree population (~100,000 trees).

Table 33. Current and recommended tree maintenance regimen for 100,000 public trees

Annual Public Trees Pruned (2019)	4,665 trees
Total Public Trees	100,000 trees
Current Tree Staff (FTE)	9 (7 arborists)
Current Rotation	21 years
Trees to Prun per Year for 7-Year Rotation (100k trees)	14,000
Recommended Trees to Prune per Crew per Year	4,000
Total # of Crews Required	3.50
Total # of New Crews	1
Total # of New Staff	3.50

To prune the 100,000 public tree population on a 7-year rotation, an average of 14,000 trees would need to be pruned annually. It is recommended that an arborist crew of 3 staff prune approximately 4,000 trees per year (there are 4,000 trees on average per FMU). This would require 3.5 arborist crews (3 staff per crew) to prune the necessary 14,000 trees each year. Given the City currently has 7 arborists on staff, a total of 3.5 new staff would be required.

Estimated Costs of Recommended Staffing Structure for Existing Trees

Using this evaluation, the estimated cost for additional staff to achieve the 7-year pruning rotation of approximately 100,000 public trees is determined and summarized in the table below.

*Table 34. Estimated staff and associated costs to maintain 100,000 public trees on a 7-year rotation**

RECOMMENDED STAFF	HOURS PER STAFF	COST PER HOUR PER FTE	# OF NEW STAFF	TOTAL COST	ESTIMATED COST PER STAFF
A) Crew Supervisor	2,088	$45.98	1.00	$96,006	$96,006
B) Arborist	2,088	$40.23	3.00	$252,001	$84,000
C) Seasonal	1,044	$24.71	0.50	$25,797	$25,797
Subtotal	--	--	*4.50*	*$373,804*	*$205,804*
EQUIPMENT	**HOURS**	**COST/UNIT**	**# OF UNITS**	**TOTAL COST**	**ANNUAL COST**
F450 Pickup	1	$57,000	1	$57,000	--
1 F450 Pickup hours	1,000	$16.94	1,000	--	$16,940
Chipper	1	$25,000	1	$25,000	--
Chipper hours	1,000	$16.94	1,000	--	$16,940
Bucket/Chip Truck	1	$200,000	1	$200,000	--
Bucket/Chip Truck Hours	1,000	$16.94	1,000	--	$16,940
Subtotal	--	--	--	*$282,000*	*$50,820*
GEAR	**HOURS**	**COST/UNIT**	**# OF UNITS**	**TOTAL COST**	**ANNUAL COST**
PPE	1	$200	3.5	$700	$175
Uniforms	1	$250	3.5	$875	$219
Chainsaw	1	$800	2	$1,600	$400
Rake	1	$25	2	$50	$13
Shovel	1	$25	2	$50	$13
Brush Bucket	1	$40	2	$80	$20
Cart	1	$50	2	$100	$25
Other (e.g. blower)	1	$500	2	$1,000	$250
Subtotal	--	--	*19*	*$4,455*	*$1,114*
TOTAL COST				**$660,259**	
ANNUAL COST					**$425,738**

**Costs are Estimated*

Based on the table above, a total of 3 new arborists and 1 seasonal (part-time) staff supervised by a new Crew Supervisor would cost approximately $374,000 including salary and fringe benefits (based on industry estimates). To support a new arborist crew, tree maintenance heavy equipment, light equipment, and personal protective equipment (PPE) would be necessary. Based on industry estimates, heavy equipment costs amount to $282,000 and light equipment amounts to $4,500. All combined, a new maintenance regiment to prune 100,000 public trees on a 7-year rotation would cost an additional $660,000 with an annual estimated cost of $426,000.

Tree Maintenance Regimen and Staffing Structures for Future Trees

These estimates can be extrapolated to determine the necessary staff and budgets required to maintain the public tree population that grows as a result of successful completion of the Citywide tree canopy goal. The Urban Forest Master Plan recommends a canopy goal of 35 percent, requiring an estimated 84,000 trees. In this study, it is assumed the City would plant 60 percent of these trees or 50,400 total trees in a 14-year period ("35% by 2035"). The following table provides a summary of the new public tree population and the staff required to maintain it on a 7-year pruning rotation.

Table 35. Recommended tree maintenance regimen for maintaining new public tree population (150k trees)

Current Public Tree Population	100,000 trees
City-led Tree Plantings for Canopy Goal	50,400 total new trees
New Public Tree Population	150,400 trees
Annual Trees for 7-Year Pruning Rotation	21,500 trees per year
Recommended Trees to Prune per Crew per Year	4,000 trees per crew
# of Crews Required	5.5 crews
# of Staff per Crew	3 staff per crew
Total Arborists Needed (FTE)	16 staff
Current City Arborists (2021)	7 staff
New Arborists Needed (FTE)	9 staff
New Crew Supervisors Needed (FTE)	3 staff
(Optional) Seasonal Staff	1 staff
(Optional) Administrative Staff (Service Requests)	1 staff
(Optional) Volunteer Coordinator	1 staff

As the City plants trees to achieve the 35 percent canopy goal and these trees mature, additional maintenance demands will require more arborists to prune the public tree population on a 7-year rotation. If the canopy goal is met and the City plants 60 percent of the trees needed for the goal, a total of 150,400 new public trees would exist in the population. If an arborist crew were to prune 4,000 trees per year and 21,500 trees need to be pruned per year for the 7-year rotation, a total of 5.5 crews are needed. A crew consisting of 3 arborists requires a total arborist staff of 16 employees. As of 2021, the City has 7 arborists. Therefore, a total of 9 new arborists are required, or 3 new arborist crews, and it is recommended that each new arborist crew be managed by a Crew Supervisor. In addition to the tree maintenance staff, it is recommended the City also acquire additional staff (Optional) to support the management of the urban forest and the ongoing efforts to achieve the 35 percent canopy goal. These optional staff include part-time seasonal, admin, and volunteer coordinator staff.

Estimated Costs of Recommended Staffing Structure for Future Trees

The associated costs for the recommended tree maintenance staff and optional support staff to manage the future public tree population (~150,400 trees) are provided below.

*Table 36. Estimated costs for staffing and equipment to manage the growing public tree population**

RECOMMENDED STAFF	HOURS PER STAFF	COST PER HOUR PER FTE	# OF NEW STAFF	TOTAL COST	ESTIMATED COST PER STAFF
A) Crew Supervisor	2,088	$45.98	3	$288,019	$96,006
B) Arborist	2,088	$40.23	9	$756,002	$84,000
C) Seasonal	1,044	(Optional) $24.71	1	$25,797	$25,797
D) Admin (Service Requests)	1,044		1	$25,797	$25,797
E) Volunteer Coordinator	1,044		1	$42,000	$42,000
Subtotal	--	--	*15*	*$1,137,615*	*$273,601*
EQUIPMENT	**HOURS**	**COST/UNIT**	**# OF UNITS**	**TOTAL COST**	**ANNUAL COST**
F450 Pickup	1	$57,000	3	$171,000	--
1 F450 Pickup hours	1,000	$16.94	3,000	--	$50,820
Chipper	1	$25,000	3	$75,000	--
Chipper hours	1,000	$16.94	3,000	--	$50,820
Bucket/Chip Truck	1	$200,000	3	$600,000	--
Bucket/Chip Truck Hours	1,000	$16.94	3,000	--	$50,820
Subtotal	--	--	--	*$846,000*	*$152,460*
GEAR	**HOURS**	**COST/UNIT**	**# OF UNITS**	**TOTAL COST**	**ANNUAL COST**
PPE	1	$200	9	$1,800	$450
Uniforms	1	$250	9	$2,250	$563
Chainsaw	1	$800	6	$4,800	$1,200
Rake	1	$25	6	$150	$38
Shovel	1	$25	6	$150	$38
Brush Bucket	1	$40	6	$240	$60
Cart	1	$50	3	$150	$38
Other (e.g. blower)	1	$500	3	$1,500	$375
Subtotal	--	--	*48*	*$11,040*	*$2,760*
TOTAL TREE MAINTENANCE REGIMEN COST				**$660,259**	
ANNUAL TREE MAINTENANCE REGIMEN COST					**$425,738**
(OPTIONAL) TOTAL SUPPORT STAFF COST				**$93,595**	
(OPTIONAL) ANNUAL SUPPORT STAFF COST					**$93,595**
TOTAL RECOMMENDED STAFF & EQUIPMENT COST				**$1,994,655**	
ANNUAL RECOMMENDED STAFF & EQUIPMENT COST					**$1,292,835**

**Costs are estimated*

Based on this case study, to properly maintain the public tree population as it grows to sustain the Citywide tree canopy goal of 35 percent, additional arborists, supervisors, and equipment is needed. It is estimated that the tree maintenance regimen necessary to manage ~150,000 public trees will have a total initial cost of $1.9 million with an annual cost of $1.2 million. In addition to the tree maintenance regimen, it is recommended the City staff the urban forestry program with part-time support staff such as a seasonal, administrative, and volunteer coordinator staff. Costs for these optional staff amount to $93,600. Combining these costs, the total estimated cost is approximately $2.0 million with an estimated annual cost of $1.3 million.

An Assessment of Contracted Tree Maintenance Costs

Alternative to updating the in-house tree maintenance regimen, the City may consider contracting routine pruning for the current 100,000 public tree population and the 150,000 estimated public tree population once the canopy goal is achieved. The table below provides industry estimates for programmed pruning and the associated costs specific to Rochester.

*Table 37. Estimated costs to contract prune the current and future public tree population**

Activity	Grid Prune
Cost per Tree	$70.35 per tree
Costs for Rochester's 100,000 Public Trees	$7,035,000
7-Year Rotation for 100,000 Public Trees (14,286 Trees per Year)	$1,005,000
Costs for Rochester's 150,400 Public Trees	$10,580,640
7-Year Rotation for 150,400 Public Trees (21,486 Trees per Year)	$1,511,520

**Costs are estimated*

Lastly, for the City's consideration, a comparison of the in-house costs versus contracted tree maintenance costs is summarized in the table below. The costs for the existing 100,000 public tree population and the estimated 150,400 public tree population after achieving the canopy goal are listed.

*Table 38. Comparison of in-house versus contracted tree maintenance for existing and future public trees**

100,000 PUBLIC TREES		150,400 PUBLIC TREES	
In-House (annual)	Contracted (annual)	In-House (annual)	Contracted (annual)
$1,013,738 per year ($425,738 for new staff + ~$588,000 for existing staff)	$1,005,000 per year Cost does not include City administrative contract coordination costs	$1,787,241 per year ($1,199,241 for new staff + ~$588,000 for existing staff)	$1,511,520 per year Cost does not include City administrative contract coordination costs

**Costs are estimated*

The above comparison shows relatively similar costs between in-house and contracted tree maintenance services. Other variables must be considered though. For instance, City staff provide services beyond tree maintenance which adds value. If these services were added to the contracted price, the cost would surpass the amount for in-house tree maintenance. The City should consider this and the following advantages and disadvantages of either scenario.

In-house Crews and Work Production

Advantages

- More flexible for other work assignments.

- Quality can be perfected to meet community standards through training and over time.
- Can respond more quickly to emergencies.
- Workforce is more stable.
- Staff can be more knowledgeable about the community, and can be motivated by pride and residency.
- More control over training and specializations.
- No administrative time is needed to write and oversee contracts.

Disadvantages

- Large investment in equipment and maintenance, for example, a lift truck and chipper can cost $225,000 per crew.
- Workers are paid regardless of work production quantity, efficiency, and quality.
- Difficult to release from employment.
- City department is responsible for damage caused by crew actions.
- City department is responsible for on-the-job injuries and workman's compensation.

Contractual Crews and Work Production

Advantages

- Funds are paid only for work performed and when completed to specifications and the satisfaction of the city department.
- Labor is available for peak demands and special projects; there is cancellation and no cost when work is not needed or when the weather is poor.
- Contractor provides all required equipment, tools, and supplies; repair, maintenance, and downtime of equipment are not the responsibility of the city department.
- All insurance and workman's compensation is the responsibility of the contractor.
- Contractor provides employee supervision, training, and certifications.
- Liability for damage to public and private property is the responsibility of the contractor.

Disadvantages

- Contractors are bound by the specifications of the contract; their work assignments are not as flexible.
- May not be as quick to respond to emergencies as in-house crews.
- Administrative time is required for contract writing, monitoring, and invoice processing.

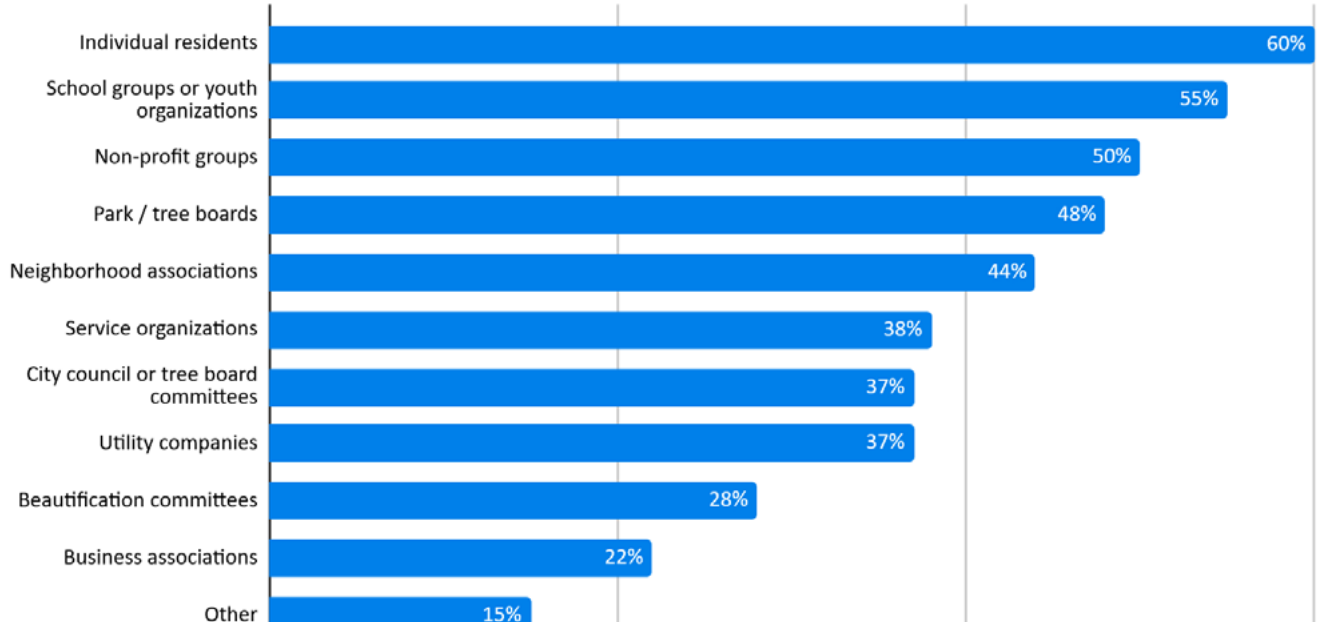
APPENDIX I. COMMUNITY PARTNERS AND OPPORTUNITIES

(UFMP Action CE.10)



To manage a sustainable and thriving urban forest a network of supporting partnerships is necessary. With the diverse land ownership types, the extent of social and environmental pressures, and the wide variety of available funds and other resources, planting and the care of urban forests is extremely challenging. Success is increasingly reliant on different interest groups sharing a common ambition, working together in partnership, and leveraging their respective strengths. Urban forestry needs to be delivered at a strategic scale if it is to provide a full range of environmental, social, and economic benefits to the residents of Rochester. Therefore, there needs to be an effective and integrated working relationship across public, private, voluntary, and community sectors-with contributions of land, skills, and finance from the widest possible range of partners. This section provides an overview of existing and potential partners, initiatives, and programs from which the City can utilize as it strives to achieve the goals of the Urban Forest Master Plan.

Figure 17. Groups that support tree care or management based on a survey of 317 communities (Hauer et al. 2018)



The City of Rochester may evaluate its current partnership network and the groups listed in the figure above to identify areas for improvement. As shown in the figure, a large portion of urban forestry support comes from the individual residents though there are many unique city organizations to also consider. The City should utilize its existing network of partners to strengthen existing partnerships and identify new opportunities. Using the outcomes of the Urban Forest Master Plan and the goals for community engagement within it will provide the Parks and Forestry Division and partners with the tools, data, and information necessary to secure these partnerships. The following table provides an example of the existing and potential partners for the Division to consider for implementing actions in the Urban Forest Master Plan and may also provide technical support and resources relating to the care of trees in Rochester.

Table 39. Example list of existing and potential partners for urban forestry collaboration

EXISTING AND POTENTIAL PARTNERS	
Local	RNeighbors Rochester Public Utilities Destination Medical Center & Mayo Clinic Rochester Area Foundation Audubon Society Boy and Girl Scouts Boys and Girls Club of Rochester Rotary Club of Rochester Rochester Area Chamber of Commerce Rochester Area Builders Association Institutions, Campuses, Health Care, Corporations
State and Regional	Minnesota Department of Natural Resources Minnesota Shade Tree Advisory Committee Minnesota Society of Arboriculture University of Minnesota Extension Service Minnesota Department of Agriculture and University of Minnesota Zumbro Watershed Partnership Olmsted Soil and Water Conservation District Master Gardeners Associations
Federal	Natural Resource Conservation Service U.S. Forest Service Environmental Protection Agency AmeriCorps Project Learning Tree
Industry	The Nature Conservancy National Urban Forestry Advisory Council Sustainable Urban Forests Coalition American Forests Arbor Day Foundation Society of Municipal Arborists International Society of Arboriculture Tree Care Industry Association Tree Nurseries Tree Care Industry

URBAN FOREST

MASTER PLAN

NOVEMBER 2023

HEALTHY TREES, HEALTHY CITY

ROCHESTER PARKS & RECREATION
GO. PLAY. EXPLORE.

PLANIT GEO™
mapping a greener future