



Portland State
UNIVERSITY

Regional Urban Forestry Assessment and Evaluation for the Portland-Vancouver Metro Area

**Prepared by Audubon Society of Portland and
Portland State University's Department of Environmental Science
and Management with funding from Metro**

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I. Key Findings

Policies relating to tree removal and preservation on private land outside regulated natural resource areas.¹

1. There is considerable variation in local urban forestry policies and programs in the region. Policies and programs vary with respect to 1.) the applicability, strength, and enforcement of regulatory elements; 2.) in level of public investment and extent of incentive/voluntary programs for tree preservation and planting; 3.) and in the level of citizen involvement and public/private partnerships.
2. Twenty-five out of thirty jurisdictions have some sort of ordinance regulating tree removal or preservation on private land outside of riparian areas subject to water quality and habitat protections.
3. The applicability of these tree removal and preservation regulations vary dramatically. The size of regulated trees, whether development is proposed, the zoning, and permit exemptions, all can determine whether a given tree is subject preservation, protection, and mitigation standards.
4. Seven of those twenty-five jurisdictions do not apply regulations consistently across all land-uses categories. Thirteen jurisdictions have significant regulatory exemptions that allow the removal of urban trees without a permit or any permit review. Only eleven jurisdictions always require tree removal permit whether development is proposed or not. Only four jurisdictions have Goal 5 programs that regulate removal of upland tree groves, although a few others regulate tree removal associated with hillside development.
5. Exemptions, the limited spatial extent of regulations, and/or the absence of protection outside the development review process reduce the applicability and therefore the effectiveness of tree preservation and mitigation standards in several municipal or development codes.
6. Where tree removal or preservations regulations do apply, the authority of local governments to require preservation and mitigation also vary considerably. Jurisdictions tend to fall in to four categories with respect to the types of regulations they apply: those that emphasize preservation, those that emphasize mitigation, and those with limited regulations, and those with no regulations.
7. Very few jurisdictions have clear and objective preservation and mitigation standards. Most have discretionary standards that are reviewed by public officials or staff. Some

¹ This excludes regulations involving permits or design standards related to for heritage tree programs or tree removal on environmentally sensitive lands or natural hazard areas. This section includes regulations applying to publically-owned land regulated by a jurisdiction the same as private land.

- rely only on the broad policy goals and staff discretion. Only six jurisdictions have the authority to require new development to demonstrate proposed designs will remove the least number of trees or basal area.
8. Mitigation standards vary between jurisdictions that require little or no mitigation to those that require 1 to 1 replacement of trees, to those that require 1 to 1 replacement of tree diameter.
 9. It is difficult to assess the efficacy of compliance and enforcement of local tree regulations, but there appears to be a clear link to level and quality of staffing and citizen involvement. Ten of the twenty five jurisdictions with tree regulations reported taking some sort of enforcement of compliance action within the last year.

Policies relating to trees in the public right-of-way.

1. There is greater consistency in policies relating to street trees relative to those regulating trees on private land.
2. Twenty-two out of thirty jurisdictions regulate street tree removal and nineteen require a permit for removal in all cases.
3. Twenty-two jurisdictions require street trees to be planted as a condition for approving development. Most jurisdictions that regulate street trees require replacement of street trees when they are removed and have tree planting standards relating to size, species and location.
4. Landowners are responsible for maintaining street trees and the condition of sidewalks and planter strips in most jurisdictions. With few exceptions, local governments provide little or no funding for street tree maintenance and management. Only West Linn, Beaverton, and Tualatin have routine street tree maintenance programs.
5. One of the biggest gaps in street tree policies and programs appears to exist in County urban service areas where permits are not required for street tree removal, policies are weak, patchy, or non-existent and there is less staffing and funding for urban forestry related activities.

Urban forestry management

1. While most jurisdictions have some local funding sources for urban forestry related activities, results indicate that the levels and sources of funding vary considerably.
2. Only five jurisdictions (Durham, Portland, Lake Oswego, Tualatin, and Vancouver) have an adopted urban forestry management plan although two more (Gresham and Tigard) have them in the works.
3. Only half of local governments have an established urban tree committee, board, or urban forestry commission.
4. Only four jurisdictions have an inventory of urban forestry canopy (Vancouver, Tigard, Tualatin, and Lake Oswego) and only two have established targets for urban forest cover (Vancouver and Portland).

5. Eleven local governments have heritage tree programs that protect trees at landowner's request.

Regional gaps & future research

1. There are a number of areas where greater regional coordination and consistency would help address gaps and support local urban forestry efforts.
 - Support local governments with little or no tree removal regulations in developing policies for tree preservation, planting, and mitigation.
 - Assistance in monitoring canopy cover and setting targets for expanding the urban forest.
 - Researching and disseminating best management practices for tree protection during construction.
 - Researching and disseminating best management practices for tree mitigation.
 - Identifying and eliminating barriers to protecting, managing and expanding the urban forest in the public right-of-ways, particularly in denser urban neighborhoods.
 - Identifying new funding sources for protecting, managing, and expanding the urban forest.
 - Quantify ecosystem service values of urban trees at a local level.
 - Strategies for improving enforcement of tree preservation and protection regulations.
2. Future research and assessment of local urban forestry programs should look more closely at:
 - Urban forest management in public parks and greenspaces.
 - Different levels and mechanisms for funding urban forestry related activities.
 - Compliance with tree preservation, planting and mitigation regulations and efficacy of enforcement activities.

II. Introduction

In 2005 the Portland Metro region adopted Nature in Neighborhoods program (Title 13 of the Regional Functional Plan) to protect and restore regionally significant fish and wildlife habitat in the Portland-Metro region. This program established land-use protections for the highest value riparian habitats in Metro's inventory of regionally significant fish and wildlife habitat. In adopting Nature in Neighborhoods, the Metro Council chose to rely on a combination of voluntary measures and other local programs to protect the region's upland wildlife habitat including much of the region's urban forest. Nature in Neighborhoods established regional performance indicators and targets to assess and evaluate progress toward protecting and restoring all 80,000 acres of regionally significant fish and wildlife habitat in the region. These measures and targets came to include a region-wide measure of urban forest canopy (although no target) to assess future trends. This regional indicator will provide a means to evaluate the

efficacy of voluntary protection efforts and local programs to protect, enhance, and manage the regional urban forest over time for its habitat, water quality, and other environmental values.

In order to successfully implement Nature in Neighborhoods and achieve regional performance targets, the region needs to strengthen and better coordinate local programs while fostering greater citizen understanding and ownership of regional performance targets. There is great potential in making local urban forestry programs and policies a strategic focus in engaging citizens and successfully implementing Nature in Neighborhoods. Despite a growing interest in urban forestry at a local level, a preliminary examination of local urban forestry programs suggests that they vary substantially across the Portland-Vancouver region. PSU planning student Clint Wertz conducted a description and analysis of municipal urban forestry programs in 1998 (Wertz 2000).² However, the region lacks an up-to-date assessment of urban forestry programs and policies to understand which jurisdictions are doing what and where.

The Regional Urban Forestry Assessment and Evaluation project begins to fill this gap by generating and sharing a consistent body of information on local urban forestry programs in the Portland-Vancouver region. The project aims to provide information to support the efforts of citizens, planners and elected officials to improve local and regional policies and programs over time. Many jurisdictions are in the process of updating their urban forestry programs. Even the process of conducting interviews as part of this study resulted in numerous opportunities to share and exchange information. The project sought to assess policies and programs as comprehensively as possible, but additional research is needed to assess the relative success of policies and programs and the amount and precise mechanisms for funding urban forestry-related activities at the local level. The results of this project and other research combined with information on changes population and forest canopy cover in the region could provide the basis for evaluating the success of policies and programs over time.

Audubon Society of Portland completed the project from July 2008 to June 2009 under a contract with Metro. Audubon Society of Portland subcontracted with Portland State University Department Environmental Science and Management to assist with research. The researchers were Jim Labbe, Urban Conservationist, Audubon Society of Portland, and Denisse Fisher, Phd. candidate at Portland State University Department Environmental Science and Management (See Appendix D). Shayna Denny with WEST Consultants, Inc. volunteered her time to complete the GIS analysis. Dr. Alan Yeakley also provided feedback and guidance throughout the project. Over 30 local government staff from jurisdictions across the region also helped complete this project. Local staff and a number of other citizens actively involved in urban forestry issues in the Portland-Vancouver region lent their time and knowledge in helping complete survey questions and participate face-to-face interviews.

III. Scope of Work and Methods

² Clinton Everette Wertz. Municipal Urban Forestry Programs in the Portland/Vancouver Metropolitan Region. A description and analysis of urban forestry best management practices. Submitted in partial fulfillment of Master's Degree in Urban and Regional Planning. Portland State University. March 2000. Pp. 79.

We assessed and evaluated urban forestry policies and programs in the three-county Portland-Metro region plus Vancouver and Clark County Washington. The regional assessment emphasized a review of regulatory policy and programs but included non-regulatory elements as well in order to assess and evaluate:

1. How do local urban forestry policies and programs compare with each other?
2. Where are there policy and programmatic gaps at the local level?
3. What are strengths and weaknesses of local policies and programs in protecting and expanding the urban forest for multiple public values (including urban wildlife)?
4. What opportunities exist to coordinate planning and implementation at the regional scale?

Phase I of the project consisted of an online survey region (Appendix A) with city and county staff in thirty jurisdictions across the Portland-Vancouver. The more detailed Phase II of the project included research, additional surveys (Appendix B), and interviews with city and county staff. In addition to interviewing staff, in some cases we also interviewed local residents actively involved in urban forestry issues and program implementation (Appendix C). Face-to-face interviews were conducted with twenty-one of the thirty jurisdictions that participated in Phase I and had policies governing tree removal on private land *and* in the public right-of-way. A technical team consisting of city and county staff, non-profit staff, and local residents actively involved in urban forestry issues reviewed and provided feedback on Phase I and Phase II survey design.³

Phase I Approach

Phase I consisted of a survey (Appendix A) completed online by local government staff (Appendix C). The purpose of Phase I was to broadly evaluate programs in the region to determine which municipal jurisdictions and counties currently have or lack general urban forestry policies and programs. The Phase I surveys were also designed to collect and distill information to allow easy comparison between cities and counties. Most critically the Phase I survey assessed whether a given municipality or county:

1. has adopted urban forestry policy goals
2. has an adopted urban forestry plan
3. has a tree protection ordinance in its municipal or development code
4. regulates tree removal on private land, in the public right-of-way or on public land
5. has an active tree preservation committee or urban forestry commission
6. requires tree planting as a condition of development
7. considers tree species in its forestry program (for example, by maintaining a tree list to regulate or inform tree removal and/or planting)
8. maintains an inventory of trees or urban forest canopy
9. systematically tracks tree removal and planting
10. has a dedicated funding stream for urban forestry programs

³ Individuals serving on the technical team included Tracy Morgan and Jennifer Karps (City of Portland), Margot Barnett (Portland Urban Forestry Commission), Jonna Papaefthimiou (City of Lake Oswego), Barbara Fryer (City of Beaverton), Chris Neamtzu (City of Wilsonville), Dan Rutzick (City of Hillsboro), Kristin Ramstad (Oregon Department of Forestry), John Frewing (Tigard resident), Todd Prager (City of Tigard), Dan Rutzick (City of Hillsboro), Lee Dayfield (Gresham resident), and Scott Fogarty (Friends of Trees).

11. funds tree planting
12. has Tree City USA designation through the National Arbor Day Foundation.

Phase I surveyed jurisdictions on guiding goals and policies of local programs and the specific intent and/or purposes of local tree preservation ordinances. Finally as part of Phase I we collected information on the size and median income of each jurisdiction in the Portland-Vancouver region. The results of Phase I determined the extent of surveys, interviews and research conducted in Phase II.

Phase II Approach

Phase II investigations assessed and evaluated policies and programs in more detail with research, additional surveys, and face-to-face interviews. We conducted face-to-face interviews with local staff with twenty-three of the twenty-five jurisdictions (all but Hillsboro and Multnomah County) that have any regulations governing the removal of urban trees on private land outside environmentally sensitive lands.⁴ For the five jurisdictions that do not regulate tree removal on private land, we conducted additional online research and corresponded with staff via email or telephone to answer relevant Phase II questions and complete narrative summaries.

Like Phase I, the Phase II surveys (Appendix B) attempted to collect comparable information about urban forestry programs but also attempted to collect information on unique aspects of local policies and programs and to identify and detail program elements in more detail to evaluate their overall strength and effectiveness. Phase II surveys and interviews included to details on local regulatory and non-regulatory programs including:

1. Tree Preservation Standards (regulated tree sizes, permit requirements, and exemptions)
2. Performance/Protection Standards for Preserved Trees
3. Heritage/Historic Tree Programs
4. Environmental Overlay Zones or Tree Preservation in Natural Resource Areas
5. Street Trees Programs and Landscaping Standards
6. Mitigation
7. Inspection and Enforcement
8. Planning and Monitoring
9. Education, Tree Planting and Maintenance Programs
10. Staffing and Funding for Urban Forestry-related activities.

GIS Analysis of Natural Resource Overlays and Water Resource Regulations

Using GIS, we assessed whether and to what extent local natural resource overlay zones or water resource regulations protect urban forest canopy (Metro 2007) and regionally significant wildlife habitat (Classes A, B, I and II and Habitats of Concern) across the Portland Metro area. Since most tree preservation ordinances focus on individual trees, apply inconsistently across a given jurisdiction and do not require specific stands of trees to be preserved, it was not possible to

⁴ Hillsboro has limited tree regulations applying to private land but because of an error in responding to the Phase I survey, we were not able to conduct a face-to-face interview. We have phone and email correspondence to answer many Phase II survey questions. Because City of Portland administers tree removal regulations for a small amount of urban unincorporated land in Multnomah County, we did not do Phase II interviews with Multnomah County.

consistently assess the efficacy of tree preservation ordinances in protecting existing urban forest canopy and regionally significant fish and wildlife habitat. Therefore we focused this portion of our analysis on environmental overlay zones and/or existing stream or wetland vegetated buffer standards in each jurisdiction. We quantified the approximate percentages of the urban forest canopy cover and regionally significant habitat within each jurisdiction that is “mostly” and “partially” protected by existing local regulations. We used environmental overlay zones boundaries, floodplain or wetland boundaries, steep slopes, vegetated buffer, and/or other regulated area proxies to approximate areas where some level of tree preservation and/or mitigation of tree removal are likely to occur with new development.⁵ We then classified each overlay or regulated area into three categories:

Mostly Protect: Establishes a minimum area where disturbance of native vegetation and soils on a lot is allowed such that no more than 15 percent of the entire overlay district or proxy regulated area would likely be disturbed and/or developed at build-out of the base zoning. In addition some level of compensatory mitigation for disturbed areas may be required.

Partially Protect: Limits disturbance of native vegetation and soils on a lot such that no more than 85 percent or more of the entire overlay district or proxy regulated area will be disturbed and/or developed at build-out of the base zoning. Actual allowed disturbance per lot could range from 16 to 84 percent. In addition some level of compensatory mitigation for disturbed areas may be required.

Compensatory Mitigation: Some level of compensatory mitigation for disturbed areas is required. *Could* limit or effectively limit the disturbance of native vegetation and soils on a lot such that more than 85 percent of the entire overlay district or proxy regulated area would likely be disturbed and/or developed at build-out of the base zoning.

Appendix E provides details and classifications for overlay zones or other natural resource regulations used in the analysis. Note that because Metro canopy and regional habitat inventories do not extend into Clark County these jurisdictions were excluded from the analysis. Also Maywood Park, Gladstone, Multnomah County, and Happy Valley were excluded from the analysis because data layers on natural resource overlay or proxy regulated areas was not available.

Narrative Summaries

To complement to inform our comparative analysis of Phase I and II survey results we also developed narrative summaries of local programs and policies. In many cases these narratives provided the opportunity to explain the particular strengths and weakness of policies and programs in individual jurisdictions.

⁵ Note that tree cover does not necessarily provide desired habitat conditions in every circumstance. For example, many Habitats of Concern include important and less common meadow or oak woodland habitats that have little or sparse tree cover. Hence this analysis assesses the degree to which local natural resource overlay zones and water resource regulations provide protection of any regionally significant habitat area, whether or not tree cover is the desire habitat condition.

IV. Results and Findings

Table 1 (Appendix F) provides summary data on year of incorporation (or year founded for Counties), acreage, population, median income and urban tree canopy cover within the thirty jurisdictions that completed Phase I surveys. Considerable variation in the age, size, median income, and canopy cover reflect the unique histories of settlement and development over the last 200 years and provides an important context for assessing local urban forestry programs.

Table I. Demographic and Tree Canopy Data by Jurisdiction

Incorporated City/Urban Area	Year Incorporated or Founded	Acres	Estimated Population (2008)	Estimated Median Income (1999)	Acres of Tree Canopy Cover (2007)	Percent Tree Canopy Cover (2007)
Beaverton	1893	11840	86,205	47,863	3,020	25.4%
Cornelius	1893	1293	10,955	45,959	235	18.4%
Damascus	2004	10333	9,975	n/a	3,711	37.4%
Durham	1966	265	1,395	51,806	144	54.3%
Fairview	1908	2275	9,735	40,931	429	18.8%
Forest Grove	1872	3192	21,465	40,135	858	23.2%
Gladstone	1911	1586	12,215	46,368	441	27.7%
Gresham	1905	14288	100,655	43,442	4,064	27.1%
Happy Valley	1965	3868	11,455	93,131	1,531	34.0%
Hillsboro	1876	14665	89,285	51,737	3,384	22.9%
Johnson City	1970	43	675	35,517	7	15.1%
King City	1966	392	2,775	28,617	60	13.5%
Lake Oswego	1910	7134	36,590	71,597	3,405	47.1%
Maywood Park	1967	107	750	56,250	47	44.0%
Milwaukie	1903	3166	20,915	43,635	757	23.9%
Oregon City	1844	5947	30,405	45,531	1,697	27.0%
Portland	1851	95260	575,930	40,146	27,231	29.4%
Rivergrove	1971	114	350	85,000	57	48.3%
Sherwood	1924	2644	16,420	62,518	541	19.8%
Tigard	1961	7416	47,150	51,581	1,920	25.4%
Troutdale	1907	3278	15,465	56,593	773	20.0%
Tualatin	1913	5088	26,040	55,762	1,028	19.8%
West Linn	1913	5037	24,400	72,010	1,977	38.7%
Wilsonville	1969	4740	17,940	52,515	1,176	24.9%
Wood Village	1951	603	3,100	43,384	87	14.3%
Vancouver	1857	29485	162,400	41,618	5,425	19.7%
Urban Multnomah County*	1854	7422	Not avail.	Not avail.	Not avail.	Not avail.
Urban Clackamas County*	1843	27648	Not avail.	Not avail.	6,609	23.9%
Urban Washington County*	1849	20404	185,786	Not avail.	8,512	41.7%
Urban Clark County*	1845	17623	Not avail.	Not avail.	Not avail.	Not avail.

* Unincorporated land inside Metro UBG or in Clark County Three Creeks Planning Area.

Sources:

Population for Oregon Cities: Population Research Center, Portland State University <http://www.pdx.edu/prc/>. **Population for Urban Washington County:** Steve Kelley, Washington County Land Use and Transportation Steve_Kelley@co.washington.or.us. **Population for Vancouver:** State of Washington Office of Financial Management: <http://www.ofm.wa.gov/pop/april1/>. **Acreages of Jurisdictions:** Regional Land Information System (Metro). **Median Income:** US Census 1999. **Tree Canopy for Oregon Cities:** Metro State of the Watershed Report <http://www.oregonmetro.gov/index.cfm/go/by.web/id=27579>. **Tree Canopy for Vancouver in 2005:** Vancouver Urban Forestry Management Plan, http://www.ci.vancouver.wa.us/parks-recreation/parks_trails/urban_forestry/docs/UJFMP_final-web.pdf. **Tree Canopy for Multnomah, Clackamas, Washington Counties** Calculated from RLIS and Metro Urban Forest Canopy 2007 Data layer.

Phase I

Local staff from all thirty jurisdictions completed the Phase I survey (Appendix G). In some cases involving smaller jurisdictions with limited staff, it was easier for us to fill out the survey over the phone. The majority of survey questions were answered but in some cases staff did not answer some questions. Questions that involved specific answers, such as a jurisdictions annual expenditure on urban forestry related activities, were more frequently left blank.

Phase II

For the most part, we completed Phase II surveys (Appendix H) after interviews with local staff. In many cases questions were not applicable or could not capture the unique circumstances, practices, or policies in a given jurisdiction. Therefore Phase II surveys were less complete and we addressed specific questions or issues in the narrative summaries.

Policies Relating to Trees on Private Land Outside Regulated Natural Resource Areas.⁶

Table II "Comparative Analysis of Local Tree Regulations for Private Land" (Appendix I) and Table III "Comparative Analysis of Local Tree Preservation and Mitigation Standards on Private Land" (Appendix J) group and compare tree ordinances applying on private land and – in many cases- on publically owned land as well. Both tables summarize policies and standards relating to tree preservation, removal, mitigation, and planting excluding those applying to heritage tree programs or environmentally sensitive lands regulated under Goals 5, 6, and 7 of Oregon land-use planning program. For the purposes of comparative analysis of policies and programs governing tree removal on private land, we found it useful to classify jurisdictions into the following four categories.

1. **Preservation Emphasis:** Jurisdictions that have specific tree preservation standards, criteria, or authority to require tree preservation. These jurisdictions tend to have higher staffing levels and political support for implementing robust tree policies and programs.
2. **Mitigation Emphasis:** Jurisdictions that have general requirements for tree preservation but put greater relative emphasis on mitigating tree removal at greater than 1 to 1 trees. These jurisdictions also tend to have higher staffing levels and political support for implementing tree policies. In these jurisdictions higher mitigation ratios appear to provide an incentive for tree preservation while maintaining flexible design. However they may result in less tree preservation. These jurisdictions also tend to have higher staffing levels and political support for implementing robust tree policies and programs.
3. **Some Regulation:** Jurisdictions without clear standards, criteria, and little or no discretionary authority to preserve trees, that allow extensive un-permitted tree removal through exemptions, and/or that do not require mitigation of tree removal greater than 1 to 1 trees.

⁶ Our analysis of policies relating to “tree removal on private land” excludes policies relates to heritage tree programs or tree removal on environmentally sensitive lands or natural hazard areas. It also includes policies applying to publically-owned land where jurisdictions apply regulations to public land.

4. No Tree Ordinance: Jurisdictions that do not regulate tree removal on private land.

Tree removal regulations on private land vary significantly with respect to where and when they apply. The size of regulated trees, whether development is proposed, the zoning, and permit exemptions, all can determine whether a given tree is subject preservation, protection, and mitigation standards.

Tables II (Appendix I) illustrates the wide range of urban tree regulations that potentially apply on developed and developing properties. Twenty-five out of thirty jurisdictions have some sort of ordinance regulating tree removal or preservation on private land. Seven of those twenty-five jurisdictions do not apply regulations consistently across all land-uses categories. The City of Milwaukie, for example, only applies tree regulations to development of flag lots while Portland does not regulate tree removal in some situations that do not involve formal land-divisions.

Thirteen jurisdictions have significant regulatory exemptions that allow the unmitigated removal of trees without a permit or permit review. For example, the City of Gresham allows three to six trees of any size to be removed within a 12 month period depending on lot size. Beaverton entirely exempts developed properties less than ½ acre and has annual exemptions on developed properties greater than ½ acre.

Another major gap in most local tree preservation ordinances is the lack of any permit required for tree removal outside the development review process. Only eleven jurisdictions always require tree removal permit whether development is proposed or not. Many jurisdictions do not have clear procedures for ensuring trees that are preserved as a condition of past development are not cut after a development application is approved. Instead these jurisdictions tend to rely on citizen complaints or inquiries in lieu of an established permit process. Other jurisdictions have specifically addressed this issue by requiring a permit to remove any tree above a minimum size even if tree removal is granted without review.

Exemptions, the limited spatial extent of regulations, and/or the absence of protection outside the development review process reduce the applicability and therefore the effectiveness of tree preservation and mitigation standards in several municipal or development codes.

Where tree removal or preservations regulations do apply, the authority of local governments to require preservation and mitigation also varies considerably, as illustrated by Table III (Appendix J). Only Portland, West Linn, Oregon City, and Vancouver have clear and objective criteria for tree preservation. Most jurisdictions that regulate tree removal have discretionary criteria that staff or public officials must consider before granting a tree removal permit. However, not all of these standards and criteria- whether discretionary or clear and objective- can or do require applicants to avoid and minimize tree removal by demonstrating a low or least impact design. Only six jurisdictions have the authority to require new development to demonstrate proposed designs will remove the least number of trees or basal area. Finally mitigation standards vary between jurisdictions that require little or no mitigation to those that require 1 to 1 replacement of trees, to those that require 1 to 1 replacement of tree diameter.

Specific regulatory requirements are important to ensure that new development avoids and minimizes tree loss. However in interviewing local staff and citizens, the efficacy of regulatory programs clearly also depends on local political leadership, staffing levels, the level of citizen involvement, and associated enforcement efforts. For example the City of Wilsonville’s code consists of a highly discretionary review process for determining tree preservation, removal, and mitigation and specific criteria for tree removal that are not exceptionally restrictive or protective relative to other jurisdictions. However per-capita staffing levels and expertise allow the City to work more actively and effectively with developers and landowners than many other jurisdictions, ensuring the technical expertise and follow-through needed to implement policies and enforce requirements that preserve trees, minimize impacts or more effectively mitigate tree removal.

It was difficult to assess the efficacy of enforcement of tree regulations by local governments. Some local staff admitted and many citizens actively involved in urban forestry issues asserted that enforcement of tree regulations is weak and inconsistent. But in other jurisdictions staffing levels or organized citizen advocates clearly improve enforcement of tree regulations. To provide a litmus test of a local government’s enforcement activities relating to tree preservation and protection, we asked each jurisdiction whether or not they had taken enforcement action or compliance efforts related to their local tree regulations sometime in the past year. Ten of the twenty five jurisdictions with tree regulations reported taking some sort of action in the last year.

Policies and Programs Relating to Trees Public Right-of-Way.

Table IV. “Comparative Analysis of Local Street Tree Policies” (Appendix K) compares basic components of local street tree policies and programs in the Portland-Vancouver region. In general, there is greater consistency in policies relating to street trees relative to those regulating trees on private land. Most jurisdictions –twenty-two out of thirty- regulate street tree removal to some degree and nineteen require a permit in all cases. Twenty-two require street trees to be planted as a condition for approving development. Most jurisdictions that regulate street trees require replacement of street trees when they are removed and have tree planting standards relating to size, species and location. Most also make landowners responsible for maintaining street trees and the condition of sidewalks and planter strips. With few exceptions, local governments provide little or no funding for street tree maintenance and management. Only West Linn, Beaverton, and Tualatin have routine street tree maintenance programs.

Smaller jurisdictions tend not to make policy distinctions between trees located on private land and those located in the public right-of-way. For example Durham and Rivergrove that lack a significant number of street trees, cover street trees under a general tree-cutting ordinance. Cornelius and Sherwood report being able to police street tree removal without a specific permitting process for removal. One of the biggest gaps in street tree policies and programs appears to exist in County urban service areas where permits are not required for street tree removal, policies are weak, patchy, or non-existent and there is less staffing and funding for urban forestry related activities.

Urban Forestry Management: Funding, Planning, Voluntary Programs, and Partnerships

Table V “Comparative Analysis of Urban Forestry Management” (Appendix L) details the wide range of staffing, funding, and programming levels relating to urban forestry among local governments in the region. While most jurisdictions have some local funding sources for urban forestry related activities, our results indicate that the levels and sources of funding vary considerably. Only five jurisdictions (Durham, Portland, Lake Oswego, Tualatin, and Vancouver) have an adopted urban forestry management plan although two more (Gresham and Tigard) have them in the works. Only half of local governments have an established urban tree committee, board, or urban forestry commission. Only four jurisdictions have an inventory of urban forestry canopy (Vancouver, Tigard, Tualatin, and Lake Oswego) and only two have established targets for urban forest cover (Vancouver and Portland). Ten jurisdictions have a certified arborist on staff. Only eight jurisdictions have a dedicated tree fund that pools in lieu planting or penalty funds. Eleven local governments have heritage tree programs that protect trees at landowner’s request.

GIS Analysis of Natural Resource Overlays and Water Resource Regulations

The extent of existing urban forest canopy and regionally significant habitat varies considerably between jurisdictions.⁷ This is clearly a product of historic land-use patterns both pre-urban agricultural uses and more recent urbanization. State or regional law requires jurisdictions to limit tree removal adjacent to streams and wetlands to protect water quality, fish and wildlife habitat, or public health and safety. Only four jurisdictions- Portland, Wilsonville, Lake Oswego, and Hillsboro- have Goal 5 programs that preserve upland forests inside the 2002 UGB, although Beaverton and Washington County require mitigation when development displaces upland forests. Other jurisdictions like Gresham and Tigard regulate tree removal associated with hillside development.

Appendix E provides the results by jurisdiction from the GIS analysis of natural resource overlays and water resource regulations that preserve tree canopy, mitigate removal of trees, or otherwise protect regionally significant wildlife habitat (not all of which includes tree canopy). Results indicate that jurisdictions provide a wide range of protection for their existing urban forest canopy through natural resource overlay zones or other regulations applying to environmentally sensitive lands. Jurisdictions like Gresham and Wilsonville mostly protect a relatively high percentage of their existing urban forest canopy with natural resource overlay zones (38.4% and 37.4% respectively). In contrast jurisdictions like Damascus, Wood Village, Cornelius, and Milwaukie mostly or partially protect a relatively small percentage of existing urban forest canopy (0%, 6.7%, 7.4%, and 9% respectively) with overlay zones or other regulations.

V. Urban Forestry Policies & Programs Narrative Summaries

The following narrative summaries detail the specific elements of local urban forestry policies and programs while highlighting strengths, weaknesses, and unique circumstances that

⁷ Note that recent analyses in the Metro State of the Watershed Report assessed forest cover within unincorporated areas within Metro’s Boundary however this analysis assessed unincorporated areas inside the UGB.

characterize programs in individual jurisdictions. In surveying local government's urban forestry policies and programs throughout the entire region, several features of individual jurisdictions stand out as exception in their apparent strength, effectiveness, scope or comprehensiveness.

In terms of regulatory programs applying to private land, there are several local government programs that stand out for one or more characteristics. The City of Lake Oswego and the City of Portland both have the most extensive programs for protecting upland tree groves. Lake Oswego's tree removal regulations are particularly thorough at addressing tree removal outside the development review process and in situations involving annexation. Portland's tree regulations for land division provide particularly detailed regulations for preserving trees of different species. The City of Tigard and Oregon City have some of the strongest provisions for mitigating tree removal; require mitigation based on regulated tree diameter with few exceptions. Most other jurisdictions merely require replacement of mature trees with a single sapling. Vancouver's tree regulations include a minimum tree density requirement that can be achieved by either planting or preservation and discretionary provisions to preserve trees of particular ecological or social significance. This mix of clear and objective standards and discretionary criteria provide both for consistency and flexibility in application. Finally, as noted above, the City of Wilsonville has staff highly trained in urban forestry and particularly strong political support for implementing policies and enforcing regulations.

Several local governments have particularly strong or comprehensive urban street tree programs. The City of Portland's Neighborhood Tree Liaison Program provides an exceptional level of training and education to local citizens. Portland has also invested heavily in street tree stocking inventories and funded extensive street tree planting. The City of Beaverton has an especially thorough street tree maintenance program.

Most cities require street tree planting as a condition of approving development but frequently tree planting is lowest on the priority of right-of-way improvements or are not planted due to a higher priority given to driveways, intersection sightlines, utilities, and other aspects of the built environment. To address this issue in its planned Villebois community, City of Wilsonville has developed a system of prioritizing right-of-way improvements to ensure that street tree planting is given higher priority. Oregon City addresses the issue by requiring as set number street trees to be planted based only on the length of street frontage associated with a new subdivision lot. If one or more street trees cannot be accommodated due to the placement of driveways, utilities, and signage and other built infrastructure, developers must pay into a tree planting fund that pays for trees to be planted on public land at other locations in the City.

Very few jurisdictions have conducted urban forestry management plans. Vancouver, Portland, and Lake Oswego have the most recent Urban Forestry Management Plan. The former two include specific goals and targets for expanding urban forest cover. The City of Portland also has an Urban Forestry Action Plan and has produced a number of other reports quantifying the ecosystem service value of the urban forest.

City of Beaverton

The City of Beaverton has also formed part of Tree City USA for the last 15 years. The City of Beaverton has a particularly thorough street tree maintenance program with a set schedule for inspecting and maintaining all street trees every three years.

The City of Beaverton first adopted regulations related to preservation of Significant Natural Resource Areas in 1985 (ORD 3441). In 1990 Beaverton adopted regulations for Preservation of Trees and Vegetation (ORD 3740), outlining specifics for tree protection, pruning and removal while refining the 1985 regulations. Revisions to the regulations for preservation of trees and vegetation within the Development Code occurred over time with the most recent edits adopted in 2006.

Several types of trees are regulated by Beaverton's Development Code and defined within Chapter 90:

1. **Significant individual Trees or Tree Groves** - Trees and groves that have been identified as possessing exceptional characteristics and are mapped on the City's Inventory of Significant Trees and Groves (60.60).
2. **Historic Trees or Tree Groves** - Trees of historic significance due to their association with historic properties or the general growth and development of the city (60.60).
3. **Landscape Trees** - Trees that have been preserved or planted as part of an approved landscape plan (40.20 and 60.05)
4. **Street Trees** - Trees located within the public or private right-of-way or easement for vehicular access, or associated with public utility easements (60.15).
5. **Trees within a Significant Natural Resource Area** (SNRA, includes wetlands and riparian corridors) - Trees located within Goal 5 areas (60.67).
6. **Community Trees** - Healthy trees of at least ten inches (10") DBH located on developed, partially developed, or undeveloped land. Also includes trees of at least of 6" for various native species (60.60).
7. **Mitigation trees** (60.60) – Trees planted in an effort to alleviate the impact of the removal of other trees. A mitigated trees takes on the designation of the tree removed.

The city just finished updating the Tree Inventory Map, effective April 30, 2009, that combines the contents previous mapping efforts and reflects recent changes. Currently, there are no plans to change the development code as it relates to trees and tree regulations.

Clackamas County, Unincorporated Urban

Clackamas County has extensive and detailed comprehensive plan language relating to urban forests and trees under Chapter 3 for "Natural Resources and Energy." Policy 6 for "Forests" calls initiating "a tree conservation and planting program for the northwest urban area to preserve urban forest areas and promote tree landscapes." Four specific implementation items under this policy include: i. An urban forest inventory; ii. Adoption of tree conservation standards in design review, grading, and subdivision ordinances that minimizes removal of trees and vegetation on undeveloped lands within the urban area; iii Development of a urban street tree planting and maintenance program; and iv. Create of a special review process for commercial timber harvesting within the urban area.

Despite the breadth and specificity of the comprehensive plan policies, the County has yet to implement them, in part due to funding constraints. Outside the recently adopted Title 13 Habitat Conservation Areas and the Willamette Greenway overlay zone, Zoning and Development Ordinances (ZDOs) have limited and nebulous code language relating to tree preservation and protection inside the Metro UGB. The regulations only apply to new single-family subdivisions and no permit is required for tree removal outside a development application. The County's heritage tree program is entirely voluntary and affords no protection for designated heritage trees. The County has tree-planting requirements for parking lots but only requires street tree planting along a few designated boulevards and in the Sunnyside Village District. Clackamas County is currently undergoing a planning process to adopt more explicit code language governing tree preservation and protection. A recently convened Urban Tree Task Force aims to improve existing ZDOs to better implement urban tree and forest related policies in the Comprehensive Plan (see below).

In September 2008, the Clackamas County Board of Commissioners appointed the 13-member citizen Trees Task Force charged to recommend changes to the ZDOs "to assure that the tree canopy is maintained, preserved and enhanced, by controlling predevelopment tree cutting without prohibiting development." The task force is also charged with making other recommendations "to contribute to long-term management of the County's urban forest reserves."

Clark County, Unincorporated Urban

Clark County has no urban forestry policies or programs. The County's development code does require landscaping associated with development within the public right-of-way including 2-year maintenance and survival requirements (Subtitle 40.320.020), but no specific standards require tree planting. Clark County's critical area ordinance (Subtitle 40.4) governs tree removal in areas of critical natural resource concern, mainly along streams, wetlands, shorelines, and geologic and flood hazard areas. Title 40 requires development and redevelopment to avoid, minimize, and provide compensatory mitigation for any impacts to critical area functions and values such that there is no net loss in those functions and values. This includes the functions and values provided by trees and other woody vegetation. Finally Clark County also has forest practices regulations that govern conversion of forest land to other uses. The regulations mainly ensure that the County's critical areas ordinance is applied in these situations.

City of Cornelius

The City of Cornelius has limited urban forestry policies and programs and is one of a handful of jurisdictions in the region that do not have Tree City USA status. Cornelius does not regulate tree removal on private land outside its Natural Resource Overlay. Cornelius does not have a permit process for removing street trees, although staff report that they are able to police street tree removal effectively given Cornelius is roughly 2 square miles in area. Cornelius's development code Title 17 for subdivisions does require the planting of street trees as part of frontage improvements for street construction. Trees must be installed along every 30 lineal feet of street frontage in accordance with an approved public works street tree list. City Transportation System

Plan details required planter strips widths for new streets; they range from 4 to 6 feet for residential streets.

City of Damascus

As Oregon's newest City Damascus does not have an adopted comprehensive plan and zoning code. Therefore it does not currently regulate tree removal as a part of development. However an increase in clear cutting and tree removal has emerged as a major issue of community concern. To address this issue the Damascus City Council adopted an interim tree-cutting ordinance in 2007 to prevent the wholesale clearing of trees in advance of pending comprehensive plan and zoning decisions. The Council has renewed the ordinance continuously since 2007 (most recently May 4, 2009).

The ordinance prohibits the clear-cutting of trees within the urban growth boundary (UGB) of the City with the intent to protect citizens of the City from personal injury and property damage due to an increased susceptibility to wind and other hazards to public peace, health and safety resulting from clear cuts. The ordinance is interim until the City can consider and adopt long-term legislation regulating forest practices, tree preservation and habitat protection. This Ordinance is expressly not intended as be a moratorium on construction or land development, function as a land use regulation, implement Metro Title 13 (Nature in Neighborhoods), or regulate forest practices.

The ordinance's most significant provision is a prohibition on clear-cutting defined as "the removal of more than ten (10) trees, from a parcel or from adjoining parcels in common ownership, within any twelve (12)-month period; or the removal of more than five trees from a parcel that leaves less than an average of one tree per 1,000 square feet of lot area, distributed throughout the entirety of the site. The ordinance includes a provision for permitted removal of hazardous trees.

The City of Damascus and local citizens are currently in the process of developing a comprehensive plan and zoning designations including Conservation Overlays. The community has repeatedly expressed the desire to conserve forested buttes in Damascus for scenic values, wildlife, water quality and sense of place. The City is on schedule to adopt policies to protect natural features in some form within the coming year.

City of Durham

Like many smaller jurisdictions Durham does not have Tree City USA designation, an urban forestry committee or tree board, or a heritage tree program. However Durham is known for its extensive urban forest cover and for prioritizing tree preservation. It is also one of a handful of jurisdictions that have an adopted urban forestry plan. City of Durham reports spending roughly \$1,000 on urban forestry related activities in the 2007/2008 fiscal year provided by development fees, general fund allocations (property taxes).

In 1975, the city passed its first tree ordinance prohibiting the cutting of trees on both public and private property without a permit whether or not development is proposed. Tree regulations are

mostly located within their development code, but some requirements can also be found within the comprehensive plan. The city does not actively regulate trees in the public right-of-way, as very few actually exist in association with a particular property. Durham's tree ordinance (Ordinance Number 228-05) applies to all trees ≥ 5 inches in diameter within the city limits, regardless of their location. Unless a tree is dead or hazardous, all tree removals must be approved by the city's planning commission and require a permit. The cost for a tree removal permit is \$10 per tree, plus a \$5 application fee. Emergency removals require an emergency permit and do not have a fee, as determined by the city administrator.

City of Fairview

The City of Fairview has Tree City USA designation but no adopted urban forestry plan or established tree board/committee or urban forestry commission. Fairview funds urban forestry-related activities through stormwater fees and City general fund allocations.

The City of Fairview defines "significant vegetation" as trees with a diameter of ≥ 6 inches, except for non-native, invasive species. The city protects "significant vegetation" associated with some development and public work projects. No trees can be planted or removed in the public right-of-way and public property without permission of the city public works director and a tree removal permit obtained. Street trees must be planted no more than 30 feet apart for all developments that are subject to land division and site design review. However, street tree standards may be waived when trees preserved within the front yards provide the same or better shading and visual quality as street trees. The city requires the developer to provide a performance bond in an amount determined by the city engineer, to ensure the planting and care of street trees during the first two years after planting. After this time period, streets become the responsibility of landowners. If street trees are removed they must be replaced trees with the same type (coniferous or deciduous). While not clearly delineated within its code, the city requires on-site mitigation for regulated trees as part of the development process and for the replacement of street trees (unless trees are hazardous). The mitigation standard stands at 1:1 tree. Mitigation trees must be 1 1/2 inch caliper if deciduous and 6 inches in height if coniferous.

City of Forest Grove

Forest Grove has had tree related policies, regulations, a tree board/committee in place since 1992, the year it received Tree City USA status. The City of Forest Grove does not have an urban forestry plan but is the only jurisdiction in the region that has a street tree inventory for its entire street network.

In March 2009, Forest Grove adopted new tree related regulations and administrative practices to better address tree preservation in the land division and development review process. The new code (10.5.100) clarifies when and where tree regulations apply. The new code also requires a tree removal permit to occur earlier in the development permitting process, adds requirements for development applications involving regulated trees, and revises tree preservation and mitigation standards. Forest Grove does not require a permit to remove trees on private property outside the development process, although there are specific criteria for removing trees that were preserved as a condition of past development. Owners of significant "registered trees" are notified annually

of their responsibilities that include a public hearing before tree removal. Depending on the code, tree removal decisions are discretionary decisions of staff, the Planning Director, or the Community Forestry Commission (CFC). Forest Grove applies a slightly modified version of Metro's Title 13 model ordinance to Habitat Conservation Areas. The city requires tree planting for new development in parking lots, along streets, and in buffer areas between zones and provides limited funding for neighborhood tree planting.

City of Gladstone Urban

The city of Gladstone only manages trees within parks and lacks a tree ordinance for private land. Within parks, if trees need to be removed, the city hires an arborist. There is no permitting system for tree removal on private property or in the public right-of-way. Existing street trees maintenance are the responsibility of property owners, except for any street trees that have been planted by the city. The city has limited staff and budget and water and sewer services have been a budgeting priority. Gladstone's landscaping standards require 15% of a property to be landscaped as part of most new development. However no tree planting or placement standards exist. Trees are also informally protected within riparian areas as part of the City's acknowledged Goal 5 program that will be updated before the end of the year in order to substantially comply with Metro Title 13. The city of Gladstone has no tree committee or urban forestry commission, does not have Tree City USA status, and has no adopted urban forestry plan.

City of Gresham

In 2009, Gresham became the newest jurisdiction in the Portland-Metro area to achieve Tree City USA status. Gresham has had tree regulations that apply both during development and outside of the development review process for over 10 years. Development Code Section 9.1000 covers all regulated trees and Section A14.004 applies to significant trees. Gresham also has three overlay zones that either directly require or indirectly result in retention of trees when properties are developed. Gresham also requires planting of street and parking lot trees as a condition of new development. Gresham funds urban forestry related activities through a combination of stormwater fees, development fees, and grants. The staff reported some \$600,000 dedicated to urban forestry-related activities in the 2007-2008 fiscal year.

Gresham hired an urban forestry planner in 2008 which reports to the planning director. The urban forestry planner is charged with a number of tree-related responsibilities including drafting an Urban Forestry Management Plan in 2009 and subsequent review and revision of tree-related codes in 2010. The City also renamed and reconstituted its Tree Preservation Committee into a newly formed Urban Forestry sub-committee to the Natural Resource and Sustainability Advisory Committee.

City of Happy Valley

The city of Happy Valley adopted its tree regulations five years ago and achieved Tree City USA in 2008. Its planning commission acts as its tree board. The City does not have an adopted urban forestry management plan and has yet to develop a heritage tree program. Happy Valley reports

spending \$70,000 on urban forestry related activities in the 2007/2008 fiscal year provided by development fees.

In May of this year, the City adopted new code and comprehensive plan amendments. Happy Valley requires a permit for trees ≥ 6 inches at four feet whether or not development is proposed. The City applies different discretionary standards for tree preservation depending on zoning and whether and what type of development is proposed. Tree mitigation is required for all zones and can be greater than 1:1 when development is proposed. The City of Happy Valley has special regulations that apply to newly annexed lands. Street trees must be planted depending on district and landscaping standards. These requirements include tree planting and buffering requirements for parking lots. Native, nuisance and prohibited plant lists can be found in Appendix A of the development code.

City of Johnson City

The City of Johnson City has no urban tree or forestry related policies or programs.

City of Hillsboro

Urban forestry goals and policies have been embedded in the City of Hillsboro's Comprehensive Plan for 30 years. In 2005, the revised Hillsboro 2020 Vision and Action Plan (a guiding community vision document and not adopted policy) included a new strategy to establish a tree planting, maintenance and preservation organization and program over the coming years. Other strategies in the Action Plan address the preservation of natural resources including trees. City of Hillsboro currently does not have an urban forestry plan, an urban tree board or commission, or Tree City USA status.

Hillsboro has limited tree preservation or protection standards outside its Natural Resource Overlay zone, however the overlay zone does include some protections for upland forests. Mature trees on private land listed on the City's Cultural Resource Inventory or within Station Community Planning Areas (near light rail stations) are regulated and can be preserved as a condition of development. In addition, staff reports that some new development approvals include conditions of approval designed to preserve and protect trees on private land but no specific code language was cited.

Street tree planting is required with new development in Hillsboro. All street trees must be planted in compliance with City standards. Property owners in Hillsboro are responsible for the maintenance of adjacent trees within the public right-of-way. Hillsboro does require a permit for street tree removal in most parts of the City. However, mature street trees listed in the City's Cultural Resource Inventory and within Hillsboro's Orenco Townsite Conservation District are regulated. For example, mature street trees within the Orenco Townsite Conservation District may be removed only with prior permission from the Planning Department based on a report from a registered arborist. Mature street tree removal in this District must be supervised by a registered arborist or professional tree service and tree replacement standards are in place.

In 2003, Hillsboro adopted a Goal 5 Natural Resources Management Plan that the Significant Natural Resource Overlay (SNRO) District. The SNRO requires new development in or near mapped natural resource areas- including some upland forests- to avoid, minimize or mitigate impacts and these impacts include those associated with tree removal.

Hillsboro is in the process of completing a citywide street tree inventory using ArcGIS-based software loaded on handheld computers. The location, species, size, and condition of 14,000 street trees have been catalogued by community residents, 4-H youth, and university student interns since 2005. The anticipated inventory completion date is fall 2009.

City of King City

According to King City's Comprehensive Plan, the protection of all regulated trees is to be encouraged so that the "removal of existing trees should be limited to what is necessitated by land development, safety, and disease". The city regulates trees that are ≥ 6 inches at four feet. City policy aims to limit the removal of existing trees to what is necessitated by land development, safety, and disease.

King City adopted its current tree regulations in 2004 under Chapter 16 of its municipal code. This chapter covers tree preservation on developable properties, which require the submittal of a site plan that includes a description of all trees that are to be retained or removed. Trees are also to be protected under best management practices during construction. The city keeps a list of any vegetation listed on a plat map or a document recorded with the plat.

King City has no designated funding source for urban forestry, does not have a designated tree committee or urban forestry commission, an urban forestry plan, or Tree City USA designation.

City of Lake Oswego

Since it initiated its tree preservation efforts over a decade ago, Lake Oswego has had one of the most comprehensive urban forest programs in the region. The city has had Tree City USA designation since 1990 and adopted a new urban forestry plan in 2007. According to their Comprehensive Plan, Lake Oswego emphasizes tree preservation rather than mitigation. A previous study on this region's urban forestry policies identify the city of Lake Oswego as one of the most active in terms of monitoring and maintenance programs, both for trees on private property and in the public right-of-way. This study recognized that Lake Oswego has some of the most stringent tree preservation standards in the Portland-Vancouver Metro region (Wertz, 2000).

According to their comprehensive plan, the city must develop a planting and maintenance program for trees in public right-of-way, open spaces and parks. Unfortunately, this request was not funded this year. The plan also explains that the city will preserve natural resource sites, through public acquisition and other methods such as conservation easements, to permanently preserve trees and tree groves. Parks and Recreation is primarily responsible for acquiring conservation easements to protect valuable forest habitats, such as oak savannah.

Lake Oswego adopted a new tree preservation ordinance in 2007 and established a Tree Code Task Force that evaluates and provides amendments to the new tree code. This task force includes an arborist from the Community Forestry Commission, a general arborist, a Natural Resources Advisory Board (NRAB) representative and local residents. Meanwhile, the Community Forestry Commission was formed to hear requests concerning Type II tree cutting permits.

Tree removal is regulated under Lake Oswego's Code (Chapter 55) and the Sensitive Lands Code (Chapter 50). Chapter 50 permits removal of up to two trees greater than 10" dbh a year on single-family residential zones unless the trees are 1) protected as condition of past development; 2) designated as a Heritage Tree; or 3) located within a Resource Conservation (RC) or Resource Protection (RP) overlay district. The City also provides detailed tree protection instructions during development.

City of Maywood Park

Maywood Park has no urban forestry related policy goals in its comprehensive plan but has had an ordinance regulating tree removal since 1989. The city requires some tree planting as a condition of development. Removal permits are required for trees on private land and in the public right-of-way. In the latter case, the City tracks street tree planting and removal and also funds some tree planting in the public right-of-way. Urban forestry activities are funded tree removal permit fees. Maywood Park does not have a Tree City USA designation, an adopted urban forestry plan, or an established tree committee or urban forestry commission. However the City does have a volunteer city forester.

City of Milwaukie

The City of Milwaukie has had a tree ordinance governing tree removal for 10 years. However these only apply to trees located in the public right-of-way and trees on flag lots, and the latter only when development is proposed. The City Council considered broader tree regulations in the past but these were never adopted. The City's Willamette Greenway zone and Water Quality Resource Areas also govern tree removal. Milwaukie provides very limited funding for urban forestry related activities through its engineering and code enforcement divisions. The city of Milwaukie does not have a Tree City USA designation, an adopted urban forestry plan, or an established tree committee or board.

Urban Unincorporated Multnomah County

Multnomah County has very little land to which it provides urban services and planning. Multnomah County regulates tree removal on this small amount of urban service area through an under agreement with City of Portland. Therefore the applicable regulatory policies relating to tree removal, preservation, and planting are the same as the City of Portland. Multnomah County does not have a tree board or urban forestry commission, an urban forestry plan, or Tree City USA designation.

City of Oregon City

Oregon City's tree ordinances have been in place for more than a decade. The City's comprehensive plan identifies the need to develop better policies to protect its urban forest, as the "total tree cover in the city has diminished" as result of development. Oregon City has created tree regulations that apply during development, annexation, and land division. Annexations (14.04.050), subdivisions (16.08.040), and multi-family and commercial/industrial development (16.12) require site plans that identify, among other features, wooded areas, isolated trees (all trees \geq 6" dbh) capable of being preserved, and significant natural resource areas.

For new development in single-family residential zones, the development code requires that all regulated trees "shall be preserved outside the building area, which is defined as right-of-way, public utility easements and within building setbacks." According to the code, all regulated trees will remain after development of the site if it is situated in a building setback, is part of landscaping, a public park or landscape strip, or legally reserved open space; is in or separated from the developable remainder of a parcel by an undevelopable area; or is on the applicant's property and not affected by the development. Oregon City currently does not waive building setback requirements to preserve trees. Oregon City does not currently have tree preservation standards that could modify subdivision design. Nor are there discretionary development standards that could require adjustments of building or driveway areas to preserve regulated trees.

Oregon City allows tree removal outside development application and without approval, on all private land with a few exceptions. Additionally, approval for regulated tree removal must be applied for in private properties located in a) Canemah National Registered Historic District; b) designed historic structures; c) the Unstable Slope Overlay District (slopes over 25% and other unstable areas); d) the Water Quality Resource Overlay District (within 200 feet of stream or wetland); and f) outside single-family residential zones. Additionally, in commercial zones all regulated trees within the property must be mitigated. There is currently no permit system to track tree removal and replacement outside the development review process unless the tree is in the public right-of-way (See below)

Chapter 12.08 regulates community forests, heritage trees and street trees. The city also requires planting of street and parking lot trees as a condition to most new development. Overall, the city's focus is on retaining canopy cover, with a large emphasis on tree mitigation during development and within sensitive areas. Oregon City is currently in the process of revising its tree regulations, which should be completed sometime this year. The city is also updating its natural overlay district (17.49) to comply with Metro's title 3 and 13. Historic/heritage trees are regulated by the city. Heritage trees are to be designated by the natural Resources Committee. A process for designation of Heritage Trees has been written into the latest code amendment, but no trees have been designated yet.

Oregon City does not have Tree City USA designation, an established urban tree committee or board, or an adopted urban forestry plan.

City of Portland

The City of Portland first received Tree City USA designation in 1979. In 1995 Portland adopted its first urban forestry management plan and its current tree regulations and urban forestry commission. The City of Portland's urban forestry plan was revised in 2004 and followed by an Urban Forestry Action Plan in 2007. Both these documents and the Comprehensive Plan contain policies relating to urban forestry in Portland. Other than Vancouver, it is the only jurisdiction that has explicit targets for urban forest canopy cover by land-use category. Portland has an established Neighborhood Tree Liaison Program that has trained neighborhood representatives as Neighborhood Tree Stewards (NTS) in urban tree care and the city's urban forestry rules and programs. The Parks Urban Forestry Division offers a 7-session course to prospective NTSs that educates stewards on general tree care, tree biology, tree planting, preservation, and identification. Once trained, NTSs work with PP&R staff on tree projects in their neighborhood.

Various city codes and chapters regulate tree removal, protection, and mitigation depending on the location, size, species, land use zone, and type of development proposed. On a single property regulations may vary further depending on size of property, size of trees and canopy cover, whether it is public or private ownership, the type of development proposed, whether the property is developed, or whether the tree was preserved as a condition of past development. Since 1972 Portland Parks and Recreation's (Parks) Urban Forestry Division has regulated trees in parks and in the public right-of-way (Chapter 20.40). Since 1995 Parks has also regulated tree removal on private property in instances that do not involve development (Chapter 20.42). Parks also staffs the Urban Forestry Commission and runs the Heritage Tree Program, a Neighborhood Tree Liaison Program, and various education and planning efforts. Title 16 and Title 17 also include tree regulation in the public right of way and associated with other public infrastructure (sewer and stormwater systems). The City is considering a new rule to regulate private streets trees by administrative rule (under Chapter 24). The Bureau of Development Services regulates tree preservation, protection and mitigation associated with land divisions and with all development in special overlay zones and Plan Districts.

In recent years there has been considerable confusion about Portland's tree regulations and concern about regulatory gaps, loopholes, adequacy of mitigation, inspections and enforcement. The City of Portland is in the midst of a comprehensive review and evaluation of tree regulations and their administration and enforcement. The "City-Wide Tree Project" identified a number of problems with the existing regulatory structure including regulatory gaps and administrative complexity. The project has suggested the need for greater consolidation and consistency and to elevate tree preservation and protection in the development review process.

The City of Portland funds urban forestry and urban forestry related activities through a variety of sources and through different bureaus. The Bureau of Development Services is funded largely through permit fees. The Urban Forestry Division is funded largely through the general fund but also through grants. Portland Parks also conducts natural area acquisition with funds from bonds and system development charges. The Bureau of Environmental Services coordinates Portland's "Grey to Green Initiative" which uses some sewer and stormwater fees to fund natural area acquisition and watershed re-vegetation, including tree planting. The Grey-to-Green initiative has a goal of planting 83,000 trees over a five-year period at a cost of roughly \$14 million. Meeting this goal will depend on success in securing federal stimulus funds. As part of that goal

the City planted some 1,700 street trees through a partnership with Friends of Trees and 144 trees in public parks and natural areas.

In 2007 the City of Portland began the [Citywide Tree Project](#), “a multi-bureau effort to clarify, simplify and provide a consistent and effective regulatory framework for trees in the City of Portland.” Over several months the City has worked with a diverse group of stakeholders to develop a series of issue papers describing the city’s policies, regulations, and administrative processes and indentifying problems and possible solutions for reform. In February 2009 staff presented a preliminary set of policy solutions and regulatory improvements to the Planning Commission. The interbureau project staff is currently preparing a refined set of policy and regulatory changes scheduled to go before the Planning Commission fall 2009. These include proposals to:

Establish a clear, cohesive regulatory framework.

- Establish a single point of contact for the public
- Pilot a 24-hour response line
- Create Comprehensive, Consolidated Tree/Urban Forestry Title
- Develop a Tree Technical Manual
- Create a consistent, equitable tree cutting permit system
- Clarify and build community understanding of the public and street tree permit system
- Consolidate permitting functions

Enhance the Urban Forest through development and redevelopment

- Establish flexible development standards to improve tree preservation
- Provide advanced mitigation credit for proactive tree planting
- Improve tree preservation, planting, and mitigation in land division and other discretionary reviews
- Tree Planting Standards for building permits
- Better address tree preservation and protection in public works and capital projects
- Optimize tree preservation and solar energy systems, sign visibility, and views
- Update and clarify in-lieu of planting fees and tree fund
- Improve implementation, inspections, resolution of violations

City of Rivergrove

The City of Rivergrove has no urban forestry related policy goals in its comprehensive plan but has had an ordinance regulating tree removal for over 10 years. The tree ordinance was mostly recently updated in 2004 and regulates trees on private land and in the public right-of-way. City staff are currently in the process of be updating the ordinance again. The City of Rivergrove regulates tree removal near streams and wetlands consistent with Metro’s Title 13 performance standards.

Ordinance No. 74-2004 requires tree-cutting permits for trees on private land and in the public right-of-way with 11.5 inch diameter measured 4.5 from the ground with special provisions for retroactive emergency permits. Permits are granted promptly for up to three trees within a 12-month period on lots located outside a Water Quality Resource Area. If located inside a Water

Quality Resource Area the permit requires the approval of the Planning Commission at one of its meetings.

City of Sherwood

The City of Sherwood has had urban tree regulations in place for the last 17 years, located within their Zoning and Community Development Code. The city implemented new tree regulations in 2007 (16.142). The city has been designated as Tree City USA for four years and has an established urban tree board or committee. The main goal of the City's tree preservation standards is to minimize the removal of trees and woodlands within the City. Sherwood does not have an adopted urban forestry plan.

The code regulates the size of regulated trees depending on species differently for tree removal and protection requirements within the development process and outside of it. For planned unit developments, site review and subdivision, the code protects Douglas fir, ponderosa pine, red cedar, white oak, big leaf maple and American chestnuts that are ten inches or greater, while all other species are regulated if they are five inches or greater. The code only allows tree removal during development within areas that are needed to build utilities and infrastructure, streets and grading necessary for development in PUD and subdivisions.

Outside of the development process, regulated deciduous trees are those that are 10" or greater and coniferous trees that are 20" or greater. Landowners are allowed to remove five trees per year, not exceeding 100" dbh total. However, there is no permit system in place. Instead, the landowner must only report it to the planning department at least 48 hours before tree removal. If landowners wish to remove more than the maximum allowance then they must apply for a site plan review at a cost of \$200.

Sherwood's natural resource overlay zones define minimum disturbance standards for resource protection, but do not have any regulations that target tree conservation specifically and regulated areas are exceeded by Clean Water Service's vegetated corridor standards. Sherwood does not regulate any heritage or historic trees.

City of Tigard

Tigard has had Tree City USA designation since 2000 and an established tree board for the past seven years. The City of Tigard first implemented its first tree ordinances and regulations 25 years ago. The previous tree regulations governed the removal of all trees on undeveloped land, developed commercial and industrial land, and public land. However, changes to the tree ordinance in 1997 now allow the removal of any tree as long as its removal is mitigated. Currently, tree removal permits are processed by means of a Type I procedure.

Tigard's regulates trees on both public and private property. Regulated trees during development are defined as any tree \geq 6 inches dbh. Trees that require a removal permit include street trees, trees on city property, trees that were planted as a condition of development approval, trees in sensitive lands areas, trees on developing properties, trees that are restricted on the deed of a

property, and heritage trees. Removal is defined as the cutting or removing of 50 percent (50%) or more of a crown, trunk, or root system of a tree (Section 9.06.020).

In fiscal year 2007/2008 Tigard spent approximately \$200,000 on urban forestry related activities. Funding comes from general fund allocations (mostly property taxes), development fees, and grants. Additional funding comes for urban forestry related activities come from Clean Water Services stormwater service fees. Through a partnership with Clean Water Services, the City of Tigard is conducting stream restoration and enhancement projects that will result in the planting of approximately 100,000 native trees from 2001 to 2011. Also, the City's Public Works Department annually plants approximately 250 new or replacement trees on public lands, distributes street trees each year to private property owners through the Street Tree Program, and plants 25 trees in celebration of Arbor Day.

Tigard is currently developing an Urban Forestry Master Plan, scheduled for completion in November 2009. This will include revisions to Tigard's tree and landscaping ordinances and the development of a tree grove protection program.

City of Troutdale

Troutdale has had tree regulations that apply both during development and outside of the development review process for at least eight years. The city has had Tree City USA status since 2000 with its parks advisory committee acting as the city's tree board. Troutdale's tree ordinance, is in the City's Municipal Code. It addresses the planting and maintenance of street trees, heritage trees and the removal of trees on undeveloped properties.

The City's street tree fund is restricted to the planting, maintenance and removal of street trees. Resources come from street tree fees during development, donations, grants or penalties. The city has also created a manual that includes a list of approved street trees, prohibited street trees and planting and pruning guidelines. It also has street tree plan to regulate the maintenance and tree removal of street trees.

The city of Troutdale regulates trees that are ≥ 6 inches in diameter. Tree removal regulations can be found within section 13.10.270 of the municipal code. There is no permit requirement for tree removal in developed property, only for undeveloped or underdeveloped properties. These include any vacant platted subdivision lots or partition parcels, or any developed properties able to be partitioned into two or more lots. A tree removal permit can be obtained in conjunction with a land use permit or under a Type II permit when not in concordance with a land use permit. The code allows for the removal of hazardous, dead or diseased trees within city limits, within all land uses.

City of Tualatin

The City of Tualatin has had Tree City USA status since 1987. The City of Tualatin has had a tree preservation ordinance and urban tree committee in place since 1979. The City Council adopted the existing ordinance in 2001 with an Urban Forestry Management Plan that focuses on

street trees. The City of Tualatin has won several awards for its urban forestry activities over the last 25 years.

Tualatin regulates removal of trees greater than 8 inches in diameter during development review and outside the development process. However various exemptions allow tree removal of trees greater than 8 inches outside these permit processes. The city of Tualatin does not require mitigation when regulated trees are removed unless those trees were designated for preservation and were lost or damaged during construction. Tualatin is working on developing new regulations that would require mitigation. Some tree preservation and tree protection apply in Tualatin's Natural Resource Protection Overlay but these areas are mostly covered by Clean Water Service's vegetated corridor standards. The City of Tualatin regulates street trees and requires the planting as a condition of approving development. The city also pays for some street tree planting. Additional tree planting requirements are applied in parking lots and as part of landscaping requirements. Over the years, urban forestry activities in Tualatin are funded via a combination of property taxes, development fees, general fund allocations, grants, and the City's Road Fund. In the 2007-2008 fiscal year the City of Tualatin spent \$215,465 on urban forestry related activities.

City officials in Tualatin are currently considering a number of potential changes to the City's tree codes including reducing exemptions that allow tree removal outside the permit process, the size of regulated trees, and requiring some mitigation of tree removal. There is also discussion of raising additional funds for urban forestry activities by establishing a Tree Bank Fund for in lieu mitigation and/or raising funds through a street utility fee.

City of Vancouver

City of Vancouver first established a street tree ordinance in 1963. The City established an Urban Forestry Commission in 1987 and achieved Tree City USA status with updated policies and regulations relating to urban forestry. Vancouver adopted its existing policies and regulations governing private tree removal and mitigation in 1997. In 2006, Vancouver adopted a revised street tree ordinance to reflect national standards and best management practices.

In 2007 Vancouver adopted its current Urban Forest Management Plan. The City's Urban Forestry Plan included a 2003 urban forest canopy inventory that established a baseline of canopy cover by land-use type and established goals for expanding urban forest cover over time. Although the plan specifies no target date for achieving canopy cover goals, the inventory will be revisited in 2011 to evaluate whether existing policies and programs are adequate.

Regulations governing tree protection, removal and mitigation include:

- The Tree Conservation Ordinance, VMC 20.770, established in 1997 and amended in 2004 regulating trees on private land including Vancouver's Heritage Tree program. VMC 20.770 primarily applies when and a property is developed or to trees preserved or planted as a condition of past development.
- Street Tree Ordinance, Vancouver Municipal Code (VMC) 12.04, established in 1963 and amended in 2006 regulating trees in the public right-of-way.

- The Critical Areas Ordinance, VMC 20.740, adopted in 2005 to protect environmentally sensitive or natural hazard lands.
- Landscaping Code, VMC 20.925, requires tree planting.

The existing suite of ordinance aim- directly or indirectly- to protect and enhance a variety of public values associated with urban forests including air and water quality, wildlife habitat, public health and safety, property values, economic development, and implementation of state and federal law. Vancouver requires the planting of street and parking lot trees as a condition of development.

Vancouver’s Urban Forestry Division’s budget for the 2007-2008 fiscal year totaled 950,000. The Division has 3 full time employees including a City Forester, funds tree planting in the public right-of-way and on public and private land, and has a number of partnerships with private and private-non-profit entities to promote stewardship and expansion of Vancouver’s urban forest. Funding from urban forestry comes from stormwater fees, the City’s general fund and compensatory mitigation via a City Tree Fund.

The City of Vancouver has no specific plans for making policy changes. However an assessment of urban forest canopy cover in 2011 for the entire City will aid in evaluating progress in achieving the goals and targets established in the Urban Forestry Management Plan. If goals are not being achieved then the policies and regulations could be revisited and revised. This could include revisiting the required minimum tree density standard.

Washington County , Urban Unincorporated

Washington County limited policies and regulations relating to tree preservation or mitigation outside "Significant Natural Resources Areas" mapped and regulated as part of the County's acknowledged Goal 5 Program or Floodplain and natural drainage hazard areas. Policy 10.h for "Biological Resources and Natural Areas" of the comprehensive plan circumscribes tree regulations to significant natural areas by committing the County to "Develop tree conservation standards to regulate the removal of or damage to trees and vegetation in identified Significant Natural Areas within the unincorporated urban area, in order to retain the wooded character and habitat of urban forested lands." Section 421 references the retention of "large trees" in flood areas. Section 422 governs tree removal associated with Significant Natural Resource Areas. These regulations have been in place since 1983. In addition, Section 407 for Landscape Design of the Community Development Code has standards for tree removal (not tree preservation) but not for tree preservation. Section 407 also contains planting standards associated with development including street trees. Some Community Plans have additional tree protections for specific sites, however all but Community Plan subordinates tree retention to “development of the site at the planned density.” Section 404 has specific tree-related standards for planned developments. No mitigation of tree removal is required. No permit is required to cut trees outside the development review process unless the site is identified as a Goal 5 resource on the applicable Community Plan. Washington County has no official sanctioned tree committee, board, or commission. The County does not have an Urban Forestry Management Plan.

Discussions with planning staff and citizens in Washington County reveal that tree removal is often deemed unavoidable because of zoned densities this widespread view may limit more innovative designs. Section 207-5.1 of the CDC specifies that conditions on approved development “shall not restrict densities to less than that authorized by the development standards of this Code.” This provision is often invoked as the reason for not preserving more trees. However there is also some disagreement as to whether staff can or does use its full discretion to preserve trees through clustering or design modification. The widespread view that tree preservation is impractical or unachievable at planned densities may dissuade staff from using their discretionary authority to preserve trees. In sum, both a lack of specific standards for tree preservation and the presumption that trees cannot be accommodated at zoned densities results in little tree preservation in urban unincorporated Washington County.

The Joint-CPO Tree Code Group formed in the summer of 2007 to explore policy and code changes and stem the accelerated loss of trees in urban unincorporated Washington County. CPO representatives and interested citizens worked together to research what policies and development codes other counties and cities have implemented to address tree preservation and increase urban forest canopy. Joint-CPO Tree Code Group produced an executive summary and research report spring of 2009 that was submitted to the Washington County Board of Commissioners. The Joint-CPO Tree Code Group has request that development of urban forestry policies be included on the County’s 2009 Work Program as a Tier 1 (priority) item. The County Commissioners did not include the request in the 2009 Work Program but there will consider for future work plans. For more information on the Joint-CPO Tree Code Group see: <http://www.washcotreegroup.org/>.

City of West Linn

The City of West Linn has had Tree City USA status for over a decade. West Linn has no explicit urban forestry related policy goals, beyond those outlined in the purpose of its community tree ordinance no. 1542. The City Council adopted these regulations into Sections 8.500-8.750 of the Municipal code in 2006 and revised them in 2008 to regulate tree removal on private property and in the public right-of-way when development is not proposed or in instances where tree removal is proposed after a development application for a site has been approved. The West Linn Development Code contains Section 54 Landscaping and Section 55 Design Review that also regulate removal and planting when development is proposed.

The City of West Linn funds urban forestry through development permits and money from the City’s general fund. These funds amounted to \$100,000 in 2007/2008 fiscal year. Staff in planning, parks, and public works all have responsibilities related to urban tree or forestry. West Linn has City Arborist that works for the Parks department but coordinates with planning and public works. West Linn has no Urban Forestry Management Plan or a tree committee or urban forestry commission. Tree removal, especially in environmentally sensitive areas, has been a controversial issue in West Linn.

No major changes are planned to the tree codes. West Linn staff is planning some minor changes to the municipal code to close loopholes and tighten up some definitions. West Linn is in also considering revisions to Section 28 for Willamette and Tualatin River Protection.

City of Wilsonville

The City of Wilsonville has had Tree City USA designation since 1997. . In part due to unusually strong political leadership and community support, the City has put a high priority of conservation of trees, vegetation and natural areas as integral parts of the City's urban form and quality of life. Since 1997 Wilsonville has received the Tree City USA Growth Award for its progress in education, partnerships, land-use planning coordination, planning and management, and wildlife habitat conservation.

Wilsonville's comprehensive plan and Section and development code includes urban tree and forestry related policy goals. Section 4.600 of the development code requires a permit whether or not development is proposed. However approval to remove up to three trees within a 12-month period is granted if trees proposed for removal are not in a zoned natural resource area, are not street or Heritage trees, and were not required to be retained as a condition of past development. Provisions allow for removal of trees that are hazardous, diseased, dead, or damaged. The City applies discretionary standards including a least impact alternative analysis for situation proposing to remove more than 4 trees and where development is proposed. Decisions are the discretion of the development director can be appealed to the development review board and the City Council. The City of Wilsonville requires mitigation of most regulated trees. In addition to Section 4.6000, the City of Wilsonville regulates tree removal in the public right-of-way, through a Heritage Tree Program and in its Significant Resource Overlay Zone (Section 4.139.00) and Willamette River Greenway (WRG) overlay zone (Section 4.600.30)

The City of Wilsonville funds urban forestry through development permits, grants, general fund allocations, a local improvement district, and a tree mitigation fund. These funds amounted to \$220,000 in 2007/2008 fiscal year and funded 3 positions engaged in urban forestry related planning, permitting, and programming including two certified arborists. Staff in planning, parks and public works all have responsibilities related to urban tree or forestry. Wilsonville has no Urban Forestry Management Plan but does have an established Tree Board.

City of Wood Village

Apart from some landscaping standards that require some street tree planting and some tree planting and vegetation maintenance in one city park (funded by general funds), the City of Wood Village has no policies or programs related to urban forestry.

The City of Wood Village regulates tree removal near streams and wetlands consistent with Metro's Title 13 performance standards. Riparian transition areas are 50' from top of bank and extending up to 200 feet where adjacent slopes are greater than 25%. As of May 2009, Wood Village has yet to substantially comply with Metro Title 13 for water quality and regionally significant fish and wildlife habitat.

VI. Regional Gaps, Future Research, and Next Steps

Many of the functions provided by the urban forest- such as watershed health and some scenic values- are regional in scope and interdependence. Hence the region has a collective interest in addressing gaps in local programs to protect, enhance and expand the urban forest. Several gaps are clearly evident from this assessment. Clearly the handful of jurisdictions that lack any tree ordinances regulating tree removal on private land or in the public right-of-way represents a major gap in policies and programs protecting the urban forest. The relatively small number of adopted urban forestry management plans to guide strategic investment in the urban forest is clearly a major gap many local urban. It is indicative of the inconsistency of policy, funding and staffing levels associated with urban forest management at the local level. That gap is most stark in County urban service areas that appear to most clearly lack the resources, if not the community interest, in urban forestry.

There are a number of areas where greater regional coordination and consistency would help address gaps and support local urban forestry efforts.

- Support local governments with little or no tree removal regulations in developing policies for tree preservation, planting, and mitigation.
- Assistance in monitoring canopy cover and setting targets for expanding the urban forest.
- Researching and disseminating best management practices for tree protection during construction.
- Researching and disseminating best management practices for tree mitigation.
- Identifying and eliminating barriers to protecting, managing and expanding the urban forest in the public right-of-ways, particularly in denser urban neighborhoods.
- Identifying new funding sources for protecting, managing, and expanding the urban forest.
- Quantify ecosystem service values of urban trees at a local level.
- Strategies for improving enforcement of tree preservation and protection regulations.

In conducting this project we encountered numerous opportunities to share and exchange information about the work of individual jurisdictions and Metro in the arena of urban forestry. There would seem to be great value in having regional setting or forum through which local staff, citizens, and urban forest practitioners could regularly meet and exchange information on local programs and policies.

There are three of areas of focus that would be of value in future assessments. It was difficult as part of this assessment to summarize urban forest management on public parklands for individual jurisdictions because a significant public parks are owned and managed by Districts that encompass multiple jurisdictions. As a consequence urban forestry activities of local park departments occurring on public land were not adequately summarized here and could be a focus of future assessment work. A related challenge related to consistently and adequately assessing funding for local urban forestry-related programs and activities. In part, this challenged stemmed from the diversity of local programs and the fact that urban forestry-related activities are likely to occur in many different city bureaus or departments. Future assessments should attempt to

comprehensively address the funding mechanisms and amounts that support local urban forest management. Finally, it was difficult to assess the efficacy of enforcement and compliance of regulatory programs that appeared to depend on staffing levels, political leadership and citizen organization and involvement. There is widespread perception by citizen advocates and some recognition by local staff that enforcing tree regulations is a lower policy and administrative priority relative to enforcement of other zoning or land-use regulations. While it could be time consuming and labor intensive, future research should assess the degree to which new development complies with local governments' tree preservation, planting and mitigation requirements.

VII. Appendices

Appendix A Phase I Survey Questions

Appendix B Phase II Survey Questions for Private Land, Public ROW, Public Land

Appendix C Jurisdiction Contacts

Appendix D Research Biographies

Appendix E GIS Analysis Results

Appendix F Phase Table I Demographic and Tree Canopy Data

Appendix G Phase I Survey Results

Appendix H Phase II Survey Results

Appendix I Table I Comparative Analysis of Local Tree Preservation Regulations for Private Land

Appendix J Table II Comparative Analysis of Local Tree Preservation and Mitigation Standards on Private Land

Appendix K Table IV Comparative Analysis of Local Street Tree Policies

Appendix L Table V Comparative Analysis of Urban Forestry Management