Urban Forest Sustainability and Management Review Report

For the City of Raleigh, North Carolina

Prepared by Dovetail Partners

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RALEIGH URBAN FORESTRY SUSTAINABILITY AND MANAGEMENT REVIEW FORM

Overview

The Urban Forest Sustainability & Management Assessment System is designed to provide a framework for comprehensively evaluating urban forest management programs.

The primary objectives are to:
- engage the full spectrum of the organizations' management team: executive, financial, resource, and outreach,
- provide program direction that increases the level of professionalism in urban forest management,
- conduct a gap analysis of management practices and the health of green assets
- increase the health of the green assets managed by the program, and…
- optimize this management for identified ecosystem services (i.e. reach an acceptable benefit:cost ratio).

This system (the checklist and the process) can be used for municipal or county urban forest management programs, or to evaluate college or corporate campus management programs. The system is particularly suited for the independent evaluation of participants in Arbor Day Foundation programs like Tree Campus USA®, Tree City USA® or Tree Line USA®. The system identifies program components that are critical for a community interested in setting and consistently achieving sustainability targets (e.g. urban tree canopy).

The system includes 11 categories of review. This review was completed following a broader study of the urban wood utilization and management programs of the city, which included extensive internal and external stakeholder engagement and consultation. The results of that study helped inform the review process. This review as completed with the assistance of a review committee consisting of local experts. Following is a brief summary of the findings for each of the eleven categories. Further descriptions of specific findings for each category are included in the Appendix (Raleigh Urban Forestry Sustainability and Management Review Form).

Summary of Findings for 11 Categories of Review

1. Management Policy and Ordinances

The City of Raleigh performs well within the Policy and Ordinances category. The City has a Comprehensive Plan, City Tree Manual, Unified Development Ordinance, and City Code that provide the basis for addressing the criteria within this section. There are opportunities for improvement within the Risk Management category (also see Category 7 for Risk Management). The City is particularly strong in having up-to-date policies and ordinances and including careful consideration of diverse management opportunities, including climate change, human health, wildlife, habitats, and unique forest areas and values.

2. Professional Capacity and Training

The City of Raleigh is strong in the category of Professional Capacity and Training with its emphasis on Certified Arborist credentials and professional involvement. The City is not involved with some of the specific programs that are listed in the assessment checklist and opportunities for participation can be reviewed and considered periodically.

3. Funding and Accounting

The City of Raleigh and the Parks, Recreation, and Cultural Resources (PRCR) Department have a robust and comprehensive annual budgeting process that provides sufficient detail for program operations as well as procedures for prioritization and contingencies. The City does not have a highly formalized process for monitoring ecosystem services or green infrastructure data, outside of the NeighborWoods annual reporting.

4. Authority

The City of Raleigh and the PRCR department have well established Decision and Management Authorities, including clear definitions of roles, responsibilities, and job duties. There is opportunity for improvement in the establishment of a clearer understanding of the Communication Protocol to ensure that gaps in project management don't occur.

5. Inventories

The City of Raleigh does not have a complete urban forest inventory; however, the information provided within the inventory which includes 80% of street trees and the 2008 UFORE Assessment provide a strong inventory baseline. This baseline continues to be enhanced with "real-time" updating from work orders and program activities. The inventory system could be enhanced by including sampling and data within the greenway and nature preserve areas that the city manages. The PRCR department will also need to evaluate inventory strategies for addressing the present and future management needs of the new Dorothea Dix parks acquisition.

6. Urban Forest Management Plans

The PRCR Department has many different elements of an Urban Forest Management Plan but some specific components are missing (e.g., criteria and indicators) and the materials are not gathered into a comprehensive overarching document that is easily accessed or communicated. The City has indicated an interest in developing a Management Plan, including providing the resources to support a planning process, but it has not yet been completed. Development of a complete management plan could help support the various goals and activities of the UF program, including the appropriate application of forestry objectives (e.g., species diversity and appropriate planting selections) versus a narrow emphasis on design intent (e.g., single species plantings).

7. Risk Management

The PRCR department has many of the pieces in place for a high quality risk management strategy; however, there may be opportunities to review procedures and protocols to ensure that practices are well documented and commonly understood. Updating CityWorks to the most current version may also provide some benefits to operations.

8. Disaster Planning

The PRCR Department recently established pre-position contracts to facilitate disaster and emergency responses for critical needs. To further support the efficiency and effectiveness of disaster planning, the PRCR could consider development of a comprehensive Mitigation Plan (potentially as a component within the overall Management Plan). Ensuring effective communication and sharing of information with the Urban Forest Strike Team (UFST) may also be beneficial. Staff involvement and training with the UFST can help develop the internal capacity that the UFST offers following emergency events (for more information, see: http://www.ufst.org)

9. Practices (Standards & BMPs)

The PRCR Department has established strong standards, practices, and BMPs through the UDO and CTM. As further experience is gained with these requirements, they can be improved as needed. It is also important to consider training, workshops, and other communication activities to ensure partners, stakeholders, contractors and others clearly understand how to comply with the requirements. There are grant opportunities for such training.

10. Community

The PRCR Department has strong community relationships which are illustrated very clearly in the NeighborWoods program and the level of documented volunteerism. The City is currently in the highly enviable position of having strong public trust (as illustrated in the findings of the prior assessment and survey activities conducted during the first phase of this project). It is very important to maintain the level of performance that has built this trust. Public engagement and public input opportunities are key strategies for the city.

11. Green Asset Evaluation

The on-site green asset evaluation was completed with city staff and the review team on June 14th, 2016. The green asset evaluation confirmed that the City of Raleigh and the PRCR Department have established an exceptional UF program. The program is comprehensive, well-defined, and professionally managed. The necessary policies and procedures are in place, and the field inspection demonstrates effective implementation. The strong program and the constructive public engagement are significant accomplishments and demonstrate the leadership of the City. However, there is reason to raise some initial concerns about potential risks to the future of the program. It has been noted that the development pressures are on the rise again in the community and this increases the need for monitoring and enforcement of tree protection measures. Additionally, in 2015 the City acquired responsibility for the Dorothea Dix property which also increases the management responsibilities for PRCR. Both of these areas of increased responsibility are also highly visible to the public.

Conclusion

The City of Raleigh's Parks, Recreation, and Cultural Resources (PRCR) Department has a strong urban forestry program. The review found many instances where the work exceeds common practice. There are also specific opportunities for improvement, some of which are areas where the City already has efforts underway. These opportunities include inventory efforts, urban forest management planning, and effective practices (standards and BMPs).

The City is currently in an enviable leadership position with a high level of public respect for the quality of the urban forestry program; however, a decline in the performance of the program or significant mis-steps with new initiatives can quickly erode public trust and create long term operational challenges.

It is important that the City maintain the high level of performance through:

1) adequate staffing, including inspectors;
2) inter-departmental training and strengthened communication and monitoring protocols between departments when projects impact trees (e.g., planning, engineering, etc); and
3) sufficient resources to support maintaining quality operations and public trust, including collaborative programs such as NeighborWoods, public engagement processes, and public-private partnerships.

For further information about the *Urban Forest Sustainability and Management Review* (UFSMR) system utilized in this project and supported by Urban Forestry South – Centers for Urban and Interface Forestry, USDA Forest Service, Forestry Sciences Laboratory in Athens, GA, see: http://www.urbanforestrysouth.org/

For information about review and assessment efforts that occurred prior to and helped inform this assessment, please see the report: *Raleigh, North Carolina: An Assessment of Municipal Tree Utilization and the Urban Forestry Program* prepared by Dovetail Partners and available at:
http://www.dovetailinc.org/report_pdfs/2016/dovetailurbanassessvanc0416.pdf

SUMMARY of RESULTS

Standard of Care (SOC)

17 actions are identified as essential core activities for a sustainably managed municipal urban forestry program.

The City of Raleigh is active in all 17, including 4 which exceed common practice.

Category	Item	Description	Evaluation
Management Policy & Ordinances	1.03	Risk Management	2) Adopted Common Practice
	1.11	Ordinance (Public)	2) Adopted Common Practice
Professional Capacity & Training	2.01	Certified Arborist - Staff	3) Exceeds Common Practice
	2.02	Certified Arborist - Contracted	3) Exceeds Common Practice
	2.03	Certified Arborist - Other Resource	1) In Development
Funding & Accounting	3.01	Budgeted Annually	2) Adopted Common Practice
	3.02	Contingency Budget Process	2) Adopted Common Practice
Decision & Management Authority	4.01	Urban Forest Manager	3) Exceeds Common Practice
	4.02	Staff Authority	2) Adopted Common Practice
Risk Management	7.01	TRAQ Attained	3) Exceeds Common Practice
	7.02	Annual Level 1 (ANSI A300 Part 9 & ISA BMP)	2) Adopted Common Practice
	7.03	Mitigation Prioritization	2) Adopted Common Practice
	7.05	Recordkeeping, Reporting, and Communications	2) Adopted Common Practice
	7.06	Standard of Care Adopted	2) Adopted Common Practice
	7.07	Tree Risk Specification	2) Adopted Common Practice
Practices, Standards, & BMPs	9.01	ANSI Standards	2) Adopted Common Practice
	9.10	Tree Risk	2) Adopted Common Practice

SUMMARY of RESULTS

'Next Step' Activities

29 actions are identified as 'next step' activities necessary for an advanced, sustainably managed, municipal urban forestry program. Of these, 7 refer to private trees, not applicable to the City of Raleigh's Parks, Recreation and Cultural Resources Department.

Of the 22 actions relevant for this review, the City of Raleigh is active in 20, including 2 which exceed common practice.

Category	Item	Description	Evaluation
Management Policy & Ordinances	1.02	No Net Loss	2) Adopted Common Practice
	1.04	Tree Canopy Goals	2) Adopted Common Practice
	1.06	Utility	3) Exceeds Common Practice
Decision & Management Authority	4.04	Tree Board. Commission, or Advisory Council	2) Adopted Common Practice
Inventories	5.04	Is there a recent (5 year) inventory?	1) In Development
	5.05	Parks/Riparian Areas	1) In Development
	5.06	Other Public Trees	1) In Development
	5.07	Continuous inventory on a cycle (≤5 years; i.e. panel)	1) In Development
	5.09	Campus (Educational)	0) Not Practiced
	5.10	Corporate	0) Not Practiced
	5.11	Other Private Property	0) Not Practiced
Urban Forest Management Plans	6.03	Street Tree Management	2) Adopted Common Practice
	6.04	Parks/Riparian Area Management	2) Adopted Common Practice
	6.05	Other Public Trees	2) Adopted Common Practice
	6.07	Campus (Educational)	0) Not Practiced
	6.08	Corporate	0) Not Practiced
	6.09	Other Private Property	0) Not Practiced

Summary of Results 'Next step' activities continued

Category	Item	Description	Evaluation
Risk Management	7.08	Urban Tree Risk Management	2) Adopted Common Practice
Disaster Planning	8.03	Urban Forestry Disaster Plan	2) Adopted Common Practice
	8.04	Pre-disaster Contracts	3) Exceeds Common Practice
	~~8.05~~	~~Mitigation Plan~~	~~0) Not Practiced~~
Practices, Standards, & BMPs	9.02	Arborist Standards	2) Adopted Common Practice
	9.04	Fertilization and Mulching	2) Adopted Common Practice
	9.05	Lightning Protection Systems	0) Not Practiced
	9.06	Planting	2) Adopted Common Practice
	9.07	Pruning	2) Adopted Common Practice
	9.08	Removal	2) Adopted Common Practice
	9.09	Support Systems (Guying and Bracing)	2) Adopted Common Practice

SUMMARY of RESULTS

Advanced Management Activities

There are 71 additional program actions or elements that are considered as advanced urban forestry management activities.

Of these 71 management elements or practices, 69 are relevant to assess in this review. The City of Raleigh is active in 59 of them, including 12 which exceed common practice.

Category	Item	Description	Evaluation
Management Policy & Ordinances	1.01	Climate Change (Sustainability)	3) Exceeds Common Practice
	1.05	Tree Protection	2) Adopted Common Practice
	1.07	Human Health – Physical & Psychological	2) Adopted Common Practice
	1.08	Wildlife Diversity/Habitat/Protection	3) Exceeds Common Practice
	1.09	Performance Monitoring	2) Adopted Common Practice
	1.10	Ordinance (Private) V	2) Adopted Common Practice
	1.12	Development Standards	3) Exceeds Common Practice
	1.13	High-Conservation Value Forests	3) Exceeds Common Practice
Professional Capacity & Training	2.04	Other Professional -Advising/ directing UF management	2) Adopted Common Practice
	2.05	Municipal Forestry Institute	1) In Development
	2.06	Urban Forestry Institute – Region 8	not invited
	2.07	Campus/city arborist – ISA CA instructor for CEUs	0) Not Practiced
	2.08	Tree Board University	0) Not Practiced
Funding & Accounting	3.03	Funding Calculated from Community Attribute	2) Adopted Common Practice
	3.04	Funding Based on Performance Monitoring	1) In Development
	3.05	Urban Forestry Line Item	2) Adopted Common Practice
	3.06	Green Asset Accounting	2) Adopted Common Practice

Summary of Results Advanced activities continued

Decision & Management Authority	4.03	Communication Protocol	1) In Development
	4.04	Tree Board. Commission, or Advisory Council	2) Adopted Common Practice
Inventories	5.01	Canopy Inventory (UTC)	2) Adopted Common Practice
	5.02	Ecosystem Services	2) Adopted Common Practice
	5.13	Spatial	3) Exceeds Common Practice
	5.14	Maintenance and Planting Records Maintained	1) In Development
Urban Forest Management Plans	6.01	Annual Maintenance Calendar	2) Adopted Common Practice
	6.10	Green Infrastructure	0) Not Practiced
	6.11	Other Written Plans	1) In Development
	6.12	Tree Planting	2) Adopted Common Practice
	6.13	UF as Part of a Comprehensive Plan	3) Exceeds Common Practice
	6.14	Urban Forest Planning and Management Criteria and Performance Indicators	0) Not Practiced
Risk Management	7.04	Occupancy Areas Mapped	2) Adopted Common Practice
Disaster Planning	8.01	Response/Recovery Mechanism V	2) Adopted Common Practice
	8.02	Urban Forestry as part of the County Disaster Plan V	2) Adopted Common Practice
	8.06	EMAC Mission Ready Packages (MRP)	0) Not Practiced
Practices, Standards, and BMPs	9.11	Green Infrastructure	0) Not Practiced
	9.12	Construction Management Standards	2) Adopted Common Practice
	9.13	Design Standards	2) Adopted Common Practice
	9.14	Genus/Species Diversity	2) Adopted Common Practice
	9.15	Ages/Diameter Distribution	2) Adopted Common Practice
	9.16	Minimum Planting Volume	2) Adopted Common Practice
	9.17	Minimum Tree Size	2) Adopted Common Practice

Summary of Results Advanced activities continued

Practices, Standards, and BMPs	9.18	Root Protection Zone (CRZ)	2) Adopted Common Practice
	9.19	Topping	2) Adopted Common Practice
	9.20	Tree Species List	2) Adopted Common Practice
	9.21	Tree Quality Standards	2) Adopted Common Practice
	9.22	Utility Right-of-Way Management	3) Exceeds Common Practice
	9.23	Wood Utilization	2) Adopted Common Practice
	9.24	Third-party forest products certification compliance	0) Not Practiced
	9.25	Energy generation	0) Not Practiced
	9.26	Composting of Leaf and/or Other Woody Debris	2) Adopted Common Practice
Community	10.01	American Grove	0) Not Practiced
	10.02	Education	3) Exceeds Common Practice
	10.03	NeighborWoods® Program	3) Exceeds Common Practice
	10.04	Open Tree Map	0) Not Practiced
	10.05	Public Perception	3) Exceeds Common Practice
	10.07	Arbor Day Celebration	2) Adopted Common Practice
	~~10.08~~	~~Arboretum designation~~	~~no arboretum~~
	10.09	Significant trees	2) Adopted Common Practice
	10.10	Memorial/Honorarium	3) Exceeds Common Practice
	10.11	Social Media	3) Exceeds Common Practice
	10.12	Tree Care	2) Adopted Common Practice
	10.13	Tree Campus USA®, Tree City USA®, Tree Line USA®	2) Adopted Common Practice

Summary of Results Advanced activities continued

Green Asset Evaluation (observed outcomes)	11.01	Deadwood	2) Adopted Common Practice
	11.02	Genus Diversity	2) Adopted Common Practice
	11.03	Mature Tree Care	3) Exceeds Common Practice
	11.04	Mulching	2) Adopted Common Practice
	11.05	Planting Site Volume Optimization	2) Adopted Common Practice
	11.06	Rooting Volume Optimization	2) Adopted Common Practice
	11.07	Species Diversity	2) Adopted Common Practice
	11.08	Soil Compaction	1) In Development
	11.09	Tree Health	2) Adopted Common Practice
	11.10	Young Tree Pruning	2) Adopted Common Practice

Appendix 1.

RALEIGH URBAN FORESTRY SUSTAINABILITY AND MANAGEMENT REVIEW FORM

Throughout this document:

Standard of Care (SOC) elements represent the minimum group of urban forestry management "best practices" that a municipality/owner should consider for implementation. Standard of Care refers to the degree of prudence and caution required of an individual who is under a duty of care (i.e. legal obligation of the controlling authority, owner, or manager) to minimize risk.

Base Practices (BP) elements represent additional urban forest management elements that may effectively expand a program beyond the SOC group. These elements are typically precursors to other "non-core" or advanced elements in any category.

The "FINDINGS" column provides a description of the documentation and observations related to the assessment of Raleigh's urban forestry program.

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1 Management Policy & Ordinances

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
1.00	Approved Policy Statements		Written policy statements approved by a governing body.		
1.01	Climate Change (Sustainability)	Also referred to as Sustainability. With reference to urban trees. Addresses the long-term health and productivity of the natural resource.		pg. 110 of 2030 Comprehensive Plan includes "Raleigh's Climate Protection Commitment" which includes "Maintain healthy urban forests; promote tree planting to increase shading and to absorb carbon dioxide"	**3) Exceeds Common Practice**
1.02	No Net Loss	Can refer to trees, basal area, or canopy.		pp 129-132 of the 2030 Comprehensive Plan include canopy and reforestation goals, including forested buffer conservation. However, there is no specific "no net loss" reference	**2) Adopted Common Practice**
1.03	Risk Management	Should reference: ANSI A300 Part 9, ISA BMP, and prioritization funding mechanisms.		City Tree Manual references ANSI A300 standards, but not Part 9 specifically; the City Tree Manual requires ISA Certified Arborists but does not reference ISA BMP. The CityWorks monitoring lists provides prioritization of activities.	**2) Adopted Common Practice**
1.04	Tree Canopy Goals	Overall community/campus goal, or by designated "zone".		pp 129-132 of the 2030 Comprehensive Plan include canopy and reforestation goals, including forested buffer conservation.	**2) Adopted Common Practice**
1.05	Tree Protection	Construction and/or landscape maintenance.		City Tree Manual Chapter 2 addresses Tree Protection Standards	**2) Adopted Common Practice**
1.06	Utility	Utility pruning, planting, and installation policy (e.g. boring vs. trenching).		City Code 9-8008, City Tree Manual Chapter 5 addresses Utility Clearance Standards	**3) Exceeds Common Practice**
1.07	Human Health – Physical & Psychological	Recognizes and addresses the human health benefits of the natural resource (e.g. exercise, air quality, stress management, shade). Could also include Urban Heat Island (UHI) policies.	Also see 1.11, 1.02	The 2030 Comprehensive plan addresses human health, including physical (e.g., exercise under "Pedestrian and Bicycle Circulation", including parks); air quality, open space to resident ratio; etc.	**2) Adopted Common Practice**
1.08	Wildlife Diversity/Habitat/Protection	Mammals, birds, or reptiles.		As described in the Comprehensive Plan, Natural areas in Raleigh's park system include categories of "Nature Preserves" and "Protected Natural Areas". Both of these categories are based upon consideration and stewardship of high quality plant and animal populations and maintaining their habitat.	**3) Exceeds Common Practice**

1 Management Policy & Ordinances *continued*

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
1.09	Performance Monitoring	Recognizes the annual or biennial calculation of metrics (e.g. some component of ecosystem services) for the purpose of tracking management performance.	Also see 3.04, 5.02 and 5.07 and/or 5.12.	Annual performance reporting is prepared, including the NeighborWoods reporting which calculates benefit value of ecosystem services of air quality, stormwater management, and lower energy costs. There is also annual reporting of activities and projects to support budgeting.	**2) Adopted Common Practice**
1.10	Ordinance (Private) V	Tree protection and management for trees on private property.		Unified Development Ordinance (UDO) Chapter 9.1 and 7.2 address landscaping, screening, and natural resource protection including tree conservation and maintenance.	**2) Adopted Common Practice**
1.11	Ordinance (Public)	Tree protection and management for public trees.		City Code Chapter 9 Section 8 (2015 adoption of new language for *Chapter 8 of Part 9 of the Raleigh City Code*) and the City Tree Manual define tree protection and management for public trees.	**2) Adopted Common Practice**
1.12	Development Standards	US Green Building Council's LEED® rating systems (or similar internationally) LEED v4 BD+C (Sustainable Sites) LEED 4 ND (Neighborhood Pattern & Design, Green Infrastructure) ASLA's SITES® Rating System	Also see 9.24 for sustainable management standards.	The 2030 Comprehensive Plan includes requirements related to meeting USGBC LEED green building ratings (or equivalent) for various categories of construction.	**3) Exceeds Common Practice**
1.13	High-Conservation Value Forests	Programs or policies for identification, acquisition, and/or protection of groups of trees or forests that provide unique public benefits.		As described in the Comprehensive Plan, Natural areas in Raleigh's park system include categories of "Nature Preserves" and "Protected Natural Areas". Both of these categories are based upon consideration and stewardship of high quality plant and animal populations and maintaining their habitat.	**3) Exceeds Common Practice**

2 Professional Capacity & Training

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
2.00	Professional Management		Provision for professional consultation.		
2.01	Certified Arborist - Staff			The City has Certified Arborists on staff. Municipal (2); Arborist (13); Tree Climber	**3) Exceeds Common Practice**
2.02	Certified Arborist - Contracted			A Certified Arborist is required on staff for contractors (e.g., see City Tree Manual pf 24)	**3) Exceeds Common Practice**
2.03	Certified Arborist - Other Resource			The City has access to other Certified Arborists (e.g., at NC State, etc.) and at times a person with these qualifications may be involved in the Park Board or other advisory groups.	**1) In Development**
2.04	Other Professional Advising/ directing UF management	This could be a professional in an allied field like: LA.		The members of the Park Board include other professionals that can inform UF Management. Current Park Board membership includes Landscape Architecture expertise.	**2) Adopted Common Practice**
2.05	Municipal Forestry Institute	Graduate of Society of Municipal Arborist's MFI program.		The City participates in the Society of Municipal Arborists, including attending meetings, but has not achieved this credential.	**1) In Development**
2.06	Urban Forestry Institute – Region 8	Attendance at Region 8's UFI (biennial professional development).		The City has not been invited to attend UFI.	**0) Not Practiced**
2.07	Campus/city arborist – ISA CA instructor for CEUs	Arborist routinely provides ISA CEU presentations/workshops.		The City annually provides speakers and presenters to various local and regional workshops and events but has does not routinely provide ISA CEU presentations. City staff commonly participate in ISA events and conferences.	**0) Not Practiced**
2.08	Tree Board University	On-line training modules from Oregon U&CF (Paul Ries) for Tree Board/ Advisory Council.	Hosted at Arbor Day Foundation website.	The City has not acquired this credential.	**0) Not Practiced**

3 Funding & Accounting

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
3.00	Urban Forestry Budget				
3.01	Budgeted Annually	Budget authorized/required for tree board, tree maintenance, and/or tree planting.	One of these two items must be checked to meet Standard of Care (SOC).	The City's annual budget addresses operations, including maintenance, planting, etc. See FY2017 Budget.	**2) Adopted Common Practice**
3.02	Contingency Budget Process	A protocol is in place to prioritize urban forestry management activities during budget shortfalls; e.g. during times of limited funding for: [1] risk management, [2] young tree care, [3] mulching.		The City utilizes a protocol for supplemental requests and the budgeting process allows to prioritization to address risk management and maintenance activities. See Parks Budget B-20 FY17.	**2) Adopted Common Practice**
3.03	Funding Calculated from Community Attribute	Budget in terms of per capita, per tree, or for performance (e.g. per tree weighted by size class or age.		For FY17 the budget is equivalent to $3.95 per citizen (budget/population calculation).	**2) Adopted Common Practice**
3.04	Funding Based on Performance Monitoring	Budget connected with/based on ecosystem service (ES) monitoring and performance.	Also see 5.02 and 5.07 and/or 5.12.	Budgeting is based upon performance indicators (see G-& in FY2017), including total park and greenway acreage, total greenway mileage, percentage of program evaluations satisfactory or higher, and total tickets sold at Pullen Park Amusements. The budget process also tracks and reports the number of volunteers engaged in the Parks Dep't and the total recreation program registrants.	**1) In Development**
3.05	Urban Forestry Line Item	Is the budget specific to urban forest management?		See FY2017 Parks Budget B-20 for Urban Trees line item.	**2) Adopted Common Practice**
3.06	Green Asset Accounting	Maintain green infrastructure data in the "unaudited supplementary disclosure of an entity's comprehensive annual financial report (CAFR)". GASB 34 implementation for municipalities.	See WERF INFR6R12 Water Asset Accounting 2013. http://www.werf.org	Annual performance reporting is prepared, including the NeighborWoods reporting which calculates benefit value of ecosystem services of air quality, stormwater management, and lower energy costs. There is also annual reporting of activities and projects to support budgeting. However, the city does not utilize the specifically referenced methodology.	**2) Adopted Common Practice**

4 Decision & Management Authority

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
4.00	Authority				
4.01	Urban Forest Manager	Professional urban forest manager with authority over the program and day-to-day activity. Including designated budget line item.	One of these two items must be checked to meet Standard of Care (SOC).	The city has an established Urban Forester (Zach Manor) with authority over the program and activities and budget. The position is defined in the City Code (9-8003, 9-8004) and the budget defines the expenditures, including staff positions.	**3) Exceeds Common Practice**
4.02	Staff Authority	Designated staff with authority over the program and day-to-day activity. Including designated line item.		In addition to the Urban Forester, there are arborists and inspectors with responsibilities for specific programs and activities. These are also outlined within the City Code and Budget. Also see the UF & PRCR Org Chart.	**2) Adopted Common Practice**
4.03	Communication Protocol	Established protocol and mechanism(s) for communication among all members of the urban forest management "community" in your municipality or organization (e.g. manager, department under control, advisory board, finance, field operations, public, NGOs, business community, developers).		The budget outlines the structure of the organization and the various partners and entities included within it. The City Tree Manual addresses appropriate contacts and public communications within the FAQs section. The City Code (9-8003 and 9-8004) address responsibilities of the Urban Forester. The City does not have a specific document addressing communication protocols as described in the criteria.	**1) In Development**
4.04	Tree Board. Commission, or Advisory Council	Establishes a board for public participation (advisory or with authority).	Also see 2.06	The City has a Greenway and Urban Tree Committee. There is also a Park Board.	**2) Adopted Common Practice**

5   Inventories

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
5.00	Inventories and Assessments				
5.01	Canopy Inventory (UTC)	Periodic (≤5 year) canopy inventory and assessment. Public & private.		A comprehensive UFORE Assessment was completed in 2008. Inventory information is kept up to date with continuous information being entered as activities are completed.	**2) Adopted Common Practice**
5.02	Ecosystem Services	Is there a recent (≤5 year) ecosystem services (ES) inventory & assessment? Public: 100% of street trees; Public & Private: sample. Or annual or biennial ES calculations from partial re-inventory and projected growth as a monitoring tool.	Also see 3.04 and 5.07 and/or 5.12.	The UFORE Assessment in 2008 includes a review and estimate of ecosystem services, including air quality benefits and carbon sequestration.	**2) Adopted Common Practice**
5.03	Public Trees V	The publicly controlled urban forest.	Any one of the following sub-elements.		
5.04	Street Trees	Is there a recent (5 year) inventory?		There is an 80% inventory of street trees, gradually being completed with work order entries and "real-time" updating. Also there is on-gong software updating.	**1) In Development**
5.05	Parks/Riparian Areas	Is there a recent (5 year) inventory?		Park trees are inventoried but not greenway and nature preserve areas.	**1) In Development**
5.06	Other Public Trees	Public facility landscaped areas, Industrial parks, green space.		Efforts are underway to address the inventory needs of the new Dorothea Dix's park project area.	**1) In Development**
5.07	Continuous inventory on a cycle (≤5 years; i.e. panel)	Partial re-inventory to support continuous forest inventory, growth projections, and the calculation of ecosystem services for the purpose of long-term monitoring of urban forest management performance (e.g. carbon or leaf surface).	Also see 3.04 and 5.02.	The inventory is continuously updated (e.g., real-time) based upon program activities, maintenance work, and observations.	**1) In Development**
5.08	Private Trees		Any one of the following sub-elements.		
5.09	Campus (Educational)	Is there a recent (5 year) inventory?		N/A	**0) Not Practiced**
5.10	Corporate	Is there a recent (5 year) inventory?		N/A	**0) Not Practiced**
5.11	Other Private Property	Is there a recent (5 year) inventory?		N/A	**0) Not Practiced**

5   Inventories *continued*

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
5.12	Continuous inventory on a cycle (≤5 years; i.e. panel)	Partial re-inventory to support continuous forest inventory, growth projections, and the calculation of ecosystem services as described	Also see 3.04 and 5.02.	N/A	**0) Not Practiced**
5.13	Spatial	Inventory data includes Lat/Long (i.e. GIS). Should address the spatial relationship between the natural resource and people (i.e. residents, visitors, activities) that would help manage the resource for benefits associated with proximity (air quality, recreation, stress mitigation, improved educational opportunity).		The CityWorks program and associated GIS layers provide geographic information and mapping capabilities to evaluate distribution, location, proximity, etc. For example, see NeighborWoods mapping and CityWorks screenshots.	**3) Exceeds Common Practice**
5.14	Maintenance and Planting Records Maintained	Planting details (nursery, species, size, cost, contractor, etc.) maintained with inventory or as separate database or recordkeeping system. Also pruning and removal histories.		Maintenance and planting records are maintained within CityWorks and the NeighborWoods database. There are also paper files.	**1) In Development**

6 Urban Forest Management Plans

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
6.00	Management Planning Activities				
6.01	Annual Maintenance Calendar	To support scheduling: An annual calendar that defines typical activity by season.		An annual maintenance calendar is established and including within the budgeting process.	**2) Adopted Common Practice**
6.02	Public Trees V	The publicly controlled urban forest.	Any one of the following sub-elements.		
6.03	Street Tree Management	Is there a recent (5 year) plan for street trees?		Street tree management plans are addressed within the budgeting process.	**2) Adopted Common Practice**
6.04	Parks/Riparian Area Management	Is there a recent (5 year) plan?		Goals, guidelines, and protection measures for these areas are provided.	**2) Adopted Common Practice**
6.05	Other Public Trees	Green space, public facility landscaped areas, Industrial parks.		Goals, guidelines, and protection measures for these areas are provided.	**2) Adopted Common Practice**
6.06	Private Trees		Any one of the following sub-elements.		
6.07	Campus (Educational)	Is there a recent (5 year) plan for Campus trees?		N/A	**0) Not Practiced**
6.08	Corporate	Is there a recent (5 year) plan?		N/A	**0) Not Practiced**
6.09	Other Private Property	Is there a recent (5 year) plan?		N/A	**0) Not Practiced**
6.10	Green Infrastructure	Is there a plan for green infrastructure (i.e. nodes & linkages)? Large-scale projects.	Also see 9.11.	The City does not have an adopted green infrastructure plan. There are goals within the budget for increasing the linkages between greenways as well as other stormwater management objectives.	**0) Not Practiced**
6.11	Other Written Plans	Other natural resource plans (e.g. tree canopy). May be a component of another plan.		The city utilizes pre-position contracts for hazard tree/hanger removal.	**1) In Development**
6.12	Tree Planting	Is there a recent (3 year) tree planting plan?). May be a component of another plan.		There is a yearly tree planting contract. Also see UDO 8.5.1 and 8.4.1.	**2) Adopted Common Practice**

6 Urban Forest Management Plans *continued*

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
6.13	UF as Part of a Comprehensive Plan	Is any UF management plan referenced in the comprehensive plan (i.e. county or municipality) or master plan (i.e. Campus)?		pp 129-132 of the 2030 Comprehensive Plan address urban forestry and the Urban Forestry Plan	**3) Exceeds Common Practice**
6.14	Urban Forest Planning and Management Criteria and Performance Indicators	Criteria and indicators based on *A Model of Urban Forest Sustainability* (Clark, J.R., Matheny, N.P., *et. al.* 1997 Journal of Arboriculture.) or on work of W.A. Kenney, P.J.E. van Wassenaer, and A.L. Satel in *Criteria and indicators for strategic urban forest planning and management*. (2011)	See City of Tampa. Also see 9.24: Third-party forest products certification.	The 2030 Comprehensive Plan includes some goals; however, it lacks this specific use of Criteria and Indicators.	**0) Not Practiced**

7 Risk Management

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
7.00	Risk Management Activities				
7.01	TRAQ Attained	At least one staff or consultant is TRAQ.		3 staff are TRAQ	**3) Exceeds Common Practice**
7.02	Annual Level 1 (ANSI A300 Part 9 & ISA BMP)	All trees in high occupancy areas visited annually.		Trees in high occupancy areas and facilities are visited and monitored annually as documented in CityWorks.	**2) Adopted Common Practice**
7.03	Mitigation Prioritization	A protocol for prioritizing mitigation following Level 1 and Level 2 assessments. Reflects the controlling agency's threshold for risk.		CityWorks records include protocol for prioritizing mitigation following assessments (Priority 1, 2, and 3). See CityWorks screenshots.	**2) Adopted Common Practice**
7.04	Occupancy Areas Mapped	Has TRAQ staff/consultant discussed/mapped occupancy levels with controlling authority?		CityWorks GIS provides mapping capacity.	**2) Adopted Common Practice**
7.05	Recordkeeping, Reporting, and Communication	A process has been put in place to maintain records on requests, inspections, evaluations, and mitigation of risk; and on the communications among the managers related to those risk assessments.		The CityWorks system provides record keeping for monitoring purposes and also provides reporting and communications capacities.	**2) Adopted Common Practice**
7.06	Standard of Care Adopted	Controlling authority has adopted a Standard of Care (SOC) or risk management policy.		The policy is included in the City Tree Manual and use of ANSO standards.	**2) Adopted Common Practice**
7.07	Tree Risk Specification	Is there a written specification that meets requirements of ANSI A300 (Part 9)? **And**, has it been discussed with the controlling authority with relevance to the controlling authority's threshold for acceptable risk?		The City utilizes ISA TRAQ sheets	**2) Adopted Common Practice**
7.08	Urban Tree Risk Management	The community has prepared and follows a comprehensive program for urban tree risk management.	See Pokorny et. al. 2003	The City Tree Manual describes the program which is implemented via CityWorks.	**2) Adopted Common Practice**

8 Disaster Planning

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
8.00	Disaster Planning Activities				
8.01	Response/ Recovery Mechanism V	Staff knowledge of the municipality's protocol for requesting disaster resources through the county or state with access to mutual aid and EMAC.		The PRCR Dep't has recently established pre-position contracts to address tree work, L&H, debris, and historic cemeteries. The Urban Forester and additional staff are knowledgeable about this protocol and other system for requesting resources as needed.	**2) Adopted Common Practice**
8.02	Urban Forestry as part of the County Disaster Plan V	The UF plan (8.3) is incorporated into the county/municipal disaster plan; specifically in reference to debris management and risk mitigation.		The Wake County EOP addresses this criteria.	**2) Adopted Common Practice**
8.03	Urban Forestry Disaster Plan	A separate/specific plan within the urban forestry management program (i.e. who to call, priorities).	See Community Forest Storm Mitigation Planning for Georgia Communities, VRMP-UTRI, or Urban Forestry Emergency Operations Planning Guide for Storm Response.	The recently established pre-position contracts and the process used in developing them provides the necessary elements of an urban forestry disaster plan. Additional details are included in existing disaster plans and operating procedures.	**2) Adopted Common Practice**
8.04	Pre-disaster Contracts	Contracts are in place for critical needs.		The PRCR Dep't has recently established pre-position contracts to address tree work, L&H, debris, and historic cemeteries.	**3) Exceeds Common Practice**
8.05	Mitigation Plan	A mitigation plan has been developed for pre-disaster, recovery, and post-disaster.	Also see 9.01 (e.g. pruning).	A formal mitigation plan has not been established.	**0) Not Practiced**
8.06	EMAC Mission Ready Packages (MRP) V	Municipality has published disaster resources with state EM and participates in inter-state Mutual Aid to support Urban Forest Strike Teams (UFST).		The City of Raleigh is aware of the strike teams but has not previously worked with them.	**0) Not Practiced**

9   Practices, Standards, and BMPs

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
9.00	ANSI Standard & BMP Activities				
9.01	ANSI Standards	Reference and adherence to ANSI Standards for arboricultural practices (A300), safety (Z133), or Nursery Stock (ANSI Z60.1) (any or all).	Also see 9.03 - 9.10.	The City Tree Manual (CTM) references ANSI A300 standards. (See CTM 13, 14, 24, 29, etc.). Also see City Code 9.8008.	**2) Adopted Common Practice**
9.02	Arborist Standards	Standards of practice for arborists (i.e. Certification).		The CTM includes standards of practice for arborists, including requirements for certified arborists throughout as well as in standard details. ANSI standards are referenced in the CTM.	**2) Adopted Common Practice**
9.03	Best Management Practices (BMPs)		Establishes or references tree maintenance BMPs (i.e. written comprehensive standards & standards).		
9.04	Fertilization and Mulching	Fertilization or mulching standards required for conserved & planted trees.		CTM Chapter 2 and detail PRCR-03	**2) Adopted Common Practice**
9.05	Lightning Protection Systems	BMP written to the ANSI A300 Standard.			**0) Not Practiced**
9.06	Planting	Planting and transplanting standards required/ specified		CTM Chapter 2 and detail PRCR-03	**2) Adopted Common Practice**
9.07	Pruning	Pruning standards required for conserved & planted trees.		CTM Chapter 5, and detail PRCR-05	**2) Adopted Common Practice**
9.08	Removal	Infrastructure damage, stump grinding, etc.		CTM Chapter 6	**2) Adopted Common Practice**
9.09	Support Systems (Guying and Bracing)	BMP written to the ANSI A300 Standard.		CTM Chapter 2 and detail PRCR-03	**2) Adopted Common Practice**
9.10	Tree Risk	Tree risk assessment procedures; ISA BMP or equivalent.		TRAQ sheet; CityWorks prioritization	**2) Adopted Common Practice**
9.11	Green Infrastructure	BMPs for site level GI practices like rain gardens and swales. Small-scale projects. Also called Green Stormwater Infrastructure.	Also see 6.10.	The comprehensive plan provides some discussion of this topic, but a full plan or BMPs have not been developed.	**0) Not Practiced**
9.12	Construction Management Standards	Written standards for: tree protection, trenching/boring in CRZs, pre-construction mulching, root or limb pruning, watering (any or all).		CTM Chapter 2 and standard details address construction management, including tree protection fence and layout, trenching, pruning, etc.	**2) Adopted Common Practice**

9 Practices, Standards, and BMPs *continued*

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
9.13	Design Standards	Standards for design that specifically require trees; standards for tree placement (i.e. location), soil treatment, and/or drainage.		The CTM and the UDO (9.1, 8.4.1, 8.5.1) address design standards for tree placement, structural soil, etc.	**2) Adopted Common Practice**
9.14	Genus/Species Diversity	Suggests or requires diversity of plant material.		The CTM provides a recommended tree list that supports diversity.	**2) Adopted Common Practice**
9.15	Ages/Diameter Distribution	Specific management for the development of an age-diverse tree population		The City works to maintain a full distribution of tree age and size classes.	**2) Adopted Common Practice**
9.16	Minimum Planting Volume	Minimum required root zone volume.		The CTM and UDO define minimum required root zone volumes (e.g., 600 cubic feet).	**2) Adopted Common Practice**
9.17	Minimum Tree Size	Minimum caliper for tree replacements, and/or minimum size of existing trees to receive tree density or canopy credit.		Minimum tree sizes are addressed in the UDO (e.g., 8.5.1) and within Chapter 2 of the CTM.	**2) Adopted Common Practice**
9.18	Root Protection Zone (CRZ)	Defines adequate root protection zone; Critical Root Zone (CRZ).		The CTM includes tree protection standards and the CRZ is defined as a radius of 1.25' feet per caliper inch at DBH from trunk of tree.	**2) Adopted Common Practice**
9.19	Topping	Prohibits topping or other internodal cuts (public & private).		The CTM includes the prohibitions against topping, tipping, flush cuts, excessive pruning, and the use of climbing irons, spurs or spikes.	**2) Adopted Common Practice**
9.20	Tree Species List	Identifies and publishes a list of the most desirable, recommended, and/or preferred species (may include native and non-native species); alternatively, a list of species prohibited.		CTM, Recommended Trees list	**2) Adopted Common Practice**
9.21	Tree Quality Standards	Written standards for tree selection at nursery in addition to Z60.1.		CTM Chapter 2 addresses Tree Quality Standards, in addition to ANSI Z60.1	**2) Adopted Common Practice**
9.22	Utility Right-of-Way (ROW) Management	Requirements for planting, pruning, and/or removal of trees within a utility ROW.		The CTM includes utility clearance standards that exceed common statewide practice.	**3) Exceeds Common Practice**
9.23	Wood Utilization	Larger diameter material is processed for wood products.	Chipped material should be included in 9.25 or 9.26 (Energy or composting). Also see 9.24, certification item.	The City makes an effort to support urban wood utilization whenever possible and is aware of local wood product companies that process urban wood.	**2) Adopted Common Practice**

9 Practices, Standards, and BMPs *continued*

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
9.24	Third-party forest products certification compliance	Adoption of one of the international standards for production of wood products (for example): American Tree Farm System (ATFS), Forest Stewardship Council™ (FSC®) Program for the Endorsement of Forest Certification (PEFC), Sustainable Forestry Initiative (SFI) Sustainable Forest Management Standard (Canada). Standards can apply to any/all publicly owned and managed trees; parks, street trees, and/or community forests.	Also see 1.13 for development standards that may include on-site utilization.	Third-party certification through these programs is not being offered to municipal forestry programs at this time.	**0) Not Practiced**
9.25	Energy generation	Local or regional use of chips or other woody debris for co-generation facilities.		The City is not engaged in bioenergy production.	**0) Not Practiced**
9.26	Composting of Leaf and/or Other Woody Debris	Leaves and small woody debris are captured and used on-site or processed by someone by composting for reuse.	See also 9.23.	The City maintains yard waste sites where these materials are collected and composted.	**2) Adopted Common Practice**

10 Community

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
10.00	Activities That Build Community				
10.01	American Grove	Does your community use American Grove to document and publicize your urban forestry program, activity, or events?	See also 10.11 for other Social Media.	Not utilized	**0) Not Practiced**
10.02	Education	The urban forest is used as an educational laboratory for class activity; Kids in the Woods, PLT, high school, or college level.		The City is active in education efforts via NeighboorWoods, Tree Stewards, volunteer events, tabling events, Right Tree Right Place, conference presentations and school interactions. Volunteer engagement is monitored and reporting through the budgeting process as a performance measure.	**3) Exceeds Common Practice**
10.03	NeighborWoods® Program	Does your community sponsor this program locally?	Alliance for Community Trees.	The NeighborWoods program has been in operation since 2004 and is very widely praised within the community.	**3) Exceeds Common Practice**
10.04	Open Tree Map	Public access to the community tree resource via an on-line mapping program (i.e. any Web Map Service; WMS).		Not utilized.	**0) Not Practiced**
10.05	Public Perception	Is public management consistent with private property requirements for tree protections and care? Does the Campus/public tree management reflect neighborhood norms?	A "good neighbor" policy.	Prior assessment survey activities indicate strong public support for the UF program and a high opinion of their professionalism and the quality of their projects.	**3) Exceeds Common Practice**
10.06	Recognition Programs	Programs that raise awareness of trees or that use trees to connect the community to significant events or activities.			
10.07	Arbor Day Celebration	Whether or not associated with Tree City USA.		The city holds Arbor Day events.	**2) Adopted Common Practice**
10.08	Arboretum designation	Internal or third party arboretum designation.		N/A	**0) Not Practiced**

10 Community *continued*

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
10.09	Significant trees	For example: size, history.		The city has a Capital Trees Program and installs signs to designate significant trees (e.g., 10,000th NeighborWoods planting)	**2) Adopted Common Practice**
10.10	Memorial/ Honorarium	Tree planting or tree care programs than honor/memorialize individuals, organizations, or events.		The city has a memorial tree program.	**2) Adopted Common Practice**
10.11	Social Media	Does your community/campus make use of Twitter, Facebook, Blogs for internal or external outreach?	See also 10.01.	PRCR is active with Twitter, Facebook, Instagram and GovDelivery.	**3) Exceeds Common Practice**
10.12	Tree Care	Are volunteers trained and used for basic tree care (e.g. mulching, pruning, planting).		Yes, volunteers are trained in planting and pruning activities via Tree Stewards and other volunteer events and ROW maintenance.	**3) Exceeds Common Practice**
10.13	Tree Campus USA®, Tree City USA®, Tree Line USA®	Community/campus meets current qualifications for any of these programs.	The Arbor Day Foundation	The City of Raleigh has been a Tree City USA community for many years.	**2) Adopted Common Practice**
10.14	Volunteer Opportunities	Ad hoc or scheduled. Any/all age groups. Tree Campus USA student activities.		The PRCR provides many volunteer opportunities and tracks volunteer engagement annually. Opportunities include diverse age groups and activities include planting, invasive removal, pruning, and mulching.	**2) Adopted Common Practice**

11 Green Asset Evaluation (Observed Outcomes)

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
11.00	Observed Outcomes (Activity, Health)				
11.01	Deadwood	Look for evidence of periodic or ad-hoc deadwood removal (i.e. lack of dead limbs ≥ 2" in the trees or on the ground).		General observation of very low amounts of deadwood in the trees or on the ground. Common practice is to take action at 4" and review conditions prior to hurricane season.	**2) Adopted Common Practice**
11.02	Genus Diversity	No genera exceed **20%** of population; make specific observations for *Acer*, *Quercus*, and *Ulmus*.	See also 11.07. Substitute any number desired in place of **20%**.	Observed diversity throughout the forest - including a wide number of conifer and deciduous species. Prior assessments indicate no genera exceed 20% of the population. Acer is close to 20% and Oak is also close to 20%.	**2) Adopted Common Practice**
11.03	Mature Tree Care	Mature trees are retained in the landscape, and are of acceptable risk; i.e. veteran tree management.		Observed mature trees retained within parks and street tree settings. Including efforts to remove hazard limbs, reduce rooting impacts from sidewalks, and protection of trees during development. The City prides itself on its City of Oaks history.	**3) Exceeds Common Practice**
11.04	Mulching	Evidence of adequate (i.e. spatial extent, depth, and material) roots zone mulching for all age classes.		Observed mulching to be adequate and appropriate to the size of diverse trees. Also observed diverse approaches to mulching to accommodate varying situations.	**2) Adopted Common Practice**
11.05	Planting Site Volume Optimization	Are species & sites matched for optimization of above ground canopy; right tree in the right spot concept.		Observed efforts to optimize planting site volume through diverse practices that vary depending upon the specific circumstances and following the City Tree Manual (3" and 10' spec). Discussed situation were 6" trees were proposed, but City required them to reduce to 4" trees sue to available space.	**2) Adopted Common Practice**
11.06	Rooting Volume Optimization	Are species & sites matched for optimization for below ground rooting volume; right tree in the right spot concept.		Observed efforts to optimize planting site volume through diverse practices that vary depending upon the specific circumstances and following the City Tree Manual. Goal of 600 cubic feet.	**2) Adopted Common Practice**

11 Green Asset Evaluation (Observed Outcomes) *continued*

Category	Component Evaluated	Description or Criteria for Evaluation	Comments & Resources	FINDINGS	
11.07	Species Diversity	No species/cultivars exceed 10% of population; make specific observations for Acer, Quercus, and Ulmus genera. Also evaluate the role of regionally local native species.	See also 11.02. Substitute any number desired in place of 10%.	The species diversity was observed to be high and the street tree inventory indicates no species/cultivars exceed 10% within planting operations, but natural regeneration within natural areas likely includes species that are more concentrated and exceed 10% (e.g., volunteer loblolly, sweetgum, etc.).	**2) Adopted Common Practice**
11.08	Soil Compaction	Observe evidence of soil compaction by users or staff during maintenance. Include "desire" lines and construction activity at time of evaluation.		Some challenges with Tree Protection Zones were observed and better oversight with increased inspector capacity could help with this challenge.	**1) In Development**
11.09	Tree Health	Rate the overall tree health in all size (age) classes; look for crown dieback, decay, foliage density & color.		Overall tree health was observed to be good across size and ag classes. Old willow oaks are recognized to be a challenge to maintain and manage.	**2) Adopted Common Practice**
11.10	Young Tree Pruning	Look for evidence of periodic (e.g. every 3 years to year 9) structural pruning (e.g. subordination cuts, dominant central leader, co-dominant stems lower that 20').		Observed evidence of periodic pruning for maintenance. The first two years are contracted. The cycle is about 3 years, based upon observed growth.	**2) Adopted Common Practice**