AUSTIN'S URBAN FOREST PLAN

July 2013 | Plan Outline & Performance Indicators

Performance Indicators

These 25 criteria and indicators of urban forestry sustainability provide a useful tool for the evaluation of urban forest management success and strategic management planning. They help guide managers to improve the health of their tree resource and the effectiveness of their management approach ultimately leading to a more livable and sustainable community.

Approaches to Urban Forestry Sustainability

Vegetative Resource: the physical components of an urban forest related to vegetative growth. These components include but are not limited to trees, plants, grasses, soils, water, etc. Managing and monitoring the criteria below may ensure a healthy and resilient urban forest well into the future.

Criteria:

- Canopy cover
- Age distribution
- Species suitability
- Species distribution
- Condition of publicly-owned trees
- Publicly-owned natural areas
- Native vegetation

Community Framework: in a truly sustainable urban forest, all members of a community must cooperate to share the responsibility for tree resource management. Community framework is the fabric for which interested citizens as well as public, private, and nonprofit stakeholders work towards a sustainable objective. The following criteria help to evaluate the success of urban forest management activities relative to the community framework.

Criteria:

- Public agency cooperation
- Involvement of large private and institutional landholders
- Green industry cooperation
- Neighborhood action
- Citizen-municipality business interaction
- General awareness of trees as a community resource
- Regional cooperation

Resource Management: this not only pertains to physical resource management but also public and administrative perceptions of management itself. Resource management includes digital inventories, plans, funding, City staff, policies, etc.

Criteria:

- Tree inventory
- Canopy cover inventory
- Citywide management plan
- Municipally-wide funding
- City staffing
- Tree establishment planning and implementation
- Tree habitat suitability
- Maintenance of publicly-owned, intensively managed trees
- Tree risk management
- Tree protection policy development and enforcement
- Publicly-owned natural areas management planning and implementation

	Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
			Low	**Moderate**	**Good**	**Optimal**	
Vegetative Resource	**Relative Canopy Cover (RCC)***	Achieve regionally-appropriate degree of tree cover, community-wide.	Existing canopy cover equals 0%-25% of potential.	Existing canopy cover equals 25%-50% of potential.	Existing canopy cover equals 50-75% of potential.	Existing canopy cover equals 75-100% of potential.	RCC = ~37% (2006) Canopy Cover = ~30% (2006)

*RCC = Existing Canopy / (Total Land Area - Unsuitable Planting Area); This measure covers the entire urban forest, including private property. Unsuitable planting area = existing canopy, impervious cover, and areas managed as prairie

	Criteria	Key Objective	Low	Moderate	Good	Optimal	Figure
	Size class distribution of trees measured via Relative Diameter at Breast Height (RDBH)*	Provide for uneven aged distribution citywide as well as at the neighborhood level.	Any relative DBH (RDBH) class (<8", 8-16", 17-24", >24") represents >75% of tree population.	Any RDBH class represents 50%-75% of tree population.	No RDBH class represents >50% of tree population.	25% of tree population is in each of 4 RDBH classes.	Trees with <8" DBH equal 45% of total tree population; trees with 8-17" DBH equal 34% of total; trees with 18-24" DBH equal 14% of total; and trees with >24" DBH equal 6%.

*RDBH = ratio between a tree's measured DBH and the maximum diameter for its species. DBH classes are based on N.A. Richards' (1982/1983) proposed DBH classification for a healthy age distribution: <8", 8-16", 17-24", & >24"

	Criteria	Key Objective	Low	Moderate	Good	Optimal	Figure
	Species suitability	Establish a tree population suitable for the urban environment and adapted to the regional environment.	<50% of trees are of species considered suitable for the area.	50%-75% of trees are of species considered suitable for the area.	>75% of trees are of species considered suitable for the area.	All trees are of species considered suitable for the area.	>65% native species (of 2008 sample inventory)
	Species distribution	Establish a genetically diverse tree population citywide as well as the neighborhood level.	<5 species dominate the entire tree population citywide.	No species represents >20% of the entire tree population citywide.	No species represents >10% of the entire tree population citywide.	No species represents >10% of the entire tree population at the neighborhood level.	Top 4 most common species: Cedar Elm comprises 15% of total 2008 sample, Live Oak = 12%, Crape Myrtle = 12%, Sugarberry = 10%.

	Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
			Low	**Moderate**	**Good**	**Optimal**	
Vegetative Resource	**Condition of public trees in the built environment (streets, active-use parkland, etc)**	Detailed understanding of the condition and risk potential of the public urban forest.	No tree maintenance or risk assessment. Request based/reactive system. The condition of the urban forest is unknown.	Sample-based inventory indicating tree condition and risk level is in place.	Statistically-significant sample urban forest inventory that includes detailed tree condition and risk ratings.	Statistically-significant sample urban forest inventory that includes detailed tree condition and risk ratings that is used to guide management.	Structural condition: 27% good, 50% fair, 21% poor, 0.8% dead/dying. Foliage condition: 37% good, 54% fair, 7% poor, 0.8% dead/dying.
	Publicly-owned natural areas	Detailed understanding of the ecological structure and function of all publicly-owned natural areas.	No information about publicly-owned natural areas.	Some basic information is known about publicly-owned natural areas but it is not comprehensive.	Comprehensive information about most publicly-owned natural areas is known and documented.	The ecological structure and function of all publicly-owned natural areas are documented and inform management.	GIS feature class of riparian areas, city-owned parks, state-owned parks, potential creeks/trails, etc.
	Native vegetation	Preservation and enhancement of local natural biodiversity.	Voluntary use of native species on publicly and privately-owned lands; invasive species are recognized.	The use of native or adapted non-native species is encouraged on a project-appropriate basis in publicly-managed areas; invasive species are recognized and their use is discouraged.	The use of native or adapted non-native species is encouraged on a project-appropriate basis in publicly-managed areas; invasive species are recognized and their use is discouraged.	The use of native or adapted non-native species is required on a project-appropriate basis in publicly-managed areas; invasive species are recognized and prohibited.	Invasive Species Management Plan and data capture ongoing.
	Urban Forest Pests	*Urban forest pests do not have a significant impact on the long-term health of the urban forest*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	Oak Wilt Suppression Policy, Chapter 6-3 City Code reference to nuisance trees

Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
		Low	**Moderate**	**Good**	**Optimal**	
Public agency cooperation	Insure all city departments cooperate with common goals and objectives.	Conflicting goals among departments and/or agencies.	Common goals but no cooperation among departments and/or agencies.	Informal teams among departments and/or agencies are functioning and implementing common goals on a project-specific basis.	Municipal policy implemented by formal interdepartmental/interagency working groups on all municipal projects.	N/A
Involvement of state and federal landholders	State and federal landholders embrace citywide goals and objectives through specific resource management plans.	Ignorance of issues and city objectives.	Educational materials and advice available to landholders. Some coordination with the city on a project-specific basis.	Clear goals for urban forest resource by landholders. Landholders attempt to meet the spirit of city goals on a consistent basis.	Landholders develop comprehensive tree management plans (including funding).	N/A
Green industry cooperation	The green industry operates with high professional standards and commits to citywide goals and objectives.	No cooperation among segments of the green industry. No adherence to industry standards.	General cooperation among nurseries, tree care companies, etc.	Specific cooperative arrangements exist for using professional standards and guidelines	Shared visions and goals including the widespread use of professional standards.	N/A
Neighborhood action	At the neighborhood level, citizens understand and cooperate in urban forest management.	No action and no neighborhood group interaction with urban forestry.	Isolated or limited number of active groups. Some neighborhood plans include urban forest goals.	Citywide coverage and active participation of neighborhood groups. Most neighborhood plans include urban forestry goals.	All neighborhoods organized and cooperating to meet urban forest goals. All neighborhood plans include urban forestry goals.	N/A

Community Framework (side label)

	Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
			Low	**Moderate**	**Good**	**Optimal**	
Community Framework	**General awareness of trees as a community resource**	The general public understands the role of the urban forest.	Trees seen as a problem, a drain on budgets.	Trees seen as important to the community.	Trees acknowledged as providing environmental, social, and economic services.	Urban forest recognized as vital to the community's environmental, social, and economic well-being.	Most citizens are aware of trees as community resource. Trees valued for shade, environmental benefits, aesthetics, and sense of place. Biggest tree issue is cost.
	Regional urban forest cooperation	Provide for cooperation and interaction among neighboring communities and regional groups.	Communities cooperate independently.	Communities share some similar urban forestry policy vehicles.	Regional urban forest planning is in effect.	Regional planning, coordination, and/or urban forest management plans.	N/A

	Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
			Low	**Moderate**	**Good**	**Optimal**	
Resource Management	**Tree inventory**	Complete inventory of the tree resource to direct its management, including age distribution, species mix, tree condition, and risk assessment.	No inventory.	Some non-comprehensive sample-based inventories of the public urban forest.	Sample inventory of the public urban forset and complete inventories in some areas.	Statistically-significant inventory of the public urban forest and complete inventories in highly-managed areas that is regularly updated and informs adaptive management.	2008 street and park tree inventory of 14,925 total trees. 2012 complete inventory of downtown trees. Complete inventory of some parks
	Canopy cover inventory	High resolution assessments of the existing and potential canopy cover for the entire community.	No inventory.	Visual or anecdotal assessment.	Citywide canopy data layer using aerial/satellite imagery.	Periodically updated citywide canopy data layer using aerial/satellite imagery included in citywide GIS and used to inform management.	2006 2-foot resolution of regional tree canopy; 2010 2-foot resolution of regional tree canopy
	Citywide management plans	Develop and implement a comprehensive urban forest management plan for public property.	No plan.	Existing plan limited in scope and implementation.	Comprehensive plan for publicly-owned intensively- and extensively-managed forest resources are accepted and implemented.	Strategic multi-tiered plan for public managed forest resources accepted and implemented with adaptive management mechanisms.	Citywide comprehensive plan adopted in 2012 mandating an urban forest plan
	Municipality-wide funding	Develop and maintain adequate funding to implement a citywide urban forest management plan.	Funding for reactive management.	Funding to optimize existing urban forest management.	Funding to provide for net increase in urban forest benefits.	Adequate private and public funding to sustain maximum urban forest benefits.	N/A

	Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
			Low	**Moderate**	**Good**	**Optimal**	
Resource Management	**City staffing**	Employ and train adequate staff to implement citywide urban forestry plan.	Some staff but none are urban forest professionals	Certified arborists and professional foresters on staff with regular professional development.	Certified arborists and professional foresters on staff with regular professional development and multi-disciplinary team within urban forestry units.	Coordinated interdepartmental team of experts working on common urban forestry goals. Staff participates in or contributes to scientific literature or research projects.	N/A
	Tree establishment planning and implementation	Urban forest renewal is ensured through a comprehensive urban forest establishment program driven by canopy cover, species diversity, and species distribution objectives.	Tree establishment is ad hoc.	Tree establishment occurs on an annual basis.	Tree establishment is directed by needs derived from a tree inventory.	Tree establishment is directed by needs derived from a tree inventory and is sufficient to meet canopy cover objectives.	City and nonprofit tree planting programs plant trees every year.
	Tree habitat suitability	All publicly-owned trees are planted in habitats that will maximize current and future benefits provided to the site.	Trees planted without consideration of the site conditions.	Tree species suitability is considered in planting site selection.	Community-wide guidelines are in place for the improvement of planting sites and the selection of suitable species.	All trees planted in sites with adequate soil quality, quantity, and growing space to achieve their genetic potential.	N/A

	Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
			Low	Moderate	Good	Optimal	
Resource Management	**Tree risk management**	All publicly-owned trees are safe.	No tree risk assessment/remediation program. Request based/reactive system. The condition of the urban forest is unknown.	Sample-based tree inventory including general tree risk information. Request based/reactive risk abatement program system.	Complete tree inventory which includes detailed tree failure risk ratings; risk abatement program is in effect reducing risks within a maximum of 1 month from confirmation of risk potential.	Complete tree inventory that includes detailed tree failure risk ratings; risk abatement program is in effect reducing risks within a maximum of 1 week from confirmation of risk potential.	N/A
	Tree protection policy development and enforcement	Trees enjoy significant protection from development impacts on public and private property.	No tree protection policy.	Policies in place to protect trees.	Policies in place to protect trees with enforcement.*	Integrated municipal-wide policies that ensure the protection of trees on public and private land are consistently enforced and supported by significant deterrents.**	Protected/Heritage Tree Ordinance, Public Tree Care Ordinance, and Landscape Ordinance.
	Water Use and Drought Response	*Irrigation for the urban forest is utilized sparingly and urban forest irrigation planning takes climate trends into consideration.*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	N/A

*Public trees   **Private trees

	Criteria	Key Objective	Performance Indicators				Figure for Most Recent Year
			Low	Moderate	Good	Optimal	
Resource Management	**Carbon Sequestration and Woody Biomass**	*All or nearly all of green waste is left on site, recycled, or used for the highest possible purpose*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	*Metric to be developed based on literature review of pest Best Management Practices and related metrics*	
	Publicly-owned natural areas management planning and implementation	The ecological structure and function of all publicly-owned natural areas are protected and, where appropriate, enhanced.	No stewardship plans or implementation in effect.	Reactionary stewardship in effect to facilitate public use (i.e. hazard abatement, trail maintenance, etc.).	Stewardship plan in effect for each publicly-owned natural area focused on sustaining the ecological structure and function of the feature.	Stewardship plan in effect for each publicly-owned natural area focused on sustaining the ecological structure and function of the feature.	N/A
	Maintenance of publicly-owned, intensively managed trees	All publicly-owned trees are maintained to maximize current and future benefits. Tree health and condition ensure maximum longevity.	No maintenance of publicly-owned trees.	Publicly-owned trees are maintained on a request/reactive basis. No systematic (block) pruning.	All publicly-owned trees are systematically maintained on a cycle longer than 20 years.	All mature publicly-owned trees are maintained on a 20 or fewer year cycle. All immature trees are structurally pruned.	N/A