

Urban Forestry Operations Review and Strategic Plan

University City, Missouri

April, 2009



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Executive Summary

Background and Purpose

Trees and forests are of vital importance to the environmental, social, and economic well-being of University City. The City has enjoyed a long history of urban forestry planning that included pioneering one of the first municipal urban forestry programs with a professional forester at the helm and has been a Tree City USA for over 25 years. The City's urban forest provides numerous benefits that are both tangible and intangible. However, this important municipal and natural resource is reaching a critical point as a result of an aging resource and dwindling budgets.

Recognizing this critical point in their urban forestry program, the City has taken a proactive step and requested this *Urban Forestry Operations Review and Strategic Plan*. The Plan is intended to provide strategies, goals, policies, standards, and actions to protect, enhance, expand, and preserve the tree canopy for the benefit of the community. The Plan intends to help coordinate and improve the City's tree management program in an equitable, efficient, and sustainable manner. Moreover, the Plan will be a valuable operational tool.

This Plan was systematically developed using a variety of information obtained through:

- a comprehensive review of existing City ordinances, specifications and standards, budgets, policies, annual plans
- interviews with key City staff and leaders
- public participation and input
- analyzing inventory data (from 2000) and making field observations
- applying national arboricultural standards and best management practices.

This is a comprehensive, customized *Urban Forestry Operations Review and Strategic Plan* for University City based on local conditions, resources, and priorities.

Vision

The *Urban Forestry Operations Review and Strategic Plan* takes its vision from the Annual Community Forestry Plan to sustain a healthy, safe, and appealing public street and park tree population in the City of University City. The Urban Forestry Commission, City staff, and citizens have this vision for the future management of the City's urban forest:

Urban Forestry Operations Review and Strategic Plan Vision Statement

-  *Provide a thorough review of urban forestry operations and recommend strategies, policies, standards, and actions to protect, enhance, expand, and preserve the City's public forest resource.*
-  *Coordinate and improve the City's urban forestry operations in an equitable, economic, and sustainable manner.*
-  *Provide a valuable strategic planning tool that will guide the City's forestry operations.*

Major Goals and Recommendations

While the City is faced with budget issues that demand a closer look at how it manages its forest resources, it creates an opportunity to become more efficient and to understand the primary areas of its mandated responsibilities.

The vision of University City's *Annual Community Forestry Plan* is "To sustain a healthy, safe, and appealing public street and park tree population in the City of University City, Missouri." This vision should guide the City's efforts to recover the loss of tree canopy and enhance all tree-related benefits by recommending strategies and actions to improve the City's urban forest management in an efficient, equitable, economic, and sustainable manner. The four *Strategic Goal Areas* are presented below with the key recommendations.

1) Increased Communication

Several City agencies have an impact on some aspect of the City's urban forest. The City's ordinances lack a comprehensive perspective, and there appears to be no support from the City Manager or other administrative staff to require or seek technical expertise when public improvement projects may impact city-owned trees. Fragmentation, or separation defined by organizational boundaries and agency-specific missions, may keep the City's departments from interacting in meaningful and productive ways to protect and enhance the urban forest. This appears to be a serious and on-going issue in University City. The current *Annual Community Forestry Plan* is an excellent source of information about activities within the Forestry Division but lacks detail in the "Action Items" section that is an excellent opportunity to plan for future needs.

Key Recommendations:

- a) The City Manager should propose and City Council should approve additions to Chapter 12.08 of the City Code that will clarify specific responsibilities for city-owned trees and enhance communication between departments.
- b) The City should find means to increase interdepartmental communication and cooperation for plans and projects that may affect the urban forest, improve the "Action Items" section of the *Annual Community Forestry Plan*, and include the Plan's content in the City's *Comprehensive Plan Updates*.

2) Improved Administration and Planning Within the Forestry Division

The City Forester has an outdated street tree inventory and no park tree inventory. A sustainable urban forestry program must have reliable data in order to efficiently plan and complete assigned tasks. The inventory will also allow a thorough analysis to be completed that will utilize nationally recognized models to calculate a full accounting of the benefits the City receives from a healthy well-managed urban forest. Additionally, the inventory data can be used to develop a solid action plan on how the City will deal with the large number of removals associated with an outbreak of emerald ash borer. Tree removals and replanting associated with this particular insect infestation could cost the City over \$1 million.

Key Recommendations:

- a) Update the City's street tree inventory and complete a park tree inventory. Both should be GIS-based inventories and the data should be loaded into a comprehensive tree management software package in order to create efficiencies in assigning needed work and tracking accomplishments.

- b) Once the inventories are complete, utilize data to calculate the technical benefits of the City's tree population with UFORE or STRATUM.
- c) Utilize the data to begin creating a plan to respond when the emerald ash borer strikes. Improve and incorporate the *Annual Community Forestry Plan* into the City's *Comprehensive Plan Updates*.

Increased Staffing and Resources

The City is currently planting 185 fewer trees than it removes each year. At this pace, the City will have a streetscape without any public trees by the year 2060. This critical event may happen sooner, given the increasing number of removals needed each year as a result of an aging street tree population, and if emerald ash borer further taxes the City's resources. Currently, an efficient cyclical tree pruning program is suffering as a result of having to deal with "on-demand" requests by property owners in University City. These requests are given top-priority and pull the forestry crew away from completing much needed and more efficient pruning on a scheduled seven-year cycle. This block-by-block method of pruning reduces set-up time and is much more efficient than dealing with "on-demand" pruning requests. Utilizing contract crews for all of the City's forestry tasks would cost the City an additional \$94,073 (a 26% increase in current costs).



The Forestry Division uses a bucket truck to reach the canopy of larger trees.

Key Recommendations:

- a) Increase staffing levels and allocate resources to avoid a severe decline in street tree numbers and overall health of the City's community forest.
- b) Utilize contract crews to handle the "on-demand" pruning requests and keep in-house crews on the cyclical pruning program.
- c) Consider charging residents for the contracted services that are performed "on demand" and outside of normally scheduled activities.

3) Expanded Education and Public Relations

Citizens, businesses, City staff and leaders, and developers need continued education and marketing targeted to increase their awareness of the benefits of trees. They need to be aware of the availability of City resources and the various ways they can become more involved in the urban forest management program and be a part of the solution. If emerald ash borer strikes the City, an awareness program will be needed to educate residents of their role and City's role in prevention, detection, removals, and replanting.

Key Recommendations:

- a) Increase public and citizen urban forestry outreach efforts, and educate elected officials and City employees on a regular basis.
- b) Hold training sessions for other City staff to educate them about the value of trees and the development of policies that protect public trees.

Implementation

The recommendations made in this Plan are intended to be considered and implemented over a period of five years. While some components should be accomplished quickly (updated inventory and software), others will take a few years to implement and fully realize savings through new efficiencies.

Trees are long-lived organisms. Planting trees today will provide benefits for future generations of citizens. However, by having systematic tree planting and maintenance programs in place, and by having adequate funding, staffing, regulations, and public education resources today, the future public tree population and overall urban forest will be expanded and sustainable.

While funding is needed to implement portions of the Plan, the efficiencies created will offset the increases and result in an overall savings to the City. Without vigilant efforts to effectively manage the City's urban forest, costs will continue to escalate and the quality of the urban forest and the City's character will suffer. Understanding how to efficiently manage this resource and many values it creates will enhance the University City experience for residents, business owners, and visitors.

Benefits

University City's urban forests are municipal assets that appreciate over time because they are alive and growing. They provide tangible and intangible benefits to the City and its citizens. Because of their significance to the environmental, social, and economic well-being of the City, trees and the urban forest should be professionally managed and protected to preserve them now for all citizens and to expand them for future citizens.



The iconic University City lions at the City's entrance are enhanced by the trees in the urban forest.

Introduction

The City of University City, Missouri has a long history of providing a professionally managed forest resource for its citizens. This management, along with the foresight of city planners and the strong tree planting efforts of the early 1900s, have resulted in streets that are now lined with healthy large-diameter oaks and sycamores. University City is strongly identified by its tree-lined streets.

The current street tree resource provides numerous benefits to the City and its residents. Healthy mature trees provide significant reductions in energy use. These reductions in heating and cooling use are partially the result of windbreaks in winter and transpiration of water from leaf surfaces in the summer. As transpiration occurs from each leaf, there is a small cooling in surrounding air temperature. Millions of leaves create significant cooling. Trees also reduce stormwater demands and cleanse the surrounding air of pollution. Property values are typically higher on sites with large trees.

However, along with the benefits mentioned above, there are costs associated with planting, pruning, nurturing, and removing city-owned trees. Staff must be hired or contracted to perform the tasks necessary for managing a municipal tree population. Trees can conflict with infrastructure such as sidewalks, curbs, and utilities. Legal issues related to tree claims can create expenses as well.

In order to effectively manage publicly owned trees, a city should make every effort to make sure that benefits exceed costs. This can be accomplished by taking steps to ensure that good planning takes place and efficient levels of service are provided to community residents that ensure public safety and maximum tree benefits.

Proper management, control, and protection of the natural environment have reached a level of profound importance for municipal governments across the country. Previously satisfied to serve the community by providing economic development, public safety, social services, and other basic municipal programs, elected officials and municipal staff are now being challenged, and even mandated by state and federal government, to take the lead in solving the problems of air pollution, water quality, stormwater control, solid waste disposal, wildlife protection, and other environmental issues. University City, like other municipalities, must now respond to a growing list of environmental concerns to protect its quality of life while simultaneously ensuring growth and complying with environmental regulations.



Tree-lined streets are common throughout University City.

The urban forest in University City may have once been considered only an aesthetic resource, but can now be looked to as a major component in the City's plan to comply with environmental regulations, provide opportunities for quality development, and maintain a high quality of life.

University City has taken the proactive step of creating an *Urban Forestry Operations Review and Strategic Plan*. This Plan intends to provide strategies, goals, policies, standards, and actions to protect, enhance, expand, and preserve the tree canopy for the benefit of the community. The Plan will help coordinate and improve the City's tree management in an equitable, economic, and sustainable manner.

Davey Resource Group provided the professional guidance and received input from University City's Urban Forestry Commission, City staff, elected officials, and citizens to develop the Plan. A summary of the objectives designed to reach the City's goals for this Plan includes:

1. Review and analyze the City's current urban forestry operations, including staffing, equipment, and budget.
2. Review city code relating to trees, with particular attention to mandated needs for service created by the code.
3. Review tree inventory data, current workload, and delivery of services.
4. Perform on-site surveys of public trees on streets, in parks, and other areas as needed or directed.
5. Conduct interviews with City personnel, elected officials, various commission members, and other key stakeholders.
6. Produce a draft version of the Plan for review and comment.
7. Complete the final version of the Plan.

The following sections of the *Urban Forestry Operations Review and Strategic Plan* present the results of the analysis, interviews, and public input throughout this project. The recommendations made in this Plan are based on the conclusions of the analysis and input in combination with urban forest best management practices and current arboricultural standards.

The urban forest, as a municipal asset, is as important to University City's economic and political viability as are water and sewage facilities, transportation systems, and community support services. The quality and availability of all these assets are indicators of University City's ability to encourage people to live and support businesses to prosper within the City limits.

University City's *Urban Forestry Operations Review and Strategic Plan* is a starting point and guide for securing a better future, and to maintain the charm, history, and livability that are hallmarks of University City.

Vision Statement of the Urban Forestry Operations Review and Strategic Plan

University City's *Urban Forestry Operations Review and Strategic Plan* is both a current operational status document and a long-term planning tool. Initially, the Plan will help coordinate and improve the City's urban forestry operations in an equitable, efficient, and sustainable manner and focus on applying current arboricultural standards and practices to municipal tree care and planting efforts. In the long-term, the Plan will be a valuable strategic planning tool, serving as a road map to guide the growth and progress of the City's comprehensive urban forest management program.

The Urban Forestry Commission, as stated in its "*Annual Community Forestry Plan – Fiscal Year 2009–2010*" (Appendix A), has this vision and goal for the future of the City's urban forest:

University City Urban Forestry Commission

Vision Statement and Goals

VISION STATEMENT:

-  *To sustain a healthy, safe, and appealing public street tree and park tree population in the city of University City.*

GOALS:

-  *To effectively manage the urban and community forest of University City in an effective manner through sound management, utilizing in-house and contracted services and building a team of effective proponents for the trees in the community.*

IN ADDITION, THIS OPERATIONAL REVIEW AND STRATEGIC PLAN HAS THE FOLLOWING GOALS:

-  *Provide a thorough review of urban forestry operations and recommend strategies, policies, standards, and actions to protect, enhance, expand, and preserve the City's public forest resource.*
-  *Coordinate and improve the City's urban forestry operations in an equitable, economic, and sustainable manner.*
-  *Provide a valuable strategic planning tool that will guide the City's forestry operations.*

History of University City and Its Urban Forest

In the late 1800s, the area that is now University City, Missouri was primarily farms and small farming communities. Just after the turn of the century, new homes were constructed just west of the St. Louis, Missouri city limit, and what would become University City began its growth. The Delmar streetcar would soon “loop” through the area.

In 1902, Edward Gardner Lewis purchased 85 acres just northwest of the 1904 St. Louis World’s Fair Forest Park construction site. Lewis was the publisher of the Woman’s Magazine and the Woman’s Farm Journal, which had outgrown two locations in downtown St. Louis. The 85-acre area would be the headquarters for the Lewis Publishing Company, as well as the site for a “high-class residential district”. Lewis decided to develop the area as a model city, a real “City Beautiful”.

Lewis’ idea for a residential community with comfortable homes for people of an upper middle class background was realized with the development of University Heights One. University Heights One was carefully designed around the landscaped park. Before the subdivision was fully developed, the land was important to the 1904 St. Louis World’s Fair. Instead of letting the acres stand idle, Lewis built a tent city to house families visiting the Fair. The popular “Camp Lewis” offered comfortable and convenient accommodations and catered meals.

The City of University City was formally incorporated in September, 1906, and Lewis became the first mayor. The City’s name reflected the community’s proximity to Washington University and Lewis’ hope that it would become a center of learning and culture. Over the next few years with Lewis’ guidance, subdivisions developed, banks opened, and commercial activity prospered.



University Heights Subdivision layout with street trees planted before homes were built.

Photo credit “The Archives of the University City Public Library”.



Edward Gardner Lewis’ vision of University City near the City’s entrance included landscaping and the creation of a “City Beautiful”.

Photo Credit “The Archives of the University City Public Library.”

During the 1920s, thousands of people resettled to less populated communities to the west of St. Louis. The 1920 Census revealed that University City had a population of 6,702, an increase of 177% — the largest percent increase recorded during that decade in any Missouri town. Between 1920 and 1930, more than 19,000 people moved to the City, bringing its population to 25,809. Many of the residents were foreign-born.



A panoramic photograph of University City c.1909 showing the use of street trees in the early development of the City.

Photo credit "The Archives of the University City Public Library."

During the Great Depression, University City suffered with the rest of the country. No new subdivisions were platted between 1930 and 1935 and improvements were put on hold. However, by the 1940s, construction boomed again as new schools, public buildings, and street improvements were developed throughout the City with the help of the Works Progress Administration.

On February 4, 1947, University City voters adopted home rule charter and firmly established a new Council-Manager form of municipal government. The City expanded to its current boundaries by the 1960s and comprised 5.8 square miles. During the decades following final annexation, the City has seen much population change, development and redevelopment, and political controversy and stability.



View of a Yale Avenue home with a sycamore street tree c. 1909

Photo credit "The Archives of the University City Public Library."

Development of Urban Forestry in University City

Protecting and preserving the City's community forest is an important concern of City leaders and citizens. Historically, this valuable resource has been well managed, but is currently undergoing the challenges brought on by an aging tree population, aggressive redevelopment, and the need to meet municipal budgets.

University City was a well-planned community from the start, with street tree plantings and park settings a major design feature. The City has always valued its urban forest resources. In 1959, it hired its first professional city forester, Mr. Dave DeVoto, and established a city-wide public tree management program. Mr. DeVoto soon authored the City's first tree ordinance. It emphasized protection of the City's treasured street trees and gave the City authority to declare diseased trees a public nuisance. This was in response to growing concern about Dutch elm disease (DED) and the need for removing diseased trees to limit spread of the disease.

Mr. DeVoto gained notoriety for his ability to manage a large public tree program and his knowledge of dealing with DED. He moved to Minneapolis in the 1970s and developed a program for the City to deal with DED. His model ordinance and program style remained in place at University City.

The City's next City Forester was Norma Bonham who directed the program from 1980 until 2000. She pushed the City to become a Tree City USA in 1982 and it has received the honor ever since. She continued the previous tree management program and enhanced cooperation with state agencies such as the Missouri Department of Conservation. She applied for and received grants to complete tree inventory, planting, and pruning projects.

The City completed a basic inventory of street trees (funded by Union Electric, the local electric utility) in 1960 and updated it to a computerized system in 2000 under Ms. Bonham's direction. She elected to complete the updated inventory utilizing volunteer data collectors and kept them involved as stewards of University City's growing community forestry program. Her tenure saw a large increase in the species diversity of the City's public trees.

In 2000, the City hired Mr. James Crowe as the City's third forester. His tenure has seen the creation of an updated ordinance (November, 2006) which created the "Urban Forestry Commission", a seven-member citizen advisory commission. They are charged with the creation and updating of an annual Community Forestry Plan, and hearing appeals from citizens that are affected by the tree ordinance.

The City's updated tree ordinance requires tree protection and/or replacement of trees removed during development of private property. It also requires "Annual Arborist Permits" for tree services that prune, treat, or remove trees within the City. The main intent of the annual permit requirement was to increase public safety and to provide a mechanism for eliminating the practice of topping. (Permit holders are required to follow current ANSI standards that prohibit topping.) The ordinance also continued the City's aggressive policy of not allowing property owners to plant, prune, or remove street trees without a job specific "Forestry Activity Permit".

Since 2000, the City has also tried to move to a systematic method of dealing with the growing tree service needs imposed by an aging tree population. Many of the City's trees were planted in the early 1900s and have reached or exceeded maturity. The systematic method attempts to prune street trees on a cyclical seven-year basis. While this approach is an efficient method to deal with the City's needs, it has been difficult to achieve since the City also prunes or removes trees based

on citizen requests. Reactive response to service requests has become the priority of the daily urban forestry operations and the cyclical pruning program has suffered. The attempt to rectify this problem during times of fiscal challenges is one of the major challenges facing the current forestry program.

Park trees are pruned on a 10-year rotation and are planted, pruned, and removed by Forestry Division staff with assistance from Park Division employees. All stumps in the City, streets, and parks are removed by Parks Division personnel.

The Forestry Division and program are part of the Department of Parks, Recreation, and Forestry and are housed at a facility located at the east end of Heman Park on Pennsylvania Avenue. The facility is shared with Park Division staff. Both Forestry and Parks utilize a fleet that includes vehicles and other “rolling stock” (trucks, bucket trucks, chippers, etc) that are purchased and maintained by a “central garage” managed by the Fleet Maintenance Division of the Department of Public Works.

Benefits and Values of the Urban Forest

General Benefits and Values

Collectively, the public trees along streets, in parks and common areas, and private trees in yards and campuses make up University City’s urban forest system. Whether they are native, young saplings, newly planted landscape trees, or mature shade and woodland trees, the whole forest canopy contributes to other efforts that strive to make the City a better, safer, more beautiful place to live, work, and play.

Trees play an important role in University City beyond providing people shade on a hot day, seasonal beauty, or a place for wildlife to thrive. Trees can:

- Absorb and filter air pollution
- Reduce energy consumption by shading homes and buildings
- Moderate stormwater flow and reduce flooding, prevent soil erosion, and stabilize hillsides
- Improve water quality by buffering ponds, streams, and rivers from pollutants
- Increase property values and help businesses attract customers and retain employees

During the planning process to develop this Plan, citizens and key stakeholders clearly expressed their deep appreciation for the value of trees in the City. Primarily, the benefits of aesthetics, environmental functions, and ecological integrity were expressed the most.



The “loop” in University City is a tree-lined street with many retail shops.

University City Tree Benefits and Values

While there has been no recent data collected, the 2000 street tree inventory provided information about the value of street trees in University City. Utilizing the “*Guide For Plant Appraisal – 9th Edition*” published by the International Society of Arboriculture, the City’s street trees were appraised at \$27,543,274. This represents an average value of \$2,429 for the 11,339 inspected trees.

In November, 2008, the City’s Park Commission prepared a “Park Master Plan”. The community benefits from the well-maintained landscapes with a combination of large growing trees and smaller flowering ornamentals.

Information Collection Process

A crucial element of developing the *Urban Forestry Operations Review and Strategic Plan* was soliciting information from City staff, elected officials, key stakeholders, and citizens of University City. Stakeholder input was used to assist Davey in identifying opportunities, issues, actions, and goals for the Plan.

Meetings and Discussion With City Staff

A series of meetings and discussions were held with City Staff including the following individuals:

- Ms. Julie Feier, City Manager
- Ms. Nancy MacCartney, Director of Parks, Recreation, and Forestry
- Mr. James Crowe, Forestry Supervisor
- Mr. Allen Hopkins, Forestry Crew Leader
- Mr. Ewald Winkler, Parks Operation Superintendent
- Mr. Andre Buehler, Park Maintenance Employee
- Mr. Richard Pierce, Fleet Maintenance Manager
- Mr. Larry Evans, Accountant (term)

Meetings and Discussion With Additional Stakeholders

A meeting was held with the seven-member University City Urban Forestry Commission in January, 2009. Extensive discussions were held relevant to the developing plan and the “*Annual Community Forestry Plan (FY 2008–2009)*”. A one-page synopsis of the proposed operations review and strategic plan was distributed along with a prepared set of questions directed at identifying urban forestry issues and needs in University City.

Additional copies of the synopsis and questions were distributed to stakeholders throughout the City. The City Manager included the list of questions in her weekly *Manager’s Report* distributed to staff and elected officials. Local green organizations such as the “*Green Center*” and “*U City In Bloom*” distributed copies to their members as well. Receipt of questionnaire responses was light, although enough were received to provide a comfortable base of information to gauge issues and needs in the community. Additionally, discussions were held with a former Forestry Supervisor, Ms. Norma Bonham Schecter, who also serves on the Urban Forestry Commission as a community volunteer.

Current Urban Forestry Operations

The management of the urban forest within the City boundaries is the responsibility of many entities and individuals. If the urban forest is defined as the individual landscape trees and total forest canopy cover within University City, then the primary stewards of this resource are the private property owners. Most of the land in University City is privately owned and controlled. Therefore, the greatest challenge, as well as the greatest opportunity for protecting and enhancing the City's urban forest, lies with educating and working with citizens.

However, the responsibility for a significant portion of the current and future urban forest lies directly with the City of University City such as street rights-of-way, parks, and other municipal land holdings. The Forestry Division within the Department of Parks, Recreation, and Forestry has direct control over and responsibilities for tree maintenance and planting on these public properties. Other City entities, such as the Parks Division, various advisory commissions, business organizations, and volunteer groups, have indirect influences on the quality and quantity of the urban forest.

In University City, many municipal agencies and entities directly and indirectly affect urban forest management as a whole, including: Department of Parks, Recreation, and Forestry; Department of Community Development; Department of Public Works; Mayor and City Council; and the City Manager.

City Organization and Urban Forestry Management Responsibilities

Department of Parks, Recreation, and Forestry

This department has direct control over the administration, maintenance, and operation of 19 City parks totaling approximately 255 acres, 126 boulevard strips, green space of approximately 34 acres, approximately 35,000 city-owned trees, recreation programs and events, as well as forestry functions.

There were 11,339 trees and 2,900 planting sites identified in the 2000 street tree inventory. The landscape trees and forests in City parks, community parks, and neighborhood parks are planted and maintained by departmental staff and contractors.

This department also has the primary responsibility for implementing the *Park Master Plan* completed in November, 2008. Within this Plan are clear goals and objectives that directly affect a large portion of the public urban forest. The decisions, policies, and actions of the Parks and Recreation Commission also have an influence on public trees.



This large-diameter cottonwood in Heman Park has severe defects.

Section 12-08 of the City Code was revised in November, 2006 and regulates the trees and shrubs on public and private property within University City. It now includes language giving authority to the City Forester to approve *Forestry Activity Permits* required on development sites on private property.

The primary responsibility for trees on public property falls within the Forestry Division in the Department of Parks, Recreation, and Forestry. There are currently four full-time positions including the City Forester, a Crew Leader, and two Tree Trimmers.

Tree planting, pruning, maintenance, removal, and wood waste generated by forestry activities are the primary responsibilities of the Forestry Division. The division coordinates citizen requests for new street trees and requests for pruning or tree removal, handles storm damage, and provides mulch and wood chips to residents free of charge. The Department of Public Works handles leaf collection and processing and produces composted leaf mulch free to residents of University City. Non-Forestry Division staff (typically Parks Division) within the Department Parks, Recreation, and Forestry handle stump removal on a seasonal basis.

While street trees are planned to be pruned on a cyclical basis (seven-year cycle), the number of citizen requests has overwhelmed this strategy and is making it more difficult and costly to complete the planned seven-year cycle. Park trees are pruned on a ten-year cycle.

The Forestry Division offices are housed in a Public Works complex located at the corner of Pennsylvania Avenue and Olive Boulevard. There is one office area shared by the Park Operations Superintendant and the City Forester and a small equipment bay for storage of tools.

The Urban Forestry Commission is also supported by the Department of Parks, Recreation, and Forestry. The Commission is charged with assisting the City Forester, Department of Community Development, Department of Public Works, City Council, and the citizens with a variety of urban forest projects, studies, educational programs, and planning. This Commission is authorized and assigned responsibilities in Section 12-08, in the City Code that was passed in November, 2006.

Each year, the Commission prepares an “Annual Community Forestry Plan” as required by the city code. A copy of the FY 2009–2010 report is provided in Appendix A. The vision and goal statement of the Plan is as follows:

VISION: To sustain a healthy, safe, and appealing public street tree and park tree population in the City of University City, Missouri.

GOAL: To effectively manage the urban and community forest of University City in an effective manner through sound management, utilizing in-house and contracted services and building a team of effective proponents for the trees in the community.

The City Forester occasionally utilizes his arboricultural education, expertise, and training to provide advice and assistance to other departments with tree management issues.

Department of Community Development

The Department of Community Development administers policies for the orderly growth and development of the City and enforces the adopted land use and zoning regulations. The Planning and Zoning staff provides inspections on construction sites, ordinance violations, and bond processing/release. These responsibilities impact the privately owned urban forest more than the publicly owned urban forest and, therefore, can likely have the greatest and most long-term impact on the City's total canopy cover.

Because the land development process, responsibilities, and inspection duties are included in the Department of Community Development, the City Forester is primarily used by them for plan review, site inspections, and enforcement actions.

Department of Public Works

While this department has no direct responsibilities for tree management on public rights-of-way, its activities have a large impact on the City's urban forest. This department indirectly affects public trees through street, curb, and sidewalk construction and repair, permitting for infrastructure repair (underground utilities), and snow and ice removal. They also handle leaf collection and processing and produce composted leaf mulch free to residents of University City.

The Street Division within the Department of Public Works is responsible for signing, marking, and maintenance of all 96.6 miles of public city-controlled streets, and related facilities, including repairs, sign installation and maintenance, cleaning, traffic control, street sweeping, leaf collection and processing, snow/ice removal, weed control on public right-of-way, and street light maintenance. Many of these activities have a direct impact on where trees are planted and overall tree health related to root loss or limb pruning to accommodate activities. Additionally, this Department is responsible for leaf pick-up offered to residents each October through December. Residents rake leaves to curb-side on designated dates, and City crews collect them and deposit them at the mulch site maintained by the Forestry Division.

The Administration and Engineering Division Staff provide right-of-way management services associated with the planning, design, construction, and control of public streets, sidewalks, and bridges within the City, administration of the Sewer Lateral Repair Program, inspections of all public properties and general support of other city departments and Public Works divisions as related to these functions. The division is also responsible for all capital improvement programs. These activities have a direct impact on nearby trees and can affect tree health.

The Fleet Maintenance Division is responsible for acquiring and maintaining the "rolling stock" used by the Forestry Division including a crane truck, bucket truck, dump truck, and two chippers.

While the Department of Public Works is not mandated by City Code to consult with the City Forester on tree related issues, there is a definite connection between services that each provides to citizens of University City. A stronger connection would be created if each Division were mandated to consult with the other on related issues. For example, the City Forester should be consulted on plans for improvements or construction of new sidewalks that may impact existing trees. Trees on city-owned property represent a sizeable investment and provide many benefits in return. Sound advice could result in protecting this investment. Additionally, the City Forester should be consulted when permits issued for excavations near city-owned trees are considered.

Mayor and City Council

University City operates under a Council-Manager form of government. The City Council, which meets twice a month, sets policy, proposes and passes legislation, and adopts an annual budget. The Council is the legislative and governing body of the City of University City. The City Council has seven members, one of whom serves as mayor. Each of the City's three wards has two representatives, who are elected to four-year terms. These elected officials are key to the growth and success of the City's urban forestry program. As the ultimate policy-making group and representatives of the citizens, the mayor and council can have direct influence over the current and future management of the urban forest. They can approve new and improved tree ordinances, support increases in program funding, support additional staffing levels, and generally make urban forestry issues a priority for the City.

City Manager

The City Council appoints the City Manager to serve as chief executive officer of the City, carrying out the policies established by the Council. Generally, the manager prepares a budget for the Council's consideration, recruits, hires, and supervises the municipal staff, and serves as the Council's chief advisor.

In a council-manager form of government, the City Manager plays a key role in the success of an urban forestry program. As chief executive officer, the manager can reorganize staffing and department responsibilities to better support urban forest management, re-allocate existing funding and seek new sources of funding, and make policies and administrative regulations for urban forest planning, tree maintenance and planting, and interdepartmental communication and coordination.

Analysis of Current Tree Management Structure and Operations

University City's goal is to have a larger, healthy, diverse, and functional urban forest and thriving residential and business communities. The dynamics of balancing urban forest management and other City needs, responsibilities, and assets are diverse and complex and suggest a dedicated, interdisciplinary, flexible approach and organization.

The following sections briefly describe the status, conditions, and limitations of ten factors that influence University City's ability to sustain an effective and viable urban forestry program.

Budget

Existing public funds for urban forest management are dispersed among various departments for various tasks. The Urban Forester position has management authority over dedicated funds for comprehensive urban forest management activities and consults annually with the Director of Parks and Recreation to make recommendations for this budget. However, there is no control or input on the expenditures made by other departments.

Dedicated funds for the City's Forestry Division are shown in Table 1. The total budget for forestry activities in 2008 was \$361,439. The budget includes funds for personnel and related personnel expenses (discussed in more detail in Manpower—Staffing and Contract Services section of this report), equipment (small tools, chain saws, etc), contracts and wood waste processing (emergency tree removal, contract tree pruning, tub grinding), purchase of trees, and vehicle expenses (as reported by Fleet Management Division).

Table 1. Forestry Division Budget (2008), University City, Missouri

		Budget	Category Total	Category Percentage
Personnel	Salary	\$ 180,609.00		
	Social Security	\$ 11,198.00		
	Medicare	\$ 2,619.00		
	Workers' Compensation	\$ 8,773.00	\$ 203,199.00	56.2%
Related Personnel	Medical	\$ 20,521.00		
	Pension	\$ 21,454.00		
	Other (car allowance, overtime, part-time tree watering, training, development, memberships, uniforms, apparel)	\$ 14,411.00	\$ 56,386.00	15.6%
Equipment	Hand Tools, Hardware	\$ 4,505.00		
	Chain Saw Maintenance	\$ 300.00	\$ 4,805.00	1.3%
Contracts and Wood Waste	Emergency Tree Removal	\$ 5,000.00		
	Contract Street Tree Pruning	\$ 30,000.00		
	Wood Chips & Log Grinding	\$ 10,000.00	\$ 45,000.00	12.5%
Trees	Tree Purchase	\$ 14,000.00	\$ 14,000.00	3.9%
Vehicles	Depreciation, Maintenance, Overhead & Insurance	\$ 38,049.00	\$ 38,049.00	10.5%
2008 Forestry Activities Budget			\$ 361,439.00	

Manpower—Staffing and Contract Services

University City's Forestry Division currently has four full-time staff. The City Forester (officially titled "Forestry Supervisor") oversees the program and supervises a three-person crew that includes a "Crew Leader" and two "Tree Trimmers".

The Forestry Supervisor manages the program staff and provides the highest level of technical expertise for the City. Currently, he is the only ISA *Certified Arborist* in the Forestry Division. This position serves as the "City Forester" as designated in the City's Code Section 12.08 ("Tree Ordinance") and is responsible for adopting and

circulating rules and regulations required by Section 12.08. This includes authorizing permits and supervising permitted work. It also includes implementing the "Community Forestry Plan" and serving as an ex-officio member of the Urban Forestry Commission.

The remaining three staff members are primarily field personnel that carry out the pruning, planting, removal, and treatment of trees on public property. Experience levels are high although none are ISA *Certified Arborists*.

The budget includes expenses associated with the salary of the four permanent positions and includes all payroll taxes, benefits (health insurance and pension), vehicle allowances, training, etc. It also includes monies for part-time employees if needed. Over 70% of the Forestry Division budget is dedicated to full-time and part-time employees and their benefits.

Contractors perform many of the services needed within the City's forestry program. In the past few years, contractors have been utilized for tree removals, pruning, and planting. Most of the contracted work is for pruning of street trees. In the Fiscal Year July, 2007 through June, 2008, 285 trees were contract pruned and represented 19.1% of the total number of trees pruned (1,491 total pruned). The cost to perform the contract tree pruning was approximately \$70.00 per tree. Removals in Fiscal Year 2006–2007 cost an average of \$760 per tree. Contracted tree planting is estimated to be \$200 per tree for a 1.5-inch caliper hardwood.



This is a typical work site and set-up of the Forestry Division crew.

Policy (Including Mandated Needs Within City Code)

While a tree ordinance has been in place since 1959 in University City, the City's Code was updated in November, 2006 with the update of Section 12.08 and is now known as "Title 12 Streets, Sidewalks and Public Places, and Trees and Shrubs." A copy of the ordinance and the accompanying "Tree Manual" are found in Appendix B. A contractor with municipal forestry expertise assisted the City with development of the new tree ordinance.

Major provisions within the ordinance provide direction in the following areas:

- Assigns duties of the City Forester.
- Creates a City Council appointed, seven-member advisory board known as the Urban Forestry Commission.
- Adopts a "Forest Activity Permit" that requires a tree survey on development sites and the preservation of all trees greater than or equal to six inches in diameter. Trees not preserved can be replaced on site with a calculated diameter "inch for inch" formula. Payments to the City's Tree Bank can be made in lieu of replacement.
- Specifies ownership and control of trees on city-owned property (streets, parks, etc.). A Forest Activity Permit is required for any work on city-owned trees by private individuals or firms. The permit requires that work be performed according to national arboricultural standards.
- Provides regulations for planting in public places.
- Establishes "Annual Arborist Permits" that are required for work performed on public trees or on development projects. Permit requires at least one ISA *Certified Arborist* or Tree Worker within the business.
- Outlines the duty of private property owners relating to decayed, diseased, or hazardous private trees (nuisance, height clearances, sight distance). Appeals process is outlined as well.
- Outlaws abuse or mutilation of city-owned trees (including 'topping').
- Outlaws interference with City Forester or designees.
- Provides penalties for violations.
- References a "Tree Manual" that contains detailed definitions and explanations of provisions within the ordinance. It is the manual that should contain all current policies and standards.

The ordinance provides no requirement or direction for other City staff to consult the City Forester on public improvement projects that may impact City-owned trees.

The City understands the need to provide professional care to its valuable urban forest. This is made clear in Section 12.08.010 of the Code, where it states, "The planting, maintenance and preservation of trees and vegetation in the course of land disturbance has been determined to be a significant issue for public health and welfare, and the City's physical and aesthetic environment." This section of the Code also states, "The planting, maintenance, and preservation of trees and vegetation has a beneficial impact on the overall well-being of the City."

The code was written to ensure that these benefits are provided to the citizens and businesses within the City. It mandates several needs and services the City must carry out in order to provide these benefits. Mandated needs and services specified in the ordinance include the following:

- A City Forester is responsible for the administration of the City's tree ordinance and an annual Community Forestry Plan (Sec. 12.08.030). This includes providing technical expertise to implement the Community Forestry Plan (Sec. 12.08.030.A.1.c).
- A City Forester is required to authorize, issue, and administer permits and supervise the work associated with the permits (Sec. 12.08.030.A.1.b). Code mandated permits include "Annual Arborist Permits" (Sec. 12.08.070) and job-specific "Forestry Activity Permits" (Sec. 12.08.040).
- Annual Arborist Permits are required for a commercial tree service to operate in University City. Requirements include insurance, an ISA *Certified Arborist* on staff, and work performance standards. These provisions protect the health, safety, and welfare of University City residents and visitors. They also ensure that work is performed to acceptable standards (Sec. 12.08.070).
- A job-specific Forestry Activity Permit is required any time City trees are removed, pruned, or planted and when trees are removed from private property as part of a development project (Sec. 12.08.040).
- The City Forester is responsible for issuing Forestry Activity Permits for development projects where trees are to be removed. The permit requires a survey and inspection of trees on the site and information about tree preservation activities. The survey is completed by an ISA *Certified Arborist* hired by the developer at their own expense. Work on the development is inspected by the City Forester to ensure that tree preservation and/or required replacement occurs according to the submitted tree survey and preservation plan (Sec. 12.08.040.A).
- The Annual Community Forestry Plan is a document that guides the work of the City Forester and contains the City-wide street tree plan (Sec. 12.08.030.B.4).
- A Tree Manual is developed and updated regularly by the City Forester. It contains the technical information necessary to perform work that is required in the City Code (Sec. 12.08.020).
- The City has traditionally exercised strong control over all trees, shrubs, and other plantings on city-owned property (Sec. 12.08.025). Additional jurisdiction extends to trees on private property for the abatement of nuisances (Sec. 12.08.080) and the preservation of trees on development sites (Sec. 12.08.040.A). This tradition of strong control is evident in the level of maintenance activity the City provides for street trees (Sec.12.08.040.B). While some cities allow adjacent property owners to plant, prune, and remove trees on city rights-of-way without permits, others exercise strong control over these activities. University City has a long tradition of providing this care for City trees, and only allowing adjacent property owners to perform this work by permit. This system has resulted in a very high-quality tree population, along with the many benefits it provides, and an efficient cost-effective method of providing quality management services.
- An appeal process is in place for persons directly affected by actions of the City Forester (Sec.12.08.030.B.8). Appeals are heard by the Urban Forestry Commission.

It is apparent the City code mandates many needs and services that are directly related to trees located within University City. The City has developed a long history of high-quality urban forestry services in meeting these mandated needs.

University City's Tree Inventory Status

A city-wide street tree inventory was completed in 2000, utilizing a trained corps of volunteers, with data compilation and analysis performed by a forestry consultant. The inventory data is still utilized, though it has not been updated since the original data was collected. A summary of the inventory was presented to City Council on April 3, 2000 and appears as Appendix C in this report.

An analysis of the inventory was performed in 2000 and portions of it appear below.

Table 2. The Twelve Most Common Street Species in University City (2000)

Rank	Species	No. of Trees	Percent of Population
1	Oak, Pin	2373	20.9%
2	Maple, Silver	1214	10.7%
3	Ash, Green	1089	9.6%
4	Sycamore	663	5.8%
5	Pear, Bradford	449	4.0%
6	Oak, Red	441	3.9%
7	Sweetgum	420	3.7%
8	Maple, Sugar	391	3.4%
9	Maple, Red	326	2.9%
10	Ash, White	241	2.1%
11	Linden, Littleleaf	237	2.1%
12	Maple, Norway	226	2.0%
TOTAL			71.2%

While 12 species make up 71.2% of the population, pin oaks (*Quercus palustris*), silver maple (*Acer saccharinum*), and green ash (*Fraxinus pennsylvanica*) dominate. The ash genus (*Fraxinus*) makes up 11.7% of the population, an ominous number given the potential for emerald ash borer (*Agrilus planipennis*) to kill nearly all ash trees in its range. The borer was recently discovered in southeastern Missouri. Outside of these issues, the species diversity is relatively strong and getting better.

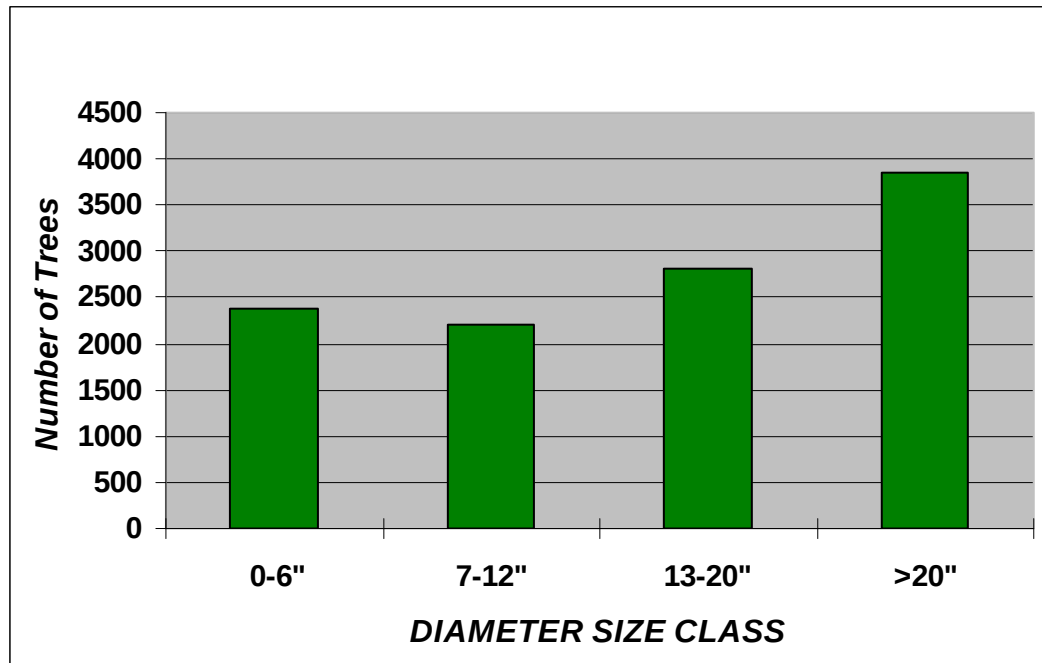


Figure 1. Diameter Size Distribution of Street Trees in University City (2000)

Each diameter class has a nearly equal representation, except for the >20" diameter class which has a higher number of trees compared to the other classes. This accurately portrays the large number of large-diameter trees along the streets of University City. While this adds character to the City and provides a large amount of the technical benefits that trees provide, the negative aspects include the higher cost to deal with the aging population. An aging tree population means that a city needs to be prepared and plan for increased costs in tree removals and tree planting. An ideal diameter class distribution includes the largest percentage of trees in the smallest size class and then decreasing percentages in each successively larger class. Properly planned, this scenario can still provide a sufficient quantity of large-diameter trees that maximize benefits.



A residential street lined with large-diameter pin oaks.

Table 3. Condition Class Distribution of University City Street Trees (2000)

Condition Class	Number of Trees	Percent of Street Tree Population
Excellent	718	6.3%
Good	8579	75.7%
Fair	1682	14.8%
Poor	321	2.8%
Dead	39	0.3%

The distribution of trees among the condition class categories is very good considering the large number of older trees on University City's streets. The regular maintenance that street trees receive from the Forestry Division results in a healthy street tree population. Only 22 trees (0.2%) were identified in the 2000 inventory as priority removals because they created elevated levels of risk.

While the street tree inventory data has not been updated, the previous tables likely reflect numbers that are relevant for general management recommendations. A new inventory would provide updated tree data for specific addresses and provide a solid foundation for additional management decisions. In addition, a new inventory could include trees located in parks and other public spaces and could be placed into a GIS-based software that would facilitate better management of the City's urban forest.

Workload and Accomplishments

City Foresters face the challenge of adequately meeting the needs of their tree resource and the needs of their residents within the constraints of a finite budget and political structure. Effective and efficient programs will make the best use of available resources to meet mandated needs. A total of 11,339 street trees were inventoried in 2000. The City maintains records and reports on street tree accomplishments, but very little in the way of work accomplishments at City parks or other City properties.

REMOVALS – University City's community forest was largely established in the early part of this century. While new plantings have occurred over the years, it is still largely a population of mature to overmature large diameter trees that provide many ecological and sociological benefits, although they do require more inspections and services than smaller established trees.

The 2000 street tree inventory identified 72 trees that were either suggested for removal for health reasons or were identified as having defects and listed as candidates for removal. While this list of trees has been addressed, each year there is an increasing number of trees needing to be removed. In Fiscal Year 2007–2008, there were 337 trees removed (the same as the previous year). All were removed by in-house forestry crews. This represents approximately 2.9% of the City's total tree inventory and represents a normal level of removals for a city of this size. It is estimated that approximately 41% of Forestry Division staff time is allocated to street tree removals.

PRUNING – Soon after the 2000 inventory, the City Forester analyzed the City’s recently completed street tree inventory and determined that a seven-year cyclical pruning program would best serve the City’s needs for maintaining trees in an efficient and cost-effective way. Many cities choose this system to best meet their needs. A seven-year pruning cycle means that 1,620 trees per year need to be pruned. In the last two reported fiscal years, the total number of trees pruned by city crews and contractors has been 1,284 in FY06–07, and 1,491 in FY 07–08. Contracted pruning accounted for 400 trees (\$50 per tree) in FY06–07, and 285 trees (\$70 per tree) in FY 07–08. It is estimated that approximately 44% of Forestry Division staff time is allocated to pruning street trees.

PLANTING – According to University City’s *Annual Community Forestry Plan*, “every attempt is made to plant at least as many trees as removed.” During FY 06–07, there were 147 trees planted (a decrease of 109 from the previous year). A slight increase occurred in FY 07–08 when 156 trees were planted. All plantings were accomplished with in-house crews. No figures were reported for maintenance activities specific to establishing newly planted trees (watering, mulching, etc.). In the 2000 street tree inventory, a total of 2,900 available (unplanted) planting spaces were identified. Planting these sites would add an additional 25% to the existing number of street trees. It is estimated that approximately 6% of Forestry Division staff time is allocated to planting new street trees.

These numbers point out a severe shortfall of about 185 trees per year in the number of planted trees compared to the number removed. If the current trend continues, there would arguably be no street trees in University City by the year 2060. This is a disturbing trend, considering the rich community forestry history of the previous 100 years, 50 years that occurred under the watchful management of a professional forester.

CITIZEN REQUESTS FOR SERVICES – The City Forester handles citizen requests for service to trees on City property. The City receives several such requests a year for services that request removal, pruning, or planting of trees on rights-of-way adjacent to the property. When requests are received, the site is inspected to determine the level of risk posed by the current tree, or the appropriateness of a planting spot. Work is scheduled and assigned a high level of priority.

Citizen requests are given top priority and typically accomplished before the regularly scheduled work involved with a cyclical pruning program. This results in a serious deferment of scheduled pruning. The efficiency of this level of service is low and the costs are high. In order for crews to complete a requested service, the site must be inspected after the request is made to determine the type of activity needed. Crews are then scheduled and have to travel to the site, set up equipment for the job, perform the work, and then have to de-mobilize equipment and travel to another site.

EDUCATION, AWARENESS, and ADMINISTRATION – Additional accomplishments of the Forestry Division include educational and awareness programs. The programs include a Citizen Tree Planting Class, the developing Memorable Trees Walk, and Arbor Day Activities.

The City Forester also maintains the street tree inventory and is researching available tree inventory and management software to assist with updating the current inventory. It is estimated that the educational and awareness programs and management activities account for approximately 9% of Forestry Division Staff time.

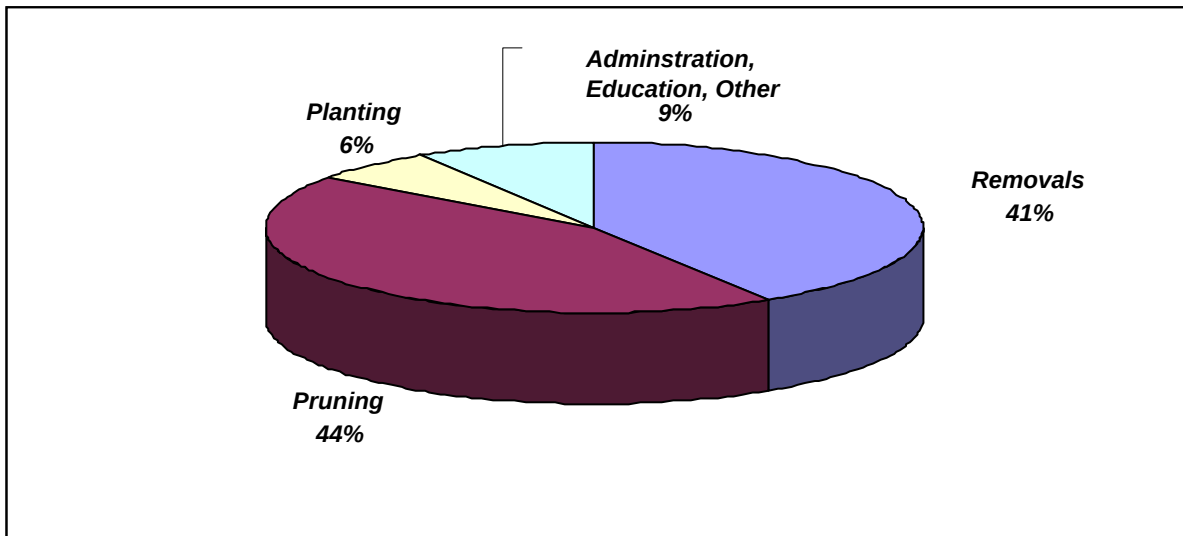


Figure 2. Distribution of Staff Time by Accomplishment Category

The distribution of staff time by category is taken from the Annual Community Forestry Plan Fiscal Year 2009–2010.

Annual Community Forestry Plan

Section 12.08.030.1.c requires that The Annual Community Forestry Plan be prepared by the City Forester, presented to the Urban Forestry Commission for adoption, and then forwarded to City Council for approval. It contains a brief plan for the care, replacement, maintenance, removal, or disposition of City trees and shrubs. A copy of the Fiscal Year 2009–2010 plan is found in Appendix A.

The plan contains an introduction, a brief overview of the Forestry Division, the City’s tree management program (review of accomplishments for previous year), and action items for the coming year.

Fragmentation

Several City agencies have an impact on some aspect of the City’s urban forest. The City’s ordinances lack a comprehensive perspective, and there appears to be no support from administration to require or seek technical expertise when public improvement projects may impact city-owned trees. Fragmentation, or separation defined by organizational boundaries and agency-specific missions, may keep the City’s departments from interacting in meaningful and productive ways to protect and enhance the urban forest. This appears to be a serious and on-going issue in University City.

Leadership

The effectiveness of an agency is, in part, a function of its leadership. Without strong, supportive leadership, or if the leadership is in an unempowered position in the organization, urban forestry goals will struggle to be met. Whether in direct or indirect control, centralized or decentralized, the City’s administrative leadership of urban forestry needs to be recognized, focused, dedicated, and supported. In order to provide effective leadership, University City’s administration needs additional education about the value of an effective urban forestry program.

Technical and Professional Resources

The City Forester provides technical and professional expertise in the field of arboriculture. An understanding of these skills by other departments is needed to prescribe and monitor the City's urban forestry activities, enforce policies and regulations, apply technical standards and practices, and review plans that affect the forest resource. Without the use of this professional component, urban forest management decisions and actions often default to inadequately prepared decision-makers, which can have long-term, negative consequences for the forest resource. There is no clear policy, or City Code language, that requires the technical and professional input from the City Forester for projects on City property that may damage trees.

Political Support

Support from elected officials and the citizens is critical to implement and maintain an effective comprehensive urban forest management program. The citizens own both the public and private urban forests, and without greater political support and increased citizen understanding and commitment, urban forest management in University City may not reach its full potential.

Management Structure and Operational Recommendations

A comprehensive, progressive, and proactive urban forest management program requires the coordination of professional talents in forestry, parks, public works, land use planning, and other public services. It requires political, administrative, and private entities to be educated and involved in urban forestry matters. It also requires sufficient funding to allow for professional management responses to a comprehensive urban forestry policy. Urban forest management can be as complex, vibrant, diverse, and fragile as the urban forestry ecosystem itself.

The reaction of many local governments to these requirements has been to reevaluate and/or reorganize the structure of the organization so that appropriate solutions might be developed, tested, and implemented to better control and maintain municipal forest resources. The following recommendations are proposed to University City to make improvements to urban forestry operations that can ultimately result in maximizing the benefits of the City's urban forest.

List of Recommendations

Change City Code to Clarify Specific Responsibilities for City-owned Trees and Enhance Communication Between Departments

The Administration should propose and Council should approve additions to Chapter 12.08 of the City Code that will clarify specific responsibilities for city-owned trees and enhance communication between departments. Identifying specific responsibilities in the City Code will increase awareness of trees as a part of the City's infrastructure that has value and needs a professional level of management. The new code language should require that all work on rights-of-way that impacts trees will receive input from the City Forester. Clear language in the City Code provides the administration a tool for requiring cooperation among various departments. The new language could be inserted into Section 12.08.0125 – Jurisdiction. Proposed language should include the following:

“City staff, including administration, department heads, and others, will request input from the City Forester on matters and projects that impact city-owned trees or private trees. This includes public works projects on city rights-of-way, the issuance of permits for privately contracted work on rights-of-way, park improvements, and the issuance of nuisance abatement requests.”

Set Internal Policies to Increase Interdepartmental Communication and Cooperation

The City should find means to increase interdepartmental communication and cooperation for plans and projects that may affect the urban forest. Without information on public and private projects, and enough time to review and comment on these plans and projects, potential problems may occur and opportunities will be missed that have immediate and long-term impacts on the urban forest. Many communities have sections of their tree ordinance that specify input from the City Forester.

Other municipalities have formalized the communication process by creating a City departmental review and approval system for major projects. Plans or project descriptions of new construction or major repair projects (not routine departmental tasks) are circulated through each department for review and comment. Each department can weigh the impact the particular project has upon its responsibilities and comment on the project. The project cannot be implemented until all departments have approved the project as planned or requests for changes have been satisfied. Another mechanism to increase communication is for representatives from all departments (as needed) to be invited to a pre-construction meeting. At this meeting, the City Forester can personally interact with City staff and private contractors who will be involved in the project. The City Forester should be officially designated as part of the review, comment, and recommendation process.

Update the City's Street Tree Inventory and Complete a Park Tree Inventory

Update the City's street tree inventory to a GIS-driven platform and perform a GIS-based park tree inventory. Acquire software that will allow continual updating and generation of work orders to improve the efficiency of forestry operations. It has been nearly nine years since the last street tree inventory was performed. While the inventory data was used to prioritize work items and assisted with the scheduling, the inventory data has never been updated. A park tree inventory has never been performed.

An updated inventory of City-owned trees should be placed in a software package that allows easy updating of maps and data. It should also contain a system for generating work orders and tracking accomplishments. Both the inventory and software needs are mentioned in the Fiscal Year 2009–2010 *Annual Community Forestry Plan*.

Calculate the Value and Technical Benefits of the City's Urban Forest

Arboricultural research and technological advances in computer analysis are allowing municipalities to document the benefits of trees beyond aesthetics and real estate values. Tree benefit models use aerial and satellite imagery and tree inventory data to determine the levels and values of public health and safety and other benefits, such as air pollution reduction, stormwater mitigation, and energy conservation.

These benefit models conduct complex statistical analyses of ecosystem and environmental services that trees provide to a community. The reports and maps created can then be used for land-use planning, policy-making, and urban forestry program evaluation.

Tree benefit models are now available for municipalities to use—the Urban Forestry Effects Model (UFORE) and the Street Tree Resource Analysis Tool for Urban Forest Managers (STRATUM). These models were developed by the U.S. Forest Service, and are part of the i-Tree suite of urban forest management tools. These models have been extensively peer-reviewed for accuracy, and are available for the City to use immediately.

The i-Tree suite of software tools help communities to identify and manage the structure, function, and value of urban tree populations. Together, the suite provides a scientifically sound system for data collection, analysis, and quantification of the benefits and costs of urban forest management.

UFORE is a computer model that calculates the structure, environmental effects, and values of the entire urban forest. The model is designed to use standardized field data from randomly located plots or complete inventories. UFORE results are compatible with ArcView™ for display in GIS systems.

The UFORE model is currently designed to provide accurate estimates of:

- Urban forest structure (*e.g.*, species composition, number of trees, tree density, and tree health), analyzed by land-use type.
- Pollution removed by the urban forest, and associated percent air quality improvement throughout a year. Pollution removal is calculated for ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, and particulate matter (<10 microns).
- Volatile organic compound emissions and the relative impact of tree species on net ozone and carbon monoxide formation throughout the year.
- Total carbon stored and net carbon annually sequestered by the urban forest.
- Effects of trees on building energy use and consequent effects on carbon dioxide emissions from power plants.
- Compensatory value of the forest, as well as the value of air pollution removal and carbon storage and sequestration.
- Tree pollen allergenicity index.
- Potential impact of pests, such as gypsy moth, emerald ash borer, or Asian longhorned beetle.

The UFORE software is in the public domain and available at no cost to all interested individuals and organizations through i-Tree. If the City wants to consider conducting its own UFORE project, be aware that the program requires specific types and amounts of data to accurately project the structure and benefits of urban vegetation. The validity of results from UFORE will depend on a large degree to how closely the City adheres to project set-up and sampling protocols. More information can be found at www.itreetools.org.

STRATUM is a street tree management and analysis tool for urban forest managers that utilizes simple tree inventory data to quantify the value of annual environmental and other benefits such as: energy conservation, air quality improvement, carbon dioxide reduction, stormwater control, and property value increases. Uniquely, this model also considers management, maintenance, and planting costs and can, therefore, produce data on costs-benefits and management needs.

Using simple, non-GIS based tree attribute data from sample plots to complete inventories and community specific information (*e.g.*, program management costs, population, and price of residential electricity), STRATUM applies tree growth and benefits models to calculate:

- Structure (*i.e.*, species composition, extent, and diversity).
- Function (*i.e.*, the environmental and aesthetic benefits trees afford the community).
- Value (*i.e.*, the annual monetary value of the benefits provided and costs accrued).
- Management needs (*i.e.*, evaluations of diversity, canopy cover, planting, pruning, and removal needs).

STRATUM produces a report consisting of graphs, charts, and tables that managers can use to justify funding, create program enthusiasm and investment, and promote sound decision-making. In short, STRATUM can assist managers and communities on answering the question whether the benefits of street trees outweigh their management costs.

STRATUM differs from other urban forest analysis and tree benefit software models in many ways:

- STRATUM is designed for analyzing street tree populations, not the entire urban forest.
- It is intended to be utilized as a planning tool, going beyond the reporting of benefits.
- Costs of management, rather than benefits alone, are incorporated to provide a platform for strategic planning.
- STRATUM is not GIS-based; it requires only basic inventory data.

STRATUM also is in the public domain and is available at no cost to communities.

Both UFORE and STRATUM are benefit models that could assist University City in fully understanding the full value of technical benefits of its urban forest, and aid the City in making the right management decisions at the right time.

Increase Staffing and Other Resources

The staffing levels and resources for urban forest management need to be increased in order to meet serious deficits in planting and pruning goals. A truly proactive and comprehensive urban forest management program requires trained and dedicated staff to oversee management and operational activities. Public safety is a primary reason for effective urban forest management. Additionally, the important duties of tree planting, tree maintenance, emergency response, plan review, development site inspection, project management, contract administration, interagency assistance and coordination, and citizen education, among others, require a sufficient level of staffing, equipment, and other program resources.

A job analysis should be performed to determine if new or existing job classifications should be created, whether existing staff could be trained and reassigned or if new hiring is needed, and what level of funding is needed to support the positions.

 During 2006 and 2007, street tree removals outpaced new plantings by an average of 185 trees per year.

 At that pace, University City's street trees would be gone by the year 2060.

The increased staffing and resources are needed to meet the following deficits in meeting stated goals and policy:

PLANTING – Each year, University City's *Annual Community Forestry Plan* stresses the desire to “plant as many trees as removed”. Without this goal, any city would eventually find its urban forest reduced and the benefits it provides greatly diminished, or gone.

The 2000 street tree inventory found 2,900 available planting spots that would adequately support a new street tree. During the last two reportable years, street tree removals in University City outpaced planting by an average of 185 trees per year. At this pace, the City would have no street trees by the year 2060. Faced with the same reality in the 1980s, the City of St. Louis found ways to increase tree planting during diminished budgets to achieve their goal of planting at least one tree for each tree removed. University City should make this a top priority as well.

University City needs to increase the number of trees planted each year by at least 185 trees per year in order to keep the current street tree population stable or increasing. This number may change depending on the number of removals made each year. As the tree population continues to age, removals may increase. Options to consider for increasing the number of trees planted each year are as follows:

Option 1 – Purchase more trees for planting on approved sites and using in-house staff to plant them. However, in-house staff is pressed already to reach planting and pruning goals, so it is doubtful this solution would be the best. One reason that planting numbers suffered in Fiscal Year 2006–2007 was the significant amount of time spent with storm clean-up. This indicates a less than ideal level of staffing, or funding to hire contractors, or both.

Option 2 – Increase funding for tree planting and utilize contracted crews to perform the work. Many communities will contract the purchase and planting of trees as it allows smaller departments to stay on task with pruning and removals. Trees that are purchased and planted by contractors are also typically done so with one- or two-year guarantees.

Option 3 – Set up a program for residents to share in the cost of getting a tree planted in the tree lawn adjacent to their property. Some municipalities will utilize this type of program to allow residents to get “on demand” tree planting. The City should still have priority areas where they can plan for tree planting in a given season. But if other property owners want a tree that is not currently scheduled, they can order it through the City. This allows the City to collect the cost (or a portion of it) from the property owner, then add it to the contractor’s list for that year. Property owners get the benefit of the contracted price, and the City has less planting expense while meeting “customer” demand.

In addition to tree planting numbers, the City also needs to ensure that newly planted trees receive adequate follow-up care until they are fully established. Newly planted trees require at least three years of structural pruning, watering, and mulching to ensure successful establishment.

PRUNING – According to University City’s *Annual Community Forestry Plan*, “Pruning is the most important tool in the management plan; proper pruning can greatly extend the health, safety, and life of trees.” It is true that a strong program of periodic pruning (especially when trees are developing) will greatly increase the health of the tree and improve public safety as well.

An effective and efficient means of making sure that all street trees receive adequate attention, including pruning, is to develop a systematic approach. University City’s program has attempted to achieve a cyclical seven-year pruning cycle. While a five-year cycle provides a better quality tree population, the seven-year cycle is acceptable in a period of budget constraints. In order to achieve a seven-year cycle, University City would need to prune approximately 1,620 trees per year (based on a population of 11,339 street trees). In the last two reportable fiscal years, pruning goals fell short by 336 trees in Fiscal Year 2006–2007 and 129 trees in Fiscal Year 2007–2008.

Cyclical pruning is performed on several trees along city blocks on a given day and results in a much more efficient method of pruning. Most cities elect to utilize a cyclical pruning program and defer citizen requests until the cyclical program reaches their street. If inspections identify high levels of risk associated with defective limbs or trees, then priority action can be taken. Otherwise the action should be deferred.

In order to meet the increased need for pruning, the City should consider an increase in funding to accommodate additional contract staff so City crews can meet cyclical pruning needs. The contracted work should be utilized to perform “on-demand” pruning for property owners. Consider alerting property owners that if a requested pruning service is not deemed to exceed risk thresholds, then the work will be deferred until the next pruning cycle hits their street. If the property owner wants it completed sooner, the City will make arrangements to have the Contractor perform the service and bill the property owner. Just as with the tree planting arrangement, property owners will have the advantage of receiving contractor prices and the assurance that a qualified company (selected by the City Forester) is performing the work. (In Fiscal Year 2007–2008, the contracted pruning cost was \$70 per tree.)

REMOVALS – According to University City’s *Annual Community Forestry Plan*, 337 trees were removed during each of the last two reportable fiscal years. This number is expected to increase as the street tree population continues to mature. Along with the aging tree population and increasing numbers of removals will be an increase in the number trees that are defective and pose potentially levels of risk.

Situations where injury or property damage has occurred from falling trees are not isolated and are well documented in the media on a regular basis. Along with the potential for personal injury or property damage comes the probability of the responsible parties being held liable for any injuries or damages. Such lawsuits can and have resulted in costly judgments against the defendants.

Public safety must be the primary concern in University City. Tree removals and pruning are a vital part of safety risk mitigation. The general tree population in the City is in good to fair condition; however, there are large trees with varying degrees of risk factors existing in the scaffold limbs, trunks, and roots. Consideration must always be made of area usage and the threat of falling limbs or trees to persons and property when putting a pruning and removal plan into action.

External indicators of increased risk trees, such as obvious root zone activity, decay fungi, or included bark, require special attention to meet the public’s safety needs. Trees that display decay fungi or obvious signs of wood decay should be carefully monitored and evaluated for safety concerns and risk management. Trees with poor structure, such as those with codominant leaders or multiple trunks, can pose a greater failure risk than trees with good structure. All City trees (especially trees in the large-size diameter class) with signs of decay and/or poor structure should be examined annually for signs of impending failure.

The 2000 street tree inventory indicated a very low number of trees with high levels of risk that needed attention. This is, in large part, a result of the Forestry Division’s vigilance with removing high-risk trees. However, the number of removals needed because of declining tree health will likely increase as a result of the aging tree population. Updating the street tree inventory and scheduling regular inspections will assist with identifying anticipated needs.

Utilized Contracted Forestry Crews for Specific Services

Consideration should be given to utilizing contracted crews for specific services, but not as a total replacement for Forestry Division crews. When municipalities face the inevitable task of balancing needed levels of service with available funds, there is nearly always the discussion of utilizing contractors to perform some or all of its services. While using contracted crews may reduce the “personal level” of the service and reduce the City’s visibility in performing vital City services, there can be cost savings if the contracted services are selected properly.

Going strictly all “in-house” or “all contract” is rarely in the best interest of a municipality. In the case of University City’s Forestry Division, this is especially true. The 2008 budget for the Forestry Division (including all personnel, equipment, vehicles, contractors, wood waste, and trees) was reported at \$361,439. Table 4 below shows the anticipated cost of utilizing contractors for all services (while retaining the City Forester) as \$455,512. This represents an increase of \$94,073 (an increase of over 26%).

While the current rates for contracted tree work are very competitive, they should be utilized to fill gaps and provide customized services such as property owner requests that are not part of the regularly scheduled activities of the Forestry Division. Utilizing them to fulfill all of the basic needs for pruning, removal, and planting would create considerable additional expense and reduce or eliminate many of the services not considered under “basic services”. These services include tree maintenance on park trees (including the municipal golf course), many of the outreach and educational services, specialized inspections, and services to other departments.

Table 4. Projected Cost of Contracting Basic Services in Forestry Division

Basic Work Categories	Number of Trees	Unit Cost ¹	Projected 100% Contract Cost
Tree Inspections	982		
Trees Pruned	1,491	\$ 71	\$ 105,861.00
Trees Removed	337	\$ 778	\$ 262,186.00
Trees Planted	156	\$ 220	\$ 34,320.00
Total			\$ 402,367.00
City Forester Cost (salary, benefits)			\$ 74,647.00
Total Cost w/ City Forester and Contracted Crews ²			\$ 477,014.00

¹ Unit Costs were provided by City Forester James Crowe and based on Fiscal 2007–2008 actual contracted costs.

² 2008 accomplishments shown are only the basic categories of service. Accomplishment statistics were not provided for activities such as tree maintenance activities provided to parks (including the golf course), outreach and education, specialized inspections, and services to other City departments and residents, storm calls, etc. These services would be eliminated or severely curtailed under a contract-based tree service system.

Initiate Planning for an Emerald Ash Borer Strategy and Response

The 2000 street tree inventory indicates 1,330 ash (*Fraxinus*) trees along the streets of University City. A total of 774 (58.2%) of these trees are greater than 13 inches in diameter. Potential removal and replanting costs could exceed \$1 million dollars.

• Remove 774 ash >13-inch diameter (\$700 each)	\$541,800
• Remove 556 ash <13-inch diameter (\$300 each)	\$166,800
• Replant 1,330 trees (\$220 each)	<u>\$292,600</u>
TOTAL	\$1,001,200

Emerald ash borer (*Agrilus planipennis*) is an exotic insect that has caused the death of millions of ash trees since it was found in Michigan in 2002. It is very aggressive and continues to spread to other areas of the United States. It was recently found in southeastern Missouri. If it spreads to the St. Louis area, it will likely kill approximately 15% of ornamental trees in the area. Inventories have indicated an average of 15% ash trees in urban tree populations including streets, parks, yards, and green spaces. To date, very little has been found in the way of controls, and communities are bracing for large numbers of removals if it becomes established in the St. Louis area. Tens of millions were reported to have been killed in southeastern Michigan alone. Information about emerald ash borer can be found at <http://www.emeraldashborer.info/>.

Increase Public Awareness and Educational Programs

As policies change and program direction shifts toward shared responsibilities with its citizenry, an active awareness and educational program will become more important. This will help to improve the connection that property owners feel with City government and the services and leadership it provides.

Plan to hold additional classes on various tree topics including tree selection, planting, and basic tree care. Develop a set of emergency workshops and informational materials for homeowners if emerald ash borer is found in the St. Louis area. Workshops geared towards developers may be helpful to explain the City's code requirements with tree preservation and replacement on development sites.

Improve the “Annual Community Forestry Plan”

Improve and incorporate the “Annual Community Forestry Plan” into the City's “Comprehensive Plan Update”. The current format of the City's “Annual Community Forestry Plan” should be expanded to include detailed information about budgeted funds allocated and spent on various tree-related activities. In a period of challenged budgets, it becomes more important to identify specific activities with specific costs. Add a section that updates the total value of the City's urban forest.

The most recent update to the City's *Comprehensive Plan* contains very little information about the City's urban forest and the benefits it provides. A member of the Urban Forestry Commission should become directly involved with the process of updating the City's *Comprehensive Plan* and ensure that the vision and goals of the Urban Forestry Commission are well represented in the *Comprehensive Plan*. This will raise the visibility of the urban forestry services provided by the City and place more emphasis on the value of planning for the future of urban forestry in University City.

Funding Sources

Urban forest management is a recognized function of University City and receives some dedicated funding. However, it appears that the current level of resources available are inadequate to accomplish the goals the Urban Forestry Commission and the citizens of University City. With greater funding levels, the City could move from a reactive to a proactive management approach, provide greater services, and increase tree canopy coverage if the security of funds to sustain all activities, programs, and initiatives are available.

There are various funding mechanisms and sources the City can consider to support increasing staff levels, public educational efforts, tree protection, maintenance, planting activities, and other components of a truly progressive, comprehensive urban forest management program.

Utilize the Existing Tree Bank

Section 12.08.020 of the City Code established a special account created to deposit funds from various sources, which are restricted for use by the urban forestry program. The funds in this account are managed by the City, subject to the annual budget process, and expenditures follow normal purchasing policies and procedures. Any funds generated from fees, permits, fines, penalties, and payments made in lieu of required planting on development sites, should be directed to the Tree Bank for forestry related activities in the City.

This innovative funding mechanism does not rely on City general funds but, instead, on the collection and deposit of monies from various sources. Suggested additional sources include, but are not limited to, the following:

Damage Compensation. This source may not generate a great deal of money, but it is a legitimate and often under-pursued source of funds. When an automobile damages a public tree or when construction equipment destroys a group of public trees, the City should seek compensation for the landscape value of that tree(s). The City can rightly seek compensation for the total damages, including: the value of the tree(s); the cost of repair or clean-up; and the cost of the administrative time used during the resolution of the situation. The receipt of \$500 from a minor car accident to \$5,000 for a major damage claim can add up over time. Generally, the compensation is collected from the insurance company of the person responsible for the damage or directly from the business that caused the damage to public trees. The compensation funds can be used to remedy the specific damage, or be used for other legitimate urban forestry functions throughout the City. The 2000 street tree inventory included tree values that were calculated using a methodology adopted by the International Society of Arboriculture and used in settlements nationwide.

Permit and Plan Review and Inspection Fees (to the extent permitted). It is not uncommon for municipalities to require private developers and businesses to support the administrative time needed for proper and professional plan review and site inspection tasks. In light of the City's goal to protect and enhance the urban forest, charging specifically for the time and arboricultural expertise needed to approve permit applications, review plans, and make site inspections might be a viable option to support the salary and benefits of additional full- or part-time urban forestry positions. The City may need to perform a job analysis to determine the time spent performing review and inspection tasks.

Developers Fees (to the extent permitted). In lieu of or in addition to new tree-related plan and inspection fees, and previously mentioned currently required expenses for tree preservation compliance, landscape installation, and other zoning/subdivision regulation activities, developers could be required to pay a set amount to support University City's overall urban forestry program. In effect, it would be a cost of doing business within the City limits. The fee could be a percentage of the total project cost, based on the number of housing units built, or based on the area of land being developed. The City's Planning Department may have better information upon which to base this fee. It is suggested that this fee would be paid and deposited in the Tree Bank before the project is approved.

Utility Company Fees (to the extent permitted). Non-municipal utility companies perform new construction, maintenance, and repair work on an annual basis in the City. This work may affect the aboveground and belowground portions of public trees. It is prudent and reasonable to assess a fee to such utility companies when their work affects municipal trees. Utility companies that excavate near city-owned trees can cause severe damage to roots that may affect the tree's health or its ability to withstand winds. Any compensation for documented damage to public trees during utility work would be collected separately on a case-by-case basis, and the utility company should be responsible for the costs for any remediation necessary (*e.g.*, pruning, fertilization, or temporary irrigation) above and beyond the fees and compensatory payment. Compensation should be made a stipulation on the permit applications for such work.

Private Donations/Corporate Sponsorships. University City is fortunate to have generous citizens who care about the quality of life in the City. The Urban Forestry Commission could solicit citizens for private donations to support tree planting, tree care, and public educational activities. A major source of donations could be from businesses and corporations who wish to sponsor non-profit, environmental activities. All potential contributors should be reminded that any donations might be tax-deductible when they file their federal income tax return if their financial situation allows.

Fund-Raising Activities. With the support of volunteers, the City can hold various fund-raising events throughout the year. Popular large events include competitive and social runs and walks. Volunteers can staff food and drink booths at local fairs and festivals. Tree and University City-related merchandise could be commissioned and sold. Restaurants can have special Tree Nights where a small percentage of the patrons' bills is donated back to the City for tree planting. Even small efforts, such as school and church bake sales and yard sales, can be encouraged to raise funds for trees in the community.

Firewood/Mulch/Wood Sales. If City property can be sold, the wood waste from tree maintenance and storm damage repairs can be a source of funds for the Tree Bank. Other cities have been successful in selling split and un-split firewood, hardwood timber, and rough wood chips to the general public and commercial businesses. Rather than pay for proper removal and disposal, cities sell these excess wood products. A new trend is when a significant or historic public tree must be removed; the logs and useable wood are given to local craftsmen who then create furniture, sculpture, and other collectibles from the wood. These are sold and all or portions of the proceeds are returned to the City. Be aware that if emerald ash borer becomes an issue, the movement and distribution of firewood may be restricted or discouraged.

Other Funding Tools

The following sources of revenue are not appropriate for inclusion in University City's Tree Bank, but are each viable sources of funding for the comprehensive urban forestry program.

Increase the General Fund Allocation to the Urban Forestry Program. During future budgeting cycles, the City should consider increasing the financial resources available for urban forestry staff and functions.

Obtain Grants. As a municipality and a non-profit with existing support structures and staff, University City is in a good position to apply for and receive grants to support urban forestry activities. The City has previously received grants for urban forestry projects, but with the investment in time and a person skilled in grant writing, there are likely multitudes of grant opportunities for University City. These opportunities can be found with the State and Federal governments, non-profit organizations, large corporate and private business foundations, and private charitable foundations. If University City establishes a Tree Bank, there will be a ready source of matching funds to leverage even more grant dollars. A local example of grant opportunities is the Tree Resource Improvement and Maintenance (T.R.I.M) cost-share program administered through the Missouri Department of Conservation and the Missouri Community Forestry Council.

Promote the Federal Tax Incentive to Citizens. As a non-profit, the City is in a unique position to encourage citizens to directly pay for desired tree planting and tree maintenance on public property. The City should inform property owners abutting the public rights-of-way, parks, or other City properties that if they pay for City-approved, proper public tree planting or tree maintenance, then that effort and any related expenditures may qualify as a charitable deduction on their federal income tax return. Until the City's urban forestry program is fully staffed, equipped, and funded, this mechanism is a good public relations tool as well as a way to accomplish needed work.

Conclusion

University City has a long history of planting trees along its streets, in its parks, and as part of new developments. It also created a model urban forest management program that took responsibility for managing this valued resource.

Recently, however, an aging street tree resource and limited budgets have created the need for a closer look at how the City can best manage its trees. The *Urban Forest Operations Review and Strategic Plan* is the resulting plan and is based on established goals, City Code, and the City's desire to collectively lead to creating a sustainable urban forestry program.

Key Goals and Recommendations

While the City is faced with budget issues that demand a closer look at how it manages its forest resources, it creates an opportunity to become more efficient and to learn the primary areas of its mandated responsibilities.

The vision of University City's *Annual Community Forestry Plan* is "To sustain a healthy, safe, and appealing public street and park tree population in the city of University City, Missouri". This vision should guide the City's efforts to recover the loss of tree canopy and enhance all tree-related benefits by recommending strategies and actions to improve the City's urban forest management in an efficient, equitable, economic, and sustainable manner. The four *Strategic Goal Areas* are presented below with the key recommendations.

1) Increased Communication

Several City agencies have an impact on some aspect of the City's urban forest. The City's ordinances lack a comprehensive perspective, and there appears to be no support from the City Manager or other administrative staff to require or seek technical expertise when public improvement projects may impact city-owned trees. Fragmentation, or separation defined by organizational boundaries and agency-specific missions, may keep the City's departments from interacting in meaningful and productive ways to protect and enhance the urban forest. This appears to be a serious and on-going issue in University City. The current *Annual Community Forestry Plan* is an excellent source of information about activities within the Forestry Division but lacks detail in the "Action Items" section that is an excellent opportunity to plan for future needs.

Key Recommendations:

- a) The City Manager should propose and City Council should approve additions to Chapter 12.08 of the City Code that will clarify specific responsibilities for city-owned trees and enhance communication between departments.
- b) The City should find means to increase interdepartmental communication and cooperation for plans and projects that may affect the urban forest, improve the "Action Items" section of the *Annual Community Forestry Plan*, and include the Plan's content in the City's *Comprehensive Plan Updates*.

2) Improved Administration and Planning Within the Forestry Division

The City Forester has an outdated street tree inventory and no park tree inventory. A sustainable urban forestry program must have reliable data in order to efficiently plan and complete assigned tasks. The inventory will also allow a thorough analysis to be completed that will utilize nationally recognized models to calculate a full accounting of the benefits the City receives from a healthy well-managed urban forest. Additionally, the inventory data can be used to develop a solid action plan on how the City will deal with the large number of removals associated with an outbreak of emerald ash borer. Tree removals and replanting associated with this particular insect infestation could cost the City over \$1 million.

Key Recommendations:

- a) Update the City's street tree inventory and complete a park tree inventory. Both should be GIS-based inventories and the data should be loaded into a comprehensive tree management software package in order to create efficiencies in assigning needed work and tracking accomplishments.
- b) Once the inventories are complete, utilize data to calculate the technical benefits of the City's tree population with UFORE or STRATUM.

- c) Utilize the data to begin creating a plan to respond when the emerald ash borer strikes. Improve and incorporate the *Annual Community Forestry Plan* into the City's *Comprehensive Plan Updates*.

Increased Staffing and Resources

The City is currently planting 185 fewer trees than it removes each year. At this pace, the City will have a streetscape without any public trees by the year 2060. This critical event may happen sooner, given the increasing number of removals needed each year as a result of an aging street tree population, and if emerald ash borer further taxes the City's resources. Currently, an efficient cyclical tree pruning program is suffering as a result of having to deal with "on-demand" requests by property owners in University City. These requests are given top-priority and pull the forestry crew away from completing much needed and more efficient pruning on a scheduled seven-year cycle. This block-by-block method of pruning reduces set-up time and is much more efficient than dealing with "on-demand" pruning requests. Utilizing contract crews for all of the City's forestry tasks would cost the City an additional \$94,073 (a 26% increase in current costs).

Key Recommendations:

- a) Increase staffing levels and allocate resources to avoid a severe decline in street tree numbers and overall health of the City's community forest.
- b) Utilize contract crews to handle the "on-demand" pruning requests and keep in-house crews on the cyclical pruning program.
- c) Consider charging residents for the contracted services that are performed "on demand" and outside of normally scheduled activities.

4) Expanded Education and Public Relations

Citizens, businesses, City staff and leaders, and developers need continued education and marketing targeted to increase their awareness of the benefits of trees. They need to be aware of the availability of City resources and the various ways they can become more involved in the urban forest management program and be a part of the solution. If emerald ash borer strikes the City, an awareness program will be needed to educate residents of their role and City's role in prevention, detection, removals, and replanting.

Key Recommendations:

- a) Increase public and citizen urban forestry outreach efforts, and educate elected officials and City employees on a regular basis.
- b) Hold training sessions for other City staff to educate them about the value of trees and the development of policies that protect public trees.

Appendix A
Annual Community Forestry Plan

ANNUAL COMMUNITY FORESTRY PLAN UNIVERSITY CITY, MO. FISCAL YEAR 2009-2010

INTRODUCTION:

The community forest is an important resource that contributes to the quality of life for the residents of University City. This community forest resource works to improve air and water quality, reduce energy costs, increase property values and beautify the city. University City is home to over 30,000 public trees approximately 12,000 of which are street trees the remaining are park and woodland trees. Our current forest resources were planted by previous residents and must be maintained and improved by current residents for the future.

Vision: To sustain a healthy, safe and appealing public street and park tree population in the city of University City, MO.

Goal: To effectively manage the urban and community forest of University City in an effective manner through sound management, utilizing in-house and contracted services and building a team of effective proponents for the trees in the community.

OVERVIEW:

The forestry division is one of three divisions making up the Parks and Recreation and Forestry Department. The division is made up of four personnel; the city forester, a crew leader/ tree trimmer and two tree trimmers. The city forester reports directly to the department director. In November of 2006 the municipal code was amended to establish new regulations on trees and shrubs. Assisting the city forester in the enforcement of this new tree ordinance is a seven person Urban Forestry Commission.

THE TREE MANAGEMENT PROGRAM:

REVIEW:

REMOVALS: University City's community forest is a diverse population of old growth and younger trees. Consequently some have died due to old age or construction damage; these trees must be removed for safety and liability issues. During the fiscal year of 2007-2008 (University City's fiscal year runs from July to July) 337 trees were removed; the same amount removed over fiscal year 2006-2007. All removals were completed in house by the forestry crew.

PRUNING: Pruning is the most important tool in the management plan; proper pruning can greatly extend the health, safety and life of trees. 1491 trees were pruned in fiscal year 2007-2008; this represents an increase of 207 trees from fiscal year 2006- 2007. Of the 1491 trees pruned 285 were by subcontractor at a cost of \$70.00 per tree.

PLANTING: Planting is the only way to insure the diversity of the community forest and every attempt is made to plant at least as many trees as removed. During the fiscal year 2007-2008 156 trees were planted; this represents a increase of 9 trees from fiscal year 2006- 2007. All plantings were made by in house personnel.

BUDGET:

Salaries \$176,162.00
Contractor Allocation: \$45,000.00

TIME ALLOCATIONS:

Pruning: 44%
Removals: 41%
Planting: 6%
Other: 9%

PROJECTIONS FOR FISCAL YEAR 09-10:

Removals: 390
Prunes: 1700
Plantings: 200

ACTION ITEMS FOR FISCAL YEAR 08-09:

PROMOTE TREE AWARENESS AND STEWARSHIP AMONG CITY RESIDENTS:

- A) Increase tree and forest educational opportunities for residents
With the assistance of the Urban Forestry Commission instituted the Citizen Tree Planting class, and formulating the University City Memorable Tree Walk.
- B) Continue with the annual Arbor Day celebration.
Arbor Day was celebrated with a tree planting and program at Jackson Park School.
- C) Provide an article to be printed in the Cityscape newspaper
Cityscape newspaper is no longer in circulation.

PROVIDE TRAINING OPORTUNITIES FOR FORESTRY CREW:

- A) Attend the International Arborists Convention
Attended the convention in July '08

RECRUIT MEMBERS FOR THE URBAN FORESTRY COMMISSION

UPDATE THE CITY'S STREET TREE INVENTORY:

- A) Compile a database of all tree care by address since 1999 tree inventory
A work in progress
- B) Purchase a software program to update 1999 tree inventory
Applying for a grant to secure this.

CONDUCT A MANAGEMENT BEST PRACTICES PLAN

Plan will be ready by the end of March 2009

ACTION ITEMS FOR FISCAL YEAR 09-10:

PROMOTE TREE AWARENESS AND STEWARSHIP AMONG CITY RESIDENTS:

- A) Expand on the forestry related opportunities for residents.
- B) Continue with the annual Arbor Day celebration.
- C) Explore other venues in media

RECRUIT MEMBERS FOR THE URBAN FORESTRY COMMISSION

IMPLEMENT MANAGEMENT PRACTICES PLAN

- A) Using the recommendations of the forestry consultant
- B) Update the City's street tree inventory.

Appendix B
Section 12.08 of the University City Code (Tree Ordinance)
and Tree Manual

SUBSTITUTE 2

INTRODUCED BY: Mr. Price

DATE: July 10, 2006

BILL NO. **8895**ORDINANCE NO. **6670**

AN ORDINANCE AMENDING TITLE 12 OF THE UNIVERSITY CITY MUNICIPAL CODE, RELATING TO STREETS, SIDEWALKS AND PUBLIC PLACES, BY REPEALING CHAPTER 12.08 THEREOF, RELATING TO STREET TREES AND SHRUBS, AND ENACTING IN LIEU THEREOF A NEW CHAPTER TO BE KNOWN AS "CHAPTER 12.08 TREES AND SHRUBS," THEREBY AMENDING SAID CHAPTER SO AS TO ESTABLISH NEW REGULATIONS ON TREES AND SHRUBS, ON BOTH PUBLIC AND PRIVATE PROPERTY; AND BY AMENDING THE HEADING TO TITLE 12 SO THAT IT SHALL BE KNOWN AS "TITLE 12 STREETS, SIDEWALKS AND PUBLIC PLACES, AND TREES AND SHRUBS;" CONTAINING A SAVINGS CLAUSE AND PROVIDING A PENALTY.

WHEREAS, at its meeting held at Screenz at 7:30 p.m. on July 10, 2006, the University City Plan Commission recommended an amendment of Chapter 12.08 of the University City Municipal Code so as to establish new regulations on trees and shrubs, on both public and private property; and

WHEREAS, due notice of a public hearing to be held by the City Council in the City Council Chambers at City Hall at 6:30 p.m. on August 28, 2006, was duly published in the St. Louis Countian, a newspaper of general circulation within said City on August 8, 2006, which was not more than thirty (30) days nor less than fifteen (15) days before the hearing date; and

WHEREAS, said public hearing was held at the time and place specified in said notice, and all suggestions or objections concerning said amendment were duly heard and considered by the City Council.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF UNIVERSITY CITY, MISSOURI, AS FOLLOWS:

Section 1. Title 12 of the University City Municipal Code, relating to streets, sidewalks and public places, is hereby amended by repealing Chapter 12.08 thereof, relating to street trees and shrubs, and enacting in lieu thereof a new chapter to be known as "Chapter 12.08 Trees and Shrubs," thereby amending said chapter so as to establish new regulations on trees and shrubs, on both public and private property; and by amending the heading to Title 12 so that it shall be known as "Title 12 Streets, Sidewalks and Public Places, and Trees and Shrubs;" so that Chapter 12.08, as so amended, shall read as follows:

Section 12.08.010 Purpose and intent.

The citizens and elected officials of the City are concerned that use and redevelopment is putting the City's tree population in jeopardy. Aging, disease, larger homes, new road construction and many other changes in the City often result in the loss of trees and vegetation, thereby changing the character and ambiance of the City. The planting, maintenance and preservation of trees and vegetation in the course of land disturbance has been determined to be a significant issue for the public health and welfare, and the City's physical and aesthetic environment.

The planting, maintenance and preservation of trees and vegetation will have substantial positive effects on storm water management, air quality, quality of water from non-point sources, erosion, flood control, wildlife habitat, noise pollution, energy conservation, and property values. It will provide for positive aesthetic benefits consistent with the established character of the City.

The planting, maintenance and preservation of trees and vegetation help moderate the effects of sun, cold and wind, and pollution. It also has a beneficial impact on the overall well-being of the City. Therefore, the standards as set out in this Chapter apply to all properties within the City's boundaries.

Section 12.08.020 Definitions.

For purposes of this chapter, the following terms, phrases, words and their derivations shall have the meaning given herein:

Arborist Permit: Annual permit required for any person pruning, treating, maintaining or removing of any tree on Development Projects and any tree in the Public Community Forest; provided however that City employees are excluded from this requirement.

Adjusted Diameter at Breast Height (DBH defined below): The DBH of a tree. (e.g., a 20-inch diameter tree with a Condition Rating of 50% has an "adjusted DBH" of 10 inches.)

Caliper: The diameter of a tree 6" above ground.

Carrying Capacity: A level in which a site has the maximum number of trees. The land cannot support any more trees without jeopardizing the health of all the trees due to overcrowding.

City: The City of University City, Missouri.

City Forester: The forester of the City or his or her duly authorized agent. The City Forester is responsible for administration of this Chapter and a Community Forestry Plan.

Community Forestry Plan: A written document that guides the work of the City Forester and envisions a long-range plan for the maintenance and improvement of the community urban forest. The Community Forestry Plan contains the City-wide street tree plan.

Condition Rating: A numerical rating developed in accordance with the International Society of Arboriculture methodology will be utilized to gauge a tree's overall health and form expressed as a percent. A healthy tree with good form may be rated at 90%, whereas a tree with many broken limbs and serious decline may be rated at 20%.

Development and/or Development Projects: The performance of any building activity; or the making of any material change to any structure; or to the natural surface of land including activities that disturb the natural surface of the land such as clearing, excavating, and filling; or any change in the use or appearance of any structure or land; or the division of land into two or more parcels. For the purposes of this Chapter, in reference to the need for a Forest Activity Permit, the terms "development" or "development projects" shall include but not be limited to the construction of **new** single family dwellings or **new** two-family dwellings and any other new construction that requires a special use permit such as Site Plan Review, Conditional Use Permit or Planned Development. The terms "development" or "development projects" shall specifically **exclude** additions to single family dwellings or two-family dwellings and the addition of accessory structures (as defined in Title 34 of the Zoning Code) including but not limited to landscaping, decks, porches, sheds, garages, fences and pools.

DBH: The diameter of a tree at breast height which shall be measured at 4 ½ feet above ground.

Forestry Activity Permit: Permit required to remove, prune or plant City Trees. It is also required when trees are to be removed from private property as part of certain development projects as set forth herein.

Maintain: To plant, mulch, fertilize, water, and/or prune as necessary, and remove if dead or diseased.

Park Trees: See Trees below.

Public Community Forest: All City Trees as a total resource.

Private Community Forest: All trees within the City's boundaries that are not City Trees.

Private Tree: See Trees below.

Site: Same as Tract (see below).

Street Trees: See Trees below.

Tract: The total area of a parcel, site, lot, or ownership of land upon which development or land disturbance is proposed irrespective of the actual limits or size of the proposed development or land disturbance activity.

Tree: A woody plant that grows mostly upright as a single stem (rarely multi-stem) that may eventually attain a height of 15 feet or more.

City Tree: Street Tree, Park Tree or other tree on property owned by the City, on City right-of-way, or to be planted on City property or City right-of-way and other trees owned by the City.

Park Tree: City Tree located in a City public park.

Private Tree: Tree located on privately-owned property (not a City Tree).

Street Tree: City Tree located in City right-of-way along a public street.

Tree Bank: An account set up within the City's financial system that will accept payments from tree replacement assessments imposed by this Chapter, or from other sources that may arise. The Tree Bank funds shall be used to plant and maintain City Trees.

Tree Canopy Coverage: The area in square feet of a tree's branch spread. Existing tree canopy is determined by measuring the ground surface area that is covered by the branch spread of a single tree or clump or grove of trees.

Tree Lawn: A narrow band of soil-filled area typically located between the edge of the street pavement and an adjacent sidewalk or to the edge of the private property lot line.

Tree Manual: A manual prepared by the City Forester and that contains the technical information necessary to perform the work outlined in this Chapter.

Tree Survey: A comprehensive account by a certified arborist of all trees 6 inches or greater in DBH on the tract of land in question. A tree survey is required for Forest Activity Permits. This survey shall be prepared in map and in narrative form, and shall include: the species, size, condition (rated 1-100) and location of each tree relative to the proposed development. Tree protection measures and limits of disturbance shall be noted on the tree survey.

Tree Topping: The drastic removal, or cutting back, of large branches in mature trees leaving large, open wounds, which subjects the tree to disease and decay. Topping causes immediate injury to the tree and ultimately results in early failure or death of the tree.



Section 12.08.025 Jurisdiction.

The City shall have control of all trees, shrubs, and other plantings now or hereafter in any street, park, public right of way, or other public place within City limits, and shall have the power to plant, care for, maintain, remove and replace such trees, shrubs and other plantings. Jurisdiction shall also extend to trees, shrub and other planting as set forth in this Chapter.

Section 12.08.030 City Forester and Urban Forestry Commission - Appointment, Authority and Supervision.

A. City Forester

1. Duties include but are not limited to the following:
 - a. Implement this Chapter: The City Forester is authorized to adopt and promulgate rules and regulations necessary to interpret and implement the provisions of this chapter to secure the intent thereof and to promote the public health, safety and general welfare.
 - b. Authorize Permits and Supervise Permitted Work: The City Forester shall be authorized to issue and administer permits and supervise permitted work in accordance with this Chapter.
 - c. Implement the Community Forestry Plan: It shall be the responsibility of the City Forester to study, investigate, develop and annually prepare an update of the Community Forestry Plan, for the care, replacement, maintenance, and removal or disposition of City Trees and shrubs. Said update shall be presented to the Urban Forestry Commission for adoption *and forwarded to Council for approval.*

- d. Member of the Urban Forestry Commission: The City Forester shall also be an ex officio non-voting member of the Urban Forestry Commission.

B. Urban Forestry Commission

1. Creation of Commission: There is hereby established an Urban Forestry Commission. The Commission shall consist of the City Forester, and seven (7) members who shall be appointed by the City Council and who shall be and have been residents of the City for at least two years immediately prior to their appointment. The terms of such members shall be staggered. Two shall be designated to serve for a term of 1 year, three shall be designated to serve for a term of 2 years, and two shall be designated to serve for a term of 3 years from the date of such initial appointment. Members subsequently appointed by the City Council shall serve for a term of 3 years. Such members shall receive no compensation for their services as such. The City Council shall appoint a Councilmember as an ex officio member of the Commission to act as liaison between Council and the Commission. The City Council may remove any member of the Commission for the misconduct or neglect of duty. Vacancies on the Commission occasioned by removal, resignation or for any other cause shall be filled for the remainder of the term in like manner as in the case of original appointment.

2. Election of Officers: The Urban Forestry Commission shall as soon as practical after original appointment of its members, meet and elect a president and such other officers as it may deem necessary. Thereafter, elections of officers shall be had annually in the month of January.

3. Adoption of Rules and Regulations: The Commission shall make and adopt such rules and regulations for its guidance and proceedings as may be expedient and necessary for the carrying out of its duties, and not inconsistent with the Charter, the provisions of this Code or other ordinances of the City.

4. Performance of Duties: The Urban Forestry Commission shall upon advice and input from the City Council, City Forester, Director of Public Works, the Director of Parks, Recreation and Forestry, and the Director of Planning adopt and annually update a Community Forestry Plan, and shall perform such other duties as may be provided by this Code or by other ordinance. Such Plan shall, upon approval of City Council, constitute the official comprehensive Community Forestry Plan for the City.

5. Quorum for Transaction of Business: A majority of the Commission members shall constitute a quorum for the transaction of business.

6. Annual and Regular Meetings: The annual meeting of the Commission shall be held in January, for the purpose of electing a President and such other officers, and for the transaction of such other business as may come before the Commission. The Commission may fix the time and place for holding of additional regular meetings with notice of such meetings to be delivered or mailed to all Commission members. The Commission shall hold a minimum of six (6) regular meetings per calendar year. Additionally, the Commission shall meet within thirty (30) days of notice to act upon any appeal.

7. Special Meetings: Special meetings of the Commission may be called or at the request of the President, or two (2) Commission members.

8. Appeals: Any person directly affected by an order, decision or determination of the City Forester shall have the right to appeal to the Urban Forestry Commission. All appeals shall be filed within 10 days after the order, decision or determination is rendered by the City Forester; provided however that appeals of special assessments pursuant to Section 12.08.080.d shall be filed within 30 days after notice of the special assessment is mailed to the property owner. All appeals shall be in writing and filed with the Director of Parks, Recreation and Forestry and City Manager for placement on the Commission's agenda. An appeal shall be based on a claim that the true intent of this Chapter or the regulations or rules adopted there under have been incorrectly interpreted or applied, and shall specify the reasons. The Commission may reverse, affirm or modify the order, decision or determination of the City Forester. The Commission shall render its decision by majority vote after an appeal hearing.

Section 12.08.040 Forest Activity Permit.

A. Private Trees on Development Projects

Prior to removal of any tree six (6) caliper inches in diameter or greater, a Forest Activity Permit shall be required on all Development Projects on private property within the City. A Forestry Activity Permit shall be obtained from the City Forester. The fee charged for each Forestry Activity Permit shall be \$50 per Development Project. The removal of diseased or dead trees, and trees which have been declared a public nuisance by the City Forester is exempt.

A tree survey of the site must be provided to the City Forester, and approved by the City Forester, prior to any excavation, grading or land clearance and also prior to the issuance of a building permit by the Building Commissioner, in connection with the development. The City Forester shall provide the Building Commissioner written notification of any approval within twenty (20) work days. In the tree survey, each tree will be rated and assigned a condition factor (expressed as a percentage) depending on its current health. The condition factor will be assigned per guidelines accepted by the International Society of Arboriculture. Multiply the actual measured DBH of each tree by the condition factor to calculate the adjusted DBH.

The preservation of trees on lots is encouraged. If complete preservation is not possible, any trees six (6) caliper inches in diameter or greater being removed from the site must be replaced with trees of comparable species, so that the combined caliper inches of the replacement trees will be equal to that of the cumulative adjusted DBH being removed. The time of replacement shall be directed by the City Forester. If the carrying capacity of the site can not support the number of trees required for this mitigation, a payment of \$120 per caliper inch not so replaced shall be made by the developer to the City Tree Bank within thirty (30) days of the City Forester making such determination; provided however that the maximum amount payable shall be \$10,000 per acre; provided further that the City Forester shall make all reasonable effort

to utilize a sum equivalent to the amount so paid into the City Tree Bank for planting of City Trees near or surrounding the Development Project.

For Development Projects subject to this Chapter, should any preserved tree die or become damaged within one year of the later of the date all building permit work is finally approved by the City, or date an occupancy permit is issued, or date of actual occupancy, as a result of Development Project activity, the developer shall, at the direction of the City Forester, replace the tree(s), or pay an assessment equal to the value of the trees that died, were damaged, or were removed. Payment shall be due within thirty (30) days of the City Forester making such determination. The value of the trees will be determined using the International Society of Arboriculture's methodology of tree appraisal. (Copies available from ISA at PO Box 3129, Champaign, IL (www.isa-arbor.com)). The City shall not issue, shall withhold, or shall revoke, as the case may be, any occupancy permits until the assessment is paid.

In lieu of any payment required to be made to the City Tree Bank under this subsection, the developer may plant trees of equal value on City property or City right-of-way as directed by the City Forester, with preference to be given to the area near or surrounding the Development Project.

B. City Trees.

No person shall plant, prune, spray or remove any City Tree or City shrub without first obtaining a Forestry Activity Permit. A Forestry Activity Permit will be issued for appropriate planting spaces only. If a tree lawn exists, the planting site must be acceptable to the City Forester. Species selection must be made from the approved species list in the Tree Manual or a species approved by the City Forester.

A Forestry Activity Permit to prune, spray or remove City Trees will be issued if the City Forester finds that the desired actions or treatments are necessary and that the proposed method and workmanship are satisfactory. If a tree is approved to be pruned or removed, the activity shall follow the American National Standard Institute A300 Standard Practices and the root stump must be grubbed out, when so required by the City Forester. The fee charged for each Forestry Activity Permit for City Tree planting, pruning and removal shall be \$50.

Maintenance activities that include mulching, watering and fertilizing do not require a Forestry Activity Permit.

C. Regulations for Planting in Public Places:

Work performed in public places under a Forestry Activity Permit shall be in strict conformance with the terms of this Chapter, and the regulations set forth in the Tree Manual and further set forth below:

1. Trees must not be less than 1¾ caliper inches.

2. No tree shall be placed so as, in the opinion of the City Forester, Director of Public Works or Chief of Police, to cause a traffic hazard.
3. Application for planting will specify which trees currently located in public right-of-way shall be removed, if any. Stumps and exposed roots will be removed if any tree is approved for removal. No tree in public right-of-way shall be removed unless clearly authorized as part of the Forest Activity Permit.
4. Trees shall be planted at least 30 feet apart except where a special permit is obtained from the City Forester.
5. No tree shall be planted where the soil is too poor to insure the growth of such tree unless the owner incorporates a suitable loam or top soil.
6. No tree shall be planted nearer than one and one-half feet from the curb line or the sidewalk unless a special permit is granted by the City Forester.
7. No tree shall be planted along any street except of the species, cultivar, or variety selected by the City Forester for that street.
8. All pruning must follow the American National Standard Institute A300 Standard Practices.

Section 12.08.050 Intentionally left blank.

Section 12.08.060 Intentionally left blank.

Section 12.08.070 Annual Arborist Permits.

Any person pruning, treating, and/or removing any tree in a Development Project and/or any tree in the Public Community Forest must first obtain an Arborist Permit to be issued by the City Forester. An Arborist Permit shall be obtained from the City Forester upon showing proof of liability insurance in the amount of \$500,000 and workmen's compensation insurance as required by State law and shall be valid for a period of one year. Issuance of a permit also requires that such person (or if a business entity, that a minimum of one person within the business entity) be recognized by the International Society of Arboriculture as a Certified Arborist or Tree Worker. All permitted work on City Trees and trees in a Development Project will be consistent with American National Standard Institute A300, Standard Practices for Woody Plant Maintenance.

Fines for pruning, treating, or removing any tree within the City without the required Arborist Permit shall be \$500 per separate offense and shall double for the second separate offense, in addition to any other penalty provided in Section 1.12.010.

Section 12.08.080 Duty of private property owners relating to decayed, diseased or hazardous trees and shrubs; appeals.

- A. Every owner of any Private Tree overhanging any street or right of way within the City shall prune such tree so that branches shall not severely obstruct the light from a street light or obstruct the view of any street intersection. The minimum clearance of any overhanging portion of a tree shall be nine (9) feet, except where greater clearance is designated by the City Forester. Every owner shall remove all dead, decayed, diseased or hazardous Private Trees which may endanger any person or adjacent property.
- B. When there is a threat of danger from any dead, decayed, diseased or hazardous Private Trees, the City Forester shall have the right to:
- i. prune any tree or shrub when it interferes with the proper spread of light along the street from a street light, or interferes with visibility of any traffic control device or sign or sight triangle at intersections;
 - ii. remove or cause to be removed any dead or diseased tree when such tree constitutes a hazard to life and/or property, or harbors insects or disease which constitutes a potential threat to other trees within the City; or
 - iii. notify in writing the owners of such dead, decayed, diseased or hazardous trees and require the owners to perform the work within the time frame directed by the City Forester.
- C. Pruning or removal, as the case may be, shall be done at the owners' expense. In the event of failure of owners to comply with this provision, the City shall have the authority to remove or prune such trees and the cost of said removal or pruning shall be assessed to the owner as provided by law in the case of special assessments. Such a special assessment shall be certified by the City Forester to the Director of Finance and shall thereupon become and be a lien upon the property until paid.
- D. No tree or tree limb which has been cut down or which has fallen or been broken down, shall be permitted to be removed to, to remain in, or upon any public property, or so near thereto as to endanger any person thereon, and it shall be the duty of the private property owner to cause the same to be promptly removed, and it shall be unlawful for any such owner to fail so to do.
- E. Emergencies: When in the opinion of the City Forester there is an actual and immediate danger from a decayed, diseased or hazardous tree or shrub which would endanger any person or property, or when any tree or part thereof has fallen and any person or property is endangered thereby, the City Forester is authorized and empowered to take such action as may be necessary to render the tree, shrub, or part thereof temporarily safe whether or not the notice procedure in this section has been instituted. The cost incurred in the performance of any such emergency procedures shall be assessed to the property owner as provided by law in the case of special assessments. Such a special assessment shall be certified by the City Forester to the Director of Finance and shall thereupon become and be a lien upon the property until paid.

F. Appeal to special assessment: Any special assessment may be appealed pursuant to Section 12.08.030(B)(8), provided that the appeal shall be filed within 30 days after notice of the special assessment is mailed to the property owner.

Section 12.08.090 Abuse or mutilation.

A. No unauthorized person on any City property or right-of-way shall:

1. Damage, cut, carve, transplant or remove any tree, shrub or plant or injure the bark or roots.
2. Pick flowers or seeds of any tree, shrub or plant.
3. Attach any nail, staple, rope, wire or any other contrivance to any tree, shrub or plant.
4. Dig or otherwise disturb the root area, or in any other way injure or impair the flow of oxygen and water to the roots.
5. Cause or permit any wire charged with electricity to come in contact with any tree, shrub or plant or allow any gaseous, liquid, or solid substance, which is harmful to such trees, shrubs or plants to come in contact with them.

B. Tree topping of any City Tree or tree in a Development Project is unlawful and shall result in an immediate revocation of the Arborist Permit for a period of one year, in addition to any other penalty provided in Section 1.12.010.

Section 12.08.100 Interference with City Forester or other employees.

It shall be unlawful for any person to interfere with the City Forester or any other City employee while engaged in his or her duties herein set forth in this Chapter.

Section 2. This ordinance shall not be construed so as to relieve any person, firm or corporation from any penalty heretofore incurred by the violation of Chapter 12.08, nor bar the prosecution of any such violation.

Section 3. Any person, firm, or corporation violating any of the provisions of this ordinance shall, upon conviction thereof, be subject to the penalty provided in Chapter 1.12, Section 1.12.010 of the University City Municipal Code.

Section 4. This ordinance shall take effect and be in force from and after its passage as provided by law.

PASSED this 6th day of November, 2006.

MAYOR

ATTEST:

CITY CLERK

CERTIFIED TO BE CORRECT AS TO FORM:

CITY ATTORNEY



CITY OF UNIVERSITY CITY TREE MANUAL



Trees in our community provide shade for our streets, parks and homes; they beautify our streets, raise the property values of our homes and reduce our energy costs. Cities that maintain a healthy tree population can take pride in the quality of life in their neighborhoods.

This manual is designed to aid arborists and educate residents on how to best manage and protect the valuable tree resource within the City of University City.

This Tree Manual is a companion to the City of University City Tree Ordinance. It can be used as a field guide and as a reference for specific examples of requirements listed in the ordinance. It includes a list of acceptable tree species to plant on City owned property in University City, as well as examples of tree surveys and other documents, required by the ordinance. The following instructions are intended to provide practical interpretation of the University City Tree Ordinance and beneficial instruction on best management practices for urban tree populations.

The Tree Manual is not intended as a replacement for the Tree Ordinance; the Tree Ordinance will remain the official city document.

Thank you for your interest in our urban forest. Your knowledge and dedication to good tree care will contribute to the success of a healthy tree population in University City!



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The roots of a tree extend far from the trunk and are found mostly in the upper 6 to 12 inches of soil.

~DEFINITIONS~

Adjusted DBH: The DBH of a tree multiplied by the condition rating of the tree, (e.g. a 20 inch diameter tree with a condition rating of 50% has an ***Adjusted DBH*** of 10 inches).

Arborist Permit: An annual permit required for any person ***Maintaining*** a tree on ***Developmental Projects*** or ***City*** owned trees.

Caliper: The diameter of a tree 6 inches above the surface of the ground.

Carrying Capacity: The maximum number of trees on a site that can be expected to grow and thrive without an unreasonable level of competition.

City: University City, Missouri

City Forester: The official representative of the city and as such is responsible for the administration of this ordinance and a ***Community Forestry Plan***.

Community Forestry Plan: A long range plan for the maintenance and improvement of the community urban forest.

Condition Rating: A percentage rating of a tree's overall health and form, a healthy tree with good form may be rated at 90%. While a tree with many broken or missing branches and in decline may only rate 20%.

Development and/ or Development Projects: The performance of any building activity; or the making of any material change to any structure; or to the natural surface of land including activities that disturb the natural surface of the land such as clearing, excavating, and filling; or any change in the use or appearance of any structure or land; or the division of land into two or more parcels. For the purposes of this Chapter, in reference to the need for a Forest Activity Permit, the terms "development" or "development projects" shall include but not be limited to the construction of **new** single family dwellings or **new** two-family dwellings and any other new construction that requires a special use permit such as Site Plan Review, Conditional Use Permit or Planned Development, the applicant must obtain a ***Forestry Activity Permit***. This definition **excludes** additions to single or two family dwellings and the addition of structures such as; decks, porches, sheds, garages, fences and pools.

DBH: The diameter of a tree at breast height (4.5 feet above the surface of the ground).

Forestry Activity Permit: Required to remove, prune or plant city owned trees. Also required to remove trees from ***Development Projects***.

Maintain: To plant, mulch, fertilize, water and prune as necessary, to remove if dead or diseased.

Public Community Forest: All trees owned by the City as a total resource.

Private Community Forest: All trees within the municipal boundaries not owned by the City.

Tract: The total area of land on which a **Development Project** is proposed irregardless of the size of the proposed development.

Tree: A wood plant growing upright as a single stem sometimes (multi-stem) attaining a height of 15 feet or more.

City Tree: A tree owned by the City.

Park Tree: A **City Tree** that is located in a public park.

Private Tree: A tree located on private property not a **City Tree**.

Street Tree: A **City Tree** located on the City right-of-way along a public street

Tree Bank: An account set up in the City's financial system to accept payments of tree replacement assessments and other sources, the funds will be used to plant and maintain **City Trees**.

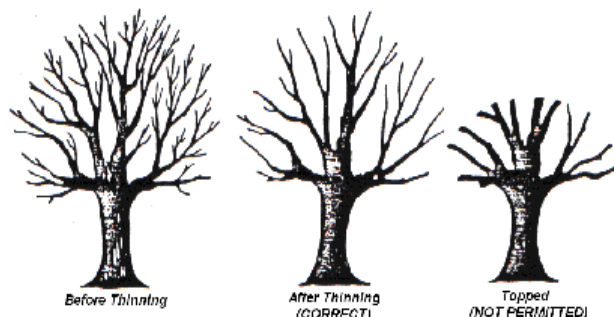
Tree Canopy Coverage: The measurement of the ground surface covered by the branch spread of a single or clump of trees.

Tree Lawn: The soil area located between the street and edge of the adjoining property line typically encompassing the street right-of-way.

Tree Manual: A manual prepared by the **City Forester**, to explain the technical information described in the Tree Ordinance.

Tree Survey: A requirement to obtain a **Forestry Activity Permit** the survey is prepared as a map and narrative showing all trees 6 inches and greater in **DBH** on the **Tract**. The survey must include the species, size, **Condition Rating**, and location of each tree in relation to the proposed development. The survey must be prepared by a certified arborist, tree protection measures and limits of disturbance must be noted.

Tree Topping: Is the drastic removal or cutting back of large limbs in mature trees resulting in large open wounds, which leaves the tree susceptible to disease and decay.



~JURISDICTION~

The **City** controls all trees, shrubs, and other plantings in public areas within the city limits and has the power to **Maintain** them as the **City** sees fit. Jurisdiction also extends to **Private Trees** under the **Forestry Activity Permit** and in other cases outlined in the ordinance.

~AUTHORITY AND SUPERVISION~

City Forester: Implements and enforces the rules and regulations of the ordinance, issues, administers and supervises all permits in accordance with the ordinance. The city forester prepares and updates the **Community Forestry Plan** and also is an ex officio non-voting member of the **Urban Forestry Commission**.

Urban Forestry Commission: Comprised of the **City Forester** and seven citizen volunteers and an ex officio city council member. The commission annually updates the **Community Forestry Plan** hears appeals to the decision or determination of the **City Forester** and perform other duties provided in the ordinance.

~FORESTRY ACTIVITY PERMIT~

Private Trees on Development Projects: The removal of trees on private property **is** restricted in situations on **Development Projects**. In these cases, a permit to remove any trees 6 inches or greater on this site must be obtained. The intent is to minimize the loss of valuable trees during major construction activities. The **City** requires a **Tree Survey** for each site before granting a **Forestry Activity Permit**.

This survey should be in map and narrative form including:

- Species
- Size (**DBH**)
- **Adjusted DBH** (**DBH** X **Condition Rating**)
- **Condition Rating**
- Location
- Tree protection measures and limits of disturbance

See Appendix A. for an example of a **Tree Survey**.

Preservation of existing trees is very important to University City. However when developing a site, this is not always possible. The ordinance attempts to mitigate this problem by requiring trees that are removed to be replaced with new trees after construction is completed. These trees are to be replaced so that the combined caliper inches are equal to the **Adjusted DBH** being removed.



CASE 1: Two Sugar Maples are to be removed during a construction project. Tree "A" is 20 inches in diameter with a condition rating of 90%; and Tree "B" is 15 inches in diameter with a condition rating of 40%. The adjusted trunk diameters are then 18 inches and 6 inches respectively. The total Adjusted DBH being removed is 24 inches. Twelve 2- inch **Caliper** Sugar Maple trees would be adequate to Replace these two trees. (Any size combination of replacement trees Is acceptable as long as the final result is **24 Caliper** inches).

Why use the "adjusted DBH for a replacement value?" This value is based on the current condition of the tree, as well as the diameter size of the tree. The **City** recognizes that a large tree can be an asset to a site; however, if this tree is in poor condition or even hazardous, it is reasonable to reduce the amount of required replacement.



CASE 2: A 30 inch Silver Maple is located on a soon-to-be-developed property and needs to be removed. The **Tree Survey** indicates that tree is in poor condition, with a condition factor of 30%. This rating could indicate that the tree is structurally deficient, infested with insects or disease or for some other reason is stressed. The tree may still provide shade, aesthetics, and character to the property but due to its defects it does not need to be replaced as if it were a "perfect tree". By multiplying the existing diameter by the **Condition Rating**, a reasonable replacement can be obtained. In this case a 30 inch diameter tree in poor condition needs to be replaced with a total of 10 **Caliper** inches of new trees.

Ideally all replacement tree plantings will take place on the developed tract of land after construction. However sometimes the number of replacement trees exceeds the **Carrying Capacity** of a site, when this is the case replacement trees maybe planted in a nearby city park or street right of way. When planting is not possible a payment of \$120.00 per caliper inch *not replaced* on the site may be paid to the City **Tree Bank**, the maximum amount payable may not exceed \$10,000 per acre. In the event any preserved tree or trees should die within one year the developer shall replace the tree(s) or pay an assessment equal to the value of the tree that died. **No occupancy permits will be issued until the assessed fees for damaged trees are paid.**

City Trees: Trees along most streets are located on city owned public right-of-way and so are owned by the **City**. Before you plant, prune, spray or remove any tree on city property you must obtain a **Forestry Activity Permit** from the **City Forester**. If you have a dead, diseased or damaged street tree contact the city forestry division and they will make arrangements to have it removed, the division also prunes and maintains trees on public property.

Regulations for Planting in Public Places: If you want to plant a tree on city owned right-of-way or park you must obtain a **Forestry Activity Permit**. A **Forestry Activity Permit** will only be issued for planting spaces that provide adequate root space and overhead clearance for the selected species. Tree lawns must be at least 4 feet wide; trees must not be less than 1 3/4 caliper inches and must be chosen from the city tree list, or be approved by the **City Forester**. (See Appendix B for the Approved City Tree List). The fee charged for each **Forestry Activity Permit** is \$50.00.

Annual Arborist Permits: Any person **Maintaining** or removing any tree in a **Development Project** or any tree in the Public Community Forest must first obtain an Annual Arborist Permit. To obtain the **Annual Arborist Permit** such person or business entity must show proof of liability insurance in the amount of \$500,000 and workmen's compensation insurance. The permit also requires that person or business entity be recognized by the International Society of Arboriculture as a Certified Arborist or Tree Worker. Fines for any work without the required Arborist Permit are \$500 per offense and doubles for the second offense, along with revocation of the Arborist Permit for one year.

~TREES ON PRIVATE PROPERTY~

Duty of Private Property Owners: It is your responsibility to prune any limbs from trees growing on your private property overhanging any street or right-of-way. The minimum clearance of any overhanging limb is 9 feet, except where the **City Forester** designates the need for greater clearance. Dead, decayed, diseased or hazardous private trees must be removed. No tree limb which has been pruned or fallen from a private tree can be placed on public property and must be removed at the expense of the property owner. If you fail to respond to hazardous or diseased trees on your property the **City Forester** can issue you a notice to remove the hazard tree or limb. If this is not successful the **City Forester** is authorized to remove the tree or limb and charge you for the service and can be a lien upon the property until paid. This assessment may be appealed within 30 days after the assessment is mailed to the property owner.

~ABUSE OR MUTILATION~

No unauthorized person on any **City** property or right-of-way shall damage, cut, carve, attach any nail, staple, rope or wire to any tree, shrub or plant. Unless authorized you may not dig or disturb the root area, pick flowers or seeds of any tree shrub or plant. You may not allow any gaseous liquid or solid substance harmful to trees, shrubs or plants to come in contact with them.

~TREE TOPPING~

Property owners are strongly encouraged **NOT** to top trees. It is unlawful to top any **City Tree** or tree in a **Developmental Project** and will result in the immediate revocation of the **Arborist Permit** for one year.

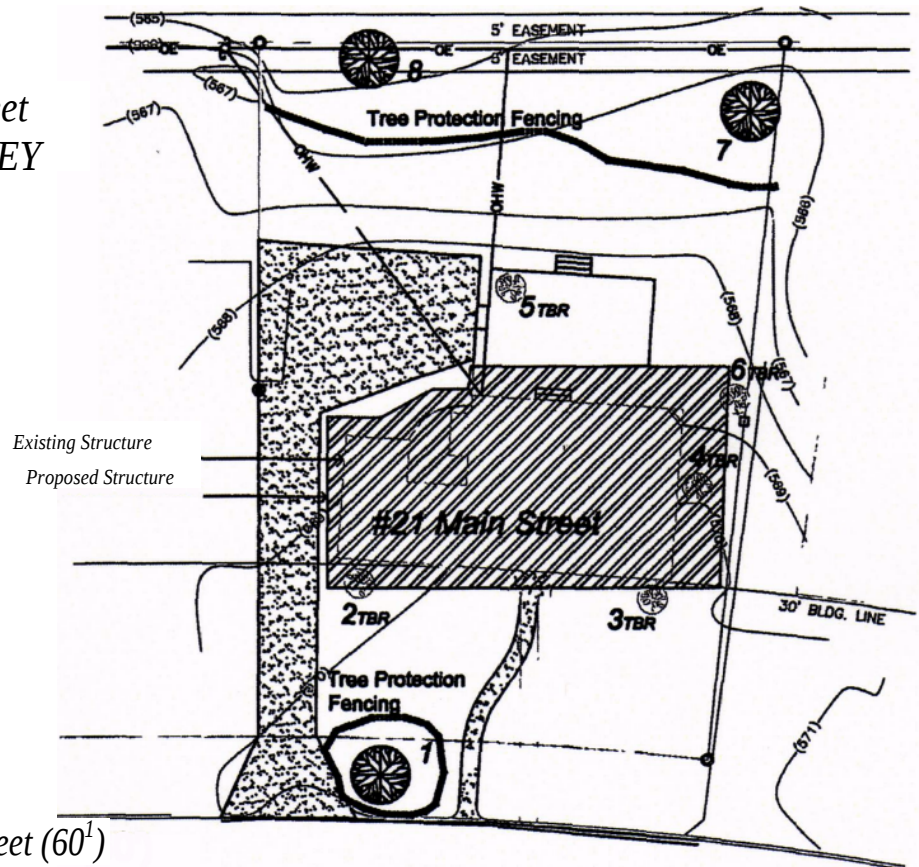
~INTERFERENCE WITH CITY FORESTER OR CITY EMPLOYEES~

It is unlawful to interfere with the City Forester or any other City employee engaged in their duties

~APPENDIX A. EAMPLE TREE SURVEY~

#21 Main Street TREE SURVEY

Scale: 1" = 30'



Tree Notes:

Limits of disturbance are located outside of the Tree Protection Fencing.

No construction shall disturb the area protected by the tree protection fencing. All construction activities, material storage and equipment shall be kept outside of the tree protection area.

EXISTING TREE LIST

Tree Number	Species	Diameter On Inches)	Condition	Adjusted DBH (In inches)	Comments
1	Pin Oak	32.5	50%		some dieback in crown
2	Holly	8.8	65%	5.7	To be removed
3	Holly	7.2	70%	5.0	To be removed
4	Holly	5.4	50%	2.7	To be removed
5	Redbud	5.6	75%	4.2	To be removed
6	Redbud	5.0	75%	3.8	To be removed
7	Siberian Elm	22.0	60%		
8	Norway Spruce	18.7	85%		
				21.4"	

~ APPENDIX B. APPROVED TREE LIST ~

*Trees with one asterisk * are appropriate street trees Trees with two asterisk ** are desired street trees*



SMALL TREES: 15-30 FEET IN HEIGHT (SPACED NO LESS THAN 30 FEET APART)

BOTANICAL NAME

Acer beurgeranum

Acer campestre

Acer ginnala

Acer griseum

Acer tataricum

Amelanchier species

Carpinus caroliniana

Cercis canadensis

Chionanthus virginicus

Comus species

Hamamelis species

Malus species

Styrax japonicus

Syringa reticulata

COMMON NAME

*Trident Maple**

*Hedge Maple***

Amur Maple

Paperbark Maple

Tartarian Maple (single-stem tree-form only)*

*Serviceberry** (single stem tree-form only)*

*American Hornbeam**

*Eastern Redbud**

White Fringe Tree

Dogwood species (requires special conditions)

Witch hazel

Crabapple species (disease resistant varieties)"

Japanese Snowbell

*Japanese Tree Lilac***

MEDIUM TREES: 30-40 FEET IN HEIGHT (SPACED NO LESS THAN 40 FEET APART)

BOTANICAL NAME

Aesculus glabra

Cladrastis kentukea (lutea)

Koelreuteria paniculata

Maackia amurensis

Magnolia species

Ostrya virginiana

Parrotia persica

Phellodendron amurense

Prunus serrulata

Pyrus calleryana

Sassafras albidum

COMMON NAME

Ohio Buckeye

*Yellowwood**

Goldenraintree

Amur Maackia

Magnolia species

Hophornbeam

Persian Parrotia

*Amur Corktree**

*Kwana Cherryz **

Callery Pear (upright cultivars "Cleveland Select")"

Common Sassafras

LARGE TREES: OVER 40 FEET IN HEIGHT (SPACED 40-50 FEET APART)

BOTANICAL NAME

COMMON NAME

12 of 13

Acer rubrum	<i>Red Maple (cultivars)**</i>
Acer saccharum	<i>Sugar Maple*</i>
Aesculus hippocastanum	<i>Horsechestnut*</i>
Alnus glutinosa	<i>European Alder*</i>
Betula nigra	<i>River Birch (single stem for street tree)*</i>
Carpinus betulus "Fastigiata"	<i>Upright Hornbeam**</i>
Celtis species	<i>Hackberry/ Sugarberry*</i>
Cercidiphyllum japonicum	<i>Katsuratree</i>
Corylus colurna	<i>Turkish Filbert**</i>
Eucommia ulmoides	<i>Hardy Rubber Tree**</i>
Fagus species	<i>Beech species</i>
Fraxinus species	<i>Ash species*</i>
Ginkgo biloba	<i>Ginkgo (male only)**</i>
Gleditsia triacanthos var. inermis	<i>Thornless Honeylocust</i>
Liriodendron tulipifera	<i>Tuliptree*</i>
Metasequoia glyptostroboides	<i>Dawn Redwood*</i>
Nyssa sylvatica	<i>Blackgum**</i>
Platanus x acerifolia	<i>London Planetree "Bloodgood"</i>
Prunus x yedoensis	<i>Yoshino Cherry*</i>
Quercus alba	<i>White Oak *</i>
Quercus acutissima	<i>Sawtooth Oak*</i>
Quercus bicolor	<i>Swamp White Oak**</i>
Quercus imbricaria	<i>Shingle Oak*</i>
Quercus macrocarpa	<i>Bur Oak*</i>
Quercus phellos	<i>Willow Oak*</i>
Quercus robur	<i>English Oak*</i>
Quercus rubra	<i>Red Oak**</i>
Quercus velutina	<i>Black Oak*</i>
Sophora japonica	<i>Japanese Pagodatree*</i>
Taxodium distichum	<i>Baldcypress**</i>
Tilia species	<i>Linden species*</i>
Ulmus americana	<i>American Elm (hybrids only)*</i>
Ulmus parvifolia	<i>Lacebark Elm**</i>
Zelkova serrata	<i>Japanese Zelkova*</i>

NOTE: All trees should be single stem unless the species is multi-stemmed by form. Select the appropriate tree for the site. Consider the following factors: height, spread, sunlight, soil conditions, width of planting area, overhead lines and underground utilities.

~APPENDIX C. SAMPLE FORESTRY ACTIVITY PERMIT~



Department of Parks, Recreation and Forestry

6801 Delmar Blvd., University City, MO. 63130, (314) 505-8619

FOREST ACTIVITY APPLICATION

Required for:

- 1. Development Projects – for removal of any tree six (6) caliper inches or larger**
- 2. City Trees – To plant, prune, spray or remove any tree**

Applicant Name: _____ Date: _____

Applicant Address: _____

Address of Work Site: _____

PERMIT FEE DUE THE CITY: \$50.00

SIGNATURE OF APPLICANT

FOREST ACTIVITY PERMIT

PERMIT#: _____ DATE: _____

THIS PERMIT IS ISSUED SUBJECT TO THE PROVISIONS OF THE MUNICIPAL CODE AND REGULATIONS. PROJECT MUST COMPLY WITH THIS PERMIT. ANY MODIFICATIONS REQUIRE ADVANCED WRITTEN APPROVAL FROM THE DIRECTOR OF PARKS, RECREATION AND FORESTRY. FAILURE TO COMPLY IS A VIOLATION OF MUNICIPAL CODE.

This Permit Issued By:

FORESTRY SUPERVISOR

~APPENDIX D. SAMPLE ANNUAL ARBORIST PERMIT~



Department of Parks, Recreation and Forestry

6801 Delmar Blvd., University City, MO. 63130, (314) 505-8619

ANNUAL ARBORIST APPLICATION

Required for:

Businesses engaged in pruning, treating or removing any City Tree or trees in a Development Project over 12" DBH

Applicant Name: _____ Date: _____

Applicant Address: _____

Certified Arborist and Certification #: _____

Proof of Liability Insurance Declaration attached (\$500,000) _____

Proof of Workman's Compensation Insurance Declaration attached _____

Address of Work Site: _____

PERMIT FEE DUE THE CITY: \$28.50

SIGNATURE OF APPLICANT

ANNUAL ARBORIST PERMIT

PERMIT#: _____ DATE: _____

THIS PERMIT IS ISSUED SUBJECT TO THE PROVISIONS OF THE MUNICIPAL CODE AND REGULATIONS. PROJECT MUST COMPLY WITH THIS PERMIT. ANY MODIFICATIONS REQUIRE ADVANCED WRITTEN APPROVAL FROM THE DIRECTOR OF PARKS, RECREATION AND FORESTRY. FAILURE TO COMPLY IS A VIOLATION OF MUNICIPAL CODE.

This Permit Issued By:

CITY FORESTER

Appendix C
The 2000 Street Tree Inventory Summary
(Present to City Council, April, 2000)

UNIVERSITY CITY -- Street Tree Inventory (2000)

Inventory Results presented to City Council April 3, 2000

Density and Distribution

A total of 11,339 public street trees were found in University City. This number is well above average when compared to other municipalities in the St. Louis area and the Midwest. The street tree density in University City is approximately one tree for every 81 feet of curb. (Based on 96 miles of streets.) The St. Louis metro area average is one tree for every 156 feet of curb. There is no question that these trees are a big part of University City's identity.

There are currently 2900 available street tree planting spaces in the city. This means that University City's existing street tree population fills approximately 80% of available spaces.

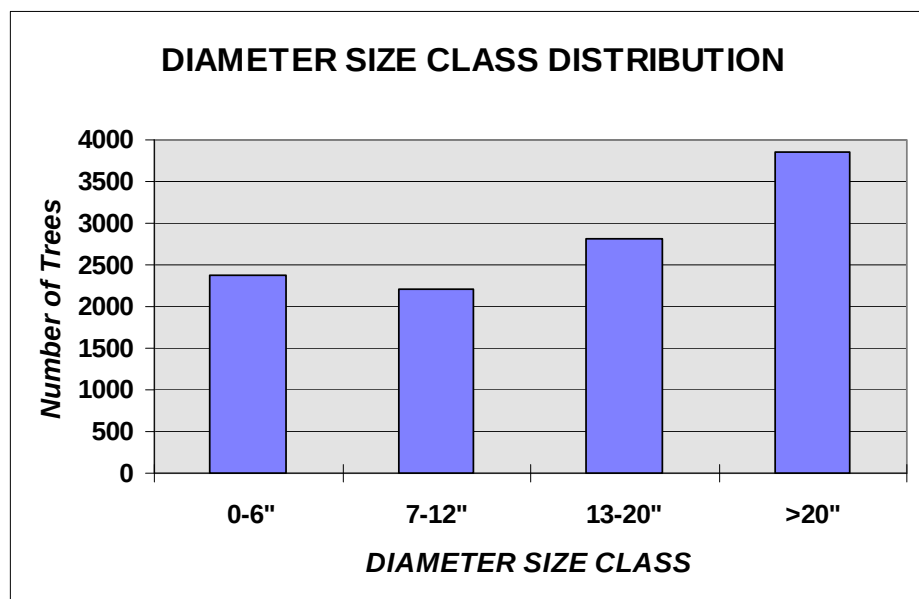
Twelve species make up 71.2% of the tree population. Diversity is a sign of a healthy urban forest. Urban foresters typically recommend that one species should not comprise more than 10% of a population. Only two species, pin oak (20.9%) and silver maple (10.7%), exceed this recommended level. This, and the fact that approximately 140 different species were identified in the inventory, provides an excellent sign of diversity in University City's urban forest. Over time, the silver maples will be removed and replaced with more desirable tree species.

TWELVE MOST COMMON STREET TREES IN UNIVERSITY CITY

RANK	SPECIES	#	%	Cumul. %
1	Oak, Pin	2373	20.9%	20.9%
2	Maple, Silver	1214	10.7%	31.6%
3	Ash, Green	1089	9.6%	41.2%
4	Sycamore	663	5.8%	47.1%
5	Pear, Bradford	449	4.0%	51.0%
6	Oak, Red	441	3.9%	54.9%
7	Sweetgum	420	3.7%	58.6%
8	Maple, Sugar	391	3.4%	62.1%
9	Maple, Red	326	2.9%	65.0%
10	Ash, White	241	2.1%	67.1%
11	Linden, Littleleaf	237	2.1%	69.2%
12	Maple, Norway	226	2.0%	71.2%

Density and Distribution (continued)

Diameter size class distribution of street trees is relatively “even”. The size of University City’s street trees are evenly distributed between four size classes. An ideal distribution provides more trees in the smaller size classes. This provides for a good “crop” of younger trees that will eventually fill in the gaps as larger trees begin to decline and die. A potential cause for concern in University City is the abundance of large diameter trees (mostly pin oak, silver maple, green ash, and sycamore). While there is currently no evidence that this population of large trees is in serious decline or poor condition, it is inevitable that this will eventually occur. Plans should be made to deal with the expensive removal and prompt replacement of these trees when they do begin to decline and die.



Over 75% of the city’s street trees are in good condition. Smaller percentages are in excellent or fair condition. A very small percentage are in poor condition or dead. These figures indicate a healthy street tree population.

**CONDITION CLASS
DISTRIBUTION
OF STREET TREES**

COND CLASS	#	Percent of Street Tree Population
Excellent (80-99)	712	6.3%
Good (60-79)	8506	75.7%
Fair (40-59)	1668	14.8%
Poor (10-39)	318	2.8%
Dead (0)	39	0.3%

Needs and Recommendations

A large percentage of maintenance needs are with the most common species. This is due, in large part, to the high number of pin oaks and silver maples that are remnants of past planting efforts. While silver maple was a “tree of choice” in the past, we have learned it does not resist decay well enough to be considered for future use. Most of the trees that require some type of pruning are silver maple. Future plantings should emphasize low maintenance trees.

There are a total of 5204 maintenance needs in the population. The vast majority of the needs are in the prune low and prune high categories. (16% and 22% of the population respectively.) This is a typical figure for populations with older trees.

<u>Maintenance Category</u>	<u>No. of Trees</u>	<u>Percent of Total</u>
Hazard Tree (Remove)	22	0.2%
Hazard Limb (High)	39	0.1%
Hazard Limb (Low)	17	0.9%
Prune (Low)	303	15.8%
Prune (High)	292	22.0%
Safety Prune	39	0.7%
Corrective Prune	82	3.8%
Utility Prune	24	0.5%
Removal Suggested	50	1.9%

- 7) **The “Hazard Tree Remove” and “Hazard Limb Prune” maintenance categories occur at a very low level.** Approximately 1% of the tree population was rated as having hazard limbs that require pruning. Only 0.2% was rated as hazard trees that need to be removed. These are very low numbers for a municipality with older trees. Most municipalities have 5-7% of their street population identified as hazard trees that need to be removed. University City’s average of 0.2% indicates a vigilant schedule of hazard tree removal. Trees in the “Removal Suggested” category should be given consideration for removal and possible replacement with more desirable species.
- 8) **Large numbers of trees in the “Removal Suggested” category indicates an overabundance of trees that have not performed well..** Topping and shearing of trees under power lines has taken a heavy toll on the health of many trees. While great strides have been made in the quality of pruning around energized lines as it regards the health of a tree, the long term aesthetics continue to decline in many cases. This is more the fault of “planting the wrong tree in the wrong place” than poor pruning practices. A utility pruning crew often has a very narrow range of pruning opportunities when confronted with a silver maple growing under power lines.

- 9) **The total value University City's street population is estimated to be \$27.5 million.**
The average value of a street in the city is \$2429.
- 11) **The inventory was completed with the assistance of over 40 volunteers that donated over 1600 hours.**
- 12) **Comparisons to the September 1959 Shade Tree Survey include the following:**

<u>SPECIES</u>	<u>1959</u>	<u>1999</u>
Total	13,764	11,339 (<2425 or 18%)
Silver Maple	5,943 (43%) (Rank 1 st)	1,214 (10.7%) (Rank 2 nd)
American Elm	1,772 (13%) (Rank 3 rd)	106 (0.9%) (Rank 21 st)
Pin Oak*	1,846 (13%) (Rank 2 nd)	2,373 (20.9%) (Rank 1 st)

*The 1959 figure is actually for the oak genus as a whole, not just pin oak.

In 1959, a total of five species represented 90% of the street tree population. Today, there are twelve species that represent only 71% of the population. While the total population is down about 18%, it can be said that the current population, while fewer in number, has a much better diversity. This will help greatly in avoiding the near collapse associated with the loss of American elms. A drastic reduction in the number of silver maples in the University City landscape is also worth noting. While the number of silver maples and their percentage of the total population is greatly reduced, they still represent the second spot on the occurrence list. Their dominance in the landscape, while not as pronounced as in 1959, should continue to be reduced.