ROANOKE
VIRGINIA

URBAN FORESTRY PLAN
An Element of
The Vision Plan

vision 2001 2020

Prepared by the Urban Forestry Task Force and the Roanoke Department of Parks and Recreation.

Adopted by City Council on 4-21-03.

Urban Forestry Task Force

Carl D. Cooper, Co-Chair

Talfourd H. Kemper, Jr., Co-Chair

John P. Bradshaw, Jr.

Betty Branch

M. Rupert Cutler

Ellen P. Shepard

Dr. Anthony R. Stavola

City Council Liaison

William D. Bestpitch

Technical Assistance

Charles A. Blankenship
Roanoke Valley Urban Forestry Council
and Valley Beautiful

City of Roanoke

Steven C. Buschor, Director
Parks and Recreation

Gary S. Hegner
Parks Superintendent
Parks and Recreation

Daniel J. Henry
Urban Forester
Parks and Recreation

Christopher L. Chittum
Senior City Planner
Planning, Building and Development

Dwayne R. D'Ardenne
Landscape Coordinator
Public Works

Principal Author and Editor

Helen Smythers
Urban Forestry Planner
Parks and Recreation

Parks and Recreation Advisory Board

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William D. Bestpitch	William H. Carder
M. Rupert Cutler	Alfred T. Dowe, Jr.

Linda F. Wyatt

City Manager

Darlene L. Burcham

This plan was adopted on 4-21-03 by City Council as an Element of ***Vision 2001-2020***.

The City of Roanoke thanks the Virginia Department of Forestry for making this plan possible by providing an Urban and Community Forestry Grant to the City.

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Foreword

The Urban Forestry Task Force believes that the City of Roanoke's tree canopy is very important to the City's future in several ways and that the City should act to protect and expand that tree canopy.

First, Roanoke's economic future will depend on its perception as a "green" or outdoors city. Visitors and residents need to see more trees at City gateways, major corridors, and within public and privately owned parcels. As Roanoke continues to move toward its goal of attracting high-tech industries, trees will help the City capitalize on its location in the mountains and bury forever the misconception that it is just an "old railroad town." To be economically competitive, Roanoke must be a sustainable and livable City.

Second, a strong tree canopy has an inherent value to the citizens of Roanoke. Trees, whether they are within City parks, school properties, street medians, or along residential streets, add to our quality of life and positive perception of the City as a place to live. National studies show that homebuyers prefer neighborhoods with tree-lined streets providing a peaceful setting.

Third, as a matter of environmental health, Roanoke needs to increase its tree canopy to 40%. Roanoke has several days of poor air quality each year, primarily due to high ozone levels in the summer. Trees absorb a variety of pollutants and thereby improve air quality. Trees also help slow down the runoff that flows swiftly off Roanoke's paved areas into our waterways, causing soil erosion as it goes. Unfortunately more of our City is covered by impervious surfaces (paved areas or buildings) than trees. Approximately 32% of our City is covered by tree canopy, but 36% of the City is covered by pavement, buildings, or other man-made surfaces. American Forests, the oldest national nonprofit citizen conservation organization, reports that a 40% tree canopy is the minimum amount necessary for a healthy urban community.

During the preparation of the City's new comprehensive plan, ***Vision 2001-2020***, there was overwhelming public support for planting trees in Roanoke. "Trees, Trees, Trees" was written down again and again as the consensus at the public meetings (e.g., Quality of Life).

This quote from page 48 of ***Vision 2001-2020*** says it best:

> ***"Trees and other vegetation represent both an environmental resource and an important landscape feature in the quality of life in the City. Maintaining and increasing the City's tree canopy will have a beneficial impact on air quality, stormwater control, noise levels, temperature, and visual appearance."***

We urge the City's elected and appointed leaders to embrace the plan and act promptly to support its accomplishment.

Carl D. Cooper
Task Force Co-Chair

Talfourd H. Kemper, Jr.
Task Force Co-Chair

Executive Summary

This study was initiated by City Council and the City Manager when it became apparent that Roanoke is losing many of the trees that make it a desirable place to live. A national association, American Forests, has worked with Roanoke and surrounding localities to document the trend of tree loss. With those facts in hand, the City Manager appointed a task force to prepare an ***Urban Forestry Plan*** to serve as a guide for the City's efforts to manage its urban forest to the maximum benefit of its residents, its environment, and its economy.

This Executive Summary highlights some actions that the Task Force recommends to the City of Roanoke in order to accomplish the purposes set forth above in the Foreword:

Major Recommendations

Long-Term Goal of 40% Tree Canopy. Achieving a 40% Tree Canopy coverage within 10 years is the long-term goal of this plan.

Reverse Net Loss of Public Trees. The City will plant enough street and park trees to reverse the "annual net loss" trend of public (City-owned) trees.

Greening of Non-Residential Corridors and Gateways. City staff will strategically target non-residential transportation corridors or gateways to the City that need additional "greening" by planting more trees.

Tree-Planting Programs in Residential Neighborhoods. The City will plant more trees in neighborhood areas (where the City owns easements or roadside strips or medians). Two general methods will be used to determine where to plant these trees:

Active:

- Identify neighborhood "boulevards" that need more tree coverage.
- Prioritize locations based on strategic return on neighborhood improvement and the increased "greening" of the City in the eyes of visitors.

Passive:

- Use the City Magazine, City website, water bill inserts, and Roanoke Valley TV to increase awareness of the City's existing tree planting program that allows citizens to request trees on specific City streets.

Encourage Planting of Trees by Citizens in Their Yards. In order to reach its long-term goal of 40% tree canopy, the City will encourage citizens to plant trees on their property.

- *Educational Awareness* - Organize seminars to inform people about tree preservation, planting, and maintenance. Provide such information in the City Magazine and Roanoke Valley TV. Provide opportunities for citizens to obtain further information on the subject as needed.

- *Incentives* - Organize private/public partnerships to provide incentives so citizens will plant trees on their property, such as a subsidized tree program for seminar attendees.

- *One Tree Per Citizen* – In order to reach the 40% goal, the City will implement a plan in cooperation with other organizations to encourage people to plant *one tree per citizen*.

Improve Tree Management. In order to protect and improve its tree canopy, the City will utilize national standards for urban forestry tree management, update the public tree ordinance and zoning ordinance, and require interdepartmental cooperation on projects that can affect public trees. For example:

- Prepare new standards and/or guidelines for better tree preservation, planting, and maintenance in private non-residential areas and private developments (in accordance with state enabling legislation).

- Adopt zoning regulations requiring "greener" site development and parking areas.

- Develop strategies to conserve significant forested areas using a variety of methods, including conservation easements.

- Participate with other City departments on streetscape design issues such as encouraging placement of overhead utilities in alleys or underground in order to avoid interference with tree-lined streets.

- Investigate and implement additional avenues for community donations, including a system for individuals to donate funds to plant trees on public property in honor or memory of loved ones.

Implementation of the Plan

The plan, to be implemented over ten years, includes a matrix indicating responsible parties and time frames. Parks and Recreation is the lead agency for many of the recommendations but interdepartmental cooperation is essential to implementation of the plan. For example, the Planning, Building, and Development Department is already working on revisions to the zoning ordinance that will result in more tree preservation and planting in new developments. Furthermore, the Urban Forestry Task Force recommends establishment of a citizen advisory committee to work with the City on implementation of the plan. This advisory committee would be especially helpful in providing advice on how to initiate the recommended actions where business and neighborhood/nonprofit groups will be involved.

"Buildings and trees should shape the City's image rather than asphalt and signs."

*Roanoke City, **Vision 2001-2020**, page 4*

Part I: Introduction

Background

Roanoke has long valued public trees and the role they play in the community. Public trees were planted as integral parts of streetscapes and parks as our neighborhoods developed during the early to middle 1900s. Many neighborhoods were designed with wide tree lawns running the entire length of many residential streets. These tree lawns and parks were soon planted with trees through cooperative efforts of the City, developers, and private citizens.

Typical of American cities, the growth of Roanoke during the middle 1900s brought with it a change to an emphasis on utilitarian infrastructure. Quality of life at that time was measured by wide paved streets, smaller and more economical houses, and less space for landscape features such as lawns and trees. Asphalt, cement, and utilities were emphasized.

Today, Roanoke officials and planners are aware of environmental concerns and modern quality of life issues. The City now strives to coordinate development to meet objectives for an improved environment. In order to meet the desires and demands of people and businesses today, we must direct public resources to such quality of life issues as clean water and air, removal of toxins and other wastes, stormwater runoff reduction, recycling of resources, energy conservation, and the protection of our rivers and forests.

Need for an Urban Forestry Plan

Roanoke's urban forestry office recently participated in two valley-wide studies with other Roanoke Valley governments; Virginia Polytechnic Institute and State University; the U.S. Forest Service; the Virginia Department of Forestry; and American Forests, the oldest national nonprofit citizen conservation organization. These reports used a combination of satellite imagery, aerial photography, and ground inventory techniques. The 1998 report showed that the tree canopy (i.e., trees at least five feet in height) in the Roanoke Valley dropped from 40% to 35% between 1973 and 1997. The second report, released in 2002, utilized enhanced satellite imagery, and provides 1997 data for individual communities in the Roanoke Valley. It indicates that the **City of Roanoke's tree canopy has dropped to 32%.** American Forests reports that a 40% tree canopy is the minimum amount necessary for a healthy urban community.

Information on the loss of tree canopy in the City was presented by the urban forester to City Council in November 2000, after which the City Manager appointed a citizen task force to address the issue through preparation of an ***Urban Forestry Plan*** for the City. An Urban and Community Forestry Grant was received from the Virginia Department of Forestry to prepare the plan. The task force began work in early 2002 on the plan presented herein with the help of the City's urban forestry staff in the Department of Parks and Recreation. The plan provides the City with a systematic method of managing its urban forest to the maximum benefit of the community, its economy, and its environment.

Urban Forestry Planning:

Assures that all needs of the community forest are recognized.
Reduces the risk to property and human safety.
Makes sure that all work is prioritized.
Provides a defensible basis for budget and grant requests.
Leads to a continuous program from year to year.

Source: National Arbor Day Foundation, ***A Handbook for Tree Board Members***, 1993, p. 15

Community Involvement

This plan deals with tree planting on public (City-owned) land, public tree management, and trees on private land. The policies and actions for each aspect of the plan are shown in the next section. Cooperation and communication are key to the successful implementation of the plan. For example, interacting with schoolchildren is a good way to make sure the desired message is taken back to the entire family. These photos of the 2002 Arbor Day Celebration at Fairview Magnet School, with Mayor Ralph Smith presiding, show the excitement generated by special tree planting ceremonies.

Arbor Day 2002
Fairview Magnet School

Part II: Action Plan

The overall tree canopy goal (i.e., to take action to achieve an average tree canopy of 40% within ten years) is shown directly below. It is followed by specific policies and actions for the three primary themes of the plan: (A) Tree Planting on Public Land, (B) Public Tree Management, and (C) Trees on Private Land.

TREE CANOPY GOAL

OVERVIEW Roanoke will take action in order to achieve an average tree canopy of 40% within ten years.

POLICY

TC P1. Roanoke's tree canopy will be increased from the present 32% to the 40% needed to be a healthy community. (See Appendix C for more information on number of trees needed.)

ACTIONS

TC A1. Increase the number of trees in Roanoke by 188,488* over the next 10 years through implementation of the actions recommended in this study. (*These would be shade trees, each of which will have at least a 30 foot wide canopy at maturity. The number of trees would be adjusted when larger or smaller trees are planted instead. The 188,488 figure includes 6,250 recommended street and park trees.)

TC A2. Because the ***Urban Forestry Plan*** has been adopted as an Element of ***Vision 2001-2020***, each City department will use the urban forestry recommendations in its project design plans, NPDES, work plans, business plans, and all other plans/reports as applicable (including, but not limited to, stormwater management, neighborhood plans, road plans, road widening plans, and plans for placing utility lines underground).

A. TREE PLANTING ON PUBLIC LAND

OVERVIEW Parks and Recreation will utilize a variety of funding sources to plant an additional 6,250 shade trees (above and beyond the 2,000 usually planted) on City streets and in City parks over the next ten years as its share of the tree planting effort needed to increase Roanoke's tree canopy from 32% to 40%. Other City departments and public entities will be encouraged to make tree planting a budgetary priority also.

POLICIES

TP P1. **Tree Canopy.** Enough trees will be planted on City land to reverse the "annual net loss" trend of public (City-owned) trees. Current trees will be maintained.

TP P2. **City Parks and Lands.** Trees at City parks and on other City land will be maintained, and the number of such trees will be increased. Where appropriate, trees at City parks may be considered for replacement or removal so long as the Parks and Recreation Department first develops a tree replacement plan detailing with species, time of planting, and location, so replacement trees are sufficient to insure no net loss of park tree canopy.

TP P3. **Gateways and Traffic Corridors.** Trees and other landscaping will be planted at the City's major gateways, and streetscape improvements will be made along major transportation corridors in the City. Current gateway and streetscape trees will be maintained.

TP P4. **Street Trees.** Trees on City streets in downtown Roanoke, downtown neighborhoods, traditional neighborhoods, and village centers will be maintained, and the number of such trees will be increased. In-fill planting will be done in areas with maintained streetscapes.

TP P5. **Funding and Planting.** Sufficient funding will be obtained and the recommended number of trees will be planted and maintained. Tree planting will be an element of Community Development Block Grant-funded projects.

TP P6. **Community Donations.** Individuals will be encouraged to donate funds to plant trees on public land in honor or memory of loved ones. These will be marketed as gifts for all types of occasions, with a special card and star ornament telling the recipient that "a tree has been planted in your honor." Opportunities for other types of community involvement will be evaluated and implemented.

ACTIONS

Identification/Prioritization

TP A1. Identify and prioritize areas of City-owned land where trees need to be planted.

TP A2. Meet with other elements of government, including the Roanoke Redevelopment and Housing Authority, Roanoke Regional Airport, School Board, Public Works, Utilities and the like, along with elements of the state and federal government who likewise control lands within the City limits, to determine tree planting opportunities and to prioritize identified areas, considering cost and resulting impact. See Appendix D for list of parties contacted. The impact on alternative transportation will be considered in prioritizing streets and corridors on which street trees are planted.

TP A3. Prepare detailed tree planting plans for priority areas, including tree distribution issues.

TP A4. Should VDOT propose the use of sound barriers along existing or future highways in the City, the City will encourage VDOT to use appropriate trees instead.

Community Involvement

TP A5. Utilize a standing volunteer committee to advise staff on a continuing basis (3 to 5 people meeting twice a year).

TP A6. Involve the community through neighborhood planting and other activities.

TP A7. Utilize grassroots support to gain higher funding (at local and state levels).

TP A8. Encourage community groups such as Valley Beautiful to support the plan and set implementation of it as their first priority. Consider asking volunteer groups to monitor the health of significant forested areas.

Funding and Planting

TP A9. Obtain additional tree planting funds in the City's general budget.

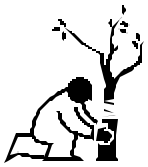
TP A10. Solicit supplemental funding sources (example - Lynchburg used sponsors to landscape a major traffic corridor).

TP A11. Be proactive in searching out and developing relationships with potential sources of funding.

TP A12. Obtain grants (work with Roanoke Valley Urban Forestry Council, Valley Beautiful, and other groups).

TP A13. Include tree planting in Community Development Block Grant-funded projects such as neighborhood revitalization.

TP A14. Establish a system for individuals to donate funds to plant trees on public land in honor or memory of loved ones. Develop additional avenues for community donations.



B. PUBLIC TREE MANAGEMENT

OVERVIEW Roanoke will protect trees on public land through continued effective management, interdepartmental and interagency cooperation, revisions to the public tree ordinance, and strategies to identify and protect key forested areas.

POLICIES

PT P1. **Cooperation.** City departments, utilities, and other applicable entities will cooperate in any activity affecting public trees in the City.

PT P2. **Management.** Adequate and permanent funding will be provided to meet urban forestry management needs (including public tree selection, protection, and maintenance). Significant parcels of forested public land will be identified and evaluated. As appropriate, methods of preserving priority forested land will be utilized.

PT P3. **Ordinances.** The City's public tree ordinance will be revised in order to provide maximum protection of public trees.

ACTIONS

Cooperation

PT A1. Provide input and assist in the development of the ***Streetscape Design Plan***.

PT A2. Participate in the City's Project Tracking System and obtain sign-off authority. Coordinate with other City departments regarding any project that might affect trees.

PT A3. Develop Construction/Tree Protection Standards.

PT A4. Develop and implement written tree trimming agreements with utility companies.

PT A5. Provide arboricultural guidance to local government agencies (including the School Board, Roanoke Regional Airport, and Roanoke Redevelopment and Housing Authority).

Management

PT A6. Require that City projects follow river/stream overlay requirements when adopted (see PL A17).

PT A7. Maintain City shade and ornamental trees on a routine basis using a cyclical maintenance schedule.

PT A8. Conduct all arboricultural operations in compliance with the standards of the American National Standards Institute.

PT A9. Determine relocation potential of trees on developed City sites.

PT A10. Identify and prioritize significant undisturbed forested areas on public land. Devise and implement strategies for preservation of the priority areas, including conservation easements.

PT A11. Establish a process for determining where new trees should be located in relation to sidewalks.

PT A12. Endeavor to get the Corps of Engineers to approve the planting of trees along the Roanoke River.

Ordinances

PT A13. Develop a public tree ordinance using the International Society for Arboriculture model and with consideration of costs associated with the ordinance.

PT A14. Revise title of current ordinance ("*Vegetation and Trash*") to more accurately reflect the subject.

PT A15. Include a comprehensive policy statement with goals.

PT A16. Meet with the Roanoke Redevelopment and Housing Authority, the Roanoke Regional Airport and the School Board to determine how best to extend the City's public tree ordinance to include those properties.

PT A17. Prohibit or limit use of invasive species.

PT A18. Ensure that utility tree trimming guidelines include compliance with the standards of the American National Standards Institute. These are technical standards prepared by the National Arborist Association and approved by ANSI for use by the industry.

PT A19. Review the VDOT Trimming Standards and include applicable items.

PT A20. Establish street tree/sidewalk conflict reduction procedures.

PT A21. Specify development/construction/excavation standards.

PT A22. Regulate insect and disease control on private land to protect public good.

C. TREES ON PRIVATE LAND

OVERVIEW Using community-based incentives, the City will achieve the goal of having one new tree planted on private land within ten years for every Roanoke resident (94,911 citizens and 94,911 trees). In addition, new zoning ordinance revisions will increase the number of trees preserved and the number of trees planted during the development process.

POLICIES

PL P1. **Community Awareness.** Comprehensive educational programs on preserving, planting, and/or maintaining trees will be available. This could include staff outreach (website, City Magazine, speeches, etc), programs for schoolchildren, citizen seminars, workshops for land developers on how to build without destroying trees, and training for tree trimmers.

PL P2. **Incentives.** Public/private partnerships will provide incentives (such as low-cost trees) to those participating in educational tree programs. Programs, such as tax credits for tree planting, will be established.

PL P3. **Standards.** City staff will work with land developers in identifying trees that should be preserved. Information on how to best achieve this objective will be made available to developers and others.

PL P4. **Regulations.** The updated zoning ordinance will minimize environmental damage during the development process. This could include requirements that parking lots have generous tree canopy coverage, that existing trees on development sites are preserved to the maximum extent possible, and that minimum tree canopy percentages are required by zoning district, among other changes.

PL P5. **Preservation of Priority Land.** Priority forested areas will be identified and methods of conserving those areas will be utilized. This might include strategies such as conservation zoning overlays, a land purchase program, or conservation easements, among others.

PL P6. **Native Species.** Where possible and appropriate, trees of native species will be planted instead of non-native trees.

ACTIONS

Community Awareness

PL A1. Provide homeowner education on tree preservation, planting, and maintenance (use videos, City Magazine, RVTV, website, etc.)

PL A2. Educate students about trees. This could include free seedlings to plant at home, peat pot give-a-ways, "My Family Planted A Tree" static car decals, teacher training, inclusion of tree issues in the SOLs, etc. Tie this in with existing annual Arbor Day ceremonies at schools.

PL A3. Provide list of certified arborists to the public on website and/or by request.

PL A4. Encourage uncertified tree workers to take advantage of training opportunities.

PL A5. Include tree topics in "Citizen University."

PL A6. Network with major private property owners in the City, including but not limited to Norfolk Southern, Carilion, and Downtown Roanoke, Inc. (as a representative of downtown business owners) to share information and collaborate in an effort to ultimately improve tree maintenance practices and procedures.

Incentives

PL A7. Give those who complete homeowner education (PL A1) certificates for reduced-price trees. Establish other incentives such as tax credits for tree planting.

PL A8. Encourage nurseries to reduce the price of trees on a City list of "best trees to plant" and include maintenance information with these trees.

PL A9. Obtain grant funding for a wide scale publicity/education effort. Consider giving a "Shining Star" or other award for significant tree planting achievements.

PL A10. Evaluate the feasibility of adopting land use value taxation for agriculture, horticulture, forest use, *and* open space as described in section 58.1-3230 of the Code of Virginia. Coordinate with existing agricultural/forestal districts.

Standards

PL A11. Have City staff person available to meet private developers on-site to identify trees that should be preserved (and provide written information on how to preserve them). All comprehensive site development plan applicants will receive a list of trees most appropriate for the area.

Regulations

PL A12. Identify and prioritize significant undisturbed forested areas on private land. Use strategies (conservation easements, zoning ordinance revisions, etc.) for preservation of key parcels.

PL A13. During zoning ordinance revision, compare existing regulations to those of other localities in the Roanoke Valley and to the list of benchmark communities.

PL A14. Include provisions in the revised zoning ordinance to help preserve trees during development.

PL A15. Include stronger tree canopy requirements for parking lots (such as a 40% minimum tree canopy at maturity) in the zoning ordinance revision.

PL A16. In the zoning ordinance revision, evaluate the potential use of tree canopy banks and minimum tree canopy regulations allowed by the state enabling legislation.

PL A17. Adopt a zoning ordinance overlay requiring riparian buffers along streams and the Roanoke River to protect water quality and the fish/wildlife habitat.

PL A18. Include provisions in the revised zoning ordinance to require use of native species trees where possible and appropriate.

PL A19. Evaluate the need for and feasibility of adopting a heritage tree ordinance (includes identifying significant individual trees within the City limits for protection).

PL A20. Include specific requirements in the zoning ordinance for reforestation on denuded slopes.

Part III: Roanoke's Urban Forest

Tree Cover in the City of Roanoke

Two reports have been published in recent years by American Forests with assistance from Roanoke Valley governments, Virginia Polytechnic Institute and State University, the U.S. Forest Service, and the Virginia Department of Forestry. The reports provide detailed statistics and Geographic Information System (GIS) maps on existing tree cover in Roanoke. Satellite imagery, aerial photography, and ground inventory techniques were used to collect the data needed for analysis. Scientists have determined that a 40% tree canopy is the minimum amount needed to maintain a healthy environment.

The 1998 report provides statistics for the Roanoke Valley as a whole, showing a decrease in tree canopy from 40% to 35% between 1973 and 1997. The second report was released in 2002 and used enhanced imagery techniques to analyze the 1997 data for individual communities in the Roanoke Valley. It indicates that the **City of Roanoke's tree canopy has dropped to 32%.**

Summary Statistics for the City of Roanoke

Indicator	Statistic
Acres of Land in City	27,471
% Trees	32%
% Impervious Surfaces	36%
% Open Space	32%

Source: American Forests, ***Urban Ecosystem Analysis: Roanoke, VA***, 2002

Most of the impervious surfaces are located downtown and in major commercial or industrial corridors. As expected, residential areas in Roanoke contain the lowest percentage of impervious surfaces and the highest percentage of tree cover and open space. (The study placed open space in the same category as the land adjacent to it.)

Land Cover Statistics for the City of Roanoke

Type of Land Use	Acres	Percent of City		
		Tree Cover	Impervious Surfaces	Open Space
Commercial Areas	2,889	16%	64%	21%
Industrial Areas	6,102	18%	53%	28%
Residential Areas	18,570	39%	26%	34%

Note: Statistics may not total 100% due to rounding done by American Forests.
Source: American Forests, ***Urban Ecosystem Analysis: Roanoke, Virginia***, 2002

Park and Street Trees

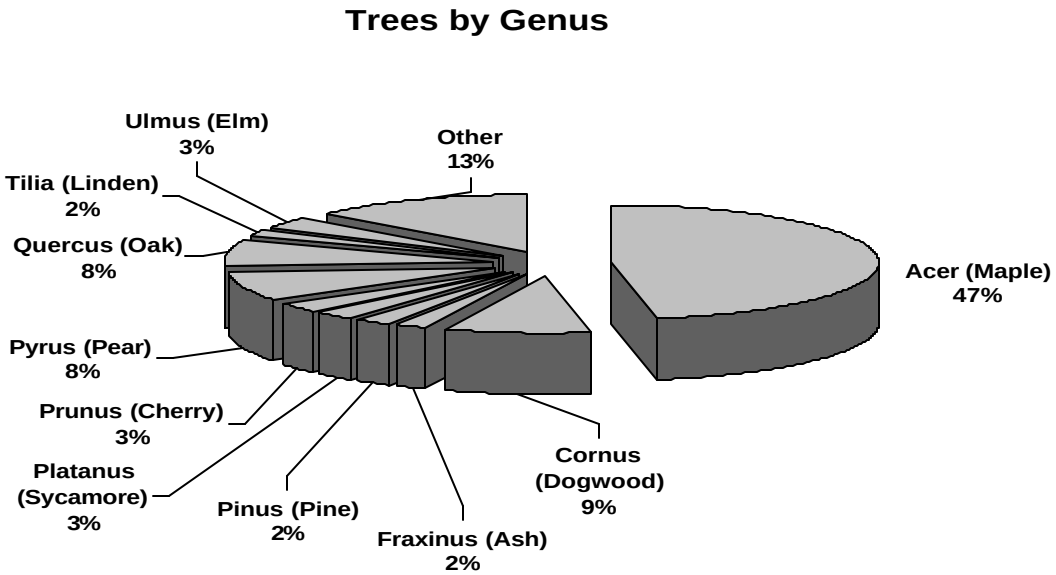
The Roanoke Department of Parks and Recreation maintains City-owned trees on streets and in parks. These trees are managed by Roanoke's urban forester (who is a certified arborist). He also oversees the planting of new trees on City land (often to replace those lost to attrition) and helps educate citizens on tree health. Other City departments call on the urban forester to help evaluate zoning permits or plans for private developments or City projects where tree preservation or the planting of new trees is important.

Public demand for service from the urban forestry office is significant. The office receives an average of 2000 citizen requests annually, including tree emergencies, pruning, removal, planting, spraying, roadside tree trimming, alley tree trimming, stump removal, and other tree related issues. All work is performed on City-owned trees and most work includes an element of public safety. Historically, a majority of tree maintenance work has been performed on a request basis, which is more costly than routine maintenance. A systematic tree maintenance program has been put into place this year in order to transition away from the request-based program.

A recent increase in tree purchase price and a decrease in tree availability have made it much more feasible for municipal governments to grow their own trees. A small City of Roanoke nursery was formed in 1990 and yields 50 trees each year, with the potential to provide additional trees in future years. The annual budget usually provides funds for approximately 150 street and park trees to be purchased wholesale and planted by City crews (for a *total of 200 trees planted per year*). Grants or funds from Roanoke's Capital Maintenance and Equipment Replacement Program (CMERP) are used when available. The City typically *removes approximately 400 trees a year* due to disease or damage. Therefore, without additional funds, a serious net tree loss occurs each year.

Tree Inventory

The City currently has inventory data on 15,664 shade and ornamental trees on streets and in parks. The City inventory includes 95% of its street trees and 68% of its park trees, and the process of inventorying the remainder of the trees is continuing. It is estimated that the City's shade and ornamental trees include *12,000 street trees* and *5,000 park trees*. The graph below shows these trees by genus and Appendix E lists the trees by genus and species and by common name. The City has 158 types of shade and ornamental trees in its parks and on its streets.



The inventory does not include public trees in non-maintained areas. Examples of trees not included are trees in wooded areas along roadsides and trees in forested areas. Such trees are not included in the inventory because of differing maintenance and replacement requirements. Landscape (i.e., shade and ornamental) trees require vastly greater maintenance than forest trees. Also, forest trees reproduce independently without human intervention, whereas landscape trees do not. Of the total 8,786 acres of tree canopy, forested areas comprise an estimated 3,700 acres, or 42%.

The population of public trees is composed of the very old and the very young and lacks a healthy middle-aged tree population. The old street trees (35 to 70 years old) are in decline and require significant maintenance. They provide shade and environmental benefits but also pose the greatest risk to the public. Very young trees (5 to 15 years old) are generally healthy, but require a lot of pruning and other maintenance. They also provide the least shade and environmental benefits. The middle-aged trees, those planted 15 to 35 years ago, are very few in number and are composed of some problematic species such as the Bradford Pear. Typically, it is the middle-aged trees that offer the greatest benefit while requiring minimal maintenance.

Street Trees

Street trees are planted on City rights-of-way in non-suburban areas. The ***Vision 2001-2020 Plan*** describes the following neighborhoods and areas in Roanoke where street trees are usually located. For the purposes of this plan, these areas are referred to as "street tree areas."

Downtown

- Mix of retail, office, residential, and light industrial uses

Downtown Neighborhoods (example - Belmont, Gainsboro, and Old Southwest)

- Adjacent to downtown
- Small lots (approximately 5000 square feet)
- Grid of narrow, tree-lined streets
- Developed between the 1890s and 1920s

Traditional Neighborhoods (example - Raleigh Court and Melrose-Rugby)

- Medium sized lots (5000 to 7000 square feet)
- Grid of narrow, tree-lined streets
- Developed between 1920s and 1940s
- Developed as the streetcar system expanded outward from downtown

The average lifespan of urban trees is 32 years, although downtown trees live an average of only 10 years. Tree coverage in these "street tree areas" varies somewhat due to the age and condition of the trees, requiring in-fill planting in some places. For example, the urban forester recently worked with a northwest Roanoke neighborhood group to plant street trees using an Urban and Community Forestry Grant from the Virginia Department of Forestry.

The ***Vision 2001-2020 Plan*** describes suburban neighborhoods as follows. These neighborhoods typically do not have City-maintained street trees. Greater Deyerle is an example of a suburban neighborhood.

1. Large lots (greater than 7000 square feet)
2. Variety of housing sizes and styles
3. Deep front setbacks
4. Wide curvilinear streets
5. Prominent driveways and garages
6. Developed after WWII
7. Developed as dependency on automobiles increased

Park Trees

The City maintains an estimated 5000 shade and ornamental trees in its 68 parks. Appendix B describes the role of urban forestry as noted in the ***Strategic Business Plan*** for Parks and Recreation and the ***Comprehensive Parks and Recreation Master Plan***. Individual plans for parks are prepared by the parks planner on a regular basis.

Streetscapes

The Roanoke Department of Public Works is leading a team of City staff in preparing a ***Streetscape Design Plan***. The plan will identify major roads in need of streetscape improvements, which can include trees, other plantings, and streetlights, among other enhancements. In addition, improvements to high priority gateways (entrances to the City) will be planned. Urban forestry staff serves on the staff advisory group for the ***Streetscape Design Plan*** in order to ensure coordination with that plan and the ***Urban Forestry Plan***.

Other Public Trees

Public trees are also located on the grounds of the Roanoke Redevelopment and Housing Authority, Roanoke Regional Airport, and Schools, in addition to state and federal public properties. These parties are included in the planning process by way of letters inviting input and requesting information on their tree canopy. City departments, such as public works, libraries, fire, economic development, and utilities, are asked to help increase tree canopy whenever possible on the land they manage. These departments, which already work with the urban forester, are asked to continue to work closely with him. Appendix D includes a list of contacted parties. Interaction with these agencies and departments will continue in a cooperative manner as the plan is implemented.

Part IV: Introduction to Recommendations/Implementation

This matrix applies to overall tree canopy recommendations. It and the matrices in the next three sections (which relate to the plan's three themes) suggest participants and time frames. Three categories of participants responsible for implementing the plan are shown. Where local government is shown as a participant, a lead department has been assigned which will be responsible for effectively utilizing the participation of other groups noted for that action statement (and/or additional groups that choose to become involved).

Action TP A4 calls for establishing a standing advisory committee of 3 to 5 members to advise staff on a continuing basis by meeting twice a year. This advisory committee could be especially helpful in providing advice on how to initiate the recommended actions where business and neighborhood/nonprofit groups will be involved. Such public/private partnerships help ensure that Roanoke's urban forest is a key element in the life of the City and its residents.

TREE CANOPY GOAL  ***OVERVIEW:*** Roanoke will take action in order to achieve an average tree canopy of 40% within ten years. **ACTIONS**	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
TC A1. Increase the number of trees in Roanoke by 188,488* over the next 10 years through implementation of the actions recommended in this study. (*These would be shade trees, each of which will have at least a 30 foot wide canopy at maturity. The number of trees would be adjusted when larger or smaller trees are planted instead. The 188,488 figure includes 6,250 recommended street and park trees.)	☑	☑	☑	●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Civic C, Comm, Eng, ED, E/EM, Fire, H&NS, Lib, PB&D, Police, PW, and Util.							
TC A2. Because the ***Urban Forestry Plan*** has been adopted as an Element of ***Vision 2001-2020***, each City department will use the urban forestry recommendations in its project design plans, NPDES, work plans, business plans, and all other plans/reports as applicable (including, but not limited to, stormwater management, neighborhood plans, road plans, road widening plans, and plans for placing utility lines underground).	☑			●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Civic C, Comm, Eng, ED, E/EM, Fire, H&NS, Lib, PB&D, Police, PW, Tech, and Util.							

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Part V: Tree Planting on Public Land Recommendations/Implementation

In Roanoke's ***1928 Comprehensive Plan***, the importance of planting street trees was emphasized, as it is in the ***Vision 2001-2020 Plan***. The latter includes specific information that was useful to the task force as it analyzed public tree planting. The task force also prepared policies and recommended actions to increase public tree canopy as shown in the matrix for this section.

"A program of street tree planting should be established and put into operation."

Source: John Nolen, ***Comprehensive Plan, Roanoke, Virginia***, 1928, p. 32

The map included in the ***Vision 2001-2020*** poster indicates streetscape improvements recommended for certain roads. These include I-581; Routes 460, 220, and 221; and heavily traveled roads such as Brambleton Avenue, Williamson Road, Shenandoah Avenue, and 10th Street; among others. In addition to trees, streetscape improvements can include such things as signage, lighting, and other plant materials. The map also highlights gateways and the proposed Village Centers, a concept which would include streetscape improvements.

Other information considered by the task force included a map prepared by the urban forestry staff showing areas where street trees are typically planted and maintained. The areas include downtown, neighborhoods near downtown, and traditional neighborhoods, but not suburban style neighborhoods. The need for this policy was confirmed by the American Forests' map of impervious surface and tree canopy in the City, showing that it is the older non-suburban streets that need more trees, while the suburban sections of the City already have more trees. (See Part III for a more detailed description.)

Policies and Actions

The task force prepared policies and action recommendations for each of the three themes of this report. The public tree planting policies highlight the need to reverse the public tree "annual net loss" trend. Sections of public parks and lands, traffic corridors, gateways, and City streets need more trees, and existing trees need to be maintained. In-fill planting should be done in areas with maintained streetscapes.

It is important that other public entities that own land within the City limits be involved in tree planting. This includes the School Board, Roanoke Regional Airport, and Roanoke Redevelopment and Housing Authority. Urban forestry staff will work with these entities and any interested managers of state and federal land to evaluate tree planting opportunities and set planting priorities.

It is recommended that a standing volunteer committee be set up to advise staff on a continuing basis (perhaps 3 to 5 people meeting twice a year). The community in general should be involved in tree planting activities, and grassroots support should be utilized to gain higher funding at local and state levels. The task force recognizes the need for sufficient funding to plant trees through public/private partnerships, grants, and inclusion in the annual City budget. A key recommendation is the establishment of a system for individuals to donate funds to plant trees on public land in honor or memory of loved ones.

In summary, the goal for Parks and Recreation is to plant a total of 8,250 shade trees on City streets and in City parks over the next ten years as its share of the total tree planting needed to increase the overall tree canopy from 32% to 40%. This figure includes the 2,000 trees the City already plants over a ten year period. Some of the trees would be replacements for damaged or diseased trees. The Other City departments and public entities will be encouraged to make tree planting a budgetary priority also.

Tree Planting on Public Land

OVERVIEW: Parks and Recreation will utilize a variety of funding sources to plant an additional 6,250 shade trees (above and beyond the 2,000 usually planted) on City streets and in City parks over the next ten years as its share of the tree planting effort needed to increase Roanoke's tree canopy from 32% to 40%. Other City departments and public entities will be encouraged to make tree planting a budgetary priority also.

ACTIONS	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
Identification/Prioritization							
TP A1. Identify and prioritize areas of City-owned land where trees need to be planted.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Civic C, Eng, ED, E/EM, Fire, H&NS, Lib, PB&D, Police, PW, and Util.							
TP A2. Meet with other elements of government, including the Roanoke Redevelopment and Housing Authority, Roanoke Regional Airport, School Board, Public Works, Utilities and the like, along with elements of the state and federal government who likewise control lands with the City limits, to determine tree planting opportunities and to prioritize identified areas, considering cost and resulting impact. See Appendix D for list of parties contacted. The impact on alternative transportation will be considered in prioritizing streets and corridors on which street trees are planted.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Civic C, Eng, ED, E/EM, Fire, H&NS, Lib, PB&D, Police, PW, and Util.							
TP A3. Prepare detailed tree planting plans for priority areas, including tree distribution issues.	☑			●	●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - will vary with location.							
TP A4. Should VDOT propose the use of sound barriers along existing or future highways in the City, the City will encourage VDOT to use appropriate trees instead.	☑			●	●	●	●
*Details on Participation of Local Gov't (City Departments): Lead - PW. Others Involved - P&R.							

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Tree Planting on Public Land

ACTIONS	Participants: Local Gov't *	Participants: Business	Participants: Neighborhood/ Nonprofit	Time Frame: Up to 1 year	Time Frame: 1 to 3 years	Time Frame: 4 to 6 years	Time Frame: 7 to 10 years
Community Involvement							
TP A5. Utilize a standing volunteer committee to advise staff on a continuing basis (3 to 5 people meeting twice a year). * Details on Participation of Local Gov't (City Departments): Lead - P&R.	☑	☑	☑	●	●	●	●
TP A6. Involve the community through neighborhood planting and other activities. * Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Comm and H&NS.	☑	☑	☑	●	●	●	●
TP A7. Utilize grassroots support to gain higher funding (at local and state levels). * (Local gov't participates only if requested by Advisory Committee)			☑	●	●	●	●
TP A8. Encourage community groups such as Valley Beautiful to support the plan and set implementation of it as their first priority. Consider asking volunteer groups to monitor the health of significant forested areas. * (Local gov't participates only if requested by Advisory Committee)			☑	●	●	●	●
Funding and Planting							
TP A9. Obtain additional tree planting funds in City's general budget. * Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Civic Center, Eng, ED, E/EM, Fire, H&NS, Lib, Police, PW, and Util.	☑		☑	●	●	●	●
TP A10. Solicit supplemental funding sources (example - Lynchburg used sponsors to landscape a major traffic corridor). * Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - PW.	☑	☑	☑	●	●	●	●

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Tree Planting on Public Land

ACTIONS	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
TP A11. Be proactive in searching out and developing relationships with potential sources of funding.	☑		☑	●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
TP A12. Obtain grants (work with Roanoke Valley Urban Forestry Council, Valley Beautiful, and other groups).	☑	☑	☑	●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - City grantwriting contractor.							
TP A13. Include tree planting in Community Development Block Grant-funded projects such as neighborhood revitalization.	☑		☑	●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - H&NS, PB&D, and PW.							
TP A14. Establish a system for individuals to donate funds to plant trees on public land in honor or memory of loved ones. Develop additional avenues for community donations.	☑	☑	☑	●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Marketing staff - to be determined.							

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Part VI: Public Tree Management Recommendations/Implementation

Part III of this plan describes how the City's urban forestry staff manages the City's public trees. The task force has recommended actions for improving cooperation, management, and ordinances related to this function of City government. Adequate and permanent funding is needed to implement the recommendations noted in the matrix for this section.

The task force evaluated the City's current public tree ordinance regulating the planting and removal of trees on public property. It was compared to ordinances in other localities and to the International Society for Arboriculture model ordinance. Several opportunities for improvement were recommended.

The City's ordinance could be revised to establish guidelines for protection of public trees near construction sites. At a minimum, the City could make it unlawful to excavate or construct streets or driveways within 10 feet of a public tree without written approval. In addition, the City could require that public trees near other construction be protected by at least an eight foot square barrier.

Staff prepared a draft revision of the public tree ordinance for review by the task force. Now that the ***Urban Forestry Plan*** has been adopted, more information will be collected and revision of the ordinance will continue. Costs associated with ordinance changes will be considered during the revision.

The cooperation and involvement of all City departments is key to successful use of this plan. The public works department is one example of a City department involved with public improvements, such as water and sewer lines, that affect trees. A continuing system of communication between those departments and the urban forester is essential to prevention of unnecessary damage to City trees. Coordination with utilities and any other entities having an effect on trees also is vital.

Tree Bordered Streams: Advice from the City's 1928 Comprehensive Plan

"A clear running stream with grassy banks tree bordered is a delight. Acquisition of land along natural stream ways should be a community duty."

Source: John Nolen, ***Comprehensive Plan, Roanoke, Virginia***, 1928, page 36

Policies and Actions

The major recommendations related to cooperation include the urban forestry staff's continued involvement with the Public Works Department's ***Streetscape Design Plan***, participation in the City's Project Tracking System, development of construction/tree protection standards, and utility company tree trimming agreements. Staff also will provide arboricultural guidance to other local government agencies (e.g., the School Board, Roanoke Regional Airport, and Roanoke Redevelopment and Housing Authority).

Management recommendations include continuation of a cyclical maintenance schedule and compliance with the standards of the American National Standards Institute, etc. The identification of key forested areas on public land and development of applicable preservation strategies are essential activities.

PUBLIC TREE MANAGEMENT

OVERVIEW: Roanoke will protect trees on public land through continued effective management, interdepartmental and interagency cooperation, revisions to the public tree ordinance, and strategies to identify and protect key forested areas.

ACTIONS	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
Cooperation							
PT A1. Provide input and assist in the development of the ***Streetscape Design Plan***. * Details on Participation of Local Gov't (City Departments): Lead - PW. Others Involved - Eng, H&NS, P&R, and PB&D.	☑			●			
PT A2. Participate in the City's Project Tracking System and obtain sign-off authority. Coordinate with other City departments regarding any project that might affect trees. * Details on Participation of Local Gov't (City Departments): Lead - Tech. Others Involved - Civic C, Comm, Eng, ED, E/EM, Fire, H&NS, Lib, P&R, PB&D, Police, PW, and Util.	☑	☑	☑	●	●	●	●
PT A3. Develop Construction/Tree Protection Standards. * Details on Participation of Local Gov't (City Departments) Lead - P&R. Others Involved - PB&D, PW, and Util.	☑			●			
PT A4. Develop and implement written tree trimming agreements with utility companies. * Details on Participation of Local Gov't (City Departments): Lead - P&R.	☑	☑			●	●	●
PT A5. Provide arboricultural guidance to local government agencies (including the School Board, Roanoke Regional Airport, and Roanoke Redevelopment and Housing Authority). * Details on Participation of Local Gov't (City Departments): Lead - P&R.	☑			●	●	●	●

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PUBLIC TREE MANAGEMENT 	Participants			Time Frame			
ACTIONS	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
Management							
PT A6. Require that City projects follow river/stream overlay requirements when adopted (see PL A17). * Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - Eng, ED, E/EM, H&NS, P&R, PW, and Util.	☑			●	●	●	●
PT A7. Maintain City shade and ornamental trees on a routine basis using a cyclical maintenance schedule. * Details on Participation of Local Gov't (City Departments): Lead - P&R.	☑			●	●	●	●
PT A8. Conduct all arboricultural operations in compliance with the standards of the American National Standards Institute. * Details on Participation of Local Gov't (City Departments): Lead - P&R.	☑	☑		●	●	●	●
PT A9. Determine relocation potential of trees on developed City sites. * Details on Participation of Local Gov't (City Departments): Lead - P&R.	☑	☑	☑	●	●	●	●
PT A10. Identify and prioritize significant undisturbed forested areas on public land. Devise and implement strategies for preservation of the priority areas, including conservation easements. * Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Civic C, Eng, ED, E/EM, Fire, H&NS, Lib, PB&D, Police, PW, and Util.	☑	☑	☑	●	●		
PT A11. Establish a process for determining where new trees should be located in relation to sidewalks. * Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Eng, H&NS, PB&D, PW, and Util.	☑			●			

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PUBLIC TREE MANAGEMENT  ACTIONS	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
PT A12. Endeavor to get the Corps of Engineers to approve the planting of trees along the Roanoke River.	☑			●	●		
* Details on Participation of Local Gov't (City Departments): Lead - Eng.							
Ordinances							
PT A13. Develop a public tree ordinance using the International Society for Arboriculture model and with consideration of costs associated with the ordinance.	☑	☑	☑	●	●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PT A14. Revise title of current ordinance ("*Vegetation and Trash*") to more accurately reflect the subject.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PT A15. Include a comprehensive policy statement with goals.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PT A16. Meet with the Roanoke Redevelopment and Housing Authority, the Roanoke Regional Airport and the School Board to determine how best to extend the City's public tree ordinance to include those properties.	☑			●	●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PT A17. Prohibit or limit use of invasive species.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							

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PUBLIC TREE MANAGEMENT  ACTIONS	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
PT A18. Ensure that utility tree trimming guidelines include compliance with standards of American National Standards Institute. These are technical standards prepared by the National Arborist Association and approved by ANSI for use by the industry.	☑	☑		●	●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PT A19. Review the VDOT Trimming Standards and include applicable items.	☑			●	●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PT A20. Establish street tree/sidewalk conflict reduction procedures.	☑	☑		●			
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Eng and PW.							
PT A21. Specify development/construction/excavation standards.	☑			●	●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Eng, PB&D, PW, and Util.							
PT A22. Regulate insect and disease control on private land to protect public good.	☑			●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							

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Part VII: Recommendations/ Implementation for Trees on Private Land

Community awareness, incentives, standards, and regulations can be used to increase tree planting and preservation on private land. The landscaping section of the zoning ordinance was compared to that of other localities by the task force to see where it differs and to identify regulations used elsewhere that might be useful here.

Policies and Actions

The task force recommends that the following be addressed in the current zoning ordinance revision:

- Preservation of key parcels of forested land.
- Provisions to help preserve trees during development.
- Stronger tree canopy requirements for parking lots (such as a 40% minimum tree canopy at maturity).
- A zoning overlay requiring riparian buffers along streams and the Roanoke River.
- Provisions to require use of native species trees where possible and appropriate.
- Potential use of *tree canopy banks* and *minimum tree canopy requirements* currently allowed by the state enabling legislation.

In regard to the last item, the authority for Virginia localities to enact legislation for *tree canopy banks* became effective July 1, 2002. Such regulations allow a portion of a development's tree canopy requirements to be met with off-site planting or replacement of trees. Although the legislation is new to Virginia, tree canopy banks have been used in other states. However, *minimum tree canopy requirements* are not new in Virginia and have been used successfully for many years. They require a 10% minimum tree canopy for business, commercial, industrial, and higher density residential areas. A 15% minimum tree canopy is required in medium density residential and 20% minimum in low density residential.

Education and incentives for tree planting are highly valuable methods of increasing tree canopy on private land. There are many examples of community awareness programs, tax incentives, and other tree programs that could be put to use in Roanoke. Public/private partnerships, especially with nurseries and corporate sponsors, or programs sponsored jointly with City schools might be possible.

It is important that the City staff continue to work with land developers in identifying trees that should be preserved and in using sound methods of protecting trees during the construction process. Uncertified tree workers should be encouraged to take advantage of training opportunities.

The community-based incentives and strategies in this plan will be combined into a **campaign calling for every citizen of Roanoke to plant one tree** within the next ten years. This will result in 94,911 additional trees on private land, not counting the additional trees that will be planted by developers after the zoning ordinance is revised.

TREES ON PRIVATE LAND

***OVERVIEW*:** Using community-based incentives, the City will achieve the goal of having one new tree planted on private land within ten years for every Roanoke resident (94,911 citizens and 94,911 trees). In addition, new zoning ordinance revisions will increase the number of trees preserved and the number of trees planted during the development process.

ACTIONS	Participants: Local Gov't *	Participants: Business	Participants: Neighborhood/ Nonprofit	Time Frame: Up to 1 year	Time Frame: 1 to 3 years	Time Frame: 4 to 6 years	Time Frame: 7 to 10 years
Community Awareness							
PL A1. Provide homeowner education on tree preservation, planting, and maintenance (use videos, City Magazine, RVTV, website, etc.)	☑		☑	●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Comm, H&NS, and Lib.							
PL A2. Educate students about trees. This could include free seedlings to plant at home, peat pots give-a-ways, "My Family Planted A Tree" static car decals, teacher training, inclusion of tree issues in the SOLs, etc. Tie this in with existing annual Arbor Day ceremonies at schools.	☑		☑	●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Comm, H&NS, and Lib.							
PL A3. Provide list of certified arborists to the public on website and/or by request.	☑			●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PL A4. Encourage uncertified tree workers to take advantage of training opportunities.			☑	●	●	●	●
* (Local gov't participates only if requested by Advisory Committee)							
PL A5. Include tree topics in "Citizen University."	☑	☑	☑	●			
* Details on Participation of Local Gov't (City Departments): Lead - H&NS. Others Involved - P&R and Comm.							

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TREES ON PRIVATE LAND

ACTIONS	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
PL A6. Network with major private property owners in the City, including but not limited to Norfolk Southern, Carilion, and Downtown Roanoke, Inc. (as a representative of downtown business owners) to share information and collaborate in an effort to ultimately improve tree maintenance practices and procedures.	☑	☑			●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
Incentives							
PL A7. Give those who complete homeowner education (PL A1) certificates for reduced-price trees. Establish other incentives such as tax credits for tree planting.	☑		☑		●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R.							
PL A8. Encourage nurseries to reduce the price of trees on a City list of "best trees to plant" and include maintenance information with these trees.		☑	☑		●	●	●
* (Local gov't participates only if requested by Advisory Committee)							
PL A9. Obtain grant funding for a wide scale publicity/education effort. Consider giving a "Shining Star" or other award for significant tree planting achievements.	☑	☑	☑		●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - Comm.							
PL A10. Evaluate the feasibility of adopting land use value taxation for agriculture, horticulture, forest use, *and* open space as described in section 58.1-3230 of the Code of Virginia. Coordinate with existing agricultural/forestal districts.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - taxation & finance-related City depts.							

Key to City Department Abbreviations:
Civic C = Civic Center; Comm = Office of Communications; Eng = Engineering; ED = Economic Development; E/EM = Environmental and Emergency Management; Fire = Fire-EMS; H&NS = Housing and Neighborhood Services; Lib = Library; P&R = Parks and Recreation; PB&D = Planning, Building, and Development; Police = Police; PW = Public Works; Tech = Technology; and Util = Utilities.

TREES ON PRIVATE LAND

ACTIONS	Participants: Local Gov't *	Participants: Business	Participants: Neighborhood/ Nonprofit	Time Frame: Up to 1 year	Time Frame: 1 to 3 years	Time Frame: 4 to 6 years	Time Frame: 7 to 10 years
Standards							
PL A11. Have City staff person available to meet private developers on-site to identify trees that should be preserved (and provide written information on how to preserve them). All comprehensive site development plan applicants will receive a list of trees most appropriate for the area.	☑			●	●	●	●
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - PB&D.							
Regulations							
PL A12. Identify and prioritize significant undisturbed forested areas on private land. Use strategies (conservation easements, zoning ordinance revisions, etc.) for preservation of key parcels.	☑			●	●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - H&NS, and PB&D.							
PL A13. During zoning ordinance revision, compare existing regulations to those of other localities in the Roanoke Valley and to the list of benchmark communities.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - P&R.							
PL A14. Include provisions in the revised zoning ordinance to help preserve trees during development.	☑		☑	●			
* Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - P&R.							
PL A15. Include stronger tree canopy requirements for parking lots (such as a 40% minimum tree canopy at maturity) in the zoning ordinance revision.	☑		☑	●			
* Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - P&R.							

Key to City Department Abbreviations:
Civic C = Civic Center; Comm = Office of Communications; Eng = Engineering; ED = Economic Development; E/EM = Environmental and Emergency Management; Fire = Fire-EMS; H&NS = Housing and Neighborhood Services; Lib = Library; P&R = Parks and Recreation; PB&D = Planning, Building, and Development; Police = Police; PW = Public Works; Tech = Technology; and Util = Utilities.

TREES ON PRIVATE LAND  ACTIONS	Participants			Time Frame			
	Local Gov't *	Business	Neighborhood/ Nonprofit	Up to 1 year	1 to 3 years	4 to 6 years	7 to 10 years
PL A16. In the zoning ordinance revision, evaluate the potential use of tree canopy banks and minimum tree canopy regulations allowed by the state enabling legislation.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - P&R.							
PL A17. Adopt a zoning ordinance overlay requiring riparian buffers along streams and the Roanoke River to protect water quality and the fish/wildlife habitat.	☑		☑	●			
* Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - E/EM, P&R, and Util.							
PL A18. Include provisions in the revised zoning ordinance to require use of native species trees where possible and appropriate.	☑			●			
* Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - P&R.							
PL A19. Evaluate need for and feasibility of adopting a heritage tree ordinance (includes identifying significant individual trees within the City limits for protection).	☑		☑		●		
* Details on Participation of Local Gov't (City Departments): Lead - P&R. Others Involved - H&NS and PB&D.							
PL A20. Include specific requirements in the zoning ordinance for reforestation on denuded slopes.	☑			●			
*Details on Participation of Local Gov't (City Departments): Lead - PB&D. Others Involved - P&R.							

Key to City Department Abbreviations:
Civic C = Civic Center; Comm = Office of Communications; Eng = Engineering; ED = Economic Development; E/EM = Environmental and Emergency Management; Fire = Fire-EMS; H&NS = Housing and Neighborhood Services; Lib = Library; P&R = Parks and Recreation; PB&D = Planning, Building, and Development; Police = Police; PW = Public Works; Tech = Technology; and Util = Utilities.

Note: PL A13 through PL A18 and PL A20 include use of the consultant already under contract with the Planning, Building, and Development Department for zoning ordinance revisions.

Appendix A:
Benefits of Trees

Ecological, Economic, and Aesthetic Benefits

In addition to mapping existing tree canopy in Roanoke, the American Forests ***Urban Ecosystem Analysis: Roanoke, VA*** report emphasizes very specific benefits of Roanoke's tree cover for the City's water and air. In addition, several other studies are quoted below to show how the benefits of trees have been quantified elsewhere.

Specific Water and Air Quality Benefits in Roanoke

Trees reduce pollution and erosion from stormwater runoff by slowing it and by reducing its peak flow. And trees improve air quality by filtering pollutants. This occurs during photosynthesis when carbon dioxide is converted into oxygen and carbon is sequestered (i.e., absorbed) into the body of the tree.

Saves $128 million total

The total stormwater retention capacity of Roanoke's existing urban forest is more than 64 million cubic feet. Without these trees, the cost of building the infrastructure to handle the increase in stormwater runoff would be **approximately $128 million**.

If the City had a 40% tree canopy, it is estimated that the savings would be $160 million.

Urban forests help air quality by removing nitrogen dioxide, sulfur dioxide, carbon monoxide, ozone, and particulate matter of 10 microns or less. Every year, the tree cover in Roanoke absorbs more than 948,000 pounds of pollutants from the air, providing **an annual value of more than $2.3 million**.

It is estimated that the annual savings would be $2.9 million if the City had a 40% tree canopy.

Saves $2.3 million per year

Additional Advantages of Trees

An article in the National Arborist Association magazine *Tree Care Industry* (July 2002 issue, pages 36-39) quotes some of the recent studies of tree benefits. Findings are described in the two items below:

Environment: In Modesto, California the benefits of the city's 90,000-plus trees exceeded management cost by a factor of nearly two to one. The benefits include:

- Annual air pollution uptake — $16 per tree
- Energy saving related to heating/cooling buildings — $10 per tree
- Stormwater runoff reduction — $ 7 per tree

Safety: A University of Illinois study reported that buildings with high levels of vegetation had over 50% fewer crimes in the vicinity. As the article reported, it was found "that a 'sense of safety' was associated with widely spaced, limbed-up trees with low plantings, in contrast with dense woods having shrubs or underbrush of any kind."

Economy: In addition to the increased tourism that a healthy environment can bring to the community, other economic advantages exist, such as higher resale values of homes. The following chart addresses common misconceptions about the costs and benefits of preserving or planting trees on building sites. Not every tree on every site can be saved, but various publications are available to help builders identify and save trees where practical.

Perceptions and Realities about Trees and Development

PERCEPTIONS	REALITIES (FACTS, CHALLENGES, AND CASE STUDIES)
PERCEPTION: The preservation of trees during construction is prohibitively expensive.	**FACT:** Minimizing clearing during the construction phase can reduce earth movement and erosion and sediment control costs by up to $5,000/acre. (1) **CHALLENGE:** More complex grading strategies may be required to preserve trees close to foundations and other structures.
PERCEPTION: People prefer large lawns to treed areas.	**CASE STUDY:** A University of Georgia study found that large old street trees were the most important indicator of community attractiveness. (2) **CASE STUDY:** A South Carolina developer found that bare house lots sold much faster after planting trees, with a $1,500 increase in the selling price. (3)
PERCEPTION: The additional costs of conserving trees outweigh the benefits.	**FACT:** It has been conservatively estimated that over $1.5 billion per year is generated in tax revenue for communities in the U.S. due to the value of privately owned trees on residential property. (4) **CASE STUDY:** The resale value of a home may be enhanced by as much as 15% with landscaping. (5) **CASE STUDY:** Landscaping has a 100 to 200% recovery value when selling a home. (6)

Source: Center for Watershed Protection, ***Better Site Design: A Handbook for Changing Development Rules in Your Community***, 1998, (page 146, 152-3).

Notes: (1) Delaware Dept. of Natural Resources and Environmental Conservation, ***Conservation Design for Stormwater Management***, 1997. (2) Coder, Dr. Kim D., University of Georgia Cooperative Extension Service, ***Identified Benefits of Community Trees and Forests***, 1996. (3) National Arbor Day Foundation, ***Placing a Value on Trees***, 1996. (4) USDA as cited by the National Arbor Day Foundation, ***Placing a Value on Trees***, 1996. (5) American Nursery and Landscape Association, as cited in *Laurel Creek Nursery Newsletter*, 1997. (6) Laurel Creek Nursery, *Laurel Creek Nursery Newsletter*, 1997.

An increase in tree canopy in the City can improve fish and wildlife habitats, thereby making the City more attractive for eco-tourists interested in watching birds and wildlife.

Alternative Transportation: Trees calm traffic and create an atmosphere that is more conducive to alternative transportation such as bicycling and walking.

Community Appearance: In a Planning Advisory Report (Number 466, page 9), the American Planning Association comments that the aesthetic benefits of trees come about because they:

- Help to break up the hard edges of buildings and walls,
- Unify diverse architectural elements,
- Create delightful formal patterns along streets, and
- Improve the appearance of an entire community.

Summary - The Top Ten Tree Benefits

The following* is a list of the major benefits of trees, along with quotes from the ***Vision 2001-2020 Plan*** emphasizing what trees mean to Roanokers and the City's environment and quality of life.

TREES:

1. Provide oxygen. A large tree can provide the oxygen requirements for four people. Trees clean the air by absorbing odors and pollution.
2. Make streets and neighborhoods more livable and walkable.
3. Conserve energy by shading and cooling buildings, and by breaking up urban heat islands, thereby reducing the need for air conditioning.
4. Reduce water runoff and soil erosion by breaking rainfall and holding soil.
5. Provide canopy to improve fish and wildlife habitat.
6. Transform barren areas and provide buffers from harsh urban landscapes.
7. Increase property values.
8. Add unity, identity, landmarks, and pride to the community.
9. Reduce glare and absorb noise, dust, and heat.
10. Increase the number of tourists visiting the community.

*Source: Tree People, *The Simple Act of Planting a Tree*, as quoted in the ***Georgia Model Urban Forest Book***, page 9

Vision 2001-2020 Plan*: *Tree Canopy Benefits Explained

"Trees and plants in general improve the air quality by converting carbon dioxide into oxygen."

"Maintaining and increasing the City's tree canopy will have a *beneficial impact* on *air quality*, *storm water control*, *noise levels*, *temperature*, and *visual appearance*."

Source: Roanoke City, ***Vision 2001-2020***, 2001, page 44 (emphasis added)

Appendix B:
Related Plans

This section describes the City plans that relate to urban forestry, along with regional plans that address the topic also. Roanoke has a long and rich history of planning for the betterment of the community. From Roanoke's first comprehensive plan in 1907 to the most recent one adopted in 2001, City leaders have recognized the importance of our natural resources.

Vision 2001-2020

The City's most recent plan, ***Vision 2001-2020***, clearly shows the importance the City places on tree canopy.

> ***Vision 2001-2020 Plan***
>
> **"Trees and other vegetation represent both an environmental resource and an important landscape feature in the quality of life in the City…Additional initiatives could include a *tree replacement policy* when trees must be removed for site development. *Regional efforts to preserve trees* in the Valley would be beneficial to the entire community."**
>
> Source: Roanoke City, ***Vision 2001-2020***, 2001, page 48 (emphasis added)

Pages 93-94 of the plan recommend that street design principles be developed. These are described as follows: "Street design principles address the design of new and existing streets and are intended to provide guidance for improvements. These principles are based on discussions of the case studies and research of design practices." Design elements that relate to trees include:

(a) Automobile

- Arterial road designs should encourage tree-lined urban boulevards…

(b) Pedestrians

- Sidewalks should be provided on both sides of urban residential, urban collector, downtown and arterial streets….Sidewalks should be separated from vehicle travel lanes by street trees and on-street parking.

(c) Trees, Signs, and Lighting

- Trees are an essential element of the streetscape and should be planted along all non-suburban streets. Wherever possible, trees should be planted so that they create a canopy over the roadway.

- Center medians planted with trees should be used on major arterials.

- Planting strips, the area between a curb and a sidewalk, should be used to accommodate street trees. They should be provided on all urban residential access streets, neighborhood collectors, and most arterials.

Vision Plan Implementation:

The ***Vision 2001-2020 Plan's*** chapter on Implementation lists strategies of interest to the urban forestry task force, such as those below. The urban forestry staff will work with the Department of Planning, Building, and Development as these strategies are implemented, especially in relation to similar action strategies of the ***Urban Forestry Plan***.

NH A16. Adopt design and performance standards for neighborhood streets, sidewalks and tree canopies. (Activity begins - within 5 years)

EC A14. Plant natural vegetation, preferably indigenous plant species, on land adjacent to the Roanoke River. (Activity begins - 6 to 10 years)

EC A20. Establish tree canopy goals that include standards for preservation and planting of trees based on zoning district and density. (Activity begins - within 5 years)

IN A4. Expand the urban forestry program to increase the number of street trees planted and replaced. (Activity begins - within 5 years)

Strategic Business Plan, Parks and Recreation

The Roanoke Department of Parks and Recreation (which includes the urban forestry staff) published its ***Strategic Business Plan*** in spring 2002. It covers fiscal years 2002-2007 and involves urban forestry as follows:

Expectations:

- Fair distribution of parks, greenways, athletic facilities, open green space, and a well maintained tree canopy

Trends:

- Protection of tree canopy

Opportunities:

- Partnerships, grants, and business alliances
- Volunteer programs such as Adopt-A-Spot, Adopt-A-Park, facilities and program opportunities
- Community Feedback -- creation of a permanent Parks and Recreation Advisory Board, Urban Forestry Task Force, youth, senior and special needs advisory groups

Urban Forestry:

- Improving maintenance levels and increasing the number of trees planted each year must occur to address community concerns

Comprehensive Parks and Recreation Master Plan

The ***Comprehensive Parks and Recreation Master Plan*** for Roanoke was completed in May 2000. The following action strategies are included in the plan:

Action Strategy 2: Distribute Resources Equitably

(A.2) The City should create a land bank for parks.

Action Strategy 4: Market Parks and Recreation Services

(E) Business Partnerships -- Parks and Recreation should utilize ten to twelve community or business partnerships per year.

(F) Adopt-a-Park -- Parks and Recreation should aggressively market at least ten Adopt-a-Park and 501(C)3 programs (e.g. Friends of the Park) per year.

Action Strategy 5: Improve Maintenance

(F) Alternative Funding -- Parks and Recreation should develop all possible alternative/creative funding strategies for augmenting maintenance efforts (volunteer programs, grants, sponsorships, etc.).

Action Strategy 7: Enhance Stewardship

(B) Parks and Recreation should create a full time "Forestry Supervision and Staff Training Specialist" position.

(C.4) Develop environmental education programs in partnership with schools, pre-schools, and other agencies and corporations.

Carvins Cove Land Use Plan

Developed in January 2000, this plan concerns the City's water reservoir located in Roanoke County. It recommends that the City take certain actions to protect water quality, make some low-impact recreational improvements, and provide user maps. Watershed planning between the City and the counties of Roanoke and Botetourt is important for water quality in Carvins Cove and the tributaries flowing into it.

Outlook Roanoke Update

The ***Outlook Roanoke Update*** was adopted by City Council in May 2002 as an element of ***Vision 2001-2020***. It was prepared by Downtown Roanoke, Inc., a group representing downtown property owners. The plan contains streetscape recommendations for downtown Roanoke that can be coordinated with tree-related City projects.

REGIONAL EFFORTS

Roanoke River Corridor Study

This study was prepared in phases in the early 1990s and covers the Roanoke River from its headwaters in Montgomery County through the Roanoke Valley to Smith Mountain Lake. The regional commissions and localities within the study area prepared the study, with the Roanoke Valley-Alleghany Regional Commission in Roanoke serving as the coordinating agency.

The final product in the series of Roanoke River studies was ***The Roanoke River Corridor: Managing a Strategic Resource*** (1993). It recommends adoption of a model river overlay zone. The model was prepared to address several areas of concern, including development of inappropriate uses in the floodplain, stream bank destabilization, absence of best management practice implementation, and loss of riparian habitat.

The model included in the study can be adapted as necessary by localities to address differing urban and rural issues. Optional elements to be considered are setbacks, vegetative buffers, agricultural buffer area requirements, erosion and sediment control, and use restrictions. The model overlay zone was adopted by Roanoke County (with slight amendments), and several of the other participating localities have considered but not adopted it.

Roanoke Valley Open Space Study

This study, prepared by the Roanoke Valley-Alleghany Regional Commission in 1999, explains open space planning options and includes maps of land ownership, elevation, slopes, and floodplains in the Roanoke Valley. In selecting specific sites that should be preserved, the study recommends that the *vulnerability* of the sites be evaluated as follows. Forested areas and floodplains, among others, are examples of sites that could be evaluated by the following criteria.

1. Look at the following factors to decide if the special resource on the site would be harmed during the development process.

    a. How significant (i.e., special, important, rare, etc.) is the resource compared to others in the locality?
    b. Is the resource sensitive (i.e., easily harmed)?
    c. Has it been designated as significant in an adopted plan?
    d. Is there more than one type of significant resource on the site?

2. Examine factors related to public or private ownership of the site.

    a. Is the site already public land that is well protected (such as the Blue Ridge Parkway or Appalachian Trail)?
    b. What are the intentions of the property owner? (This is easier to determine for public land.)
    c. Is it protected by a conservation easement or use-value taxation?

3. Determine if there are conditions present that increase the likelihood that the site will be developed.

    a. Is it in a "popular" location (near schools/attractive subdivisions/etc.)?
    b. Is there development pressure in the locality that would make previously unattractive sites desirable (i.e., once the "best" sites are gone, building on other sites such as steep slopes no longer seems as cost-prohibitive)?
    c. Does the site already have the necessary zoning and do water, sewer, and roads already serve it?

An examination of the cost and benefit of purchasing, preserving, and/or managing each special site should be conducted also, and the locality needs to decide if it has the funds and staff to manage the site. In determining benefits, it is noted that preservation of some sites, such as floodplains, could serve more than one purpose - for example, stormwater management and greenways.

Project Impact - Roanoke Valley

From 1997 through 2001, the cities of Roanoke and Salem, the county of Roanoke, and the town of Vinton participated in Project Impact, a national disaster mitigation program. The Federal Emergency Management Agency created Project Impact to encourage communities to design and implement disaster mitigation programs and strategies. The primary threats in this region, flooding and wildfires, were studied in depth in the Project Impact report entitled ***Hazard Mitigation Through Land Use Planning: An Analysis of Flooding and Wildfire Hazard in the Roanoke Valley***, Marsh Witt Associates (October 2001).

Several of the recommended strategies for flood reduction rely on trees and other vegetation in order to prevent erosion and slow stormwater runoff. For example:

- *Encourage and promote creative stormwater practices* - As an example, Low Impact Development (LID) involves retention of vegetation on-site in order to slow stormwater runoff and allow more rainfall to sink into the groundwater.

- *Establish standards to manage steep slope development* - Stormwater runs more swiftly off a steep slope that has been cleared of trees and other vegetation. These areas also are more susceptible to land erosion.

- *Require riparian buffers* - Riparian buffers (trees and other vegetation along streams) help filter out pollutants in stormwater runoff, thereby contributing to improved water quality. For example, the Virginia Riparian Forest Buffer Panel recommends at least a 65 to 100 foot wide forested buffer.

- *Implement the Roanoke River Corridor Overlay Plan* - The model overlay includes regulations to limit land disturbance and establish a 50 to 100 foot wide vegetated buffer along the Roanoke River.

- *Adopt zoning and tax incentives to compensate owners for development rights* - Examples are cluster housing, conservation easements, and purchase of significant sites (including forested areas) for preservation.

Wildfire prevention recommendations are included in the study also, along with a map of flood and wildfire hazard areas for the Roanoke Valley. Tips for protecting homes from wildfire are included on the map:

- *Create an area that you can defend around your home* - In this area, use low growing plants and those that have a high moisture and low resin content. All plants are flammable, but some burn more easily than others.

- *Survey the area within 30 feet of your home* - Remove pine straw mulch, woodpiles, and other flammable materials and trim trees so that no branches are close to your roof.

- *Create firebreaks around your home* - Plant in "islands" and use walkways and well maintained turf grass.

Appendix C:

Total Tree Canopy Needs

The common thread among the policies and actions in this plan is the need to increase the tree canopy in Roanoke from the current 32% to 40%. The current and recommended tree canopy figures in this study are from the 2002 American Forests report entitled ***Urban Ecosystem Analysis: Roanoke, Virginia***. (See Part III above for more information.) The statistics in that report have been used to prepare the following chart, which shows that an additional 188,488 public and private trees need to be planted over the next 10 years to meet the 40% overall tree canopy needed for a healthy community.

Specific recommendations for bringing about the needed change are described in this plan. Increased public tree planting, better public tree protection, and education/incentives to get homeowners to plant trees are all part of the plan. The City staff can help increase tree canopy by sharing expertise with developers and coordinating activities within City departments and others. Recommendations for changes in the landscaping requirements will be addressed during the City's zoning ordinance revision.

The primary goal of the plan is to increase the City's tree canopy to the 40% needed for a healthy community and a high quality of life.

Tree Canopy Needs

Type of Area	Total Acres	Current Tree Canopy		Tree Canopy Goal		Additional Tree Canopy Needed to Meet 40% Goal (assuming shade trees are planted for maximum canopy*)	
		Acres	Percent	Acres	Percent	Acres	Trees*
Commercial	2,889	462	16%	577	20%	115	5,635
Industrial	6,012	1,082	18%	1,202	20%	120	5,880
Residential	18,570	7,242	39%	9,209	49.5%	1,967	96,383
All Areas	27,471	8,786	32%	10,988	40%	2,202	107,898
Add 3.1% more trees to replace tree loss among the "new" shade trees (over 10 years)							3,340
Total for all areas + adjustment for attrition =							**111,238**
Add 3.1% more trees to replace tree loss among existing shade trees (over 10 years)							77,250
GRAND TOTAL = additional shade trees needed to meet 40% goal							**188,488**

Source of data for current tree canopy by acreage and percent, and tree canopy percentage goals: American Forests, ***Urban Ecosystem Analysis: Roanoke, Virginia***, 2002.

* The number of trees per acre is based on the estimation that 49 shade trees (each of which will have at least a 30 foot wide canopy at maturity) are equal to one acre. This should be adjusted when larger or smaller trees are planted instead.

Appendix D:

List of Contacts

City Departments and Other Public Entities Contacted for Comments on the Plan and Information on Tree Canopy Needs

City Departments

Civic Center
Communications
Economic Development
Engineering (under Public Works)
Environmental and Emergency Management
Fire-EMS Administration
Housing and Neighborhood Services
Library
Planning, Building, and Development
Police
Public Works
Technology
Utilities

Other Public Entities

American Electric Power
Blue Ridge Parkway
Downtown Roanoke Inc.
Federal Highway Administration
Friends of the Rivers of Virginia
George Washington and Jefferson National Forest
Health Department
Redevelopment and Housing Authority
Roanoke Regional Airport
Roanoke Regional Preservation Office
Roanoke Valley Economic Development Partnership
Roanoke Valley Garden Clubs
Roanoke Valley Greenway Commission
Roanoke Valley Resource Authority
School Superintendent
U.S. Post Office
Valley Beautiful
Veterans Affairs Department
Virginia Cooperative Extension
Virginia Department of Environmental Quality
Virginia Department of Fire Programs
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Transportation
Virginia Western Community College
Western Virginia Land Trust

Appendix E:

City-Maintained Trees on Streets and in Parks

("City-Maintained Trees" are shade and ornamental trees)

Common Name	Genus and Species	Number of Trees	Percent of Total
Ailanthus	Ailanthus itissima	21	0.1340
American Sycamore	Platanus occidentalis	370	2.3606
Amur Corktree	Phellodendron amurense	1	0.0064
Apple	Malus pumila	8	0.0510
Arborvitae	Thuja occidentalis	6	0.0383
Ash, Green	Fraxinus pennsylvanica	176	1.1229
Ash, Other	Fraxinus	19	0.1212
Ash, White	Fraxinus americana	118	0.7528
Beech, American	Fagus grandifolia	1	0.0064
Beech, European	Fagus sylvatica	6	0.0383
Birch, European	Betula pendula	2	0.0128
Birch, Other	Betula	7	0.0447
Birch, Paper	Betula papyrifera	27	0.1723
Birch, River	Betula nigra	7	0.0447
Birch, Sweet	Betula lenta	8	0.0510
Black Locust	Robinia pseudoacacia	139	0.8868
Blackgum	Nyssa sylvatica	23	0.1467
Boxelder	Acer negundo	71	0.4530
Bradford Pear	Pyrus calleryana	1018	6.4948
Buckeye, Ohio	Aesculus glabra	1	0.0064
Buckeye, Yellow	Aesculus octandra	7	0.0447
Butternut	Juglans cinerea	2	0.0128
Canadian Hemlock	Tsuga canadensis	130	0.8294
Catalpa, Northern	Catalpa speciosa	36	0.2297
Catalpa, Southern	Catalpa bignonioides	21	0.1340
Cedar, Atlas	Cedrus atlantica	7	0.0447
Cedar, Deodar	Cedrus deodara	4	0.0255
Cherry, Black	Prunus serotina	160	1.0208
Cherry, Chokecherry	Prunus virginiana	3	0.0191
Cherry, Kwanzan	Prunus serrulata	105	0.6699
Cherry, Mazzard	Prunus avium	4	0.0255
Cherry, Other	Prunus	36	0.2297
Cherry, Yoshino	Prunus yedoensis	130	0.8294
Chestnut, Chinese	Castenea mollissimo	22	0.1404
Cleveland Select	Pyrus calleryana	39	0.2488
Crabapple, Other	Malus	61	0.3892
Crape Myrtle	Lagerstroemia	24	0.1531
Crape Myrtle, Car Bty	Lagerstroemia	58	0.3700
Dogwood, Flowering	Cornus florida	1356	8.6513
Dogwood, Other	Cornus	10	0.0638
Douglas - Fir	Pseudotsuga menziesii	28	0.1786

Common Name	Genus and Species	Number of Trees	Percent of Total
Eastern Cottonwood	Populus deltoides	4	0.0255
Eastern Redbud	Cercis canadensis	76	0.4849
Eastern Redcedar	Juniperus virginiana	19	0.1212
Elm, American	Ulmus americana	215	1.3717
Elm, Chinese	Ulmus parvifolia	19	0.1212
Elm, Other	Ulmus	14	0.0893
Elm, Siberian	Ulmus pumila	284	1.8119
Endowment Sugar Maple	Acer saccharum	23	0.1467
Fir, Other	Abies	2	0.0128
Flowering Plum	Prunus triloba	1	0.0064
Fringetree	Chionanthus virginicus	2	0.0128
Gingko	Gingko biloba	100	0.6380
Goldenraintree	Koelreuteria paniculata	57	0.3637
Hackberry	Celtis occidentalis	34	0.2169
Hawthorn, Other	Crataegus	4	0.0255
Hickory, Bitternut	Carya cordiformis	6	0.0383
Hickory, Mockernut	Carya tomentosa	32	0.2042
Hickory, Other	Carya	7	0.0447
Hickory, Pignut	Carya glabra	6	0.0383
Hickory, Shagbark	Carya ovata	7	0.0447
Holly, American	Ilex opaca	13	0.0829
Holly, Other	Ilex	2	0.0128
Honeylocust	Gleditsia triacanthos	16	0.1021
Honeylocust, Sunburst	Gleditsia triacanthos	20	0.1276
Hophornbeam	Ostrya virginiana	2	0.0128
Hornbeam, American	Carpinus caroliniana	8	0.0510
Horsechestnut	Aesculus hippocastanum	8	0.0510
Japanese Pagoda Tree	Sophora japonica	4	0.0255
Japanese Zelkova	Zelkova serrata	37	0.2361
Juniperus, Other	Juniperus	16	0.1021
Kentucky Coffeetree	Gymocladus dioicus	12	0.0766
Kousa Dogwood	Cornus kousa	45	0.2871
Leyland Cypress	Cupressocyparis leylandii	10	0.0638
Linden, American	Tilia americana	97	0.6189
Linden, Little Leaf	Tilia cordata	210	1.3398
Linden, Other	Tilia	7	0.0447
London Planetree	Platanus acerifolia	28	0.1786
Magnolia, Other	Magnolia	10	0.0638
Magnolia, Saucer	Magnolia soulangiana	63	0.4019
Maple, Amur	Acer ginnala	105	0.6699
Maple, Black	Acer nigrum	100	0.6380
Maple, Crimson King	Acer platanoides	3	0.0191
Maple, Hedge	Acer campestre	97	0.6189
Maple, Japanese	Acer palmatum	10	0.0638
Maple, Norway	Acer platanoides	2474	15.7841
Maple, Norway Super	Acer platanoides	22	0.1404
Maple, Other	Acer	2	0.0128

Common Name	Genus and Species	Number of Trees	Percent of Total
Maple, Red	Acer rubrum	896	5.7165
Maple, Sugar Columnar	Acer saccharum	1	0.0064
Maple, Silver	Acer saccharinum	594	3.7897
Maple, Sugar	Acer saccharum	2915	18.5977
Maple, Sycamore	Acer pseudoplatanus	11	0.0702
Maple, Trident	Acer buergeranum	6	0.0383
Mimosa	Albizia julibrissin	3	0.0191
Mulberry, Other	Morus	47	0.2999
Mulberry, Red	Morus rubra	15	0.0957
Mulberry, White	Morus alba	17	0.1085
Oak, Basket	Quercus michauxii	2	0.0128
Oak, Black	Quercus velutina	54	0.3445
Oak, Bur	Quercus macrocarpa	2	0.0128
Oak, Chestnut	Quercus prinus	84	0.5359
Oak, Northern Red	Quercus rubra	111	0.7082
Oak, Other	Quercus	6	0.0383
Oak, Pin	Quercus palustris	433	2.7625
Oak, Post	Quercus stellata	18	0.1148
Oak, Scarlet	Quercus coccinea	6	0.0383
Oak, Shingle	Quercus imbricaria	2	0.0128
Oak, Shumard	Quercus schumardi	4	0.0255
Oak, White	Quercus alba	376	2.3989
Oak, Willow	Quercus phellos	37	0.2361
October Glory Maple	Acer rubrum	21	0.1340
Osage Orange	Maclura pomifera	3	0.0191
Other	Other	27	0.1723
Paper-Mulberry	Broussonetia papyrifera	2	0.0128
Paulownia, Royal	Paulownia tomentosa	1	0.0064
Pear, Callery	Pyrus calleryana	127	0.8103
Pecan	Carya illinoiensis	12	0.0766
Persimmon	Diospyros virginiana	32	0.2042
Pine, Austrian	Pinus nigra	11	0.0702
Pine, Eastern White	Pinus strobus	183	1.1675
Pine, Loblolly	Pinus taeda	6	0.0383
Pine, Other	Pinus	20	0.1276
Pine, Pitch	Pinus rigida	33	0.2105
Pine, Red	Pinus resinosa	1	0.0064
Pine, Scotch	Pinus sylvestris	4	0.0255
Pine, Shortleaf	Pinus echinatta	2	0.0128
Poplar, Balsam	Populus balsamifera	1	0.0064
Poplar, Lombardy	Populus nigra	1	0.0064
Poplar, Other	Poplar	17	0.1085
Poplar, White	Populus alba	2	0.0128
Purpleleaf Plum	Prunus cerasifera	16	0.1021
Redspire Pear	Pyrus calleryana	63	0.4019
Sassafras	Sassafras albidum	1	0.0064
Sentry Sugar Maple	Acer saccharum	29	0.1850

Common Name	Genus and Species	Number of Trees	Percent of Total
Serviceberry	Amelanchier	42	0.2680
Serviceberry Cumulus	Amelanchier laevis	34	0.2169
Skymaster Oak	Quercus	25	0.1595
Sourwood	Oxydendrum arboreum	5	0.0319
Southern Magnolia	Magnolia grandiflora	94	0.5997
Southern Red Oak	Quercus falcata	64	0.4083
Spruce, Colorado Blue	Picea pungens	2	0.0128
Spruce, Colorado	Picea pungens	4	0.0255
Spruce, Norway	Picea abies	60	0.3828
Spruce, Other	Picea	2	0.0128
Spruce, White	Picea glauca	2	0.0128
Sweetgum	Liquidambar styraciflua	99	0.6316
Tuliptree	Liriodendron tulipifera	155	0.9889
Virginia Pine	Pinus virginiana	66	0.4211
Walnut, Black	Juglans nigra	112	0.7146
Walnut, English	Juglans regia	9	0.0574
Walnut, Other	Juglans	16	0.1021
Weeping Cherry	Prunus subhirtella	3	0.0191
Willow, Corkscrew	Salix matsudana	1	0.0064
Willow, Weeping	Salix babylonica	2	0.0128
Yew	Taxus	1	0.0064
Yew, Pacific	Taxus brevifolia	4	0.0255
Zelkova	Zelkova	2	0.0128
TOTAL		**15,664**	

City of Roanoke
Department of Parks and Recreation
210 Reserve Avenue
Roanoke, Virginia 24016