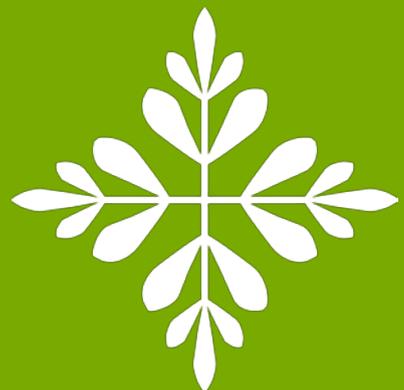




# 5 YEAR MASTER TREE PLAN

PREPARED BY:  
CITY OF SHAKER HEIGHTS  
FORESTRY DEPARTMENT

IMPLEMENTED: MAY 2021



# Contents

Introduction .....	3
Utility Work around Shaker.....	6
Mission Statement .....	7
Tree Advisory Board.....	7
Forestry Department Goals .....	8
Strategies to Reach Our Goals.....	9
Actions Required to Meet our Strategies.....	9
Implementation.....	10
Inventory & Maintenance.....	11
Tree Selection Model .....	13
Criteria for Tree Selection .....	15
Minimum Planting Clearances.....	16
Construction and Tree Preservation .....	16
Sewer and Water Main Replacement.....	16
Gas Main Replacement .....	17
Utility Maintenance.....	17
Permitting.....	18
Implementation .....	18
Appendices .....	19
Appendix A—Shaker Heights Yearly Tree Plan Schedule.....	20
Appendix B—Street Tree Inventory Work Sheet.....	21
Appendix C—Urban Site Index (USI) Inventory Work Sheet.....	22
Appendix D— Urban Site Index (USI) Map.....	23
Appendix E—Planting Species and Site Conditions.....	24
Appendix F—City Codified Ordinance Chapter 161 .....	28
Appendix G—City Codified Ordinance Chapter 747 .....	29



## Introduction

Ask residents to describe what they love about Shaker Heights and you'll often hear the words "tree-lined streets." To be sure, the beauty of our community is in large part thanks to the thousands of trees that make up the City's urban forest, whether on our tree lawns, on private properties or in our parks and natural spaces, including the 200-plus acres of the Shaker Parklands.

But trees are more than just beautiful. In fact, they play an important role in the health of any city, including Shaker Heights. Trees are one of the few investments a city can make that create a monetary return on the investment. A 2011 study by the National Forest Service found that "every dollar spent on planting and caring for a community tree yields benefits that are two to five times that investment—benefits that include cleaner air, lower energy costs, improved water quality and storm water control and increased property values, among others."

Shaker Heights is fortunate to have tree-lined streets and forested parks, but this asset must be protected and maintained. Unfortunately, the City has seen

significant losses in its tree canopy in recent decades, partly as a result of the devastation of the American Elm and Ash populations. The City also faces ongoing threats to its canopy from other invasive insects and diseases, and the City's maturing canopy requires constant maintenance.

On average, from 2017 to 2019, the City removed 375 trees a year and installed 365 replacement trees the following year. In 2019, the City planted an additional 169 trees for streetscape projects, like the Warrensville Center Rd. and Farnsleigh Rd. multipurpose paths. In 2020, the City anticipates it would plant 314 new trees. On a positive note, the Forestry Department is now close to planting one tree for every tree that is removed.

Cuyahoga County's Planning Department has noted that Shaker Heights' tree canopy is shrinking. Between the surveys completed in 2011 and 2017, Shaker Heights has lost 11.3 percent of its canopy.

One of the goals of this plan is to increase Shaker Heights' tree canopy by filling all vacant planting holes within our tree lawns and increasing tree plantings in parks, public properties and empty median spaces. This plan also has provisions to cultivate our young trees with additional mulching and young tree training designed to perfect tree development. The goal is to develop quality trees with large tree canopies.



Another consideration in this plan is the historical significance of Shaker Heights. The designers of Shaker Heights envisioned wide tree lawns to accommodate the largest tree possible, helping to create stately tree-lined streets. A goal of this plan is to plant the largest growing tree possible within the available planting space.

It will be a challenge to increase our dwindling canopy and it will take several years to see the results of our work. For every 120 trees we successfully plant and maintain, we should see a one percent increase in our tree canopy. Additionally, it takes nearly 10 years of growth for a tree to become apparent in the County's survey.



**THE DESIGNERS OF SHAKER HEIGHTS ENVISIONED STATELY TREE-LINED STREETS LIKE ATTLEBORO RD.**

The Street Tree Master Plan is a comprehensive plan to be used as a guide for improving and increasing Shaker Heights' urban forest. This plan includes goals to improve our urban forest, strategies to reach our goals, and information about how the City's Public Works Department will implement the plan. A tree selection model was developed specifically for Shaker Heights based upon its unique tree lawn widths and soil conditions. Lastly, the plan outlines tree protection and preservation as aging infrastructure is replaced.

## Utility Work around Shaker

Utility work has posed and continues to pose a challenge for our street trees. As the City and our region's utility companies work to replace aging infrastructure, we have discovered some significant issues with previously planted trees. In many cases, street trees were planted too close together and over existing infrastructure, including utility boxes and sewer and water laterals. This not only makes it more difficult to perform routine maintenance of this infrastructure, but also increases the City's costs for infrastructure repair and replacement. In some cases, trees must be prematurely removed; in others, the utilities must be moved or, in the case of laterals, re-rerouted. Additionally, large (and/or too many) trees planted in narrow tree lawns can cause damage to sidewalks, curbs and driveway aprons. As these problem trees are removed, the remaining trees are left with a distorted growing pattern. The Street Tree Master Plan will address these issues, in part by requiring minimal planting distances from existing underground utilities and hardscape items (e.g. sidewalks).

In the coming years, Shaker Heights will spend an estimated \$2 million annually on sewer projects. The City will also continue to annually repave eight to 12 streets and upgrade water mains. In short, infrastructure rehabilitation and replacement will be ongoing in the City, including these notable upcoming projects:

- A major capital improvement project will take place along Lomond Boulevard between Sherrington and Lindholm roads within the next three years. This improvement project will involve replacing the gas main, water main, and sanitary and storm sewer systems.
- Dominion Energy is also focused upon replacing its aging underground utilities. Between 2017 and 2019, Dominion Energy replaced between three to four miles of gas mains and services a year. In 2020, it replaced nearly five and half miles of gas main along Shaker Blvd., Warrensville Center Rd., Belvoir Rd. and multiple side streets.

As Shaker Heights strives to modernize its infrastructure, our Street Tree Master Plan will guide us into the future and help ensure the health of our urban forest for future generations. This sustainable plan prioritizes maintaining the tree canopy, standardizing planting, developing the City's existing young trees through young tree pruning, and, lastly, installing trees in currently available spaces. Central to maintaining our beautiful urban forest is planting the largest growing tree that is appropriate for a planting space, avoiding over-crowding, and maintaining the tree canopy with our available staff and resources.



**SOUTHERLY PARK IN SHAKER HEIGHTS**

## **Mission Statement**

Protect and enhance the health and diversity of our urban forest to ensure the economic, environmental, and social benefits for future generations. This is accomplished through a comprehensive program of tree planting, pruning, removal, pest and disease control, and inventory management.

## **Tree Advisory Board**

For our forestry program to be successful, we need community involvement. The Tree Advisory Board is instrumental in the effort to engage Shaker residents. This group consists of two Council members and several citizen members who help relay community concerns and provide recommendations to the Mayor, Public Works Director and City Forester. The Tree Advisory Board also assists with educational programs, policy development, Arbor Day activities, grant applications, and other special projects.



**ARBOR DAY PLANTING EVENT**

Additionally, the Tree Advisory Board is responsible for assessing the Forestry Department's annual planting program during its first meeting of the year. Note that the Tree Advisory Board may also monitor and

amend the plan as it deems appropriate during the year. All changes to the annual plan must be approved by the Director of Public Works.

Going forward, the Tree Advisory Board will include the Director of Public Works (or a designee), two members of City Council and three or more citizen members as appointed by the Mayor and confirmed by Council. Citizen members serve a two-year term with the appointment date ending on the December 31.

Citizens interested in serving on the Tree Advisory Board can learn more and apply at <https://www.shakeronline.com/587/Service-on-City-Committees>

## Forestry Department Goals

1. Maintain the health and vigor of all street trees in the City of Shaker Heights
2. Address tree hazards to cultivate a safe urban forest
3. Plant the most suitable tree for a given site
4. Achieve a fully stocked urban forest and expand the tree canopy within Shaker Heights parks and public lands
5. Provide opportunities for community education and involvement
6. Protect existing street trees from construction damage
7. Enhance our tree inventory to include more native tree species

## Strategies to Reach Our Goals

1. Prune or remove, for safety, all identified hazardous trees each year
2. Perform young tree training (pruning) of newly planted street trees. Specifically, new trees will be pruned every two or three years for the first 10 years, then every six years for the balance of the tree's life. Young tree maintenance will be contracted out
3. Plant a diverse population of trees with an emphasis on using native tree species. Where feasible, plant one tree for every tree that is removed; also, fill vacant planting sites as the City's inventory allows
4. Maintain mulch rings around street trees to a depth of two inches
5. Educate community members (residents, elected officials, employees, contractors etc.) on the value of and need for a sustainable urban forest

## Actions Required to Meet our Strategies

1. Inventory all street trees and open planting spaces in the City\*
2. Develop a plan to inventory, inspect and prune mature street trees at least once every six years
3. Identify proper planting locations following criteria from "Specification for a Planting Site" (Appendix E)
4. Develop a comprehensive Master Planting Design based upon the Ohio Division of Forestry's "Urban Site Index" (Appendix C) for every street in the City
5. Educate residents on proper young street tree maintenance, such as watering and mulching through mailings, social media, email newsletters, and the City website
6. Prune newly planted street trees every two-to-three years to develop central leaders and proper scaffolding branches. These pruning techniques will promote structurally healthy trees, increase the tree canopy and lessen the future work load
7. Conduct second-year mulching for newly planted street trees
8. Install only two-inch diameter trees as they adapt and perform better than four-inch diameter trees

9. Require newly appointed Tree Advisory Board members to attend the Tree Commission Academy
10. Encourage City officials and residents to participate in Arbor Day activities
11. Provide residents with information on proper planting, pruning and mulching techniques through social media, email newsletters and the City website
12. Review construction plans, suggest changes as appropriate to protect City trees, and monitor construction activity near trees
13. Work with the Planning Department to ensure appropriate trees are selected for new construction projects and that site conditions are conducive for planting
14. Provide necessary training for a knowledgeable and experienced Forestry Department
15. Protect the City's trees from construction damage and improper care and pruning

*\* Note: Open planting spaces are spaces where a newly planted tree will not conflict with utilities, has ample space from other trees, and won't interfere with existing sidewalks and driveways as it grows.*

## **Implementation**

1. Segment Shaker Heights into six areas that can each be pruned within a single year timeframe (see Figure 1 on next page).
2. Develop a Master Planting Design for Shaker Heights based on the Urban Site Index (USI) developed by the Ohio Division of Forestry
3. Inventory one of the six areas during the months of June, July and August. The inventory will identify open planting locations, hazardous/underperforming trees, and trees requiring pruning maintenance
4. Conduct pruning, planting and other required maintenance in the fall and winter; planting will take place in the spring
5. Purchase a tablet for field use in collecting data, storing utility information to avoid planting conflicts, and tracking contractor work

6. Use a tree tracking program to inventory and track street trees and required maintenance City wide
7. Shaker Heights Forester (or lead foreman) will collect and evaluate the field data. Public Works staff will assist with data entry and the Forester will create work orders for either the contractor or Forestry crew
8. Data for each work area will be updated every six years

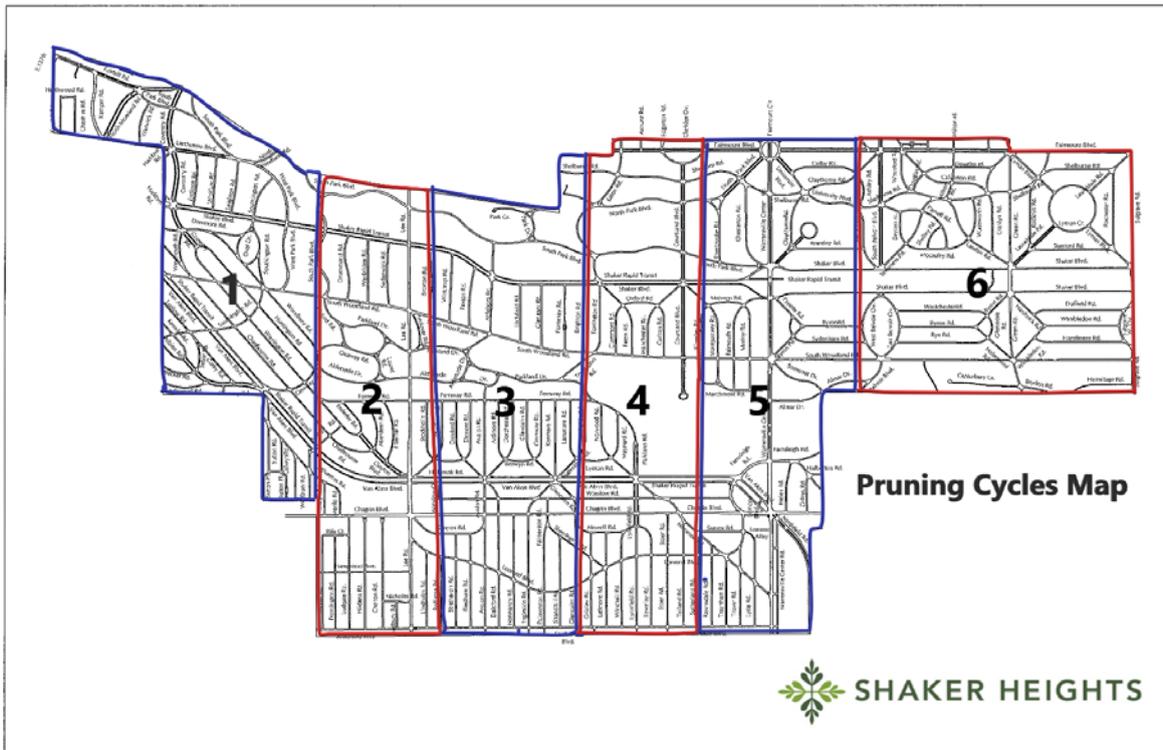


FIGURE 1: THE CITY IS DIVIDED INTO SIX MANAGEMENT AREAS

## Inventory & Maintenance

Creating and maintaining a systematic approach for the City's street tree program will allow crews to work efficiently year round, ensuring that the City's street trees are well-maintained and that available planting spaces are filled in a timely manner with trees well-suited to the location. Routine data collection will also provide the Forestry Department with important information for use in assessing the health of our urban forest and making decisions about the program.

Specifically:

- Studies have found that systematic tree pruning within a five to six year cycle is the most efficient use of resources and will minimize storm damage calls
- The City currently has 110 lane miles of roadway. Crews will need to prune a minimum of 18.5 miles yearly to obtain a six year pruning cycle. This does not include park maintenance or City properties
- The Shaker Heights Forestry Department would inventory the designated pruning area during the summer months of June, July and August. Note that the late summer months are the best time to identify the weakest trees for removal
- Data would be used to identify pruning work, hazardous tree removals, and planting locations
- The information collected for each tree will include:
  - Property address
  - Location on the tree lawn (i.e. cell number)
  - Species and variety
  - Diameter at breast height
  - Condition of the tree
  - Type of maintenance required
  - Type of overhead power
  - Sidewalk damage
  - Tree lawn width
  - Available planting area
  - Curb and/or sidewalk information
- Pruning would be assigned to City crews in the fall. The work would carry through the winter until complete
- Tree removals will also take place during the fall and winter months
- For the majority of trees, planting will occur in the spring. Any remaining planting work will happen in the fall planting season

- Identifying empty planting locations the prior fall will allow us to fill empty planting spaces and increase our tree canopy

## Tree Selection Model

The goal of the Tree Selection Model is to develop a standard planting system for the entire City within the right of way. The idea is to plant the best-suited tree based upon site conditions, which includes the amount of available growing space. For example, the City will plant small trees in small spaces and large trees in the large spaces.

The Forestry Department will use the Urban Site Index (USI) from the Ohio Division of Forestry (Appendix C and also see map in Appendix D) to help



**TREE LAWN WIDTHS RANGE FROM 3 TO 28 FEET IN SHAKER HEIGHTS**

determine the best-suited tree for a planting site. The USI provides a methodology for scoring a planting site based on the following: conditions of the site (including

traffic), soil, utilities, space available for planting, etc. Specific types of trees are recommended based on the site's score. The USI is in the process of being implemented by Forestry Departments across Ohio.

Much of Shaker Heights has optimal planting conditions. The City was developed prior to World War II, when heavy earth equipment was not available. As a result, construction of the City did not disrupt the soil horizons (i.e. parallel layers of different types of soil). These intact soil horizons make many of our tree lawns conducive for planting quality trees.

Tree lawn widths in Shaker Heights range from three-feet wide on some side roads to 28-feet wide on main roads, like South Woodland Rd. The average width of most of the City's side street tree lawns is six to eight feet, which will accommodate a medium-size tree (mature height of 40 feet). Tree lawns that are four to six feet wide are suitable for smaller growing trees (mature height of 20 feet). Tree lawns that are eight feet or wider are conducive to larger growing trees (mature height of 50 feet), provided there are no overhead power lines or underground obstructions.



**THE USE OF ROCK SALT IS ANOTHER CONSIDERATION WHEN SELECTING TREES**

Primary power lines run parallel with most of the City's main roads. The Tree Selection Model will limit planting sizes under these primary wires to small trees. Overtime, this strategy will reduce the amount of pruning required by power

companies, in turn creating healthier trees. When possible, large trees will be planted on the opposite side of the street from power lines.

Another consideration when it comes to tree planting is the use of rock salt for ice control, which is often necessary during the winter months. The USI takes into account the use of rock salt within its scoring matrix. In general, streets with high volumes of traffic, multiple lanes and higher speeds tend to score lower on the USI matrix. In general, the City will plant the best-suited tree based on the matrix score and tree lawn width for these harsh conditions. In addition, these areas will be monitored to determine if, over time, alternative trees are required on high traffic, salt laden roads.

## Criteria for Tree Selection

1. Complete the Urban Site Index for every City street (see Appendix D)
2. Identify the appropriate tree (or trees) for each individual street based upon the Urban Site Index
3. Create tree diversity by mixing tree species. This will help control insect and disease problems limiting significant tree losses within a single street
4. Attempt to follow the maximum 10 percent species, 20 percent genus and 30 percent family rule\*
5. Create a planting plan for the entire City and alter the plan only as required to substitute for underperforming tree species within specific planting conditions
6. Limit planting size to two-inch diameter trees. Two-inch diameter trees perform better than four-inch diameter trees because it takes the two-inch diameter trees less time (two years vs. four years for four-inch diameter trees) to recover from the shock of being transplanted; in fact, two-inch diameter trees often outgrow four-inch diameter trees over their lifetime for this reason. In addition, it is easier to avoid utility conflicts with a two-inch diameter tree.
7. The Forester assigns street tree planting

*\* Note: These terms refer to tree taxonomy. For example, the family Aceraceae includes the genus Maple, which includes the species Red Maple. Learn more at <https://www.arborday.org/trees/treeguide/classification.cfm>*

## Minimum Planting Clearances

As noted, the key to the Street Tree Master Plan is to plant the largest tree possible for a particular site. Figure 2 provides minimum planting clearances for small, medium and large trees.

Clearance	Small Trees	Medium Trees	Large Trees
Tree Lawn Width	4-6 feet	6-8 feet	Over 8 feet
Minimum Overhead Clearance	30 feet	50 feet	60 feet
Other Trees and Plantings	15-25 feet	25-40 feet	35-40 feet

FIGURE 2: MINIMUM PLANTING DISTANCES

## Construction and Tree Preservation

Infrastructure repairs and replacement are the greatest threat to our street trees. The City's gas, water and sewer lines have a limited life expectancy and also require maintenance to keep them functional. The Public Works Department takes the time to evaluate and determine the best means to repair or replace aging infrastructure, while trying to preserve trees.

Shaker Heights is unique in the way in which its utility systems were originally designed. Unlike newer developments in which the utilities are within the roadway, Shaker Heights has many streets where the gas, water and sewer mains are within the sidewalk or tree lawn. In these cases, it is challenging to make repairs without damaging tree roots or removing trees.

### Sewer and Water Main Replacement

To help avoid damaging the mature trees that often line our streets, Shaker Heights will attempt to place a lining within the existing sewer to extend its serviceable life. Alternatively, if a new sewer main is required, the City will attempt to install it in a more favorable location (and abandon the old system in place). This may also be an option for new water mains. A new water main can be installed in a different

location, while the old system is abandoned in place in order to protect existing trees.

## Gas Main Replacement

Directional drilling is commonly used when installing new gas mains. The advantage of directional drilling is that it only requires several small excavations to install hundreds of feet of new pipe. As a result, this technique causes only minimal impact to the street trees or surrounding area. The disadvantage of directional drilling is that it is limited to utility projects that do not require pipes to be graded to take advantage of gravity. For example, sewer main projects cannot use directional drilling, as these systems depend on gravity to move water/sewage through pipes.



**INFRASTRUCTURE REPAIR AND REPLACEMENT IS THE GREATEST THREAT TO OUR STREET TREES.**

## Utility Maintenance

When street trees are planted over sewer laterals, gas or water valve boxes, routine maintenance becomes a challenge. Valve boxes must be accessible, so that utility companies can perform maintenance or turn service off in the event of an emergency. In many of these cases, the City must remove the tree in order to access the underground utility to make repairs. The Street Tree Master Plan, which

requires planting trees 10-15 feet from underground utilities, we will help minimize these issues in the future.

## Permitting

The City can use its existing permitting system to ensure contractors take precautions to protect our trees. The Public Works Department requires any contractor working in the right of way to obtain a Right of Way Permit. The Department then uses the submitted permit to track work within the right of way that may impact trees. In addition, the Department provides contractors applying for a Right of Way Permit with required standards to follow to help minimize construction damage to our trees.

## Implementation

- The Forestry Department will implement protections from construction activity — including utility maintenance — for City trees as follows:
- Select the proper tree for the planting space and strategically plant the tree to avoid hardscape conflicts and above and below ground utility conflicts
- Work with the Planning Department to ensure that the Forestry Department is involved in proposed construction plan reviews and issuing of Right of Way permits
- Require contractors to contact the Forestry Department when pruning or digging around trees; contractors will be required to have a Certified Arborist supervise tree pruning work
- Forestry Crews will prune tree lawn trees prior to City construction projects to reduce the possibility of broken limbs and tree damage
- Ensure contractors working around trees avoid stock piling material or driving equipment under the tree canopy
- Require contractors to remove damaged trees at their own expense and compensate the City for the lost value of the tree
- Require hand digging and root pruning when working near trees
- Spot inspection of construction projects
- Modify sidewalks as needed to minimize root damage or cutting
- Repair/rebuild soils that were previously destroyed by construction, making these areas conducive to new plantings



## **Appendices**

## Appendix A—Shaker Heights Yearly Tree Plan Schedule

Shaker Heights Yearly Tree Plan Schedule

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tree Removals												
Tree planting list and letters to residents												
Spring Tree Tagging												
Spring Planting												
Tree Pruning												
Remove previous years tree stakes												
Stump Grinding												
Fall Planting												
Fall planting list and tree tagging												
Work Orders / Resident Request												
Spring Warranty Drive Thru												
Summer Warranty Drive Thru												
Leaf/Brush Collection												
Arbor Day Activities												
Tree City USA Application												
Monitor Construction Activities												
Leaves Off Drive Thru												
Leaves On Drive Thru												

## Appendix B—Street Tree Inventory Work Sheet

STREET TREE INVENTORY																			
Collectors															Page		Comments on back		
Date															City/Stand				
Maintenance																			
Add	Dir	Street	Cell	Spp	Var	DBH (In)	Cond	CS	CT	T	S	H	R	Pow	Walk	TLn (Ft)	Plant	Pri	Notes

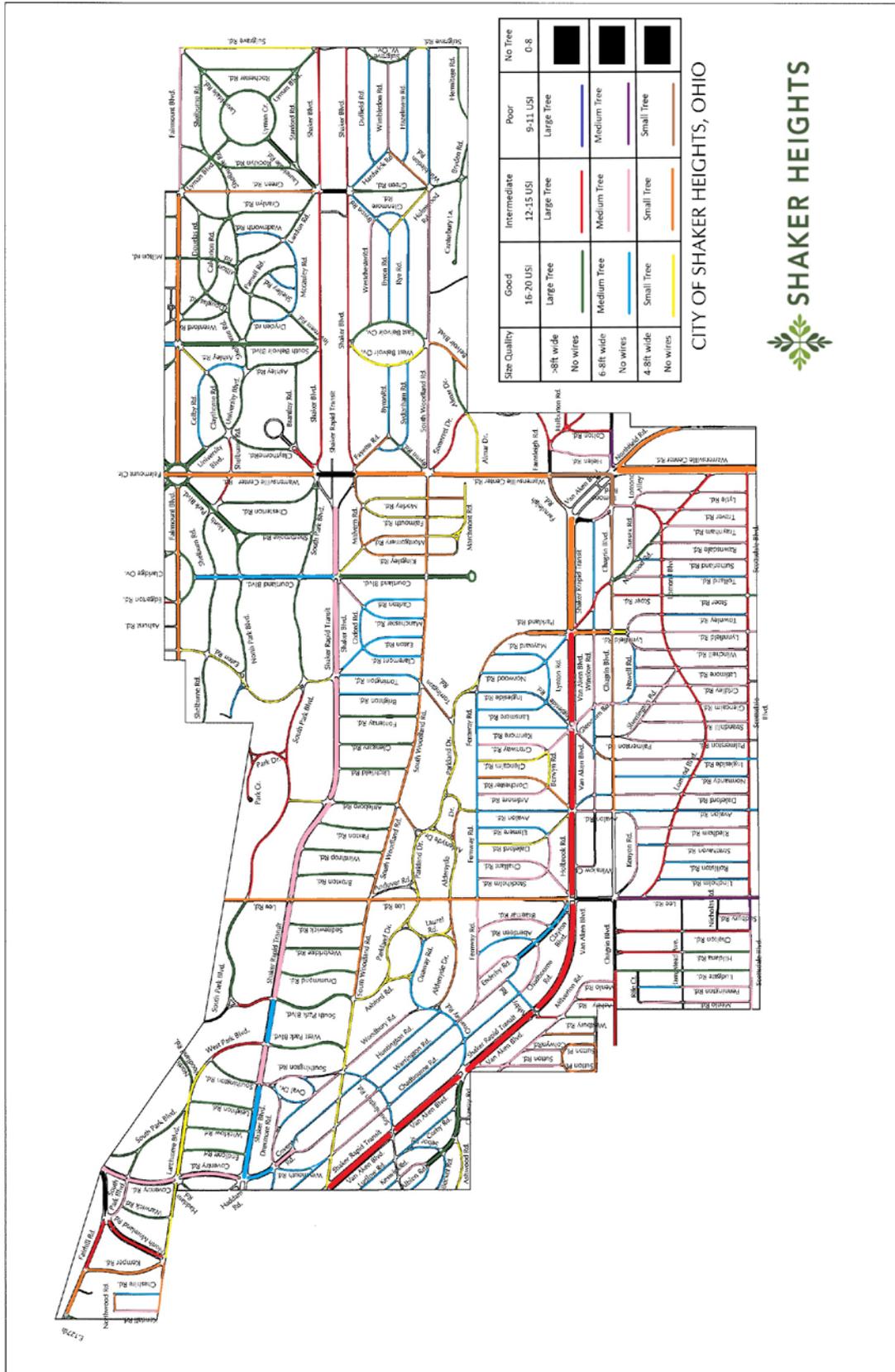
<b>Add</b>	House/building number					<b>Maintenance</b> (check all that apply)																						
<b>Dir</b>	Direction (N, S, E, W) if applicable					<b>CS</b>	Clearance Prune: Needed for sidewalk (8') or street (14')																					
<b>Street</b>	Street of house/building address					<b>CT</b>	Clearance Prune Traffic: Needed for traffic signs/lights																					
<b>Spp</b>	Tree Species					<b>T</b>	Train: Young tree with structural defects that can be fixed with pruning																					
<b>Var</b>	Tree Variety					<b>S</b>	Standard Maintenance: No dead wood or broken branches over 4" diameter																					
<b>Cell</b>	19	18	17	16	15	14	13		12	<b>Pow:</b>	<b>Plant</b>																	
	20	Rear					11				<b>P</b>	Primary or Transmission Lines																
	21										10	<b>S</b>	Secondary															
	22											9	<b>O</b>	Other lines														
	23												8	<b>Pri: Priority</b>														
	24													<b>P</b>	Primary: Sidewalk & Curb													
	1													2	3	4	5	6	7	<b>S</b>	Secondary: Sidewalk or Curb							
<b>Walk:</b> Check if sidewalk damaged								<b>T</b>	Tertiary: No Sidewalk, No Curb																			
<b>Cond:</b>	<b>Condition</b>					<b>TLn:</b>	<b>Treelawn</b>																					
<b>G</b>	Good					Width of Treelawn in feet																						
<b>F</b>	Fair					<b>Notes</b>																						
<b>P</b>	Poor					Anything of special note																						
<b>D</b>	Dead																											

## Appendix C—Urban Site Index (USI) Inventory Work Sheet

URBAN SITE INDEX (USI) INVENTORY																
		Collectors (s)														
		Date													Comments on back	
		Large scale! Look for change in USI or size class														
			Segment Start	Segment End												
			Street/Add #/ Landmark	Street/Add #/ Landmark	Spp	Veg	Surf	Prob	Layer	Speed	Lane	Park	Length	Total	Size	Pri
1																
2																
3																
4																
5																

Dir	Street Direction if applicable (N/S/E/W) i.e. N Main St vs S Main St	Spp	Species													
	Veg	Vegetation			Speed	Speed limit of street				Pri	Priority					
0	just bare dirt, gravel or some sort of pavement				0	50 mph or more				1	Curb & Sidewalk					
1	sparse weeds with dirt showing through				1	35 to 49 mph				2	Curb or Sidewalk					
2	patchy grass and weeds				2	less than 35 mph				3	No Curb, No Sidewalk					
3	good (un-watered) lush grass, some weeds are ok.															
					Lane	Number of traffic lanes on street										
	Surf	Surface compaction			0	6 lanes or more										
0	no soil, pavement				1	4 lanes										Site Scores
1	hard like walking on office carpeting				2	2 lanes						0 to 8				No Tree
2	moderate like walking on living room carpeting											9 to 11				Poor
3	soft like walking on well-padded, shag carpeting				Park	Type of parking on street						12 to 15				Intermediate
					1	No parking						16 to 20				Good
	Prob	Shovel or Probe penetration			2	On street parking										
0	does not go into the ground															
1	goes in but not completely				Length	Block length between traffic control devices										
2	goes in but requires lots of effort				0	More than ½ mile										
3	goes in fully with ease				1	½ to ¼ mile										
					2	less than ¼ mile										
	Layer	Soil layers														
0	no soil				Size	Size Class for Tree										
1	no top soil un-layered subsoil or a clear separation			L	>8 Feet Wide	& no overhead primary electric										
2	layering in the soil from the old native soil			M	6-8 Feet Wide	& no overhead primary electric										
3	good layering of the A-B-C native soil			S	4-6 Feet Wide	or primary overhead electric										

# Appendix D— Urban Site Index (USI) Map



## Appendix E—Planting Species and Site Conditions (1/4)

See key in Appendix B for USI

LATIN NAME	COMMON NAME	HEIGHT	SPREAD	USI	SIZE
<i>Acer campestre</i>	Hedge Maple	25-40 ft	25-40 ft	I	M
<i>Acer ginnala</i>	Amur Maple	20ft	10ft	P	S
<i>Acer miyabe</i> "State Street"	Miyabe Maple	40ft	25ft	I	M
<i>Acer nikoense</i>	Nikko Maple	30-45ft	30-45ft	G	M
<i>Acer platanoides</i> "Crimson King"	Crimson King Maple	40ft	35ft	I	M
<i>Acer rubrum</i> "Armstrong"	Armstrong Maple	45ft	15ft	I	M
<i>Acer rubrum</i> "October Glory"	October Glory Red Maple	50ft	35ft	I	L
<i>Acer rubrum</i> "Red Sunset"	Red Sunset Red Maple	45ft	35ft	I	M
<i>Acer saccharum</i> "Green Mountain"	Green Mountain Sugar Maple	65ft	50ft	G	L
<i>Acer tataricum</i>	Tatarian Maple	20-30ft	15-20ft	I	S
<i>Aesculus carnea</i>	Red Horsechestnut	30-40ft	20-30ft	I	L/M
<i>Aesculus flava</i>	Yellow Buckeye	60-75ft	40-50ft	I	L
<i>Aesculus glabra</i>	Ohio Buckeye	20-40ft	20-40ft	I	L/M
<i>Aesculus pavia</i>	Red Buckeye	12-15ft	12-15ft	I	S
<i>Alnus glutinosa</i>	Common Black Alder	15-25ft	15-25ft	P	L
<i>Alnus rugosa</i>	Speckled alder	12-15ft	12-15ft	P	S
<i>Alnus serrulata</i>	Hazel or Smooth Alder	6-20ft	6-5ft	P	S
<i>Amelanchier Autumn Blaze</i>	Autumn Blaze Serviceberry	20-25ft	15ft	I/P	S
<i>Amelanchier x grandiflora</i> 'Princess Diana'	Princess Diana Serviceberry	20ft	15ft	I/P	S
<i>Amelanchier X grandiflora</i> "Robin Hill"	Robin Hill Serviceberry	20-25ft	15ft	I/P	S
<i>Betula alleghaniensis</i>	Yellow Birch	60-80ft	60-75ft	G	M/L
<i>Betula lenta</i>	Sweet Birch	60-80ft	35-45ft	I	M/L
<i>Betula nigra</i> "Heritage" ( Tree form)	Heritage River Birch	45ft	25ft	I	L
<i>Carpinus betulus</i>	European Hornbeam	30ft	20ft	G	M
<i>Carpinus betulus</i> 'Fastigiata'	Pyramidal European Hornbeam	35ft	25ft	G/I	M
<i>Carpinus caroliniana</i>	American Hornbeam	25-35ft	20-25ft	G/I	M/S
<i>Carpinus japonica</i>	Japanese Hornbeam	20-30ft	20-25ft	I	S
<i>Catalpa speciosa</i>	Northern Catalpa	40-60ft	35ft	P	L
<i>Carya laciniosa</i>	Shellbark Hickory	60-90ft	40-60ft	I	L
<i>Carya cordiformis</i>	Bitternut Hickory	60-90ft	30-50ft	I	L
<i>Carya glabra</i>	Pignut Hickory	60-90ft	25-40ft	P	L
<i>Carya ovata</i>	Shagbark Hickory	70-100ft	50-70ft	I	L
<i>Castanea dentata</i>	American Chestnut cultivars?	80ft?	50-75ft?	I	L

## Appendix E—Planting Species and Site Conditions (2/4)

See key in Appendix B for USI

LATIN NAME	COMMON NAME	HEIGHT	SPREAD	USI	SIZE
<i>Celtis occidentalis</i>	Common Hackberry	40ft	40ft	P	L
<i>Cercidiphyllum japonicum</i>	Katsura	40-50ft	40-50ft	I	L
<i>Cercis canadensis</i>	Redbud	25ft	30ft	I	S
<i>Chionanthus virginicus</i>	American Fringe Tree	12-20ft	12-20ft	G	S
<i>Cotinus obovatus</i>	American Smoke Tree	20-30ft	20-30ft	I	S/M
<i>Chionanthus retusus</i>	Chinese Fringe Tree	18ft	18ft	G	S
<i>Cladrastis kentukea</i>	Yellowwood	30-40ft	30-40ft	I	M
<i>Cornus florida</i>	White Flowering Dogwood	25-30ft	20-25ft	G	M
<i>Corylus colurna</i>	Turkish Filbert	40-50ft	25-30ft	I	L
<i>Crataegus crusgalli inermis</i> "Crusader"	Crusader Hawthorne	15ft	12-15ft	I	S
<i>Diospyros virginiana</i>	American Persimmon	40-60ft	25-35ft	I	M
<i>Eucommia ulmoides</i>	Hardy Rubber tree	40ft	40-60ft	P	M
<i>Evodia daniellii</i>	Korean Evodia	25-30ft	25-30ft	I	S
<i>Fagus Grandifolia</i>	American Beech	60-80ft	40-80ft	G	L
<i>Fagus sylvatica</i> "Roseomarginata"	Tricolor Beech	30ft	20ft	G	M
<i>Ginkgo biloba</i> 'Autumn Gold'	Autumn Gold Ginkgo	45ft	35ft	P	L
<i>Ginkgo biloba</i> 'Fairmont'	Fairmount Ginkgo	80ft	60ft	P	L
<i>Ginkgo biloba</i> 'Princeton Sentry'	Princeton Sentry Ginkgo	40ft	15ft	P	L
<i>Gleditsia triacanthos</i> "Shadmaster"	Upright Honey Locust	50-75ft	25-40ft	P	L
<i>Gleditsia triacanthos inermis</i>	Honey Locust	60ft	30ft	P	L
<i>Gymnocladus dioicus</i>	Kentucky Coffeetree	70ft	40-50ft	I	L
<i>Halesia carolina</i>	Carolina Silverbell	30-40ft	20-35ft	I	S/M
<i>Juglans nigra</i>	Black Walnut	60-85ft	60-85ft	G	L
<i>Koeireuteria paniculata</i>	Goldenrain Tree	30-40ft	25-30ft	I	M
<i>Liquidambar styraciflua</i> "Moraine"	Moraine Sweetgum	60ft	18-25ft	I	L
<i>Liquidambar styraciflua</i> 'Slender Silhouette'	Slender Silhouette Sweetgum	35-45ft	7ft	I	L
<i>Liquidambar styraciflua</i> 'Variegata'	Golden varagated Sweetgum	40ft	20ft	I	L
<i>Liquidambar styraciflua</i> 'Silver King'	Silver King Sweetgum	30-40ft	15-20ft	I	L
<i>Liriodendron tulipifera</i>	Tulip Tree	60-80ft	35ft	G	L
<i>Maackia amurensis</i> Starburst'	Starburst Maackia	20-30ft	20-30ft	I	M
<i>Maclura pomifera</i>	Osage Orange	50-60ft	35-60ft	P	M/L
<i>Magnolia acuminata</i>	Cucumber Magnolia	50-80ft	40-60ft	G	L

## Appendix E—Planting Species and Site Conditions (3/4)

See key in Appendix B for USI

LATIN NAME	COMMON NAME	HEIGHT	SPREAD	USI	SIZE
Magnolia X Galaxy"	Galaxy Magnolia	20-30ft	15ft	G	M
Malus "Candy mint"	Candy Mintcrabapple	10ft	10-15ft	P	S
Malus "Harvest Gold"	Harvest Gold Crabapple	20ft	15ft	P	S
Malus "Indian Summer"	Indian Summer Crabapple	15-20ft	15-20ft	P	S
Malus "reizam"	Rejoyce Crab Apple	12-15ft	6-8ft	P	S
Metasequoia glyptostroboides	Dawn Redwood	50ft	25-30ft	I	L
Morus Rubra	Red Mulberry	40-60ft	35-40	I	M/L
Nyssa sylvatica	Tupelo	30-50ft	20-30ft	I	L
Ostrya virginiana	American Hophornbeam	40ft	25ft	I	L
Platanus x acerifolia "Bloodgood"	Bloodgood London Planetree	50ft	40ft	I	L
Platanus occidentalis	American Sycamore	80ft	60ft	I	L
Parrotia persica	Persian Ironwood	20ft	15ft	I	S
Parrotia persica "Vanessa"	Vanessa Parrotia	20-40ft	10-15ft	G	M
Phellodendron amurense "Macho"	Macho Amur Corktree	35ft	30ft	I	M
Prunus Serotina	Black Cherry	60-80ft	30-60ft	P	L
Prunus virginiana "Canada Red"	Canada Red Chokeycherry	25ft	20ft	G	M
Pyrus calleryana "Redspire"	Redspire Pear	No Longer Planting			
Pyrus calleryana "Cleveland Select"	Cleveland Select Pear	No Longer Planting			
Pyrus ealleryana "Jaczam"	Jack Pear	16ft	10ft	P	S
Oxydendrum arboreum	Sourwood	20-50ft	10-25ft	G	S/M
Quercus acutissima	Sawtooth Oak	35-45ft	40ft	I	M
Quercus alba	White Oak	70-100ft	50-80ft	G	L
Quercus bicolor	Swamp White Oak	45ft	45ft	I	L
Quercus cerris	Turkey Oak	40-60ft	40-50ft	I	L
Quercus coccinea	Scarlet Oak	50ft	40ft	I	L
Quercus ellipsoidas	Northern Pin Oak	50-70ft	40-60ft	I	M/L
Quercus glandulifera	Konara Oak	35-45ft	35-45ft	I	M
Quercus imbricaria	Shingle Oak	50ft	50ft	I	L
Quercus lyrata	Overcup Oak	35-45ft	35-45ft	I	M
Quercus macrocarpa	Bur Oak	50-70ft	50-70ft	I	L
Quercus michauxii	Swamp Chestnut Oak	60-70ft	60-70ft	I	L
Quercus montana	Chestnut Oak	70-100ft	50-70ft	G	L
Quercus palustris 'Pringreen'	Green Pillar Pin Oak	50-60ft	12-15ft	I	L

## Appendix E—Planting Species and Site Conditions (4/4)

See key in Appendix B for USI

LATIN NAME	COMMON NAME	HEIGHT	SPREAD	USI	SIZE
<i>Quercus petraea columnna</i>	Columnar Durmast Oak	50-60ft	20ft	I	L
<i>Quercus phellos</i>	Willow Oak	25-35ft	25-35ft	I	M
<i>Quercus robur</i>	English Oak	25-35ft	25-35ft	I	M
<i>Quercus robur 'Pectinata'</i>	Cutleaf English Oak	25-35ft	25-35ft	I	M
<i>Quercus rubra</i>	Red Oak	60-75ft	50ft	G	L
<i>Quercus shumardii</i>	Shumard Oak	40-60ft	40-60ft	I	L
<i>Quercus stellata</i>	Post Oak	35-50ft	35-50ft	I	M/L
<i>Robinia pseudoacacia</i>	Black Locust	50ft	35ft	P	L
<i>Salix alba "Tristis"</i>	Niobe Weeping Willow	40-50ft	50ft	I	L
<i>Sassafras albidum</i>	Sassafras	30-60ft	25-40ft	I	M/L
<i>Sophora japonica</i>	Japanese Pagoda Tree	45ft	35ft	P	M
<i>Sorbus alnifolia</i>	Korean Mountainash	35ft	20ft	G	M
<i>Sorbus americana</i>	American Mountain Ash	15-30ft	15-25ft	G	S
<i>Staphylea trifolia</i>	Bladdernut	10-15ft	10-20ft	G	S
<i>Syringa pekinensis</i>	Peiking Lilac	20-25ft	15-20ft	P	S
<i>Syringa reticulata</i>	Japanese Tree Lilac	25ft	15-25ft	P	S
<i>Syringa reticulata 'Ivory Silk'</i>	Ivory Silk Tree Lilac	20ft	15ft	P	S
<i>Taxodium distichum</i>	Bald Cypress	50-70ft	20-30ft	I/P	L
<i>Tilia cordata 'Greenspire'</i>	Greenspire® Linden	40-50ft	35ft	I	L
<i>Tilia americana "Redmond"</i>	Redmond Linden	60ft	35ft	I	L
<i>Tilia tomentosa "Sterling Silver"</i>	Silver Linden	40-60ft	35ft	I	L
<i>Ulmus "Holmstead"</i>	Holmstead Elm	55ft	35ft	P	L/M
<i>Ulmus "Morton Acculade"</i>	Morton Elm	50-60ft	30-40ft	P	L/M
<i>Ulmus americana "american liberty"</i>	Liberty Elm	50-70ft	50-70ft	P	L/M
<i>Ulmus americana "Valley Forge"</i>	Valley Forge American Elm	70ft	60ft	P	L/M
<i>Ulmus frontier</i>	Frontier Elm	35ft	25ft	P	M
<i>Viburnum prunifolium and rufidulum</i>	Rusty & Blackhaw Viburnum	10-20ft	10-20ft	I	S
<i>Zelcova serrata "Green Vase"</i>	Green Vase Zelcova	60ft	40ft	P	L/M

## Appendix F—City Codified Ordinance Chapter 161

### CHAPTER 161

#### Tree Advisory Board

**161.01 Creation; purpose.**

**161.02 Membership.**

**161.03 Term; vacancies.**

#### CROSS REFERENCES

Trees and Shrubs -  
see GEN. OFF. Ch.  
747

#### **161.01 CREATION; PURPOSE.**

There is hereby created a "Tree Advisory Board" whose purpose shall be to advise the Mayor and staff on issues involving the City's trees and urban forests in order to facilitate City-wide strategic programs, enhance planting activities, and obtain grant funds for the maintenance of the City's tree programs.

(Ord. 12-40. Enacted 4-23-12.)

#### **161.02 MEMBERSHIP.**

Membership of the Tree Advisory Board shall be comprised of the Director of Public Works or his or her designee; and two members of City Council and three or more citizen members who shall be appointed by the Mayor and confirmed by Council.

(Ord. 15-29. Enacted 4-27-15.)

#### **161.03 TERM; VACANCIES.**

Citizen members of the Tree Advisory Board shall serve two-year, calendar year terms. Appointments to fill vacancies in the minimum number of members, or to add members, shall be filled by appointment by the Mayor and confirmation by Council. The terms of citizen members shall end on December 31 of the year following the year that their term began.

(Ord. 12-40. Enacted 4-23-12.)

## Appendix G—City Codified Ordinance Chapter 747

### 747.01 INJURY TO TREES AND SHRUBS.

It shall be unlawful for any person:

- (a) To remove, destroy, cut down, break, climb or injure any tree, ornamental plant or shrub in any street or public ground within the City, or any stake, wire or device protecting the same, except with and in conformance to the written permission of the Director of Public Works, which permission shall be given only when the Director finds that the proposed action is necessary to preserve the appropriate use of the street or public ground.

To prune, fertilize, spray or otherwise treat any tree, ornamental plant or shrub, or to attach any rope, wire, chain, sign or other device thereto, except when employed by the City to do so, or with and in conformance to the written permission from the Director, which permission shall be given only when the Director finds that the proposed action will not substantially injure the tree, ornamental plant or shrub. Upon application for a permit to prune any tree, plant or shrub, the Director, or a subordinate designated by him, shall make an actual inspection of the tree, plant or shrub proposed to be pruned, and shall point out to the applicant, or mark with paint or both, the branches, if any, which may be removed and the point of removal, and the designation shall constitute a part of the permit.

- (b) To permit any gas, salt, brine, oil, liquid dye or other substance deleterious to tree life to come in contact with the soil surrounding the roots of any tree, ornamental plant or shrub in such manner as to kill or injure the same.
- (c) To place or maintain upon the ground in any public street or place within the City any stone, concrete or other impervious material in such manner as to obstruct the free access of air and water to the roots of the tree, ornamental plant or shrub. An area of less than nine (9) square feet of open ground around the base of the trunk of a tree three (3) inches in diameter with an increase of one (1) square foot of open ground for every two (2) inches increase in diameter shall be prima-facie evidence of violation of this subsection.
- (d) To cause or procure or knowingly or negligently to permit a wire or other conductor charged with electricity to come in contact with any tree, ornamental shrub, or plant so as to kill or injure the same, or fail to remove any wire or conductor or to cut off the current therefrom within forty-eight (48) hours after written notice from the Director to do so, in case the Director finds it necessary to cut, prune or remove the tree.

- (e) To fail to provide a good and sufficient protection for any tree, ornamental plant or shrub against any injury arising from any building operation of which he has charge.
- (f) To cause or knowingly or negligently to permit any animal to injure any tree, ornamental plant or shrub.
- (g) To maintain any of the nuisances defined in this chapter (Ord.6439. Enacted 9-17-56.)

#### **747.02 NUISANCES IN CONNECTION WITH TREES.**

- (a) The following acts, things and conditions done or existing within this City are declared to constitute nuisances:
    - (1) Any tree upon any street or public place or so near thereto as to permit the roots of the tree to penetrate through or under the surface thereof.
    - (2) Any tree, plant or shrub, wherever located within the City, infected with any parasite, insect, fungus or pest, which may be communicated to any other tree, plant or shrub.
    - (3) Any tree which has fallen or is in such condition as is likely to fall on any public or private property, including the property upon which it is situated.
    - (4) Any tree, plant or shrub which branches or trunk obstruct or impede traffic on any street or public place. Branches overhanging any public sidewalk, pavement or roadway within nine (9) feet of the surface thereof shall be deemed prima-facie to obstruct or impede traffic thereon.
  - (b) Whenever in the opinion of the Director any of the nuisances defined in this section exists, he shall cause its abatement and cause the cost of the abatement to be charged and collected in the manner provided by ordinance of this City. (Ord. 6439. Enacted 9-17-56.)
- 8.

#### **747.02 PLANTING TREES AND SHRUBS.**

No tree, ornamental plant or shrub shall be planted on any public street or ground within the City except by persons employed by the City for that purpose, or with and in conformance to the written permission of the Director of Public Works, who shall grant such permission only if he finds that the proposed planting will not interfere with the appropriate public use of the street or ground and is consistent with any plan of planting already in effect thereon. Such permission shall specify the manner in which the planting shall be done, in order to insure such consistency and lack of interference, and to promote the proper growth of the trees, ornamental plants or shrubs proposed to be planted.

(Ord. 6439. Enacted 9-17-56.)

#### **747.03 GRASS AND WEEDS.**

The existence upon any lot or parcel of land within the City of grass or weeds likely to catch fire and spread the same to other property, or of weeds which are spreading or maturing seeds, or about to do so, ragweed, goldenrod, poison ivy, or poison oak, is declared to be a nuisance. No person being the owner, occupant or person in control of any lot or parcel of land within the City shall permit a nuisance as herein defined to exist or continue thereupon.

(Ord. 64-145. Enacted 9-21-64.)

#### **747.04 USE OF DDT PROHIBITED.**

The use of the chemical compound known as DDT as a spray or in any manner by which it is released within the City is hereby prohibited.

(Ord. 69-161. Enacted 8-18-69.)

#### **747.05 DISEASED OR DEAD ELM TREES TO BE REMOVED.**

The owner of any property within the City upon which is located an elm tree infected with Dutch Elm Tree disease or any dying or dead elm tree shall cause such elm tree to be immediately cut down and all parts thereof to be destroyed or disposed of in such a manner as to preclude the transmission of elm tree disease or the harboring, feeding or breeding of the elm tree beetle.

(Ord. 69-161. Enacted 8-18-69.)

#### **747.06 DUTCH ELM DISEASE AND DUTCH ELM DISEASED TREES DECLARED TO BE NUISANCES.**

It is hereby declared and determined that the following things and conditions nuisances which may be abated by the Director of Public Works or the Director of Safety, as provided in Chapter 107 of the Codified Ordinances, to-wit:

- (a) Dutch Elm disease.
- (b) Elm bark beetles.
- (c) Any living or standing elm tree, or part thereof, infested with the Dutch Elm disease fungus, or in a weakened condition which harbors any of the elm bark beetles.
- (d) Any dead elm tree or part thereof, including logs, branches, stumps, firewood or other elm tree material from which the bark has not been removed, burned or buried. Ord. 70-29. Enacted 2-23-70.)

## **Acknowledgements**

This plan is made possible thanks to the hard work, dedication and commitment of the Mayor and Chief Administrative Officer, Tree Advisory Board, Planning Department, Zoning Administrator, Communication and Marketing Department, Ohio Department of Natural Resources, City Forester and Public Works staff.