



CITY OF HAMMOND

URBAN FORESTRY
MANAGEMENT PLAN

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ACKNOWLEDGMENTS

The City of Hammond is steadfast in its commitment to building a healthier, more equitable, resilient community by investing in thoughtful urban forestry planning, park revitalization, and resident outreach.

Funding for this project is provided by the U.S. Department of Agriculture Forest Service through the Urban and Community Forestry Program, in partnership with Indiana Department of Natural Resources. USDA and Indiana Department of Natural Resources are equal opportunity providers and employers. A broader collaborative team including research educators, student fellows, local government staff and stakeholders, urban forestry consultants, and GIS specialists contributed to this effort by collecting and analyzing baseline land cover (urban tree canopy) data and developing a prioritized planting plan. This partnership reflects an ongoing collaboration between Indiana University and the City of Hammond Parks and Recreation Department.

This project also received philanthropic support from the NiSource Foundation and Columbia Gas via the NIPSCO Environmental Action Grant in 2025.



EXECUTIVE SUMMARY

BENEFITS OF THE URBAN FOREST

Perspectives on trees and green spaces in urban communities have evolved, with urban tree canopy increasingly recognized as an essential component of a city or town's green infrastructure. Trees provide far more than aesthetics and shade; they deliver measurable environmental, economic, and social benefits. These benefits include stormwater management, watershed protection, improved water quality, urban heat island mitigation through temperature moderation and cooling, air pollutant reduction, and energy conservation.

The extent and condition of a community's urban tree canopy directly influences the scale of benefits the community receives. When properly selected, planted, and maintained, trees significantly enhance quality of life for Indiana communities by supporting public health, environmental resilience, and neighborhood livability. Unlike many other forms of community infrastructure, the urban forest is a living asset that—when actively managed and protected—appreciates in value over time, providing increasing returns on investment as trees mature.



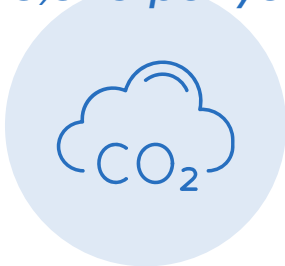
2025 INVENTORY KEY FINDINGS

In 2025, Davey Resource Group, Inc. (DRG) conducted a tree inventory of the City of Hammond's public trees in the 2nd and 3rd Districts. Key findings from the inventory include:

- + The inventoried area includes **4,418 sites**, consisting of **3,948 trees**, **70 stumps**, and **500 potential planting locations**.
- + The appraised value of the inventoried tree population is approximately **\$8.52 million**.
- + Overall, the tree population is rated in **Fair condition (70%)**.
- + The most common species inventoried were **silver maple (15%)**, **red maple (11%)**, **Callery pear (7%)**, and **green ash (5%)**.
- + The population is relatively young, with **38% of trees** having trunk diameters between **0 and 8 inches**.
- + Recommended maintenance includes:
 - » Priority 1–2 pruning for 22% of trees,
 - » Priority 1–3 removals for 5% of trees,
 - » Training pruning for 19% of trees,
 - » Tree planting for 11% of total sites, and
 - » Stump removal for 2% of total sites.
- + Collectively, inventoried trees provide an estimated **\$62,000 annually** in environmental benefits, including:
 - » **Air quality improvement:** 1.449 tons valued at \$39,414 per year;
 - » **Carbon sequestration:** 35.93 tons valued at \$15,549 per year; and
 - » **Stormwater management:** 787,600 gallons valued at \$7,038 per year.

Hammond's Urban Tree Canopy (UTC) assessment shows that trees currently cover approximately **16% of the city** (2,496 acres), an indicator of significant opportunity for improvement. Analysis identifies a **maximum potential canopy of 40%** (6,160 acres), with **24% of the city** (3,664 acres) classified as preferred plantable area suitable for long-term tree establishment. To expand canopy cover, the City of Hammond should **plant at least two trees for every tree removed, or at least 500 trees annually**. These findings highlight an opportunity to expand canopy, preserve existing trees, and enhance environmental, public health, and quality-of-life outcomes through sustained urban forestry investment.

\$15,549 per year



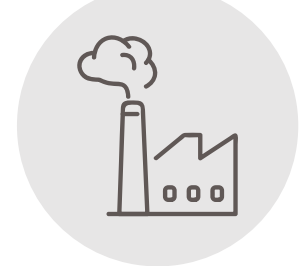
35.93 tons
of carbon
sequestration

\$7,038 per year



787,600 gallons
of stormwater
runoff

\$39,414 per year



1.449 tons
of air pollutants

VISION OF URBAN FORESTRY IN HAMMOND

The vision, goals, and recommendations in this Urban Forestry Management Plan (UFMP) are informed by community input and data gathered by DRG. Hammond residents value their urban green spaces and recognize that sustained investment in public trees is essential to the City's long-term vitality. City of Hammond community members **envision a healthy urban forest as diverse, resilient, and proactively managed, supported by expanded education and collaboration among residents, City departments, and partner organizations.**

RECOMMENDATIONS

Implementation of the recommendations outlined in this UFMP will position the City of Hammond to advance its urban forestry vision and strengthen long-term canopy health.



Short-Term Actions (0-1 Year)

1. Establish a Tree Board
2. Adopt a five-year maintenance plan
3. Continue to inventory public trees citywide
4. Formalize the tree work permit process
5. Grow internal capacity by increasing urban forestry personnel and sponsoring International Society of Arboriculture (ISA) certification



Medium-Term Actions (1-3 Years)

6. Secure additional funding for urban forest management
7. Devise an outreach and engagement strategy
8. Forge community partnerships
9. Establish a community stewardship program
10. Adopt tree preservation policies
11. Update the Arboricultural Specification Manual



Long-Term Actions (3+ Years & Ongoing)

12. Sustain planting new trees to grow canopy cover
13. Shift toward proactive maintenance
14. Assess progress and adapt

Adopt a Budget and Tree Maintenance Schedule

Figures 1 and 2 illustrate a potential five-year budget and maintenance schedule designed to address priority inventory actions and planting goals. In the first scenario, the City of Hammond’s annual urban forestry budget would average \$529,000, which is comparable to the mean and median budgets of peer cities of a similar size. The second scenario is adapted to maximize the City of Hammond’s partnership with the Student Conservation Association (SCA) to reduce labor costs. In the second scenario, the annual urban forestry budget is approximately \$181,000. Any tree maintenance schedule should include regular inspections, proactive pruning, and early intervention to address pests, disease, and structural issues. Detailed budget projections and full five-year budget scenarios and tree maintenance schedules can be found in Appendix A.

FIGURE 1. FIVE-YEAR BUDGET A

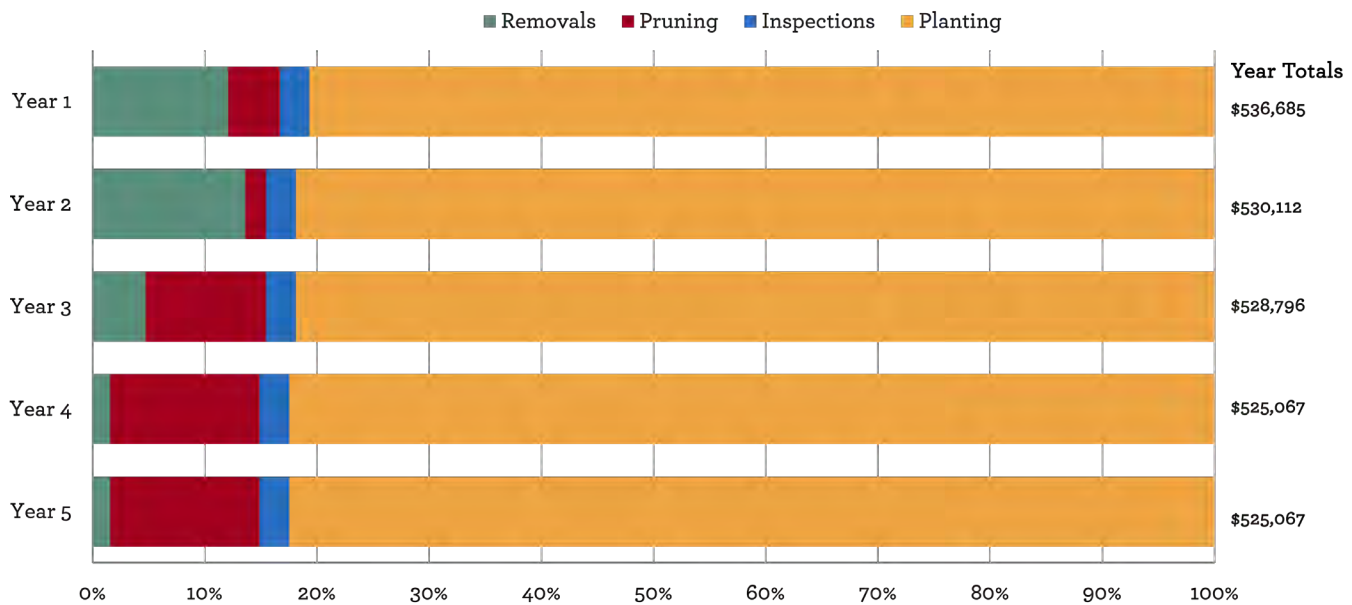
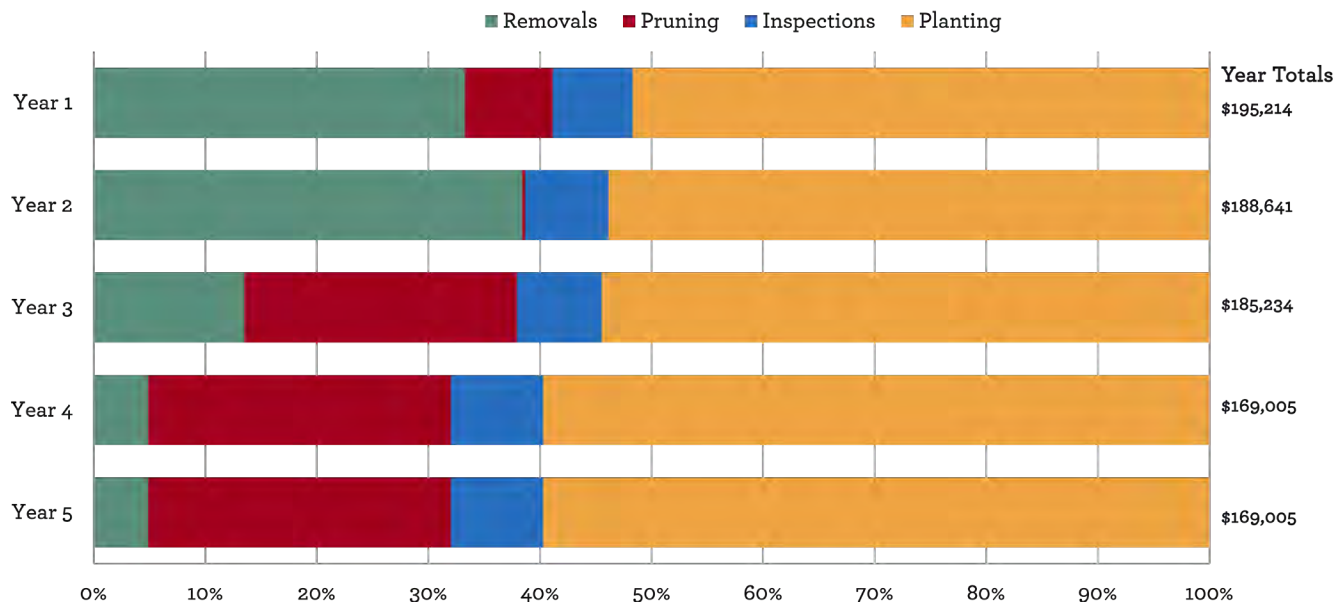


FIGURE 2. FIVE-YEAR BUDGET B





INTRODUCTION AND BACKGROUND

In 2024, the City of Hammond, Indiana and Delta Institute was awarded a grant from the Indiana Department of Natural Resources (IDNR), Division of Forestry, Community & Urban Forestry Program. The grant's purpose is to promote sustainable urban forests by funding tree planting, urban forest analysis, and management activities aimed at increasing climate resilience and protecting and expanding urban tree canopy cover.

The grant has made possible the Hammond Green Canopy Initiative project, which seeks to:

- ✦ Develop a site-specific Urban Forestry Management Plan for the City of Hammond with community involvement;
- ✦ Conduct a tree inventory of public trees in the City of Hammond's 2nd and 3rd Districts;
- ✦ Support tree planting and beautification efforts in Harrison Park; and
- ✦ Engage the community in the planning process

DRG was selected through a competitive request for proposals (RFP) process to conduct the tree inventory, complete tree planting in Harrison Park, and author this UFMP in collaboration with Delta Institute and City of Hammond Parks and Recreation Department.

“A healthy urban forest means preserving the urban forest that we already have, proper maintenance, and educational workshops and activities for all ages.” – Community Member



Both the inventory and planting efforts focused on the City of Hammond's 2nd and 3rd Districts where there is a higher proportion of economically disadvantaged residents and comparatively lower canopy coverage. As part of the inventory, DRG assessed tree health and risk levels to inform priority maintenance recommendations. DRG also identified potential planting locations; however, planting site identification was limited to 500 sites within the inventory area. As a result, the full planting potential within Hammond's street rights-of-way (ROW) is not known in either the 2nd and 3rd Districts or citywide. Comparable communities are 52% stocked on average, suggesting that there may be roughly one available planting space for each existing tree. DRG completed the field inventory work in September 2025, and the inventory dataset and Inventory Summary Report were delivered to the City in November 2025.

Simultaneously, the City of Hammond was selected by Indiana University's Environmental Resilience Institute (ERI) to participate in the Urban Green Infrastructure cohort and host a McKinney Climate Fellow from May to August 2025. The McKinney Climate Fellow prepared a Geographic Information System (GIS) analysis of urban tree canopy land cover across the City and developed data-driven recommendations for tree planting locations that would provide the greatest environmental and community benefits, incorporating both environmental and sociodemographic indicators.

Two community tree planting events were held in the fall of 2025, organized by Delta Institute and with support from ERI, resulting in the installation of 200 trees across Harrison Park, Turner Park, People's Park, Irving Park, and Columbia Park. Approximately

50 volunteers assisted in the tree planting events. DRG is contracted to provide establishment and maintenance care for the newly planted trees for the next one to three years to support long-term survival.

Beginning in August 2025, a Community Working Group (CWG) was convened to shape a shared community vision for urban forestry in the City of Hammond and discuss the creation of this UFMP. The CWG included local business owners, residents, City Council members, the Superintendent of Hammond's Park Department, the McKinney Climate Fellow, employees from SCA, Delta Institute staff, and DRG. This group met periodically throughout the planning process to review findings, discuss priorities, and provide feedback on draft components of the UFMP.



This UFMP summarizes the urban forest analysis results, outlines a five-year tree maintenance plan and program budget for managing the City of Hammond’s public trees, and proposes additional strategic actions, such as expanded community engagement, policy improvements, and sustainable funding mechanisms.

PLANNING ACTIVITIES TIMELINE





HAMMOND'S CLIMATE AND GEOGRAPHY

The City of Hammond is located in Lake County, the northwesternmost county in Indiana. Due to its location on the border with Illinois, Hammond is considered a part of the greater Chicago metropolitan region. The City is home to nearly 78,000 residents, making it the eighth largest city in Indiana.

The City of Hammond encompasses more than 15,000 acres and is bordered by Lake Michigan to the north. The City is intersected by both the Grand Calumet River and the Little Calumet River. Historically, much of Hammond consisted of dune and swale wetlands prior to extensive land grading and drainage undertaken to support urban and industrial

development. Soils in the area are predominantly sandy due to glacial deposits from the last ice age.

Hammond experiences a humid, temperate climate with moderately wet springs and cold winters influenced by lake-effect snowfall from Lake Michigan. Prevailing winds off the lake provide seasonal cooling during summer months; however, widespread deforestation across the Chicago metropolitan region has contributed to elevated urban heat in Hammond. These climatic and geographic conditions play a significant role in shaping the City's urban forest structure, species selection, and long-term management strategies.

HISTORY OF URBAN FORESTRY EFFORTS IN HAMMOND

Tree City USA Status

The City of Hammond has qualified for the Arbor Day Foundation’s Tree City USA status for 15 years, beginning in 1997. After allowing its designation to lapse for several years, the City renewed efforts under the current Parks Superintendent to reestablish and maintain Tree City USA status. According to Arbor Day Foundation reporting, the City of Hammond spent \$2.68 per capita on urban forestry in 2024. This level of investment is slightly higher than that of nearby Merrillville (\$2.09 per capita), but substantially lower than neighboring Tree Cities such as Munster (\$10.52) or Highland (\$15.94).



Policy Framework

DRG reviewed the City of Hammond’s municipal code provisions related to tree protection, as well as the Arboricultural Specifications Manual. Regulations governing public trees are primarily covered in Chapter 105: *Municipal Street Tree Regulations*, which establishes the following framework:

Trees are also briefly mentioned in Chapter 157: *Subdivisions* and Chapter 160: *General Maintenance*. Chapter 157.081 requires trees in new subdivisions to be planted no closer than 40 feet apart, appropriately spaced from utilities, and a minimum of two inches in diameter at the time of planting. Chapter 160.03 requires trees and shrubs to be maintained so as to not obstruct public ROWs.

The City of Hammond’s Municipal Street Tree Regulations are supported by the Arboricultural Specification Manual, which outlines best practices for tree planting and pruning, provides lists of approved and prohibited species, and includes a tree species identification guide. The Arboricultural Specification Manual can be obtained from the Parks and Recreation Department, but an electronic version is not currently available on the City’s website.

1. The Hammond Parks Department, under the direction of the Board of Park Commissioners, oversees and enforces all regulations governing public trees.
2. All public trees are managed according to the City’s Arboricultural Specifications Manual, which establishes standards for planting, maintenance, and removal.
3. A tree care permit is required for planting, removal, excavation near, or disturbance of public trees and tree lawns, with limited exemptions for minor pruning and emergencies.
4. Tree topping is prohibited, and all pruning and removals must follow accepted arboricultural practices.
5. Construction and utility activities near public trees must include protective measures, and excavation within 10 feet of a public tree requires approval.
6. Contractors performing tree work for hire must be registered and permitted by the Parks Department.
7. Violations are subject to fines of up to \$500 per day, corrective action by the City, and potential property liens for recovery of costs.

Staffing and Capacity

The City of Hammond's urban forestry activities are led by the Parks and Recreation Department with support from the Public Works Department, the regional utilities provider Northern Indiana Public Service Company (NIPSCO), and private arborist contractors.

The Parks and Recreation Department has five full-time and two to four part-time seasonal employees responsible for urban forest maintenance under the supervision of the Parks Superintendent. Because urban forestry is only one of the several responsibilities assigned to these staff, the City's ability to proactively manage the urban forest is limited. Due to the limited capacity in both personnel and equipment, City crews focus on lighter arboriculture tasks such as watering, mulching, and ground pruning, while more complex or hazardous work is contracted out. At this time, there is no certified arborist employed by the City of Hammond.

The Parks Superintendent oversees tree care permitting, conducts site visits, and assigns and supervises tree-related work to Parks and Recreation Department staff. The City of Hammond issues annual requests for bids for urban forestry services, with a stated preference for awarding contracts to local businesses. Contractors are provided with lists of priority tree removals and pruning needs.

The Department of Public Works and NIPSCO also conduct tree pruning to maintain proper clearance above streets and utility infrastructure. In addition, community groups and nonprofit organizations such as the Hammond Parks Foundation and the Student Conservation Association (SCA) support Hammond's urban forest through tree planting and beautification projects that supplement city capacity and encourage community involvement.



CURRENT CHALLENGES AND VULNERABILITIES

Urban trees face inherently stressful growing conditions, making them more vulnerable to pests, disease, and environmental stressors. Elevated temperatures associated with urban heat islands exacerbate both biotic and abiotic stress, negatively affecting tree health, growth, and longevity. These challenges are expected to intensify as climate change continues to alter regional conditions.

Climate projections in the Chicago metropolitan area predict an increase in the frequency and intensity of extreme weather events, which may cause direct physical damage to trees. Shifts in temperature and precipitation patterns may also reduce the long-term suitability of some tree species that are currently common in the region. Milder winters, wetter springs, drier summers, and the continued introduction of non-native species have contributed to the spread of pests and diseases within the urban forest. When combined with deferred maintenance, these pressures increase the City of Hammond's emergency response workload following severe weather events.

A substantial portion of the City of Hammond's public trees are currently susceptible to one or more pests or disease. The prevalent threats identified include the eastern tent caterpillar (affecting 57% of street trees and 45% of park trees), Asian longhorn beetle (56% of street trees and 32% of park trees), and the spotted lantern fly (52% of street trees and 47% of park trees). Pest infestations weaken trees, increase maintenance needs, and shorten overall lifespan, contributing to declining canopy health and stability.

The City of Hammond's urban forest has also been shaped by historic pest outbreaks. Like many Midwestern communities, the City experienced substantial canopy loss following the emerald ash borer (EAB) infestation in the early 2000s. EAB caused the death of 99% of ash trees in the US, which cost billions of dollars to remove and replace trees



and led to a significant decrease in canopy cover in areas where ash trees were common. Due to the large scale of EAB's impact, the City of Hammond continues to address a backlog of afflicted ash trees in 2026.

As part of the Chicago metropolitan region, Hammond's urban forest is particularly susceptible to development pressures. Plantable area is already limited, as will be discussed in subsequent sections. When urban populations expand, cities that do not prioritize urban forestry often choose to develop existing greenspaces to accommodate infrastructure and housing needs. Reverting developed land back to greenspace is challenging due to the resulting soil disturbance and compaction. Consequently, preserving existing greenspace and integrating urban forestry expertise into the urban planning process is critical.

The combined effects of urban heat islands, climate change, pest pressure, and development represent ongoing vulnerabilities for Hammond's urban forest. These factors influence species composition, canopy resilience, and long-term sustainability and are important considerations for future management strategies outlined in later sections of this UFMP.



EQUITY AND ENVIRONMENTAL JUSTICE CONSIDERATIONS

American Forests' Tree Equity Score analysis indicates that much of the City of Hammond faces inequitable tree canopy distribution. Tree Equity Scores are calculated using tree canopy coverage, surface temperature, health indicators, and demographic characteristics such as income, age, and race. Using this data, each census block group is scored from 0 to 100, where a score of 0 indicates the highest need for tree investment to address inequity.

Tree Equity Scores in Hammond range from 56 to 97, with a citywide composite score of 75 (Figure 3). American Forests classifies this score as High Priority. Figure 4 illustrates the disparity between the highest and lowest scoring census block groups in Hammond. Nearly all the census block groups within the 2nd and 3rd Districts are rated as High Priority.

FIGURE 3.

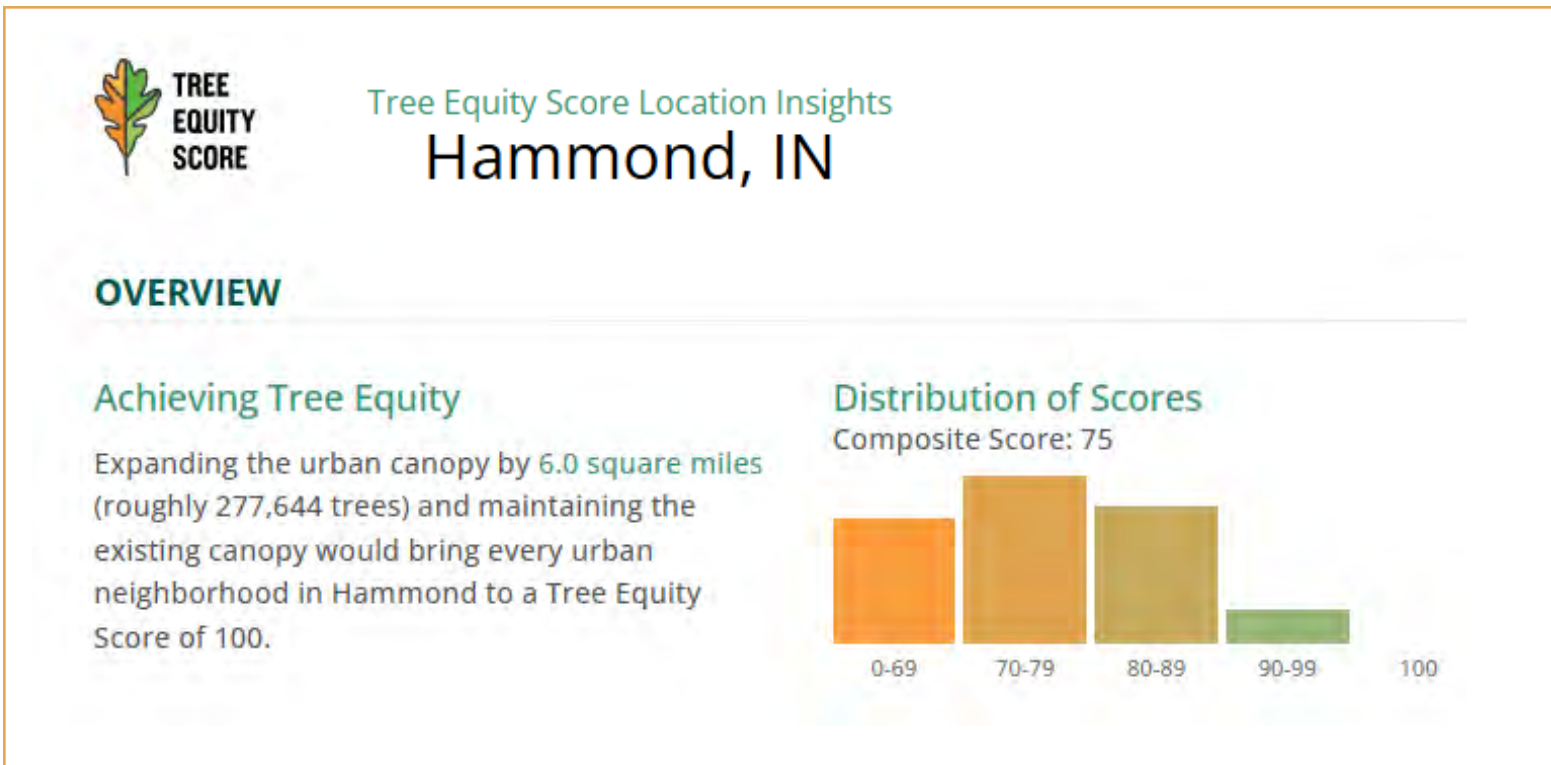


FIGURE 4.

Census Block Group 180890208004

Population 1,066

Hammond, IN

IN Congressional District 1

56

Tree Equity Score

Ranked 72nd of 72 block groups in Hammond

Priority **HIGHEST**

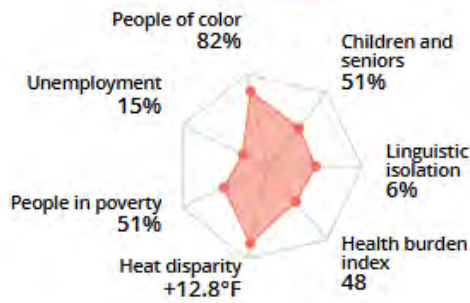
Current Canopy Cover 16%



Canopy Cover Goal: 50%

Score indicators

Priority index



Census Block Group 180890215001

Population 737

Hammond, IN

IN Congressional District 1

97

Tree Equity Score

Ranked 1st of 72 block groups in Hammond

Priority **LOW**

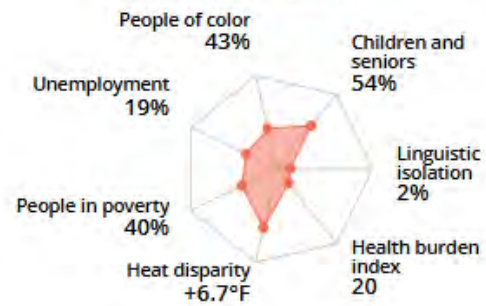
Current Canopy Cover 37%



Canopy Cover Goal: 40%

Score indicators

Priority index



BACK TO MAP



[Change location](#)

Summary

Urban area population	77,897	Children (0-17)	25%
Tree canopy cover	20%	Seniors (65+)	12%
People in poverty	42%	Linguistic isolation	4%
People of color	64%	Average health burden index	32
Unemployment	7%	Neighborhoods below 100	100%

The background features a stylized, dark grey tree canopy with a central vertical axis. Two horizontal gold lines intersect this axis, each with a gold circular dot at the center. The title text is centered between these lines.

**VISION OF URBAN
FORESTRY IN
HAMMOND**

SHARED COMMUNITY AND STAKEHOLDER PERSPECTIVE

Feedback gathered from the Community Working Group (CWG) meetings, survey responses, interviews, and volunteer events demonstrates that Hammond residents are passionate about trees and the benefits they provide to the community. There is strong interest in improving urban forest management, with both residents and City staff identifying gaps in coordination, technical knowledge, and resources as barriers to long-term health of the urban forest. Community members expressed a desire for expanded education opportunities and more consistent collaboration among residents, city departments, and partner organizations.

The community broadly acknowledges that the City of Hammond's urban forest delivers critical economic, environmental, and social benefits, including improved public health, climate resilience, and neighborhood livability. As a result, sustained investment in public trees through proactive planning, protection, and maintenance is viewed as crucial to the City's long-term success.

“I would love to get some of the public schools involved in tree planting. I think that would be very beneficial to their education and give them hands on experience with learning about the importance of green spaces.”
–Community Member



DESIRED FUTURE CONDITIONS

Canopy Goals

While the CWG did not establish a formal citywide canopy goal, there was consensus that the City of Hammond should develop a data-informed target aligned with available resources and implementation capacity.

Community members emphasized the importance of understanding what resources, policies, and partnerships are required to meaningfully increase canopy cover over time. The CWG also supported working toward a long-term canopy goal of approximately 24% through a combination of strategic tree planting, preservation of existing trees, and improved regulations to protect tree canopy during development.

Community feedback also strongly emphasized the importance of preserving existing greenspace, including natural areas and wooded parcels, as a critical component of Hammond’s environmental identity and long-term resilience. Participants noted that maintaining and protecting existing canopy is as important as new planting in achieving canopy goals and sustaining environmental and community benefits over time.

Forest Health

A healthy urban forest in the City of Hammond is envisioned as diverse, resilient, and proactively managed. Community members emphasized shifting from reactive tree care to planned maintenance, regular inspections, and early intervention for pests, disease, and structural issues. Improving species and age diversity, reducing reliance on high-risk or short-lived species, and prioritizing long-term survivability were identified as key strategies. Forest health is also closely tied to soil quality, adequate growing space, and protection from construction-related damage, all of which require coordinated planning and enforcement.

Community feedback also highlighted the value of dedicated forestry expertise, such as establishing a City Forester position or investing in ongoing forestry training for staff, to strengthen technical knowledge, improve decision-making, and support long-term program sustainability.



Community Priorities and Preferences

Among 44 survey respondents, approximately 36% identified preserving natural greenspaces as the City of Hammond's top priority over the next 10-20 years, followed by 15% who prioritized increasing overall tree canopy. When asked where trees could have the greatest transformative impact, vacant lots were selected slightly more often than other locations such as parks, business districts, schoolyards, industrial edges, streets, and existing woods. When imagining a healthier urban forest in Hammond, residents indicated that such a future would be characterized by large, mature trees, a community knowledgeable about arboriculture, and active community involvement in urban forest management.

Community members also emphasized the importance of ensuring that a new Tree Board elevates resident voices and reflects neighborhood perspectives. Leveraging best practices from neighboring communities with established Tree Boards was identified as a potential approach to inform board structure, clarify roles, and strengthen long-term effectiveness and public trust.



OPPORTUNITIES FOR ENHANCEMENT

Internal Capacity

Community feedback consistently emphasized the need for stronger technical expertise and long-term program stability to support urban forestry goals. Expanding internal capacity through additional staffing, professional training, and modern equipment would enable the City to move from reactive tree care toward proactive management. Actions such as establishing a City Forester position or investing in ongoing forestry training for staff would strengthen institutional knowledge, improve consistency in decision-making, and support implementation of canopy goals, tree protection standards, and routine maintenance programs. Increased internal capacity would also enhance coordination between departments, reducing long-term costs and risk while improving overall forest health.

Stakeholder Participation and Transparent Decision-Making

Establishing a functional and visible Tree Board could improve transparency, accountability, and public trust. A Tree Board can provide technical guidance and serve as a forum for public input and policy recommendations, while helping align community values with City decision-making.

Community members emphasized the importance of ensuring the Tree Board elevates resident voices and reflects neighborhood perspectives. Leveraging best practices from neighboring communities with established Tree Boards may help guide structure, roles, and long-term effectiveness.

Education and Accessible Resources

Residents identified knowledge and engagement as key components of a healthier urban forest. Expanding education and outreach through workshops, volunteer programs, community events, social media, and accessible online resources can increase public understanding of tree care, tree protection requirements, and the benefits of preserving existing canopy. Informed residents are more likely to support planting initiatives, advocate for the protection of mature trees and greenspaces, and actively participate in stewardship efforts on both public and private property.

Tree Protection Policy

Preserving existing canopy was consistently identified as a top community priority. Adopting or strengthening tree protection standards within planning and development ordinances provides a direct mechanism to address this concern. Clear, enforceable regulations can reduce avoidable tree loss, protect public investment in existing trees, and provide consistency for project applicants. Integrating tree protection requirements into development review processes also aligns regulatory actions with long-term canopy goals and forest health objectives.

Canopy and Forest Health Objectives

Community input supports a holistic approach to urban forestry that balances canopy expansion with preservation and long-term forest health. City objectives should prioritize protecting existing canopy while improving tree longevity through proactive maintenance, regular inspections, and early intervention. Strategically directing planting efforts to underserved and priority areas, increasing species and age diversity, and embedding tree protection into capital projects and redevelopment decisions provide actionable pathways toward a more resilient, equitable, and well-managed urban forest. Together, these actions translate community values into an implementation framework that supports environmental sustainability and community well-being over time.



The background features a dark grey, stylized fan or wheel shape with multiple segments radiating from the center. Two horizontal gold lines are positioned above and below the text, each with a small gold circle in the center.

COMMUNITY ENGAGEMENT

As part of the development of the City of Hammond’s UFMP, public input was solicited to ensure that community values, concerns, and priorities were reflected in the plan’s recommendations. Public engagement activities included in-person meetings with a CWG, a virtual focus group presentation, an online comment form, direct email correspondence, casual conversations during community tree planting events, and interviews with key local forestry partners. Outreach activities took place between August and December of 2025, after the Hammond Green Canopy Initiative project was formally announced to the community during the June 23, 2025 Hammond City Council meeting. The community was invited to share their vision for urban forestry in Hammond before the UFMP was drafted, as well as to provide input on key priorities once the UFMP was initially drafted. All comments received during the feedback period were documented, reviewed, and evaluated. Common themes and priorities identified through public input were incorporated into the UFMP and directly informed its recommendations.



COMMUNITY SURVEY RESULTS

Public comments on a draft UFMP were collected via Google Forms in late 2025. In total, 44 public comments were received: 41 responses through an online survey and three additional written comments submitted via email. The majority of public comments emphasized the importance of protecting existing tree canopy and undeveloped forested areas. Many commenters expressed their desire for the UFMP to address canopy preservation in the context of large-scale infrastructure and land-use decisions.

Respondents consistently highlighted the need for a UFMP that balances tree planting goals with long-term stewardship, tree preservation policy, and transparent decision-making. Commenters expressed appreciation for the data-driven nature of the draft plan while also requesting clearer, actionable steps that the City of Hammond could take to protect existing canopy, strengthen policy, and ensure community involvement.

The results for each survey question are discussed on the following page.

1. What do you believe Hammond’s most important urban forestry priorities should be over the next 10–20 years?
(increasing canopy, improving tree health, reducing hazards, addressing inequities, enhancing public space, other with option to write in)

Respondents stated preserving undeveloped greenspaces should be a top priority for the City of Hammond. While they support increasing tree planting, many expressed concern that even large numbers of new trees would take years to replace the economic and environmental benefits that mature trees provide. As a result, protection of the city’s limited existing green spaces was identified as the top priority, followed by increasing canopy cover and protecting mature trees. (FIGURE 5)

FIGURE 5.

2. What types of places in Hammond would you most like to see transformed by trees or greener infrastructure? Feel free to note specific addresses or locations in “Other”. (streets, parks, schoolyards, business districts, industrial edges, vacant lots, other)

Respondents' selections were relatively evenly distributed across all options, with vacant lots (18.9%) and streets (16.8%) taking slight leads over other locations. Parks received the lowest share of responses at 10.5%.

Specific locations were also mentioned in the survey, during individual interviews, and through conversations with the CWG:

- + 177 Place (800 block)
- + 2nd District walking paths
- + The Biology Department at Purdue Northwest
- + Columbia Park
- + Downtown
- + The Dyer Blvd. parkway
- + Erie Lackawanna Bike Trail between Douglas St. and Fayette St.
- + Grand Avenue
- + Highway interchanges
- + Irving Park
- + State Line Generating Station Brownfield
- + Train station easement
- + Wolf Lake

3. When you imagine a healthier urban forest, what changes do you hope to see most?
(For example: tree species, locations, maintenance, education, community involvement, etc.)

For this open-ended question, DRG identified common themes based on key words and tabulated the number of times each theme was referenced.

<p>22.9% Preservation <i>Protection of mature trees or greenspaces through policy or procurement of property</i></p>	<p>22.9% Habitat restoration <i>Selection of native species, removal of invasive species, supporting wildlife and natural ecosystems, integrating naturalized landscape designs</i></p>	<p>18.6% Community involvement <i>Stakeholder participation in decision making at all levels and volunteering opportunities</i></p>	<p>14.3% Education <i>City events, school programs, printed and online resources</i></p>
<p>10% Improved forestry practices <i>More widespread adherence to forestry BMPs such as proper pruning, and improving diversity of tree species, sizes and ages</i></p>	<p>5.7% Ecosystem services <i>Improved air quality, stormwater management, erosion control, reduced sound pollution, shade and cooling</i></p>	<p>4.3% Increased canopy cover <i>Tree population, planting, canopy cover expansion</i></p>	<p>1.4% Job opportunities <i>Urban forestry careers with the city or job training</i></p>

5. Please share any additional thoughts, suggestions, or concerns. List the specific section or page number in the draft if applicable.

Finally, respondents were given the opportunity to share additional comments about Hammond’s urban forest or the draft UFMP that the survey had not already addressed. Several respondents expressed frustration about feeling excluded from past decisions related to the urban forest and broader city development. Others raised concerns about the potential for decreased property values due to flooding, which they noted may be exacerbated by canopy loss and increased impervious surfaces. Respondents also suggested potential partner organizations that could support urban forestry efforts, which have been included on the next page.

POTENTIAL PARTNERS

The success of the City of Hammond’s urban forest will require the participation of a variety of internal and external stakeholders. The following groups and organizations represent key partners for stewardship that should be included in future decision-making and the implementation of this UFMP.

Internal

Hammond Planning Commission: This advisory body reviews development plans for the City. The Planning Commission could be a valuable partner in integrating urban forest objectives into future land use and development decisions.

Hammond Public Works: This department includes the Streets, Sanitation, and Street Lighting divisions. Public Works already assists with pruning activities and should be consulted on future tree planting to minimize conflicts between trees and infrastructure.

Hammond Environmental Management: This department oversees permitting and complaints related to air and noise pollution. Their expertise could be beneficial in developing goals related to pollution reduction and environmental health.

Hammond Sanitary District: This governing body is responsible for stormwater treatment and management. Their knowledge and coordination would be beneficial in meeting goals related to reduction of stormwater runoff.

Hammond Community Development: This department manages community block grants, school partnerships, downtown development, and park improvements. Their participation could serve as a key resource for grant acquisition and building partnerships with external groups.

Future Tree Board: Establishing a Tree Board for the City of Hammond presents an opportunity to formalize collaboration across departments, agencies, and community partners while elevating resident input in urban forestry decision-making. A Tree Board would serve as an advisory body to support policy development, program coordination, and implementation of the Urban Forestry Management Plan, helping align technical expertise with community priorities.



External

Community and Civic Organizations:

Groups such as the Hammond Rotary Club, Legacy Foundation, Greater Hammond Community Services, Inc, United Way of Northwest Indiana, Inc, neighborhood associations, YMCA of Hammond, and Veterans of Foreign Wars provide local buy-in, meeting spaces, and volunteer recruitment networks.

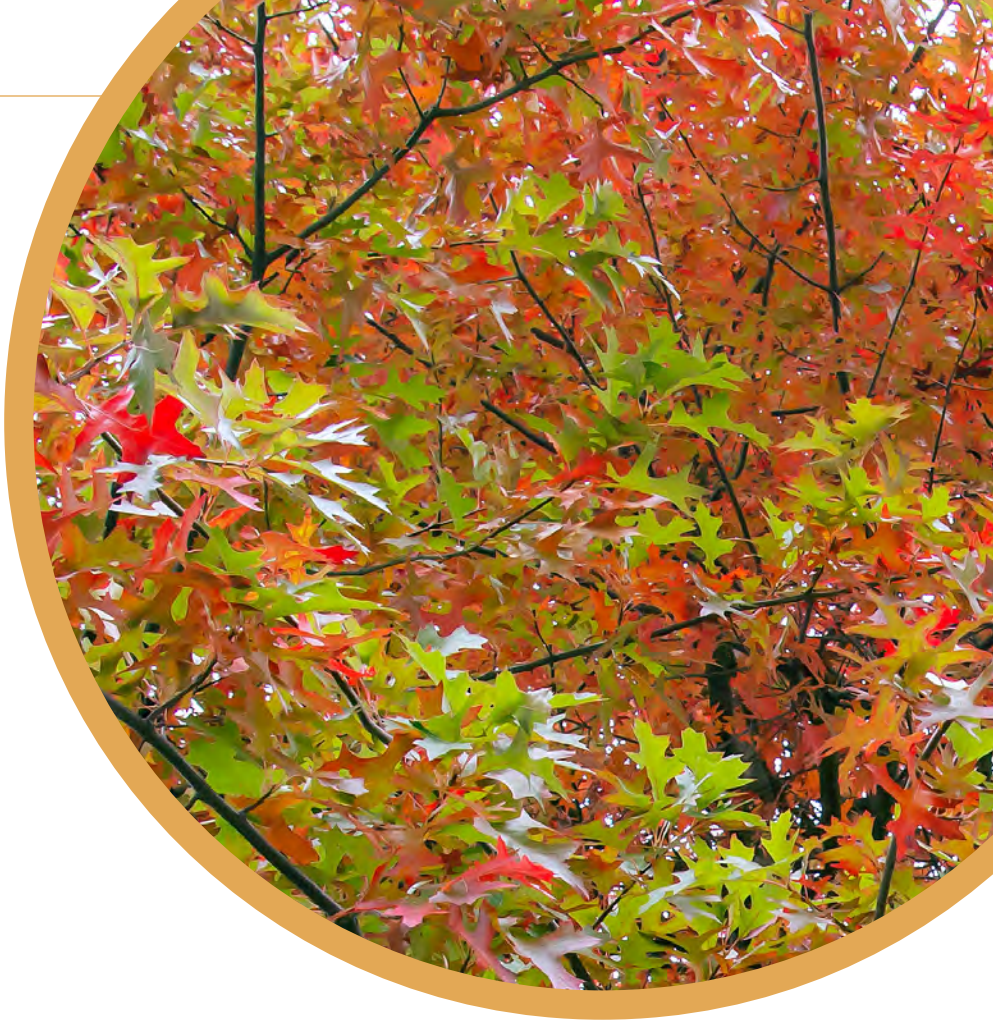
Environmental and Conservation

Partners: Dunes-Calumet Chapter of the Audubon Society, Lake County Cooperative Invasive Species Management Area (CISMA), Lake County Soil and Water Conservation District, Purdue Extension Lake County, Save the Dunes, Shirley Heinze Land Trust, and local Master Gardener groups. These organizations bring technical expertise, environmental credibility, and additional volunteer capacity.

Education and Youth Groups: Bishop Noll Institute, the Boys & Girls Club of Greater Northwest Indiana, Girl Scouts, Hammond Education Foundation, Hammond Urban Enterprise Association, Scouting America, and School City of Hammond. School sports teams, youth leagues, and after school clubs within the Hammond School system should also be considered. These groups are strong candidates for volunteer events, career experience, and stewardship programs, such as tree watering and monitoring in the first two years after planting.

State Agencies: Indiana Department of Environmental Management (IDEM) and Indiana Department of Nature Resources (IDNR) are agencies that oversee habitat restoration statewide. The City of Hammond should maintain their relationship with both IDEM and the DNR for their technical assistance and access to additional funding opportunities.

Businesses and Sponsors: Local unions (USS, Carpenters Local, etc.), regional businesses with corporate sustainability goals, and neighborhood small businesses willing to provide supplies, refreshments, or volunteers.





**TREE RESOURCE
ASSESSMENT**

A comprehensive understanding of the structure, condition, and benefits of the City of Hammond’s urban forest is essential for informed decision-making that supports public health, environmental quality, and long-term resilience. To support the development of the UFMP, the Hammond Green Canopy Initiative project supported an inventory and assessment of the trees, stumps, and planting sites located in the street ROW and parks of Districts 2 and 3. In addition, a citywide UTC assessment was completed to better understand where tree canopy exists and where canopy gaps remain. Partnerships with Delta Institute and ERI strengthened the scope and quality of these assessments.

DRG collected inventory data, assessed tree copy data, and analyzed both datasets to evaluate species composition, age structure, tree condition, canopy cover, and canopy opportunity. The ERI McKinney Climate Fellow further prioritized potential planting areas utilizing the tree canopy data in combination with environmental and community-based factors. Environmental benefits and economic value were quantified using inventory data and tree canopy data. The inventory data was processed through the i-Tree Eco benefits model, developed by the United States Department of



Agriculture Forest Service in partnership with The Davey Tree Expert Company. Environmental benefits and economic value derived from tree canopy data were estimated using the i-Tree Landscape benefit model, also developed by the United States Department of Agriculture Forest Service. This section summarizes findings from both the tree inventory and UTC assessment.

“I hope to see more animal and plant diversity in Hammond, I love my city and it would look so beautiful with more trees and the native plants will thrive with more insects as well!” –Community Member

DISTRICTS 2 AND 3 INVENTORY OVERVIEW

In August and September 2025, DRG arborists conducted a GIS-based tree inventory of trees, stumps, and planting sites along the street ROW of District 2 and District 3, as well as within Harrison Park and Dr. Martin Luther King, Jr. Memorial Park. All tree assessments were conducted by ISA Certified Arborists. A total of 4,418 sites were documented, including 3,948 trees, 70 stumps, and 500 potential planting locations. Additional information about the inventory can be found in Appendix B.

Species Diversity

Species diversity is critical to reducing vulnerability to pests, diseases, and climate stressors. As a benchmark, the 10-20-30 Rule recommends that no single species comprise more than 10% of the population, no single genus more than 20%, and no single family more than 30%.

Within the inventory area:

- + Silver maple (*Acer saccharinum*) represents 15% of the population,
- + Red maple (*Acer rubrum*) represents 11%, and
- + The genus *Acer* (maple) accounts for 35% of all inventoried trees.

These findings indicate an overreliance on maple species and highlight the need for greater species and genus diversity in future planting efforts (Figures 6 and 7).

FIGURE 6

FIGURE 7

Size Class Distribution

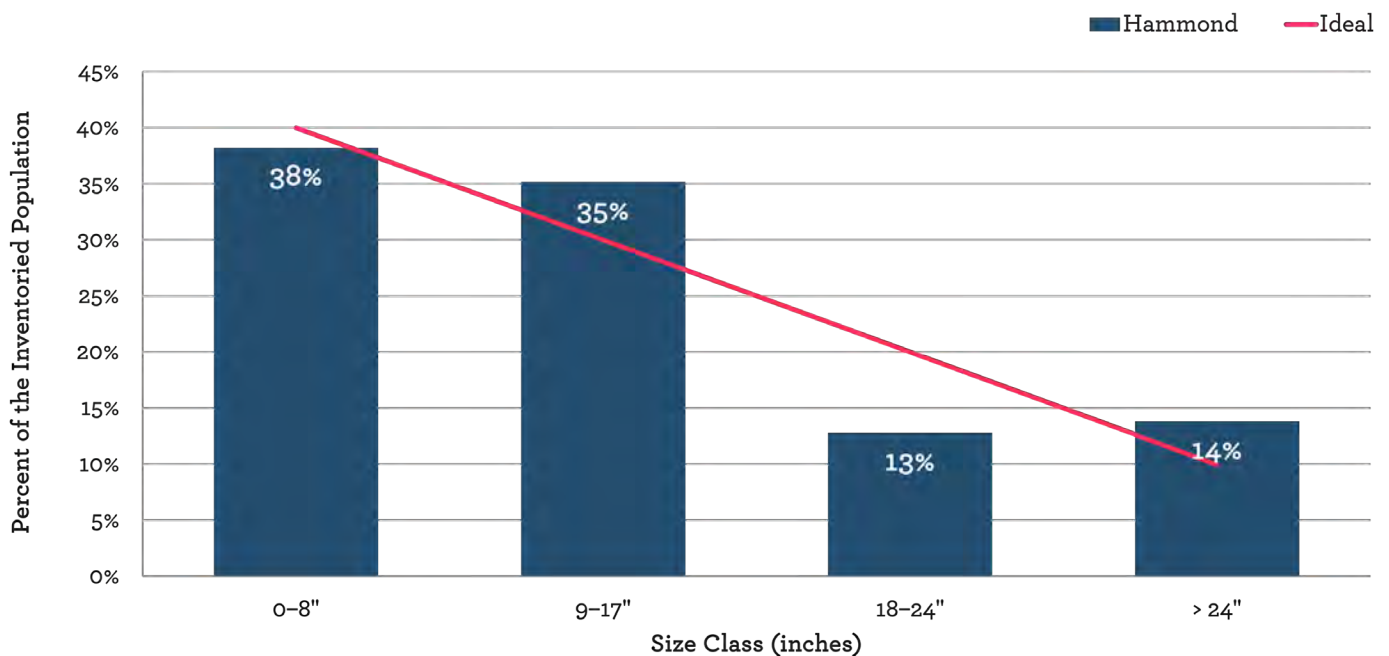
Diameter at standard height (DSH) was used to evaluate age structure and population stability. Trees were categorized as:

- + Young (0–8 inches DSH),
- + Established (9–17 inches DSH),
- + Maturing (18–24 inches DSH), and
- + Mature (>24 inches DSH).

These categories allow comparison to Richards' ideal distribution (1983), developed from observations of well-adapted street trees in Syracuse, New York. According to Richards, an ideal distribution for a healthy urban forest includes a high proportion of young trees (about 40% of the population) and a smaller proportion of large-diameter trees (about 10%), reflecting a stable population that is continuously replenished with new plantings.

Figure 8 compares the City of Hammond's inventoried distribution to this ideal. While the distribution generally trends toward Richards' model, the proportion of maturing trees is approximately 7% below recommended levels. As planting initiatives progress and young trees mature with receiving proper care, this imbalance is expected to gradually correct itself.

FIGURE 8



Condition

Tree condition was evaluated based on multiple factors including root characteristics, branch structure, trunk, canopy and foliage health, and presence of pests. Each inventoried tree was rated as Good, Fair, Poor, or Dead. Most trees were found to be in Fair (70%) or Good (21%) condition (Figure 9).

Overall, the urban forest within the inventoried areas received a Fair condition rating. Condition ratings declined slightly as trees reached maturity (Figure 10), underscoring the importance of proactive maintenance—such as pruning, soil improvement, and preventive inspections—to sustain long-term tree health.

FIGURE 9

FIGURE 10

URBAN TREE CANOPY ASSESSMENT OVERVIEW

Over the past two decades, significant advances have been made in quantifying urban forests. GIS has become increasingly accessible to local governments and community stakeholders, greatly improving urban forest planning and management capabilities. UTC assessments provide especially valuable information for informed, defensible decision-making related to tree planting, canopy preservation, and long-term urban forest management.

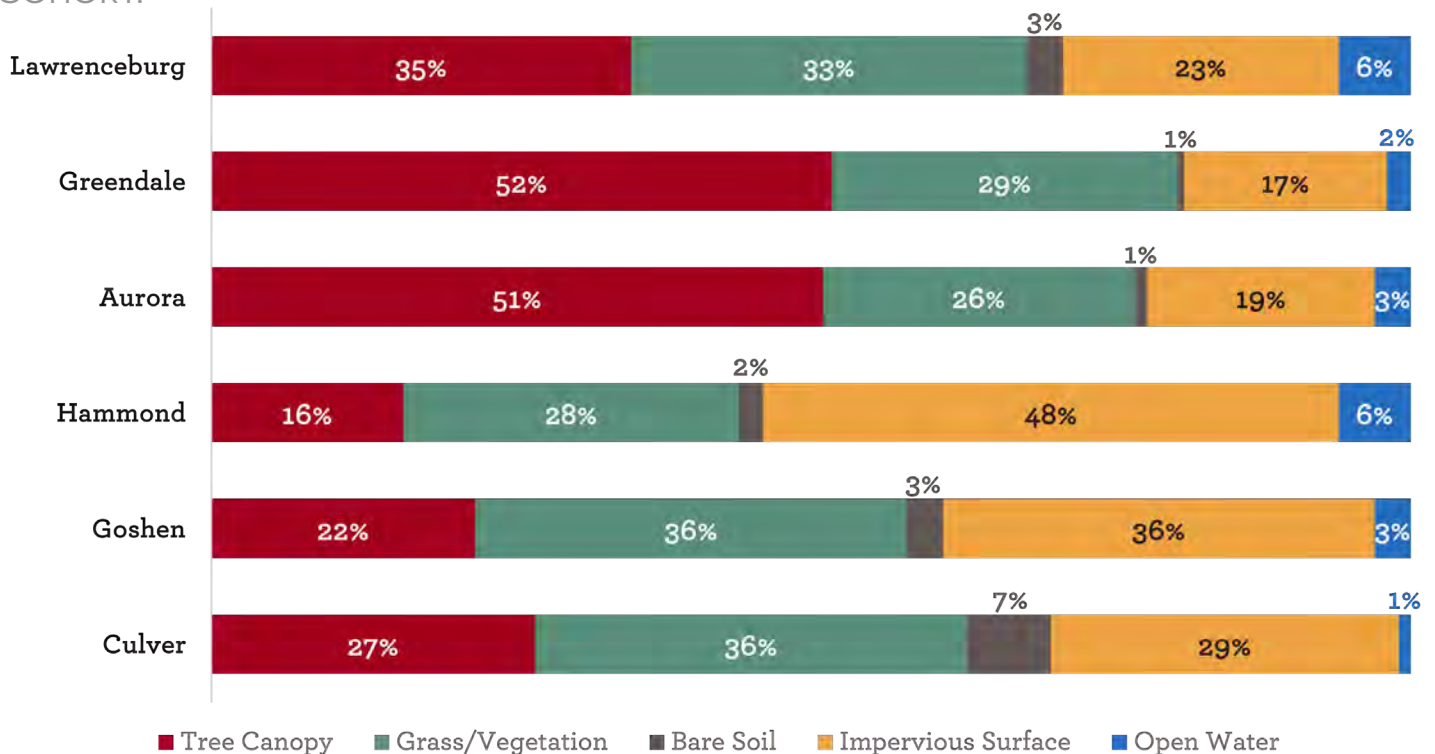
As part of the Urban Green Infrastructure Resilience Cohort, ERI partnered with DRG and a McKinney Climate Fellow to conduct a citywide UTC assessment for the City of Hammond. DRG assessed existing land cover, supported the McKinney Climate Fellow in defining planting potential, and assisted with the analysis of community factors and planting prioritization.

Land Cover

Using 2024 National Agriculture Imagery Program (NAIP) leaf-on imagery, DRG classified land cover across the City of Hammond into five GIS categories: tree canopy, pervious surfaces, impervious surfaces, bare soil, and open water. Figure 12 illustrates the resulting land cover distribution within the City, while Figure 11 compares the City’s land cover with other five municipalities in Indiana participating in the 2025 UGI Resilience Cohort.

Among cohort communities, the City of Hammond exhibits the lowest percentage of tree canopy and the highest proportion of impervious surface, underscoring the importance of targeted canopy expansion and preservation strategies.

FIGURE 11. LAND COVER CLASSIFICATION VARIANCES FOR THE SIX MUNICIPALITIES IN INDIANA PARTICIPATING IN THE 2025 URBAN GREEN INFRASTRUCTURE RESILIENCE COHORT.



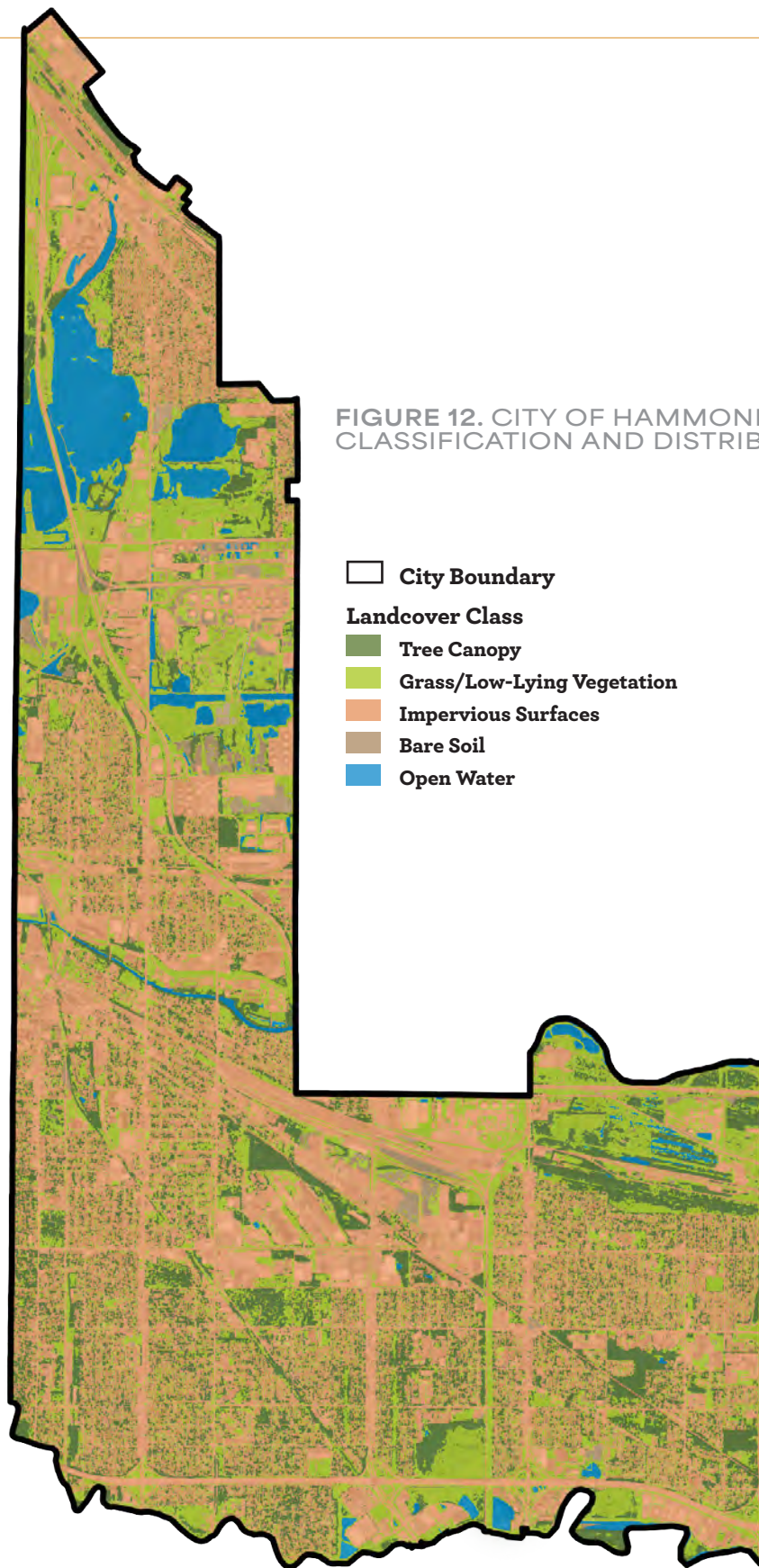






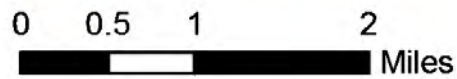


FIGURE 12. CITY OF HAMMOND LAND COVER CLASSIFICATION AND DISTRIBUTION.

-  City Boundary
- Landcover Class**
-  Tree Canopy
-  Grass/Low-Lying Vegetation
-  Impervious Surfaces
-  Bare Soil
-  Open Water



Planting Potential

The municipal boundary of the City of Hammond encompasses approximately 24 square miles (15,282 acres; see Table 1). As of 2024, tree canopy covers approximately 16 percent of the City’s total land area. Analysis indicates a maximum potential tree canopy of 40 percent, of which 24 percent of the land area is classified as preferred plantable area.

Preferred plantable areas represent realistic locations for future tree establishment and were identified through collaboration among DRG, City staff, and the McKinney Climate Fellow. These areas include suitable ROW, parks, vacant lands, and select private parcels, while excluding land uses that are generally impractical for tree planting, such as athletic fields and utility corridors. Achieving the maximum canopy potential is feasible but will require coordinated planning, sustained investment, cross-departmental collaboration, and long-term commitment.



TABLE 1. TREE CANOPY COVER AND PLANTING POTENTIAL IN HAMMOND, INDIANA

LOCAL GOVERNMENT	TOTAL ACRES	TREE CANOPY ACRES	POSSIBLE TREE CANOPY ACRES	PREFERRED PLANTABLE ACRES	MAXIMUM TREE CANOPY ACRES
<i>City of Hammond</i>	15,282	2,496	4,579	3,664	6,160
<i>Percent of Total</i>	100%	16%	30%	24%	40%

Canopy Distribution and Opportunity

Expanding tree canopy requires a comprehensive approach that includes planting, preservation, and ongoing maintenance. Tree planting alone will not achieve canopy goals without maintenance of existing trees and strong preservation policies to address development impacts. A tree canopy assessment is a foundational tool that enables the City to grow, maintain, and protect its urban forest efficiently and strategically for future generations.

Tree canopy and planting potential were analyzed across multiple geographic and land use categories, including public versus private land, zoning classifications, council districts, census tracts, and parcels (Appendix C).

The majority of the City of Hammond’s land is privately owned (10,405 acres), compared to 4,877 acres of public land. Existing tree canopy is slightly higher on private land (17%) than on public land (14%). If all preferred plantable areas are planted, canopy could reach 37% on public land and 42% on private land.

TABLE 2. URBAN TREE CANOPY BY LAND OWNER TYPE (PRIVATE VS. PUBLIC)

LOCAL GOVERNMENT	LAND OWNERSHIP	TOTAL ACRES	TREE CANOPY ACRES PERCENT		PREFERRED PLANTABLE ACRES PERCENT		MAX TREE CANOPY ACRES PERCENT	
			ACRES	PERCENT	ACRES	PERCENT	ACRES	PERCENT
City of Hammond	Public	4,877	701	14%	1,093	22%	1,794	37%
	Private	10,405	1,795	17%	2,572	25%	4,367	42%



Private parcels represent the largest opportunity, containing 2,572 acres of preferred plantable area.

Tree canopy cover also varies widely across the City of Hammond’s council districts, ranging from 10% in District 1 to 25% in District 6. **District 1, the largest district by area, has the lowest existing canopy but represents the greatest absolute opportunity for expansion, with 1,099 acres of preferred plantable area.** Districts 4, 5, and 6 currently support higher canopy coverage, ranging from 21% to 25%, and could achieve a maximum canopy of 46% to 55% if all preferred planting areas are fully utilized.

District 6 not only has the highest existing canopy at 25% but also the highest potential maximum canopy at 55%, reflecting both strong current conditions and substantial available planting area. Across all districts, there is meaningful capacity for canopy growth, with maximum potential coverage ranging from 31% to 55%, highlighting opportunities for preserving high-canopy areas while strategically planting in lower-canopy districts.

TABLE 3. TREE CANOPY COVER BY COUNCIL DISTRICT.

CITY OF HAMMOND COUNCIL DISTRICTS	TOTAL ACRES	CANOPY		PREFERRED PLANTABLE		MAXIMUM TREE CANOPY	
		ACRES	PERCENT	ACRES	PERCENT	ACRES	PERCENT
1	4,467	433	10%	1,099	25%	1,532	34%
2	2,204	274	12%	408	19%	682	31%
3	2,258	337	15%	428	19%	765	34%
4	1,525	364	24%	337	22%	701	46%
5	2,439	500	21%	660	27%	1,160	48%
6	2,389	588	25%	732	31%	1,320	55%

Business and commercial zones have the lowest existing canopy at just 7% and a maximum potential of 23%, highlighting the need for targeted, site-specific strategies to maximize canopy in these areas.

Analysis by zoning reveals distinct opportunities and challenges across the city. Residential areas currently support the highest existing canopy, totaling 1,298 acres, and could reach up to 45 percent coverage if all preferred planting areas are utilized. Manufacturing zones, while exhibiting relatively low canopy at 10%, offer significant planting potential, with over 1,090 acres available that could increase coverage to 35%.

Special zoning areas, including institutional and mixed-use parcels, maintain a moderate canopy of 17% and could expand to 45%.

These findings support a dual strategy: preserve existing canopy in high-canopy residential and special zoning areas while prioritizing new planting and design-based solutions in manufacturing and commercial districts to address gaps and expand the overall urban forest.

TABLE 4. TREE CANOPY BY ZONING

CITY OF HAMMOND ZONING	ACRES	TREE CANOPY		PREFERRED PLANTABLE		MAX TREE CANOPY	
		ACRES	PERCENT	ACRES	PERCENT	ACRES	PERCENT
<i>Residential*</i>	5,793	1,298	22%	1,300	22%	2,598	45%
<i>Manufacturing</i>	4,396	450	10%	1,091	25%	1,541	35%
<i>Special**</i>	3,802	660	17%	1,067	28%	1,727	45%
<i>Business/Commercial***</i>	1,298	87	7%	208	16%	295	23%

**Includes all Residential R and PUD Zones*

***Includes all S1, S2, and S3 Zones*

****Includes Commercial & Oxbow Overlay District*

Prioritized Planting Area

Planting urban trees improves community health by reducing the risks of urban heat island effect, mitigating flooding and stormwater runoff, improving air quality, enhancing biodiversity, and increasing overall well-being. To identify where trees will generate the greatest community benefit, the McKinney Climate Fellow, with DRG’s guidance and City staff input, categorized the preferred planting areas by creating a prioritized planting area analysis.

Several community factors were selected, weighted, indexed by grid, and averaged within polygons across the study area to prioritize planting areas. Factors included existing tree canopy percentage, proximity to hardscape, urban heat island index, floodplain proximity, soil permeability, soil erosion factor (K-factor), slope, population density, minority population, and median household income. Illustrative maps of these variables are provided in Appendix D.



TABLE 5. RESULTS OF COMPOSITE PRIORITIZED PLANTABLE AREA ANALYSIS

	VERY HIGH	HIGH	MODERATE	LOW	VERY LOW	TOTAL ACRES
	ACRES	ACRES	ACRES	ACRES	ACRES	
<i>City of Hammond</i>	283.72	401.75	433.18	550.9	2,418.15	4,088
<i>Percent of Total</i>	7%	10%	11%	13%	59%	100%

Preferred planting areas were classified into five priority categories: Very High, High, Moderate, Low, and Very Low, based on projected community benefit. Figure 13 illustrates the resulting prioritized plantable areas across the City of Hammond, Indiana.

After conducting a land cover and UTC assessment, tree canopy goal setting is the next step. Tree planting strategies are necessary to meet tree canopy goals. This summary supports two easy-to-meet, actionable strategies, including:

1. Tree preservation policy development within geographic areas that have the most existing tree canopy.
2. Tree planting within geographic areas that have the lowest existing tree canopy and/or the largest preferred plantable area.

National trends indicate that urban forests are experiencing canopy loss due to development, natural mortality, invasive pests, disease, and climate stressors. The UGI Cohort government study for the City of Hammond has an existing tree canopy cover of 16% with a maximum potential tree canopy of 40%. The preferred plantable area is equivalent to 3,664 acres. Plantable areas designated as Very High and High priority in the government's prioritized planting plan should be planted first.

Preserving existing canopy while expanding planting efforts is essential. Reaching projected tree canopy potential will require the UGI local governments to preserve all existing tree canopy while expanding the urban forest in designated preferred plantable areas. **Further analyzing, establishing, planning, and setting out to achieve a tree canopy goal from a public and private perspective is the only way local governments will slow the loss of trees and tree canopy. If local governments want to sustain tree canopy, setting goals will help organize tree planting programs and direct tree preservation.** Establishing realistic and achievable tree canopy goals will help capitalize on the economic, environmental, and social benefits trees provide to the community.

Many communities have set tree canopy goals, standards, or policies to guide long-term urban forest management. Each UGI Cohort local government should consider adopting a community wide tree canopy goal that is measurable, time-bound, and attainable. While the overall goal should apply citywide, supporting objectives may be more targeted, for example, by public versus private land, zoning classification, or priority planting areas.

To ensure goals are achievable, local governments should use the results of the UTC assessment and associated GIS tools to guide annual tree planting plans, preservation strategies, and capital improvement planning. Public outreach should also be strengthened to communicate the benefits of the urban forest and build community support. Tools such as i-Tree Tools, a free software suite developed by the U.S. Forest Service and partners, can help quantify and clearly communicate the economic, environmental, and social values of trees.

Indiana local governments and their partners play a critical role in promoting, expanding, and sustaining urban tree canopy to ensure long-term benefits for current residents and future generations.

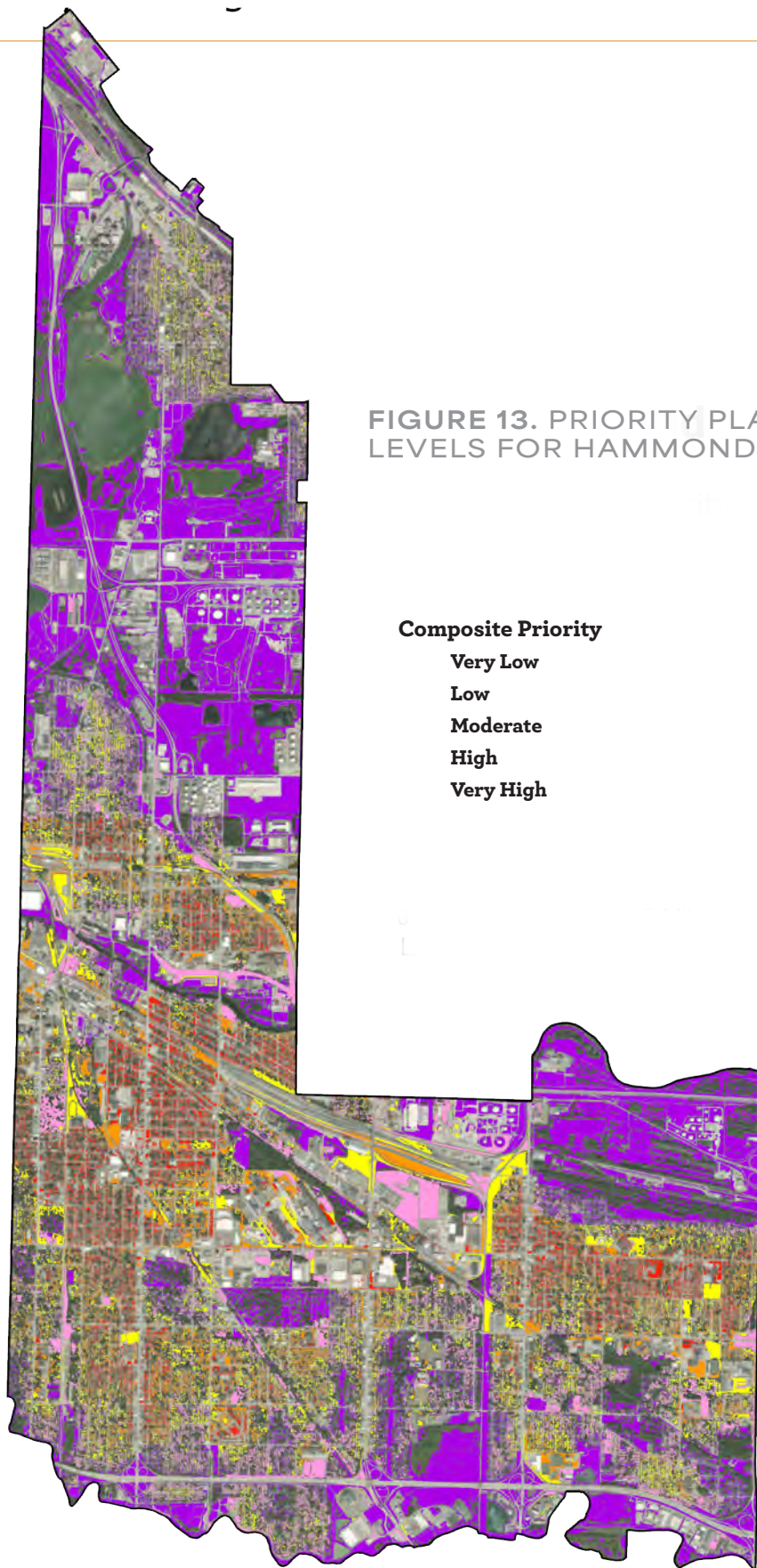
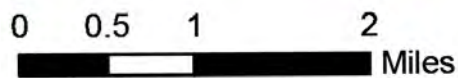


FIGURE 13. PRIORITY PLANTING LEVELS FOR HAMMOND

Composite Priority

- Very Low
- Low
- Moderate
- High
- Very High



rtthstar G

Tree and Canopy Benefit Evaluation

Urban tree canopy is a critical component of municipal infrastructure, providing measurable benefits such as stormwater reduction, air quality improvement, urban heat mitigation, carbon sequestration, energy savings, and enhanced quality of life. Unlike most infrastructure assets, trees increase in value over time when properly maintained.

i-Tree Eco was applied to inventoried trees to quantify benefits such as air quality improvement, carbon dioxide (CO₂) sequestration, and stormwater control. Inventoried trees in the City of Hammond's 2nd and 3rd Districts provide approximately \$62,001 in annual ecosystem services (Figure 14).

i-Tree Landscape was used to quantify citywide canopy benefits, indicating that the City of Hammond's urban forest delivers roughly \$2,000,000 in annual ecosystem services.

Managing the urban forest requires balancing expert recommendations, community needs, public safety, fiscal constraints, and environmental factors. When these elements are carefully considered and informed by public tree inventory and UTC data, the city can make strategic decisions that improve both tree health and community well-being.

FIGURE 14.





**PLANTING AND
MAINTENANCE PLAN**

MAINTENANCE PRIORITIES

The diagram below illustrates a cyclical approach to public tree maintenance management. At the center is Priority Maintenance, typically encompassing extreme- and high-risk tree care as well as follow-up inspections. Surrounding this central focus are stages of routine tree care, forming a continuous cycle. This approach reinforces that regular inspections and inventory updates, pruning of mature and young trees, tree and stump removal, and new tree planting all support ongoing tree health, while addressing high-risk issues remains the top priority.



Risk Management

Risk is a graduated scale that measures potential tree-related hazards, based on observed defects and potential targets. Every tree, regardless of condition, carries some inherent risk of whole or partial tree failure. As part of the Districts 2 and 3 inventory process, a modified Level 2 rapid risk assessment was conducted for each inventoried tree. Risk ratings were assigned based on the current editions of ANSI A300 (Clause 13) and the companion publication *ISA Best Management Practices: Tree Risk Assessment, Second Edition*. Trees may have multiple potential modes of failure, each with its own associated risk rating. During the inventory, the potential mode of failure with the highest risk rating was recorded. The specified timeframe for the risk assessment was one year. Appendix E provides additional details and definitions on the ISA risk rating system.

Risk rating categories include Extreme, High, Moderate, and Low. DRG recommends that tree maintenance activities be prioritized according to the assigned risk rating. Trees with Extreme or High-Risk ratings should be attended to first, followed by Moderate Risk trees and then Low Risk trees. Trees with a Low-Risk rating should be maintained after higher-risk trees have been pruned or removed. The following sections describe the recommended maintenance activities for each risk rating category.

Priority Maintenance

Prioritizing tree maintenance based on risk enables the City to address the highest safety concerns and potential liability in a systematic and defensible manner (Stamen 2011). As part of the Districts 2 and 3 inventory, each tree was assigned a Primary Maintenance category and a corresponding recommended maintenance activity. Primary Maintenance categories include Priority 1 Removal, Priority 2 Removal, Priority 3 Removal, Priority 1 Prune, Priority 2 Prune, Discretionary Prune, and Training Prune.

DRG identified 1,222 trees requiring priority removal or pruning, with 1,134 trees classified as Priority 1 or Priority 2 and an additional 88 trees classified as Priority 3 Removal. Trees meeting the criteria for Priority 1 or Priority 2 maintenance were further evaluated using a formal risk rating to account for condition, defect severity, and potential consequences of failure. Figure 16 summarizes the risk values associated with Priority 1–3 maintenance categories. The following sections outline recommended implementation strategies based on assigned risk ratings.





High Priority Maintenance Needs

Addressing Extreme, High, and Moderate Risk trees identified in the inventory as Priority 1 or 2 in a timely manner will reduce risk, improve public safety, maximize tree benefits, and minimize long-term costs. In general, higher-risk trees with larger diameters should be addressed first, as they typically pose greater potential consequences if failure occurs. Once these trees are addressed, recommended tree maintenance activities should be completed for small diameter trees. Asset management software such as TreeKeeper® should be used to update the inventory data as work is scheduled and completed.

The District 2 and 3 inventory identified:

- ✦ No Extreme Risk trees for pruning or removal.
- ✦ 1 High Risk street tree recommended for pruning. The High Risk tree recommended for pruning is 30 inches DSH.
- ✦ No High Risk trees recommended for removal.
- ✦ 27 Moderate Risk street trees and 4 Moderate Risk park trees recommended for Priority 1 pruning, ranging in size from 18 to 54 inches DSH.
- ✦ 8 Moderate Risk street trees and 0 Moderate Risk park trees recommended for Priority 2 pruning, ranging in size from 20 to 41 inches DSH.
- ✦ 16 Moderate Risk street trees and 5 Moderate Risk park trees recommended for Priority 2 removal, ranging in size from 10 to 40 inches DSH.
- ✦ 20 Moderate Risk street trees and 1 Moderate Risk park tree recommended for Priority 2 removal, ranging in size from 8 to 33 inches DSH.

Low Risk and Priority 3 trees are categorized as low priority maintenance and are discussed in the next section.

High Priority Maintenance Recommendations

- ✦ Trees with Extreme, High, or Moderate Risk ratings recommended for removal should be removed immediately and prioritized based on their risk rating and size class. Tree removal is recommended when pruning will not correct the tree's defects, will not eliminate the risks caused by defects, or when pruning would be cost-prohibitive.
- ✦ Trees with Extreme, High, or Moderate Risk ratings recommended for pruning should be pruned immediately and prioritized based on their risk rating and size class. High priority pruning and removals can be performed at the same time to increase efficiency of maintenance crews.

“When I imagine a health urban forest, I hope to see maintenance of existing old growth trees and education for their landowners.”

–Community Member

Routine Maintenance



Low Priority Maintenance Needs

After elevated risk trees have been addressed, Low Risk trees and Priority 3 removals become the next level of maintenance focus. Trees recommended for pruning with a Low Risk rating can be incorporated into a proactive, routine pruning cycle.

As the backlog of elevated-risk trees is reduced, the City of Hammond should gradually transition towards a fully proactive maintenance program. TreeKeeper® or similar data management software should be used to track work history, update inspection data, and schedule maintenance.

The inventory identified:

- ✦ 88 Priority 3 trees recommended for removals without an assessed Risk Rating. The Priority 3 trees recommended for pruning range in size from 1 to 38 inches DSH.
- ✦ 952 Low Risk trees recommended for pruning. The Priority 3 trees recommended for pruning range in size from 18 to 54 inches DSH.
- ✦ 100 Low Risk trees recommended for removal. The Priority 3 trees recommended for pruning range in size from 5 to 63 inches DSH.

Priority 3 removals typically include small, dead, invasive, or structurally-poor trees. Healthy trees growing in poor locations or undesirable species are also included in this category. Removing these trees will reduce breeding site locations for pests and diseases, improve aesthetics, and create opportunities for replacement planting.

Low Priority Recommendations

- ✦ Priority 3 removals and Low Risk trees should be pruned and removed after all higher risk pruning and removals have been completed.
- ✦ Priority 3 removals and Low Risk pruning and removals may be performed concurrently with routine pruning.



Routine Pruning Cycle

A routine pruning cycle is a core component of proactive urban forest management and works in coordination with young tree training and routine inspections to sustain a healthy, safe, and resilient tree canopy. In practice, a routine pruning cycle means trees are pruned on a structured, recurring schedule based on documented maintenance needs rather than in response to complaints or storm damage. This approach improves public safety, reduces long-term maintenance costs, and supports consistent, equitable tree care across all neighborhoods while ensuring compliance with ANSI A300 standards and ISA best management practices.

The routine pruning cycle includes mature trees with a primary maintenance need of Discretionary Prune, as identified through inventory updates and routine inspections. For mature trees, a five-year pruning interval is widely accepted as best practice, balancing biological needs, risk management, and operational efficiency. Inventory and inspection data should inform which trees are scheduled each year within the cycle, allowing resources to be directed where needs are greatest.

Routine Pruning Cycle Recommendations

- + Implement a five-year routine pruning cycle following completion of higher-priority maintenance work.
- + Assess tree maintenance needs during routine inspections and inventory updates, and schedule and prune as prescribed.
- + Routine pruning activities should include:
 - » Removal of dead, dying, diseased, or broken branches
 - » Pruning to maintain clearance for streets, sidewalks, signs, and utilities
 - » Structural pruning to improve branch spacing and attachment strength
 - » Reduction of risk associated with branch failure
 - » Light crown cleaning focused on tree health, not heavy pruning or topping

Establishing a predictable five-year cycle improves budget planning, staffing efficiency, and long-term canopy performance while extending the useful life and benefits of mature trees.

Young Tree Training Cycle

Young tree training cycles improve the form and structure of young, newly planted trees that are less than 6 inches DSH. Early corrective pruning addresses structural problems such as codominant leaders, included bark, multiple attachments at a single point, and crossing branches, which are issues that can become costly and hazardous if left uncorrected. A three-year cycle is recommended due to the rapid growth rate of young trees and the importance of early structural correction. The District 2 and 3 inventory identified 860 small, young trees that should be incorporated into a young tree training cycle. TreeKeeper® should be used to schedule and document young tree training activities.

Young Tree Training Cycle Recommendations

- + Implement a three-year young tree training cycle following completion of all higher-priority maintenance work.
- + Assess and prune approximately 354 young trees annually within the three-year cycle.
- + Adjust annual totals as planting rates and growth patterns change.
- + Begin training one to two years after planting and continue until trees can no longer be safely pruned from the ground using pole pruners and hand tools. At planting, new trees should receive minimal pruning, limited to removing broken, dead, or crossing branches.

Routine Inspections and Inventory Updates

Routine inspections are essential for identifying developing tree defects and emerging risk conditions.

Inspections should be conducted by a qualified arborist trained in tree care and risk evaluation, ideally an ISA Certified Arborist with the Tree Risk Assessment Qualification (TRAQ).

Level 1 and Level 2 assessments can be integrated into routine pruning operations to streamline workflows and reduce overall costs. When new maintenance needs are identified, trees should be promptly added to the work schedule and inventory records updated in TreeKeeper®.

All public trees should be inspected regularly. Level 1 inspections are particularly effective for identifying dead trees, large limb failures, or storm-related damage. Post-storm inspections are essential following major weather events that may increase tree risk.

To maintain consistent annual costs and up-to-date data, the City of Hammond should re-inventory approximately one-fifth (20%) of public trees annually across all districts and parks. Based on the current inventory for Districts 2 and 3 and two parks (Harrison Park and Dr. Martin Luther King, Jr. Memorial Park), this equates to updating roughly 552 trees per year within a five-year inventory cycle. DRG estimates there are nearly 14,000 street trees along approximately 268 miles of road centerlines, as reported by the Indiana Department of Transportation Roadway Assets dataset (2024), highlighting the importance of a phased and scalable inspection and inventory strategy.

Routine Inspections and Inventory Update Recommendations

- ✦ Utilize asset management software (e.g., TreeKeeper®) to update inventory data, document inspections, track maintenance activities, and maintain complete work records.
- ✦ Establish procedures for incorporating newly identified work into maintenance schedules and budgets.
- ✦ Conduct Level 1 walk-by or drive-by assessments as a cost-effective first step for post-storm evaluations and to flag trees needing further inspection.
- ✦ Complete an inventory of all remaining four districts and parks.
- ✦ Perform Level 2 basic assessments on a routine cycle, ideally one-fifth (20%) of public trees annually to identify less visible defects and ensure data accuracy.
- ✦ Maintain a rolling five-year inventory update cycle (based on the current inventory of approximately 3,620 public trees not recommended for removal, the City of Hammond should plan to update about 724 trees per year as part of a five-year inventory cycle).

Stump Removal

The inventory identified 70 stumps. While often not considered a high priority, the timely removal of stumps opens up more space for planting and improves aesthetics in parks and along streets.

Stump Removal Recommendations

- ✦ Include stump grinding and removal as a standard component of all tree removal contracts to ensure complete site restoration.
- ✦ Conduct quality assurance and quality control inspections of contractor work to verify that stumps are fully removed and that sites are left in suitable condition.
- ✦ Complete stump removal prior to any targeted planting efforts to ensure planting locations are fully available.
- ✦ Avoid planting directly in locations where stumps were recently removed whenever possible, as decomposing roots can create air pockets, reduce soil quality, and limit rooting space, all of which can negatively affect new tree establishment.



TREE PLANTING STRATEGY

Tree Selection Guidelines

Routinely planting trees is an important part of maintaining and expanding the City of Hammond's tree canopy and maximizing the tree benefits provided to the community. Planting opportunities exist in suitable vacant street sites, sites with stumps, parks, and on private property. During the District 2 and 3 inventory, 500 potential planting sites and 70 stumps were identified throughout the inventoried area, including 251 sites in parks, 212 sites along streets, and 107 along the Erie Lackawanna Trail. The identification of planting sites was capped at 500 sites for this effort, therefore the full planting potential within street right-of-way both within the 2nd and 3rd Districts and citywide remains unknown. Indiana communities similar in size to the City of Hammond are, on average, approximately 52% stocked, meaning there is roughly one available planting space for each existing tree.

Selecting appropriate tree species requires evaluating growth characteristics, environmental preferences, and tolerance to urban conditions relative to specific site conditions. Planting the “right tree in the right place” will ensure the tree thrives, increasing its benefits, improving tree survival and condition, reducing future tree care costs, and minimizing conflicts with other infrastructure.

Within the District 2 and 2 inventoried street sites, approximately 21% of the sites were suitable for a small tree, 6% were suitable for a medium tree, and 65% were suitable for a large tree. This indicates substantial opportunity to prioritize larger canopy trees where space allows.

Planting Recommendations

- + Prioritize planting the largest-stature tree feasible at each site, as large deciduous trees provide the greatest long-term ecosystem services, including shade, stormwater interception, and air quality benefits.
- + Adopt a minimum 1:1 replacement rate, with a long-term goal of achieving 2:1 or 3:1 planting-to-removal ratios. Budget projections (Appendix A) assume a 2:1 replacement strategy.
- + Emphasize tolerance to heat, drought, salt exposure, compacted soils, and changing climate conditions when selecting tree species, with final species decisions made on a site-by-site basis.
- + Pursue alternative canopy strategies where traditional street tree planting is constrained, including:
 - » Development of pocket parks
 - » Enhancement of nearby parks and public grounds
 - » Setback planting programs placing public trees within 20 feet of the public right-of-way
 - » Encouraging private property planting through education, tree giveaways, and incentive programs
- + Improve planting success by increasing available growing space through:
 - » Enlarged planting strips and tree wells
 - » Use of structural soils or suspended pavement systems (e.g., Silva Cells)
 - » Coordination with engineering and planning departments to integrate trees early into street and redevelopment projects
- + Continue to pursue state and federal grant funding, particularly within Environmental Justice areas, and strengthen partnerships with local organizations to expand planting capacity and community engagement.

Growing Space Recommendations

Adequate growing space is fundamental to long-term tree health, structural stability, and canopy retention.

- + Develop planting standards that match tree size to available soil volume, prioritizing small-stature species only where rooting space is constrained.
- + Establish tree-friendly standards for sidewalks, streets, and private development that accommodate root growth and reduce future infrastructure conflicts.
- + Encourage collaboration among planning, engineering, and urban forestry staff to incorporate trees early in capital improvement and redevelopment design processes.



Infrastructure Clearance Guidelines

Overhead Utility Clearance

- + Small trees (>30 feet tall at maturity): plant within 20 feet from overhead utilities
- + Medium trees (30-45 feet tall at maturity): plant 20 feet or greater from overhead utilities
- + Large trees (>45 feet tall at maturity): plant 40 feet or greater from overhead utilities

Other Infrastructure Clearances

- + 40 feet between large trees
- + 30 feet from intersections (approaching traffic)
- + 30 feet between medium trees
- + 20 feet from fire hydrants
- + 20 feet between small trees
- + 15 feet from utility poles, streetlights, buildings
- + 10 feet from driveways, intersections (retreating traffic), crosswalks, important street signage
- + 5 feet from underground utilities

Minimum Planting Space Dimensions

- + Small trees: 4 feet x 4 feet
- + Medium trees: 6 feet x 6 feet
- + Large trees: 8 feet x 8 feet

Planting and Canopy Cover Targets

DRG calculated potential planting targets using Lake County’s TreeKeeper Canopy with canopy data from the 2010 Chicago Regional Trust Initiative, which determined 16% canopy cover for the City of Hammond. Modeling parameters assumed 1% mortality and a planting ratio of 20:40:40 for small, medium, and large species, respectively.

The planting scenarios below reflect the number of new trees planted annually over a defined active planting period. This active planting phase is designed to achieve a specific canopy cover goal after the newly planted trees have matured over an additional, designated number of years.

Canopy modeling indicates multiple pathways for increasing the City of Hammond’s tree canopy over time:

- ✦ A 24% canopy cover could be achieved by 2086 by planting approximately 571 trees annually for 30 years.
- ✦ A more modest goal of 20% canopy cover could be reached by 2076 with 391 trees planted annually for 30 years.
- ✦ Achieving 18% canopy cover by 2046 would require 672 trees planted per year for 20 years, while the same 2% increase could be achieved more gradually planting 477 trees per year through 2056.

Table 6 suggests a planting rate of 500 trees each year. Based on discussions with the CWG, planting 500 trees a year is both realistic and consistent with historical capacity.

TABLE 6. PLANTING SCENARIOS

CANOPY COVER TARGET	# OF ACTIVE PLANTING YEARS	NUMBER OF TREES	# OF YEARS FOR MATURATION	YEAR TARGET IS MET
24%	30	571	30	2086
20%	30	391	20	2076
18%	20	672	20	2046
18%	30	477	30	2056

FIVE-YEAR ANNUAL MAINTENANCE SCHEDULE AND BUDGET

The following figures present two complementary budgeting scenarios to guide the City of Hammond’s future urban forestry program. Detailed budget tables are located in Appendix A. Figures 1 and 2 provide five-year projected budgets based on full utilization of professional service providers. These scenarios are intended to help City officials understand the relative costs associated with implementing recommended forestry activities. Although Hammond’s current allocations for public space tree management may be limited, the estimates offered reflect established urban forestry management principles and serve as planning level guidance for developing and evaluating a comprehensive five year program.

FIGURE 1. FIVE-YEAR BUDGET A

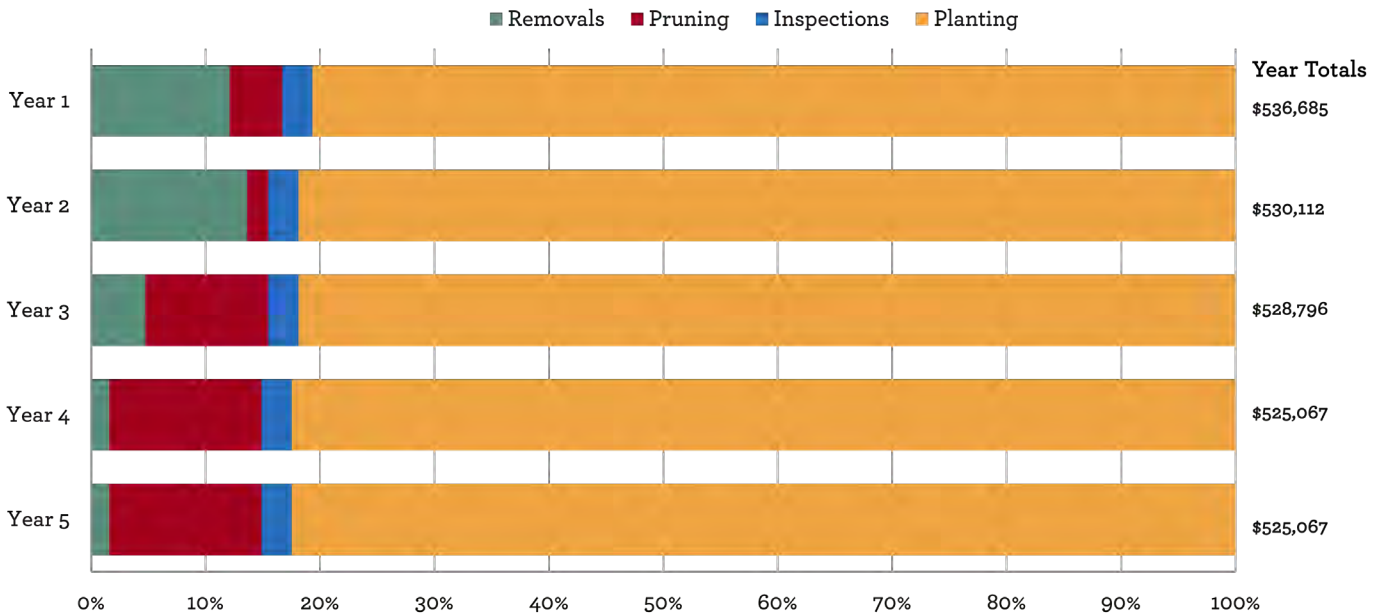
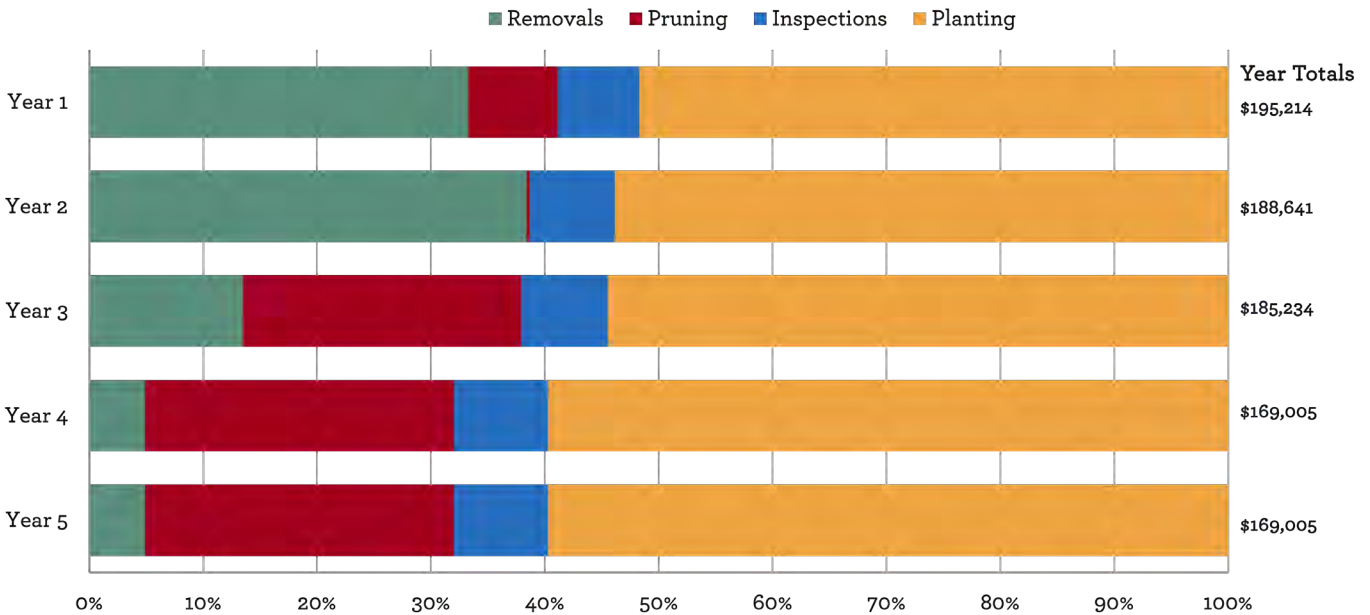


FIGURE 2. FIVE-YEAR BUDGET B





Research indicates that cities similar in size to Hammond have a mean and median urban forestry budget of \$647,000 and \$452,000, respectively. Using the City of Hammond’s District 2 and 3 tree inventory data, an example five-year annual maintenance schedule and budget within this range is provided in Figure 1. Following this plan, the annual urban forestry budget would average \$529,000. Budget projections are based on the City’s average industry rates. Following this schedule, or a similar phased approach, can help transition the city’s tree care program from a reactive model to a more proactive, risk-based management strategy.

The largest portion of the budget is allocated to planting and establishment care of new trees. This focus on tree planting also presents the greatest opportunity for the City of Hammond to lower expenditure by leveraging volunteer planting and stewardship programs to reduce labor costs, as well as by securing grants and sponsorships from local businesses to offset material and labor costs.

For example, the partnership between the City of Hammond and the SCA, as outlined in the 2023 agreement, provides an important foundation for ecological restoration, native plant establishment,

and long term stewardship within Hammond’s parks and natural areas. Under this arrangement, a conservation crew of six members and two leaders delivers 34 weeks of habitat restoration, invasive species removal, native seed collection and planting, trail maintenance, debris clearing, and ecological surveying—activities that strengthen the City’s urban forest and support broader ecosystem health. By integrating youth conservation employment, hands-on environmental training, and structured SCA oversight with the City’s provision of project sites, operational guidance, materials, and staff support, this partnership enhances Hammond’s capacity to manage, maintain, and expand healthy urban green spaces.

Figure 2 presents a second scenario that maximizes the use of SCA crews. In this model, SCA personnel would prune all trees between 0–12 inches in diameter—averaging approximately 502 trees annually within a four week work period—and would install and maintain newly planted street and park trees (0.75–1.25 inch caliper), averaging roughly 500 plantings each year completed in approximately six weeks, along with ongoing watering throughout the growing season. Because this scenario expands SCA involvement to include street trees, adjustments to the current scope of work would be required. Importantly, the city benefits from significant cost savings under this arrangement, as it does not pay SCA directly; program costs are fully covered through philanthropic funding, provided the obligations outlined in the agreement are met. The City of Hammond’s responsibilities reflected in this budgeting scenario include supplying materials and tools as needed, as well as providing vehicles and equipment not supplied by SCA. In this scenario, Hammond’s annual urban forestry budget would be approximately \$181,000.

Together, these tables offer a practical framework for evaluating operational needs, determining resource allocation, and planning the long term financial commitments required to sustain and grow Hammond’s urban forest.





PROGRAMMING

This section describes programs, policies, and governing structures incorporated into the urban forestry strategies of peer cities in northwest Indiana and the Great Lakes Region. Examining how neighboring communities manage their urban forest provides the City of Hammond with insight into its own strengths and gaps, while offering practical examples, inspiration, and adaptable tools to inform next steps.

POLICY

Tree Ordinance Comparison

DRG reviewed the City of Hammond's tree protection provisions of the Municipal Code and compared the policies with similar provisions within three peer cities in Indiana: Crown Point, South Bend, and West Lafayette.

The Purpose of Tree Ordinances

A strong municipal tree ordinance should be grounded in clearly defined community needs, goals, and long-term vision. Before establishing regulations, a city should clearly identify what it seeks to achieve—such as preserving canopy cover, improving equity in tree access, protecting environmental resources, or supporting development—and determine how the ordinance can advance these goals while balancing property rights and public access. Grounding the ordinance in a shared community vision helps ensure it is purposeful, equitable, and publicly defensible.

Effective ordinances clearly articulate the benefits trees provide and align those benefits with community priorities. They define protections, responsibilities, and penalties, and establish transparent standards for planting, removal, and replacement that align with recognized best management practices and reference the most recent professional standards.

A strong ordinance also outlines a clear and predictable review process, specifying who reviews permits, what criteria are considered, who grants approval, and on what timeline. Additionally, it identifies funding mechanisms to support implementation, describes opportunities for public input and appeals, and clarifies which decisions require City Council action versus administrative approval. These elements support transparency, consistency, and enforceability.



Reviewed Plans & Policies

The following municipal codes were reviewed:

City of Hammond Municipal Code

- + Chapter 105: Municipal Street Tree Regulations

City of Crown Point Municipal Code

- + Section 93: Trees; Landscape Plan

City of South Bend Municipal Code

- + Chapter 19: Trees and Vegetation
- + Article 21-09: Site Development
 - » Section 21-09:01: Landscape

City of West Lafayette Municipal Code

- + Chapter 10: Environment
 - » Article III: Trees and Landscaping

Crown Point, South Bend, and West Lafayette were selected as peer examples due to their established tree policies and relevance to the City of Hammond’s regulatory context. As the City of Hammond seeks to strengthen its tree protection framework—particularly regarding construction impacts and private property protections—these ordinances provide useful models and transferable best practices.

Street Tree Removal Protections

In the City of Hammond, property owners are responsible for tree care, maintenance, and removal of street trees. The City maintains a permit system for street tree removals, though in the case of emergencies, such as damage inflicted by severe storms or other disturbances that impact public safety, the requirement for a permit may be waived. The current code does not clearly define the criteria used to evaluate and approve removal permits.

All three peer cities similarly assign responsibility for tree care and removal to property owners. West Lafayette requires a formal permit for street tree removals, while Crown Point and South Bend require approval from a designated municipal authority, even if a formal permit structure is not used.

Importantly, all three cities define justification criteria for tree removal, enabling the designated authority to determine whether the removal is warranted. Common criteria include:

- + The tree poses a safety hazard
- + The tree has existing structural defects
- + The tree has a risk of damaging property
- + Removal of the tree impacts surrounding canopy coverage

Crown Point and West Lafayette additionally require mitigation with the approved removal of a street tree.

Protection During Construction

Across the four peer cities, there is a generally consistent intent to protect trees during construction, though clarity, enforceability, and implementation mechanisms vary.

Crown Point has the most comprehensive construction-related tree protection provisions. The city requires a site plan, restricts construction impacts on trees located on adjacent properties, clearly defines tree protection areas and preservation measures, and authorizes inspections to verify compliance. While Crown Point does not explicitly require a standalone Tree Preservation Plan, its required landscape plan incorporates many of the same elements, including an inventory of protected trees, clearly identified protection measures, and designation of the party responsible for post-construction landscape maintenance. Although mitigation is not required when trees are damaged, property owners or developers are held financially responsible through penalties or fees if the city must address damage or replant trees.

South Bend's ordinance expresses a strong intent to conserve existing trees, stating that all proposed development should preserve healthy trees with a caliper of six inches or greater. However, this intent is not consistently supported by enforceable standards. The code does not require an arborist assessment, site plan, or compliance inspections, and while tree protection areas and preservation measures are referenced, they are not clearly defined. Preservation methods are subject to approval by the Superintendent of Parks, but the criteria for approval are not specified. Mitigation is only required if a tree is removed or killed as a result of construction activities.

West Lafayette takes a more structured approach by requiring a site plan, defining tree protection areas and preservation measures, and mandating mitigation when trees are damaged during construction. Although inspections are not explicitly codified, the city retains enforcement authority by allowing the withholding of a Certificate of Occupancy if development does not comply with the approved site plan.

Hammond provides a baseline level of protection during construction, though its provisions are less robust than those in Crown Point. The city requires a site or landscape plan, includes protections for trees on adjacent properties as needed, and defines tree protection areas and preservation measures such as fencing. Hammond does not require an assessment by a certified arborist; however, similar to Crown Point, the code could allow for discretionary arborist review. In Crown Point, for example, the ordinance authorizes an arborist to assess development sites that apply for land development permits and to inventory trees proposed for protection, providing additional flexibility and professional oversight without mandating an assessment for every project.



Private Property Tree Protections

The reviewed municipal codes from the selected cities showed that private property tree protections were limited, if not completely non-existent. Private property tree protections can be contentious, as they may be perceived as limiting private property rights. Although the intent is to safeguard public benefits, such as environmental health, stormwater management, and long-term canopy cover, property owners may view additional permits, restrictions, or costs as burdensome, particularly when the benefits are shared community wide, but the responsibilities are borne privately.

One common solution is an elective or voluntary “Significant Tree” program, which allows property owners to opt in by designating trees on their properties that meet defined species, size, or cultural, historical, or environmental significance. In some cases, nominations are reviewed and approved during public hearings to allow for public comment. Protections and designations may remain in effect even after the property is sold, ensuring continuity while maintaining voluntary participation.

Aspirational Tree Policy

According to the Arbor Day Foundation, the most robust tree ordinances should address eight key areas:

- + **Purpose:** A statement of the vision for the urban forest and the intent of the tree ordinance
- + **Authority and credentials:** Designates a specific person, department, board, or committee as having the authority and outlines specific credentials required to perform tree care
- + **Tree preservation:** Provides a system by which trees meeting certain criteria are protected from removal
- + **Construction protection protocols:** Sets standards for tree protection measures required during development
- + **Mitigation:** Specific requirements for the replanting of trees which are removed or damaged
- + **Tree planting standards:** Specifications for tree sizes, species, spacing, etc.
- + **Tree management:** Defines who is responsible for tree care and reference to best management practices
- + **Enforcement:** Outlines how tree policy will be enforced, including fines for noncompliance

The Village of Wilmette, Illinois and the Town of Merrillville, Indiana provide strong examples of comprehensive and enforceable tree protection policies.

Preservation of Mature Trees

Chapter 29 of Wilmette’s Code of Ordinances is dedicated to the management of its urban forest. It opens with a statement of the village’s goals to grow canopy and minimize the removal of trees. These goals are supported by several objectives outlining how trees enhance the community. Where Wilmette’s tree policy really shines is its protection measures for mature trees.

Wilmette’s tree removal policy aims to preserve healthy mature trees by establishing two categories: Protected and Heritage.

Protected Trees:

- + Any tree 6 inches DSH or greater
- + Require an approved permit for removal
- + May be removed even if the tree is in good condition and is not hazardous
- + If a healthy Protected Tree is removed, a replacement tree must be planted or a fee paid in lieu

Heritage Trees:

- + Any trees from the genera *Quercus* (oak) or *Carya* (hickory) that are 10” DSH or greater or,
- + Any tree 20 inches DSH or greater that is not classified as invasive, ornamental, or undesirable
- + May not be removed if healthy, unless additional zoning stipulations determined by the Zoning Ordinance are met
- + If removal is approved, a Heritage Tree requires a replacement tree or a fee in lieu.

For both categories, the number of required replacement trees or the fee amount increases based on the size of the tree being removed.

The Village Forester assesses all permit applications.

As a certified arborist, the Village Forester is qualified to assess whether the health or other risk factors necessitates the removal of a Heritage tree. The Village does *not* charge permit fees for the removal of trees that are dying, hazardous, or invasive.

While Wilmette’s tree preservation policy broadly applies to private property removals, similar policies could be adapted in Hammond to focus specifically on development scenarios, reducing the regulatory burden on homeowners while preserving mature canopy during redevelopment.

Preservation of During Development and Redevelopment

The Town of Merrillville, Indiana, offers an example of how to implement effective tree preservation strategies during development or re-development. Before a Building Permit is issued, the Planning Commission (advised by the Environmental Committee) must approve the permittee’s landscaping plan.

This mandatory Landscaping Plan must include:

- + A detailed list of all tree species, sizes, and locations to be planted
- + Identification of existing trees to be preserved, along with an explanation of protection measures that meet the minimum Landscape Standards
- + Detailed site plans depicting all other features of the property and construction plans

Furthermore, developers must plant a minimum number of trees based on the lot’s size and zoning. However, credits may be granted for preserving existing trees. The Merrillville Environmental Committee is authorized to award these credits, conduct site visits, and advise developers on which trees should be preserved.

This structure incentivizes tree retention while maintaining flexibility for development and ensuring professional oversight.

TREE BOARDS

DRG reviewed relevant municipal code sections pertaining to Tree Boards or Tree Commissions in two peer cities in Indiana – Chesterton and Michigan City.

A Tree Board is an appointed advisory body that supports municipal governments in managing the urban forest, including public trees and other regulated trees such as heritage or significant trees. Also known as tree commissions, councils, or committees, Tree Boards provide guidance on tree-related policies, planning and development considerations, and community engagement efforts that promote urban forest stewardship.

Tree Boards typically include a mix of municipal forestry staff, elected officials, representatives from tree-focused nonprofits or private businesses, utility representatives, and residents—both with and without technical tree expertise. The most valuable attribute of a Tree Board member is an interest in trees and a commitment to preserving the urban forest and the benefits it provides to the community.

In communities with limited municipal forestry capacity, Tree Boards can expand the administrative and engagement capacity. Serving in an advisory role, members act as liaisons between the municipality and the public, offering community perspectives, innovative ideas for urban forestry programs and initiatives, and advisory support that complement municipal staff efforts.

Best Practices

When establishing a Tree Board, municipalities should consider the following best practices:

1. **Clearly define the Tree Board’s role and authority:** Establish a charter that defines the Tree Board’s responsibilities. Include these responsibilities in ordinance or resolution and clearly distinguish the relationship between the tree board, city staff, and elected officials.
2. **Establish membership criteria:** Define board size, term length and limits, methods of appointment and role descriptions. Municipalities should consider staggering terms to maintain continuity and determine what kinds of representation and levels of expertise needed on the Tree Board based on city priorities.
3. **Establish a dedicated staff liaison:** Assign a municipal staff member, such as the designated forestry authority, arborist, or urban forester, or elected representative as the primary liaison. This staff liaison will help establish the credibility and sustainability of the Tree Board while ensuring Tree Board work and discussions are moving through the appropriate channels.
4. **Establish and adopt Tree Board standard operating procedures:** Establish bylaws that outline meeting frequency, officer hierarchy and roles, and reporting requirements. Ensure that these procedures are consistent with municipal standards and meeting requirements.
5. **Develop and launch a Tree Board member orientation and training program:** Well-informed Tree Board members are better positioned to support the goals and priorities of the municipality’s urban forestry program. The City should provide training and orientation to new members on the City’s tree-related ordinances and policies, urban forestry fundamentals, basic tree biology and ecology, and municipal processes.

Review of Example Tree Boards in Peer Cities

Chesterton, Indiana



The City of Chesterton’s Tree Committee is clearly established within Section 26-2 of the municipal code, *Establishment of a Tree Committee*. The code states:

“There shall be created a committee that serves solely in an advisory capacity to the Town Council that shall be known as the “Tree Committee”. The Tree Committee shall be composed of three members who are residents of the town who shall be appointed by the Town Council. The term of office for the members shall initially be two years. After the initial term is over, each successive term shall be one, two and three years, respectively. All member of the Tree Committee serve at the pleasure of the Town Council and the Town Council has the ability to remove any member at any time for any reason deemed sufficient to the Town Council.”

This section clearly defines the committee’s role, size (three members), residency requirement, appointment process, and term structure. Members serve initial two-year terms, followed by staggered one-, two-, and three-year terms, Members serve at the pleasure of the Town Council.

Section 26-3, *Tree Committee Duties and Responsibilities*, outlines the role and responsibilities of the committee, including:

- A. “The Tree Committee shall serve in an advisory capacity to the Town Council on all matters pertaining to this chapter.
- B. Matters upon which the Tree Committee may advise the Town Council include, but are not limited to, the following:
 1. Assist in policy development concerning the care, preservation, selection, planting, transplanting, spraying, maintenance and removal of trees and shrubs in the street right-of way, public parks and other public places assuring good arboricultural practices are followed;
 2. Make recommendations regarding tree care of street trees and park trees and the sodding, seeding and maintenance of lawns along existing town streets;
 1. Assist, when requested by the Town Council, in the preparation of grant applications that would fund municipal tree-related projects;
 2. Assist the Street Commissioner, when requested, concerning matters contained within this chapter;
 3. When requested by the Town Council, present inventory of public trees in the town;
 4. Cooperate with the state’s Department of Transportation concerning planting efforts along state road rights-of-way with town boundaries;
 5. Conduct educational programs as necessary while working with private and public agencies and organizations to establish programs for planting and the care of street trees;
 6. Advise, as needed, concerning amendments to this chapter, including the Arboricultural Specifications Manual;
 7. Meet as needed;
 8. Elect a President and Vice-President annually and keep a written record of its proceedings, all in accordance with state law; and
 9. Shall serve without compensation.”

Chesterton’s municipal code establishes a Tree Committee that aligns well with the above best practices for establishing a municipal Tree Board. The committee is clearly defined as an advisory body to the Town Council, with responsibilities that span policy development, coordination with municipal staff, public education, interagency cooperation, and support for grant funding. The inclusion of duties related to education, inventory awareness, recordkeeping, and adherence to arboricultural standards reflects the comprehensive role a Tree Board can play in supporting municipal decision-making.

Opportunities for improvement relate primarily to clarity and structure. While the advisory role is well articulated, the frequent use of “when requested” language may limit the committee’s ability to operate proactively and enthusiastically. The framework could be strengthened by formally establishing a regular meeting schedule, clarifying expectations for coordination with staff, and defining a role in long-term planning and periodic reporting to the Town Council.

Michigan City, Indiana



Michigan City's City Tree Board is formally established within Section 102-32 of the municipal code, *City tree board; creation and establishment*. The code states:

“There is hereby created and established a city tree board for the city, which shall consist of seven voting members. One member shall be a member of the common council elected by the council. One member, to be appointed by the common council, shall be nominated by a city neighborhood association. The mayor, with the advice and consent of the common council shall appoint the remaining five members. Further, not less than four members of the seven member city tree board shall be residents of the city, and it is preferred that two members of the seven member city tree board possess a degree in forestry, horticulture, or landscape architecture; or be a certified arborist or a full-time professional in the tree care industry with a minimum of five years' experience.”

This section defines the city Tree Board's size, membership and expertise requirements, and appointment processes. At least four members must be city residents, and the code expresses a preference for at least two members to possess relevant professional qualifications.

Section 102-33, *City tree board; term of office*, formally codifies the specifications for each member's term limit based on the individual who appointed them. Section 102-34, *City tree board; duties and responsibilities*, declares the city Tree Board's responsibility as:

- + “Study, investigate, counsel, develop, and administer a written plan for the care, preservation, pruning, planting, replanting, removal, or disposition of trees and shrubs in parks, alleys, along streets in the tree lawn, and in other public areas.” They are also responsible for updating this plan every four years.
- + “When requested by the city council, the board of public works and safety, or the mayor, shall consider, investigate, make findings, report, and recommend upon any special matter or question coming within the scope of its authority as detailed in this article.”
- + “Establish educational and informational programs, pamphlets and literature for dissemination to the public to assist the public in the proper care, preservation, pruning, planting, replanting, removal, or disposition of trees and shrubs within private property ownership of the citizens of the city.”
- + “Develop qualifications and a job description for the position of city forester. The city tree board shall further interview prospective candidates and make recommendation to the Michigan City Board of Public Works and Safety for the candidate of choice for the position of city forester.”

Finally, Section 102-35, *City tree board; operation*, formally codifies the city Tree Board’s autonomy in establishing its own operating procedures, such as meeting times and cadence, delegation of its own officers, establishment of their own rules and regulations and recording and reporting requirements. It also states that “a majority of the appointed members shall be a quorum for the transaction of business.”

Michigan City establishes a Tree Board that aligns well with best practice by clearly defining board size, membership, expertise and appointment processes. The inclusion of both community members, individuals with technical expertise, and elected representatives supports decision making that is inclusive of a wide range of stakeholder experiences and perspectives. Term limits and a codified operating authority encourage accountability and effective governance.

The Tree Board’s responsibilities are proactive, in that they are expected to develop and provide regular updates to an urban forestry plan, create and execute public education initiatives, and offer advisory support on special tree-related matters. Its involvement in developing qualifications and recommending candidates for the city forester position demonstrates strong collaboration and coordination between the board and municipal staff in that expectations and program goals are aligned amongst the two and represented in the city’s selection of a new city forester.

An opportunity to strengthen Michigan City’s municipal code would be to clearly define the scope and extent of advisory and administrative responsibilities to ensure clarity in governance.



STAFFING

Insufficient staffing levels and deferred maintenance limit a city's ability to shift from reactive to proactive management. Investing in internal capacity can lead to long-term cost savings by enabling crews to prevent larger, more expensive problems. For instance, doubling the inspection personnel could halve the time needed to survey the public tree population, allowing issues to be discovered and resolved twice as quickly.

A 2014 study by the University of Wisconsin examined trends in municipal urban forestry management, including staffing. The research found that in surveyed communities with a population between 50,000 and 99,000, 57% assigned the responsibility for urban forest management to a dedicated Arborist or Forester, rather than a department director (Director of Public Works), or a city manager.

The presence of a dedicated arborist or urban forester indicates that urban forestry is a primary responsibility, rather than one of many competing duties. In contrast, department directors often oversee multiple divisions, which can limit the attention given to the urban forest when there is not a dedicated position. The study also found that the likelihood of employing a dedicated forester increases with community population size. **Furthermore, cities comparable in size to the City of Hammond employed an average of 7 to 9 total full-time equivalent employees for urban forestry.**

Regarding training and education, 85% of surveyed communities indicated that their forestry staff attend tree care workshops, and 77% had at least one ISA Certified Arborist on staff. Overall, staff credentials and specialization tended to increase with community size, reflecting a broader trend toward professionalization in urban forestry programs.



COMMUNITY PARTNERS

Across Indiana and the Great Lakes region, cities with effective urban forestry programs consistently invest in community engagement as a means of protecting existing canopy, improving planting outcomes, and building long-term stewardship capacity.

Indianapolis, IN – Shared Stewardship and Workforce Development Indianapolis partners with Keep Indianapolis Beautiful (KIB) to coordinate volunteer tree planting and community-led watering programs for newly planted trees. These efforts significantly improve early tree survival while reducing long-term maintenance demands on city staff. KIB also supports youth internships and workforce development opportunities, connecting urban forestry to education, job training, and neighborhood pride. KIB implements its programs at the block and neighborhood scale. By meeting residents where they are—through schools, faith-based organizations, and community events—Indianapolis has expanded participation and strengthened stewardship in areas with historically lower canopy cover

Fort Wayne, IN – Public Education and Transparency Fort Wayne integrates public-facing education into its urban forestry program through tree inventories, public reporting, and neighborhood engagement around tree removals and replacements. By clearly communicating why trees are removed and how replanting decisions are made, the city has strengthened public trust and reduced conflict related to tree management activities.

South Bend, IN – Equity-Focused Engagement South Bend’s urban forestry initiatives intentionally prioritize underserved neighborhoods by pairing canopy assessments with targeted outreach and planting programs. Community meetings, partnerships with neighborhood organizations, and integration with broader climate and resilience planning help align tree investments with public health and equity goals.

Goshen, IN – Nonprofit Partnerships Goshen works with non-profit partner Trees for Goshen to strive towards 45% canopy cover by 2045. While the City of Goshen works to increase and maintain trees on public property, Trees for Goshen can engage property owners to grow canopy on private property. Because 80% of land in cities is privately owned, cooperation between governments, individuals, and nonprofits enables communities to increase the canopy more than they could on their own.

Chicago, IL – Data-Informed Engagement Chicago’s urban forestry program combines citywide canopy data with public engagement to prioritize planting and preservation efforts. Interactive maps, community workshops, and partnerships with regional non-profits help residents understand canopy disparities and participate in shaping neighborhood-level solutions.

Lessons for the City of Hammond

These regional examples demonstrate that successful urban forestry programs:

- ✦ Treat community engagement as an ongoing practice, not a one-time outreach effort
- ✦ Pair technical data with clear public communication
- ✦ Create formal roles for residents in advisory and stewardship capacities
- ✦ Use partnerships to extend municipal capacity and improve long-term outcomes

For Hammond, adopting similar engagement approaches can help address community concerns around canopy loss, strengthen preservation efforts, and ensure that urban forestry decisions reflect shared priorities across neighborhoods.



METRICS AND MANAGEMENT

This section outlines the best management practices and success indicators used to guide implementation and evaluate progress of the urban forest program. These metrics support transparent reporting, adaptive management, and long-term sustainability of the community's urban forest.

TRACKING PROGRESS AND SUCCESS INDICATORS

Tree Planting and Establishment

The program will prioritize planting in areas with low canopy cover, elevated heat exposure, and environmental justice needs, ensuring that new trees contribute meaningfully to community resilience. Species selection will focus on climate-resilient, site-appropriate, and diverse options to reduce long-term vulnerability to pests, diseases, and climate stressors. All planting and establishment activities will follow ANSI A300 standards, including proper mulching, staking, and early-care practices. A structured multi-year watering and inspection schedule will be implemented to promote strong establishment and survival. Additionally, all planting locations, species details, and condition data will be tracked through a GIS-based tree inventory to support long-term monitoring and management.



Success Indicators

- + Number of trees planted annually, compared to plan targets
- + Survival rate of newly planted trees at 1-, 3-, and 5-year intervals
- + Percentage of plantings meeting diversity targets (e.g., no species >10%)
- + Percentage of trees planted in priority/vulnerable neighborhoods

Habitat Restoration and Natural Area Management

The program will begin with baseline assessments to document natural area conditions and identify the presence and extent of invasive species. Based on these findings, management activities will focus on restoring native understory vegetation, removing invasive species, and improving soil health to support long-term ecosystem function. These areas will be maintained through a cyclical review and treatment schedule, such as semi-annual or annual stewardship events. Additionally, the program will coordinate with community partners to support volunteer involvement, stewardship activities, and public education to strengthen long-term restoration outcomes.

✓ Success Indicators

- + Acres of habitat restored or improved annually
- + Reduction in invasive species cover over time
- + Increase in native species richness or vegetative cover
- + Percentage of restoration areas maintained on schedule

Environmental and Green Infrastructure Benefits

The program will use canopy-expansion modeling to guide planting goals and ensure long-term stormwater runoff and carbon sequestration benefits. Where site conditions allow, plantings will prioritize long-lived, high-performing species capable of generating substantial canopy and environmental returns over time. Ongoing maintenance—including adherence to pruning standards, risk mitigation practices, and proactive care—will support canopy longevity and overall forest resilience. To monitor progress and inform future planning, canopy cover changes will be tracked through periodic LiDAR or aerial imagery analyses on a recurring cycle, typically every five years.

✓ Success Indicators

- + Annual gallons of stormwater runoff intercepted or treated, modeled using accepted tools (i-Tree Eco/Hydro, TreeKeeper Canopy, or similar)
- + Increase in permeable surface or hydrologically functional green space
- + Reduction in localized nuisance flooding reports
- + Annual tons of carbon sequestered, based on growth modeling
- + Net canopy gain over the management period
- + Percentage of trees reaching maturity (vs. premature removal)

MONITORING AND ADAPTIVE MANAGEMENT STRATEGIES

Monitoring and Adaptive Management

The program will maintain a GIS-based tree inventory that is updated on a rolling cycle to provide accurate, up-to-date information for management decisions. Routine inspections will be conducted in accordance with ANSI A300 standards and ISA best management practices to assess tree health and identify potential risks. Data from the inventory and monitoring activities will be used to adjust planting strategies, maintenance schedules, and species selection, ensuring that management practices remain responsive to changing conditions. Annual reporting will summarize outcomes, track progress toward goals, and inform adaptive management priorities to support the long-term health and resilience of the urban forest.

✓ Success Indicators

- + Completion of annual or cyclical inspections for all managed trees
- + Documented updates to management actions based on monitoring findings
- + Decrease in preventable tree failures or mortality
- + Year-over-year improvement in tree condition ratings

Budgeting, Funding, and Program Sustainability

The program will develop a multi-year budget with clearly defined allocations for planting, maintenance, monitoring, and community engagement activities to ensure long-term program sustainability. Diversified funding sources will be pursued, including state and federal grants, municipal appropriations, utility partnerships, and collaborations with private or nonprofit organizations. Cost-tracking for labor, materials, and contracted services will be implemented to inform and refine future budgeting decisions. Where applicable, performance-based funding strategies—such as grants tied to canopy or program outcomes—will be used to align financial resources with measurable results and program priorities.

✓ Success Indicators

- + Secured funding that meets annual program needs
- + Percentage of budget allocated to proactive vs. reactive work
- + Increase in leveraged funding via grants or partnerships
- + Annual cost per tree maintained, tracked and stabilized or reduced over time



RECOMMENDATIONS & NEXT STEPS



The Urban Forest Management Plan's timeline for implementation is structured across three phases to ensure sustained and holistic progress.



Short-term (0-1 Year) priorities focus on foundational capacity building and addressing immediate needs, including growing internal capacity by hiring a certified arborist and adopting a dedicated budget based on the two scenarios discussed in the UFMP. This phase will also address the maintenance backlog in the 2nd and 3rd Districts and establish the long-term goal of 24% canopy cover, while forming a Tree Board for enhanced collaboration.



In the **Medium-term (1-3 Years)**, the focus shifts to strengthening protective policies by incorporating increased tree protection provisions into municipal code and development ordinances. Strategic planting efforts will be directed toward low-canopy areas, and species selection lists will be improved to increase diversity by reducing the use of overused species such as maples and invasive species. The medium term also includes developing a public outreach and education plan and seeking new partnerships.



Long-term (3+ Years & Ongoing) efforts are centered on sustaining and preserving the expanded urban forest, requiring a commitment to maintain planting goals of at least 500 trees per year (or two trees for every one removed) to work toward the 24% canopy goal. This phase will also implement a shift to proactive maintenance, including regular inspections and preventive care, and continue to increase species diversity to meet the 10-20-30 Rule benchmark.

Recommendation 1: Establish a Tree Board

Issue Statement: The City of Hammond has no formalized governing body to act as a liaison between the community and policy makers. Establishing a Tree Board will bring together stakeholder groups to advocate for the needs of Hammond's urban forest and assist in the implementation of the UFMP.

Actions:

- + Consult the Arbor Day Foundation's resources for Tree Boards: <https://www.arborday.org/media/14606/download>
- + Determine the number of board members, their roles, and term lengths
- + Draft a position description for Tree Board members including qualifications and responsibilities
- + Identify potential members from diverse backgrounds
- + Establish a regular meeting schedule and initial work plan

Recommendation 2: Adopt a five-year maintenance plan

Issue Statement: Having a budget and maintenance schedule improves efficiency, helps identify gaps in funding, and provides metrics for determining program success.

Actions:

- + Utilize the Tree Resource Assessment and Planting and Maintenance Plan chapters of the UFMP to estimate quantity and frequency of maintenance activities
- + Include external funding and partnerships in the final budget calculations
- + Design the budget and maintenance schedule to support other recommendations in the UFMP
- + Integrate good recordkeeping processes to track plan progress

Recommendation 3: Continue to inventory public trees citywide

Issue Statement: Begin a rolling inventory of the remaining four districts and maintain a centralized database to improve maintenance planning and long-term management.

Actions:

- + Identify funding sources to complete a full inventory of public trees
- + Develop bid specifications and issue an RFP for inventory services if needed
- + Establish procedures to regularly update a database of the tree population after maintenance activities are completed
- + Create a plan and timeline to complete cyclical re-inventory of Hammond's public trees

Recommendation 4: Formalize the tree work permit process

Issue Statement: Develop a standard operating procedure for receiving, reviewing, and following up with tree work permits, including criteria for approval or denial to ensure consistent and timely response to permit applications.

Actions:

- + Create a standard permit form; make available both hard copy and electronic
- + Determine the timeline for addressing permit requests, including pre- and post-work site visits
- + Create and maintain a database of all permit requests to identify trends

Recommendation 5: Grow internal capacity

Issue Statement: To decrease the maintenance backlog, the City should hire more urban forestry personnel to meet the national average staffing level. Additionally, internal capabilities could be strengthened by adding an ISA-certified arborist to the team or by supporting ongoing professional education for current staff.

Recommendation 6: Secure additional funding for urban forest management

Issue Statement: Changes in the City of Hammond’s general fund have resulted in a reduction of funds allocated to the Parks and Recreation Department, especially for urban forestry activities, necessitating the search for alternative funding sources.

Actions:

- + Assign funding and grant research and application responsibilities to members of a Tree Board
- + Utilize volunteers and stewardship programs to reduce the costs associated with the planting and care of young trees
- + Seek sponsorships from local businesses, corporations, and civic clubs to cover material costs
- + Enlist organizations such as the Legacy Foundation, ERI, and the United Way for grant writing and technical assistance
- + Pursue grants geared toward public health, emergency response, education, equity, wildlife habitat, and urban planning
- + Leverage cross-sector partners to qualify for grants open to non-profits, educational institutions, small businesses, etc.
- + Continue to seek grants at the state and federal levels
- + Urban Forestry Funding Sources & Resources: https://indiana.sharepoint.com/:w:/s/msteams_99e015/IQAqKve6T-KFT7j2EnY2FzgFAR8XiU2wbZN-L8EtLgUjar4?rttime=eTLJ0jJV3kg

Recommendation 7: Devise an outreach and engagement strategy

Issue Statement: While Hammond residents are passionate about the urban forest, there is a gap in knowledge and opportunities to participate.

Actions:

- + Schedule frequent social media posts on multiple platforms promoting urban forestry events and information; enlist internal and external partners to share posts to reach broader audiences
- + Increase visibility by tabling at public events
- + Make print and electronic publications easily accessible and multilingual
- + Regularly host education and volunteering events geared toward different audiences
- + Create multiple avenues for community members to submit feedback
- + Build transparency and community participation into decision making processes

Recommendation 8: Forge community partnerships

Issue Statement: The success of the City of Hammond's urban forest will require the participation of a variety of internal and external stakeholders.

Actions:

- + Use the suggestions included in this UFMP as a starting point
- + Designate a member of the Tree Board to act as community liaison
- + Identify shared goals with prospective partners
- + Include partners in planning and goal-setting processes

Recommendation 9: Establish a community stewardship program

Issue Statement: Growing canopy requires public support. As the City of Hammond commits to planting more trees, establishing a community stewardship program will improve the survival rate of young trees and provide job training for community youth.

Recommendation 10: Adopt tree preservation policies

Issue Statement: Revise the City of Hammond's tree policies in the municipal code of ordinances to include measures which prioritize the preservation of mature trees and greenspace in the face of development.

Recommendation 11: Update the Arboricultural Specification Manual

Issue Statement: The current Arboricultural Specification Manual was last revised in 2015 and is not readily available for community members.





Recommendation 12: Sustain planting new trees to grow canopy cover

Issue Statement: To prevent canopy loss, the City of Hammond should strive to maintain planting goals and continue to identify new planting locations.

Actions:

- + Adopt a canopy cover target and timeline
- + Leverage partnerships to increase canopy on private property
- + Maintain a planting rate of at least 500 trees per year or two trees planted for each tree removed, whichever is most appropriate
- + Follow species selection advice from this UFMP to maintain population diversity and resilience

Recommendation 13: Shift toward proactive maintenance

Issue Statement: As the City of Hammond reduces the backlog of priority maintenance needs, it should fully transition to a proactive and preventative management approach.

Actions:

- + Implement cyclical inspection schedules
- + Monitor emerging pests and diseases
- + Prioritize structural pruning and young tree training, which prevent structure issues from progressing

Recommendation 14: Assess progress and adapt

Issue Statement: Planning is an ongoing process and the needs of the City of Hammond’s urban forest will evolve over time. To remain on track, the City of Hammond should regularly review its goals and success indicators.





APPENDIX

APPENDIX A.

FIGURE 1. FIVE-YEAR BUDGET A

ACTIVITY COST			YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		FIVE YEAR
ACTIVITY	DIAMETER	COST/TREE	COUNT	COST	COUNT	COST	COUNT	COST	COUNT	COST	COUNT	COST	COST
High Priority Removals	1-3"	\$44	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
	4-6"	\$91	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
	7-12"	\$218	3	\$655	0	\$0	0	\$0	0	\$0	0	\$0	\$655
	13-18"	\$495	9	\$4,458	0	\$0	0	\$0	0	\$0	0	\$0	\$4,458
	19-24"	\$954	11	\$10,496	0	\$0	0	\$0	0	\$0	0	\$0	\$10,496
	25-30"	\$1,303	9	\$11,723	0	\$0	0	\$0	0	\$0	0	\$0	\$11,723
	31-36"	\$1,650	9	\$14,847	0	\$0	0	\$0	0	\$0	0	\$0	\$14,847
	37-42"	\$2,344	1	\$2,344	0	\$0	0	\$0	0	\$0	0	\$0	\$2,344
>43"	\$3,211	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
Activity Total(s)			42	\$44,524	0	\$0	0	\$0	0	\$0	0	\$0	\$44,524
Low Priority Removals	1-3"	\$44	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
	4-6"	\$91	0	\$0	0	\$0	2	\$182	0	\$0	0	\$0	\$182
	7-12"	\$218	0	\$0	0	\$0	32	\$6,989	0	\$0	0	\$0	\$6,989
	13-18"	\$495	0	\$0	15	\$7,430	13	\$6,439	0	\$0	0	\$0	\$13,868
	19-24"	\$954	0	\$0	17	\$16,221	0	\$0	0	\$0	0	\$0	\$16,221
	25-30"	\$1,303	0	\$0	9	\$11,723	0	\$0	0	\$0	0	\$0	\$11,723
	31-36"	\$1,650	0	\$0	8	\$13,198	0	\$0	0	\$0	0	\$0	\$13,198
	37-42"	\$2,344	0	\$0	4	\$9,376	0	\$0	0	\$0	0	\$0	\$9,376
>43"	\$3,211	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
Activity Total(s)			0	\$0	53	\$57,948	47	\$13,610	0	\$0	0	\$0	\$71,557
Stump Removals	1-3"	\$23	5	\$117	0	\$0	0	\$0	0	\$0	0	\$0	\$117
	4-6"	\$36	10	\$364	0	\$0	2	\$73	0	\$0	0	\$0	\$437
	7-12"	\$57	17	\$972	0	\$0	32	\$1,830	0	\$0	0	\$0	\$2,803
	13-18"	\$94	25	\$2,340	15	\$1,404	13	\$1,217	0	\$0	0	\$0	\$4,961
	19-24"	\$122	23	\$2,811	17	\$2,077	0	\$0	0	\$0	0	\$0	\$4,888
	25-30"	\$143	14	\$2,002	9	\$1,287	0	\$0	0	\$0	0	\$0	\$3,289
	31-36"	\$179	14	\$2,512	8	\$1,435	0	\$0	0	\$0	0	\$0	\$3,947
	37-42"	\$208	4	\$832	4	\$832	0	\$0	0	\$0	0	\$0	\$1,664
>43"	\$237	1	\$237	0	\$0	0	\$0	0	\$0	0	\$0	\$237	
Activity Total(s)			113	\$12,186	53	\$7,036	47	\$3,120	0	\$0	0	\$0	\$22,342
High Priority Pruning	1-3"	\$26	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
	4-6"	\$39	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
	7-12"	\$98	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
	13-18"	\$156	2	\$312	0	\$0	0	\$0	0	\$0	0	\$0	\$312
	19-24"	\$221	5	\$1,105	0	\$0	0	\$0	0	\$0	0	\$0	\$1,105
	25-30"	\$293	13	\$3,803	0	\$0	0	\$0	0	\$0	0	\$0	\$3,803
	31-36"	\$397	11	\$4,362	0	\$0	0	\$0	0	\$0	0	\$0	\$4,362
	37-42"	\$494	6	\$2,964	0	\$0	0	\$0	0	\$0	0	\$0	\$2,964
>43"	\$787	3	\$2,301	0	\$0	0	\$0	0	\$0	0	\$0	\$2,301	
Activity Total(s)			40	\$14,846	0	\$0	0	\$0	0	\$0	0	\$0	\$14,846
Routine Inspection	Drive-by Assessment	\$5	12,600	\$63,000	12,600	\$63,000	12,600	\$63,000	12,600	\$63,000	12,600	\$63,000	\$315,000
	Walk-by Assessment	\$10	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	\$70,000
Activity Total(s)			1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	\$70,000
Young Tree Training (3-year Cycle)	1-3"	\$26	190	\$4,931	190	\$4,931	190	\$4,931	690	\$17,931	690	\$17,931	\$50,657
	4-6"	\$39	77	\$3,003	77	\$3,003	77	\$3,003	77	\$3,003	77	\$3,003	\$15,015
	7-12"	\$98	20	\$1,950	20	\$1,950	20	\$1,950	20	\$1,950	20	\$1,950	\$9,750
Activity Total(s)			287	\$9,884	287	\$9,884	287	\$9,884	787	\$22,884	787	\$22,884	\$75,422
Routine Pruning (5-year Cycle)	1-3"	\$26	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
	4-6"	\$39	0	\$0	0	\$0	4	\$140	4	\$140	4	\$140	\$421
	7-12"	\$98	0	\$0	0	\$0	21	\$2,087	21	\$2,087	21	\$2,087	\$6,260
	13-18"	\$156	0	\$0	0	\$0	51	\$7,987	51	\$7,987	51	\$7,987	\$23,962
	19-24"	\$221	0	\$0	0	\$0	43	\$9,503	43	\$9,503	43	\$9,503	\$28,509
	25-30"	\$293	0	\$0	0	\$0	38	\$11,232	38	\$11,232	38	\$11,232	\$33,696
	31-36"	\$397	0	\$0	0	\$0	19	\$7,534	19	\$7,534	19	\$7,534	\$22,601
	37-42"	\$494	0	\$0	0	\$0	8	\$3,853	8	\$3,853	8	\$3,853	\$11,560
>43"	\$787	0	\$0	0	\$0	6	\$4,602	6	\$4,602	6	\$4,602	\$13,806	
Activity Total(s)			0	\$0	0	\$0	190	\$46,938	190	\$46,938	190	\$46,938	\$140,813
Replacement Tree Planting and Maintenance	Purchasing	\$150	113	\$16,950	53	\$7,950	47	\$7,050	0	\$0	0	\$0	\$31,950
	Planting	\$500	113	\$56,500	53	\$26,500	47	\$23,500	0	\$0	0	\$0	\$106,500
	Watering & Mulching	\$216	113	\$24,408	53	\$11,448	47	\$10,152	0	\$0	0	\$0	\$46,008
Activity Total(s)			339	\$97,858	159	\$45,898	141	\$40,702	0	\$0	0	\$0	\$184,458
New Tree Planting and Maintenance	Purchasing	\$150	373	\$55,950	433	\$64,950	439	\$65,850	486	\$72,900	486	\$72,900	\$332,550
	Planting	\$500	373	\$186,500	433	\$216,500	439	\$219,500	486	\$243,000	486	\$243,000	\$1,108,500
	Watering & Mulching	\$216	373	\$80,568	433	\$93,528	439	\$94,824	486	\$104,976	486	\$104,976	\$478,872
Activity Total(s)			1,119	\$323,018	1,299	\$374,978	1,317	\$380,174	1,458	\$420,876	1,458	\$420,876	\$1,919,922
Natural Mortality (1%)	Tree Removal	\$495	14	\$6,934	14	\$6,934	14	\$6,934	14	\$6,934	14	\$6,934	\$34,671
	Stump Removal	\$94	14	\$1,310	14	\$1,310	14	\$1,310	14	\$1,310	14	\$1,310	\$6,552
	Replacement Tree	\$866	14	\$12,124	14	\$12,124	14	\$12,124	14	\$12,124	14	\$12,124	\$60,620
Activity Total(s)			42	\$20,369	42	\$20,369	42	\$20,369	42	\$20,369	42	\$20,369	\$101,843
Activity Grand Total			3,382	\$536,685	3,293	\$530,112	3,471	\$528,796	3,877	\$525,067	3,877	\$525,067	\$2,645,727
Cost Grand Total				\$536,685		\$530,112		\$528,796		\$525,067		\$525,067	\$2,645,727

FIGURE 2. FIVE-YEAR BUDGET B

ACTIVITY COST			YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		FIVE YEAR	
ACTIVITY	DIAMETER	COST/TREE	COUNT	COST	COUNT	COST	COUNT	COST	COUNT	COST	COUNT	COST	COST	
High Priority Removals	1-3"	\$44	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
	4-6"	\$91	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
	7-12"	\$218	3	\$655	0	\$0	0	\$0	0	\$0	0	\$0	\$655	
	13-18"	\$495	9	\$4,458	0	\$0	0	\$0	0	\$0	0	\$0	\$4,458	
	19-24"	\$954	11	\$10,496	0	\$0	0	\$0	0	\$0	0	\$0	\$10,496	
	25-30"	\$1,303	9	\$11,723	0	\$0	0	\$0	0	\$0	0	\$0	\$11,723	
	31-36"	\$1,650	9	\$14,847	0	\$0	0	\$0	0	\$0	0	\$0	\$14,847	
	37-42"	\$2,344	1	\$2,344	0	\$0	0	\$0	0	\$0	0	\$0	\$2,344	
>43"	\$3,211	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0		
Activity Total(s)			42	\$44,524	0	\$0	0	\$0	0	\$0	0	\$0	\$44,524	
Low Priority Removals	1-3"	\$44	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
	4-6"	\$91	0	\$0	0	\$0	2	\$182	0	\$0	0	\$0	\$182	
	7-12"	\$218	0	\$0	0	\$0	32	\$6,989	0	\$0	0	\$0	\$6,989	
	13-18"	\$495	0	\$0	15	\$7,430	13	\$6,439	0	\$0	0	\$0	\$13,868	
	19-24"	\$954	0	\$0	17	\$16,221	0	\$0	0	\$0	0	\$0	\$16,221	
	25-30"	\$1,303	0	\$0	9	\$11,723	0	\$0	0	\$0	0	\$0	\$11,723	
	31-36"	\$1,650	0	\$0	8	\$13,198	0	\$0	0	\$0	0	\$0	\$13,198	
	37-42"	\$2,344	0	\$0	4	\$9,376	0	\$0	0	\$0	0	\$0	\$9,376	
>43"	\$3,211	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0		
Activity Total(s)			0	\$0	53	\$57,948	47	\$13,610	0	\$0	0	\$0	\$71,557	
Stump Removals	1-3"	\$23	5	\$117	0	\$0	0	\$0	0	\$0	0	\$0	\$117	
	4-6"	\$36	10	\$364	0	\$0	2	\$73	0	\$0	0	\$0	\$437	
	7-12"	\$57	17	\$972	0	\$0	32	\$1,830	0	\$0	0	\$0	\$2,803	
	13-18"	\$94	25	\$2,340	15	\$1,404	13	\$1,217	0	\$0	0	\$0	\$4,961	
	19-24"	\$122	23	\$2,811	17	\$2,077	0	\$0	0	\$0	0	\$0	\$4,888	
	25-30"	\$143	14	\$2,002	9	\$1,287	0	\$0	0	\$0	0	\$0	\$3,289	
	31-36"	\$179	14	\$2,512	8	\$1,435	0	\$0	0	\$0	0	\$0	\$3,947	
	37-42"	\$208	4	\$832	4	\$832	0	\$0	0	\$0	0	\$0	\$1,664	
>43"	\$237	1	\$237	0	\$0	0	\$0	0	\$0	0	\$0	\$237		
Activity Total(s)			113	\$12,186	53	\$7,036	47	\$3,120	0	\$0	0	\$0	\$22,342	
High Priority Pruning	1-3"	\$26	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
	4-6"	\$39	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
	7-12"	\$98	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
	13-18"	\$156	2	\$312	0	\$0	0	\$0	0	\$0	0	\$0	\$312	
	19-24"	\$221	5	\$1,105	0	\$0	0	\$0	0	\$0	0	\$0	\$1,105	
	25-30"	\$293	13	\$3,803	0	\$0	0	\$0	0	\$0	0	\$0	\$3,803	
	31-36"	\$397	11	\$4,362	0	\$0	0	\$0	0	\$0	0	\$0	\$4,362	
	37-42"	\$494	6	\$2,964	0	\$0	0	\$0	0	\$0	0	\$0	\$2,964	
>43"	\$767	3	\$2,301	0	\$0	0	\$0	0	\$0	0	\$0	\$2,301		
Activity Total(s)			40	\$14,846	0	\$0	0	\$0	0	\$0	0	\$0	\$14,846	
Routine Inspection	Drive-by Assessment	\$5	12,600	\$63,000	12,600	\$63,000	12,600	\$63,000	12,600	\$63,000	12,600	\$63,000	\$315,000	
	Walk-by Assessment	\$10	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	\$70,000	
Activity Total(s)			1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	1,400	\$14,000	\$70,000	
Young Tree Training (3-year Cycle)	1-3"	\$1	190	\$190	190	\$190	190	\$190	190	\$190	190	\$190	\$1,948	
	4-6"	\$2	77	\$154	77	\$154	77	\$154	77	\$154	77	\$154	\$770	
	7-12"	\$6	20	\$120	20	\$120	20	\$120	20	\$120	20	\$120	\$600	
Activity Total(s)			287	\$464	287	\$464	287	\$464	287	\$464	287	\$464	\$3,318	
Routine Pruning (5-year Cycle)	1-3"	\$1	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0	
	4-6"	\$2	0	\$0	0	\$0	4	\$7	4	\$7	4	\$7	\$22	
	7-12"	\$6	0	\$0	0	\$0	21	\$128	21	\$128	21	\$128	\$385	
	13-18"	\$156	0	\$0	0	\$0	51	\$7,987	51	\$7,987	51	\$7,987	\$23,962	
	19-24"	\$221	0	\$0	0	\$0	43	\$9,503	43	\$9,503	43	\$9,503	\$28,509	
	25-30"	\$293	0	\$0	0	\$0	38	\$11,232	38	\$11,232	38	\$11,232	\$33,696	
	31-36"	\$397	0	\$0	0	\$0	19	\$7,534	19	\$7,534	19	\$7,534	\$22,601	
	37-42"	\$494	0	\$0	0	\$0	8	\$3,853	8	\$3,853	8	\$3,853	\$11,560	
>43"	\$767	0	\$0	0	\$0	6	\$4,602	6	\$4,602	6	\$4,602	\$13,806		
Activity Total(s)			0	\$0	0	\$0	190	\$44,847	190	\$44,847	190	\$44,847	\$134,540	
Replacement Tree Planting and Maintenance	Purchasing	\$100	113	\$11,300	53	\$5,300	47	\$4,700	0	\$0	0	\$0	\$21,300	
	Planting	\$8	113	\$893	53	\$419	47	\$371	0	\$0	0	\$0	\$1,683	
	Watering & Mulching	\$94	113	\$10,622	53	\$4,982	47	\$4,418	0	\$0	0	\$0	\$20,022	
Activity Total(s)			339	\$22,815	159	\$10,701	141	\$9,489	0	\$0	0	\$0	\$43,005	
New Tree Planting and Maintenance	Purchasing	\$100	373	\$37,300	433	\$43,300	439	\$43,900	486	\$48,600	486	\$48,600	\$221,700	
	Planting	\$8	373	\$2,947	433	\$3,421	439	\$3,468	486	\$3,839	486	\$3,839	\$17,514	
	Watering & Mulching	\$94	373	\$35,062	433	\$40,702	439	\$41,266	486	\$45,684	486	\$45,684	\$208,398	
Activity Total(s)			1,119	\$75,309	1,299	\$87,423	1,317	\$88,634	1,458	\$98,123	1,458	\$98,123	\$447,612	
Natural Mortality (1%)	Tree Removal	\$495	14	\$6,934	14	\$6,934	14	\$6,934	14	\$6,934	14	\$6,934	\$24,671	
	Stump Removal	\$94	14	\$1,310	14	\$1,310	14	\$1,310	14	\$1,310	14	\$1,310	\$6,552	
	Replacement Tree	\$202	14	\$2,827	14	\$2,827	14	\$2,827	14	\$2,827	14	\$2,827	\$14,133	
Activity Total(s)			42	\$11,071	42	\$11,071	42	\$11,071	42	\$11,071	42	\$11,071	\$55,356	
Activity Grand Total			3,382		3,293		3,471		3,877		3,877		907,100	
Cost Grand Total					\$195,214		\$188,641		\$185,234		\$169,005		\$169,005	\$907,100

APPENDIX B. TREE INVENTORY ANALYSIS REPORTS

Percent of Individual Trees by Species

Species	Number of Trees	Percent of Population
Silver maple (<i>Acer saccharinum</i>)	584	15.2%
Red maple (<i>Acer rubrum</i>)	417	10.8%
Callery pear (<i>Pyrus calleryana</i>)	288	7.5%
Green ash (<i>Fraxinus pennsylvanica</i>)	178	4.6%
Norway maple (<i>Acer platanoides</i>)	157	4.1%
Siberian elm (<i>Ulmus pumila</i>)	154	4.0%
Elm spp (<i>Ulmus</i>)	140	3.6%
Thornless honeylocust (<i>Gleditsia triacanthos v. inermis</i>)	136	3.5%
Apple spp (<i>Malus</i>)	110	2.9%
Freeman maple (<i>Acer x freemanii</i>)	94	2.4%
White mulberry (<i>Morus alba</i>)	81	2.1%
Plum spp (<i>Prunus</i>)	71	1.8%
Northern red oak (<i>Quercus rubra</i>)	69	1.8%
Northern hackberry (<i>Celtis occidentalis</i>)	60	1.6%
Japanese tree lilac (<i>Syringa reticulata</i>)	59	1.5%
American basswood (<i>Tilia americana</i>)	59	1.5%
Sugar maple (<i>Acer saccharum</i>)	53	1.4%
Hawthorn spp (<i>Crataegus</i>)	47	1.2%
American sycamore (<i>Platanus occidentalis</i>)	45	1.2%
Blue spruce (<i>Picea pungens</i>)	44	1.1%
Eastern redbud (<i>Cercis canadensis</i>)	37	1.0%
Pin oak (<i>Quercus palustris</i>)	37	1.0%
River birch (<i>Betula nigra</i>)	35	<0.1%
Northern catalpa (<i>Catalpa speciosa</i>)	35	<0.1%
Sweetgum (<i>Liquidambar styraciflua</i>)	35	<0.1%
Norway spruce (<i>Picea abies</i>)	32	<0.1%
White oak (<i>Quercus alba</i>)	32	<0.1%
Kentucky Coffee tree (<i>Gymnocladus dioica</i>)	31	<0.1%
Eastern cottonwood (<i>Populus deltoides</i>)	30	<0.1%
Northern white cedar (<i>Thuja occidentalis</i>)	29	<0.1%
Serviceberry spp (<i>Amelanchier</i>)	28	<0.1%
Ginkgo (<i>Ginkgo biloba</i>)	28	<0.1%
Eastern red cedar (<i>Juniperus virginiana</i>)	25	<0.1%
White spruce (<i>Picea glauca</i>)	25	<0.1%
Austrian pine (<i>Pinus nigra</i>)	25	<0.1%
Bur oak (<i>Quercus macrocarpa</i>)	25	<0.1%
Chinkapin oak (<i>Quercus muehlenbergii</i>)	25	<0.1%
Swamp white oak (<i>Quercus bicolor</i>)	23	<0.1%
Hedge maple (<i>Acer campestre</i>)	21	<0.1%

Benefits Summary of Trees by Species

Location: Hammond, Lake, Indiana, United States of America
 Project: Hammond, IN, Series: HammondIN2025, Year: 2025
 Generated: 10/16/2025

Species	# of Trees	Carbon Storage (ton)	Carbon Storage (\$)	Gross Carbon Sequestration (ton/yr)	Gross Carbon Sequestration (\$/yr)	Avoided Runoff (gal/yr)	Avoided Runoff (\$/yr)	Pollution Removal (ton/yr)	Pollution Removal (\$/yr)	Replacement Value (\$)
Hedge maple	21	2.97	1,285.39	0.07	32.15	2,044.49	18.27	0.00	116.06	20,356.00
Freeman maple	94	37.14	16,071.47	1.15	496.15	21,054.63	188.14	0.04	1,195.18	209,910.79
Amur maple	15	2.94	1,270.21	0.05	22.91	1,194.04	10.67	0.00	67.78	12,455.32
Boxelder	4	1.10	477.91	0.03	14.97	619.84	5.54	0.00	35.19	2,850.36
Black maple	7	2.99	1,294.47	0.07	28.33	1,082.22	9.67	0.00	61.43	20,168.59
Japanese maple	13	0.61	264.12	0.02	6.92	233.33	2.09	0.00	13.25	4,850.54
Norway maple	157	66.81	28,911.91	1.72	742.36	16,729.07	149.49	0.03	949.64	424,154.33
Red maple	417	84.04	36,365.20	3.35	1,448.65	35,133.38	313.95	0.07	1,994.37	516,962.78
Silver maple	584	807.62	349,480.15	9.76	4,221.86	203,594.08	1,819.32	0.39	11,557.15	2,104,682.80
Sugar maple	53	29.27	12,666.78	0.39	169.25	9,049.65	80.87	0.02	513.71	152,941.73
Ohio buckeye	8	7.62	3,295.58	0.14	61.48	1,551.40	13.86	0.00	88.07	33,914.38
Horse chestnut	1	0.09	38.26	0.00	1.77	86.63	0.77	0.00	4.92	667.21
Tree of heaven	18	20.12	8,707.38	0.28	119.59	2,763.52	24.69	0.01	156.87	19,389.51
Serviceberry spp	28	0.84	365.62	0.05	23.40	287.91	2.57	0.00	16.34	7,245.63
Smooth service berry	1	0.17	75.25	0.01	2.82	48.36	0.43	0.00	2.74	794.67
River birch	35	33.95	14,692.53	0.51	218.81	6,686.71	59.75	0.01	379.58	119,597.93
Paper birch	1	0.16	67.34	0.01	2.30	37.02	0.33	0.00	2.10	253.59
European white birch	5	0.89	383.78	0.04	17.49	676.34	6.04	0.00	38.39	4,271.91
European hornbeam	7	0.46	197.17	0.02	9.25	254.86	2.28	0.00	14.47	2,078.49
American hornbeam	16	0.41	177.09	0.02	8.81	366.71	3.28	0.00	20.82	2,247.44
Bitternut hickory	3	0.03	14.83	0.00	1.25	30.63	0.27	0.00	1.74	276.75
Shagbark hickory	1	0.00	1.86	0.00	0.23	3.69	0.03	0.00	0.21	33.75
Northern catalpa	35	16.08	6,958.48	0.31	136.11	7,111.10	63.54	0.01	403.67	38,926.75
Eastern redbud	37	2.25	975.44	0.05	22.41	806.38	7.21	0.00	45.77	13,622.54
Northern hackberry	60	2.55	1,101.39	0.07	29.40	5,717.90	51.10	0.01	324.58	62,758.49
Sawara cypress	1	0.01	3.54	0.00	0.32	33.06	0.30	0.00	0.78	47.61
Alternateleaf dogwood	2	0.00	0.70	0.00	0.27	3.38	0.03	0.00	0.19	77.21
Smoke tree	8	0.23	100.38	0.02	9.24	76.28	0.68	0.00	4.33	949.15
Flowering dogwood	6	0.10	42.47	0.01	3.42	41.94	0.37	0.00	2.38	928.37

APPENDIX C

METHODOLOGY AND ACCURACY ASSESSMENT

Davey Resource Group Classification Methodology

Davey Resource Group utilized an object-based image analysis (OBIA) semi-automated feature extraction method to process and analyze current high-resolution color infrared (CIR) aerial imagery and remotely-sensed data to identify tree canopy cover and land cover classifications. The use of imagery analysis is cost-effective and provides a highly accurate approach to assessing your community's existing tree canopy coverage. This supports responsible tree management, facilitates community forestry goal-setting, and improves urban resource planning for healthier and more sustainable urban environments.

Advanced image analysis methods were used to classify, or separate, the land cover layers from the overall imagery. Artificial intelligence is used to get an object-oriented approach to cluster together objects with similar spectral (i.e., color) and spatial/contextual (e.g., texture, size, shape, pattern, and spatial association) characteristics. The land cover results of the extraction process was post-processed and clipped to each project boundary prior to the manual editing process in order to create smaller, manageable, and more efficient file sizes. Secondary source data, high-resolution aerial imagery provided by each UTC city, and custom ArcGIS® tools were used to aid in the final manual editing, quality checking, and quality assurance processes (QA/QC). The manual QA/QC process was implemented to identify, define, and correct any misclassifications or omission errors in the final land cover layer.

Classification Workflow

1. Prepare imagery for feature extraction (resampling, rectification, etc.), if needed.
2. Gather training set data for all desired land cover classes (canopy, impervious, grass, bare soil, water).
3. Run AI on training samples to get a land coverage layer. Export the resulting layer and separate each land cover class for editing.
4. Edit and finalize canopy layer at 1:2000 scale. A point file is created to digitize-in small individual trees that will be missed during the extraction. These points are buffered to represent the tree canopy. This process is done to speed up editing time and improve accuracy by including smaller individual trees.
5. Edit the impervious layer to reflect actual impervious features, such as roads, buildings, parking lots, etc. to update features.
6. Using canopy and actual impervious surfaces as a mask; input the bare soils training data and extract them from the imagery. Quickly edit the layer to remove or add any features. Davey Resource Group tries to delete dry vegetation areas that are associated with lawns, grass/meadows, and agricultural fields.
7. Edit the water layer to reflect existing natural water features.
8. Use geoprocessing tools to clean, repair, and clip all edited land cover layers to remove any self-intersections or topology errors that sometimes occur during editing.
9. Input canopy, impervious, bare soil, and hydrology layers into Davey Resource Group's Five-Class Land Cover Model to complete the classification. This model generates the pervious (grass/low-lying vegetation) class by taking all other areas not previously classified and combining them.
10. Thoroughly inspect final land cover dataset for any classification errors and correct as needed.
11. Perform accuracy assessment. Repeat Step 11, if needed.

Automated Feature Extraction Files

The automated feature extraction (AFE) files allow other users to run the extraction process by replicating the methodology. Since Feature Analyst does not contain all geoprocessing operations that Davey Resource Group utilizes, the AFE only accounts for part of the extraction process. Using Feature Analyst, Davey Resource Group created the training set data, ran the extraction, and then smoothed the features to alleviate the blocky appearance. To complete the actual extraction process, Davey Resource Group uses additional geoprocessing tools within ArcGIS®. From the AFE file results, the following steps are taken to prepare the extracted data for manual editing.

1. Davey Resource Group fills all holes in the canopy that are less than 30 square meters. This eliminates small gaps that were created during the extraction process while still allowing for natural canopy gaps.
2. Davey Resource Group deletes all features that are less than 9 square meters for canopy (50 square meters for impervious surfaces). This process reduces the amount of small features that could result in incorrect classifications and also helps computer performance.
3. The Repair Geometry, Dissolve, and Multipart to Singlepart (in that order) geoprocessing tools are run to complete the extraction process.
4. The Multipart to Singlepart shapefile is given to GIS personnel for manual editing to add, remove, or reshape features.

Accuracy Assessment Protocol

Land Cover Classification	Code Value
Tree Canopy	1
Impervious	2
Pervious (Grass/Vegetation)	3
Bare Soil	4
Open Water	5

Determining the accuracy of spatial data is of high importance to Davey Resource Group and our clients. To achieve the best possible result, Davey Resource Group manually edits and conducts thorough QA/QC checks on all urban tree canopy and land cover layers. A QA/QC process will be completed using ArcGIS® to identify, clean, and correct any misclassification or topology errors in the final land cover dataset. The initial land cover layer extractions will be edited at a 1:2000 quality control scale in the urban areas and at a 1:2500 scale for rural areas utilizing the most current high-resolution aerial imagery to aid in the quality control process.

To test for accuracy, random plot locations are generated throughout the city area of interest and verified to ensure that the data meet the client standards. Each point will be compared with the most current NAIP high-resolution imagery (reference image) to determine the accuracy of the final land cover layer. Points will be classified as either correct or incorrect and recorded in a classification matrix. Accuracy will be assessed using four metrics: overall accuracy, kappa, quantity disagreement, and allocation disagreement. These metrics are calculated using a custom Excel® spreadsheet.

Land Cover Accuracy

The following describes Davey Resource Group’s accuracy assessment techniques and outlines procedural steps used to conduct the assessment.

1. Random Point Generation—Using ArcGIS, 1000 random assessment points are generated.
2. Point Determination—Each point is carefully assessed by the GIS analyst for likeness with the aerial photography. To record findings, two new fields, CODE and TRUTH, are added to the accuracy assessment point shapefile. CODE is a numeric value (1–5) assigned to each land cover class (Table 1) and TRUTH is the actual land cover class as identified according to the reference image. If CODE and TRUTH are the same, then the point is counted as a correct classification. Likewise, if the CODE and TRUTH are not the same, then the point is classified as incorrect. In most cases, distinguishing if a point is correct or incorrect is straightforward. Points will rarely be misclassified by an egregious classification or editing error. Often incorrect points occur where one feature stops and the other begins.
3. Classification Matrix—During the accuracy assessment, if a point is considered incorrect, it is given the correct classification in the TRUTH column. Points are first assessed on the NAIP imagery for their correctness using a “blind” assessment—meaning that the analyst does not know the actual classification (the GIS analyst is strictly going off the NAIP imagery to determine cover class). Any incorrect classifications found during the “blind” assessment are scrutinized further using sub-meter imagery provided by the client to determine if the point was incorrectly classified due to the fuzziness of the NAIP imagery or an actual misclassification. After all random points are assessed and recorded; a classification (or confusion) matrix is created. The classification matrix for this project is presented in Table 2. The table allows for assessment of user’s/producer’s accuracy, overall accuracy, omission/commission errors, kappa statistics, allocation/quantity disagreement, and confidence intervals (Figure 1 and Table 3).

Classes	Tree Canopy	Impervious Surfaces	Grass & Low-Lying Vegetation	Bare Soils	Open Water	Row Total	Producer's Accuracy	Errors of Omission
Tree Canopy	152	3	5	0	0	160	95.00%	5.00%
Impervious	1	457	0	2	0	460	99.35%	0.65%
Grass/Vegetation	6	14	281	0	0	301	93.36%	6.64%
Bare Soils	0	2	1	25	0	28	89.29%	10.71%
Water	0	0	2	0	49	51	96.08%	3.92%
Column Total	159	476	289	27	49	1000		
User's Accuracy	95.60%	96.01%	97.23%	92.59%	100.00%		Overall Accuracy	96.40%
Errors of Commission	4.40%	3.99%	2.77%	7.41%	0.00%		Kappa Coefficient	0.9459

4. Following are descriptions of each statistic as well as the results from some of the accuracy assessment tests.

Overall Accuracy - Percentage of correctly classified pixels; for example, the sum of the diagonals divided by the total points $((152+457+281+25+49)/1000 = 96.40\%)$.

User's Accuracy - Probability that a pixel classified on the map actually represents that category on the ground (correct land cover classifications divided by the column total $[152/159 = 95.60\%]$).

Producer's Accuracy - Probability of a reference pixel being correctly classified (correct land cover classifications divided by the row total $[152/160 = 95.00\%]$).

Kappa Coefficient - A statistical metric used to assess the accuracy of classification data. It has been generally accepted as a better determinant of accuracy partly because it accounts for random chance agreement. A value of 0.80 or greater is regarded as "very good" agreement between the land cover classification and reference image.

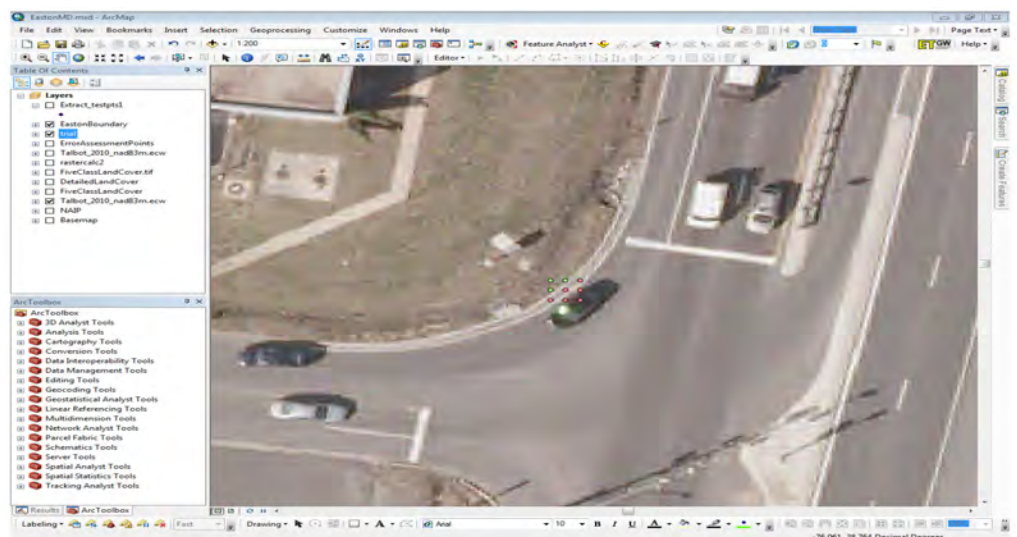
Errors of Commission - A pixel reports the presence of a feature (such as trees) that, in reality, is absent (no trees are actually present). This is termed as a false positive. In the matrix below, we can determine that 4.40% of the area classified as canopy is most likely not canopy.

Errors of Omission - A pixel reports the absence of a feature (such as trees) when, in reality, they are actually there. In the matrix below, we can conclude that 5.00% of all canopy classified is actually classified as another land cover class.

Allocation Disagreement - The amount of difference between the reference image and the classified land cover map that is due to less than optimal match in the spatial allocation (or position) of the classes.

Quantity Disagreement - The amount of difference between the reference image and the classified land cover map that is due to less than perfect match in the proportions (or area) of the classes.

Confidence Intervals - A confidence interval is a type of interval estimate of a population parameter and is used to indicate the reliability of an estimate. Confidence intervals consist of a range of values (interval) that act as good estimates of the unknown population parameter based on the observed probability of successes and failures. Since all assessments have innate error, defining a lower and upper bound estimate is essential.



Confidence Intervals

Class	Hectares	Percentage	Lower Bound	Upper Bound
Tree Canopy	2,495.6	16.3%	16.0%	16.6%
Impervious Surfaces	7,325.5	47.9%	47.5%	48.3%
Grass & Low-Lying Vegetation	4,256.6	27.9%	27.5%	28.2%
Bare Soils	322.4	2.1%	2.0%	2.2%
Open Water	881.7	5.8%	5.6%	6.0%
Total	15,281.8	100.00%		

Statistical Metrics Summary

Overall Accuracy =	96.40%
Kappa Coefficient =	0.9459
Allocation Disagreement =	2%
Quantity Disagreement =	2%

Accuracy Assessment

Class	User's Accuracy	Lower Bound	Upper Bound	Producer's Accuracy	Lower Bound	Upper Bound
Tree Canopy	95.6%	94.0%	97.2%	95.0%	93.3%	96.7%
Impervious Surfaces	96.0%	95.1%	96.9%	99.3%	99.0%	99.7%
Grass & Low-Lying Vegetation	97.2%	96.3%	98.2%	93.4%	91.9%	94.8%
Bare Soils	92.6%	87.6%	97.6%	89.3%	83.4%	95.1%
Open Water	100.0%	100.0%	100.0%	96.1%	93.4%	98.8%

PRIORITY PLANTING ANALYSIS

Summary

The purpose of this feature class is to create a priority planting plan for Hammond, Indiana. This layer identifies and prioritizes possible locations based on stormwater mitigation, heat island mitigation, and social equity.

Description

To help Hammond, Indiana increase its canopy coverage by community, an urban tree canopy assessment was conducted to determine the current land cover. This landcover was used to find the most suitable locations to plant trees. These locations were narrowed down to spaces over 25 sqft. This analysis creates locations to plant trees based available space and planting variable priority.

Data Quality

Planting sites and priority levels are generalized based on data derived from the Priority Planting analysis. No field verification of planting sites was conducted. Before planting, the city will need to conduct site assessments to ensure planting locations can adequately sustain planting trees.

Lineage

This process uses available planting space by finding open grass and base soil area. Non feasible areas such as recreation fields, agriculture, high voltage power line corridors, etc. were removed from the grass and bare soil areas. The remaining areas are considered potential planting areas and then are prioritized using stormwater, temperature, and social equity variables.

Fields

SQFT – the square feet area of each planting space

UniqueID - unique identifying number of planting space

StormMean - Stormwater mean rank (mean rank of 0-4)

StormPriority - Stormwater priority rank

HeatMean - Heat Island mean rank (mean rank of 0-4)

HeatPriority - Heat Island priority rank

RaceMean – Minority population mean rank (mean rank of 0-4)

RacePriorit – Minority population priority rank

IncomeMean - Income mean rank (mean rank of 0-4)

IncomePriority – Income priority rank

DensityMean – Population density total mean rank (mean rank of 0-4)

DensityPriority – Population density total priority rank

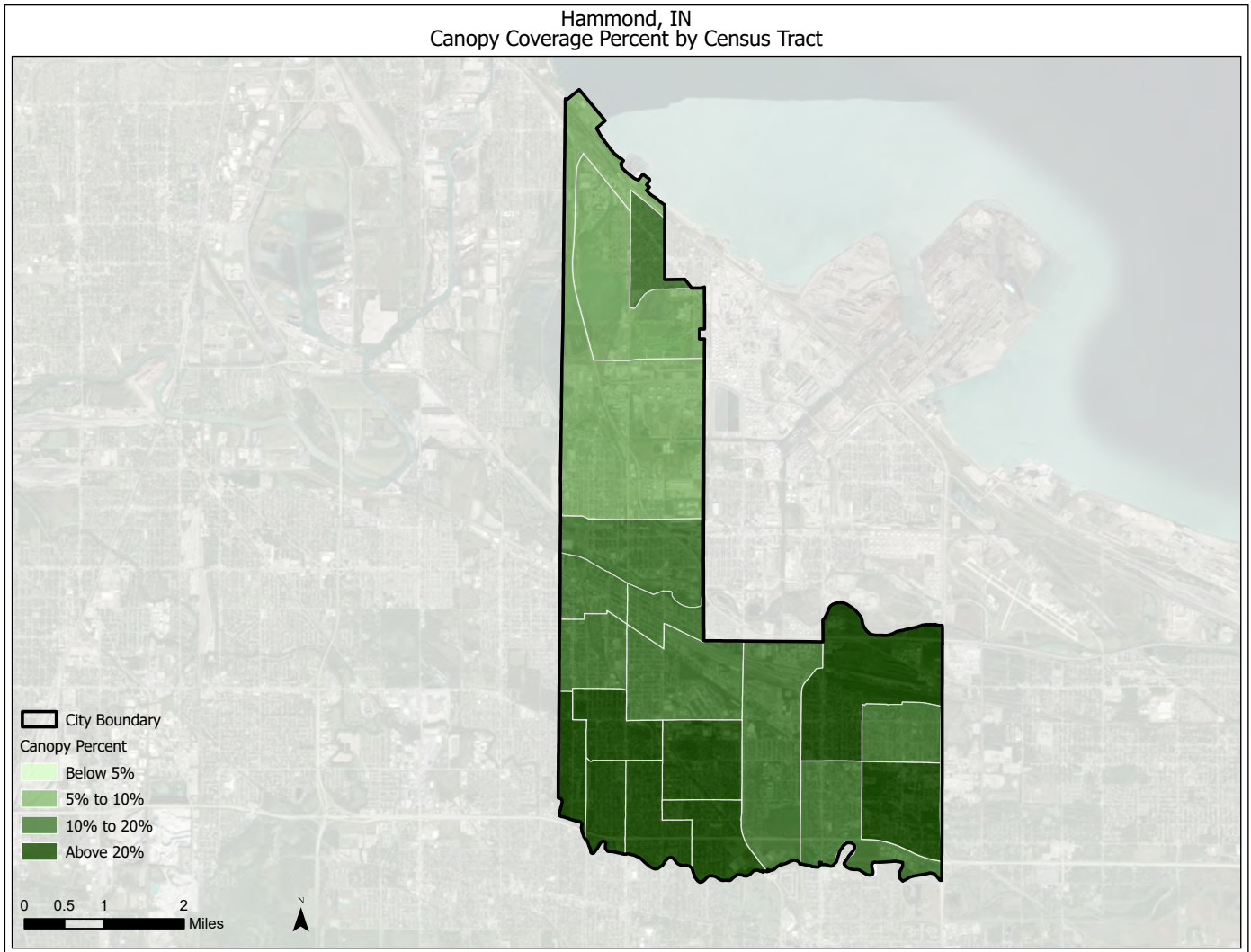
SocialCompositeMean - Social equity composite (population, income, race) mean rank (mean rank of 0-4)

SocialCompositePriority - Social equity composite (population, income, race) priority rank

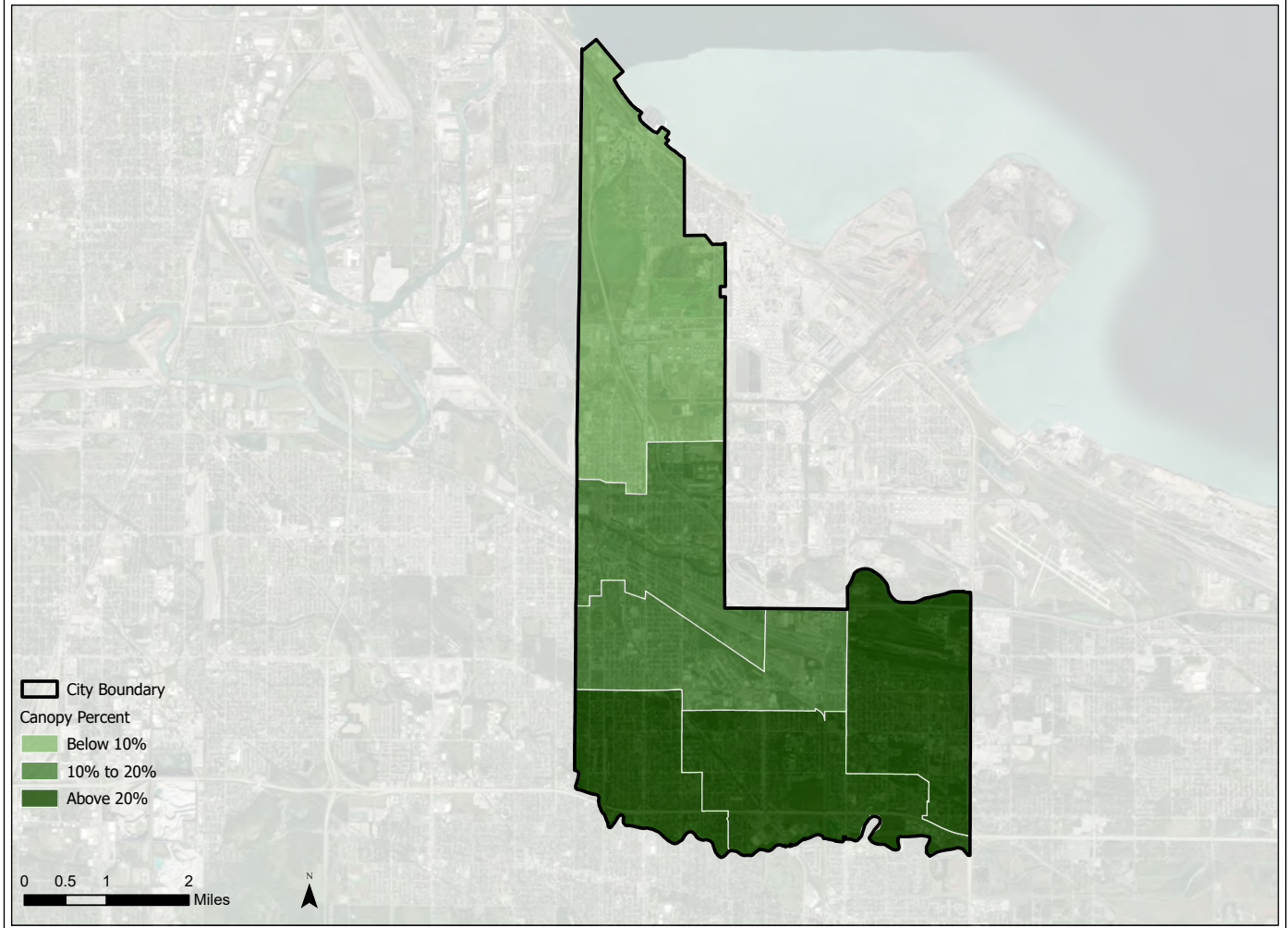
CompositeMean - Overall composite (Stormwater, heat island, social equity) mean rank (mean rank of 0-4)

CompositePriority - Overall composite (Stormwater, heat island, social equity) priority rank

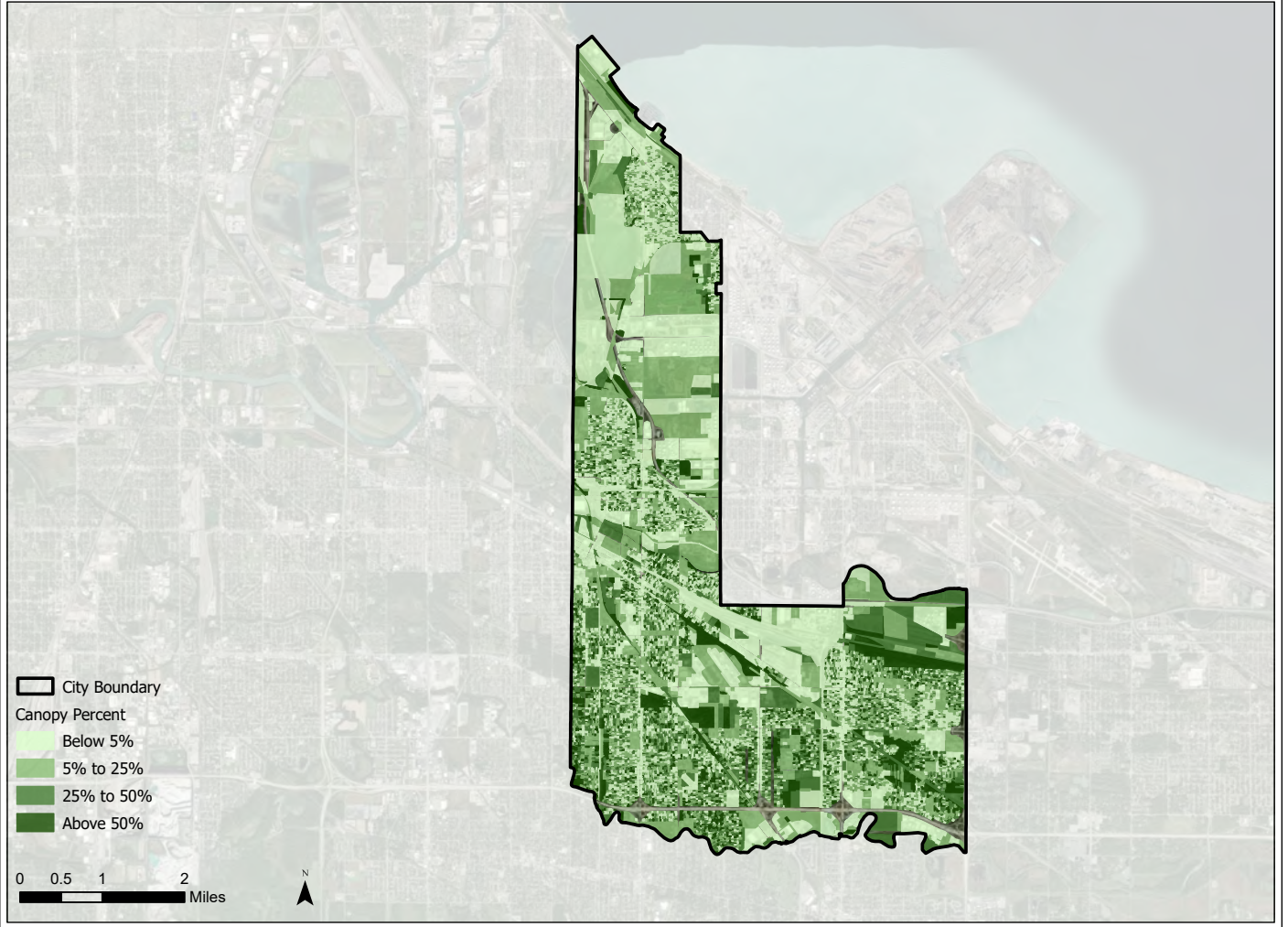
APPENDIX D. VARIABLE MAPS



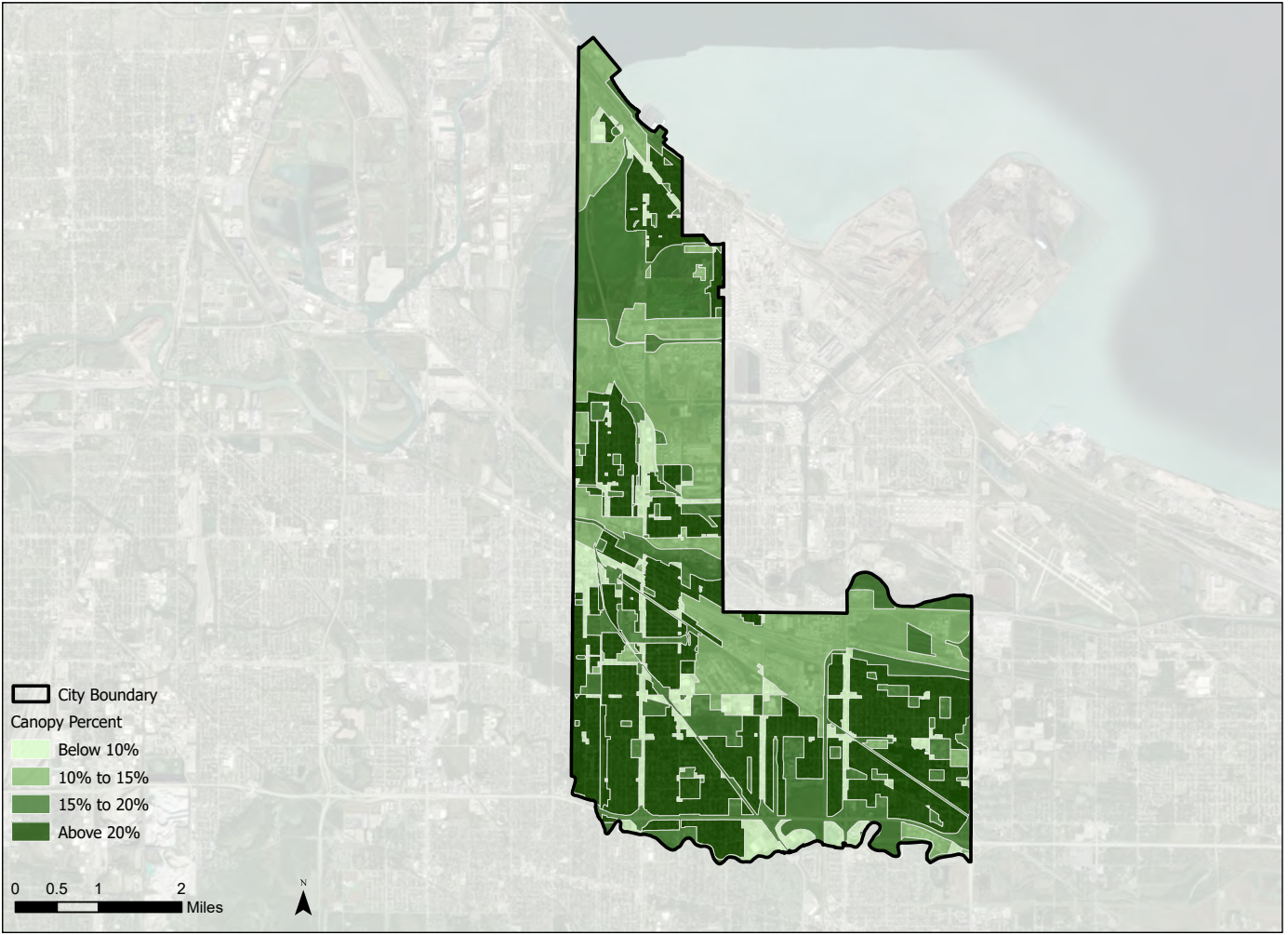
Hammond, IN
Canopy Coverage Percent by Council District



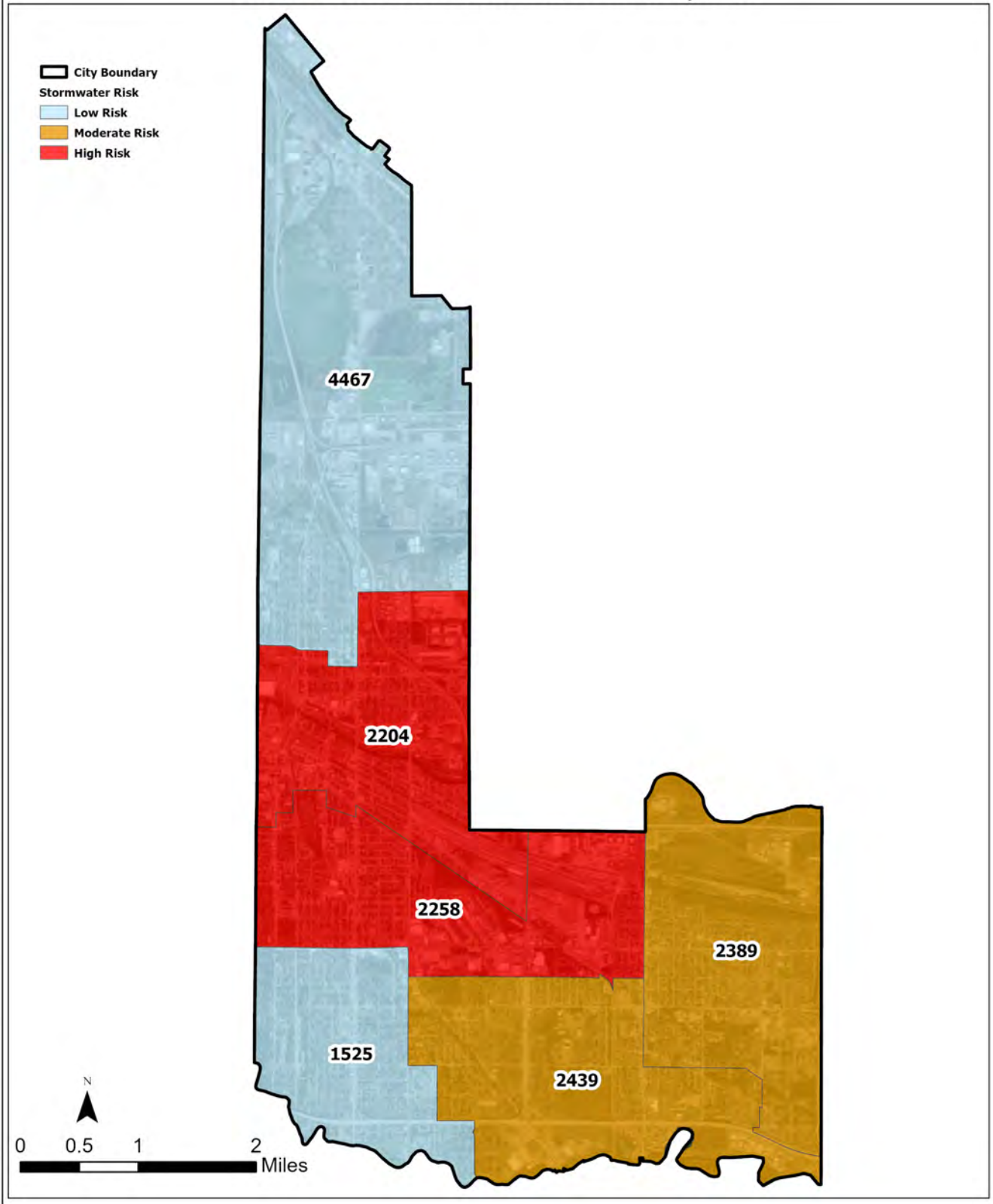
Hammond, IN
Canopy Coverage Percent by Parcel



Hammond, IN
Canopy Coverage Percent by Zoning



Hammond, IN Council District Stormwater Risk Impacts



Priority Planting Levels for Hammond - Flooding Risk

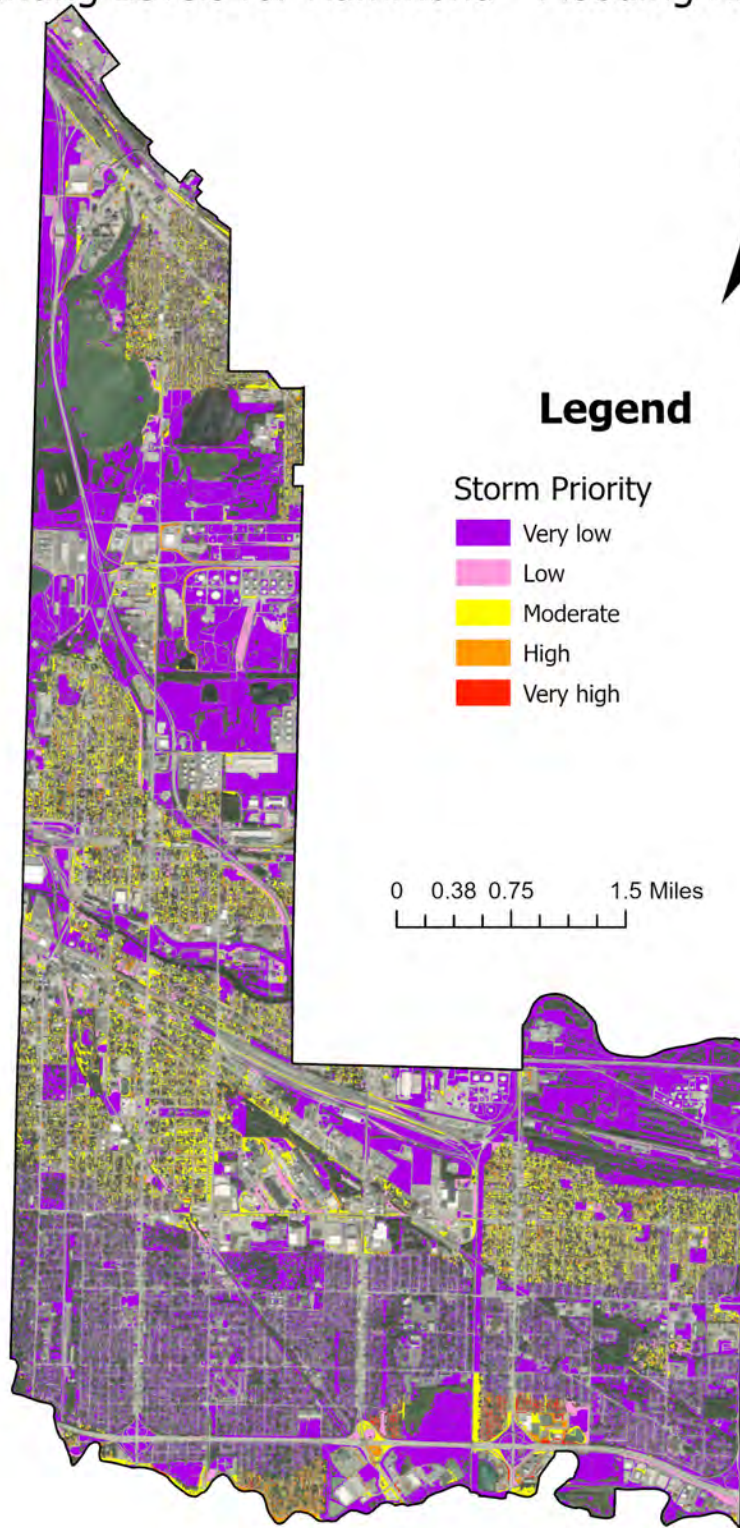


Legend

Storm Priority

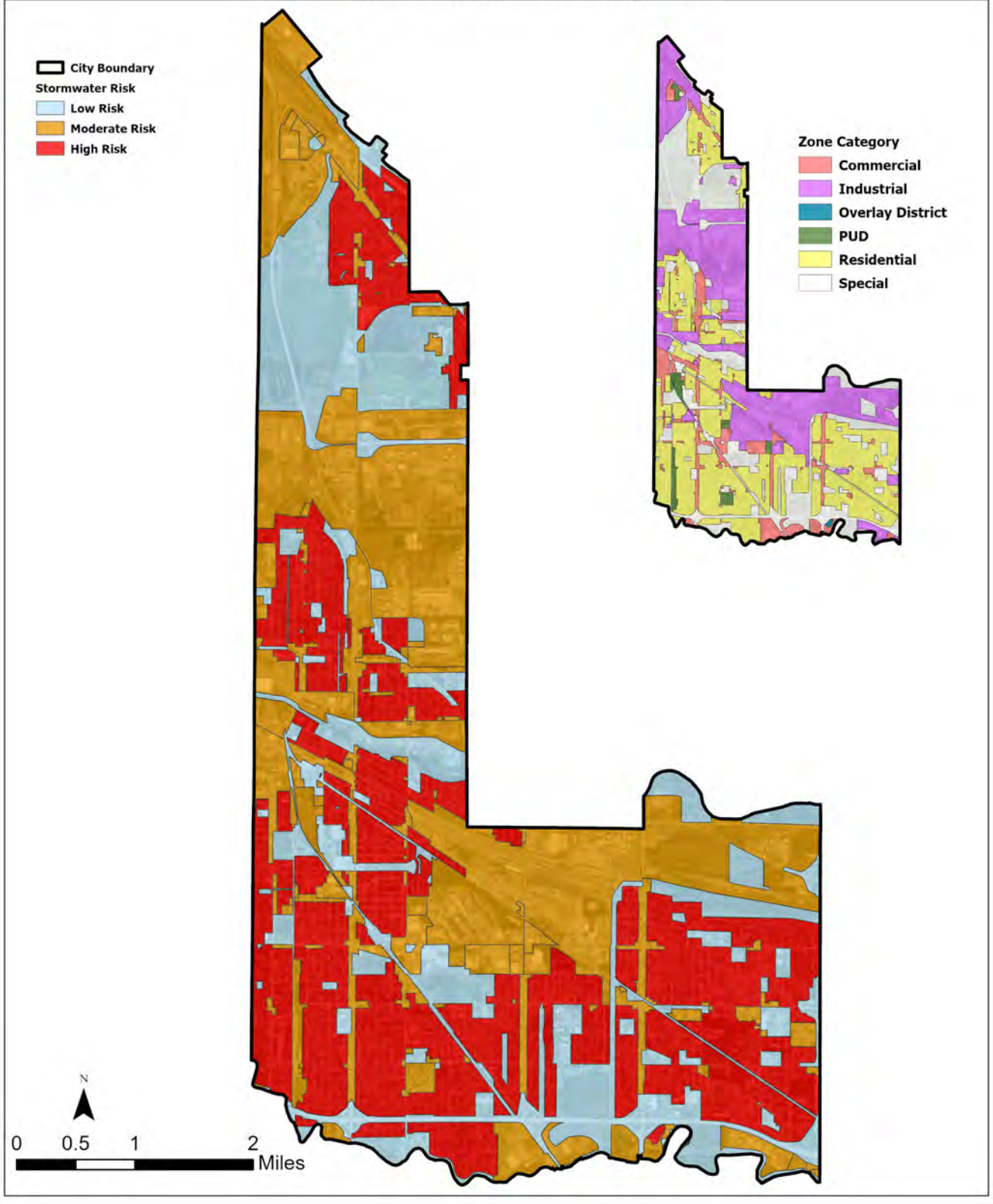
- Very low
- Low
- Moderate
- High
- Very high

0 0.38 0.75 1.5 Miles

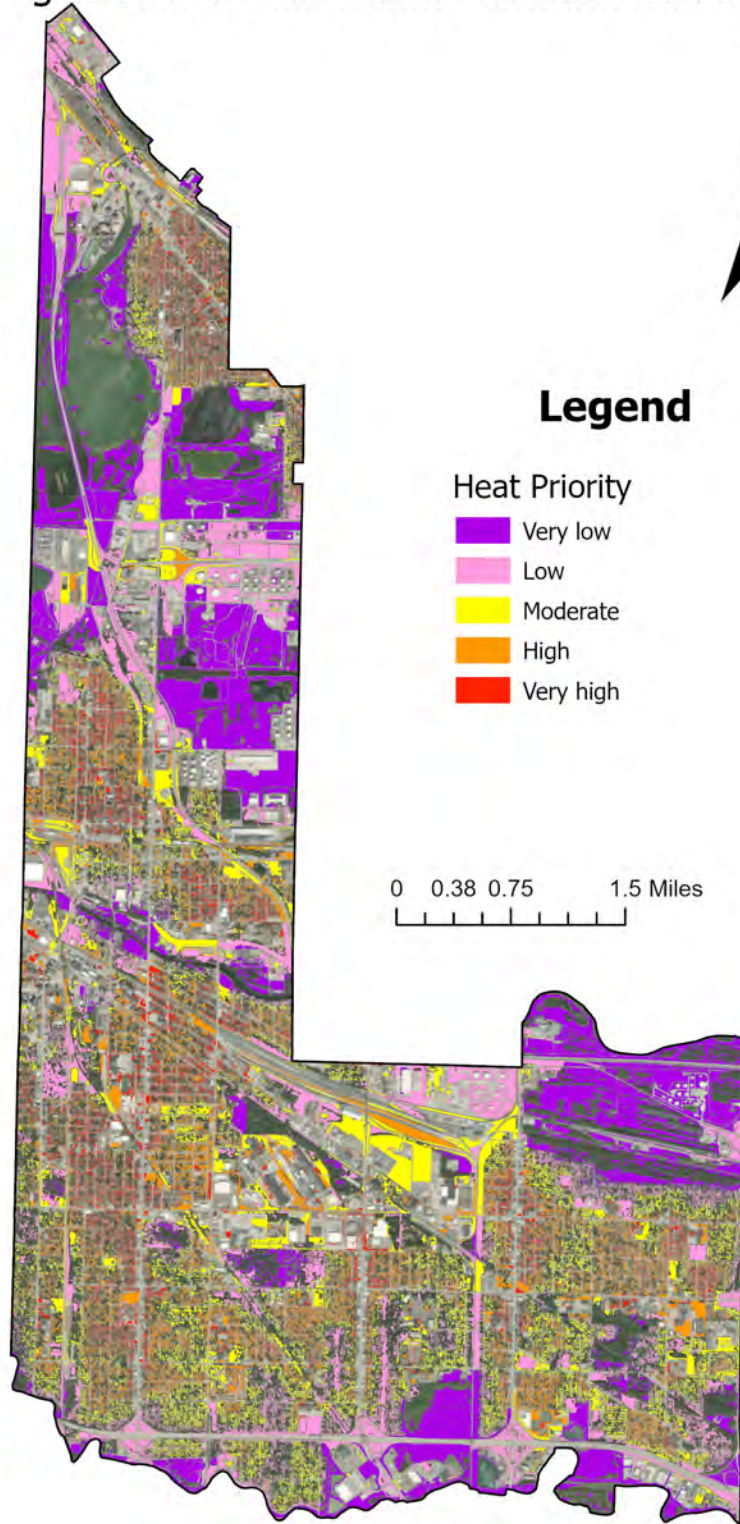


IGIO, Maxar

Hammond, IN Zoning Stormwater Risk Impacts



Priority Planting Levels for Hammond - Urban Heat Island



Legend

- Heat Priority
- Very low
 - Low
 - Moderate
 - High
 - Very high

0 0.38 0.75 1.5 Miles

IGIO, Earthstar Geographics

Priority Planting Levels for Hammond

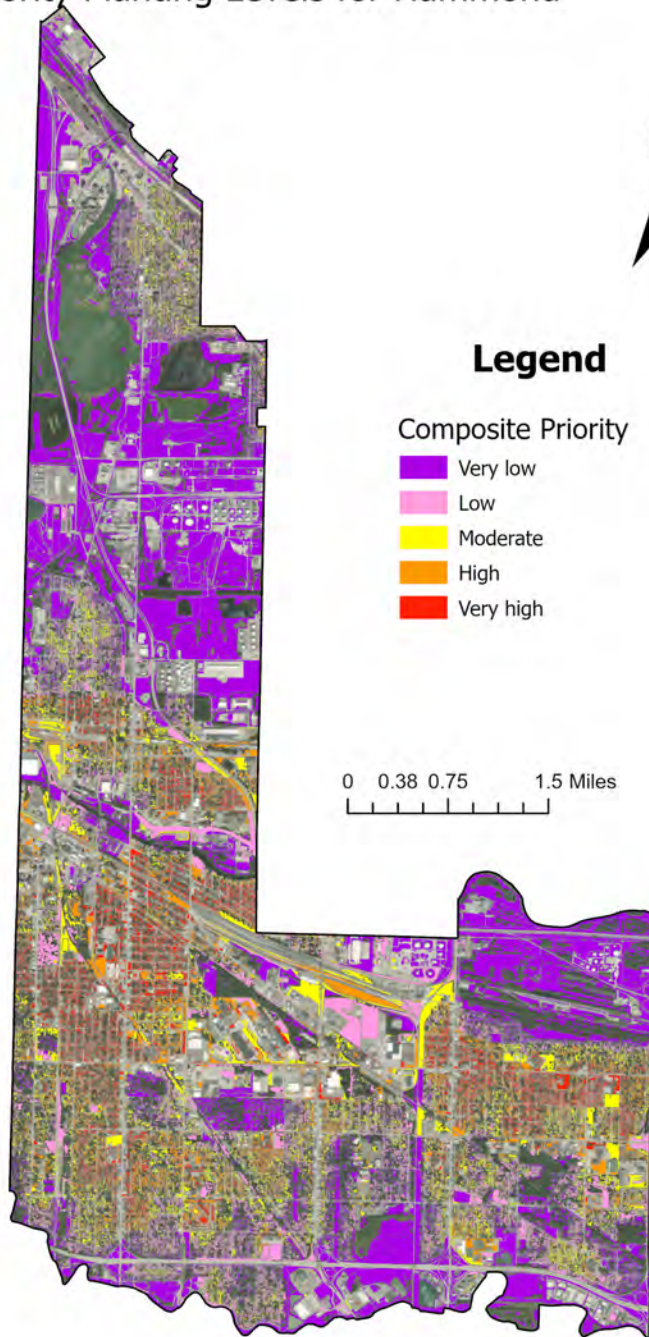


Legend

Composite Priority

- Very low
- Low
- Moderate
- High
- Very high

0 0.38 0.75 1.5 Miles



IGIO, Earthstar Geographics



APPENDIX E.

DATA COLLECTION

DRG collects tree inventory data using a customized ArcPad program, called Rover, loaded onto pen-based field computers. At each site, the following data fields were collected:

- | | |
|-------------------------------|----------------------------|
| + Address | + Multi-Stem |
| + Comments | + Overhead Utilities |
| + Condition | + Park Name |
| + Defect | + Primary Maintenance Need |
| + Further Inspection Required | + Residual Risk |
| + Hardscape Damage | + Risk Rating |
| + Inventory Date | + Size* |
| + Level 2 Assessment Complete | + Species |
- * measured in inches in diameter at 4.5 feet above ground or diameter at standard height (DSH)].*

Maintenance needs are based on Best Management Practices: Tree Risk Assessment (International Society of Arboriculture 2011). The knowledge, experience, and professional judgment of DRG's arborists ensure the high quality of inventory data.

Equipment and Base Maps

Inventory arborists use FZ-G1 Panasonic Toughbook® units with internal GPS receivers. Geographic information system (GIS) map layers are loaded onto these units to help locate sites during the inventory. Arborists use a combination of GPS location data and aerial background imagery to locate and place each site.

Addressing

In addition to XY geographic coordinates for each inventoried site, addressing information was also collected during the inventory. While geographic coordinates allow spatial representation of the data within a geographic information system, such as TreeKeeper® or ArcMap, addressing information allows each site to be located in the field without use of a GPS. The following fields were collected as part of the addressing of each site:

- ✦ **Address:** The numeric address of the parcel nearest to the site. This field is automatically filled by the data collection program where parcel addressing is available. When parcel addressing was not available, the arborist used their best judgement to assign a logical address number to the site.
- ✦ **Suffix:** Indicates whether the arborist needed to manually assign an address number to the site. If the arborist added the address number manually, this field reads “X”. If the data collection program assigned an address number, this field is left blank.
- ✦ **Street:** The street to which the assigned parcel is addressed. The Address and Street fields, together, provide the street address of the site (e.g., 111 Example Rd.). The street is usually assigned by the data collection program based on parcel data included in the program.
- ✦ **On Street:** The street on which the site is physically located. Assigned by the data collection program.
- ✦ **Side:** Indicates on what side of the parcel a site is physically located. Assigned by the arborist, this field can read front, side, rear, median, or N/A.
- ✦ **Front** – The site is located on the front side of the parcel. The Street and On Street names should match.
- ✦ **Side** – The site is located on the side of the parcel. The Street and On Street names will likely not match.
- ✦ **Rear** – The site is located on the rear side of the parcel, which only happens when a parcel occupies the full space between two roads. The Street and On Street names will not match.
- ✦ **Median** – The site is located in a median. Technically, sites located in medians do not have addresses but are assigned to the closest parcel address to aid in finding them in the field. All median sites will have Suffix = X.
- ✦ **N/A** – The site is located in a park or other public grounds rather than along the street ROW. Since these sites may be anywhere within a public grounds parcel, a side designation is not necessarily useful and is omitted.

RISK ASSESSMENT

Every tree, regardless of defects, condition, location, and other factors, has an inherent risk of whole or partial tree failure. Risk assessment seeks to provide a metric of the level of risk associated with any given tree to allow for risk management to be undertaken by a tree manager. The current editions of ANSI A300 (Clause 13) standards and the ISA's associated publication Best Management Practices: Tree Risk Assessment were used to guide an organized, systematic, and reproducible method for assessing tree risk.

Trees can have multiple modes of potential failure with varying levels of risk associated with each. During the inventory, the mode of failure with the greatest associated risk was recorded as the overall risk rating for the tree. The specified time frame for the risk assessment was one year.

Risk ratings can help tree managers set priorities and organize tree work. Generally, trees with higher risk ratings should be maintained or removed first, to lower the risk and liability associated with these trees. It is up to the tree manager to decide what level of risk is acceptable and under what circumstances.

Levels of Risk Assessment

Arborists assess tree risk using different tools and at different levels of detail. ISA best management practices suggest three levels of risk assessment, from least to most intensive.

Level 1: Limited Visual Assessment

A walk-by or drive-by assessment designed to quickly scan a large population of trees and identify those which need a more advanced assessment due to defects with an imminent or probable likelihood of failure. Level 1 assessments do not typically result in risk ratings but rather provide a list of tree locations with any recommended remedial action. A recommendation for which trees should be assessed at the next level of assessment may be recommended. This method may be a good option when funding for a full inventory and risk assessment is not available or after major storms when a rapid survey of damage is needed.

Level 2: Basic Assessment

A detailed, 360-degree visual inspection of individual trees assessing the site, roots, trunk, and branches resulting in an assessment of the tree's health and a risk rating that can be used to prioritize tree work within a large population of trees. DRG applies level two guidelines during most inventories and rapid tree assessments.

Level 3: Advanced Assessment

Additional inspection following a Basic Assessment that uses specialized equipment to provide more detailed information about an individual tree, typically to help make management decisions about that specific tree. Advanced assessments may require use of a bucket truck to reach defects in the crown of the tree, equipment, and experience to perform sonic tomography to map decay pockets, or sampling of diseased plant tissue for identification in a lab, to name a few examples.

PROCESS OF RISK ASSESSMENT

The primary components of a risk assessment in line with the current editions of ANSI A300 (Clause 13) standards and the ISA's Best Management Practices: Tree Risk Assessment are as follows.

Time Frame

Tree risk should be assessed within a specified time frame. Since all trees are likely to experience whole or partial tree failure at some point during their existence, and since conditions of a tree and site can change dramatically over time, setting a specific time frame for risk assessment is essential to conveying risk accurately and determining appropriate management practices. Most risk assessments will have a specific time frame of one to three years. Predictive power decreases as time increases, so assessments are not typically done for more than a five-year period.

Likelihood of Failure

The first step in assessing tree risk involves determining the likelihood that the tree or tree part will fail within the specified time frame. Site factors, such as slope, soil texture and saturation, and recent grading or tree removals, are considered in tandem with tree factors such as health, species-specific failure profile, damage, and structural defects. The likelihood of failure is then characterized as either:

- ✦ **Improbable** – The tree or tree part is not likely to fail during normal weather conditions and may not fail in extreme weather conditions within the specified time frame.
- ✦ **Possible** – Failure may be expected in extreme weather conditions, but it is unlikely during normal weather conditions within the specified time frame.
- ✦ **Probable** – Failure may be expected under normal weather conditions within the specified time frame

Likelihood of Target Impact

The next step is to determine how likely it is that the tree or tree part in question will impact a target if it fails. This involves consideration of the potential targets located around a tree, which may include fixed structures such as houses or playground equipment with a constant occupancy rate and mobile targets such as people or vehicles with lower occupancy rates, as well as an assessment of where a tree or tree part will land if it fails. The likelihood of target impact is then characterized as either:

- ✦ **Very Low** – The chance of the failed tree or tree part impacting the specified target is remote.
- ✦ **Low** – There is a slight chance that the failed tree or tree part will impact the target.
- ✦ **Medium** – The failed tree or tree part could impact the target, but it is not expected to do so.
- ✦ **High** – The failed tree or tree part is likely to impact the target.

Combined Likelihood of Failure & Target Impact

LIKELIHOOD OF FAILURE	LIKELIHOOD OF IMPACTING TARGET			
	VERY LOW	LOW	MEDIUM	HIGH
IMMINENT	<i>Unlikely</i>	<i>Somewhat Likely</i>	<i>Likely</i>	<i>Very Likely</i>
PROBABLE	<i>Unlikely</i>	<i>Unlikely</i>	<i>Somewhat Likely</i>	<i>Likely</i>
POSSIBLE	<i>Unlikely</i>	<i>Unlikely</i>	<i>Unlikely</i>	<i>Somewhat Likely</i>
IMPROBABLE	<i>Unlikely</i>	<i>Unlikely</i>	<i>Unlikely</i>	<i>Unlikely</i>

The likelihood of failure and the likelihood of impacting a target are combined using the matrix below to determine the likelihood of failure impacting a target.

Consequence of Failure & Target Impact

The consequences of a tree failing and striking a target are a function of the value of the target and the amount of injury, damage, or disruption that could be caused by the failure and impact. Considerations when determining potential consequences include the size of the part which may fail, the fall distance, characteristics of the target, and whether there are any structures which may protect the target. Consequences of failure and target impact are characterized as either:

- ✦ **Negligible** – Does not result in personal injury, involves low-value property damage, or disruptions that can be replaced or repaired.
- ✦ **Minor** – Involves minor personal injury, low- to moderate-value property damage, or small disruption of activities.
- ✦ **Significant** – Involves substantial personal injury, property damage of moderate- to high-value, or considerable disruption of activities.
- ✦ **Severe** – Involves serious personal injury, high-value property damage, or major disruption of important activities.

Risk Rating

The combined likelihood of failure & target impact is then combined with the consequence of failure & target impact in the matrix, below, to produce a risk rating. There may be multiple modes of potential tree failure and multiple targets to consider, and each combination of failure and target will result in a different risk rating. The overall highest risk rating is usually used as the risk rating for the tree

LIKELIHOOD OF FAILURE & TARGET IMPACT	CONSEQUENCES			
	NEGLIGIBLE	MINOR	SIGNIFICANT	SEVERE
VERY LIKELY	<i>Low</i>	<i>Moderate</i>	<i>High</i>	<i>Extreme</i>
LIKELY	<i>Low</i>	<i>Moderate</i>	<i>High</i>	<i>Extreme</i>
SOMEWHAT LIKELY	<i>Low</i>	<i>Low</i>	<i>Moderate</i>	<i>Moderate</i>
UNLIKELY	<i>Low</i>	<i>Low</i>	<i>Low</i>	<i>Low</i>

Risk Mitigation, Prioritization, and Residual Risk

Once a risk rating is assigned, the final step is to determine whether risk mitigation is necessary and prioritize risk mitigation work. Extreme and High Risk trees should be managed first, followed by Moderate Risk trees as time and budgets allow, or as deemed necessary by the tree manager. Low Risk trees can typically be maintained during routine maintenance cycles or when time and budgets allow.

Risk mitigation can take many forms. Common methods of mitigation include tree removal or pruning to remove parts that may fail. Other forms of mitigation may include cabling and/or bracing weak branch unions, moving targets such as sheds or play equipment outside the anticipated impact zone, excluding targets from the impact zone using fencing or other barriers, and/or monitoring the tree. Ultimately, it is up to the tree manager to decide what mitigation techniques are appropriate for each tree and what level of risk is acceptable.

Residual risk is the risk remaining after mitigation and considering the residual risk after a mitigation action may help tree managers determine the best actions to take. For example, a tree with a large dead limb over a busy intersection might have a High-Risk rating, but removal of that limb would sufficiently mitigate the risk such that the residual risk is low. In this case, it may be best to remove the dead limb but retain the tree. In other cases, there may not be any mitigation option short of tree removal which will reduce risk to an acceptable level, in which case the tree should be removed.

GLOSSARY OF TERMS

Adaptive Management

An approach to urban forest management that uses monitoring, data collection, and evaluation to adjust strategies and practices over time in response to changing conditions, performance outcomes, and community needs.

ANSI A300 Standards

National tree care standards developed by the American National Standards Institute (ANSI) that define best practices for tree pruning, planting, maintenance, and risk assessment.

Arboricultural Specification Manual

A City-adopted document that establishes standards and specifications for tree planting, pruning, maintenance, removal, and protection, consistent with accepted arboricultural best management practices.

TreeKeeper® Asset Management Software

A GIS-based system used to store, manage, and update tree inventory data, inspection records, maintenance history, and work planning information.

Canopy Cover / Tree Canopy Cover

The percentage of land area covered by the crowns of trees when viewed from above, typically measured using aerial imagery.

Canopy Cover Target / Tree Canopy Goal

A measurable and time-bound objective established by the City to guide long-term strategies for increasing or maintaining urban tree canopy cover.

Carbon Sequestration

The process by which trees absorb carbon dioxide from the atmosphere and store it as carbon in biomass, helping mitigate climate change.

Community Stewardship Program

An organized initiative that engages residents, volunteers, and partner organizations in tree planting, watering, monitoring, education, and long-term care.

Community Working Group (CWG)

A representative group of residents, stakeholders, City staff, and partners convened to provide input, guidance, and feedback during development of the Urban Forest Management Plan.

Extreme / High / Moderate / Low Risk

Categories used in tree risk assessment to describe the combined likelihood of tree failure, likelihood of impact, and potential consequences if failure occurs.

Environmental Justice / Tree Equity

The principle that all communities should have fair access to the environmental, public health, and quality-of-life benefits provided by trees and green infrastructure.

Heritage Tree

A tree meeting defined size, species, age, or cultural significance criteria that receives the highest level of protection under municipal policy.

Infrastructure Clearance Guidelines

Minimum recommended distances between trees and nearby utilities, streets, sidewalks, buildings, and other infrastructure to reduce conflicts and ensure public safety.

International Society of Arboriculture (ISA) Certified Arborist

A professional credential awarded by the ISA indicating demonstrated knowledge and competency in tree biology, care, maintenance, and risk assessment.

Mitigation

Required actions—such as replacement planting or payment of a fee in lieu—that offset the removal or loss of protected or public trees.

Priority Maintenance

Tree work recommendations ranked by urgency based on risk, condition, and potential impacts to public safety or infrastructure.

Preferred Plantable Area

Land identified as suitable for long-term tree establishment based on space availability, land use, and the absence of major infrastructure conflicts.

Proactive Maintenance

Planned, cyclical tree care activities conducted to prevent hazards, improve tree health, and reduce long-term costs, rather than responding only to complaints or emergencies.

Protected Tree

A tree meeting specific criteria—such as size, species, or location—that is subject to removal restrictions and additional regulatory review.

Reactive Maintenance

Tree care activities performed in response to emergencies, storm damage, public complaints, or immediate safety concerns.

Residual Risk

The level of risk that remains after mitigation measures (such as pruning or removal) have been implemented.

Risk Assessment / Tree Risk Assessment

A systematic evaluation of tree condition and potential failure using observation, professional judgment, and accepted standards such as ANSI A300 and ISA Best Management Practices.

Routine Maintenance / Routine Pruning Cycle

Regular, scheduled tree care—typically on a five-year cycle—for mature trees to maintain structure, health, and clearance.

Stormwater Management

The role of trees in intercepting rainfall, reducing surface runoff, and improving water quality through increased infiltration and evapotranspiration.

Street Tree / Public Tree

A tree located within the public right-of-way, parks, or other publicly owned land and managed by or under the authority of the City.

Structural Pruning

Pruning performed to improve branch structure, attachment strength, spacing, and long-term stability of trees.

Tree Board

An appointed advisory body that provides guidance on urban forestry policy, planning, education, and community engagement.

Tree Inventory

A systematic, GIS-based record of trees documenting location, species, size, condition, risk rating, and recommended maintenance.

Tree Ordinance

Municipal regulations governing the planting, maintenance, protection, and removal of trees within City jurisdiction.

Tree Removal Permit

Formal authorization required for the removal or substantial alteration of public or protected trees, except in designated emergency situations.

Tree Risk Assessment Qualification (TRAQ)

An advanced ISA credential demonstrating specialized training in evaluating tree risk and recommending mitigation options.

Tree Stewardship

Responsible care, management, and protection of trees to ensure long-term health, safety, and environmental benefits.

Urban Forest

The collective network of trees, shrubs, and associated vegetation within the City, including those on public and private land.

Urban Forest Management Plan (UFMP)

A strategic planning document that guides the long-term care, protection, expansion, and sustainable management of the City's urban forest.

