

Tree Ordinance and Policy Recommendations

June 12, 2017

The Honorable Mayor Fournier and
Members of the City Commission:

For fiscal year 2016-2017, the city commission created an objective to investigate options for preserving or increasing the number of trees including tree replacement requirements for developers and a citywide tree replacement fund. The tree ordinance report examines the city's current practices, defines the issue, assesses the benefits of a healthy urban forest, conducts a cost-benefit analysis, and constructs and evaluates alternative solutions to the problem (Attachment 1).

Royal Oak has 30.5 percent tree canopy coverage. However, in the last three years, approximately 1,800 trees have been removed by the city, while only 250 have been replaced. This year, 190 trees are planned to be planted. Additionally, the city's tree planting program has sold an average of 93.4 trees per year to residents. In order to live up to its distinction as a "Tree City, USA," Royal Oak must aggressively address the loss of its canopy coverage.

Trees yield a considerable number of benefits to a community. These benefits justify the costs of creating, promoting and maintaining the urban forest. The environmental benefits include reduced stormwater runoff, shade and cooling, air and water pollutant mitigation, carbon storage and biodiversity. The economic benefits include improved walkability, increased patronage of businesses, increased property values and decreased energy spending. The societal benefits include improved mental and physical health, improved quality of life, environmental justice and enhanced community character. 20 years after planting, the net economic benefits (benefits minus costs) of a public tree ranges from \$0.14 (small tree) to \$60.04 (large tree) per year, while the annual net economic benefit of a private trees ranges from \$19.86 to \$86.92 per year. Over a 40 year period, a public tree yields between \$160 (small tree) to \$2,320 (large tree) in net benefits, while a private tree yields between \$600 and \$3,040 in net benefits.

Chapter 710: Trees provides basic protection for trees on public property. It also establishes the inspection, notice, removal, and cost assessment of infected trees. *Chapter 770: Zoning* sets landscaping standards to be included in development site plans. These ordinances provide a foundation for protecting and replacing trees in public areas; however, they do not establish the means to protect and preserve the urban forest, replace removed trees on private property, inform residents about tree planting and maintenance, nor meet the FY 16/17 objective. Thus, Royal Oak must combine ordinance changes with non-ordinance action in order to best grow and preserve the urban forest.

After considerable research, internal discussion and cost-benefit analysis, staff recommends the following changes to city policies and ordinances:

1. Hire a Parks Maintenance Worker I and promote a PMW I to Parks Maintenance Worker II (at an approximate combined budget cost of \$75,593) in order to allow city arborists to focus on issues regarding the urban forest
2. Expand the tree planting program by improving public outreach and offering public education on tree planting and maintenance

3. Create a tree education plan utilizing the city's online presence and creating in-person classes to disseminate information and promote tree growth
4. Direct city arborists to create an urban forest plan to capture the state of Royal Oak's urban forest, analyze its urban forest management, develop species and maintenance standards, identify the threats to a healthy urban forest, and create short- and long-term tree goals
5. Amend the zoning ordinance to include a tree protection plan for sites passing through site plan review, and require the replacement of all trees removed on these sites (see Attachment 2)
6. Create an urban forest funding mechanism based on fees when planting on-site is not practicable; fees would be used to fund the planting of trees off-site

Through the implementation of these recommendations, the city commission can best achieve its fiscal year 2016-2017 objective and have the most feasible impact on Royal Oak's urban forest. However, the planning division does not have the capacity to take on additional duties and the planning commission may experience delays to site plan review under these recommendations. The community development department has indicated that they do not support the fifth and sixth recommendations of amending the zoning ordinance and establishing a fee structure.

The following resolution is recommended for approval:

Be it resolved, the city commission approves the creation of a parks maintenance worker 1 position; and

Be it further resolved, the city commission directs staff to increase public outreach for the tree planting program; and

Be it further resolved, the city commission directs staff to create a tree public education plan and program; and

Be it further resolved, the city commission directs staff to create an urban forest plan including standards for species and maintenance; and

Be it further resolved, the city commission requests the planning commission to consider the recommended changes to the zoning ordinance; and

Be it further resolved, the city commission directs staff to establish a fee structure for payments in lieu of tree replacement.

Respectfully submitted,
Eric Lofquist
Graduate City Management Fellow

Approved,



Donald E. Johnson
City Manager

2 Attachments

Attachment 1

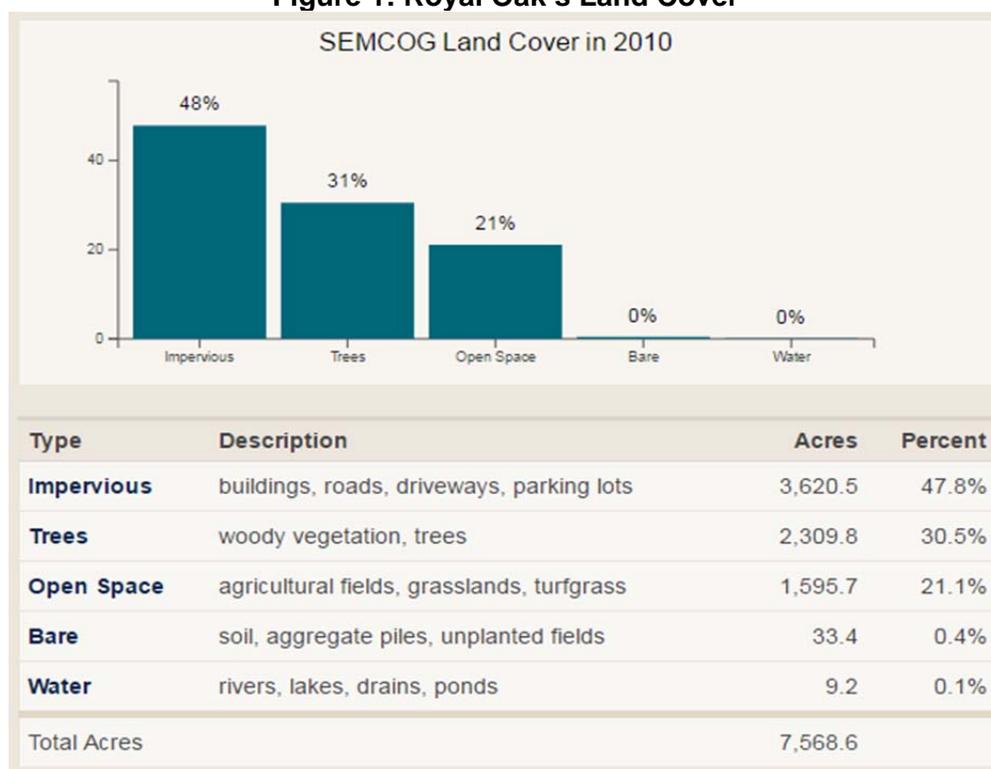
Tree Ordinance Report

As part of its FY16/17 goals and objectives, the City of Royal Oak adopted a goal to maintain, replace, and enhance city infrastructure in an environmentally and fiscally sustainable manner, and an objective to investigate options for preserving or increasing the number of trees including tree replacement requirements for developers and a citywide tree replacement fund. The commission directed that this goal would be measured by the number of trees removed, replaced, and added. To accomplish this goal, this report examines the city's current practices, defines the issue, assesses the benefits of a healthy urban forest, and constructs and evaluates alternative solutions to the problem.

State of Trees in Royal Oak

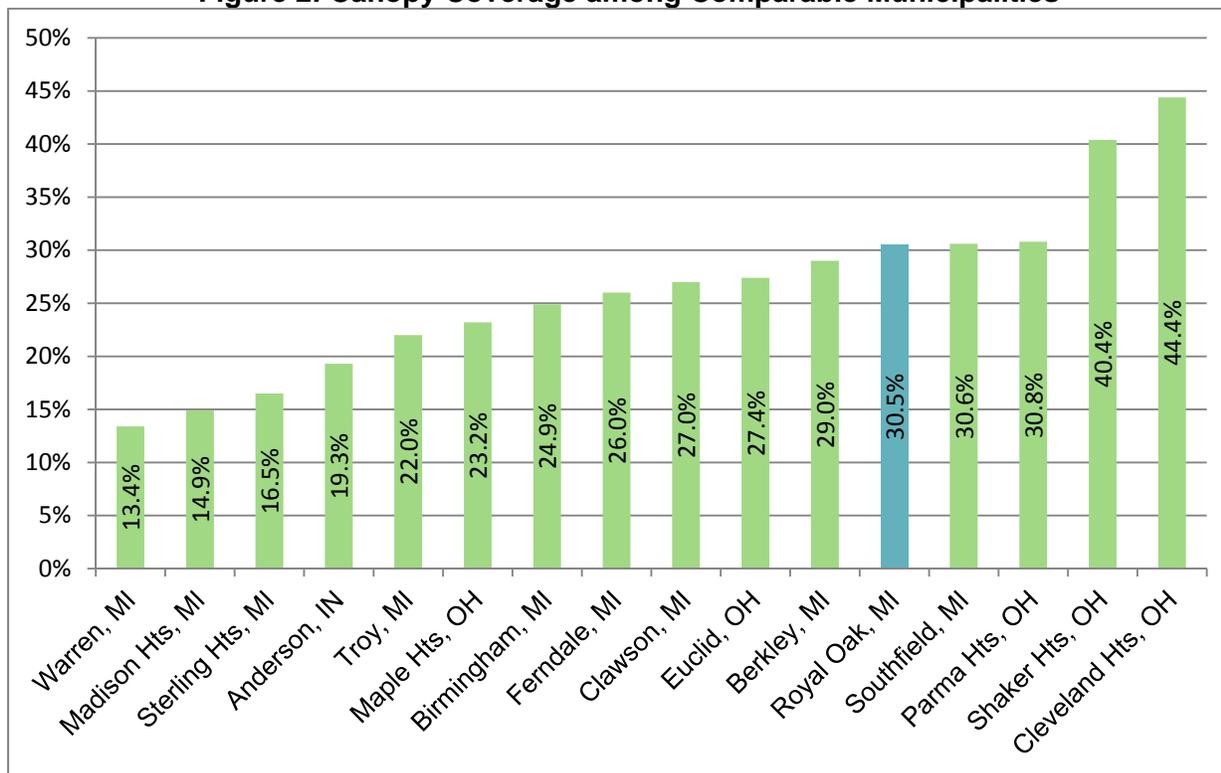
According to [Southeast Michigan Council of Government's \(SEMCOG\) data](#), Royal Oak's 11.8 square miles of land has 30.5 percent tree coverage and has 47.8 percent impervious cover (Figure 1). Among similar municipalities, Royal Oak stands slightly above average in terms of tree canopy coverage. Figure 2 (on the following page) compares canopy coverage among Midwestern suburban municipalities similar to Royal Oak in population, population density, geography, proximity to a major city, and median income.

Figure 1: Royal Oak's Land Cover



data provided by SEMCOG

Figure 2: Canopy Coverage among Comparable Municipalities



In the last three years, Royal Oak has purchased 250 trees for the purpose of installation as street trees, according to the Department of Public Services (DPS) and Recreation Director Greg Rassel. This year, the city has made strides to restoring its urban forest by purchasing 190 trees for planting on the right-of-way in southeast corner of the city (Street Tree Planting Program, CAP1733). The city's tree planting program, which has been in existence for nearly 30 years, aims to replace trees that are lost to disease and other factors. Over the last five years, the city has sold 467 trees (an average of 93.4 per year) for planting across the city. Among those, 73.5 percent (343) were requested by residents to be planted on city property, while only 9 percent (42) were requested to be planted on private property. The remaining 17.6% (82) were designated as extras for residents putting in late requests or for use by DPS. Residents are able to apply for and purchase trees for \$150, a lower price than area nurseries. Trees purchased for city easement will be planted at no additional charge by a city contractor, while trees purchased for private property will be delivered, but not planted.

Public Trees:

Trees on public property (such as at city hall or at public parks), or on city right-of-way.

Private Trees:

Trees on private property such as residential or commercial land

Royal Oak has earned the National Arbor Day Foundation distinction of "Tree City USA" every year since the distinction's inception in 1976. This distinction is awarded to municipalities that have a tree board or department legally responsible for municipal trees; a tree care ordinance which provides guidelines for planting, maintaining and removing trees from public spaces; a community forestry program with an annual budget of at least \$2 per capita; and the observance and proclamation of Arbor Day.

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Currently, the city addresses public trees through city codes 710 and 770. [Chapter 710: Trees](#) designates that DPS is responsible for trees on public property. The chapter includes provisions requiring that trees removed by DPS be replaced at the city's expense and that private entities wishing to remove public trees receive permission from DPS. Additionally, the code bans fires from being started within 10 feet of a public tree; prevents attachment of wires, ropes, chains, cables, or signs to public trees without a permit; and prevents excavation within five feet of a public street without obtaining a permit. Private entities requesting the removal of public trees, if approved by DPS, are required to pay a deposit equal to the replacement value of the tree(s) lost. If replacing the lost tree(s) on-site is not practicable, the replacement tree(s) are placed in another more desirable location. Finally, the ordinance establishes the inspection, notice, removal, and cost assessment of infected trees, as well as setting fines and penalties for violation of the ordinance.

[Chapter 770: Zoning](#) also addresses trees. This chapter sets landscaping standards to be included in development site plans. Before development is to occur, site plans must be reviewed and approved by the Zoning Commission. The landscape plan makes limited references to trees, including the location, spacing, size (height, caliper and size of root ball), root type (shallow or deep) and descriptions for each plant type to be planted (§770-90). Additionally, it stipulates that the front yard setback or greenbelt shall be landscaped with one tree every 30 feet—or 20 feet for non-ornamental deciduous trees or evergreen trees (§770-90).

These ordinances provide a foundation for protecting and replacing trees in public areas; however, they do not establish the means to increase canopy cover and expand the urban forest, protect trees during construction or other work, map and track Royal Oak's trees, nor institute policies for trees on private land. In order to best meet Royal Oak's 2016-2017 Strategic Planning Goals and Objectives, these ends must be addressed.

Current Trends

Royal Oak has recorded a demonstrable decline in its urban forest. In 1999, the city implemented the Davey Tree Treekeeper software to better track public tree removals within the city. Since then, 1,800 trees have been removed by the city. In the last three years alone, nearly 900 trees have been removed. During the same three years, the city has purchased approximately 250 trees to plant on public land, less than one third of the trees removed. While it is impossible to determine the number of trees added or removed by residents and developers on private property over this span of time, it is highly unlikely that the number of trees added compensates for the net number of public trees lost by the city. As a whole, the city has a declining urban forest.

As it is currently staffed, DPS is unable to keep up with the resident demand for trees and maintenance. The Parks and Forestry Division of the DPS has decreased from 14 employees to just three over the last 15 years. To supplement this crew, DPS has brought on an outside contractor. As indicated in the October 24, 2014 city commission memo regarding the potential addition of a dangerous tree ordinance, DPS Director Greg Rassel cited that "The DPS has qualified personnel staff to evaluate the trees and make a determination (as to their health and viability)...however there are not the hours that allow for the additional work-load. ." Due to the yearly average of over 500 calls from residents for tree work to be done, any alternative solution must account for the workload and the logistical challenges of managing an urban forest. Rassel also cited high demand for Royal Oak's current Tree Planting Program, highlighting a need for increased capacity to successfully manage the city's urban forest.

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The city's last full tree survey was conducted in 1999 and utilized the Treekeeper software. The survey showed that Royal Oak had 26,794 trees. However, the system only maps trees removed or serviced by the city; it does not provide information on tree changes by the public in the last 18 years. This illustrates the largest barrier of analysis: the lack of information regarding Royal Oak's full tree canopy.

One of the City of Royal Oak's arborists, Rob Barger, reported that the city's forest is both aging and decaying. A significant number of trees in the city are Silver Maple (*Acer Saccharinum*) which grow relatively quickly, but are susceptible to storms, disease and age which causes various forms of structural damage. Others, such as the Kwanzan Cherry trees (*Prunus Serrulata*) have not recovered from the extreme colds of recent winters, while Bradford Pear (*Pyrus Calleryana*) and Little Leaf Linden (*Tilia Cordata*) trees have noticeable structural problems. Additionally, the city has identified mono strands of hard maples, ash trees and American Elms as plagued with the Verticillium wilt disease, emerald ash borer and Dutch Elm disease respectively. Barger also cited other additional threats to Royal Oak's urban forest include sidewalk and street repaving programs, overhead utility line-clearance work, misplacement of trees, the loss of trees due to the development boom, and increased hazards of soil compaction in parks.

Benefits of an urban forest

According to an [American Planning Association \(APA\) report](#), promoting tree and urban forest growth has a great number of environmental, economic and societal benefits. Healthy urban forests contribute to reduced stormwater runoff, shade and cooling, air and water pollutant mitigation, carbon storage and biodiversity. Trees reduce stormwater runoff by intercepting rain water on leaves, branches, trunks and in soil, allowing it to evaporate or soak into the soil and be filtered before entering rivers. Additionally, trees have shading and cooling benefits to the urban heat island as they absorb sunlight and provide shade, in contrast with impervious surfaces which absorb sunlight and convert it to heat. Trees can absorb atmospheric carbon, reducing greenhouse gases and their impact on global warming. Finally, trees within an urban forest provide a wildlife habitat.

The economic benefits of an urban forest include improved walkability, increased patronage of businesses, increased property values and decreased energy spending. The APA report noted that an urban forest of well-maintained trees increases the likelihood that shoppers will pay more for parking, stay longer in shops and downtown business areas, and pay 12 percent more for goods and services. Additionally, the study found that property values may be increased by as much as six percent in areas lined with trees as well as increasing their likelihood to be sold. Finally, trees provide commercial and residential energy savings.

The societal benefits of an urban forest include improved mental and physical health, improved quality of life, environmental justice and enhanced community character. The APA report also documented the health and wellness benefits of an urban forest: green spaces promote outdoor recreation which has been lost in many urban areas, tree canopies help reduce harmful sun exposure by about half and mitigate air pollution which is linked to asthma and other respiratory conditions. Additionally, residents living in an area with an "attractive outdoor setting" are more likely to socialize with their neighbors, feel safer and less stressed, and experience less violence. As a result, tree planting and environmental projects "increase community capacity and build societal structure." Finally, green spaces and trees greatly enhance community character and beauty, which would promote and support the Royal Oak's identity and brand of tree-lined streets.

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The Midwest Community Tree Guide calculates the net benefits of public and private trees. It determines these figures by taking the benefit savings and subtracting the costs. These benefits and costs are calculated based on typical small (crabapple), medium (red oak) and large (hackberry) trees. The benefits are calculated based on the electrical, natural gas, CO₂, ozone, NO₂, SO₂, PM₁₀, VOCs and BVOCs savings; rainfall interception; and other benefits. The costs are calculated based pruning, removal and disposal, pests and diseases, infrastructure repair, cleanup, liability and legal, administrative, and other costs. In order to obtain more comprehensive data on Royal Oak's tree benefits and costs, a comprehensive technical study would need to be conducted. However, the Midwest Community Tree Guide's estimates accurately illustrate the basic financial incentive to increase and preserve the urban forest on both public and private land. According to the guide, trees give the following net benefits:

Annual benefits of trees, 20 years after planting						
	Public Trees			Private Trees		
	Small	Medium	Large	Small	Medium	Large
Total Benefits	\$26.79	\$52.54	\$95.92	\$28.34	\$58.05	\$102.03
Total Costs	-\$26.65	-\$33.00	-\$35.88	-\$8.48	-\$13.12	-\$15.11
Total Net Benefits	\$0.14	\$19.54	\$60.04	\$19.86	\$44.93	\$86.92

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Options and Considerations Summary	
Option 1: Continue enforcing the current tree ordinance without changing the way it protects and regulates public or private trees.	<ul style="list-style-type: none">• No changes to current ordinances
Option 2: Pursuing non-ordinance actions, which would promote urban forest growth and tree preservation, while continuing to enforce the current tree ordinance.	<ul style="list-style-type: none">• No changes to current ordinances• Utilize non-ordinance action such as:<ul style="list-style-type: none">• Targeted tree planting campaigns (public and private)• Education and information programs• Creating partnerships to regrow the urban forest• Conduct an updated tree survey
Option 3: Better protect public trees and amend various ordinances to regulate private trees on developing sites through site plan review (which excludes one- and two-family residential developments)	<ul style="list-style-type: none">• Amend the zoning ordinance to require the inclusion of a Tree Protection Plan<ul style="list-style-type: none">• Specifies the size, location, and species of all trees on site• Specifies methods that will be used to protect the trees• At the discretion of the planning commission and city arborists, all trees removed during development on sites passing through site plan review (excluding one- and two-family residential developments) must be replaced• Creation of an urban forest funding mechanism based on fees in lieu of planting on-site• Hire an additional full-time city arborist• Conduct an updated tree survey
Option 4: Better protect public trees and amend various ordinances to regulate all private land	<ul style="list-style-type: none">• Amend the zoning ordinance to require the inclusion of a Tree Protection Plan<ul style="list-style-type: none">• Specifies the size, location, and species of all trees on site• Specifies methods that will be used to protect the trees• At the discretion of a city arborist, all trees removed on public and private land must be replaced• Creation of an urban forest funding mechanism based on fees in lieu of planting on-site• Hire an additional full-time city arborist• Conduct an updated tree survey

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<p>Option 5: Pursue non-ordinance actions while regulating private trees on developing sites through site plan review</p>	<ul style="list-style-type: none">• Hire a Parks Maintenance Worker I and promote a PMW I to Parks Maintenance Worker II in order to allow city arborists to focus on issues regarding the urban forest• Expand the tree planting program• Create a tree education plan• Direct city arborists to create an urban forest plan• Amend the zoning ordinance to include a tree protection plan for sites passing through site plan review, and require the replacement of all trees removed on these sites• Create an urban forest funding mechanism based on fees when planting on-site is not practicable; fees would be used to fund the planting of trees off-site <p><i>Additional Item for Consideration:</i> Update the city's tree survey</p>
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Amendment of the Tree Ordinance: Options and Considerations

In determining if and how Royal Oak's tree ordinance should be amended, five options have been identified and analyzed—each is evaluated based on efficacy, cost, equity, administrative feasibility, unintended consequences, sustainability, and political feasibility. These seven metrics are critical to the successful implementation of any public policy and will serve as a guideline for recommendations to Royal Oak's ordinance.

Option 1: Continue enforcing the current tree ordinance without changing the way it protects and regulates public or private trees

The first option is to continue enforcing the current tree ordinance, which poses no additional costs to the city, and will continue to be administratively feasible. However, as identified in this report, the current ordinance does not effectively protect or preserve private trees, creating an unsustainable practice where private trees may be removed without being replaced, or damaged without proper protection measures. This option also risks diminishing the utility of Royal Oak's urban forest, which could lead to the long-term reduction of trees on privately developed sites and threatens to further degrade Royal Oak's urban forest. In terms of political feasibility, developers and landowners will be satisfied with no change to current codes, while Royal Oak's environmentalist community and city commission (who set the 2016-2017 Strategic Planning Goals and Objectives) will likely not be satisfied with this solution.

Option 2: Pursuing non-ordinance actions, which would promote urban forest growth and tree preservation, while continuing to enforce the current tree ordinance

The second option is to use non-ordinance action to supplement the city's existing tree ordinance, such as targeted tree planting campaigns (both public and private), the support of public tree education and information programs, and creating partnerships with organizations such as Global Releaf.

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Option 2 would be more effective at promoting urban forest growth than the first option. Economically and environmentally, the sustainability of option 2 is dependent on private property owner participation in the programs. Due to the number of requests and waiting list for Royal Oak's current Tree Planting Program, it can be assumed that resident participation will be high. Royal Oak's environmentalist community, city commission, and residents (as indicated by participation in existing tree programs) will likely be more satisfied with this solution than option 1, and developers should have few concerns with option 2. Therefore, option 2 would be much easier to implement than options 3-5. However, there may be community pushback if programs are unsuccessful and have minimal impact on the growth of the urban forest. Potential unintended consequences include low resident participation, increased costs to the city for marginal benefits to the urban forest, program stagnation, and the inability to adequately target areas of need.

Additionally, Royal Oak must decide whether to commit resources to updating and maintaining a tree survey. The estimated cost of the survey is \$40,000 to \$50,000, but it would allow the city to better track its green resources, target areas in need of trees for planting, and support other city objectives. Most communities that have successful tree programs maintain a tree inventory of some type. The upkeep of this inventory would be primarily the responsibility of city arborists with the assistance of the geographic information system coordinator. Currently, Royal Oak has a five-year contract with the Treekeeper inventory software by Davey Tree.

An example of option 2 is the community of Wilmington, Delaware. Wilmington established a tree commission for the purpose of making recommendations of tree species for planting, how to control disease and pest damage, tree maintenance standards, public education and information programs and departmental standards. Additionally, they prepare and review the community tree plan, annual urban forest reports, annual urban forestry work plan and budget, and grants. As urban forest administrator of the City of Wilmington Herbert White explained, the city was able to identify areas which were particularly barren of trees and target them in a tree planting campaign. Supplemented by programs such as the elderly or disabled property owner program and the city street tree assistance program, Wilmington was able to effectively promote the installation of new trees on both public and private land.

The "Street Tree Plan" adopted by the Borough of Chambersburg, Pennsylvania also provides an example of this option. The "Street Tree Plan" defines Chambersburg's vision, sets goals and objectives for the borough's trees, and establishes the Shade Tree Commission to be responsible for the "care, custody and control of all shade trees" and issuing permits for removal and other tree maintenance. The municipal street tree plan summarizes the findings of the Chambersburg Street Tree Inventory, categorizing by street, species, and diameter at breast height, height class, condition and management needs. Additionally, it creates an annual work plan, conducts site analysis, and makes planting recommendations.

Option 3: Better protect public trees and amend various ordinances to regulate private trees on developing sites through site plan review

The third option provides the most reliable way of enforcing a new tree policy or amended ordinance. For private trees, this option would require all developments passing through the site plan review process (which excludes one- and two-family residential developments) to present a Tree Protection Plan specifying the size, location and species of all trees on-site and the methods that will be used to protect the trees. In order to preserve and increase the city's urban

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forest, if a developer proposes to remove a tree from a site, a city arborist must advise the Planning Commission and the developer as to the size and amount of trees required to replace the removed trees. This option would be very effective for ensuring all developments eligible for site plan review comply with ordinance regulations. However, it would be ineffective for protecting or preserving private trees on sites not developing and one- or two-family residential developments (hereby defined as “unregulated trees”). As an additional document needed to be approved, the Tree Protection Plan would have consequences to the timeliness of the site plan review process. Since it would pose an additional cost and restraint to developers, option 3 could discourage development. Finally, it would likely burden the DPS with resident calls and complaints as well as increased logistical responsibility.

Costs associated with this option would be from the training required to update the planning commission, community development, and the department of public services on the amended zoning ordinance, administering the code, and regularly updating the tree survey database. Due to the increased workload to city staff, an additional full-time arborist is necessary for successful implementation. While the city does have arborists on staff, they would not be able to manage the additional responsibilities posed by any of the alternatives while completing their current responsibilities. The cost of hiring a new arborist would fall on the city, and potential funding sources are plan review fees and permitting costs to administer the codes. Alternatively, allocating new responsibilities to existing staff, commissions and boards may prove to be overburdening, thus proving the necessity for an arborist. Finally, an updated tree survey would be necessary for successful implementation.

Arlington Heights, Illinois provides a successful example of Option 3. Their ordinance stipulates that “the requirements apply to all public and private new construction, enlargements or expansion of any structure, building or parking, service areas, and other construction. Existing developed or contiguous single family subdivided residential lots and public right-of-way shall be excluded.” Additionally, “a Tree Survey and a Tree Preservation Plan shall be submitted to the Planning Department for review” indicating the size, location and species of all trees on-site and the methods that will be used to protect the trees. These documents will be approved before development is to occur. In addition, Arlington Height’s ordinance ensures the replacement of all removed trees under the Tree Preservation Plan, including the number of replacement trees, the species of tree, and the protection of those trees.

Option 4: Better protect public trees and amend various ordinances to regulate all private land

The fourth option provides the most comprehensive tree protection, preservation and replacement strategies. Beyond monitoring the removal of trees during the site plan review process (option 3), option 4 would regulate all private trees in Royal Oak. If any developer or resident removes a tree on private land, it must be replaced at the discretion of a city arborist. Option 4 the most effective option for regulating trees on one- or two-family residential developments and on non-developing sites. Additionally, it is environmentally sustainable for both public and private trees, as it makes property owners responsible for protecting and replacing their own trees. However, this option comes with a myriad of political and administrative feasibility challenges including the potential for uneven application, increased administration and burden on city staff regarding resident complaints and requests, and the dissemination of ordinance information to residents. Moreover, it would be infeasible to monitor private residential property and non-developing sites for the removal of individual trees, instead relying upon resident complaints and widespread knowledge and adherence to the ordinance in order to be successful. Thus, it is not economically or politically feasible or sustainable.

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Like option 3, the cost associated with option 4 comes from the training required to update the planning commission, community development, and the department of public services on the amended zoning ordinance, administering the code, and regularly updating the tree survey database. An additional full-time Arborist position and updated tree survey are also required for successful implementation. Option 4 is the most administratively challenging than any other option. In addition to the site plan review process being lengthened, enforcing the ordinance on sites that don't pass through the site plan review process would rely on a full-time arborist and the department of public services or other city departments to field resident questions, complaints, inspections and requests. Residents removing trees without being aware of ordinance regulations creates a number of regulatory challenges. Finally, developer pushback or hesitancy to develop poses a serious threat to general acceptability of the code.

The Charter Township of Grand Blanc offers a solution that most closely matches with Option 4. It establishes that a "regulated development" is defined by the ordinance as, "all commercial, institutional, office, industrial or multiple family development or redevelopment, and all new single-family residential developments or improvements to an existing residence." The ordinance states that for all regulated developments, "no person shall remove, cause to be removed, transplant, or destroy any regulated tree" without first obtaining a permit." In addition, for every regulated tree that is removed, "an equivalent number of replacement trees shall be planted." It also stipulates that any resident or property owner may nominate a tree for Historic or Specimen Tree designation based upon its "age, type, size, historical or cultural association." If designated, it will be unlawful to damage, destroy or remove the tree without permit.

The City of Clayton, Missouri most exemplifies this option. For each residential development, a certain percent of the lot must be covered by canopy, dependent upon which zoning district that lot is located. To encourage the preservation of existing trees, the method of calculating canopy cover for existing trees is multiplied by 1.25. Additionally, Clayton has deployed a number of restrictions in order to protect trees. These measures include protective installations, guidelines and procedures in order to ensure that construction, demolition or any other site work does not injure existing trees.

Option 5: Pursue non-ordinance actions while regulating private trees on developing sites through site plan review

Option 5 is the combination of Options 2 and 3. It would increase non-ordinance measures of protecting trees, such as expanding the tree planting program, increasing public education and information, and creating tree maintenance standards for staff and contractors. It would also require all developments passing through the site plan review process (which excludes one- and two-family residential developments) to present a Tree Protection Plan specifying the size, location and species of all trees on-site and the methods that will be used to protect the trees. Developers will be required to replace or contribute funds to replace all trees removed on-site.

This option would be effective at promoting urban forest growth on both private and public land. Option 5 is sustainable both economically and environmentally, assuming that resident participation in the Tree Planting Program and other tree programs continues to be high. Royal Oak's environmentalist community, city commission, and residents (as indicated by participation in existing tree programs) will likely be most satisfied with this option, but developers may have concerns with having to replace or fund the replacement of trees. Like option 2, there may be community pushback if programs are unsuccessful and have minimal impact on the growth of the urban forest. Potential unintended consequences include low resident participation,

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increased costs to the city for marginal benefits to the urban forest, program stagnation, and the inability to adequately target areas of need. By incorporating both option 2 and 3, option 5 protects, preserves, and increases the most amount of trees feasible to the city's ability.

Recommendation

In order to best achieve the commission's goal to "maintain, replace, and enhance city infrastructure in an environmentally and fiscally sustainable manner," and recognizing the established environmental, social, and economic value of Royal Oak's tree canopy, Royal Oak should follow option 5: pursue non-ordinance actions which promote urban forest growth and tree preservation and better protect public trees and amend various ordinances to regulate private trees on developing sites through site plan review (which excludes one- and two-family residential developments).

1. Hire a Parks Maintenance Worker I and promote a PMW I to Parks Maintenance Worker II in order to allow city arborists to focus on issues regarding the urban forest

Royal Oak has two arborists currently on staff at the level of Parks Maintenance Worker (PMW) II. In order to free up city arborist time and ability to assist in the recommendations in this report, an additional PMW I will have to be hired and a current PMW I will have to be promoted to PMW II. The base salary max of a PMW I is \$44,184 with an approximate budget cost (which includes benefits) of \$66,650. The base salary max of a PMW II is \$51,984 with an approximate budget cost of \$75,593. These staffing changes will enable the two current arborists to carry out the recommendations in this report.

2. Expand the tree planting program

Over the last five years, 467 trees have been purchased by the city to sell to residents. The total cost to the city over this span has been \$102,771. In total, revenue from sale to residents covered roughly half of these costs, resulting in the net cost to the city being \$51,921. Based on Midwest Community Tree Guide estimates, the benefits of the number of trees planted in the program range from \$80,080 (if all trees planted were small trees) to \$923,440 (if all trees planted were large trees) over a 40 year period. While it is difficult to assess the precise benefits without doing a full technical analysis, the Midwest Community Tree Guide estimates prove that any addition of trees will be beneficial to the community.

By improving public outreach, encouraging residents to purchase trees for private property, and offering public education on tree planting and maintenance, Royal Oak can effectively promote tree growth through the tree planting program.

3. Create a tree education plan

Cities such as [Wilmington, DE](#) and [Ann Arbor, MI](#) maintain online education and information regarding the planting and maintenance of trees. Since Royal Oak already maintains a website, an online tree education would pose no additional costs, would be easy to create and maintain, and could inspire residents to plant and maintain their share of a healthy urban forest.

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Classes and other in-person education sessions can also be utilized to promote private tree growth. City arborists could offer public education for residents to learn how to properly plant and maintain trees—included in the cost of the class could be a tree that students get to take home and plant in their own back yards.

4. Direct city arborists to create an urban forest

Cities such as [Ann Arbor, MI](#) and [Chambersburg, PA](#) have created urban forest plans to manage and preserve their urban forest. In Royal Oak, city arborists could create a similar urban forest plan to better capture the state of Royal Oak's urban forest, analyze its urban forest management, develop species and maintenance standards, identify the threats to a healthy urban forest, and create short- and long-term tree goals. An urban forest plan would have minimal costs beyond arborist time.

5. Amend the zoning ordinance to include a tree protection plan for sites passing through site plan review, and require the replacement of all trees removed on these sites

This amendment would stipulate that all developments passing through the site plan review process (which excludes one- and two-family residential developments) must present a Tree Protection Plan specifying the size, location and species of all trees on-site and the methods that will be used to protect the trees. If a developer proposes to remove a tree from a site, a city arborist must advise the Planning Commission and the developer as to the size and amount of trees required to replace the removed trees.

As the images on the following page show, some sites have many trees removed while other sites have little or no trees removed. Since the beginning of 2016, 36 unique site plans have been reviewed by the planning commission. Among those site plans, nine (25%) were on land with a substantial amount of trees (five or more), but only one site dictated terms for preserving the existing trees on site. Among those nine site plans, approximately 123 trees are threatened to be removed by development. Based on the Midwest Community Tree Guide, the loss of these trees represents a monetary loss of between \$73,800 and \$373,920 to the city and community over the next 40 years. On sites not removing trees, such as the Northwood Shopping Center Development, there is opportunity for Royal Oak to become “tree positive” by encouraging tree growth on this private land.

6. Create an urban forest funding mechanism based on fees when planting on-site is not practicable; fees would be used to fund the planting of trees off-site

In order to facilitate the zoning ordinance change, an urban forest funding mechanism must be created. For developers removing trees on sites passing through site plan review, a fee can be paid into this funding mechanism in lieu of replacing trees on-site, when replacing trees on-site is not practicable. Although it applies only to trees on city-owned land, [Ann Arbor, MI](#) offers an example of a similar funding mechanism in action. Fees will be determined by the city commission and city arborists in consideration of caliper inch and based on annual public bid for planting new three inch caliper trees.

Attachment 1

The funds contributed by developers in lieu of planting on-site would be used by DPS to plant trees in other city locations in need of tree canopy. There would be minimal administrative costs to maintaining this funding mechanism.

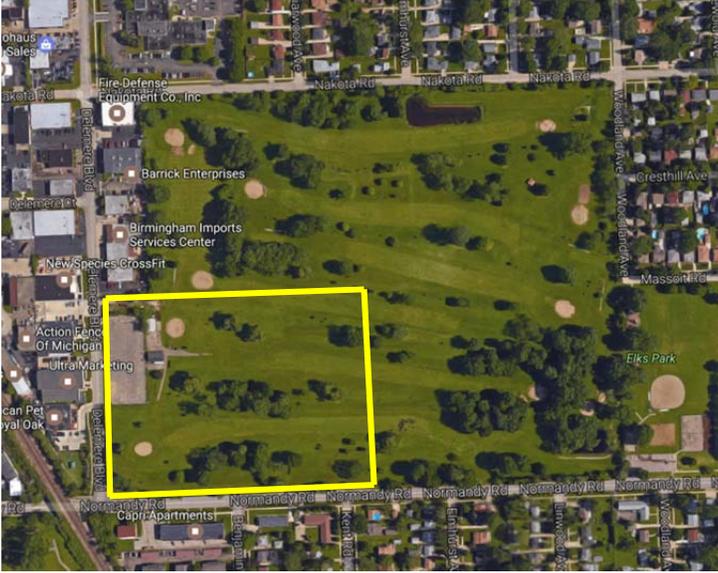
Additional consideration: Update the city's tree survey

The city's last full tree survey was conducted in 1999 and utilized the Treekeeper software. The survey showed that Royal Oak had 26,794 trees. However, the system only maps trees removed or serviced by the city; it does not provide information on tree changes by the public (on private property). Other inaccuracies to city data have arisen in the 18 years since the last survey. An updated survey would allow the city to better track its green resources, target areas in need of trees for planting.

The estimated cost of an updated survey is \$2/tree. The survey has the option to be done for only city-owned trees or for all trees (public and private). Currently, Royal Oak has a five-year contract with the Treekeeper inventory software by Davey Tree.

Attachment 1

Appendix A: Overhead of future/current developments and estimates of trees to be lost



Left: Normandy Oaks Golf Course

Robertson Brothers full redevelopment would remove approx. 35 trees

Right: 11 Mile and S Center St. parking lot

Etkin LLC development would remove approx. 29 trees



Left: Northwood Shopping Center

No private trees removed in redevelopment



Right: 3rd and Knowles St

No private trees removed in redevelopment

ORDINANCE CHANGE

Chapter 770. Zoning

Article VI. Landscaping and Screening Design Standards

AN ORDINANCE TO AMMEND CHAPTER 770-90, SECTION (K) LANDSCAPE ELEMENTS:

(4)

Existing trees. The preservation and incorporation of existing trees is encouraged **REQUIRED**. Where existing trees are used to satisfy the requirements of this section, the following requirements shall apply:

(a)

Paving, or other site improvements, shall not encroach upon the dripline of the existing tree(s) to be preserved.

(b)

If existing plant material is labeled "To Remain" on site plans by the applicant or required by the City, protective techniques such as snow fencing shall be installed during construction and noted as such on the plans. No vehicle or other construction equipment shall be parked or stored within the dripline of any plant material intended to be saved.

(c)

In the event that healthy trees which are used to meet the minimum requirements of this chapter or those labeled to remain are cut down, destroyed, damaged, or excavated at the dripline, as determined by the City, the contractor shall replace them with trees of similar character and size. However, in the event that a similar sized tree is not available, multiple trees of no less than two-and-five-tenths-inch caliper each will be planted. In the event that sufficient space does not exist on site to plant multiple trees, the applicant shall provide an alternative solution to the Plan Commission which still meets the intent of this section of this chapter.

(D)

EXPEMPTIONS TO THE REQUIREMENT TO PRESERVE AND INCORPORATE EXISTING TREES, ESTABLISHED IN 770-90 (K) (4), MAY BE GRANTED PROVIDED THE LANDSCAPE PLAN CONTAINS ALL OF THE FOLLOWING:

- I.) **A DEMONSTRABLE HARDSHIP EXISTS THAT MAKES PRESERVATION OF EXISTING TREES NOT PRACTICAL WITH THE SPIRIT AND SCOPE OF THE DEVELOPMENT AS DETERMINED BY THE PLANNING COMMISSION.**
- II.) **A TREE REPLACEMENT PLAN CONSISTENT WITH STANDARDS PREVIOUSLY ESTABLISHED, APPROVED BY THE CITY ARBORIST, SHOWING THE LOCATION AND NET GAIN OF TREES ON THE SITE; OR**
- III.) **AN AGREEMENT APPROVED BY THE OWNER AND THE CITY FOR THE PAYMENT OF A TREE FEE IN LIEU OF REPLACEMENT.**