

# City of Tampa Urban Forest Management Plan

November 2013



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RESOLUTION NO. 2013- 021

**A RESOLUTION ACCEPTING THE CITY OF TAMPA URBAN FOREST MANAGEMENT PLAN AS THE STRATEGIC PLAN FOR THE MANAGEMENT OF TAMPA'S URBAN FOREST; ESTABLISHING ADAPTABLE, QUANTIFIABLE, AND SCIENCE-BASED STRATEGIES FOR MAINTAINING AND EXPANDING THE URBAN FOREST; RESCINDING ALL RESOLUTIONS IN CONFLICT; PROVIDING AN EFFECTIVE DATE.**

**WHEREAS**, in 2010, under an agreement authorized by City Council through Resolution 2010-392, the City engaged experts from University of South Florida and University of Florida IFAS, to provide complementary professional-technical assistance to City natural resources staff in completing the plan and to develop and manage the public engagement effort; and

**WHEREAS**, to insure a balance of continued stakeholder input throughout the planning process, the City initiated the formation of a steering committee comprised of members from a variety of government, business, and neighborhood interests; and

**WHEREAS**, to insure consistency and efficiency in interdepartmental coordination, as well as design and review of future capital improvement projects, the City initiated the formation of an Internal Technical Advisory Committee comprised of department directors and their appointed designees; and

**WHEREAS**, an extensive public outreach effort involving the development and use of a web-based and social media campaign, several stakeholder meetings, focus groups, and use of an online survey, thereby providing multiple opportunities for the public to provide feedback and input into the formulation of the plan; and

**WHEREAS**, to insure continued progress and implementation of the Urban Forest Management Plan, the Plan calls for the ongoing continuation of the Internal Technical Advisory Committee and the creation of an Advisory Committee on Natural Resources, which will be comprised of members from a variety of government, business, and neighborhood interests; and

**WHEREAS**, on a semi-annual basis, the internal technical advisory committee will be responsible for reviewing the implementation of each 5-year list of preferred alternatives for action derived from the Plan, and reporting those findings to the Advisory Committee on Natural Resources; and

**WHEREAS**, on an annual basis, both committees will hold a joint session to discuss accomplishments and recommended strategies for accomplishing the scheduled objectives from the Plan, and publish a report of those findings for distribution to the City Council, Administration, and the general public; and

*E2013-8 CH 27*

**WHEREAS**, the Urban Forest Management Plan was presented in an open, public information workshop on September 18, 2013, at the Barksdale Senior Community Center in West Tampa; and

**WHEREAS**, the Urban Forest Management Plan was presented to City Council in a public workshop on November 14, 2013.

**NOW, THEREFORE,**

**BE IT RESOLVED BY THE CITY COUNCIL  
OF THE CITY OF TAMPA, FLORIDA:**

**Section 1.** That the City Council of the City of Tampa hereby acknowledges the Urban Forest Management Plan as the strategic plan, with a 20-year planning horizon, defining criteria, performance measures, and alternatives for action; and, by following an adaptable, quantifiable, and science-based approach, the City of Tampa will address the challenges to growing and maintaining a healthy urban forest, in an efficient and sustainable manner.

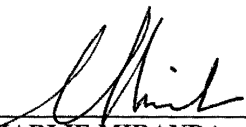
**Section 2.** That the proper officers of the City of Tampa are hereby authorized to do all things necessary and proper in order to carry out and make effective the provisions of this resolution.

**Section 3.** That this resolution shall take effect immediately upon its adoption.

**PASSED AND ADOPTED BY THE CITY COUNCIL OF THE CITY OF TAMPA,  
FLORIDA, ON NOV 21 2013.**

**ATTEST:**

  
SHIRLEY FOXX-KNOWLES  
CITY CLERK

  
CHARLIE MIRANDA  
CHAIRMAN, CITY COUNCIL

**APPROVED AS TO FORM:**

  
MARTIN SHELBY  
CITY COUNCIL ATTORNEY

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# Introduction

The City of Tampa’s urban forest consists of the remnants of native forest found within private property, parks, medians and rights-of-way; and planted trees, palms and shrubs found on all public and private property.

Tampa’s urban forest plays a significant role in maintaining the health and vitality of urban life. The urban forest provides a wealth of benefits to neighborhoods and residents through the reduction of energy consumption, the removal of pollutants from the air and water, reduction in storm-water flows, increased valuation of private property, increased worker productivity, reduction in stress and violent crime, as well as providing recreational opportunities and aesthetic diversity. At the same time stresses from the urban environment including air pollution, damage by vehicles, increased impervious surface, soil compaction, and maintenance neglect reduce the diversity and magnitude of these benefits and may lead to tree-related problems.

The inherently close interaction between people and trees in Tampa requires active and diligent management of the urban and community tree and forest resources to ensure public safety. A scientifically grounded management program is necessary in order to maximize the value and minimize the risk associated with trees within this complex and dynamic human ecological system called the City of Tampa. The initial step in meeting these challenges is the identification and organization of baseline information in the form of an inventory that describes the location, composition, structure, and health of the trees and woodlands. The 2006 Urban Forest Ecological Analysis and its publication led to broad public support for the development of a management plan designed to enhance urban forest sustainability.

Urban forest sustainability is defined in terms of maintaining healthy and functional vegetation and associated systems that provide long-term benefits desired by the community. This definition places significant emphasis on the role of the communities and institutions who manage the urban forest (Dwyer et al. 2003).

The City of Tampa Urban Forest Management Plan was developed through a collaborative effort supported by Mayor Bob Buckhorn and Tampa City Council, that involved all the departments of the City of Tampa, the University of Florida, the University of South Florida, Hillsborough County Extension, business and professional organizations, neighborhood associations and citizens. This strategic plan for the management of Tampa’s urban forest addresses the numerous challenges to growing and maintaining a healthy urban forest in an efficient manner. Management of the urban forest, with its long biological life cycles and slow growth, is a long-term investment. The plan recognizes that attempts to enhance its vigor, longevity, and diversity must reflect this reality.

Tampa’s strategic urban forest management plan was developed with a 20-year planning horizon to meet the challenge of programmatic continuity by planning on a long time framework. At the same time it provides guidance for intermediate 5-year city-wide work planning. In turn it provides direct input into short-term annual departmental operational plans and decision-making.

## Human Benefits-Urban Forests

- Temperature and Energy Use
- Shade
- Wind Control
- Active Evaporation
- Air quality
- Oxygen Production
- Pollution Reduction
- Carbon Dioxide Reduction
- Hydrology
- Water Run-Off
- Economic Stability
- Property Values
- Product Production
- Aesthetic Preferences
- Visual Screening
- Recreation
- Health

## How the Plan Was Developed

The initial step in the development of the urban forest plan began with the organization of the Mayor's Steering Committee on Urban Forest Sustainability (2008-2013) by the city government. The members of the committee represented a broad diversity of government, business and neighborhood interests. Through a series of facilitated sessions, the Committee developed a consensus vision statement and series of six goals.

In 2010 the City Council authorized funding for the development of a science-based comprehensive Urban Forest Management Plan. The plan was to include specific recommendations on policies, procedures and practices, and provide information required by policy makers, planners, utilities, environmental managers,

businesses and citizen volunteers to optimize the benefits of the urban forest while minimizing management costs.

From the work of the Mayor's Steering Committee on Urban Forest Sustainability, the City developed six principles used to guide the development of the plan and test each of its components for consistency with the original vision statement and goals. The Steering Committee reviewed and approved the guiding principles.

The City of Tampa Urban Forest Management Plan was developed following a model for strategic urban forest planning first introduced by Clark et al. (1997) which recommended the use a series of management criteria and performance indicators to measure urban forest management success. Building on the work of Clark et al. (1997), Kenney et al. (2011) described a more comprehensive criteria and set of performance indicators. The model developed by Kenney et al. was identified as an appropriate template to use in the development of Tampa's urban forest management plan, and accepted by the Steering Committee. The City representatives then worked with the project team from the University of Florida and University of South Florida to outline a framework for plan development that would meet the unique biological, physical and social characteristics of the City.

Unlike other public infrastructure components, properly planted and maintained trees increase in value over time. ... An urban forest management plan, based upon a recent tree inventory data and analysis of available staff, equipment and budget resources, is an essential tool for protecting this valuable resource.

(American Public Works 2007)

### Vision Statement

Maintain and expand Tampa's urban forest in recognition of the many benefits it provides, including: enhancing quality of life for present and future citizens, attaining numerous economic and ecological benefits Nature provides, and seizing opportunities to better understand our natural environment through scientific research and public education.

### Goals

1. To understand and communicate the need to maintain and protect the complexity of natural systems in the urban forest so that the public will support a rich, diverse habitat.
2. To advance public appreciation of the economic, social and environmental values of Tampa's urban forest in all education settings, from in-school to adult education and public service campaigns, so as to create an ethic of individual stewardship.
3. To promote proper tree care in the urban forest through education and enforcement.
4. To create inclusive partnerships that encourage collaboration among all affected parties to benefit Tampa's urban forest.
5. To improve the policy framework for the conservation, reclamation, restoration and increase of natural resources within the urban forest.
6. To promote recognition, maintenance and regeneration of Tampa's urban forest that is economically and ecologically feasible.

## 6 Guiding Principles of the City of Tampa's Urban Forest Management Plan

1. Government Efficiency
2. Economic Growth
3. Public Private Partnerships
4. Increase the social, environmental and economic benefits of the urban forest by reducing costs
5. Support Communities
6. Support Basic Tenets of the City's Comprehensive Plan

The City then organized an Internal Technical Advisory Committee to work on drafting the Tampa specific criteria and performance indicators. The Directors of all of the City's departments appointed members of the Internal Technical Advisory Committee. The Internal Technical Advisory Committee worked through a deliberate step by step review and edit process over the course of several months. Their work led to a detailed set of criteria and performance indicators for urban forest management that reflected the concerns of each department.

Throughout the deliberation of the Internal Technical Advisory Committee, City staff continued to meet and share information on progress with the Steering Committee on Urban Forest Sustainability to ensure that the plan remained true to the initial vision and goals (see appendix for example of test for consistency). A web site was established and used by the City to disseminate all meeting notes and intermediate documents.

Following completion of the 1<sup>st</sup> DRAFT of the Criteria and Performance Indicators the directors of the City's departments met on three separate occasions to review, prioritize the criteria and reach consensus on the language and intent of the plan. The final DRAFT of the Criteria and Performance indicators were then reviewed and commented on by the Steering Committee.

The performance indicators for each of the criteria were then evaluated to determine the present state of urban forest management in Tampa. Alternatives for action were then developed that, if implemented, would be expected to incrementally move the performance indicators to the next highest level. These alternatives were specific actions, policies or programs that could be initiated by the City of Tampa. A total of 178 quantifiable alternatives for action were developed (see appendix). The alternatives for action were reviewed and edited by all city departments.

The edited set of alternatives for action was then evaluated with consideration of requirements for capital expenditures, potential personnel costs, length of time to achieve a measurable outcome, and the need to sequence certain actions. A set of preferred alternatives for action were chosen to guide the first 5-year planning horizon. These preferred actions and intended outcomes are to become part of the annual departmental operational plans and individual work plans.

Criteria are essential elements against which sustainability of urban forest management is judged.

Performance Indicators provide a quantifiable means for measuring progress in achieving goals and objectives.

## Organization of the Plan

The City of Tampa's Urban Forest Management Plan identifies a series of quantifiable steps that guides activities and resources to accomplish predetermined outcomes, the time frame for implementation and the responsible agency or partnership. Clear lines of responsibility and measureable objectives tied to reasonable timelines allow the city to measure successes and identify programmatic areas in need of further attention. The plan itself is best seen as a long-term process, a living and adaptable plan of action, and not a static product.

Specific criteria and performance indicators for sustainable urban forest management developed by the City of Tampa provide a framework for defining sustainable urban forest management and assessing progress toward this goal. The criteria define essential elements against which sustainability of urban forest management is judged, with due consideration paid to the environmental, economic and social and cultural roles of the urban forests and remnant forest ecosystems. Criteria are envisioned as a large-scale reflection of public values- and reflect the vision and goals initially set by the Steering Committee on Urban Forest Sustainability.

Performance indicators enable measurement of progress towards the achievement of the key objectives for each criterion. Each criterion's performance indicators are to be monitored to assess the effectiveness of urban forest management within the City of Tampa, and to facilitate decision-making in the City's urban forest policy processes. The ultimate aim of this tool is to promote improved urban forest management practices over time, and to further the development of a healthier and more productive urban forest.

The criteria and performance indicators have been organized into four major topic areas: Vegetation Resource; Community Framework; Institutional Framework; and Resource Management. The Vegetation Resource criteria and performance indicators are used to monitor the urban forest resource to provide an accurate assessment within the City's changing environment. The Community and Institutional criteria and performance indicators assess changing economic and social conditions critical to urban forest sustainability. The Resource Management criteria and performance indicators provide the means for measuring how well management is proceeding in sustaining or enhancing these urban forest conditions and for tracking subsequent changes.

The criteria and indicators are tied to the 5-year cycle of urban forest assessment. The Urban Forest Analysis provides a source of reference information for policy makers, resource managers, and concerned citizens. This information presents a concise and comprehensive assessment of the City of Tampa's Urban Forest. It also provides information needed for tracking long-term trends and analysis concerning management of the City's urban forests for present and future generations.

The criteria and performance indicators allow the City of Tampa the assessment capability to use an adaptive management approach to urban forestry, and promote flexible decision-making. Careful monitoring of the indicators will help the administration adjust policies or operations as part of an iterative learning process leading to more effective decisions and enhanced benefits, while reducing tensions among stakeholders.

Example: CRITERIA AND PERFORMANCE INDICATORS FOR THE VEGETATION RESOURCE

| Criteria                                      | Vegetation Resource – Performance Indicators                         |                                                                       |                                                                      |                                                              | Key Objective                                                                                               |
|-----------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|                                               | Low                                                                  | Moderate                                                              | Good                                                                 | Optimal                                                      |                                                                                                             |
| Species suitability for Tampa's climate zones | Less than 50% of trees are of species considered suitable for Tampa. | <b>50%-75% of trees are of species considered suitable for Tampa.</b> | More than 75% of trees are of species considered suitable for Tampa. | At least 90% of the trees are of species suitable for Tampa. | Establish a tree population suitable for Tampa's urban environment and adapted to the regional environment. |

Example: CRITERIA AND PERFORMANCE INDICATORS FOR THE COMMUNITY FRAMEWORK

| Criteria                                                      | Vegetation Resource – Performance Indicators |                                                         |                                                                                        |                                                                                                    | Key Objective                                                                       |
|---------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                               | Low                                          | Moderate                                                | Good                                                                                   | Optimal                                                                                            |                                                                                     |
| General awareness of the urban forest as a community resource | Urban forest seen as a community problem.    | <b>Urban forest seen as important to the community.</b> | Urban forest acknowledged as providing environmental, social, and economical services. | Urban forest recognized as vital to the community's environmental, social and economic well being. | The general public understands the importance of the urban forest to the community. |

Example: CRITERIA AND PERFORMANCE INDICATORS FOR THE INSTITUTIONAL FRAMEWORK

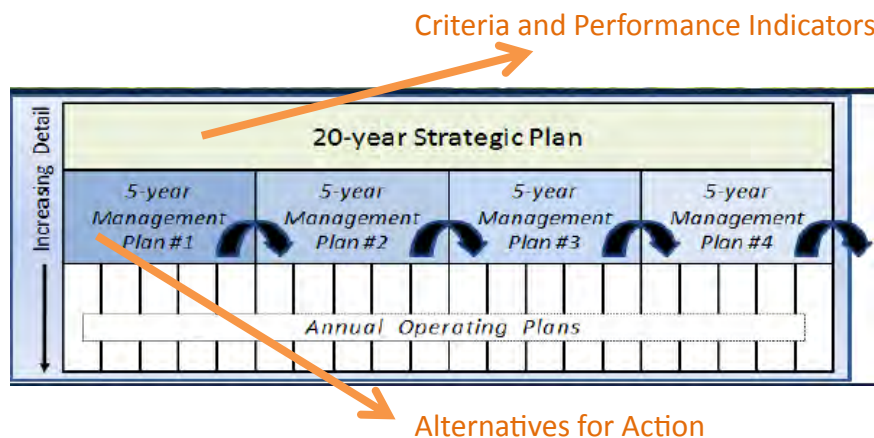
| Criteria                       | Vegetation Resource – Performance Indicators                                                 |                                                                                                                               |                                                                                                                              |                                                                                                                                | Key Objective                                                                |
|--------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                                | Low                                                                                          | Moderate                                                                                                                      | Good                                                                                                                         | Optimal                                                                                                                        |                                                                              |
| City public agency cooperation | Conflicting processes among departments and or agencies that are inconsistent with the UFMP. | <b>Urban Forest Management Plan (UFMP) processes are held in common but no cooperation among departments and/or agencies.</b> | Departments and/or agencies are functioning and implementing processes consistent with the UFMP on a project-specific basis. | Municipal standards in place for implementing the UFMP by interdepartmental/ inter-agency processes on all municipal projects. | Ensure all city departments cooperate with goals and objectives of the UFMP. |

Example: CRITERIA AND PERFORMANCE INDICATORS FOR THE RESOURCE MANAGEMENT APPROACH

| Criteria                      | Vegetation Resource – Performance Indicators                                      |                                                                                                        |                                                                                                                                            |                                                                                                                                               | Key Objective                                                                                                             |
|-------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|                               | Low                                                                               | Moderate                                                                                               | Good                                                                                                                                       | Optimal                                                                                                                                       |                                                                                                                           |
| Urban forest management plan. | <b>Existing urban forest management plan limited in scope and implementation.</b> | Comprehensive plan for publicly owned and managed urban forest resources are accepted and implemented. | Strategic multi-tiered plan for public and private urban forest resources is accepted and implemented with adaptive management mechanisms. | A comprehensive urban forest management plan for private and public property is accepted and implemented with adaptive management mechanisms. | A comprehensive urban forest management plan for private and public property is integrated into plans for sustainability. |

## Adaptive Management and Monitoring

Adaptive Management is a scientific approach to an urban forest management decision process. It promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals; increases scientific knowledge; and reduces tensions among stakeholders.



Adaptive Management is a scientific approach to an urban forest management decision process.

Using an adaptive management approach will require the consistent monitoring of all the city's criteria for urban forest sustainability. The City will be able to judge if its new approaches to urban forest conservation are being effective, develop relationships between management actions and outcomes, and identify significant trends. This will allow the City to adjust management actions over time as changes occur both in the physical/biological environment and in the expectations of the City's residents.

Few activities suggested by the strategic plan are as important to the success of urban forest management as monitoring, but this step is often overlooked, poorly designed, and often underfunded by most cities. Monitoring the city's natural resources is a process very similar to those already developed for business. The basic applications have already been developed, and there is little reason to reinvent the processes. We present a design for the monitoring program that incorporates the principles of sampling design theory and experimental design. Careful consideration has been paid to the selection of indicators.

## Types of Monitoring

Monitoring here refers to the periodic and systematic measurement of observations of process or object. The City should institute three forms of monitoring in association with the management plan: implementation, effectiveness and validation.

1. The implementation monitoring will determine if the plan is being implemented as designed. It asks, "Did we do what we set out to do?"
2. Effectiveness monitoring determines if the action achieved the stated goal or objective. It asks, "Did it work?"
3. Validation monitoring determines if assumptions and models being used are valid and effective.

### *Implementation Monitoring*

The Internal Technical Advisory Committee will review, on a semi-annual basis the implementation of the 5-year Management Plan's preferred alternatives for action (see Appendix). They will report their findings to the Advisory Committee on Natural Resources. Once a year these two committees will hold a joint session to discuss accomplishments and recommend strategies for accomplishing the scheduled objectives. Each year these two committees will jointly publish a report to be distributed to the Mayor, City Council, Department Directors and communities.

### *Effectiveness Monitoring*

The Urban Forest Analysis, conducted in 2006 serves as the beginning of the effectiveness-monitoring program. Information from Urban Forest Analysis describes the present state of the urban forest and how it is changing over time. The use of the criteria and key objectives allow the City to better understand and correlate the effectiveness of its urban forest management practices and policies to reaching specific outcomes identified by the Urban Forest Analysis.

Effectiveness monitoring will formally be conducted every 5 years, following the publication of the latest urban ecological analysis and forest opportunity spectrum analysis. Effectiveness monitoring will be reviewed by the Internal Technical Advisory Committee and Advisory Committee on Natural Resources and jointly reported out in a public meeting.

### *Validation Monitoring*

Prior to contracting the 5-year Urban Forest Analysis and Forest Opportunity Spectrum Analysis the City will review the scientific methods and models to be used to characterize the urban forest. Choosing appropriate forms of analysis will be extremely valuable in supporting management decision-making. The Internal Technical Advisory Committee will conduct the review with the assistance of scientists from the University of Florida and University of South Florida.

# Recommended Methods for Measuring Management Plan Performance Criteria

## Vegetation Resource

Species suitability for Tampa's climate zones

Measure: NOAA climate zones and Urban Forest Analysis

No net loss of canopy cover by municipal planning district

Measure: canopy will be measured by planning district using land cover classification and image analysis – Urban Forest Analysis

Tree species diversity in the City

Measure: Urban Forest Analysis

Diameter distribution of trees in the City

Measure: directly measured by Urban Forest Analysis

Tree health condition by municipal planning district

Measure: Urban Forest Analysis

Wind resistance of tree species citywide

Measure: will use 15-years of post hurricane research by the University of Florida that identified the structural integrity of common tree species in wind storms and the Urban Forest Analysis

Tree species longevity citywide

Measure: Urban Forest Analysis

Condition assessment of publicly owned trees (tree managed intensively)

Measure: Urban Forest Analysis

## Resource Management

Urban forest management plan

Measure: review by Internal Technical Advisory Committee

Municipality – wide funding

Measure: annual review by Internal Technical Advisory Committee

City natural resource and forestry staffing

Measure: annual review by Internal Technical Advisory Committee

Management of publicly and privately owned natural areas

Measure: annual internal review of public land management to include random sampling of resources and development of monitoring reports

Urban forest protection policy development and enforcement

Measure: semi-annual review of process by Internal Technical Advisory Committee and Urban Forest Analysis for outcomes

Urban forest inventory public-private

Measure: semi-annual review of process by Internal Technical Advisory Committee and Urban Forest Analysis for outcomes

Publicly owned natural areas management planning and implementation

Measure: annual review by Internal Technical Advisory Committee and Natural Resources Advisory Committee

Native vegetation management

Measure: internal review of public lands by Parks and Recreation Dept. and annual random sampling of development projects

Canopy cover inventory by municipal planning district

Measure: Urban Forest Analysis

Tree planting and establishment on public and private land

Measure: Urban Forest Analysis and Opportunity Spectrum Analysis

Maintenance of publicly managed trees within public rights-of-way

Measure: Annual review of work plans and accomplishments for right-of-way tree maintenance

Invasive plant species management

Measure: internally review of public and private lands using random sampling

Public tree risk assessment and abatement along emergency and evacuation routes

Measure: internal agency review of sampling, inventory to determine degree of hazards and hazard reduction annually

Public tree risk assessment and abatement city-wide

Measure: internal agency review of sampling, inventory to determine degree of hazards and hazard reduction annually

## Community Framework

General awareness of trees as a community resource

Measure: 5-year community survey conducted by City of Tampa

Neighborhood Cooperation

Measure: 5-year community survey conducted by City of Tampa

Citizen-Municipality-Business Interaction

Measure: semi-annual review by Technical Advisory Committee

Support by private land holders

Measure: semi-annual review by the Internal Technical Advisory Committee

## Institutional Framework

City Public agency cooperation

Measure: semi-annual review by the Internal Technical Advisory Committee

Design and development industry cooperation

Measure: annual random sampling of site specific designs and implementation and Urban Forest Analysis

Landscape and arboriculture industry cooperation

Measure: the green industry use of ANSI standards, state BMP's, state nursery grades and standards

Cooperation within the geographic region of the Tampa Bay Watershed

Measure: semi-annual review by Internal Technical Advisory Committee

# Tampa's 20-Year Framework for Urban Forest Management

| Criteria                                                                       | Vegetation Resource - Performance Indicators                                                                                      |                                                                                      |                                                                             |                                                                                                    | Key Objective                                                                                                                |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                                                                                | Low                                                                                                                               | Moderate                                                                             | Good                                                                        | Optimal                                                                                            |                                                                                                                              |
| Species suitability for Tampa's climate zones                                  | Less than 50% of trees are of species considered suitable for Tampa.                                                              | <b>50%-75% of trees are of species considered suitable for Tampa.</b>                | More than 75% of trees are of species considered suitable for Tampa.        | At least 90% of the trees are of species suitable for Tampa.                                       | Establish a tree population suitable for Tampa's urban environment and adapted to the regional environment.                  |
| Canopy cover relative to goals by municipal planning district                  | The existing canopy cover equals 0%-25% of the goal.                                                                              | The existing canopy cover equals 25%-50% of the goal.                                | The existing canopy cover equals 50%-75% of the goal.                       | The existing canopy cover equals 75%-100% of the goal.                                             | Relative canopy cover to goal for each municipal planning district category.                                                 |
| Tree species diversity                                                         | Fewer than five species dominate the entire tree population citywide.                                                             | No species represents more than 20% of the entire tree population citywide.          | No species represents more than 15% of the entire tree population citywide. | <b>No species represent more than 10% of the entire tree population citywide.</b>                  | Establish a diverse tree population citywide.                                                                                |
| Diameter (DBH) distribution of trees in the city                               | Any relative DBH (RDBH) <sup>i</sup> class (0%-25% RDBH, 26%-50% RDBH, etc.) represents more than 75% of the tree population.     | Any RDBH class represents between 50% and 75% of the tree population.                | No RDBH class represents more than 50% of the tree population.              | 25% of the tree population is in each of four RDBH classes.                                        | Provide for uneven aged distribution <sup>ii</sup> citywide.                                                                 |
| Tree health condition by municipal planning district.                          | Less than 30% of trees rated as excellent health condition.                                                                       | <b>31 - 60% of trees rated as excellent health condition.</b>                        | 61 - 85% of trees rated as excellent health condition.                      | Greater than 85% of trees rated as excellent health condition in all municipal planning districts. | Healthy trees live longer, produce greater no. of benefits and reduce costs associated with maintenance.                     |
| Wind resistance of tree species <sup>iii</sup> citywide                        | Majority of trees are rated in lowest category of wind resistance.                                                                | <b>Majority of trees are rated in medium and high categories of wind resistance.</b> | Majority of trees are rated in high category of wind resistance.            | Greater than 80% of trees are rated in highest category of wind resistance.                        | Reduce disruption of social and economic services; reduce cost of cleanup and protect private property and human well being. |
| Tree species longevity                                                         | Less than 25% of trees are of species considered long-lived for Tampa.                                                            | 25% to 49% of trees are of species considered long-lived for Tampa.                  | <b>50%-75% of trees are of species considered long-lived for Tampa.</b>     | More than 75% of trees are of species considered long-lived for Tampa.                             | Establish a long-lived <sup>iv</sup> tree population that maximizes benefits vs. costs                                       |
| Condition assessment of the publicly managed trees (trees managed intensively) | <b>No tree maintenance or condition assessment. Request based/ reactive system. The condition of the urban forest is unknown.</b> | Sample-based inventory indicating tree condition and condition level is in place.    | Complete tree inventory that includes detailed tree condition rating.       | Complete tree inventory that included detailed tree condition ratings.                             | Detailed understanding of the condition of all publicly-owned trees.                                                         |
| <b>Current State - Summary</b>                                                 | <b>1</b>                                                                                                                          | <b>3</b>                                                                             | <b>1</b>                                                                    | <b>1</b>                                                                                           |                                                                                                                              |

| Criteria                                                                                                                                 | Resource Management - Performance Indicators                                      |                                                                                                                              |                                                                                                                                            |                                                                                                                                                                                          | Key Objective                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                          | Low                                                                               | Moderate                                                                                                                     | Good                                                                                                                                       | Optimal                                                                                                                                                                                  |                                                                                                                                                          |
| Urban forest management plan.                                                                                                            | <b>Existing urban forest management plan limited in scope and implementation.</b> | Comprehensive plan for publicly owned and managed urban forest resources are accepted and implemented.                       | Strategic multi-tiered plan for public and private urban forest resources is accepted and implemented with adaptive management mechanisms. | A comprehensive urban forest management plan for private and public property is accepted and implemented with adaptive management mechanisms.                                            | A comprehensive urban forest management plan for private and public property is integrated into plans for sustainability.                                |
| Municipality-wide funding.                                                                                                               | <b>Funding for reactive management<sup>v</sup>.</b>                               | Consistent funding for proactive management.                                                                                 | Consistent funding to provide for net increase in urban forest benefits.                                                                   | Consistent private and public funding to sustain maximum urban forest benefits.                                                                                                          | Develop and maintain adequate and consistent funding to implement the urban forest management plan.                                                      |
| City natural resource and forestry staffing                                                                                              | No training for urban forestry staff.                                             | <b>Certified arborist on staff with regular professional development.</b>                                                    | Certified arborist and professional foresters <sup>vi</sup> on staff with regular professional development and support staff.              | Multi-disciplinary professional team <sup>vii</sup> within the urban forestry unit.                                                                                                      | Employ and train adequate professional staff to implement citywide urban forest management plan.                                                         |
| Management of publicly and privately owned natural areas <sup>viii</sup> (trees managed extensively; e.g., woodland, ravine lands, etc.) | No information about publicly or privately owned natural areas.                   | <b>Publicly and privately owned natural areas are identified in a generalized "natural area survey" or similar document.</b> | Ecosystem structure and function in publicly and privately owned natural areas is documented.                                              | The ecological structure and function of all publicly owned and privately owned natural areas are documented and used in making management decisions.                                    | Management decisions are based upon a detailed understanding of the ecological structure and function of all publicly and privately owned natural areas. |
| Urban forest protection policy development and enforcement                                                                               | No urban forest protection policy.                                                | Policies in place to protect public portion of the urban forest.                                                             | <b>Policies in place to protect public and private portions of the urban forest with enforcement.</b>                                      | Integrated municipal wide policies that ensure the protection of the urban forest on both public and private land and are consistently enforced and supported by significant deterrents. | The benefits derived from the urban forest are ensured by the implementation and enforcement of the urban forest management plan.                        |
| Urban forest inventory public-private                                                                                                    | Sample-based inventory of publicly owned urban forest.                            | <b>Sample-based inventory of publicly owned and privately owned urban forest.</b>                                            | Complete inventory of publicly owned urban forest and sample-based inventory of privately-owned urban forest including citywide GIS.       | Complete inventory of the urban forest resource.                                                                                                                                         | Complete inventory of the urban forest resource to direct its management, included age distribution, species mix, tree condition, and assessment.        |
| Publicly owned natural areas management planning and implementation                                                                      | <b>Reactionary stewardship in effect.</b>                                         | Stewardship plan for each publicly owned natural area.                                                                       | Implementation of stewardship plans in effect for each publicly owned natural area focused public use and access.                          | Implementation of stewardship plan in effect for each publicly owned natural area focused on public use and sustaining the ecological structure and function of the feature.             | Support maintenance and enhancement of regional biodiversity, ecological health and social well-being.                                                   |

| Criteria                                                           | Resource Management - Performance Indicators (continued)                  |                                                                                                                                         |                                                                                                                                                                                                                                      |                                                                                                                                                                                           | Key Objective                                                                                                                                                                          |
|--------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                    | Low                                                                       | Moderate                                                                                                                                | Good                                                                                                                                                                                                                                 | Optimal                                                                                                                                                                                   |                                                                                                                                                                                        |
| Native vegetation <sup>x</sup> management                          | Voluntary use of native species on publicly and privately owned lands.    | The use of native species is encouraged on a project-appropriate basis in both intensively and extensively managed areas <sup>x</sup> . | <b>The use of native species is required on a project-appropriate basis in both intensively and extensively managed areas.</b>                                                                                                       | Native vegetation management plans are developed and implemented for public and private lands                                                                                             | Preservation and enhancement of local natural biodiversity <sup>xi</sup> .                                                                                                             |
| Canopy cover inventory by municipal planning district              | Coarse visual assessment using aerial photography.                        | Sampling <sup>xii</sup> of tree cover using aerial photographs or satellite imagery.                                                    | Sampling of tree cover using aerial photographs or satellite imagery included in citywide GIS.                                                                                                                                       | <b>Citywide high-resolution assessments of the existing and potential canopy cover.</b>                                                                                                   | Monitor change over time to gauge affect of public policy and management practices.                                                                                                    |
| Tree planting and establishment on public and private land.        | <b>Tree planting and establishment is <i>ad hoc</i>.</b>                  | 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 (see canopy cover criterion, Appendix 1).                                                                    | Tree planting and establishment program are driven by the UFMP objectives for canopy cover, species diversity, and species distribution objectives to ensure urban forest sustainability. | Tree planting and establishment is directed by objective criteria set in the urban forest management plan and informed by the Tampa Urban Forest Opportunity Spectrum Analysis (2007). |
| Maintenance of publicly managed trees within public rights-of-way. | <b>Publicly managed trees are maintained on a request/reactive basis.</b> | Publicly managed trees are systematically maintained on a cycle longer than five years.                                                 | Mature publicly managed trees are maintained on a five years cycle. All immature trees are structurally pruned.                                                                                                                      | Publicly managed trees are monitored and maintained through periodic inventories to identify structural, disease and insect problems.                                                     | All publicly managed trees within rights-of-way are maintained to maximize current and future benefits, tree health, and condition and ensure maximum longevity.                       |
| Tree site suitability <sup>xiii</sup> (physical environment)       | Tree species are considered in planting site selection.                   | <b>Guidelines are in place for the selection of suitable species to meet specific site criteria.</b>                                    | Public trees are planted in sites with adequate soil quality and quantity, and growing space to achieve their growth and form potential. Private owners are provided science-based standards on tree selection and site suitability. | All trees are planted in sites that will maximize current and future benefits.                                                                                                            | Management <sup>xiv</sup> of urban forest will become more efficient and effective in producing environmental, social and economic benefits.                                           |
| Invasive Plant Species Management                                  | Recognition of invasive species.                                          | <b>Recognition of invasive species, are actively discouraged and voluntary control on private and public lands.</b>                     | Invasive species are recognized and their use is prohibited.                                                                                                                                                                         | Invasive plant species management plans are developed and implemented for public and private lands.                                                                                       | Elimination of invasive plant species.                                                                                                                                                 |

| Criteria                                                                             | Resource Management - Performance Indicators (continued)             |                                                                                                                 |                                                                                                                                          |                                                                                                                                                                       | Key Objective                                                                                                                                        |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                      | Low                                                                  | Moderate                                                                                                        | Good                                                                                                                                     | Optimal                                                                                                                                                               |                                                                                                                                                      |
| Public tree condition assessment and abatement along emergency and evacuation routes | The condition of trees along emergency evacuation routes is unknown. | <b>No tree condition assessment/ remediation program along emergency routes. Request based/reactive system.</b> | Sample-based tree inventory including general tree risk information along emergency/evacuation routes. Risk abatement is not systematic. | Complete tree inventory which includes detailed tree failure risk ratings; risk abatement program is in effect eliminating hazards along emergency/evacuation routes. | Emergency and evacuation routes will be clear during the on-set of storms and will require minimal clearing of woody debris following a storm event. |
| Public tree condition assessment and abatement city-wide                             | The condition of the urban forest is unknown.                        | <b>No citywide public tree condition assessment/ remediation program. Request based/reactive system.</b>        | Sample-based public tree inventory including general tree risk information. Request-based/reactive risk abatement program system.        | Inventory of public trees includes detailed tree risk ratings; risk abatement program is in effect eliminating hazards.                                               | All publicly managed trees are free of recognizable hazards.                                                                                         |
| <b>Current State - Summary</b>                                                       | <b>5</b>                                                             | <b>7</b>                                                                                                        | <b>2</b>                                                                                                                                 | <b>1</b>                                                                                                                                                              |                                                                                                                                                      |

| Criteria                                                      | Community Framework - Performance Indicators                                       |                                                                       |                                                                                                           |                                                                                                    | Key Objective                                                                            |
|---------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                               | Low                                                                                | Moderate                                                              | Good                                                                                                      | Optimal                                                                                            |                                                                                          |
| General awareness of the urban forest as a community resource | Urban forest seen as a community problem.                                          | <b>Urban forest seen as important to the community.</b>               | Urban forest acknowledged as providing environmental, social, and economical services.                    | Urban forest recognized as vital to the community's environmental, social and economic well being. | The general public understands the importance of the urban forest to the community.      |
| Neighborhood cooperation                                      | <b>Majority of neighborhoods are unfamiliar with Urban Forest Management Plan.</b> | Isolated or limited number of active neighborhood groups.             | Majority of neighborhood associations form partnerships with city government.                             | All neighborhoods associations form partnerships with city government.                             | At the neighborhood level, citizens understand and cooperate in urban forest management. |
| Citizen- municipal-business – commuter interaction            | No interaction among constituencies.                                               | <b>Some interaction among constituencies, with conflicting goals.</b> | Informal and/or general cooperation.                                                                      | Formal interaction with staff coordination.                                                        | All constituencies in the community interact for the benefit of the urban forest.        |
| Support by private land holders                               | Unfamiliar with issues.                                                            | <b>Educational materials and advice available to landholders.</b>     | Clear goals for tree resources by landholders. Incentives for protection and management of private trees. | Landholders develop comprehensive tree management plans (including funding).                       | Private landholders embrace citywide goals and objectives of the UFMP.                   |
| <b>Current State - Summary</b>                                | <b>1</b>                                                                           | <b>3</b>                                                              | <b>-</b>                                                                                                  | <b>-</b>                                                                                           |                                                                                          |

| Criteria                                                                               | Institutional Framework - Performance Indicators                                                        |                                                                                                                               |                                                                                                                              |                                                                                                                                | Key Objective                                                                                                                                                              |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                        | Low                                                                                                     | Moderate                                                                                                                      | Good                                                                                                                         | Optimal                                                                                                                        |                                                                                                                                                                            |
| City public agency cooperation                                                         | Conflicting processes among departments and or agencies that are inconsistent with the UFMP.            | <b>Urban Forest Management Plan (UFMP) processes are held in common but no cooperation among departments and/or agencies.</b> | Departments and/or agencies are functioning and implementing processes consistent with the UFMP on a project-specific basis. | Municipal standards in place for implementing the UFMP by interdepartmental/ inter-agency processes on all municipal projects. | Ensure all city departments cooperate with goals and objectives of the UFMP.                                                                                               |
| Design and development industry, and other government agency <sup>xv</sup> cooperation | Unfamiliar with issues                                                                                  | <b>Recognition and acceptance of issues.</b>                                                                                  | Implement design and construction objectives consistent with the UFMP                                                        | Implement design and construction objectives that exceed UFMP objectives and support citywide green infrastructure.            | Design and development industries, and other government agencies embrace citywide UFMP goals and objectives.                                                               |
| Landscape and arboriculture industry cooperation                                       | No cooperation among segments of the green industry. No adherence to professional standards and ethics. | <b>General cooperation among nurseries, tree care companies, etc.</b>                                                         | Specific cooperative arrangements with City.                                                                                 | Shared vision and goals including the use of professional standards and ethics.                                                | The landscape and arboriculture industries operate with high professional standards and ethics, and commits to citywide urban forest management plan goals and objectives. |
| Cooperation within the geographic region of the Tampa Bay Watershed <sup>xvi</sup>     | <b>Government and planning agencies operate independently.</b>                                          | Government and planning agencies share similar policy vehicles.                                                               | Regional planning is in effect.                                                                                              | Watershed, natural resource and comprehensive planning are coordinated.                                                        | Cooperation and interaction among neighboring regional planning agencies and governments to support forest sustainability within the watershed.                            |
| <b>Current State - Summary</b>                                                         | <b>1</b>                                                                                                | <b>3</b>                                                                                                                      | <b>-</b>                                                                                                                     | <b>-</b>                                                                                                                       |                                                                                                                                                                            |

## Notes:

<sup>i</sup> RDBH – Relative Diameter at Breast Height: the ratio between the measured diameter at breast height and the maximum diameter for the species.

<sup>ii</sup> \* Uneven Aged Distribution: the population of all trees is comprised of a diversity of ages. Uneven-aged forest stands (urban forests) usually possess a reverse J-shaped diameter distribution, with large numbers of small trees and relatively few large-diameter trees. In reality, each species of tree within the forest stand (urban forest) will have its own diameter distribution, and the overall age distribution is a composite of these (after Nyland, 1996).

<sup>iii</sup> \* Wind Resistance of Trees: Duryea et al. (2007). "Hurricanes and the urban forest: effects on southeastern coastal plain trees." *Arboriculture and Urban Forestry*, 33(2): 83-97 and

Duryea et al. (2007). "Hurricanes and the urban forest: effects on tropical and sub-tropical trees." *Arboriculture and Urban Forestry*, 33(2): 98-112.

<sup>iv</sup> Long-lived: refers to species of trees that exhibit the ability to tolerate harsh urban conditions for time frames that approximate their natural life span.

<sup>v</sup> Reactive management: dealing with problems as they come up.

<sup>vi</sup> Professional forester: a professional engaged in the practice of the art and science of forestry. A forester typically has earned at least a baccalaureate degree in forestry from a university accredited by the Society of American Foresters.

<sup>vii</sup> Multi-disciplinary professional team: a group of natural resource management professionals from diverse disciplines who come together to provide comprehensive assessment and consultation regarding the management of the urban forest.

<sup>viii</sup> Natural preserves: Areas designated for conservation purposes and operated by contractual agreement with, or managed by a federal, state, region-

al or local government or non-profit agency, such as, national parks, state parks, city and county parks, lands purchased under the Save Our Coast, Conservation and Recreation Lands, Save Our Rivers, or Environmental Lands Acquisition and Protection Programs (ELAPP), sanctuaries, preserves, monuments, archaeological sites, historic sites, wildlife management areas, national seashores and Outstanding Florida Waters (Tampa Comp Plan).

<sup>ix</sup> Native species: Flora and fauna that naturally occur in the City of Tampa. Not to mean naturalized or indigenous species that originate from outside the County (Tampa Comprehensive Plan).

<sup>x</sup> Extensively managed: refers to forest, wildlife and fisheries management practices most appropriately used to manage large woodlands, natural parks and forest land.

<sup>xi</sup> Biodiversity: is described by the United Nation's Convention on Biological Diversity as the variety of life on Earth and the natural patterns it forms.

<sup>xii</sup> Sampling: a sample measures a portion of a population, and in forestry, this is usually a very small portion. Estimates derived from data collected from the measured sample is then extrapolated to the entire population, most of which has not been measured.

<sup>xiii</sup> Tree species suitability: can be based on regionally specific guidelines, such as the tree suitability matrix developed by the University of Florida IFAS Extension specifically for the City of Tampa.

<sup>xiv</sup> Management: the application of appropriate technical forestry principles, practices, and business techniques (e.g., accounting, cost/benefit analysis, etc.) to the management of an urban forest to achieve the city's objectives.

<sup>xv</sup> Other government agency: refers to all government agencies and government contractors not working for the City of Tampa.

<sup>xvi</sup> Tampa Bay Watershed:



# 1st Five-Year Urban Forest Management Plan (2014-2019)

The first 5-year management plan represents the initial alternatives for action needed to lay the foundation for a comprehensive urban forest management. Alternatives for action chosen for implementation in the first 5-year Urban Forest Management Plan had to lead to no net increases in operational or capital costs. These actions have to do with the processes, procedures, ordinances and education to support the institutional, community and technical capacities needed to move the management of the urban forest forward. (see Appendix for the complete list of Alternatives for Action)

***Preferred Alternatives of Action for the 1st Five-Year Urban Forest Management Plan are arranged by category.*** Each action is preceded by the year in which it is intended to be initiated or completed. The specific criteria addressed by each action are then listed (see next section). Finally, the responsible or lead City department is indicated.

## Education

**Year 1**—Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest.

Criteria: Vegetation (Veg) – 1, 3, 4, 5, 6, 7

Resource Manage. (RM) – 6, 11, 12, 13, 14

Community Framework (CF) – 1, 2, 4

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

**Year 1**—Prepare and maintain an interactive urban forest website for City of Tampa's residents.

Criteria: CF – 1

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

**Year 1**—Provide and maintain a current list of qualified and certified ISA or ASCA arborists working in the City of Tampa.

Criteria: Veg – 5

Responsible Department: Dept. of Planning and Development

**Year 3**—In partnership with state universities and natural resource agencies conduct training programs on inventory and management of natural areas for public and private property owners.

Criteria: RM – 4

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

**Year 3**—Encourage the organization of a Tampa Bay Urban Forestry Consortium within the Regional Planning Council and the Planning Commission, to ensure cooperation and interaction among planning agencies and governments to support forest sustainability within the watershed.

Criteria: Institutional Framework (IF) – 4

Responsible Department: Dept. of Planning and Development in cooperation with the University of Florida IFAS Extension

## Organization and Staff

**Year 1**—Identify an appropriate inventory system to assess condition of publicly managed trees. This is the only action that will require a capital expenditure, and was supported by the Department Directors.

Criteria: Veg – 8

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

**Year 1**—Improve the efficiency of urban forest management by realigning the long-term management and regulation of the UF within the Planning Department, and consolidate management of public trees and natural areas within the Dept of Parks and Recreation.

Criteria: RM – 2

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

**Year 1**—Assign the Natural Resources Section of the Planning Division with the responsibility and authority for oversight of the City's implementation of the urban forest management plan. Rule development and regulations will be done under the supervision of the Code Administrator, Planning and Urban Design.

Criteria: RM – 1

Responsible Department: Dept. of Planning and Development

**Year 3**—Require that all City of Tampa personnel enforcing urban forest Land Development Regulations have a minimum level of training equivalent to an certified arborist (ISA, ASCA), including continuing education.

Criteria: RM – 5

Responsible Department: Dept. of Planning and Development

**Year 3**—Provide training of the GIS section of the Planning Division on the utilization of the citywide urban forest inventory/analysis to support monitoring and planning of the urban forest.

Criteria: RM – 6

Responsible Department: Dept. of Planning and Development

**Year 3**—Purchase a work order system for the management of the urban forestry program.

Criteria: RM – 10b

Responsible Department: Parks and Recreation Dept.

**Year 5**—Create a system of review and risk assessment of trees in parks and public spaces that is directly tied to an internal Parks and Recreation Department work order system.

Criteria: RM – 14

Responsible Department: Parks and Recreation Dept.

**Year 5**—Require the use of the City of Tampa's formalized Tree Matrix on all tree planting projects required through code or through use of public funds, which follows Tree Matrix review committee recommendations.

Criteria: Veg – 2, 3

RM – 5, 11

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

**Year 5** – In cooperation with state universities and natural resources agencies develop a strategic framework, which include criteria, performance indicators and key objectives for the conservation of regional biological diversity that supports comprehensive plan policies.

Criteria: RM – 7

Responsible Department: Dept. of Planning and Development

## Plan Implementation

**Year 1**—Prepare a draft of an Executive Order, for the Mayor’s consideration, that directs all City of Tampa agencies to actively cooperate in the implementation of the UFMP.

Criteria: This action supports all criteria and implementation of adaptive management process.

Responsible Department: Dept. of Planning and Development

**Year 1**—Prepare a draft resolution, for City Council consideration, that recognizes the UFMP as the strategic plan for the management of the urban forest in the City of Tampa.

Criteria: This action supports all criteria and implementation of adaptive management process.

Responsible Department: Dept. of Planning and Development

**Year 1**—Establish an Internal Technical Advisory Committee, comprised of appointed departmental representatives. The committee will meet quarterly to review progress, as part of the adaptive management strategy, identify issues and make recommendations associated with the successful implementation of the UFMP. The Planning Division Manager or Director of Planning and Development Department shall chair and facilitate the committee.

Criteria: This action supports all criteria and implementation of adaptive management process.

Responsible Department: Dept. of Planning and Development

**Year 1**—Create an Advisory Committee on Natural Resources, consisting of a balanced representation of the City’s economic, environmental and social interests, to assist the Planning and Development Department on an annual basis in making recommendations as part of the adaptive management strategy for implementation of the UFMP.

Criteria: This action supports all criteria and implementation of adaptive management process.

Responsible Department: Dept. of Planning and Development

**Year 1**—Prepare a LDR to require the use of the City of Tampa’s Tree Matrix as a guidance document for all tree planting required through code or through use of public funds.

Criteria: Veg – 2

RM – 11

Responsible Department: Dept. of Planning and Development

**Year 1**—Prepare a LDR that requires adherence to ANSI Tree, Shrub, and other woody Plant Maintenance (A300 series).

Criteria: IF – 3

Responsible Department: Dept. of Planning and Development

**Year 1**—Prepare a LDR to require publicly financed tree planting projects to utilize wind resistant tree species along all emergency evacuation routes.

Criteria: Veg – 6

RM – 3

Responsible Department: Dept. of Planning and Development

**Year 1**—Revise the current LDR to clarify and streamline protection and management requirements of private trees to support sustainable development, consistent with the City of Tampa’s Comprehensive Plan. (CP# 32.3.3)

Criteria: CF – 4

Responsible Department: Dept. of Planning and Development

**Year 1**—Revise LDR to include preservation and management plans for native plant communities, and restoration of native vegetation on development sites where appropriate.

Criteria: RM – 8

Responsible Department: Dept. of Planning and Development

**Year 1**—Prepare a LDR that requires removal and treatment of invasive plant species (Florida Noxious Weed List – DPI, 5B – 57.007) on all new or redesigned development sites.

Criteria: RM – 12

Responsible Department: Dept. of Planning and Development

**Year 1**—Revise LDR's to allow the use of alternative site designs and mitigation strategies that support the key objectives of the UFMP.

Criteria: IF – 2

Responsible Department: Dept. of Planning and Development

**Year 3**—Revise current LDR to reflect the comprehensive plan objectives and policies for UF management including its ecological structure and function. (CP obj# 32.3 – policies 2 – 6) (CP obj# 38.2 – policies 1 – 14) (CP obj #38.27 - policies 1 – 4) (CP obj#38.3 – policies 4 – 14) (CP obj#38.4: policies 1 – 6) (CP obj#38.5 – policies 1, 2, 4 – 6)

Criteria: RM – 5

Responsible Department: Dept. of Planning and Development

**Year 3**—Incorporate the criteria and key objectives of the UFMP into the City of Tampa Comprehensive Plan.

Criteria: This action supports all criteria

Responsible Department: Dept. of Planning and Development

## Urban Forestry Program Funding Alternatives

**Year 3**—Establish a partnership with Emergency Operations Management agencies to support funding for a complete tree inventory that evaluates general tree risk within the rights-of-way along emergency-critical routes and evacuation routes.

Criteria: RM – 13

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

Monitoring and Evaluation

**Year 5**—Contract the 5-year urban forest inventory and analysis with state universities utilizing tree trust funds.

Criteria: RM – 6, 9

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

**Year 5**—Include the Forest Opportunity Spectrum Analysis as part of the 5 year urban forest inventory/analysis.

Criteria: RM – 10a

Responsible Department: Dept. of Planning and Development and Parks and Recreation Dept.

# Appendices

# Consistency between Vision, Goals and Final

*Example of consistency between Vision and Goals/Objectives for Urban Forest Sustainability set by Steering Committee, the Guiding Principles, and Urban Forest Criteria/Key Objectives and Alternatives for Action:*

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## Vision for Urban Forest Sustainability

Maintain and expand Tampa's urban forest in recognition of the many benefits it provides, including: enhancing quality of life for present and future citizens, attaining numerous economic and ecological benefits Nature provides, and seizing opportunities to better understand our natural environment through scientific research and public education.

## Forest and Tree Maintenance

*GOAL: To promote proper tree care in the urban forest through education and enforcement.*

**Guiding Principles:** 1. government efficiency; public – private partnerships; 2. support communities; and 3. increase the social, environmental and economic benefits of the urban forest by reducing costs.

**OBJECTIVES:**

### 1. Develop Urban Forest Management Plan

**Criteria:** Urban forest management plan.

**Key Objective:** A comprehensive urban forest management plan for private and public property is integrated into plans for sustainability.

**Alternative for Action:** Develop Strategic Plan for Urban Forest Management and begin implementation of first 5-year plan.

### 2. City should require certification of companies involved in tree care to enhance enforcement

**Criteria:** Urban forest protection policy development and enforcement.

**Key Objective:** The benefits derived from the urban forest are ensured by the implementation and enforcement of the urban forest management plan.

**Alternative for Action:** Prepare a LDR that requires adherence to ANSI Tree, Shrub, and other woody Plant Maintenance (A300 series).

### 3. Education by the City of citizens and community members

**Criteria:** Neighborhood cooperation.

**Key Objective:** At the neighborhood level, citizens understand and cooperate in urban forest management.

**Alternatives for Action:**

- a. Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest.
- b. In partnership with state universities and natural resource agencies conduct training programs on inventory and management of natural areas for public and private property owners.

# Complete Set of Alternatives for Action

## City of Tampa Urban Forest Plan

**NOTE: Many of the alternatives for actions are listed under several criteria and reflect the efficiency of these actions.**

CP = Comprehensive Plan

Budget: \$ = will not lead to increase in operational budget or capital expenditures; \$\$\$ = may require increase in operational budget or capital expenditures

MC = alternative for action addresses multiple criteria

## VEGETATION RESOURCE

### CRITERIA 1 – Species suitability for Tampa’s climate zones (Current State-moderate)

Alternatives for Action:

Year to be Accomplished

- 1 – Prepare a Land Development Regulation (LDR) that requires the use of the City of Tampa Tree Matrix as a guidance document for all tree planting projects required through code or through use of public funds tree planting projects. PD, \$, MC
- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 3 - Prepare a digital City of Tampa brochure on tree care and maintenance for inclusion on urban forest web site. PD & PR, \$, MC

### CRITERIA 2 – Canopy cover relative to goals by municipal planning district

Alternatives for Action:

Year to be Accomplished

- 1 - Prepare a Land Development Regulation (LDR) to require tree trust mitigation occur within the same municipal planning district or other district with demonstrated need identified by the urban forest inventory/analysis. PD, \$, MC
- 1 - Revise current LDR to prioritize preservation or conservation of representative stands of upland native tree canopy. (CP – policy# 38.2.6) PD, \$, MC
- 1 - Require any tree planting or tree preservation required through a LDR or through use of public funds not lead to a net loss of tree canopy cover by municipal planning district. PD, \$
- 1 - In cooperation with the University of Florida Hillsborough County Extension, provide tools and training to the engineering, landscape architecture, architecture, landscape design, landscape maintenance, natural resources and arboricultural industries to maximize value of urban forest resources in site and landscape design. PD & PR, \$, MC
- 1 – Prepare a LDR to require the use of the City of Tampa’s Tree Matrix as a guidance document for all tree planting required through code or through use of public funds. PD, \$, MC

- 3 - Incentivize appropriate tree preservation by using techniques such as clustering and transfer of development rights, to protect environmentally sensitive resources (CP-policy# 38.2.5) PD, \$
- 1 - Form a committee of public and private natural resource professionals to review and revise the City of Tampa Tree Matrix every five years. PD & PR, \$, MC
- 5 - Require the use of the City of Tampa's formalized Tree Matrix on all tree planting projects required through code or through use of public funds, which follows Tree Matrix review committee recommendations. PD, \$, MC

### **CRITERIA 3 – Tree Species Diversity (Current State-optimal)**

#### **Alternatives for Action:**

##### **Year to be Accomplished**

- 1 – Prepare an LDR to require the use of the City of Tampa's Tree Matrix as a guidance document for all tree planting projects required through code or through use of public funds. PD, \$, MC
- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 3 - Prepare LDR to require that landscape plans demonstrate tree species diversity supports no more than 10% of any species citywide. PD, \$, MC
- 3 - Identify and apply for grants that support tree and shrub planting with neighborhood partners and non-profit organizations that support diversifying species. PD & PR, \$, MC
- 5 - Form a committee of public and private natural resource professionals to review and revise the City of Tampa Tree Matrix every five years. PD & PR, \$, MC
- 5 - Require the use of the City of Tampa's formalized Tree Matrix on all tree planting projects required through code or through use of public funds which follow Tree Matrix review committee recommendations. PD & PR, \$, MC

### **CRITERIA 4 – Diameter Distribution of trees in the City**

#### **Alternatives for Action:**

##### **Year to be Accomplished**

- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 - Prepare a LDR that requires a diversity of tree species for replacement and tree planting that will, at maturity, ultimately develop into a diversity of size classes. PD, \$
- 3 - Provide a diversity of tree species, for all tree giveaway programs, that will support the development of a diversity of size classes. PD & PR, \$\$\$
- 3 - Require all publicly financed tree-planting projects utilize a diversity of tree species that will, at maturity, ultimately develop into a diversity of size classes. PD & PR, \$

## **CRITERIA 5 – Tree Health by Municipal Planning District (Current State-moderate)**

### **Alternatives for Action:**

#### **Year to be Accomplished**

- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 - Provide and maintain a current list of qualified and certified ISA or ASCA arborists working in the City of Tampa. PD, \$, MC
- 1 - Utilize the City of Tampa tree matrix as guidance for all tree planting projects required through code or through use of public funds to ensure that the tree species used matches the site characteristics (right-tree-right-place). PD & PR, \$, MC
- 1 - Prepare a LDR that requires the City of Tampa to revoke an occupational license for arborists or tree care businesses that are found to be in violation of ANSI A300 standards. PD, \$, MC
- 3 - Prepare a LDR that requires the use of certified arborists (ISA, ASCA) on all publicly financed Capital Improvement Projects (CIP) and other projects that impact existing tree resources. PD, \$, MC
- 3 - Prepare a digital City of Tampa brochure on tree care and maintenance for inclusion on urban forest web site. PD & PR, \$, MC

## **CRITERIA 6 – Wind Resistance of Tree species Citywide (Current State-moderate)**

### **Alternatives for Action:**

#### **Year to be Accomplished**

- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 - Enforce the use of Florida grade #1 or better tree nursery stock on all tree planting projects or tree preservation required by code or through use of public funds. PD & PR, \$, MC
- 1 - Prepare a LDR to require publicly financed tree planting projects to utilize wind resistant tree species along all emergency evacuation routes. PD, \$, MC
- 1 – Form a partnership with the Tampa Bay Wholesale Growers Association (TBWGA) and Florida Nursery and Growers Landscape Association (FNGLA) to promote the availability of wind resistant tree species for use in the City of Tampa. PD & PR, \$
- 3 - Prepare a memorandum of understanding with the FL Dept of Transportation, Hillsborough County, Hillsborough Co School Bd and licensed utilities that confirms that their tree care and pruning practices does not lead to structural defects or increase the potential for tree failure during storms. PD, \$, MC
- 3 – In partnership with the State of Florida Office of Insurance Regulation prepare standards for tree maintenance that meet the needs of Insurance Companies operating in the City of Tampa. PD, \$

**CRITERIA 7 – Tree species longevity (Current State-good)**

Alternatives for Action:

Year to be Accomplished

- 1 - Enforce the use of Florida #1 or better tree nursery stock for all tree planting projects required through code or through use of public funds. PD & PR, \$, MC
- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 – Prepare a LDR that requires the use of the City of Tampa Tree Matrix as a guidance document for all tree planting projects required through code or through use of public funds. PD, \$, MC
- 3 - Form a committee of public and private natural resource professionals to review and revise the City of Tampa Tree Matrix every five years. PD & PR, \$, MC
- 5 - Require the use of the City of Tampa's formalized Tree Matrix on all tree planting projects through code or through use of public funds which follow Tree Matrix review committee recommendations. PD & PR, \$, MC

**CRITERIA 8 – Condition Assessment of the publicly managed trees (Current State-low)**

Alternatives for Action:

Year to be Accomplished

- 1 - Identify an appropriate inventory system to assess condition of publicly managed trees. PR, \$
- 3 – Utilizing the Neighborhood Tree Steward Program, develop partnerships with neighborhoods to assist in conducting inventories. PD & PR, \$
- 3 - Purchase appropriate technology based on the inventory specification for tree condition assessments of publicly managed trees. PR, \$\$\$, MC
- 3 - Train and require City of Tampa staff under the direction of the City's Urban Forester and Natural Resources Planning Div. to utilize the purchased inventory technology. PD & PR, \$\$\$, MC

## RESOURCE MANAGEMENT

### Criteria 1 – Urban forest management plan (Current State-low)

#### Alternatives for Action:

##### Year to be Accomplished

- 1 - Assign the Natural Resources Section of the Planning Division with the responsibility and authority for oversight of the City's implementation of the urban forest management plan, including rule development and regulations. PD, \$
- 1 - Assign the City's Urban Forester with operational responsibility for managing public trees, in accordance with the UFMP using an adaptive management approach. PR,\$
- 1 - Publish UFMP on City of Tampa web site. PD, \$
- 1 – Use UFMP for development of LDRs pertaining to the urban forest. PD, \$, MC
- 1 – Request an annual audit from the Hillsborough County Forester of assessment of progress in the implementation of the UFMP. PD, \$
- 3 - Publish brochures, posters and fact sheets, in English and Spanish, to describe the benefits of the city's urban forest and the implementation of the UFMP. PD & PR, \$\$\$, MC
- 3 - Prepare an educational program on urban forest management tailored to support the mission of the various departments within the City of Tampa. PD & PR, \$
- 3 - Incorporate the criteria and key objectives of the UFMP into the City of Tampa Comprehensive Plan. PD, \$, MC
- 5 – Conduct a comprehensive review and update of the UFMP's alternatives for action. PD & PR, \$, MC
- 5 - Review all City of Tampa procedures and practices to confirms that they are aligned with UFMP. PD & PR, \$, MC

### Criteria 2 – Municipality-wide funding (Current State-low)

#### Alternatives for Action:

##### Year to be Accomplished

- 1 - Improve the efficiency of urban forest management by realigning the long-term management and regulation of the UF within the Planning Department, and consolidate management of public trees and natural areas within the Dept of Parks and Recreation. PD & PR, \$
- 1 – Prepare a scope of work to conduct a scientific study to determine the economic contribution of the urban forest for the Ad Valorem tax base of the City of Tampa and make recommendation to City Council to fund the study. PD, \$\$\$
- 1 - Provide a link to US Forest Service on the City of Tampa's urban forestry website to allow residents to determine economic benefits of individual trees. PD & PR, \$, MC
- 1 - Require that an annual report, on Florida Arbor Day, be prepared by the Parks and Recreation Department and the Planning and Development Department that identifies all appropriate federal and state grant opportunities, and the status of all ongoing grants and applications. PD & PR, \$

- 3 - In cooperation with the Budget Department investigate alternative funding sources for urban forest management. PD & PR, \$
- 3 – Prepare a scope of work to conduct a market study to determine the economic contributions of UF to economic growth in the City of Tampa and make recommendation to the City Council to fund the study. PD, \$\$\$
- 5 – Based upon a work force assessment, recommend funding to hire sufficiently qualified urban forestry personnel to provide systematic preventive maintenance of all publicly owned trees. PR, \$\$\$
- 5- Implement alternative sources for long term, consistent funding for UF management, including but not restricted to: voluntary rounding of utility bills, fees for public tree maintenance, fees for technical assistance, and additions to various City based taxing districts. PD & PR, \$

### **Criteria 3 – City Natural Resource and Forestry Staffing (Current State-moderate)**

Alternatives for Action:

Year to be Accomplished

- 1 – Prepare a clear hierarchical organizational structure that identifies responsibilities and accountability for implementation of the UFMP. PD & PR, \$
- 1 - Consolidate management of public trees and natural areas within the Parks and Recreation Dept. PD & PR, \$
- 1 - Prepare a LDR to require publicly financed tree planting projects to utilize wind resistant tree species along all emergency evacuation routes. PD, \$, MC
- 1 - Standardize UF staff training requirements for urban forestry and natural resource employees. PD & PR, \$, MC
- 1 - Evaluate cost effectiveness of outsourcing urban forestry services. PR, \$
- 3 - City of Tampa will accredit and license natural resource professionals\* for natural resource site assessments for development plan review. PD, \$, MC
- 3 – Designate a Natural Areas Manager for the City of Tampa. PR, \$\$\$, MC

### **Criteria 4 – Management of publicly and privately owned natural areas (Current State-moderate)**

Alternatives for Action:

Year to be Accomplished

- 1 – Rewrite the LDR to preserve and protect coastal wetlands, non-tidal wetlands, and riverine vegetative buffers, based upon best available science. PD, \$, MC
- 3 - In partnership with state universities and natural resource agencies conduct training programs on inventory and management of natural areas for public and private property owners. PD & PR, \$, MC
- 3 - Require the Parks and Recreation Department's designated natural areas manager to be a State of Florida, Public Pesticide Applicator license holder with appropriate license categories. PR, \$\$\$

- 3 - Require the Parks and Recreation Department's designated natural areas manager to be certified as a State of Florida Prescribed Fire Manager. PR, \$\$\$
- 3 – Require all staff participating in natural areas prescribed burning to complete federal courses: Incident Command System (I.C.S.) courses S-130 Firefighter Training, S-190 Introduction to Wildland Fire Behavior. PR, \$\$\$
- 3 – Cooperate with state universities and natural resource agencies to conduct inventory/analysis of publicly owned natural areas. PR, \$\$\$, MC
- 5 - Cooperate with state universities and natural resource agencies in the preparation of natural resource management plans that identify criteria and quantifiable performance objectives for City-owned natural areas. (CP obj#38.3, policy1, 9, 11, 12, 14) PR, \$\$\$, MC
- 5 - Require annual progress report on the management of natural areas to the Natural Resource Planning Section of the Planning Division (CP obj#38.3, policy 1). PD & PR, \$, MC
- 5 - Prepare partnership with the University of South Florida to jointly manage Hillsborough River floodplain (USF Forest Preserve, City of Tampa Eco-Palms). (CP obj#38.3, policy 7, 8, 14) PD & PR, \$, MC

#### **Criteria 5 – Urban forest protection policy development and enforcement (Current State-good)**

##### **Alternatives for Action:**

##### **Year to be Accomplished**

- 1 – Natural Resource Section of the Planning Division shall provide technical guidance for protection and enhancement of the urban forest during land development. PD, \$
- 1 – Prepare an LDR to require the use of the City of Tampa's Tree Matrix as a reference document for all tree planting project required through code or through use of public funds. PD, \$, MC
- 1 - Prepare a Land Development Regulation (LDR) to require tree trust mitigation occur within the same municipal planning district or other district with demonstrated need identified by the urban forest inventory/analysis. PD, \$, MC
- 1 - Revise current LDR to incorporate measurable criteria for assessing damage, effective removal and other tree violations. PD, \$
- 1 - Assure that all required tree preservation requirements for site plan reviews are followed up with site visits and hazard tree assessments. PD, \$
- 3 - Revise current LDR to reflect the comprehensive plan objectives and policies for UF management including its ecological structure and function. (CP obj# 32.3 – policies 2 – 6) (CP obj# 38.2 – policies 1 – 14) (CP obj #38.27 - policies1 – 4) (CP obj#38.3 – policies 4 – 14) (CP obj#38.4: policies 1 – 6) (CP obj#38.5 – policies 1, 2, 4 – 6) PD, \$, MC
- 3 - Require that all City of Tampa personnel enforcing UF LDR's have a minimum level of training equivalent to an certified arborist (ISA,ASCA), including continuing education. PD & PR, \$, MC
- 5 – Require certification and licensing of landscape and arboricultural industry working within the City of Tampa. PD, \$, MC
- 5 - Form a committee of public and private natural resource professionals to review and revise the City of Tampa Tree Matrix every five years. PD & PR, \$, MC
- 5 - Require the use of the City of Tampa's formalized Tree Matrix on all tree planting projects required through code or through use of public funds which follows Tree Matrix review committee recommendations. PD & PR, \$, MC

**Criteria 6 – Urban forest inventory public-private (Current State-moderate)**

Alternatives for Action:

Year to be Accomplished

- 1 - Cooperate in the Development of an 'Open Tree Map' inventory technology for use by City of Tampa. PD & PR, \$, MC
- 1 - Assure public access to UF inventory/analysis report and maps. PD, \$, MC
- 1 – Train City of Tampa arborists and natural resource staff on the use of 'Open Tree map' technology. PD & PR, \$, MC
- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 3 – Provide training of the GIS section of the Planning Division on the utilization of the citywide urban forest inventory/analysis to support monitoring and planning of the urban forest. PD, \$, MC
- 5 - Contract the 5-year urban forest inventory and analysis with state universities utilizing tree trust funds. PD & PR, \$\$\$, MC
- 5 - Integrate urban forestry work order system with urban forest inventory to direct management prioritization. PR, \$\$\$, MC
- 5 - Conduct a sample based right of way tree inventory/assessment using USDA Forest Service iStreets technology to support work prioritization. PD & PR, \$\$\$, MC

**Criteria 7 – Publicly owned natural areas management planning and implementation (Current State-low)**

Alternatives for Action:

Year to be Accomplished

- 5 – In cooperation with state universities and natural resources agencies develop a strategic framework, which include criteria, performance indicators and key objectives for the conservation of regional biological diversity that supports comprehensive plan policies. PD & PR, \$, MC
- 3 - Designated Natural Areas Manager will participate in the inventory/analysis of vegetation and preparation of natural resource management plans on all City of Tampa natural areas. PR, \$, MC
- 3 – Cooperate with state universities and natural resource agencies to conduct inventory/analysis of publicly owned natural areas. PR, \$\$\$, MC
- 3 – Develop a cooperative agreement with the Florida Forest Service, and Fish and Wildlife Commission to manage the City of Tampa Natural Areas. PR, \$\$\$, MC
- 5 - Cooperate with state universities and natural resource agencies in the preparation of natural resource management plans that identify criteria and quantifiable performance objectives for City-owned natural areas. (CP obj#38.3, policy1, 9, 11, 12, 14) PR, \$\$\$, MC

## **Criteria 8 – Native Vegetation Management (Current State-good)**

### Alternatives for Action:

Year to be Accomplished

- 1 – In partnership with local conservation organizations, support education on the values and management of native vegetation through workshops. PD & PR, \$, MC
- 1 - Work with the TBWGA and FNGLA to assure the availability a diversity of native tree and shrub stock for planting in the City of Tampa. PD & PR, \$, MC
- 1 - Revise LDR to include preservation and management plans for native plant communities, and restoration of native vegetation on development sites where appropriate. PD, \$, MC
- 3 - Prepare a LDR to implement the protection of the attributes, functions and amenities of the natural environment in the City of Tampa (CP Obj #38.2, policy 1, 4, 5, 6, 8, 10, 11, 12, 13, and 14; Obj#38.3 policy 1 and 4). PD, \$, MC

## **Criteria 9 – Canopy cover inventory by municipal planning district (Current State-optimal)**

### Alternatives for Action:

Year to be Accomplished

- 5 - Continue contract with state universities to conduct the 5 year urban forest inventory/analysis to monitor change in canopy coverage utilizing tree trust funds. PD & PR, \$\$\$, MC

## **Criteria 10a – Tree planting and establishment on public and private land (Current State-low)**

### Alternatives for Action:

Year to be Accomplished

- 5 - Include the Forest Opportunity Spectrum Analysis as part of the 5 year urban forest inventory/analysis. PD & PR, \$, MC
- 1 - Implement an Arbor Day citywide tree seeding giveaway program for private residents, which uses the Tampa Tree Matrix guide and the right tree right place concept. PD & PR, \$\$\$, MC
- 1 - Incorporate the City of Tampa Tree Matrix into LDR to reflect tree species diversity and space considerations. PD, \$, MC
- 1 - Revise LDR to include technical guidelines for tree planting and establishment. PD, \$, MC

**Criteria 10b – Maintenance of publicly managed trees within public rights of way (Current State-low)**

Alternatives for Action:

Year to be Accomplished

- 3 – Purchase a work order system for the management of the urban forestry program. PR, \$\$\$
- 1 - Consolidate management of public trees within rights-of-way under Parks and Recreation Department. PR, \$
- 1 - Cooperate in the Development of an 'Open Tree Map' inventory technology for use by City of Tampa. PD & PR, \$, MC
- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 - Prepare and implement a performance-based contract to assist with the maintenance of publicly owned trees. PD & PR, \$\$\$, MC
- 1- Formalize the current process to ensure that all City of Tampa departments meet technical standards for tree protection within the rights-of-way. PD, \$, MC
- 3 – Implement an urban forestry work order system that is integrated with the UF inventory and directs management prioritization. PR, \$
- 3 - Conduct an in-house work force assessment to determine appropriate professional and technical positions need to fully implement the UFMP. PD & PR, \$
- 5 - Train all responsible natural resources and urban forestry staff on the use of inventory technology and work order tracking system. PD & PR, \$, MC
- 5 - Conduct a sample based right of way tree inventory/assessment using USDA Forest Service iStreets technology to support work prioritization. PD & PR, \$\$\$, MC

**Criteria 11 – Tree-site Suitability (Current State-moderate)**

Alternatives for Action:

Year to be Accomplished

- 1 – Prepare a LDR to require the use of the City of Tampa's Tree Matrix as a guidance document for all tree planting projects required through code or through use of public funds. PD, \$, MC
- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 5 - Form a committee of public and private natural resource professionals to review and revise the City of Tampa Tree Matrix every five years. PD & PR, \$, MC
- 5 – Update the LDR to require the use of the City of Tampa's formalized Tree Matrix on all tree planting projects required through code or through use of public funds which follow Tree Matrix review committee recommendations. PD & PR, \$, MC

## **Criteria 12 – Invasive Plant Species Management (Current State-moderate)**

### Alternatives for Action:

#### Year to be Accomplished

- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 - Prepare a LDR requires removal and treatment of invasive plant species (Florida Noxious Weed List – DPI, 5B – 57.007) on all new or redesigned development sites. PD, \$, MC
- 1 - City of Tampa to actively participate in Florida Cooperative Invasive Species Management Agreement, Suncoast Chapter. PR, \$
- 1 - Cooperate with the Florida Natural Areas Inventory to identify invasive plant species on all City of Tampa public land. PD & PR, \$
- 3 – Initiate an ongoing public program to control invasive plant species on all City of Tampa public-ly owned land. PR, \$\$\$, MC

## **Criteria 13 – Public tree condition assessment and abatement along emergency and evacuation routes (Current State-moderate)**

### Alternatives for Action:

#### Year to be Accomplished

- 1 - Prepare a LDR to require all trees planted in rights-of-way along emergency-critical routes and evacuation routes, meet all space requirements, as well as wind resistance as identified in the Tampa Tree Matrix guide. PD, \$, MC
- 3 - Establish a partnership with Emergency Operations Management agencies to support funding for a complete tree inventory that evaluates general tree risk within the rights-of-way along emergency-critical routes and evacuation routes. PR, \$, MC
- 3 - Establish a memorandum of agreement with the State of Florida, Hillsborough County, and the Federal government for management of trees along State, County, and Federal rights of way. PD & PR, \$
- 5 – Complete the tree inventory along emergency-critical routes and evacuation routes. PR, \$\$\$, MC
- 5 – Develop and implement an ongoing risk abatement program to eliminate hazards along emergency evacuation routes. PD & PR, \$\$\$

#### **Criteria 14 – Public tree condition assessment and abatement citywide** (Current State-moderate)

##### Alternatives for Action:

###### Year to be Accomplished

- 1 – Provide ongoing training program for qualified staff and/or contractors to recognize general tree risk on public lands. PD & PR, \$, MC
- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 5 – Develop and implement a City of Tampa Tree Risk Abatement Program for all publicly managed trees. PD & PR, \$\$\$
- 5 – Create a system of review and risk assessment of trees in parks and public spaces that is directly tied to an internal Parks and Recreation Department work order system. PR, \$
- 5 - Prepare a photo guide for common tree hazard conditions in the City of Tampa, and distribute the information via the UF website. PD & PR, \$\$\$, MC

## COMMUNITY FRAMEWORK

#### **Criteria 1 – General Awareness of the urban forest as a community resource** (Current State-moderate)

##### Alternatives for Action:

###### Year to be Accomplished

- 1 - Prepare and maintain an interactive urban forest website for City of Tampa's residents. PD & PR, \$, MC
- 1 - Provide a consistent message for the City on the social, economic and environmental benefits of the urban forest, to be communicated to neighborhoods by all City Departments. PD & PR, \$, MC
- 1 - Utilize public buildings, et.al. for posters, brochures or advertisements that support an appreciation for the benefits derived from the City of Tampa's urban forest. PD & PR, \$, MC
- 1 – Continue to cooperate with the University of Florida and Hillsborough County Extension on the use of community based social marketing to better understand residents perspectives on the value and trees and their care. PD & PR, \$, MC
- 1 - Adjust the Neighborhood Tree Stewardship Program to reflect input from neighborhood associations as identified through the community based social marketing program. PD & PR, \$, MC
- 1 – Provide direct technical guidance to residents and businesses for the protection and enhancement of trees and shrubs. PD & PR, \$
- 1 – Conduct annual Florida and National Arbor Day Programs to promote general awareness of the urban forest as a community resource. PD & PR, \$\$\$, MC
- 3 - Prepare a presentation for use by City employees to discuss and illustrate the benefits of the Tampa's urban forest. PD & PR, \$

- 3 – Organize annual teacher in-service workshops on the use of ‘Project Learning Tree’ in City of Tampa elementary schools. PR, \$

## **Criteria 2 – Neighborhood Cooperation** (Current State-low)

Alternatives for Action:

Year to be Accomplished

- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 – City of Tampa staff will participate in Neighborhood meetings and other special events to promote implementation of the urban forest management plan. PD & PR, \$
- 1 - Enhance the efficiency and effectiveness of the City of Tampa’s entire tree planting programs, based on social marketing strategies derived from ongoing neighborhood focus groups. PD & PR, \$
- 1 – All City of Tampa departments shall notify neighborhoods, through the use of the Neighborhood Relations email list, of any scheduled public tree maintenance or removal projects prior to commencement of operations. PD & PR, \$
- 3 - Hold a yearly “State of Tampa’s Urban Forest” workshop for neighborhoods and businesses with the intent of receiving feedback concerning the implementation of the UFMP. PD & PR, \$
- 5 - Conduct web based neighborhood survey every 5 years to assess residents’ attitudes toward the urban forest and needed technical support. PD & PR, \$

## **Criteria 3 - Citizen-municipal-business-commuter interaction** (Current State-moderate)

Alternatives for Action:

Year to be Accomplished

- 1 - Create an Advisory Committee on Natural Resources, consisting of a balanced representation of the City’s economic, environmental and social interests, to assist the Planning and Development Department on an annual basis in making recommendations as part of the adaptive management strategy for implementation of the UFMP. PD, \$, MC
- 1 – Cooperate with neighborhood and non-profit organizations to enhance volunteer programs for the benefit of the urban forest. PD & PR, \$, MC
- 3 - Prepare presentations on the benefits derived from the urban forest that support economic development and local business interests. PD & PR, \$
- 3 – Cooperate with the University of Florida to initiate community based social marketing strategy to better understand the business community perceptions for urban forestry and prepare a marketing strategy. PD & PR, \$\$\$

#### **Criteria 4 – Support by Private Land Owners (Current State-moderate)**

##### Alternatives for Action:

###### Year to be Accomplished

- 1 - Prepare and implement the Neighborhood Tree Stewardship program to educate residents on tree care and the urban forest. PD & PR, \$, MC
- 1 - Implement a formal City of Tampa technical assistance program on the protection of natural resources during land development, for private landowners. PD, \$, MC
- 1 – Revise the current LDR to clarify and streamline protection and management requirements of private trees to support sustainable development, consistent with the City of Tampa's Comprehensive Plan. (CP# 32.3.3) PD, \$, MC
- 3 - Provide landowners with an approved list of landscape and arboricultural companies that embrace UFMP criteria, keep objectives, and meet all industry standards for professional conduct (insurance, worker's compensation, et.al.). PD, \$, MC
- 3 – Identify public natural resource agency contacts for private landowner assistance on the City of Tampa's urban forest web site. PD, \$

## **INSTITUTIONAL FRAMEWORK**

#### **Criteria 1 – City public agency cooperation (Current State-moderate)**

##### Alternatives for Action:

###### Year to be Accomplished

- 1 - Prepare a draft of an Executive Order, for the Mayor's consideration, that directs all City of Tampa agencies to actively cooperate in the implementation of the UFMP. PD, \$
- 1 – Prepare a draft resolution, for City Council consideration, that recognizes the UFMP as the strategic plan for the management of the urban forest in the City of Tampa. PD & PR, \$
- 1 – Establish an Internal Technical Advisory Committee, comprised of appointed departmental representatives. The committee will meet quarterly to review progress, as part of the adaptive management strategy, identify issues and make recommendations associated with the successful implementation of the UFMP. The Planning Division Manager or Director of Department of Planning and Growth shall chair and facilitate the committee. PD, \$
- 1 – City of Tampa cooperates in the presentation workshops on urban design and arboriculture in cooperation with the University of Florida/Hillsborough County Extension. PD & PR, \$
- 1 - All departments reference compliance with natural resource protection standards found in the City of Tampa Land Development Regulations on a project specific basis. PD, \$, MC

**Criteria 2 – Design and development industry, and other government agency cooperation (Current State-moderate)**

Alternatives for Action:

Year to be Accomplished

- 1 - Cooperate with the state universities in the presentation of workshops on emerging urban design and conservation science. PD & PR, \$, MC
- 1 - Revise Land Development Regulations to allow the use of alternative site designs and mitigation strategies that support the key objectives of the UFMP. PD, \$
- 3 - City of Tampa will accredit and license natural resource professionals\* for natural resource site assessments for development plan review which will include but not be limited to vegetation location and condition, soils, hydrology and presence of significant wildlife habitat, wetlands and other natural features. PD, \$, MC
- 3 –Cooperate with the state universities to develop and implement pilot projects, funded through grants that demonstrate techniques for urban sustainability, i.e., green streets, low impact development strategies. PD & PR, \$
- 3 - Prepare a LDR that provides incentives to promote a natural systems approach to site development that is consistent with the key objectives of the comprehensive plan. (CP# 38.2) PD, \$

**CRITERIA 3 – Landscape and arboriculture industry cooperation (Current State-moderate)**

Alternatives for Action:

Year to be Accomplished

- 1 – Prepare a LDR that requires adherence to ANSI Tree, Shrub, and other woody Plant Maintenance (A300 series). PD, \$, MC
- 1 - Enforce the current LDR that references compliance with requirements for the use of Florida grades and standards for tree and landscape materials. PD, \$, MC
- 3 – Present a program on the City of Tampa’s UFMP to the International Society of Arboriculture – Florida chapter, Florida Nursery Growers and Landscape Association, the Florida Chapter of American Society of Landscape Architects and public utilities. PD & PR, \$
- 5 – Require certification and licensing of landscape and arboricultural industry working within the City of Tampa. PD, \$, MC

**CRITERIA 4 – Cooperation within the geographic region of the Tampa Bay Watershed (Current State-low)**

**Alternatives for Action:**

Year to be Accomplished

- 3 – Encourage the organization of a Tampa Bay Urban Forestry Consortium within the Regional Planning Council and the Planning Commission, to ensure cooperation and interaction among planning agencies and governments to support forest sustainability within the watershed. PD & PR, \$, MC
- 1 – Meet with the Planning Commission staff to initiate discussions on cooperation in meeting the regional objectives in the UFMP and Comprehensive Plan. PD, \$, MC

**Departments with primary responsibility for implementation of alternative for action:**

**PD** = Planning and Development Department

**PR** = Parks and Recreation Department

Qualified natural resource professional status if they:

1. a. Possess a 4-year degree in Natural Resource Sciences, Natural Resource Management, landscape or environmental planning; OR b. Have accumulated 4 years of professional experience in natural resource sciences, natural resource management, landscape or environmental planning or the equivalent (as determined by the City); OR c. Possess a graduate degree in natural resource science, natural resource management, landscape or environmental planning in these or other related fields of study and 1 year professional experience in these or related fields.

**AND**

2. Have satisfactorily completed a City of Tampa approved natural resource site assessment course.

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## City of Tampa's Tree Matrix

# CITY OF TAMPA TREE MATRIX (Page 1)

| Scientific Name                  | Common Name              | Plant Family   | Florida Native | Mature Spread | Mature Height  | Growth Rate | pH                        | Drought Tolerance | Aerosol Salt Tolerance | Root Salt Tolerance |
|----------------------------------|--------------------------|----------------|----------------|---------------|----------------|-------------|---------------------------|-------------------|------------------------|---------------------|
| Acacia farnesiana                | Sweet Acacia             | Fabaceae       | Yes            | 15 to 25 feet | 15 to 25 feet  | fast        | acidic, alkaline          |                   | MEDIUM                 | MEDIUM              |
| Acer rubrum                      | Red Maple                | Sapindaceae    | Yes            | 25 to 35 feet | 60 to 75 feet  | fast        | acidic                    | MEDIUM            | LOW                    | LOW                 |
| Acer saccharum subsp. floridanum | Florida Sugar Maple      | Sapindaceae    | Yes            | 25 to 40 feet | 50 to 60 feet  | moderate    | acidic                    |                   | NONE                   | NONE                |
| Acroelorrhaphe wrightii          | Paurotis Palm            | Arecaceae      | Yes            | 12 feet       | 30 feet        | moderate    | slightly alkaline, acidic | HIGH              | MEDIUM                 | MEDIUM              |
| Aesculus pavia                   | Red Buckeye              | Sapindaceae    | Yes            | 15 to 25 feet | 15 to 20 feet  | moderate    | acidic                    |                   |                        |                     |
| Avicennia germinans              | Black Mangrove           | Avicenniaceae  | Yes            |               |                |             |                           |                   | HIGH                   | HIGH                |
| Bismarkia nobilis                | Bismarkia                | Arecaceae      | No             |               |                |             |                           |                   | MEDIUM                 | MEDIUM              |
| Butia capitata                   | Pindo Palm               | Arecaceae      | No             | 10 to 15 feet | 15 to 25 feet  | slow        | slightly alkaline, acidic | HIGH              | MEDIUM                 | MEDIUM              |
| Callistemon citrinus             | Lemon Bottlebrush        | Myrtaceae      | No             | 10 feet       | 25 feet        | moderate    | alkaline, acidic          | MEDIUM            | MEDIUM                 | LOW                 |
| Callistemon rigidus              | Upright Bottlebrush      | Myrtaceae      | No             |               |                |             |                           |                   | MEDIUM                 | MEDIUM              |
| Callistemon viminalis            | Weeping Bottlebrush      | Myrtaceae      | No             |               |                |             | alkaline, acidic          | HIGH              | MEDIUM                 | LOW                 |
| Carpinus caroliniana             | American Hornbeam        | Betulaceae     | Yes            | 20 to 30 feet | 20 to 30 feet  | slow        | acidic, slightly alkaline |                   | NONE                   | NONE                |
| Carya aquatica                   | Water Hickory            | Juglandaceae   | Yes            |               |                |             |                           |                   |                        |                     |
| Carya glabra                     | Pignut Hickory           | Juglandaceae   | Yes            | 30 to 40 feet | 50 to 65 feet  | moderate    | slightly alkaline, acidic | MEDIUM            | MEDIUM                 | NONE                |
| Carya illinoensis                | Pecan                    | Juglandaceae   | Yes            | 50 to 70 feet | 70 to 100 feet | moderate    | alkaline, acidic          |                   | LOW                    | NONE                |
| Celtis laevigata                 | Sugarberry               | Celtidaceae    | Yes            | 50 to 60 feet | 50 to 70 feet  | fast        | alkaline, acidic          | MEDIUM            | LOW                    | LOW                 |
| Celtis occidentalis              | Common Hackberry         | Celtidaceae    | Yes            | 40 to 50 feet | 45 to 80 feet  | fast        | alkaline, acidic          | MEDIUM            | LOW                    | LOW                 |
| Cercis canadensis                | Eastern Redbud           | Fabaceae       | Yes            | 15 to 25 feet | 20 to 30 feet  | fast        | alkaline, acidic          | MEDIUM            | NONE                   | NONE                |
| Chionanthus rutus                | Chinese Fringetree       | Oleaceae       | No             |               |                |             |                           |                   |                        |                     |
| Chionanthus virginicus           | Fringetree               | Oleaceae       | Yes            | 10 to 15 feet | 12 to 20 feet  | slow        | acidic                    |                   | NONE                   | NONE                |
| Coccoloba uvifera                | Seagrape                 | Polygonaceae   | Yes            | 20 to 30 feet | 25 to 30 feet  | moderate    | alkaline, acidic          | HIGH              | HIGH                   | HIGH                |
| Cordia alliodora                 | White Geiger Tree        | Boraginaceae   | No             |               |                |             |                           |                   | MEDIUM                 |                     |
| Cornus florida                   | Flowering Dogwood        | Cornaceae      | Yes            | 25 to 30 feet | 20 to 30 feet  | moderate    | acidic, slightly alkaline | LOW TO MEDIUM     | LOW                    | NONE                |
| Diospyros virginiana             | Common Persimmon         | Ebenaceae      | Yes            | 20 to 35 feet | 40 to 60 feet  | moderate    | alkaline, acidic          | HIGH              | MEDIUM                 | LOW                 |
| Elaeocarpus decipiens            | Japanese Blueberry       | Caprifoliaceae | No             |               |                |             |                           |                   |                        |                     |
| Eriobotrya japonica              | Loquat                   | Rosaceae       | No             | 20 feet       | 25 feet        | moderate    | acidic                    | MEDIUM            | MEDIUM                 | MEDIUM              |
| Forestiera segregata             | Florida Privet           | Oleaceae       | Yes            | 5 to 10 feet  | 10 to 15 feet  | moderate    | acidic, alkaline          | HIGH              | MEDIUM                 | LOW                 |
| Fraxinus americana               | White Ash                | Oleaceae       | Yes            | 10 to 15 feet | 35 to 60 feet  | moderate    | acidic                    | LOW               | NONE                   | NONE                |
| Fraxinus caroliniana             | Pop Ash                  | Oleaceae       | Yes            | 40 to 60 feet | 50 to 80 feet  | fast        | alkaline, acidic          |                   | MEDIUM                 |                     |
| Fraxinus pennsylvanica           | Green Ash                | Oleaceae       | Yes            | 25 to 30 feet | 30 to 45 feet  | moderate    | slightly alkaline, acidic |                   |                        |                     |
| Fraxinus tomentosa               | Pumpkin Ash              | Oleaceae       | Yes            | 45 to 50 feet | 60 to 70 feet  | fast        | alkaline, acidic          |                   | MEDIUM                 |                     |
| Gordonia lasianthus              | Loblolly-Bay             | Theaceae       | Yes            | 25 to 35 feet | 50 to 75 feet  | moderate    | acidic, alkaline          |                   |                        |                     |
| Hamamelis virginiana             | Witch-Hazel              | Hamamelidaceae | Yes            | 15 to 25 feet | 20 to 30 feet  | slow        | acidic, slightly alkaline |                   |                        |                     |
| Ilex cassine                     | Dahoon Holly             | Aquifoliaceae  | Yes            | 8 to 12 feet  | 20 to 30 feet  | moderate    | moderate                  | MEDIUM            | MEDIUM                 | LOW                 |
| Ilex cornuta 'Burfordii'         | Burford Holly            | Aquifoliaceae  | No             | 15 to 25 feet | 15 to 25 feet  | moderate    | alkaline, acidic          | HIGH              | MEDIUM                 | NONE                |
| Ilex decidua                     | Possumhaw                | Aquifoliaceae  | Yes            | 10 to 15 feet | 10 to 15 feet  | slow        | alkaline, acidic          |                   |                        |                     |
| Ilex opaca                       | American Holly           | Aquifoliaceae  | Yes            | 15 to 25 feet | 35 to 50 feet  | slow        | acidic, slightly alkaline | MEDIUM            | MEDIUM                 | LOW                 |
| Ilex vomitoria                   | Yaupon Holly             | Aquifoliaceae  | Yes            | 15 to 20 feet | 15 to 20 feet  | moderate    | alkaline, acidic          | HIGH              | HIGH                   | HIGH                |
| Ilex x attenuata                 | 'East Palatka' Holly     | Aquifoliaceae  | Yes            | 10 to 15 feet | 30 to 45 feet  | moderate    | acidic                    | HIGH              | MEDIUM                 |                     |
| Ilex x 'Nellie R. Stevens'       | Nellie R. Stevens' Holly | Aquifoliaceae  | Yes            |               |                |             |                           |                   |                        |                     |
| Jacaranda mimosifolia            | Jacaranda                | Fabaceae       | No             | 45 to 60 feet | 25 to 40 feet  | fast        | slightly alkaline, acidic | MEDIUM            | NONE                   | NONE                |

| Wind Resistance | Flood Tolerance | Soil Area (w/3ft depth) | Distance from Paved Surface | Parking Lot Use                                                                                  | Street Trees Use                                                                                 | Other Uses                                                                                     |
|-----------------|-----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| N/A             | OCCASIONAL      | 10' x 10'               | 2'                          |                                                                                                  | street without sidewalk                                                                          |                                                                                                |
| MEDIUM LOW      | EXTENDED        | 30' x 30'               | 10'                         |                                                                                                  | street without sidewalk, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          |                                                                                                |
| YES             |                 | 30' x 30'               | 10'                         |                                                                                                  | street without sidewalk, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          | shade, deck or patio, bonsai                                                                   |
| N/A             | OCCASIONAL      |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| N/A             |                 | 10' x 10'               | 2'                          |                                                                                                  | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk | deck or patio, specimen, container or planter, shade, reclamation                              |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| HIGHEST         | NONE            | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk | deck or patio, specimen, urban tolerant                                                        |
| N/A             | NONE            |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| N/A             | OCCASIONAL      |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| MEDIUM HIGH     | OCCASIONAL      | 10' x 10'               | 2'                          |                                                                                                  | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                                                                |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| MEDIUM HIGH     | OCCASIONAL      | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  |                                                                                                |
| LOWEST          |                 | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  | fruit                                                                                          |
| MEDIUM LOW      | EXTENDED        | 30' x 30'               | 10'                         | parking lot island > 200 sq ft                                                                   | tree lawn > 6 ft wide, street without sidewalk                                                   |                                                                                                |
| MEDIUM LOW      |                 | 30' x 30'               | 10'                         |                                                                                                  | street without sidewalk, tree lawn > 6 ft wide                                                   | urban tolerant, reclamation, shade, bonsai                                                     |
| MEDIUM HIGH     | NONE            | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk, tree lawn 3-4           | container or planter, deck or patio, shade, specimen, reclamation                              |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| MEDIUM HIGH     | OCCASIONAL      | 10' x 10'               | 2'                          |                                                                                                  | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide | specimen, deck or patio, container or planter                                                  |
| MEDIUM HIGH     | OCCASIONAL      | 10' x 10'               | 2'                          |                                                                                                  | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk |                                                                                                |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| HIGHEST         | NONE            | 10' x 10'               | 2'                          |                                                                                                  | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          |                                                                                                |
| MEDIUM HIGH     | EXTENDED        | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  |                                                                                                |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| N/A             | NONE            |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| N/A             | NONE            | 10' x 10'               | 2'                          |                                                                                                  |                                                                                                  | reclamation, superior hedge, espalier, specimen, deck or patio, screen, container or planter   |
| N/A             | EXTENDED        | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  |                                                                                                |
| MEDIUM HIGH     |                 | 30' x 30'               | 10'                         |                                                                                                  | tree lawn > 6 ft wide, street without sidewalk                                                   | shade                                                                                          |
| N/A             | EXTENDED        | 20' x 20'               | 6'                          |                                                                                                  |                                                                                                  |                                                                                                |
| MEDIUM LOW      |                 | 30' x 30'               | 10'                         | parking lot island > 200 sq ft                                                                   | street without sidewalk, tree lawn > 6 ft wide                                                   | shade, urban tolerant, reclamation                                                             |
| N/A             |                 | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  | specimen                                                                                       |
| N/A             |                 | 10' x 10'               | 2'                          |                                                                                                  |                                                                                                  |                                                                                                |
| HIGHEST         | EXTENDED        | 10' x 10'               | 2'                          |                                                                                                  | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                                                                |
| N/A             |                 | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk | deck or patio, screen, espalier, urban tolerant, container or planter, hedge                   |
| N/A             | EXTENDED        | 10' x 10'               | 2'                          |                                                                                                  |                                                                                                  | deck or patio, specimen, bonsai, container or planter, reclamation                             |
| HIGHEST         | EXTENDED        | 20' x 20'               | 6'                          | parking lot island 100-200 sq ft, parking lot island > 200 sq ft                                 | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk |                                                                                                |
| HIGHEST         | EXTENDED        | 10' x 10'               | 2'                          | parking lot island 100-200 sq ft, parking lot island > 200 sq ft, parking lot island < 100 sq ft | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk | espalier, hedge, deck or patio, screen, specimen, container or planter, urban tolerant, bonsai |
| N/A             |                 | 20' x 20'               | 6'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide | container or planter, screen, specimen, urban tolerant, hedge                                  |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                |
| LOWEST          | NONE            | 30' x 30'               | 10'                         | parking lot island > 200 sq ft, parking lot island 100-200 sq ft                                 | street without sidewalk, tree lawn > 6 ft wide                                                   | shade, specimen                                                                                |

# CITY OF TAMPA TREE MATRIX (Page 2)

| Scientific Name                            | Common Name             | Plant Family  | Florida Native | Mature Spread | Mature Height  | Growth Rate    | pH                                  | Drought Tolerance | Aerosol Salt Tolerance | Root Salt Tolerance |
|--------------------------------------------|-------------------------|---------------|----------------|---------------|----------------|----------------|-------------------------------------|-------------------|------------------------|---------------------|
| <i>Juniperus chinensis</i>                 | Chinese Juniper         | Cupressaceae  | No             | 15 to 25 feet | 40 to 50 feet  | moderate       | acidic, alkaline                    | HIGH              | MEDIUM                 | MEDIUM              |
| <i>Juniperus virginiana</i>                | Red Cedar               | Cupressaceae  | Yes            | 20 to 30 feet | 30 to 45 feet  | fast           | alkaline, acidic                    | HIGH              | HIGH                   | HIGH                |
| <i>Lagerstroemia indica</i>                | Crape myrtle            | Lythraceae    | No             | 15 to 25 feet | 10 to 30 feet  | moderate       | alkaline, acidic                    | HIGH              | MEDIUM                 | LOW                 |
| <i>Laguncularia racemosa</i>               | White Mangrove          | Combretaceae  | Yes            | 30 to 40 feet | 30 to 50 feet  | moderate       | acidic, alkaline                    | MEDIUM            | HIGH                   | HIGH                |
| <i>Ligustrum japonicum</i>                 | Ligustrum               | Oleaceae      | No             |               |                |                |                                     |                   | MEDIUM                 | MEDIUM              |
| <i>Liquidambar orientalis</i>              | Oriental Sweetgum       | Altingiaceae  | No             |               |                |                |                                     |                   |                        |                     |
| <i>Liquidambar styraciflua</i>             | Sweetgum                | Altingiaceae  | Yes            | 35 to 50 feet | 60 to 75 feet  | moderate       | acidic, slightly alkaline           | LOW TO MEDIUM     | MEDIUM                 | MEDIUM              |
| <i>Livistona chinensis</i>                 | Chinese Fan Palm        | Arecaceae     | No             | 10 to 12 feet | 30 to 50 feet  | moderate       | alkaline, acidic                    | MEDIUM            | MEDIUM                 | NONE                |
| <i>Livistona decora</i>                    | Ribbon Palm             | Arecaceae     | No             |               |                |                |                                     |                   | NONE                   | NONE                |
| <i>Magnolia grandiflora</i>                | Southern Magnolia       | Magnoliaceae  | Yes            | 30 to 40 feet | 60 to 80 feet  | moderate       | slightly alkaline, acidic           | MEDIUM            | MEDIUM                 | LOW                 |
| <i>Magnolia virginiana</i>                 | Sweetbay Magnolia       | Magnoliaceae  | Yes            | 15 to 25 feet | 40 to 50 feet  | moderate       | sand, loam, clay                    | LOW               | LOW                    | NONE                |
| <i>Morus rubra</i>                         | Red Mulberry            | Moraceae      | Yes            | 35 to 50 feet | 50 to 75 feet  | fast           | acidic, slightly alkaline           |                   | NONE                   | NONE                |
| <i>Myrcianthes fragrans</i>                | Simpson stopper         | Myrtaceae     | Yes            |               |                |                |                                     |                   | HIGH                   | HIGH                |
| <i>Myrica cerifera</i>                     | Southern Waxmyrtle      | Myricaceae    | Yes            | 20 to 25 feet | 15 to 25 feet  | fast           | alkaline, acidic                    | MEDIUM TO HIGH    | HIGH                   | HIGH                |
| <i>Nyssa aquatica</i>                      | Water Tupelo            | Comaceae      | Yes            | 25 to 35 feet | 75 to 100 feet | slow           | slightly alkaline                   | LOW TO MEDIUM     |                        |                     |
| <i>Nyssa sylvatica</i>                     | Black Gum               | Comaceae      | Yes            |               |                |                |                                     |                   | MEDIUM                 |                     |
| <i>Nyssa sylvatica</i> var. <i>biflora</i> | Swamp Tupelo            | Comaceae      | Yes            | 70 feet       |                | slow to medium |                                     |                   | MEDIUM                 |                     |
| <i>Olea europaea</i>                       | Olive                   | Oleaceae      | No             | 35 to 50 feet | 25 to 50 feet  | slow           | acidic, slightly alkaline, alkaline |                   | HIGH                   |                     |
| <i>Osmanthus americanus</i>                | Devilwood               | Oleaceae      | Yes            | 10 to 15 feet | 15 to 25 feet  | moderate       | acidic                              |                   |                        | NONE                |
| <i>Ostrya virginiana</i>                   | American Hophornbeam    | Betulaceae    | Yes            |               |                |                |                                     |                   | NONE                   | NONE                |
| <i>Parkinsonia aculeata</i>                | Jerusalem-Thorn         | Fabaceae      | No             | 20 to 25 feet | 15 to 20 feet  | fast           | alkaline, acidic                    | HIGH              | HIGH                   | HIGH                |
| <i>Persea borbonia</i> *                   | Redbay                  | Lauraceae     | Yes            | 30 to 50 feet | 30 to 50 feet  | moderate       | alkaline, acidic                    | MEDIUM            | MEDIUM                 | MEDIUM              |
| <i>Persea palustris</i> *                  | Swamp Bay               | Lauraceae     | Yes            |               |                |                |                                     |                   |                        |                     |
| <i>Phoenix canariensis</i> *               | Canary Island Date Palm | Arecaceae     | No             | 20 to 25 feet | 40 to 60 feet  | slow           | alkaline, acidic                    | HIGH              | HIGH                   | MEDIUM              |
| <i>Phoenix dactylifera</i> *               | Date Palm               | Arecaceae     | No             | 12 to 15 feet | 50 to 80 feet  | slow           | alkaline, acidic                    |                   | MEDIUM                 | MEDIUM              |
| <i>Phoenix reclinata</i> *                 | Senegal Date Palm       | Arecaceae     | No             | 50 feet       | 35 feet        | slow           | acidic, slightly alkaline           | MEDIUM            | MEDIUM                 | MEDIUM              |
| <i>Phoenix roebelenii</i> *                | Pygmy Date Palm         | Arecaceae     | No             |               |                |                |                                     |                   | LOW                    | NONE                |
| <i>Phoenix rupicola</i> *                  | Cliff Date Palm         | Arecaceae     | No             |               |                |                |                                     | HIGH              | MEDIUM                 | MEDIUM              |
| <i>Phoenix sylvestris</i> *                | Wild Date Palm          | Arecaceae     | No             |               |                |                |                                     |                   | MEDIUM                 | MEDIUM              |
| <i>Pinus clausa</i>                        | Sand Pine               | Pinaceae      | Yes            | 15 to 25 feet | 25 to 40 feet  | slow           | slightly alkaline, acidic           | HIGH              | MEDIUM                 | LOW                 |
| <i>Pinus elliottii</i> var. <i>densa</i>   | Slash Pine              | Pinaceae      | Yes            | 35 to 50 feet | 75 to 100 feet | fast           | acidic, slightly alkaline           | HIGH              | MEDIUM                 | LOW                 |
| <i>Pinus palustris</i>                     | Longleaf Pine           | Pinaceae      | Yes            | 30 to 40 feet | 60 to 80 feet  | fast           | acidic, slightly alkaline           | HIGH              | LOW                    | NONE                |
| <i>Pinus taeda</i>                         | Loblolly Pine           | Pinaceae      | Yes            |               |                |                |                                     |                   | LOW                    | NONE                |
| <i>Platanus occidentalis</i>               | Sycamore                | Platanaceae   | Yes            | 50 to 70 feet | 75 to 90 feet  | fast           | alkaline, acidic                    | MEDIUM            | LOW                    | MEDIUM              |
| <i>Podocarpus macrophyllus</i>             | Podocarpus              | Podocarpaceae | No             | 20 to 25 feet | 30 to 40 feet  | slow           | alkaline, acidic                    | HIGH              | MEDIUM                 | LOW                 |
| <i>Podocarpus nagi</i>                     | Broadleaf Podocarpus    | Podocarpaceae | No             |               |                |                |                                     |                   | MEDIUM                 |                     |
| <i>Prunus angustifolia</i>                 | Chickasaw Plum          | Rosaceae      | Yes            | 15 to 20 feet | 12 to 20 feet  | moderate       | acidic                              | HIGH              | LOW                    | LOW                 |
| <i>Prunus serotina</i>                     | Black Cherry            | Rosaceae      | Yes            | 35 to 50 feet | 60 to 90 feet  | fast           | alkaline, acidic                    |                   |                        |                     |
| <i>Prunus umbellata</i>                    | Flatwoods Plum          | Rosaceae      | Yes            | 12 to 20 feet | 12 to 20 feet  | moderate       | slightly alkaline, acidic           |                   | NONE                   | NONE                |
| <i>Quercus geminata</i>                    | Sand Live Oak           | Fagaceae      | Yes            | 45 to 60 feet | 30 to 50 feet  | moderate       | alkaline, acidic                    | HIGH              | HIGH                   | HIGH                |

| Wind Resistance | Flood Tolerance | Soil Area (w/3ft depth) | Distance from Paved Surface | Parking Lot Use                                                                                  | Street Trees Use                                                                                 | Other Uses                                                                                                           |
|-----------------|-----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| N/A             |                 | 20' x 20'               | 6'                          |                                                                                                  |                                                                                                  | screen                                                                                                               |
| LOWEST          | OCCASIONAL      | 20' x 20'               | 6'                          | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide | screen, reclamation, bonsai, Christmas tree, urban tolerant                                      |                                                                                                                      |
| HIGHEST         | NONE            | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk | specimen, deck or patio, container or planter, trained as a standard, urban tolerant, shade                          |
| N/A             | EXTENDED        | 20' x 20'               | 6'                          |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| MEDIUM/HIGH     | EXTENDED        | 30' x 30'               | 10'                         | parking lot island > 200 sq ft                                                                   | street without sidewalk, tree lawn > 6 ft wide                                                   |                                                                                                                      |
| HIGHEST         | NONE            | 20' x 20'               | 6'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft      | deck or patio, specimen, indoors                                                                                     |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| HIGHEST         | OCCASIONAL      | 30' x 30'               | 10'                         |                                                                                                  | street without sidewalk, tree lawn > 6 ft wide                                                   |                                                                                                                      |
| MEDIUM/HIGH     | EXTENDED        | 20' x 20'               | 6'                          |                                                                                                  | street without sidewalk, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          |                                                                                                                      |
| MEDIUM/LOW      | OCCASIONAL      | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| MEDIUM/LOW      | EXTENDED        | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                                                                                      |
| MEDIUM/HIGH     | EXTENDED        | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  | urban tolerant, specimen                                                                                             |
| YES             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| YES             | EXTENDED        |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 | 20' x 20'               | 6'                          |                                                                                                  | street without sidewalk                                                                          | espalier, trained as a standard, specimen, container or planter                                                      |
| N/A             | EXTENDED        | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                                                                                      |
| YES             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             | NONE            | 10' x 10'               | 2'                          |                                                                                                  |                                                                                                  |                                                                                                                      |
| MEDIUM/LOW      | OCCASIONAL      | 20' x 20'               | 6'                          |                                                                                                  | street without sidewalk, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          |                                                                                                                      |
|                 |                 |                         |                             |                                                                                                  | street without sidewalk, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          |                                                                                                                      |
| HIGHEST         | NONE            | 30' x 30'               | 10'                         | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          | specimen, urban tolerant                                                                                             |
| HIGHEST         |                 | 30' x 30'               | 10'                         | parking lot island 100-200 sq ft, parking lot island > 200 sq ft                                 | tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk                          | specimen, indoors                                                                                                    |
| N/A             | NONE            |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| LOWEST          | NONE            | 20' x 20'               | 6'                          |                                                                                                  |                                                                                                  |                                                                                                                      |
| MEDIUM/LOW      | OCCASIONAL      | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  |                                                                                                                      |
| MEDIUM/LOW      |                 | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| MEDIUM/LOW      | LOW             | 30' x 30'               | 10'                         | parking lot island > 200 sq ft                                                                   | tree lawn > 6 ft wide, street without sidewalk                                                   | screen, shade, urban tolerant                                                                                        |
| HIGHEST         | LOW             | 30' x 30'               | 10'                         | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide | screen, specimen, shade, hedge, reclamation, espalier, deck or patio, urban tolerant, trained as a standard, indoors |
| YES             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                                                                                      |
| MEDIUM/HIGH     | NONE            | 10' x 10'               | 2'                          | parking lot island 100-200 sq ft, parking lot island > 200 sq ft, parking lot island < 100 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                                                                                      |
| MEDIUM/LOW      |                 | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  |                                                                                                                      |
| N/A             |                 | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                                                                                      |
| HIGHEST         | OCCASIONAL      | 30' x 30'               | 10'                         | parking lot island 100-200 sq ft, parking lot island > 200 sq ft                                 | tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk                          |                                                                                                                      |

# CITY OF TAMPA TREE MATRIX (Page 3)

| Scientific Name                                | Common Name                  | Plant Family   | Florida Native | Mature Spread  | Mature Height | Growth Rate | pH                                  | Drought Tolerance | Aerosol Salt Tolerance | Root Salt Tolerance |
|------------------------------------------------|------------------------------|----------------|----------------|----------------|---------------|-------------|-------------------------------------|-------------------|------------------------|---------------------|
| <i>Quercus incana</i>                          | Bluejack Oak                 | Fagaceae       | Yes            | 25 to 35 feet  | 25 to 50 feet | moderate    | acidic, slightly alkaline           | HIGH              |                        |                     |
| <i>Quercus laevis</i>                          | Turkey Oak                   | Fagaceae       | Yes            | 25 to 30 feet  | 30 to 40 feet | moderate    | acidic                              | HIGH              | NONE                   | NONE                |
| <i>Quercus laurifolia</i>                      | Laurel Oak, Diamond Leaf Oak | Fagaceae       | Yes            | 35 to 45 feet  | 60 to 70 feet | fast        | acidic, slightly alkaline           | MEDIUM            | LOW                    | MEDIUM              |
| <i>Quercus michauxii</i>                       | Swamp Chestnut Oak           | Fagaceae       | Yes            |                |               |             |                                     |                   |                        |                     |
| <i>Quercus myrtifolia</i>                      | Myrtle oak                   | Fagaceae       | Yes            | 35 to 40 feet  | 8 feet        | moderate    | alkaline, acidic                    | HIGH              | HIGH                   | HIGH                |
| <i>Quercus nigra</i>                           | Water Oak                    | Fagaceae       | Yes            | 60 to 70 feet  | 50 to 60 feet | fast        | acidic, alkaline                    | MEDIUM            | LOW                    | MEDIUM              |
| <i>Quercus phellos</i>                         | Willow Oak                   | Fagaceae       | Yes            |                |               |             |                                     |                   | MEDIUM                 |                     |
| <i>Quercus shumardii</i>                       | Shumard Oak                  | Fagaceae       | Yes            |                |               |             |                                     |                   | MEDIUM                 | NONE                |
| <i>Quercus virginiana</i>                      | Southern Live Oak            | Fagaceae       | Yes            | 60 to 120 feet | 60 to 80 feet | moderate    | alkaline, acidic                    | HIGH              | HIGH                   | HIGH                |
| <i>Rhizophora mangle</i>                       | Red Mangrove                 | Rhizophoraceae | Yes            | 15 to 25 feet  | 15 to 25 feet | moderate    | acidic, slightly alkaline, alkaline |                   | HIGH                   | HIGH                |
| <i>Sabal causarium</i>                         | Puerto Rican Hat Palm        | Arecaceae      | No             |                |               |             |                                     |                   | MEDIUM                 | MEDIUM              |
| <i>Sabal palmetto</i>                          | Cabbage Palm                 | Arecaceae      | Yes            | 10 to 15 feet  | 40 to 50 feet | slow        | alkaline, acidic                    | HIGH              | HIGH                   | HIGH                |
| <i>Salix caroliniana</i>                       | Coastal Plain Willow         | Salicaceae     | Yes            |                | 30 feet       | fast        | alkaline, acidic                    | LOW               | LOW                    | LOW                 |
| <i>Sambucus nigra</i> subsp. <i>canadensis</i> | American Elderberry          | Adoxaceae      | Yes            | 6 to 10 feet   | 8 to 12 feet  | moderate    | alkaline, acidic                    | LOW               |                        |                     |
| <i>Tabebuia chrysotricha</i>                   | Yellow Tabebuia              | Bignoniaceae   | No             |                |               |             |                                     |                   | MEDIUM                 |                     |
| <i>Tabebuia impetiginosa</i>                   | Purple Tabebuia              | Bignoniaceae   | No             | 10 to 15 feet  | 12 to 18 feet | slow        | alkaline, acidic                    | MEDIUM            |                        |                     |
| <i>Taxodium ascendens</i>                      | Pondcypress                  | Cupressaceae   | Yes            | 10 to 15 feet  | 50 to 60 feet | fast        | slightly alkaline, acidic           | MEDIUM            | MEDIUM                 | NONE                |
| <i>Taxodium distichum</i>                      | Baldcypress                  | Cupressaceae   | Yes            | 25 to 35 feet  | 60 to 80 feet | fast        | acidic, slightly alkaline           | MEDIUM            | MEDIUM                 | NONE                |
| <i>Trachycarpus fortunei</i>                   | Chinese windmill palm        | Arecaceae      | No             | 6 to 10 feet   | 10 to 20 feet | slow        | alkaline, acidic                    | MEDIUM            | MEDIUM                 | MEDIUM              |
| <i>Ulmus alata</i>                             | Winged Elm                   | Ulmaceae       | Yes            | 30 to 40 feet  | 45 to 70 feet | fast        | alkaline, acidic                    | MEDIUM            | MEDIUM                 | NONE                |
| <i>Ulmus americana</i>                         | American Elm                 | Ulmaceae       | Yes            | 50 to 70 feet  | 70 to 90 feet | fast        | alkaline, acidic                    | MEDIUM            | MEDIUM                 | LOW                 |
| <i>Ulmus parvifolia</i> 'Drake'                | 'Drake' Chinese Elm          | Ulmaceae       | No             |                |               |             |                                     |                   | MEDIUM                 | NONE                |
| <i>Ulmus parvifolia</i> 'UPMTP' pp11295 Bosque | Bosque' Chinese Elm          | Ulmaceae       | No             | 35 to 50 feet  | 35 to 45 feet | moderate    | acidic, alkaline                    |                   | MEDIUM                 | NONE                |
| <i>Viburnum obovatum</i>                       | Blackhaw                     | Adoxaceae      | Yes            | 6 to 10 feet   | 8 to 25 feet  | moderate    | acidic, alkaline                    |                   |                        |                     |
| <i>Washingtonia robusta</i>                    | Washington Palm              | Arecaceae      | No             | 10 to 15 feet  | 60 to 90 feet | moderate    | alkaline, acidic                    | HIGH              | MEDIUM                 | MEDIUM              |



Planning & Urban Design

| Wind Resistance | Flood Tolerance | Soil Area (w/3ft depth) | Distance from Paved Surface | Parking Lot Use                                                                                  | Street Trees Use                                                                                 | Other Uses                                                 |
|-----------------|-----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| N/A             | OCCASIONAL      | 20' x 20'               | 6'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 3-4 feet wide, street without sidewalk                                                 |                                                            |
| HIGHEST         | NONE            | 20' x 20'               | 6'                          | parking lot island 100-200 sq ft, parking lot island > 200 sq ft                                 | street without sidewalk, tree lawn 4-6 feet wide, tree lawn > 6 ft wide                          |                                                            |
| MEDIUM - LOWEST | OCCASIONAL      | 30' x 30'               | 10'                         | parking lot island > 200 sq ft                                                                   | tree lawn > 6 ft wide                                                                            |                                                            |
| YES             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| HIGHEST         | NONE            | 20' x 20'               | 6'                          |                                                                                                  |                                                                                                  |                                                            |
| LOWEST          | EXTENDED        | 30' x 30'               | 10'                         |                                                                                                  | street without sidewalk                                                                          |                                                            |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| YES             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| HIGHEST         | OCCASIONAL      | 30' x 30'               | 10'                         | parking lot island > 200 sq ft                                                                   | tree lawn > 6 ft wide, street without sidewalk                                                   |                                                            |
|                 |                 |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| N/A             | OCCASIONAL      | 10' x 10'               | 2'                          |                                                                                                  |                                                                                                  |                                                            |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| HIGHEST         | EXTENDED        | 20' x 20'               | 6'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft      |                                                            |
| N/A             | EXTENDED        |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| N/A             | EXTENDED        | 10' x 10'               | 2'                          |                                                                                                  |                                                                                                  |                                                            |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| N/A             |                 | 10' x 10'               | 2'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                            |
| HIGHEST         | EXTENDED        | 30' x 30'               | 10'                         | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk | deck or patio, container or planter, specimen              |
| HIGHEST         | EXTENDED        | 30' x 30'               | 10'                         | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk                          |                                                            |
| HIGHEST         | NONE            | 10' x 10'               | 2'                          |                                                                                                  |                                                                                                  |                                                            |
| MEDIUM HIGH     |                 | 30' x 30'               | 10'                         | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk | spaced six to 10 feet apart around a patio or sitting area |
| MEDIUM LOW      | EXTENDED        | 30' x 30'               | 10'                         |                                                                                                  |                                                                                                  | shade, specimen, urban tolerant, reclamation               |
| N/A             |                 |                         |                             |                                                                                                  |                                                                                                  |                                                            |
| LOWEST          |                 | 20' x 20'               | 6'                          | parking lot island < 100 sq ft, parking lot island 100-200 sq ft, parking lot island > 200 sq ft | street without sidewalk, tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide |                                                            |
| N/A             | OCCASIONAL      | 10' x 10'               | 2'                          |                                                                                                  | street without sidewalk                                                                          | reclamation, urban tolerant, shade, specimen               |
| LOWEST          | NONE            | 30' x 30'               | 10'                         |                                                                                                  | tree lawn 3-4 feet wide, tree lawn 4-6 feet wide, tree lawn > 6 ft wide, street without sidewalk |                                                            |
|                 |                 |                         |                             |                                                                                                  |                                                                                                  | specimen                                                   |

Produced in cooperation with UF/IFAS



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# Cost – Benefit Analysis of Urban Trees

## Calculating Benefits

Note\* Benefits are realized at four geographic scales: parcel, neighborhood, community and global.

Annual benefits are calculated as:

$$B = E + AQ + CO_2 + H + A$$

Where

$E$  = value of net annual energy savings (cooling and heating)

$AQ$  = value of annual air-quality improvement (pollutant uptake, avoided powerplant emissions, and BVOC emissions)

$CO_2$  = value of annual  $CO_2$  reductions (sequestration, avoided emissions, release from tree care and decomposition)

$H$  = value of annual stormwater-runoff reductions

$A$  = value of annual aesthetics and other benefits

Annual costs ( $C$ ) are the sum of costs for residential yard trees ( $C_y$ ) and public trees ( $C_p$ ) where:

$$C_y = P + T + R + D + I + S + Cl + L$$

$$C_p = P + T + R + D + I + S + Cl + L + A$$

Where

$P$  = cost of tree and planting

$T$  = average annual tree pruning cost

$R$  = annualized tree and stump removal and disposal cost

$D$  = average annual pest and disease control cost

$I$  = annual irrigation cost

$S$  = average annual cost to repair/mitigate infrastructure damage

$Cl$  = annual litter and storm cleanup cost

$L$  = average annual cost for litigation and settlements from tree-related claims

$A$  = annual program administration, inspection and other costs

Net benefits are calculated as the difference between total benefits and costs:

$$\text{Net benefits} = B - C$$

Benefit – cost ratios (BCR) are calculated as the ratio of benefits to costs:

$$BCR = B \div C$$

## Case Study: U.S. Forest Service, Central Florida

The U.S. Forest Service conducted a research project to determine benefits and costs of urban forests in Central Florida using Orlando, Florida field data and other information drawn from across the region including St. Petersburg, City of Tampa and Dunedin (Peper et. al. 2010).

The outcome of their work is a process for the quantification of benefits and costs for representative small, medium and large broadleaf trees and a conifer in the Central Florida region, which can be used as a starting point for more specific benefit cost analysis for the City of Tampa.

Small broadleaf – crape myrtle  
Medium broadleaf – southern magnolia  
Large broadleaf – live oak  
Conifer – slash pine

The analysis distinguished between “yard trees” (those planted in residential sites) and “public trees” (those planted on streets or in parks). Benefits were calculated based on tree growth curves and numerical models that consider regional climate, building characteristics, air pollutant concentrations, and prices. Tree care costs and mortality rates were based on results from a survey of municipal and commercial arborists. A 60-percent survival rate was assumed over a 40-year timeframe.

General outcomes from the U.S. Forest Service research project:

1. Large trees provide the most benefits.
2. Average annual benefits over 40 years increase with mature tree size and differ based on tree location.
3. Except for conifers, the lowest values were for public trees and the highest values were for yard trees on the western side of houses.

Benefits range as follows (40 years after planting):

- ◆ \$23 to \$30 for a small tree (24 ft tall)
- ◆ \$59 to \$74 for a medium tree (46 ft tall)
- ◆ \$127 to \$149 for a large tree (56 ft tall)
- ◆ \$32 to \$34 for a conifer (67 ft tall)

\*Benefits associated with reduced levels of stormwater runoff and increased property values accounted for the largest proportion of total benefits in this region. Energy savings, reduced levels of air pollutants and CO<sub>2</sub> in the air were the next most important benefits.

\*Energy conservation benefits differ with tree location as well as size. Trees located opposite west-facing walls provided the greatest net cooling energy savings.

The benefits of trees were offset by the costs of caring for them. Based surveys of municipal and commercial arborists from throughout the region, the **average annual cost** for tree care over 40 years ranges from \$20 to \$31 per tree.

Annual costs for yard and public trees, respectively:

- ◆ \$20 and \$22 for a small tree
- ◆ \$23 and \$27 for a medium tree
- ◆ \$25 and \$31 for a large tree
- ◆ \$23 and \$27 for a conifer

\*Planting costs, annualized over 40 years, were the greatest expense for yard trees (\$11 per tree per year); planting costs for public trees were significantly lower (\$6 per tree per year).

\*For public trees, pruning (\$7 to \$11 per tree per year) and removal and disposal expenses (\$4 to \$6 per tree per year) were the greatest costs.

\*Public trees also incur administrative costs, including inspections (\$2 to \$4 per tree per year).

Average annual net benefits (benefits minus costs) per tree for a 40-year period were calculated:

- ◆ \$1 for a small public tree to \$10 for a small yard tree on the west side of a house
- ◆ \$32 for a medium public tree to \$51 for a medium yard tree on the west side of a house
- ◆ \$96 for a large public tree to \$123 for a large yard tree on the west side of a house
- ◆ \$7 for a public conifer to \$9 for a yard conifer in a windbreak

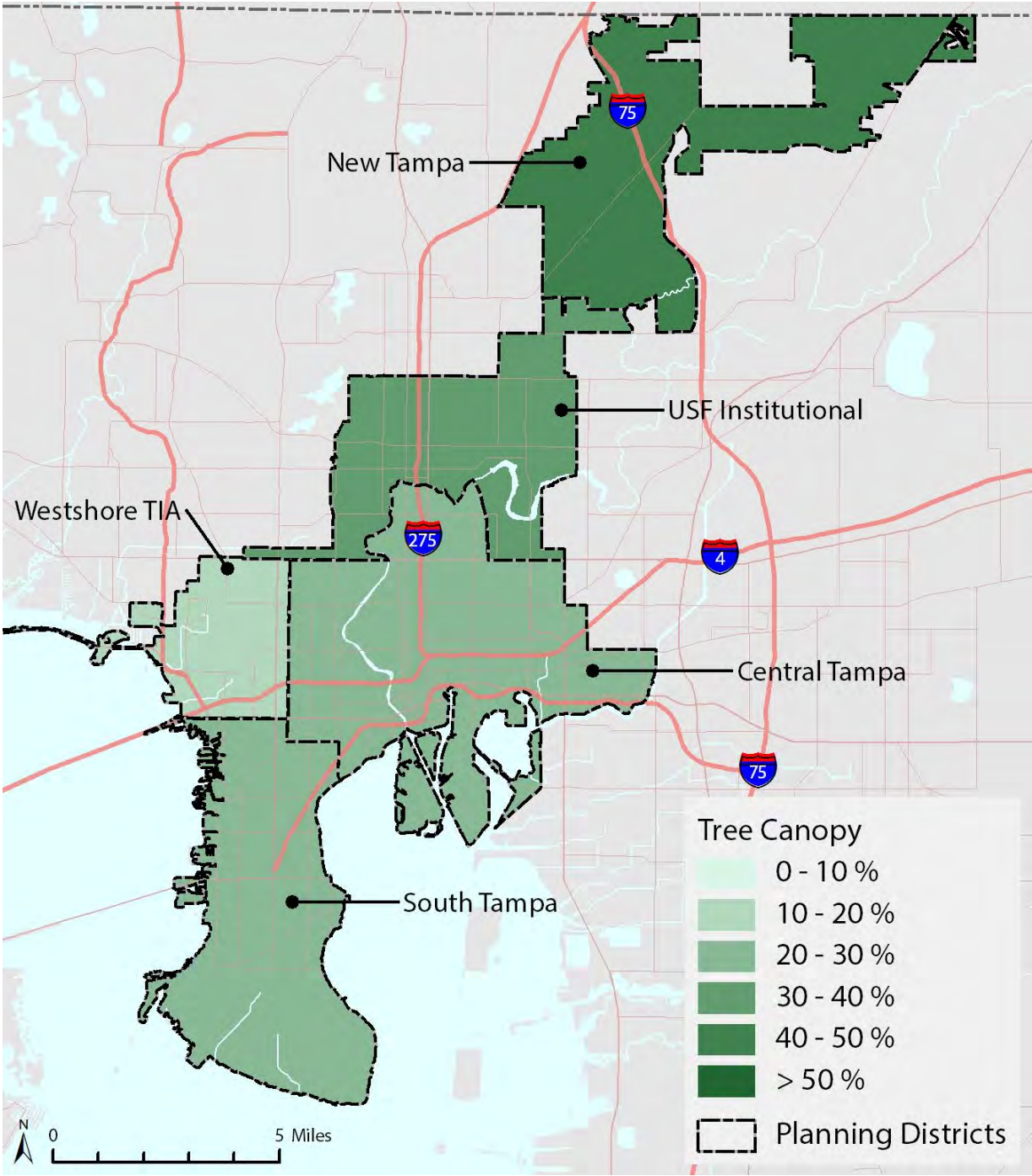
\*Environmental benefits alone, including energy savings, stormwater runoff reduction, improved air quality, and reduced atmospheric CO<sub>2</sub>, were greater than tree care costs for medium and large trees.

Net benefits for a yard tree opposite a west wall and a public tree were substantial when summed over the entire 40-year period:

- ◆ \$403 (yard) and \$23 (public) for a small tree
- ◆ \$2,039 (yard) and \$1,266 (public) for a medium tree
- ◆ \$4,939 (yard) and \$3,859 (public) for a large tree
- ◆ \$344 (yard) and \$296 (public) for a conifer

\*Private trees produce higher net benefits than public trees. Survey results indicated that this was primarily due to higher maintenance costs for street and park trees. The standard of care is often higher for public trees because municipalities need to manage risk, maintain required clearances for pedestrians and vehicles, remove tree debris after hurricanes, and repair damage to sidewalks and curbing caused by tree roots.

# Map of Municipal Planning Districts



# Tampa Comprehensive Plan Policies and Objectives Referenced in the Urban Forest Management Plan

## CHAPTER 4

### *Tree Canopy*

Objective 32.3: Mature tree canopy is a vital community and environmental asset that is appreciated and desired by residents in new and established neighborhoods alike. The protection and supplementation of this tree canopy is a necessity in order to sustain the resource and maintain the environmental benefits, such as cooler temperatures, that the mature canopy provides.

Policy 32.3.1: The City will provide 800 trees annually to preserve and augment the community's canopy and sustainability.

Policy 32.3.2: The City shall implement the recommendations from the Tree Canopy Analysis to serve as a valuable management tool in retaining optimum tree cover in Tampa.

Policy 32.3.3: The City shall continue to promote the City's Tree and Landscape Ordinance as a key element in retention and provision of private plant materials to support sustainable development principles of tree preservation, and minimal impact to the existing site resources.

Policy 32.3.4: The City shall consider the community's street trees as infrastructure and all efforts will be made to preserve and protect these trees as a community and private property asset.

Policy 32.3.5: Public/private beautification efforts on public property shall continue, but only when private maintenance agreements have been executed.

Policy 32.3.6: The City shall require provision of open space in the private development process through various performance incentives and tools, including but not limited to form-based zoning, cluster zoning, planned development review, dedication of easements for public access, and on-site transfer of development rights.

## CHAPTER 5

### *Natural Systems and Living Resources*

Native plants and vegetation are found in the natural community that is suited to the soil, topography, and hydrology of a particular site. The use of appropriate native vegetation in local landscaping can help achieve water conservation goals, preserve diverse habitat even in urban areas, greatly reduce maintenance costs for landscaping, and protect property values. Retention and incorporation of the vegetation of this community in the landscaping plans of development projects reduces the need for extensive irrigation and the use of pesticides and fertilizers. Native plant communities also provide water quality treatment and flood attenuation benefits.

The Tampa/Hillsborough County metropolitan area, due to the size, extensive estuarine shoreline, and location in a transitional climate zone (temperate to sub-tropical), contains representative examples of over half of the major plant communities in the state. The Hillsborough River corridor, New Tampa, portions of MacDill AFB and McKay Bay constitute major contiguous stands of natural habitat in the City. Although wetland protection laws have slowed the destruction of wetland habitat, Tampa is still losing natural habitat, especially mesic and xeric (upland) habitats.

Some native species of plants and animals are able to adapt to man's changes to the environment, but a great many are dependent on specific natural habitat types or large, relatively undisturbed areas of diverse habitats. These plants and

animals, which cannot withstand extensive changes in their environment, comprise the vast majority of the State's endangered and threatened species.

Objective 38.2: The City shall continue to review all land development applications and to apply land development regulations to ensure the protection of the attributes, functions and amenities of the natural environment in a manner that continues to ensure a net environmental benefit under all projected scenarios.

Policy 38.2.1: The following environmentally sensitive areas shall be protected. Proposed development and redevelopment proposals that may directly impact any of these areas shall be assessed for negative environmental impacts to these areas, and mitigation will be required in accordance with local, state and federal environmental regulations.

- ◆ Hillsborough River 100 year floodplain;
- ◆ Tampa Bay tidal creeks and associated tidal wetlands;
- ◆ Significant and essential wildlife habitat;
- ◆ Areas of high aquifer recharge/contamination potential;
- ◆ McKay Bay;
- ◆ Sulphur Springs.
- ◆ Properties acquired through the Environmental Lands Acquisition Purchase Program; and
- ◆ Any other major environmentally sensitive areas demarcated on the Future Land Use map.
- ◆ Orange Lake, a wetland area of the Hillsborough River located in the Temple Crest neighborhood and known for its bird-nesting habitat.

Policy 38.2.2: On an ongoing basis, the City shall monitor the latest research in wetlands management techniques including construction setbacks and buffer distances and evaluate its use in the City.

Policy 38.2.3: The City shall work with the Southwest Florida Water Management District in assessing development methods to monitor and mitigate the impacts of cumulative impact of future developments.

Policy 38.2.4: Through the land planning and development review processes, the City shall require the provision of wildlife corridors, and shall restrict the fragmentation of large natural plant communities which provide significant wildlife habitat.

Policy 38.2.5: The City shall use techniques, which may include clustering and transfer of development rights, to protect environmentally sensitive resources.

Policy 38.2.6: In the development review process, the City shall require the preservation or conservation of representative stands of upland native plant communities.

Policy 38.2.7: Minimize the use of fill as a means of meeting minimum flood elevations in order to reduce the destruction of native plant communities and maintain natural drainage patterns and water table levels.

Policy 38.2.8: The City may require the maintenance of higher levels of service for public infrastructure (e.g., roadways) as a means of reducing densities and clustering development intensity away from environmentally sensitive areas.

Policy 38.2.9: The City shall require development petitioners to develop and implement habitat management plans as part of their development approval, where appropriate.

Policy 38.2.10: New road rights-of-way shall be routed to avoid traversing significant and essential wildlife habitat unless there is no reasonably feasible and prudent alternative and the roadway design incorporates design features for the safe passage of wildlife.

Policy 38.2.11: Design features for wildlife crossings shall be appropriate for the wildlife species expected to utilize the crossing and shall be designed in accordance with the recommendations of the Florida Fish and Wildlife Conservation Commission. Road reconstruction or widening within significant wildlife habitat shall also incorporate design features for the safe passage of wildlife.

- Policy 38.2.12: The City shall continue to require the conservation of trees and existing native vegetation in new development projects.
- Policy 38.2.13: The Development Review Committee shall consider the presence of environmentally sensitive lands in formulating their recommendations for development.
- Policy 38.2.14: Development proposals may be considered for density/intensity credits for protecting environmentally sensitive areas on-site.
- Objective 38.3: To appropriately use, protect and conserve native vegetative and animal habitat of the City.
- Policy 38.3.1: Promote the acquisition, retention and management of unique natural areas to preserve environmental, recreation and other public benefits.
- Policy 38.3.2: Cooperate with adjacent local governments to conserve, appropriately use, or protect unique vegetative communities located within more than one local jurisdiction.
- Policy 38.3.3: Proposed wildlife corridors will be coordinated with established and planned wildlife corridors in adjacent jurisdictions.
- Policy 38.3.4: The City shall continue to ensure the protection of significant and essential wildlife habitat by:
- ◆ Maintaining an Upland Habitat Protection Map for the protection of such resources;
  - ◆ Requiring verification of the presence of significant wildlife habitat and essential wildlife habitat and any other salient features the City deems appropriate;
  - ◆ Distinguishing between wetlands and uplands;
  - ◆ Providing for the protection of varying types of wildlife habitats;
  - ◆ Maintaining minimum and maximum thresholds for the protection of wildlife habitats;
  - ◆ Permitting a range of complementary land use mechanisms that can be used to protect wildlife habitats and/or mitigate hardships, including, but not limited to: setbacks, clustering and transfer of development rights;
  - ◆ Allowing for offsite mitigation/compliance;
  - ◆ Identifying wildlife corridors and protecting such corridors from fragmentation;
  - ◆ Providing for the review and recommendation of the Florida Fish and Wildlife Conservation Commission;
  - ◆ Providing for the safe passage of wildlife across rights-of-way;
  - ◆ Requiring Management Plan Agreements;
  - ◆ Limiting the effective duration of an Upland Habitat Plan Approval to (2) years after issuance;
  - ◆ Requiring a project compatibility plan for development proposed adjacent to nature preserves;
  - ◆ Requiring conservation and preservation area designations to be maintained in perpetuity; and
  - ◆ Providing for an appellate procedure to be heard by the City Council.
- Policy 38.3.5: In the event of annexations, the City will ensure the protection of identified, significant wildlife habitats.
- Policy 38.3.6: The City shall maintain a tracking process for offset mitigation/compliance efforts.
- Policy 38.3.7: The City shall protect and conserve significant wildlife habitat, and shall prevent any further net loss of essential wildlife habitat in the City.
- Policy 38.3.8: The City shall attempt to maintain populations of listed species occurring in the City of Tampa and shall attempt to increase the abundance and distribution of populations of such species.
- Policy 38.3.9: The City, in consultation with the Florida Fish and Wildlife Conservation Commission, shall protect and require mitigation for impact to areas identified as essential wildlife habitat.

Policy 38.3.10: The City shall restrict development activities that adversely affect areas identified as essential wildlife habitat. Where development activities are proposed in such areas, the City may require site-specific wildlife surveys and other field documentation, as needed, to assist in assessing potential impacts.

Policy 38.3.11: On-site preservation shall be considered the most desirable alternative to protect upland habitat and plant and wildlife species. However, in some cases as specified in applicable local regulations and determined in cooperation with the Florida Fish and Wildlife Conservation Commission and, when appropriate, the U.S. Fish and Wildlife Service, the protection of upland wildlife habitat or upland habitat for endangered or threatened species or species of special concern will best be accomplished through off-site preservation. In such case, off-site preservation sites must meet all appropriate acquisition, preservation, restoration, habitat suitability, manageability, size, and other provisions of local regulations. The City coordinator shall also incorporate the recommendations concerning the site from the Florida Fish and Wildlife Conservation Commission and other appropriate agencies. Design features for the safe passage of wildlife shall be appropriate for the wildlife species expected to utilize the crossing and shall be designed in accordance with the recommendations of the Florida Fish and Wildlife Conservation Commission.

Policy 38.3.12: The City shall protect the County's east/west wildlife corridor greenway, connecting Cypress Creek and the Hillsborough River.

Policy 38.3.13: The City shall consult with and consider the recommendations of the Florida Fish and Wildlife Conservation Commission in determining the issuance of, and conditions to be placed on, land development approvals that would impact upon listed species. Conditions of approval shall ensure the maintenance and, where appropriate, increase the abundance and distribution of populations of such species.

Policy 38.3.14: The City shall recommend specific management and recovery strategies for key listed species, as they are developed by the Florida Fish and Wildlife Conservation Commission and the U.S. Fish and Wildlife Service, and shall assist in their implementation. These management techniques shall also be incorporated into the management plans of natural preserve lands owned or managed by the City.

Objective 38.4: Lands subject to Florida Administration Commission Final Order No. AC- 93-087 that are annexed into the City of Tampa – Development must be clustered in order to increase the amount of open space acreage for preservation of natural resources (including significant wildlife habitat, aquifer recharge, floodplains and other resources).

Policy 38.4.1: A minimum of 25% of a parcel shall be set aside as open space. If more than 25% of a project or parcel is classified as one or more of the natural resources listed above, then additional lands, i.e. those in excess of 25%, must also be preserved, to a maximum of 50% of the entire site. There is one exception. All wetlands must be preserved even if the wetland acreage exceeds 50% of the total site acreage.

Policy 38.4.2: Open space shall include all, or as much as possible, of the most significant, productive, or sensitive natural resources areas on the site. The siting of development shall be controlled to minimize impacts on the functions of the open space and the natural resources therein.

Policy 38.4.3: Clustering will be identified on detailed site plans in a compact and contiguous fashion. Types of uses allowed in the open space areas must be consistent with the preservation of significant wildlife habitat and biologically functioning and integrated with the habitat. Examples of permitted uses include conservation, mitigation areas, nature observation, hiking, stormwater systems, landscaping, and pedestrian and bike trails.

Policy 38.4.4: Wherever feasible and functionally possible, required open spaces for individual projects shall be integrated into a green way system, particularly when contiguous parcels have already been identified or reserved for such purposes, such as but not limited to a wildlife corridor, bicycling, hiking, inline skating, and horseback riding.

Policy 38.4.5: Lands dedicated for the preservation of natural resources shall be dedicated and maintained in perpetuity.

Policy 38.4.6: A maintenance plan for the open space shall be provided by the landholder at the time of final development plan certification. The lands may be privately maintained or maintained by another entity capable and committed to its management.

Objective 38.5: To continue to encourage environmentally-friendly landscaping principles that promote the natural function of soils, the conservation of water resources and enhance the City's identity.

Policy 38.5.1: Require the use of at least 60% native plants in new developments and redevelopments.

Policy 38.5.2: Require that public planting areas must feature native and environmentally-friendly landscaping plants and design.

Policy 38.5.3: Continue the use of native plant species in landscaping demonstration projects for the purposes of educating the public, on the benefits of maintaining native wildlife populations and conserving water.

Policy 38.5.4: Distribute and periodically update a recommended native plant list- ing and other educational materials to increase public awareness on the benefits of utilizing native plant species in landscape projects.

Policy 38.5.5: Cooperate with the U. S. Department of Agriculture and the FDEP to eliminate exotic nuisance plant species (e.g. Brazilian pepper).

Objective 38.6: The City shall continue to seek acquisition of ecologically valuable land through environmental land acquisition programs.

Policy 38.6: The City shall support the Environmental Lands Acquisition and Protection Program (ELAPP) to acquire lands containing a diversity of natural habitat types to ensure maximal diversity of wildlife species.

Policy 38.6.2: The City shall continue to support and encourage public acquisition of natural preserves under federal, state, and regional programs.

Policy 38.6.3: During the acquisition of natural preserve lands, the City shall give priority to acquiring the optimal acreage needed to maintain the integrity of the natural plant communities or ecological units involved, and to establish a County-wide system of interconnected wildlife corridors.

Policy 38.6.4: The City shall cooperate in the management of natural resources on publicly-owned City lands, as appropriate, with the U. S. Fish and Wildlife Service, the Florida Fish and Wildlife Conservation Commission, FDEP and SWFWMD.

Policy 38.6.5: The City shall promote the varied (multiple) use of natural preserves, in a manner compatible with the protection of wildlife habitat, to provide for passive recreation, watershed protection, erosion control, maintenance or enhancement of water quality, aquifer recharge protection, or other such natural functions.

Policy 38.6.6: Through the land use planning process, the City shall restrict incompatible development activities adjacent to publicly-owned or managed natural preserves.

Policy 38.6.7: Management plans will be prepared for newly acquired natural preserves in the City of Tampa within three years of acquisition, in accordance with ELAPP criteria.

Policy 38.6.8: The City shall promote, through appropriate signs and information, public education on the benefits of natural preserves, to eliminate the problems of human intrusion into preserves designated for limited public access.

Policy 38.6.9: The City shall continue to implement the natural resource management plan for McKay Bay and its adjacent natural tidal wetlands.

The following are some statistics on just how important trees are in a City setting.

*"The net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day."*

—U.S. Department of Agriculture

*"Landscaping can reduce air conditioning costs by up to 50 percent, by shading the windows and walls of a home."*

—American Public Power Association

*"If you plant a tree today on the west side of your home, in 5 years your energy bills should be 3% less. In 15 years the savings will be nearly 12%."*

—Dr. E. Greg McPherson, Center for Urban Forest Research

*"A mature tree can often have an appraised value of between \$1,000 and \$10,000."*

—Council of Tree and Landscape Appraisers

*Trees aid in traffic control. They separate pedestrians and vehicles, providing safer walking conditions.*

—Mid-Columbia Community Forestry Council

### *Urban Forestry*

Objective 38.27: The City of Tampa will maximize the retention and enhancement of the City's mature native shade tree canopy for the environmental value and for the contribution to this City's quality of life.

Policy 38.27.1: The City will seek to maintain and increase environmentally beneficial plant life.

Policy 38.27.2: The City will develop a "greening" program with a goal of increasing tree cover in areas of concentrated vehicular use where the urban heat island effect could be mitigated through planting trees and shrubs.

Policy 38.27.3: Toward reducing the energy requirements of new buildings, the land development review process will incorporate a review of how trees and shrubs could be oriented on a construction site to reduce cooling loads by taking advantage of evapotranspiration and shade.

Policy 38.27.4: The City will investigate ways to provide incentives to property owners who use certified arborists to assess the health of and properly trim existing large-trunk trees.

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## Project Partners



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