City of Dallas
Urban Forest Advisory Committee

Annual Report
2009

A Cooler Dallas!!!

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Memorandum

CITY OF DALLAS

DATE : March 1, 2010

TO: Honorable Members of the Dallas City Council

SUBJECT: **Outstanding Urban Forestry Progress: Urban Forest Advisory Committee Annual Report**

Due to the continued support of the City Council Members, the City of Dallas Urban Forest Advisory Committee produced outstanding results in 2009. The committee's Annual Report clearly demonstrates significant progress in managing our urban forest to maximize the many benefits we receive, and is worthy of your review. A healthy urban forest of trees provides not only cleaner air, water and soil, but also a place where people want to live, work and play. Trees are a wise investment in our future and the committee acts as our professional investment advisors.

Due to a limited budget and staff, we are fortunate to have a team of volunteer professionals willing to donate personal time to be strong stewards of our urban environment. The committee contributed time equivalent to almost three full time staff members. They donated 5,820 hours of time at a value of $351,666.56, and raised over $119,000.00 for urban forestry. Their 2009 accomplishments helped to build a solid foundation for the future growth and health of our urban forest.

The recent Citizen Forester Program graduated 20 new foresters, each of which will donate 25 volunteer hours each year towards urban forestry initiatives. In 2009, the Citizen Foresters contributed a total of 1360 volunteer hours. Working with other committee officials, 32 public presentations were provided as educational outreach. The committee also developed a cutting edge way to inventory trees that also provides data for managing other types of green/grey infrastructure. They planted many trees as well as developed an "Adopt a Median" program as a way to encourage citizens to take ownership in a part of Dallas and to help to expand our urban forest canopy cover.

I commend our committee members for their outstanding contributions and dedicated efforts. Working together, we will leave a living legacy of a cooler and greener Dallas for future generations to enjoy.

Tom Leppert,
Mayor, City of Dallas

cc: Mary K. Suhm, City Manager
Deborah Watkins, City Secretary
Tom P. Perkins, City Attorney
Craig Kinton, City Auditor
Judge C. Victor Lander, Administrative Judge
Ryan S. Evans, First Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager
A.C. Gonzalez, Assistant City Manager
Forest Turner, Assistant City Manager
Jeanne Chipperfield, Chief Financial Officer
Helena Stevens-Thompson, Assistant to the City Manager
Frank Librio, Public Information Office

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January 11, 2010

The Honorable Mayor Tom Leppert
Council Member Pauline Medrano
Chairperson, Quality of Life and Governmental Services Committee
City of Dallas
1500 Marilla St., Room 5FN
Dallas, Texas 75201

Re: Dallas Urban Forest Advisory Committee Annual Report for 2009

Dear Mayor Leppert and Council Member Medrano:

On behalf of the Dallas Urban Forest Advisory Committee, we wish to express our sincere appreciation for your continued support and commitment to improve our urban forest.

Four years ago, the committee was established and an "acorn" was planted. The acorn has grown and, due to meticulous care, has become a flourishing committee which provides a very important resource for the city. Working with city officials as our partners, the committee will continue to provide an endless bounty in the future. Your support represents our roots, which provide a foundation for our future growth.

The committee worked diligently in pursuit of many important objectives during 2009 and enjoyed great success in many important areas of forest management. As a result, we are quite pleased to present our Annual Report detailing our progress.

Committee volunteers contributed a total of 5,820 hours in 2009 or the equivalent of three full time staff working for the city. The volunteer hours contributed have a monetary value of $351,666.56. The committee raised a total of $119,525.00.

The committee completed recommended changes to our tree ordinance, found a new way to inventory trees which will also help to manage green/grey infrastructure, and updated the city's MOWmentum Agreement guidelines for landscapes in medians, among other successes.

To leave a legacy of a healthy urban forest for future generations to enjoy is indeed a gift worthy of our time, effort and funds. As a result, your support is greatly appreciated!!

Respectfully,

Steve Houser
Chairman, Dallas Urban Forest Advisory Committee
City of Dallas
1500 Marilla St., Rm. 6FN
Dallas, Texas 75201
Phone: 972-442-1524
Fax: 972-429-0012

cc: Councilmember Delia Jasso, Dist. 1
Councilmember David A. Neumann, Dist. 3,
Councilmember Dwaine R. Caraway, Mayor Pro Tem, Dist. 4
Councilmember Vonciel Jones Hill, Dist. 5
Councilmember Steve Salazar, Dist. 6
Councilmember Carolyn R. Davis, Dist. 7
Councilmember Tennell Atkins, Dist. 8
Councilmember Sheffie Kadane, Dist. 9
Councilmember Jerry R. Allen, Dist. 10
Councilmember Linda Koop, Dist. 11
Councilmember Ron Natinsky, Dist. 12
Councilmember Ann Margolin, Dist. 13
Councilmember Angela Hunt, Dist. 14
City Manager, Mary K. Suhm
City Secretary, Deborah Watkins
City Attorney, Tom P. Perkins
City Auditor, Craig Kinton
Administrative Judge, Judge C. Victor Lander
First Assistant City Manager, Ryan S. Evans
Assistant City Manager, Jill A. Jordan, P.E.
Assistant City Manager, A.C. Gonzalez
Assistant City Manager, Forest Turner
Chief Financial Officer, Jeanne Chipperfield
Assistant to the City Manager, Helena Stevens-Thompson
Director of Parks & Recreation Department, Paul Dyer
Assistant Director of Parks & Recreation Department, Willis Winters
Senior Park Planner, Parks & Recreation Department, Michael Hellmann
Director of the Office of Environmental Quality, Eric Griffin
Director of Street Services, Gilbert Aguilar
Director, Public Information Office, Frank Librio
Public Information Officer, Meranda Carter Cohn
Department of Public Works, Water Conservation Division Manager, Carole Davis
Sustainable Development and Construction Dept., Chief Arborist, Phil Erwin
Director, Sustainable Development and Construction Dept, Theresa O'Donnell
City Forester, Karen Woodard

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City of Dallas
Urban Forest Advisory Committee

Appointed Member List
2010

Honorary Members

- Councilmember David A. Neumann, Chairperson, Trinity River Committee. Address: 1500 Marilla St. Room 5FS, Dallas, 75201. Office: 214-670-0776, Fax: 214-670-5115. Email: David.neumann@dallascityhall.com.
- Councilmember Steve Salazar, Vice Chairperson, Trinity River Committee, Address: 1500 Marilla St., Room 5FS, Dallas, 75201. Office: 214-670-4199, Fax: 214-670-5115. Email: Steven.Salazar@dallascityhall.com.
- Councilmember Pauline Medrano, Chairperson, Quality of Life Committee. Address: 1500 Marilla St. Room 5FN, Dallas, 75201. Office: 214-670-4048, Fax: 214-670-5117. Email: Pauline.Medrano@dallascityhall.com.
- Chris Heinbaugh, Chief of Staff, Office of the Mayor, Address: 1500 Marilla St., Room 5EN, Dallas 75201. Office: 214-670-4054. Email: Chris.Heinbaugh@dallascityhall.com.

City of Dallas Liaisons

- Michael Hellmann, Senior Park Planner, Degreed Forester, Dallas Park & Recreation Department. 1500 Marilla St. Room 6FN, Dallas, 75201. Office: 214-670-4103, Fax: 214-670-4286. Email: Michael.Hellmann@dallascityhall.com.
- Karen Woodard, Degreed Forester, Dallas Urban Forester, Dallas Park & Recreation Department, 1500 Marilla St., Room 6FN, Dallas, 75201. Office: 214-670-4070, Fax: 214-670-3205. Email: Karen.Woodard@dallascityhall.com.
- Phil Erwin, Chief Arborist, Building Inspection, Degreed Forester, ISA Certified Arborist. Oak Cliff Municipal Center, 320 E. Jefferson, Room 105, Dallas, 75203. Office: 214-948-4117, Fax: 214-948-4374. Email: Philip.Erwin@dallascityhall.com.
- Kevin Lefebvre, Environmental Coordinator for Sustainability, Committee Liaison, Dallas Office of Environmental Quality, 1500 Marilla St., Dallas, Texas 75201. Office: 214-670-6646, Fax: 214-670-8207. Email: Kevin.Lefebvre@dallascityhall.com.

- Elizabeth Ponce, MOWmentum Program Manager, Committee Liaison, Dallas Street Services, 2710 Municipal St., Dallas, Texas 75215. Office: 214-670-4491, Fax: 214-670-8207. Email: Elizabeth.Ponce@dallascityhall.com.
- Stephen D. Worden, Dallas Park and Recreation Department Standards Liaison, Interim Manager, Samuell Farm Outdoor Learning Center, 100 E. Highway 80, Mesquite, Texas 75149. Office: 972-289-7652, Fax: 972-288-9337, Email: Stephen.Worden@DallasCityHall.com .
- Richard Smart, Environmental Coordinator, Committee Liaison, Dallas Public Works & Transportation, Storm Water Management, 320 E. Jefferson Blvd., Room 108, Dallas, Texas 75203. Office: 214-948-4183, Fax: 214-948-4076. Email: Richard.Smart@dallascityhall.com.
- Cory Herpel, Environmental Coordinator, Committee Liaison, Dallas Public Works & Transportation, Water Quality Group. 320 E. Jefferson Blvd., Room 108, Dallas, Texas 75203. Office: 214-948-4305. Email: Cory.Herpel@dallascityhall.com .
- Meranda Carter Cohn, Public Information Officer, Committee Liaison, Dallas Office of Public Information, 1500 Marilla St., Dallas, Texas 75201. Office: 214-671-8573, Fax: 214-670-0160, Email: Meranda.Cohn@dallascityhall.com .
- Mary Ayala, Sr. Project Manager, Committee Liaison, Dallas Trinity River Corridor Office, 1500 Marilla St., Room 6BS, Dallas, Texas 75201. Office: 214-671-9507. Fax: 214-670-3226. Email: Mary.Ayala@dallascityhall.com.
- Carole Davis, Department of Public Works, Water Conservation Division Manager, 1500 Marilla St., Dallas Texas 75201. Office: 214-243-1175, Email: Carole.Davis@DallasCityHall.com .
- Amanda Popken, Development Information Analyst, Committee Liaison, Dallas Office of Economic Development, 1500 Marilla St., Dallas, Texas 75201. Office: 214-671-9819, Email: Amanda.Popken@DallasCityHall.com

Voting Members:

- Robert Curry, Committee Chairperson, Citizen Forester, President, Save Open Spaces. Address: 10081 San Juan Drive, Dallas, Texas 75228, Cell: 214-876-8258, Email: DallasTrees10@gmail.com .
- Kurt Kretsinger, President, Datebook Publishing Inc., Committee Team Leader, Planting/Transplanting. Address: 9322 W. Lake Highlands, Dallas, Texas 75218, Office: 214-321-5224, Fax: 214-321-6759. Email: Kurt@datebook.com,
- Kassandra G. McLaughlin, Commercial Real Estate Attorney for Brown McCarroll, L.L.P. Address: 2001 Ross Avenue, Suite 2000, Dallas, TX 75201-6929. Office: 214-999-6100 (Main), Fax: 214-999-6170 (Main). Email: Kmclaughlin@mailbmc.com.
- Gary Gene Olp, AIA, LEED AP, Board Member, USGBC N. Texas, President, GGO Architects, Corp.. Address: GGO Architects, Corp., 718 N. Buckner Blvd, Suite 316, Dallas, 75218. Office: 214-328-9091, Fax: 214-328-4614. Email: Gary@ggoarchitects.com.

- Mike FitzGerald, Committee Team Leader, Public Relations & Media. Address: 5944 Marquita Ave, Dallas, Texas 75206. Cell: 214-673-1778. Email: Michael.R.FitzGerald@gmail.com.
- Bill Seaman, Degreed Horticulturist, Certified Arborist, Landscape Designer, Committee Team Leader, Land Planning, Development & City Codes. Address: P.O. Box 670512, Dallas, 75367-0512. Cell: 214-882-5580. Email: Wm.Seaman@tx.rr.com.
- Sara Beckelman, Committee Assistant Secretary, Citizen Forester, Committee Liaison for the North Texas Master Naturalist program, Master Composter Trainer. Address: 2705 Pennington Street, Irving, Texas 75062, Office: 972-442-1524, Cell: 972-989-7707, Email: SBwormlady@aol.com .
- Dick Coupe, North Texas Master Naturalist, Dallas County Master Gardener, Address: 7223 Hunters Ridge, Dallas, Texas 75248, Home: 972-392-2315. Email: Jdcoupe@sbcglobal.net.
- Eric Larner, Committee Team Leader, Citizen Foresters, Committee Liaison, Dallas County Master Gardeners. Address: 1806 Clear Creek Lane, Carrolton Texas 75007. Home: 972-492-3494. Email: CitizenForester@tx.rr.com .

Non Voting, Appointed Members

- Brad Mayfield, Certified Arborist, Degreed Forester, Region Forester for ONCOR Electric Delivery, Vegetation Management Department. Address: 115 W. 7th Street, Suite 825, Ft Worth, 76102. Office: 817-215-6831, Fax: 817-215-6921. Email address: James.Mayfield2@ONCOR.com .
- Micah D. Pace, M.S. in Forestry, B.S. in Natural Resource Management, Regional Urban Forester, Texas Forest Service. Address: Texas Forest Service, 2100 Ross Ave. Suite 957, Dallas, Texas 75201. Office: 214-273-6687, Fax: 214-953-3028. Email: MPace@TFS.TAMU.edu .
- Deborah Hill, Committee Liaison, Uptown Dallas, Board Member and Maintenance Committee Member. Address: 2610 Allen Street # 5505, Dallas, Texas 75204. Home: 214-303-1118. Email: walkbutneverrun@aol.com .
- Fred Burrell, M.S. in Secondary Education, Dallas County Extension Agent/Natural Resources, Texas Agrilife Extension Service, Dallas Office. Address: 10056 Marsh Lane, Suite B -101, Dallas, Texas 75229. Office: 214-904-3050, Fax: 214-904-3080. Email: F-Burrell@ag.tamu.edu .
- Lora Hinchcliff, Committee Secretary, Team Leader, Wood Waste Recycling, Texas Certified Nursery Professional (2009-2010 Chairperson, Region Four), Territory Representative, Living Earth Technology Company. Address: 1901 California Crossing Rd., Dallas, Texas 75220. Cell: 214-673-3341. Email: LHinchcliff@Letcogroup.com .

- J. Brett Johnson, M.S. Interdisciplinary Studies, Wildlife Biology/Geography, Urban Wildlife Biologist, Region 3, Texas Parks and Wildlife Department, Sponsor/Advisor to the North Texas Chapter of the North Texas Master Naturalist program. Address: P.O. Box 941, Cedar Hill, Texas 75106. Office: 972-293-3841, Email: dallasbiologist@airmail.net .
- Paul Lindenberger, Vice President of Operations, Committee Liaison, Downtown Dallas. Address: 1412 Main St., Suite 4600e, Dallas, Texas 75201. Main Office: 214-744-1270, Direct/Office: 214-744-6668, Fax: 214-744-1986. Email: lindenberger@downtowndallas.com. .
- Janette Monear, Executive Director, Texas Trees Foundation. Address: 2100 Ross Avenue, Suite 975, Dallas, Texas 75201. Office: 214-273-6688, Email: Janette@TexasTreesFoundation.org .
- Luis M. Salcedo, P.E.,R.P.L.S., President Salcedo Group Inc. Civil Engineering, Surveying & GIS, Committee Team Leader, Tree Surveys, Inventories & Tracking. Address: 400 Zang Blvd., Suite 1420, LB 78, Dallas Texas 75208. Office: 214-941-8610, Fax: 214-941-2331. Email: LSalcedo@SalcedoGroupInc.com .
- Lawrence P. Hochberg, Principal, President, Hochberg PC, Board Member, Landscape Committee Chair, Turtle Creek Association, Committee Liaison, Turtle Creek Association. Address: 3710 Rawlins, Suite 950, Dallas, Texas 75219. Office: 214-884-4801, Email: LHochberg@sbcglobal.net .
- Adam Jochelson, Environmental Engineer, City of Dallas Sanitation Services Department, Committee Liaison for the Dallas Sanitation Services Department. Address: Solid Waste Disposal Operations, 3112 Canton Street, 2nd floor, Dallas, Texas 75226. Office: 214-670-1891, Fax: 214-670-0198, Email: Adam.Jochelson@DallasCityHall.com .
- Timothy Herfel, Environmental Protection Specialist, Environmental Protection Agency, 1445 Ross Avenue, Seventh Floor, Dallas 75201. Office: 214-665-6685, Email: Herfel.Timothy@epamail.epa.gov .
- Stan Aten, Committee Liaison, Oak Cliff Earth Day, Office: 214-565-5233, Email: SAten@att.net .
- Patrick Boyd, Committee Liaison, Jefferson Median Beautification Project, Senior Design Associate, David Ralston Landscape Associates, the Meadow Building, 5646 Milton, suite 110, Dallas, Texas 75206. Office: 214-824-6333, Email: PBoyd@DallasGardens.com .

The State of the Dallas Urban Forest

The current state of our urban forest in Dallas can be defined in general terms by committee members and supporters knowledgeable on the various related subjects. In order to fully quantify all the aspects of our urban forest according to national standards, more baseline data and further study would be required. Current efforts are leading in this direction and more detailed data will be available in the future. However, to provide a general overview requires a description and analysis of the following five primary areas:

1) Tree Canopy Coverage

- A measure of total tree canopy looking down from above such as a satellite image.
- Current estimates of coverage are less than 2% in downtown. The estimate for industrialized areas is less than 10% coverage. Residential areas faired much better with some approaching 30%. However, more specific detailed data is needed in this area.
- Tree canopy coverage must be increased in urban heat island problem areas to at least 30% on both public and private property to fully maximize the benefits of future planting efforts.

2) Tree Planting

- Estimates of public tree plantings range from 1,000 to 1,500 trees per year. According to a recent Trust for Public Land national survey, we are way behind other large communities that plant over 10,000 trees on public property annually.
- UFAC will be tracking local public planting projects for potential future carbon credit claims.

3) Tree Condition

- UFAC is working to complete a tree inventory for a 20 square mile area in the city which will be completed in mid 2010. With the data, a more precise analysis of forest condition can be completed and important baseline data will be gathered which is the first step to better manage the health of our urban forest in the future.
- According to UFAC experts, the general condition of our urban forest is one of decline due the number of trees lost and not replaced as well as invasive plants, pests and pathogens. Trees are often lost due to development or redevelopment. They are also threatened by deadly pathogens such as Oak Wilt which is easily spread in a neighborhood much the same as Dutch Elm Disease. The Dallas area currently contains over 150 infected sites which can be most of a city block. Invasive and non native pests such as the Soapberry Borer are devastating the

local populations of this species. Invasive and non native plants such as Chinese Privet are dominating our natural areas and suppressing the growth of native plants.

- Current computer modeling software coupled with tree inventory data (once complete) will help to update the forest condition data and quantify the many benefits offered by Dallas trees.

4) Tree Protection

- UFAC recently completed recommended changes to our tree ordinance that encourage and incentivize tree preservation as well as responsible (sustainable) land use practices.
- The incentive portion of the recommended changes offers the opportunity to track those that become educated about trees, work to protect them as well as build responsibly (sustainably).

5) Tree awareness

- With a growing public awareness of the need to reduce our environmental "footprint" as well as the many benefits offered by trees, support for tree and forest projects continues to grow.
- UFAC worked diligently in this area and realized many great successes as expressed in the following report.

Urban Forest Management Results

Tree Inventory Research Pilot Project

UFAC worked with Dr. Fang Qiu, Associate Professor of GIS and Remote Sensing, Geospatial Information Sciences, University of Texas at Dallas, to provide a briefing for the City Council's Quality of Life as well as the Transportation/Environment Committees regarding our research project. Dr. Qiu is also scheduled to provide a presentation with more details for regional officials in January at the North Central Texas Council of Governments (NCTCOG). The 20 square mile tree inventory will be the first ever developed using images and algorithms offering the ability to manage an urban forest by analyzing baseline data and maps rather than using city staff or volunteers in the field. A tree inventory is the most important first step in managing the urban forest in Dallas or in any community. The images and technology can also be used to manage many other types of green/grey infrastructure, such as computer modeling of storm water runoff, code enforcement or analyzing/managing streets and public works infrastructure. With support from other infrastructure managers that will use the information sharing the expense, expanding the area surveyed to include all of Dallas becomes a possibility.

UFAC wishes to express our sincere appreciation to the Turtle Creek Association and Mr. Lawrence Hochberg, Committee Liaison, Landscape Committee Chair for the Turtle Creek Association, for the opportunity to use a recent tree survey of Turtle Creek as a way to ensure the accuracy of our preliminary research.

Dallas Tree Ordinance

UFAC officials and our Team Leader for Land Planning, Development and City Codes, Mr. Bill Seaman, worked diligently in completing recommended changes to the Dallas Tree Ordinance. The effort to find a common ground began in 2007, and included meetings with representatives from the development and building industry and our Chief Arborist, Mr. Phil Erwin. In the early meetings, one of the **UFAC** priorities was to consider offering incentives for responsible and sustainable land use practices. By building responsibly and conserving trees, as well as important ecosystems, we help to offset our environmental footprint plus improve our quality of life. Although **UFAC** developed its recommended changes outside of the meetings with developers and builders as well as the Chief Arborist, the education they offered was important in finding potential solutions.

The meetings also discussed a "matrix" or spreadsheet which offers incentives for various types of responsible land use practices. In July a sub-committee was formed under the existing Green Building Task Force, which included **UFAC** members, to develop the final version. Members included: Mr. David Marquis, Task Force Chair; Mr. Bob Stimson, President, Oak Cliff Chamber of Commerce; Mr. Steve Houser, UFAC Chair and Mr. Bob Curry, UFAC Vice Chair; Mr. Bill Seaman; Mr. Phil Erwin; as well as other builders, developers and construction officials.

A preliminary version of the recommendations from **UFAC** was previously publicized and a public stakeholder meeting was held in City Hall on Monday, June 15, 2009. Many of the suggested changes were included in the recommendations.

The final version of the recommendations, a copy of the incentives (or matrix) along with an overview of the issues and a description are found in the Appendix, pages 53-84.

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MOWmentum Agreement, Landscape and Species Standards

UFAC worked with various city officials to update the city's MOWmentum Agreement, General Standards for Landscape and Recommended Tree Species List which were limited in their scope as far as our future sustainability and outdated. The three documents will provide accurate guidelines for citizens to follow which save a great deal of staff time plus encourages planting the right tree in the right location as well as proper maintenance. Clear guidelines also help to encourage the public to plant trees in public areas which offers many benefits to all citizens.

Adopt-a-Median

UFAC worked with various city officials to develop an "Adopt-a-Median" program as a way to encourage others to take ownership of a small part of Dallas by planting trees and landscaping their neighborhood. With a limited city budget and staff, it provides the best opportunity to plant and maintain more trees on public property. The program was

approved by city officials and more public exposure is expected in the future. The program has the potential to change the face of Dallas and greatly increase our quality of life and economic future in many ways (see Appendix, pages 85-86).

Quality of Life Committee Briefings

UFAC and Mr. Michael Hellmann, Senior Park Planner with Dallas Park & Recreation, provided briefings regarding the way the city departments in Dallas deal with tree issues as well as how a Division or Office of Urban Forestry fits into other typical governmental structures around the nation. **UFAC** hoped to establish a formal group within the city structure that deals specifically with trees; however, approval was not granted due to concerns relating to the current budget constraints. However, it is difficult to manage an entire urban forest with only one forester that works within the Park and Recreation Department.

Fall Foliage Tree Planting Project

UFAC, officials, Citizen Foresters, as well as Dallas County Master Gardeners, worked to plant 27 trees in two medians along Skillman, just south of Lovers Lane. The species selected were those that are known to produce good fall color, which provides a committee “signature” or "showcase". The event was covered by WBAP, Fox 4 and Univision.

The committee is now working with the adjoining neighborhood association and city officials to develop maintenance plans and another tree planting project in the medians on Lovers Lane.

City Boards and Commissions

UFAC spoke with the Chairperson for all city Boards and Commissions to ensure they were aware of the resource offered by the committee. **UFAC** also met with the chair for the City Plan Commission to establish stronger ties.

UFAC Vice Chair and Citizen Forester, Mr. Robert Curry, provided a briefing for the Environmental Health Commission regarding the committee and the many ways we can work together.

Trinity River

UFAC and city officials worked with Citizen Foresters to support the ongoing Trinity Buckeye Trail clean-up efforts. By suppressing the non-native Chinese privet, more of the native plants can thrive. **UFAC** also supports the continued expansion of trails throughout the Trinity Corridor by the Student Conservation Association, Groundwork Dallas and the Trinity Audubon Center.

Trinity Forest Levee Trees

UFAC met with officials from the Trinity Project Office regarding the Corps of Engineers' request to remove thousands of trees on (or near) the Trinity levees (within 50 feet of the levee toe). Committee input included items such as the possibility of transplanting smaller trees, installing root barriers near the levee to preserve more trees, preserving the wood from trees for park benches, evaluating how many roots exist inside the levees and how tree removal could affect levees as roots decay. Dallas is among the first to potentially be required to remove trees within 50` feet of the levee toe.

ONCOR Vegetation Management (Tree Pruning)

UFAC worked with local residents concerned about recent ONCOR tree pruning to ensure they were educated about the associated issues. Since the UFAC appointed members include a staff member from ONCOR, an open line of communication was established during the inception of the committee.

UFAC attended a public meeting with ONCOR officials and Councilmember Dave Neumann to air public concerns and allow ONCOR officials to explain the issues affecting their neighborhood. **UFAC** was contacted by Councilmember Angela Hunt to speak during a second public meeting on the subject in Lee Park. **UFAC** touched on some of the concerns from neighborhoods but focused primarily on potential solutions found in Oklahoma regulations. Some of the solutions offered by UFAC and others have already been enacted by ONCOR and the dialogue continues with ONCOR officials to find more common ground.

EPA Urban Heat Island Final Report

UFAC worked with EPA officials, Dallas Office of Environmental Quality and the Houston Advanced Research Center (HARD) in developing the final head island report (see Appendix, pages 87-98). The report clearly details how the heat island effect has a direct connection to inner-city temperatures and energy use, as well as our air quality. Furthermore, the report shows how trees and urban forestry provides viable solutions.

Wood Waste Recycling

UFAC officials and Ms. Lora Hinchcliff**,** Committee Secretary and Wood Waste and Recycling Team Leader, met with Mr. Ron Smith, Director of Sanitation Services to learn about current and future wood-waste recycling efforts. Current plans appear to be quite good and **UFAC** respectfully requested a liaison to serve on the committee. Mr. Adam Jochelson was appointed as a result and we hope to work more closely with the department to offer committee support for future projects.

The Wood Waste and Recycling Team is working with the Dallas Sanitation Services Department in tracking waste dumped at the McCommas Bluff Landfill. Wood waste

that was recycled by chipping/grinding into mulch was between 7,000 and 8,000 tons in 2004-2005 and 2005-2006 respectively. In 2008-2009 over 33,000 tons of wood waste was recycled and to date, over 25,000 tons have been recycled in 2009-2010 fiscal year. It appears that wood waste recycling will continue to increase in the future.

TCEQ Fiscal Year Runs 1 Sept thru 31 August

	FY04-05	FY05-06	FY06-07	FY07-08	TONNAGE for PAST FISCAL YEAR FY08-09	TONNAGE Y-T-D Q1FY09-10
Brush / Bulky	137,428	129,848	118,756	108,656	91,685	22,908
C&D	259,305	150,353	151,626	191,041	151,486	39,222
Roofing	25,667	19,363	11,763	42,909	39,087	14,444
Brush Grinding*	7,385	8,213	-	-	33,656	25,670

Economic Development and Forestry

UFAC worked with Ms. Amanda Popken, Development Information Analyst with the Office of Economic Development, to provide tree and forest related facts as well as information about our diverse forest ecosystems. The information is to be the environmental section of an economic development atlas, geared toward the long term analysis of planned future growth.

Watershed Demonstration Model

UFAC Liaisons and Environmental Coordinators, Mr. Richard Smart and Mr. Cory Herpel, worked with others to develop a storm water demonstration model that shows how our water becomes polluted. It also shows how trees play a role in water quality, as well as water quality by cleaning and reducing storm water runoff. The model is an outstanding educational tool, which will help the public understand how they can improve the quality of our water supply.

Jefferson Median Tree Planting Project

UFAC officials and Citizen Foresters worked with Committee Project Liaison, Mr. Patrick Boyd, as well as Mr. Van Johnson and Mr. Jason Wright, to plant 32 trees in the Jefferson Blvd. median. The project was a big success with Councilmember Delia Jasso speaking about the importance of the project and also helping to plant a few trees.

Sustainable Landscapes

UFAC developed a rough proposal for the landscaped median in front of City Hall at the request of Councilmember Angela Hunt. The intent was to show ways to reduce the city's environmental footprint in many ways and save city maintenance funds as well. The up front costs are a concern at present due to the city budget however the long term benefits to the city budget and to the environment were clearly expressed. To develop more sustainable landscaped medians requires the education of the public regarding the importance of native drought adaptive and noninvasive vegetation (see Appendix, pages 99-110).

Tree and Sidewalk Interface Problems

UFAC worked with Chief Arborist, Mr. Phil Erwin, regarding a growing city-wide problem of trees causing problems for streets and sidewalks. **UFAC** offered input and supports Mr. Erwin as he works to find a resolution to the problems. As an example of the discussions, appointed committee member, Mr. Gary OLP, AIA, LEED AP, suggested a reciprocal easement access agreement as a way of allowing the sidewalk to be moved away from a tree. Chief Arborist, Mr. Phil Erwin suggested the establishment of a "neighborhood management plan" as a potential way to resolve these types of circumstances.

Turtle Creek Forest Analysis

UFAC encouraged Mr. Larry Hochberg, Committee Liaison for Turtle Creek Association, as well s the Landscape Committee Chair, to use the association's recent tree inventory data to complete a computer analysis of the benefits offered. Mr. Hochberg worked with the Texas Forest Service to complete the analysis and the results should be released soon. The data will help to quantify the many benefits offered by the Turtle Creek forest. **UFAC** is very appreciative of the efforts by Mr. Hochberg and the Turtle Creek Association as well Mr. Micah Pace, Regional Representative and others with the Texas Forest Service.

Arlington Urban Forest Analysis

UFAC worked with the Texas Forest Service and Arlington City Forester, Mr. Matt Churches, to complete a sampling inventory of their urban forest to be utilized in computer modeling software (Urban Forest Effects Model or UFORE). The inventory and software are used to assess the financial value of the many benefits offered by their urban forest (storm water runoff reduction, carbon absorption, forest value and others). The research is not complete but the data helps decision makers understand the financial benefits offered by trees in Arlington, Dallas and around the region.

Irving Street Tree Analysis

UFAC, Citizen Foresters, and Master Naturalists worked with the Texas Forest Service and Irving's "Green Advisory Committee" volunteers to complete a sampling inventory of street trees in the old downtown area of Irving. The inventory data was analyzed using computer software that shows some of the benefits they offer. It is a very usable tool that helps to educate regional decision makers regarding some of the benefits of trees.

UFAC also expressed appreciation for the city's establishment of a "Green Advisory Committee" that is similar to **UFAC** in its mission and goals. Establishing the group helped them gain the "Tree City USA" designation by the National Arbor Day Foundation. To have another group similar to UFAC established in Irving is a testament to the success of the committee.

Community Gardens

UFAC is working with the Office of Environmental Quality in support of community gardens and encouraging city codes that would allow their establishment.

Samuell Farm Outdoor Learning Center

UFAC Citizen Foresters and City Forester, Ms. Karen Woodard, developed a tree survey for the property to help educate visitors regarding the trees that inhabit the farm. This provides a learning experience to all those interested in trees that visit the park.

Dixon Branch Park Tree Planting

UFAC Citizen Foresters worked with residents and the Student Conservation Association (SCA) to plant 17 trees in Dixon Branch Park. Council Member Sheffie Kadane attended in support the event and to inspect the work.

Dallas Arbor Day Celebration

UFAC Citizen Foresters worked with the Dallas Park & Recreation Department, the EPA, and Texas Trees Foundation to plant 100 trees at Skyline High School in support of the city's 2009 Arbor Day Celebration. Speakers during the event focused on the importance of trees and the need to educate others as well as to plant more trees.

Dallas Water Utilities

UFAC announced the establishment of relations with the Dallas Water Utilities Department and the designation of Ms. Carole Davis as our liaison. Due to the direct connection between water and trees, there is a need to expand our working relations with the Department, as well as all water related officials in the future.

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Volunteer Hour and Value Summary

Volunteer Hour Totals

- General Volunteer Hours: 868
- Management Volunteer Hours: 3,592
- Citizen Forester Volunteer Hours: 1360.20
- **Total Volunteer Hours: 5,820.20**

Value of Volunteer Time

- General Volunteer Hours Value: $18,054.40
- Management Volunteer Hours Value: $305,320.00
- Citizen Forester Volunteer Hours Value: $28,292.16
- **Total Value of Volunteer Time: $351,666.56**

See Appendix, pages 111-113, for details

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Public Education – Outreach

Girl Scouts

UFAC worked with a local Girl Scout Troop in educating the public about trees and in advocating for more tree conservation efforts. The group provided a display on trees during public events and collected over 900 signatures on a petition to save 85 trees. Miss Kristyn Harris (age 14) received the National Girl Scout Silver Award, which is the second highest award available for the age group on a national level, due to her efforts.

UFAC Website

UFAC Public Relations Team Leader, Mr. Mike FitzGerald, worked throughout the year to reorganize and edit the entire committee website. Since this is our primary education tool, it will be simpler and easier to navigate, plus provide an extensive amount of information for the public. Improvements include clear information about the Committee, its activities, and a city specific section which informs the public of Dallas' urban forest potential and provides an understanding of Dallas' tree related ordinance. The site will also highlight many of the city's tree-lined neighborhoods.

Media

UFAC enjoyed media coverage regarding many of its activities including

- Ms. Alexa Schirtzinger with the *Dallas Observer* wrote an article regarding drought stress and changes in hardiness zones: http://blogs.dallasobserver.com/unfairpark/2009/01/there_is_unrest_in_the_forest.php#more

- Ms. Alexa Schirtzinger with the *Dallas Observer,* wrote an article regarding urban forestry in Dallas: http://www.dallasobserver.com/2009-03-19/news/dallas-wants-to-be-a-green-city-so-why-not-save-some-trees
- Black White Read on Line covered the annual dedication for the *Celebration Tree Grove* by the *Love of the Lake* volunteers, Mayor Leppert was seen wearing an I LOVE TREES button in a photo by Glen Kitto: http://lakewood-dallas.blackwhiteread.com/view/article/10037?page=6
- Mr. Rudy Bush, Reporter with the *Dallas Morning News*, wrote the following article regarding our tree ordinance: http://cityhallblog.dallasnews.com/archives/2009/05/join-the-dallas-tree-ordinance.html
- Ms. Nancy Visser, Reporter with the *Dallas Morning News*, wrote the following article regarding our Signature Tree Planting Project: http://eastdallasblog.dallasnews.com/archives/2009/05/tree-project-on-skillman-is-ge.html
- Ms. Alexa Schirtzinger, Reporter with the *Dallas Observer* wrote the following article: http://blogs.dallasobserver.com/unfairpark/2009/05/love_it_or_leaf_it_dallas_inch.php
- Public Relations Team Leader, Mr. Mike Fitzgerald, was interviewed by WBAP radio during our Fall Foliage Tree Planting Project
- The International Society of Arboriculture, Texas Chapter, prints updates from the committee in their newsletters which reaches thousands around the state: http://www.isatexas.com/Members/Newsletter.htm
- Mr. Brad Watson with *Channel 8* covered the potential Trinity levee tree removals as well as the UFAC public stakeholder meeting regarding the tree ordinance: http://www.wfaa.com/sharedcontent/dws/wfaa/latestnews/stories/wfaa090609_mo_tress.655a15df.html
- The *Dallas Morning News*, Editorial Board, wrote the following article regarding UFAC recommended changes to the tree ordinance: http://www.dallasnews.com/sharedcontent/dws/dn/opinion/editorials/stories/DN-trees_20edi.State.Edition1.1dc93b1.html
- *Dallas Morning News* Editor, Ms. Sharon Grigsby, wrote the following article regarding the tree ordinance: http://dallasmorningviewsblog.dallasnews.com/archives/2009/06/is-this-the-bes.html#comments
- *Dallas Observer* Reporter, Ms. Alexa Schirtzinger, wrote the following regarding the tree ordinance: :http://blogs.dallasobserver.com/unfairpark/2009/06/sure_only_god_can_make_a_tree.php
- *Advocate Magazines* Reporter, Ms. Audra Glover, wrote the following regarding the same subject: http://www.advocatemag.com/preston-hollow/blog/48071387.html
- *Dallas Morning News* Reporter, Mr. Rudy Bush, wrote the following regarding the potential Trinity levee tree removals: http://www.dallasnews.com/sharedcontent/dws/news/localnews/stories/DN-dalcouncil_04met.ART.Central.Edition1.50b32d3.html
- Ms. Audra Glover with the *Advocate* wrote the following article regarding our recommended changes to the tree ordinance:http://www.advocatemag.com/preston-hollow/blog/Update_Citys_tree_ordinance_update_well_received_so_far.html?c=y
- The *Advocate* printed a great article by previous City Council Member, Mrs. Sandy Greyson, regarding the tree ordinance and our recommended changes: http://www.advocatemag.com/preston-hollow/magazine/Root_Problem.html

- Mr. Roy Appleton with the *Dallas Morning News* published the following article regarding issues relating to ONCOR: http://www.dallasnews.com/sharedcontent/dws/news/localnews/stories/DN-trees_01met.ART.State.Edition1.4be31f9.html
- Ms. Allison Pless with *Oak Cliff on line* published the following regarding ONCOR related issues: http://oakcliffonline.com/index.php?option=com_content&task=view&id=535&Itemid=1
- Mr. Appleton with the *Dallas Morning News* covered a fundraising effort to relocate the power lines on a particular property: http://oakcliffblog.dallasnews.com/archives/2009/08/oak-cliff-men-reach-out-for-he.html
- The North Central Texas Council of Governments newsletter published an updated article on the benefits of trees: http://www.nctcog.org/envir/features/2009/Sep/RegVoices.asp
- Mrs. Jacquielynn Floyd, Columnist with the *Dallas Morning News,* published an article encouraging the preservation of a Palm tree: http://www.dallasnews.com/sharedcontent/dws/dn/localnews/columnists/jfloyd/stories/DN-floyd_16met.ART0.State.Edition1.4bc6eab.html
- *Oak Cliff People* published an article by Josh Hixon regarding the Jefferson Median Project: http://www.peoplenewspapers.com/ME2/Audiences/dirmod.asp?sid=A4CEC4C80FFA4390B478190966922D6A&nm=Archives&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&AudID=3E017068694948C3BE75FD51480D8A7D&tier=4&id=6CF6270FACB44C11A272BD6DB8059A56
- University of Texas at Dallas newsletter regarding our research project: http://www.utdallas.edu/news/2009/12/08-002.php
- Mr. Roy Appleton with the *Dallas Morning News* covered the Jefferson Median Project: http://oakcliffblog.dallasnews.com/archives/2009/12/a-nip-of-cold-and.html
- Ms. Georgia Fisher with *People Newspapers* covered the Jefferson Median Project: http://www.peoplenewspapers.com/ME2/Audiences/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=5AC50CE2B3C144EFBF6881F31DF03662&AudID=3E017068694948C3BE75FD51480D8A7D
- Mrs. Jacquielynn Floyd with the *Dallas Morning News* followed up on the relocation of the "Gritty Palm": http://www.dallasnews.com/sharedcontent/dws/dn/localnews/columnists/jfloyd/stories/DN-floyd_15met.ART.State.Edition1.4baa450.html

Public Presentations

UFAC Citizen Forester Team Leader and Dallas County Master Gardener Liaison, Mr. Eric Larner, provided the following public outreach presentations in 2009:

- Dallas Water Conservation Seminar (Richland College) "Trees – How to Conserve Water and Money"
- Frisco Garden Club "Benefits of Trees and Caring for your Trees"
- Greenhill School Earth Day Event "Trees are Cool!!!"
- Texas AgriLife Extension "Farm Day" Event "Trees" for 4th Graders
-

- Sammons Center “Benefits of Trees” “Right Tree – Right Place”, “Care and Maintenance of Trees”
- VA Medical Center – Therapeutic Horticulture Series “The Value of Trees in our City and Home Landscape”
- Dallas Home & Garden Show “Benefits of Trees”, “Right Tree-Right Place”, “Taking Care of your Trees”
- Addison Arbor Foundation, “Health Care Plan for your Home Landscape Trees”

Additional **UFAC** public outreach presentations:

- Dallas County Master Gardeners Speakers Bureau Training: “Tree Pruning”
- EPA Sustainable Skylines Conference: “Tree Survey Research Project”
- Celebration Tree Grove/White Rock Lake Earth Day Event: “Benefits of Trees”

Photo by Glen Kitto with BlackWhiteRead

- Public Stakeholders Meeting on Tree Ordinance: “Recommended Revisions to the Dallas Tree Ordinance”
- First Men’s Garden Club: “Plant and Tree Propagation”
- Dallas Home and Garden Show: “Shade Trees”, “Guide to Pruning”
- Presentation to the League of Women Voters: “Recommended Revisions to the Dallas Tree Ordinance”
- Texas AgriLife Extension “Farm Day” Event: “Trees” for 4th graders.
- Presentation at Kiest Park for neighborhood association on “Trees”

Oak Cliff Earth Day

UFAC Liaison for Oak Cliff Earth Day Event, Mr. Stan Aten, worked to keep **UFAC** informed about the annual event and he was instrumental in its success. **UFAC** Citizen Foresters and officials provided educational materials, answered questions and worked to enlist public support for urban forest initiatives. Over 8,000 people attended the event.

City of Dallas Website

UFAC worked with Mrs. Meranda Carter Cohn, Public Information Officer, and the City Secretary's office to establish a committee presence on the official City of Dallas website at www.ci.dallas.tx.us/cso/boards.shtml . Mrs. Cohn also worked previously to establish a committee presence on the "Green Dallas" website as well. (www.greendallas.net/trees.html)

Lake Highlands Community Garden

UFAC Wood Waste Recycling Team Leader, Ms. Lora Hinchcliff, represented the committee during the ground breaking of 54 additional garden plots for the Lake Highlands Community Garden. She also worked to solicit a donation of mulch for the project.

Farm Day

UFAC as well as the Citizen Forester Team Leader and Liaison for the Dallas County Master Gardeners, Mr. Eric Larner presented the Benefits of Trees to 3378 fourth grade children, 203 teachers and 169 chaperones, for a total of 3750 participants during the annual "Farm Day" event sponsored by the Texas AgriLife Extension Service and the Dairy Association. The Benefits of Trees presentation is an ongoing effort during Farm Day teaching over 50,000 fourth grade children in the past 11 years.

Regional Conservation Conference

UFAC Liaison for the North Texas Master Naturalist program, Mr. Dick Coupe, represented the committee during the regional conservation conference which was held at the DISD Environmental Education Center. Conservation of our trees and native ecosystems encourages a better quality of life and public education is crucial in ecosystem conservation.

Dallas Museum of Nature and Science

The **UFAC** Education Display was used at the museum along with posters showing how pencils are made, to educate the public about the benefits of Trees.

Save Dallas Water

UFAC Citizen Forester Team Leader and Master Gardener Liaison, Mr. Eric Larner and Master Naturalist Liaison, Mr. Dick Coupe, provided presentations during the Save Dallas Water event regarding planting the right tree in the right location and mulching it which helps to save water.

EPA Sustainable Skyline Conference

UFAC and Dr. Fang Qiu, Associate Professor of GIS and Remote Sensing with UTD, provided a presentation regarding our tree inventory research project (listed under "Forest Management Results").

Veterans Hospital

UFAC Citizen Forester Team Leader and Master Gardener Liaison, Mr. Eric Larner and Citizen Forester, Mr. Gene Morrissey, provided a presentation on trees for the spinal injury section at Veterans Hospital, which was well received.

Annual Website Report

The General Summary provides a quick overview of the general statistics for the entire web site during the report time frame.

General Summary		
1.	Host name	dallastrees.org
2.	Host URL	http://www.dallastrees.org
3.	Program start time	Jan 28, 2010 18:55
4.	Time of first request	Jan 28, 2007 01:04
5.	Time of last request	Jan 28, 2010 23:59
6.	Time last 7 days lasts until	Jan 28, 2010 18:55
7.	Successful server requests	380,920 Requests
8.	Successful requests in last 7 days	4,205 Requests
9.	Logfile lines without status code	70,260 Lines
10.	Logfile lines without status code in last 7 days	0 Lines
11.	Successful requests for pages	118,511 Requests for pages
12.	Successful requests for pages in last 7 days	1,757 Requests for pages
13.	Distinct files requested	19,313 Files
14.	Distinct files requested in last 7 days	1,172 Files
15.	Distinct hosts served	23,325 Hosts
16.	Distinct hosts served in last 7 days	382 Hosts
17.	Unwanted lines in the logfile	10 Lines
18.	Total data transferred	39.126 GB
19.	Total data transferred in last 7 days	399.262 MB

Yearly Report Chart

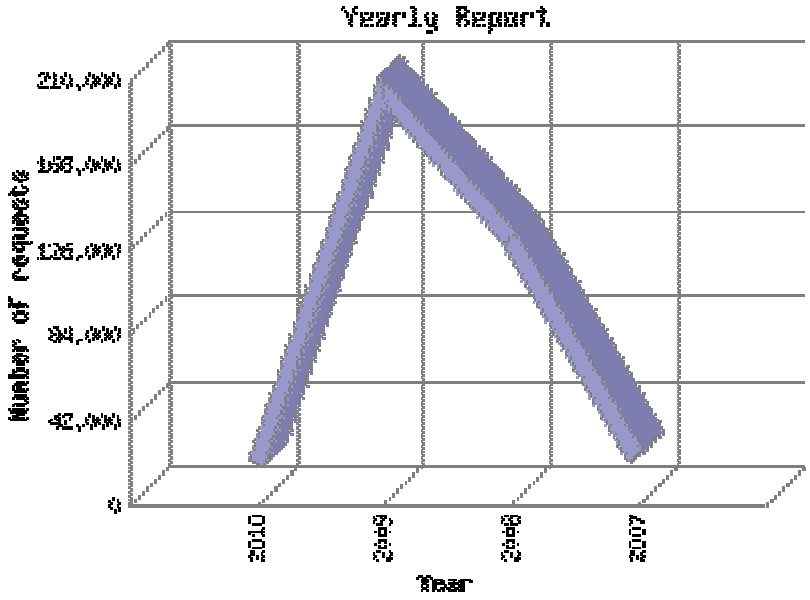


Figure 1 Yearly Report

Yearly Report Tabular Data

Year		Number of requests	Number of page requests
1.	2007	23,645	7,498
2.	2008	132,035	28,684
3.	2009	204,636	73,218
4.	2010	21,001	9,281

Table 1 Yearly Report Table

Yearly Report Analysis

The Yearly Report shows total activity on your site for each calendar year. Remember that each page hit can result in several server requests as the images for each page are loaded.

2009 has been the most active year since the web site inception: 73,218 pages were sent out and **204,636 requests were handled.**

Yearly average: 29,670 pages sent. **95,329 requests handled.**

The rate of increase of requests over time shows a steady, steep upward tread with a slight slowdown in the 2nd quarter of 2008. This could be due to users being familiar with the site by this time so it takes fewer hits to get the information they need. The peak for this year seems to be the first quarter then there is a

decline. To investigate further we need to view the year at a finer granularity. See the next few chapters to determine the nature and quality of this suspected decline. It could also be an artifact caused by having so few data points.

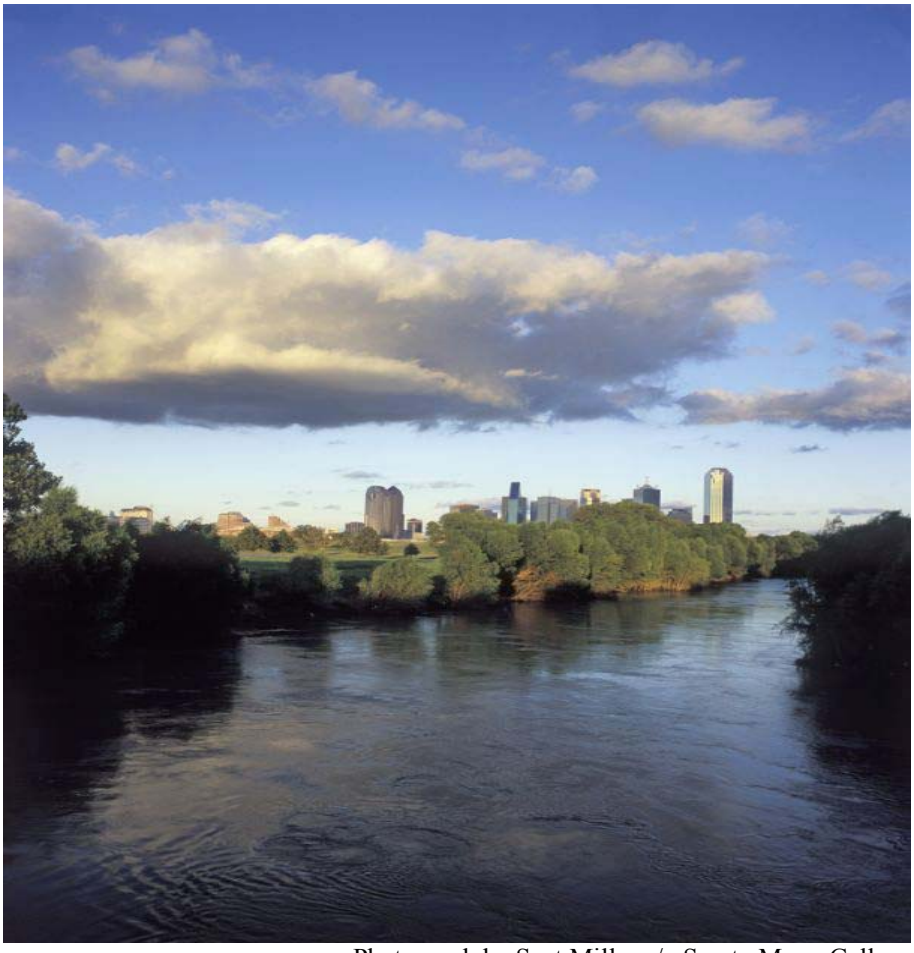
Note: The first and last years are partial years and therefore will not represent a complete year's worth of data, resulting in lower hits in the chart and table.

More details can be found in the full report. To review, please visit the UFAC ftp site: www.DallasTrees.org/lisfiles.asp

Fundraising Results

Sun to Moon Fundraiser

UFAC worked with Groundwork Dallas and the Sun to Moon Gallery in a fundraising event showcasing artwork and photographs related to the Trinity River Forest and featuring Dallas City Manager, Mary Suhm as the featured speaker. The event was a huge success and there was a steady stream of dignitaries that sparked many interesting conversations about the Great Trinity Forest.



Photograph by Scot Miller c/o Sun to Moon Gallery

Donation from Mr. Kurt Kretsinger

UFAC Tree Planting Team Leader, Mr. Kurt Kretsinger, graciously provided a donation of **$5,000.00** ear marked specifically for tree planting projects and their maintenance. **UFAC** is greatly appreciative of his support and commitment to Dallas trees.

Donation from Mr. and Mrs. Pat Merriman

Mr. and Mrs. Pat Merriman previously donated **$10,000.00** to our tree inventory research project in 2008. However, UFAC continued to have a difficult time raising an additional $30,000.00 to complete the project due to the poor economic conditions. The Merrimans graciously agreed to hire a professional grant writer, Mrs. Barbara van Pelt, for assistance. After Mrs. van Pelt worked with to develop a grant outline, a grant submission was made to the Harold Simmons Foundation. The grant was approved for **$10,000.00** and the committee greatly appreciates the support of Mrs. Lisa Simmons Epstein and Mrs. Serena Simmons Connelly with the Harold Simmons Foundation.

Mrs. van Pelt worked diligently to find other grants that were compatible without success. As a result, the Merrimans offered an additional $10,000.00, making their total contribution well over **$20,000.00.**

Strategic Plan for Urban Forest Sustainability 2010

Although all forestry initiatives are important, the top ten goals for 2009 are listed below with the remaining goals listed in the five year plan (2009-2013). All goals combined provide a vision and guidance for future urban forest related initiatives. Due to the fact that the committee is divided into numerous critical area teams, progress is achieved in many areas in an efficient and timely manor.

Division or Office of Urban Forestry

Urge the city to establish a Division or Office of Urban Forestry. A department or office that deals specifically with tree and forest related affairs provide the resources necessary to adequately manage the problems associated with the urban forest. Until a division or office is established, **UFAC** will continue to work to improve interdepartmental cooperation and the education of various department staff. Proper management of the forest is required to reduce the loss of trees to many causes and helps to reduce the number of hazardous trees. The division or office could be funded thru storm water management fees to avoid any burden to the city budget. Since trees intercept and reduce storm water runoff which reduces the potential for floods, the concept is a viable option to be explored.

Urban Forest Inventory Research Project

Complete an urban forest inventory and analysis which will provide the baseline data required to fully develop a future vision and urban forest management plans. Since the City of Dallas currently has very limited tree inventory data regarding public trees, the acquisition of the information is an important priority for the city. We cannot manage an asset that we do not fully understand.

Since approximately seventy percent of the urban forest is owned by private interests, if the intent of the tree survey is to quantify facts in planning for future urban sustainability, data regarding both the private and public sector trees should be gathered and analyzed. Due to the direct correlation between trees and air quality, storm water management (flooding), inner urban temperatures (energy savings), our quality of life and much more, a complete inventory and analysis is required to fully research and understand the facts.

New technology, hyperspectral imaging, has recently been developed that will aid in the tree inventory process. The Committee previously approved a pilot project to test the technology and its viability for a large-scale survey. Dr. Fang Qiu, an Associate Professor of GIS and Remote Sensing Geospatial Information Sciences at the University of Texas at Dallas (UTD), is the lead researcher on the project. UTD has the computers and specialized software to interpret the data using specific algorithms written for each species of tree to pull out data for that tree, its height; girth and canopy spread, and place it on a map.

Critical tree canopy cover baseline data will be acquired for managing the urban forest which can be used for computer modeling regarding air, water and infrastructure planning and management. Also, biomass will be calculated which will be critical in claiming carbon credits in the future. Since computer modeling is not a fully developed science our research project is focused on finding an economical, accurate and efficient way to survey all trees (public and private) making any future modeling results more accurate.

The images can also be used for water management and public works and many others uses, which would diversify the expense and bring regional air, water and infrastructure planners together in the process. It also would go a long way in gaining weight of evidence (WOE) for our State Implementation Plan (SIP) in the future and help provide a potential source for funding. The research will help to provide a foundation for the future of urban forestry initiatives and green infrastructure planning (visioning) in the region.

Budget and Staff Support

Develop and gain approval of a city budget request regarding recommended forestry expenditures for the 2011 budget. Given the need to take full advantage of the recently completed Trinity Forest Management Plan, an increase in the city budget, including staff should be considered. Since the Trinity Forest is the largest urban, bottomland hardwood forest in the country, an investment in its future condition is a wise investment. Also, current research shows that for every dollar spent on trees, we receive up to six dollars in benefits. Investment in infrastructure degrades in value over time but an investment in green infrastructure grows in value each year, offering a significant return on the investment. It is also difficult to grow the tax base with a green infrastructure that is not in great condition.

Public Tree Planting, Strategic Shading

Encourage the adoption and planting of street medians and public easements by local groups. Encourage the strategic shading of heat island and high energy use areas using drought tolerant species of trees which research quantifies as better for air quality and those that can adapt to poor water quality (or grey water) in the future. Also, encourage planting trees in major transit corridors. Urge the public to take ownership and become good stewards of these areas. Establish a public relations campaign and simple guidelines regarding street and easement tree planting projects. Educate the public by promoting the committee's free, tree planting guide; provide information in city water bills or electric bills; and continue to offer public presentations at every opportunity. Work to develop other ways to support and encourage public tree planting projects. Success will be measured by the number of adopted medians and public areas receiving ideal species of trees, which are properly maintained. Since parking lots contribute to the heat island effect, consider requiring more trees per parking space (or per foot of parking

area) during development or redevelopment. Success will be measured by the increase in tree canopy cover and the decrease in heat island problem areas.

A potential funding option is a simple one percent charge on all new street installations or street renovations that is dedicated to trees and landscape. This avoids any burden to the city budget and greatly increases our quality of life as we develop or redevelop an area.

Potential Budget Assistance

Encourage city officials to consider requiring a minimum of one percent (1%) of the total construction costs for all future road construction or reconstruction to be earmarked for trees to assist with air quality and heat island concerns plus improve our quality of life. Another alternative is to require one tree for a specified number of feet in new street construction.

Tree Ordinance

Committee recommendations regarding the Dallas Tree Ordinance (article 10) are complete and include incentives to encourage the conservation of trees and ecological sustainability. Meetings with officials from the building, construction and development community in an effort to explore potential solutions to problems were concluded. A task force was established under the existing "Green Building Task Force that met for several months to complete the incentives portion of the committee recommendations. City officials will be briefed in early 2010 in hopes of gaining approval and moving forward with the recommendations.

Discussions with ONCOR officials continue regarding their current vegetation management practices. During the year, ONCOR responded to concerns by enacting a number of positive changes regarding their management protocol. Further dialogue may produce other suggested changes that will be recommended to city officials. It is not clear if changes are required in our tree ordinance or codes regarding utilities and city attorneys are currently investigating the issue.

Sustainable Practices

Work toward water conservation by promoting native and drought adaptive vegetation that thrives on natural rainfall as well as efficient irrigation systems. Encourage reducing the amount of turf in our parks and public areas and replace it with mulched tree groves. The Park and Recreation Department is working diligently toward this goal and expects to reduce the amount of turf they maintain by 1,000 acres. Current efforts include chipping all limbs generated in a particular park and leaving the mulch on site to save landfill space and expense to dump. With more areas mulched, water will be conserved, fewer mowers will be needed (which helps air quality) plus it reduces the budget costs

and our dependence on oil. However, more wood chippers should to be purchased to fully accomplish this goal. Success will be measured by the reduction in wood waste going to the landfill, reduced maintenance equipment costs as well as maintenance expenses (fuel, oil), reduced personnel costs for maintenance, plus a decrease is the expense to irrigate our parks.

We also recommend mowing turf grass at higher heights and less often to conserve fuel, water, and budget as well as air quality. Taller turf requires less water and has fewer problems with other competing plants (weeds) plus fewer pathogen problems such as Brown Patch. In areas that are seldom used, establishment of prairie plants would further conserve resources and budget plus provide a show of color. Develop a list of acceptable landscape materials modeled after state lists that recognize some "weeds" as beneficial. Offer training for city officials regarding water efficient landscape design and the related irrigation components. Consider adopting rainwater harvesting codes that help to conserve water.

Continue to urge officials to use our Hyperspectral and LiDAR images to provide baseline data for "Greenprinting" of our natural resources. Building around natural features offers the greatest amount of benefits in reaching sustainability in the future.

Public Outreach

Expand the community outreach of the existing successful efforts and expand the Citizen Forester program by growing the number of people involved and the number of projects they complete. Long range plans include developing a Master Citizen Forester program to advance the education level of volunteers which also advances the education of the public as well as public officials. The Citizen Forester program educated twenty new students in 2009 and plans to include over thirty students in 2010, many of which are already signed up.

Standards for Working around Trees

Standards or best management practices for subcontractors or city crews working around trees or construction activities that may impact their health should be developed and established. This would include the development of a tree protection manual as part of the city's standard practices and protocol. Benefits include decreasing the probability of damage to a tree by equipment and below standard tree care practices. Develop bilingual guidelines for all city departments and all city contractors/sub contractors working on, near or around trees, that prevent damage to tree roots, trunks or limbs. Work to ensure that all those dealing with trees are well informed and the result will be reduced tree damage plus increased tree health and longevity in the long term.

Formal Training Programs

Develop formal tree care and forestry training programs for all departments dealing with trees. Develop a basic equipment list for forestry/tree care personnel that adhere to federal and industry standards. Develop complete safety training programs for forestry/tree care personnel and ensure compliance as well as acceptance in writing by all personnel. This step may offer a reduction in insurance coverage costs due to the reduced chances of an injury. Since the city hired a new City Forester in 2008 (Ms. Karen Woodard), efforts to train Park Department staff have resumed. Although it will take time to fully develop these programs, improved basic tree care and employee safety are critical goals.

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Strategic Plan for Urban Forest Sustainability 2010-2014

The following are not in order of priority; however, all are important to the future of Dallas.

Wood Waste Recycling

Support existing recommendations for wood waste recycling throughout the city from the Sanitation Department. In meeting with department officials, the committee finds that sound management plans are in place for the future but are hampered by budget constraints. Contingency plans are also in place for a significant event such as wind or ice damage to a great number of trees. The committee will continue to support existing plans and explore ways to conduct business in the most sustainable but budget conscious manner. The committee Wood Waste Recycling Team Leader, Ms. Lora Hinchcliff, will continue working to find ways to recycle more wood waste and support existing efforts. Such efforts will be invaluable now that the City converted McCommas Bluff to include a bioreactor.

Fund Raising

Designate a team leader for fundraising/grant writing plus develop a solid campaign to raise funds which will become a part of our strategic plan for the future. We are currently working to develop a long term campaign that encourages the public to take ownership in our urban forest and teaches them to become good stewards of the urban forest by donating time, talents or funds.

Vision for the Regional Urban Forest of 2050

Encourage support for the development of a regional vision for the urban forest of 2050. By creating a regional vision for the future regional urban forest we emphasize the importance of trees, create visibility and potential financial support plus encourage collaborative efforts to reach goals of mutual importance. These could include better conservation and restoration of existing forest stands, support for reforestation and public outreach campaigns as well as cooperative research projects. Work toward the inclusion of trees in our State Implementation Plan (SIP) for air quality due to the potential state and federal support associated with acceptance. These steps also encourage future funding of urban forest related projects as well as expanding the technology developed in our research project.

Integrated Storm Water Management

The committee will continue to support the establishment of sound, storm water management practices due to the relationship with trees and forested areas. Committee officials served on the city task force to develop the guidelines and city officials are expected to approve the recommendations in 2010.

The committee will continue to encourage water related managers (as well as other/green/grey/blue infrastructure managers) to consider using our Hyperspectral and LiDAR images to provide baseline data for computer modeling of storm water runoff quantity & quality, pooling of water, existing erosion problems or violations, among many other uses. We will work to start a dialogue between various managers to gather a consensus on future uses of the technology and to help diversify the associated expenses.

Weather Events and Trees

Recommend the establishment of city standards and protocol regarding storm or weather damaged trees, including pruning standards, wood waste pickup and recycling. Each significant storm in the area generates a large amount of wood waste and has the potential to damage a large numbers of trees. There is currently no set standard for remedial treatment of damaged trees or determination of potential hazard trees once the event concludes.

Campaign against Invasive Plants & Trees

Develop a campaign to fight invasive and non-native plants/trees. Plans should include a strong educational component that urges the public as well as city officials to do their part in suppressing invasive plants on private and public property. The number of people and groups educated as well as involved in suppression efforts will establish the success of the campaign.

The results of our research project show that we can locate existing stands of Chinese Privet or Chinese Tallow, which provide the baseline data required to develop an invasive species suppression/management plan. Work with Park and Recreation Department officials to develop future strategies. It is easier to be proactive by controlling the problem before it becomes a major concern to wildlife and entire ecosystems.

Review all Tree Related City Codes, Standards & Regulations

Review all city codes that may potentially affect trees or forests in any shape or form (such as the escarpment ordinance and floodplain regulations). A number of city codes are currently under review that relate to trees. As a result, the committee will be providing professional advice on various codes to allow sound, fact-based decisions by officials in the future.

Track Public Tree Planting

Establish procedures and guidelines as well as develop a data base to track all public tree planting projects, including the planting of trees in the park system. Development of an electronic spreadsheet that records pertinent data as well as basic data management protocol will be required. In order to track the success and possibly claim carbon credits in the future, the upkeep of a data base will be required.

Urban Heat Island Reduction

Continue to work with the Office of Environmental Quality, Houston Advanced Research Center, EPA and others to further develop strategies that reduce the urban heat island effect. Continue to urge using sound tree and urban forest management practices as viable solutions to heat island problems. Continue to develop tree planting programs directed specifically toward heat island problem areas. In developing future committee recommendations regarding city codes, encourage incentives for the long term preservation of trees in a heat island problem area. This would include recommendations to plant more trees during the development or redevelopment of properties in problem areas. Public support for the Adopt a Median Program would have a positive long term effect without adding to the city budget. Also, establishing a 1% charge on all new or renovated street construction projects which was dedicated to landscaping would offer tremendous long term benefits. The amount of reduction in the heat island effect in the future will determine the level of our success.

Develop Partnerships

Continue to work closely with the North Texas Master Naturalists and the Dallas County Master Gardeners on various projects and help them develop more public speakers as well as presentations relating to trees/forests. We hope to develop at least three new "tree talkers" per year. Further develop relationships with the Downtown and Uptown Development organizations, the Trinity Blacklands Urban Forestry Council and others to explore future opportunities.

Community Service Support

Investigate the possibility of using those required by the courts to perform community service to assist with tree planting, mulching and basic tree care. Proper care of our urban forest is a monumental task that requires much more effort than the current city budget allows. Success will be judged by the number of community service supporters involved in the future and their contribution toward tree related initiatives.

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Appendix

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1 December 2009

City of Dallas Urban Forest Advisory Committee

Draft of Recommended Revisions to Article X

ARTICLE X.
LANDSCAPE AND TREE PRESERVATION CONSERVATION REGULATIONS.

Division 51A-10.100. In General.

SEC. 51A-10.101. DEFINITIONS.

In this article:

( ) ARBORIST means a city employee who is subordinate to the chief arborist, responsible for administering the rules and regulations outlined in Article X as directed by the chief arborist. When directed by the chief arborist, the arborist has the authority to administer Article X.

(1) ARTIFICIAL LOT means an area within the building site that is delineated by the building official chief arborist or the director of park and recreation for the sole purpose of satisfying the requirements of this article (see Section 51A-10.122).

( ) BOARD OF ADJUSTMENT for the purpose of this article means the city's quasi-judicial board that has the authority to review and rule on appeals to Article X as outlined in this article.

(2) CALIPER means:

(A) for a single-stem tree, the diameter of the trunk measured 12 inches above the ground undisturbed grade for a tree having a diameter up to and including eight inches, and measured at four and one-half feet above the ground for a tree having a diameter of more than eight inches. measured 12 inches above undisturbed grade.

(B) for multi-stem trees, the diameter of the trunk measured at the narrowest point below branching when branching occurs higher than 12 inches above the ground undisturbed grade. When branching occurs at or lower than 12 inches above the ground undisturbed grade, caliper means the diameter of the largest stem plus the average diameter of the remaining stems, measured at four and one-half feet above the ground.

(3) CANOPY TREE means a species of tree that normally bears crown foliage no lower than six feet above ground level upon maturity.

( ) CHIEF ARBORIST means the city employee responsible for administering the rules and regulations outlined in Article X. In this division, the chief arborist also includes all subordinate city arborists who have been authorized by the chief arborist to administer Article X as a representative of the chief arborist. To avoid a conflict of interest or the perception of a conflict in interest, and to foster consistent enforcement of Article X, the chief arborist shall not be subordinate directly or indirectly to the director of development services. The Chief Arborist shall be part of the department of urban forestry or an equivalent department at such time as such department is authorized.

( ) CITY FORESTER means the city employee responsible for administering the management of the city's urban forest. For the purposes of this article the city forester advises the chief arborist in matters regarding the use of the reforestation fund and the interest on such fund. The city forester is an employee of the park and recreation department until such time a department of urban forestry or an equivalent department is authorized.

(4) CLEARING means any activity that removes or seriously injures one or more trees or the vegetative ground cover of one or more trees, such as root mat removal or topsoil removal.

(5) CRITICAL ROOT ZONE means the circular area of ground surrounding a tree extending a distance of one foot per caliper inch of the tree, measured from the tree trunk or stem.

( ) DUPLEX USE for the purpose of this article means continuously occupied, legal use of a residential unit designed to accommodate two families. Duplex use does not include, but is not limited to vacant lots, residential units permitted for demolition, lots permitted for grading, lots permitted for construction, lots permitted for flood plain fill, and constructed units that do not have a certificate of occupancy.

(6) ENHANCED PAVEMENT means any permeable or nonpermeable decorative pavement material intended for pedestrian or vehicular use. Examples of enhanced pavement include brick or stone pavers, grass paver, exposed aggregate concrete, and stamped and stained concrete.

(7) EVERGREEN TREE OR SHRUB means a tree or shrub of a species that normally retains its leaves throughout the year.

(8) FLOOD PLAIN means any land area susceptible to inundation by the hundred-year frequency flood.

(9) GRADING means any digging, scooping, removing, depositing or stockpiling, of earth materials.

(10) GROUND COVER means natural mulch, or plants of species that normally reach a height of less than three feet upon maturity, installed in such a manner so as to form a continuous cover over the ground.

( ) HERITAGE TREE means a protected tree with a caliper of 24 inches or greater, or a Post Oak, *Quercus stelata*, with a caliper of 12 inches or greater. The chief arborist may classify any tree or grove of trees that has attained a size that is unusually large for its species, a Heritage Tree. Mitigation for such a tree shall be three times the standard caliper inches for replacement trees or three times the standard payment in to the Reforestation Fund.

( ) HISTORIC TREE means any tree in the city of Dallas that has been recognized by resolution of the city council to have a significant cultural connection with the citizens of Dallas, past and present, and those cultures living in the area prior to the mid 1800's. Historic trees would include trees that are the only living witnesses to historic events. Candidates for Historic Tree status will be presented to the city council by the city forester. Mitigation for such a tree shall be five times the standard caliper inches for replacement trees or five times the standard payment in to the Reforestation Fund.

(11) HUNDRED-YEAR FREQUENCY FLOOD means the flood having a one percent chance of being equaled or exceeded in any given year. This flood is based upon the drainage area being fully developed to current zoning limitations.

( ) INVASIVE PLANT SPECIES means those plants whose introduction is more likely than not to cause environmental harm.

(12) LANDSCAPE ARCHITECT means a person licensed to use the title of "landscape architect" in the State of Texas in accordance with state law.

(13) LANDSCAPE AREA means an area at least 80 percent of which is covered by natural grass, ground cover, or other natural plant materials (excluding screening).

(14) LANDSCAPE BUFFER STRIP means a landscape area that serves a buffer function.

(15) LARGE SHRUB means a shrub that normally reaches a height of six feet or more upon maturity.

(16) LARGE TREE means a tree of a species that normally reaches a height of 30 feet or more upon maturity.

(17) LOT means:

(A) a "lot" as defined in Section 51A-2.102; and

(B) an "artificial lot" as defined in this section.

(18) LOT WITH RESIDENTIAL ADJACENCY means any of the following:

(A) A building site containing a multifamily use that is adjacent to or directly across:

(i) a street 64 feet or less in width; or

(ii) an alley;

from private property in a single family, duplex, townhouse, or CH district.

(B) A building site containing a nonresidential use that is adjacent to or directly across:

(i) a street 64 feet or less in width; or

(ii) an alley;

from private property in an agricultural, single family, duplex, townhouse, CH, multifamily, or manufactured housing district.

(C) An artificial lot containing a multifamily use if the lot is less than 200 feet from private property in a single family, duplex, townhouse, or CH zoning district.

(D) An artificial lot containing a nonresidential use if the lot is less than 200 feet from private property in an agricultural, single family, duplex, townhouse, CH, multifamily, or manufactured housing zoning district.

( ) NATIVE PLANT SPECIES means those plants that are part of the natural ecosystems of North Central Texas, and thus are adapted to seasonable growing conditions.

(19) NONPERMEABLE COVERAGE means coverage with any pavement that is not "permeable pavement" as defined in this section.

( ) PALM TREE means any plant that is part of the family Palmae, characterized by chiefly tropical evergreen trees or shrubs having large compound leaves in featherlike or fanlike fronds, large clusters of small flowers, and fleshy or dry fruit, and including the palmettos.

(20) PERMEABLE PAVEMENT means a paving material that permits water penetration to a soil depth of 18 inches or more. Permeable pavement may consist of nonporous surface materials poured or laid in sections not exceeding one square foot in area and collectively comprising less than two-thirds of the total surface area.

(21) PRIVATE PROPERTY means any property not dedicated to public use, except that "private property" does not include the following:

(A) A private street or alley.

(B) Property on which a utility and public service use listed in Section 51A-4.212 is being conducted as a main use.

(C) A railroad right-of-way.

(D) A cemetery or mausoleum.

(22) PROTECTED TREE means: those trees as specified in Table A

(A) a tree that has a caliper of eight inches or more and is not one of the following trees:

(i) *Acer saccharinum* (Silver Maple).

(ii) *Ailanthus altissima* (Tree of Heaven).

(iii) *Albizzia julibrissen* (Mimosa or Silktree).

(iv) *Celtis occidentalis/ laevigata* (Hackberry or Sugarberry).

(v) *Fraxinus velutina* (Arizona Ash).

(vi) *Juniperus virginiana* (Eastern Red Cedar)[unless protected under subparagraph (B).]

(vii) *Maclura pomifera* [female only] (Bois d'Arc or Horseapple).

(viii) *Melia azedarach* (Chinaberry).

(ix) *Prosopis glandulosa* (Mesquite) [unless protected under subparagraph (B).]

(x) *Salix nigra* (Black Willow).

(xi) *Sabium sebiferum* (Chinese Tallow).

(xii) *Ulmus pumila* (Siberian Elm).

(B) an Eastern Red Cedar (*Juniperus virginiana*) or Mesquite (*Prosopis glandulosa*) tree that has a caliper of eight inches or more and the trunk is located:

(i) in, or within 120 feet of the boundary of: a floodplain [as defined in Article V]; a wetland area [as defined in federal environmental regulations]; or an escarpment zone [as defined in Article V]; or

(ii) within 50 feet of a natural channel setback line [as defined in Article V].

(C) an Eastern Red Cedar (*Juniperus virginiana*) or Mesquite (*Prosopis glandulosa*) tree that has a caliper of at least 12 inches; or

(D) a tree that was planted as a replacement tree.

(23) REMOVE OR SERIOUSLY INJURE means an intentional or negligent action that will more likely than not cause a tree to decline and die within five years of the act. Actions that constitute removing or seriously injuring a tree include, but are not limited to: cutting down a tree; excessively pruning or topping a tree; compacting the soil above the root system of a tree; changing the natural grade above the root system of a tree; damaging the root system or the trunk of a tree (such as by operating machinery near, or by clearing or grading the area around, the trunk of a tree); failing to repair an injury to a tree from fire or other causes, which results in or permits tree infections or pest infestations into or on the tree; applying herbicidal or other lethal chemicals over the root system of a tree; and placing nonpermeable pavement over the critical root zone system of a tree. The determination of whether a tree is deemed removed or seriously injured rests solely on the chief arborist.

(24) RESPONSIBLE PARTY means the property owner and any other person or entity responsible for removing or seriously injuring a protected tree.

(25) REPLACEMENT TREE means a tree that is planted in accordance with Section 51A-10.134.

(26) SCREENING means screening that complies with Section 51A-4.602, except as those regulations may be expressly modified in this article.

( ) SINGLE FAMILY USE for the purpose of this article means continuously occupied, legal use of a residential unit designed to accommodate one family. Single family use does not include, and is not limited to: vacant lots, residential units permitted for demolition, lots permitted for grading, lots permitted for construction, lots permitted for flood plain fill, and constructed units that do not have a certificate of occupancy.

(27) SMALL TREE means a tree of a species that normally reaches a height of less than 30 feet upon maturity.

(28) SOIL means a medium that plants will grow in.

( ) URBAN FOREST CONSERVATION DISTRICT means a collective group of contiguous lots where the property owners, agree to tree preservation regulations that exceed those regulations delineated in Division 51A-10.130. The purpose of such a district includes, but is not limited to preserving the character of the neighborhood, maintaining street canopy cover, and protecting privacy.

(29) TREE SURVEY means a report that meets all of the requirements for a tree survey in Section 51A-10.132.

(30) UNDERSTORY means a grouping of natural low-level woody, herbaceous plant species, or plants that normally reach a height of less than three ten feet upon maturity.

(31) VISIBILITY TRIANGLE means the term "visibility triangle" as defined in Section 51A-4.602.

(32) WATER COURSE means a natural or constructed channel for the flow of water. (Ord. Nos. 19455; 20496; 22053; 25155)

SEC. 51A-10.102. PURPOSE.

[Note from the Committee: It is the recommendation that the committee work with the city attorney's office to structure a more appropriate purpose statement than what currently exists. It is also the recommendation of the committee that the "PURPOSE" statement precede the previous "DEFINITIONS" section.]

The process of development with its alteration of the natural topography, vegetation, and creation of impervious cover can have a negative effect on the ecological balance of an area by causing increases in air temperatures and accelerating the processes of runoff, erosion, and sedimentation. The economic base of the city can and should be protected through the preservation and enhancement of the unique natural beauty, environment, and vegetative space in this area. Recognizing that the general objectives of this article are to promote and protect the health, safety, and welfare of the public, the city council further declares that this article is adopted for the following specific purposes:

(1) To aid in stabilizing the environment's ecological balance by contributing to the processes of air purification, oxygen regeneration, ground-water recharge, and storm water runoff retardation, while at the same time aiding in noise, glare, wind, and heat abatement.

(2) To provide visual buffering between land uses of differing character to alleviate the harshness of urban life.

(3) To enhance the beautification of the city.

(4) To safeguard and enhance property values and to protect public and private investment.

(5) To conserve energy.

(6) To provide habitat for wildlife.

(7) To encourage the preservation conservation of large trees which, once removed, can be replaced only after generations. (Ord. Nos. 19455; 22053)

SEC. 51A-10.103. ACCEPTABLE PLANT MATERIALS.

(a) No artificial plant materials may be used to satisfy the requirements of this article.

(b) In satisfying the requirements of this article, the use of high-quality, winter-hardy,; and heat and drought-tolerant plant materials is recommended and encouraged. Native plant species are preferred when landscape conditions are species appropriate.(Ord. Nos. 22053; 25155)

(c) No palm trees, or members of the Palmae family, shall be used satisfy the requirements of this article.

(d) The chief arborist shall have the authority to require plant species substitutions on a submitted landscape plan should he/she deem the scheduled plant is an invasive plant species.

SEC. 51A-10.104. SOIL PLANTING AREA REQUIREMENTS.

(a) Soil P planting areas in general must consist of native soils, prepared soils, structural soils, and areas of permeable pavement; and have the following soil depths and dimensions:

(1) For each large shrub or small tree installation, a minimum of 24 inches of soil depth and 16 64 square feet of surface area (total of 32 cubic feet).

(2) For each large tree installation, a minimum of 36 inches of soil depth and 25 180 square feet of surface area (total of 75 cubic feet).

(b) Planting areas located above underground buildings or structures must have the following soil depths and dimensions:

(1) For each large shrub or small tree installation, a minimum of 30 inches of soil depth and 25 64 square feet of surface area (total of 62.5 cubic feet).

(2) For each large tree installation, a minimum of 40 inches of soil depth and 36 180 square feet of surface area (total of 120 cubic feet).

(c) The building official chief arborist may waive the minimum planting area requirements if a proposed alternative soil depth and dimension is sufficient to sustain a healthy and vigorous plant. a landscape architect certifies that the proposed alternative soil depths and dimensions are sufficient to support the healthy and vigorous growth of the plant materials affected. (Ord. Nos. 22053; 25155)

SEC. 51A-10.105. PROTECTION OF PLANTING AREAS.

Required areas for plant materials must be protected from vehicular traffic through the use of concrete curbs, wheel stops, or other permanent barriers subject to the review and approval of the city arborist. (Ord. Nos. 22053; 25155)

SEC. 51A-10.106. IRRIGATION REQUIREMENTS.

All plant materials used as screening under this article must be irrigated by an automatic irrigation system installed to comply with current State of Texas Board of Licensed Irrigators industry standards. Other plant materials used to comply with this article must be located within 100 50 feet of a verifiable water supply. Proposed watering methods (irrigation or otherwise) must be:

(a) indicated on the landscape plan, if any; and

(b) adequate to maintain the plant materials in a healthy, growing condition at all times. (Ord. Nos. 22053; 25155)

SEC. 51A-10.107. PLANTERS ALLOWED.

Planters may be used to satisfy the requirements of this article provided that the soil requirements in Section 51A-10.104 are met. (Ord. 22053)

SEC. 51A-10.108. GENERAL MAINTENANCE.

(a) Required plant materials must be maintained in a healthy, growing condition at all times. The property owner is responsible for regular weeding, mowing of grass, irrigating, fertilizing, pruning, and other maintenance of all plantings as needed. Any plant that dies must be replaced with another living plant that complies with this article and the approved landscape plan, if any, within 90 days after notification by the city.

(b) Any damage to utility lines resulting from the negligence of the property owner or his agents or employees in the installation and maintenance of required plant materials in a utility easement is the responsibility of the property owner. If a public utility disturbs a landscaped area in a utility easement, it shall make every reasonable effort to preserve the plant materials and return them to their prior locations after the utility work. If, nonetheless, some plant materials die, it is the obligation of the property owner to replace the plant materials. (Ord. 22053)

SEC. 51A-10.109.

References to this section, or paragraphs or subsections of this section, now refer to Section 51A-10.135, or corresponding paragraphs or subsections of Section 51A-10.135. (Ord. Nos. 22053; 22581; 25047; 25155)

SEC. 51A-10.110. SPECIAL EXCEPTION.

(a) The board of adjustment may grant a special exception to the requirements of this article upon making a special finding from the evidence presented that:

(1) strict compliance with the requirements of this article will unreasonably unjustly burden the use of the property;

(2) the special exception will not adversely affect neighboring property; and

(3) the requirements are not imposed by a site-specific landscape plan approved by the city plan commission or city council.

(b) In determining whether to grant a special exception under Subsection (a), the board of adjustment shall consider the following factors:

(1) The extent to which there is residential adjacency.

(2) The topography of the site.

(3) The extent to which landscaping exists for which no credit is given under this article.

(4) The extent to which other existing or proposed amenities will compensate for the reduction of landscaping. (Ord. Nos. 22053; 25155)

Division 51A-10.120. Landscaping.

SEC. 51A-10.121. APPLICATION OF DIVISION.

(a) This division does not apply to the following:

(1) Property governed by a landscape plan approved by the city council or the city plan commission.

(2) Property lots in the following districts:

(A) The Dallas Arts District (Planned Development District Nos. 145 and 145-H/18).

(B) The Deep Ellum/Near East Side District (Planned Development District No. 269).

(C) The Oak Lawn Special Purpose District (Planned Development District No. 193).

(D) Central area districts.

(3) Restoration of a building that has been damaged or destroyed by fire, explosion, flood, tornado, riot, act of the public enemy, or accident of any kind. For purposes of this section, "restoration" means the act of putting back into a former or original state.

(4) Property located within or in close proximity to an airport boundary if the city's director of aviation determines that the required landscape materials will threaten public health or safety.

(b) Only Section 51A-10.125(a) of this division applies to lots containing single family or duplex uses.

(c) This division only becomes applicable to a lot or tract when the nonpermeable coverage on the lot or tract is increased by more than 2,000 square feet within a 24-month period, or when an application is made for a building permit for construction work that:

(1) increases the number of stories in a building on the lot; or

(2) increases by more than 35 percent or 10,000 square feet, whichever is less, the combined floor areas of all buildings on the lot within a 24-month period. The increase in combined floor area is determined by adding the floor area of all buildings on the lot within the 24 months prior to application for a building permit, deducting any floor area that has been demolished in that time or will be demolished as part of the building permit, and comparing this figure with the total combined floor area after construction.

(d) When this division becomes applicable to an individual lot or tract, its requirements are binding on all current and subsequent owners of the lot or tract.

(e) The city council shall, as a minimum, impose landscaping requirements that are reasonably consistent with the standards and purposes of this division as a part of any ordinance establishing or amending a planned development district, or granting or amending a specific use permit. (Note: This subsection does not apply to ordinances that merely renew a specific use permit when no substantive changes are made other than to extend the time limit of the permit.) All landscaping requirements imposed by the city council must be reflected in a landscape plan that complies in form and content with the requirements of Section 51A-10.123. (Ord. Nos. 19455; 19786; 20496; 22053; 25155)

SEC. 51A-10.122. ARTIFICIAL LOT DELINEATION.

(a) In general. If the building site is over two acres in size, the applicant may request that the building official chief arborist create an artificial lot to satisfy the requirements of this division. The building official chief arborist shall not create an artificial lot which would, in his or her opinion, violate the spirit of the landscape regulations. Any artificial lot created by the building official chief arborist must:

(1) wholly include the area on which the construction work is to be done; and

(2) have an area that does not exceed 50 percent of the area of the building site.

(b) In city parks over five acres. In city parks over five acres in size, the director of park and recreation chief arborist may create authorize an artificial lot to satisfy the requirements of this division. Any artificial lot created by the director of park and recreation chief arborist must wholly include the area on which the construction work is to be done.

(c) Platting not required. An artificial lot need not be platted; however, it must be delineated on plans approved by the building official chief arborist prior to the issuance of a building permit. (Ord. Nos. 19455; 20496; 22053)

SEC. 51A-10.123. LANDSCAPE PLAN SUBMISSION.

(a) If this division applies to a lot pursuant to Section 51A-10.121, a landscape plan must be submitted to the building official chief arborist with the application for a building permit for work on the lot. A landscape plan submission must consist of two blueline or blackline prints. The plan must have a scale of one inch equals 50 feet or larger (e.g. one inch equals 40 feet, one inch equals 30 feet, etc.) and be on a standard drawing sheet of a size not to exceed 36 inches by 48 inches. A plan which cannot be drawn in its entirety on a 36 inch by 48 inch sheet must be drawn with appropriate match lines on two or more sheets.

(b) Any person may prepare the landscape plan required under this division. There is no requirement that the plan be prepared by a landscape architect or by a person engaged in the landscape business.

(c) A landscape plan required under this division must contain the following infomation:

(1) Date, scale, north point, and the names, addresses, and telephone numbers of each property owner and the person preparing the plan.

(2) Location of existing boundary lines and dimensions of the lot, the zoning classification of the lot, and the zoning classification of adjacent properties. A vicinity map should also be attached to or made a part of the plan.

(3) Approximate centerlines of existing water courses and the location of the flood plain, the escarpment zone, and geologically similar areas, as those terms are defined in Article V, if applicable; the approximate location of significant drainage features; and the location and size of existing and proposed streets and alleys, utility easements, driveways, and sidewalks on or adjacent to the lot.

(4) Location of all utility easements, including the location of utility poles and overhead utility lines.

(4 5) Project name, street address, and lot and block description.

(5 6) Location, height, and material of proposed screening and fencing (with berms to be delineated by one-foot contours).

(6 7) Locations and dimensions of proposed landscape buffer strips.

(7 8) Complete description of plant materials shown on the plan, including names (common and scientific name), locations, quantities, container or caliper sizes at installation, heights, spread, and spacing. The location and type of all existing trees on the lot over six eight inches in caliper must be specifically indicated, along with any previous replacement trees of any caliper.

(8 9) Complete description of landscaping and screening to be provided in or near off-street parking and loading areas, including information as to the amount (in square feet) of landscape area to be provided internal to parking areas and the number and location of required off-street parking and loading spaces.

(9 10) An indication of which protected trees will be removed during construction and how existing healthy trees proposed to be retained or transplanted will be protected from damage during construction.

(10 11) Size, height, location, and material of proposed seating, lighting, planters, sculptures, and water features.

(11 12) A description of proposed watering methods. if an irrigation system is not proposed. If the landscape is to include an irrigations system a irrigation plan shall be included following the same scale and dimensions noted in subsection (a).

(12 13) Location of visibility triangles on the lot (if applicable). (Ord. Nos. 19455; 10496; 22053)

SEC. 51A-10.124. LANDSCAPE PLAN REVIEW.

The building official chief arborist shall review each landscape plan submitted to determine whether it complies with the requirements of this division. All landscape plans must comply with the mandatory provisions in Section 51A-10.125. In addition, all landscape plans must comply with at least two four "design standards" as described in Section 51A-10.126. The same landscape features and elements may be strategically placed so as to comply with more than one provision. (For example, the same large trees might be located so as to be classified as "street trees" and "parking lot trees.") (Ord. Nos. 19455; 20496; 22053)

SEC. 51A-10.125. MANDATORY LANDSCAPING REQUIREMENTS.

(a) Single family and duplex uses.

(1) General. Except as provided in Section 51A- 10.127, a lot containing a single family or duplex use established after May 29, 1994, must comply with this subsection before the final inspection of any building on the lot. The lot must have at least three trees with a caliper equal to or exceeding two inches. At least two of these trees must be located in the front yard. The trees must be species listed in Section 51A-10.134. The trees may be located in the public right-of-way if all private licensing requirements of the city code and charter are met.

(2) Shared access development.

(A) Single family districts. Shared access developments in single family districts must comply with the following requirements:

(i) Three trees with a caliper equal to or exceeding two inches are required for each individual lot in the shared access development. One of the three required trees per lot may be located on the individual lot, but at least two trees per individual lot must be located in the front yard of the shared access development, where all of the property in the shared access development is considered to be one lot ("shared trees").

(ii) If there is more than one front yard to the shared access development, where all of the property in the shared access development is considered to be one lot, the shared trees must be evenly distributed within those front yards.

(iii) The trees must be species listed in Section 51A-10.134 Table B. The trees may be located in the public right-of-way if all private licensing requirements of the city code and charter are met.

(B) Districts other than single family districts. Shared access developments in districts other than single family districts must comply with the following requirements:

(i) A minimum of 20 percent of the shared access development must be designated as landscape area. Permeable pavement does not count as landscape area.

(ii) One site tree must be provided for every 4,000 square feet within the shared access development. Every site tree must have a planting area of at least 25 180 square feet. The trunk of any site tree must be located at least two-and- one-half four-feet from any pavement. Site trees must be species listed in Section 51A-10.134 Table B.

(iii) In addition to any site trees, one large canopy street tree must be provided for every 25 feet of street frontage, excluding shared access points, with a minimum of two street trees required. Street trees may be located within the front yard or parkway if all private licensing requirements of the city code and charter are met. In this subpargraph, parkway means the portion of a street right-of-way between the projected street curb and the front lot line or corner side lot line. If the director chief arborist determines that a large canopy tree would interfere with utility lines, the arborist shall approve a substitute street tree from a species listed in Section 51A-10.134 Table B, or may modify the plan to locate the trees where no utility conflict will exist. may be provided.

(b) Other uses. Lots containing a use other than single family or duplex must comply with the following requirements:

(1) Perimeter landscape buffer strip. A landscape buffer strip must be provided along the entire length of the portion of the perimeter of the lot where a residential adjacency exists, exclusive of driveways and accessways at points of ingress and egress to and from the lot. The buffer strip must be at least 10 feet wide, except that:

(A) any portion of the buffer strip adjacent to public street frontage need not exceed 10 percent of the lot depth; and

(B) any portion of the buffer strip in the front yard and adjacent to the side lot line need not exceed 10 percent of the lot width.

(2) Screening of off-street loading spaces.

(A) All off-street loading spaces on a lot with residential adjacency must be screened from that residential adjacency.

(B) In all districts except CS and industrial districts, all off-street loading spaces on a lot must be screened from all public streets adjacent to that lot.

(C) The screening required under Subparagraphs (A) and (B) must be at least six feet in height measured from the horizontal plane passing through the nearest point of the off-street loading space and may be provided by using any of the methods for providing screening described in Section 51A-4.602(b)(3).

(3) Site trees.

(A) One tree having a caliper of at least two inches must be provided for each 4,000 square feet of lot area, or fraction thereof, with a minimum of four trees being provided, except for industrial uses in IM and IR districts, where one tree having a caliper of at least two inches must be provided for each 6,000 square feet of lot area, or fraction thereof, with a minimum of four trees being provided.

(B) Existing trees that are determined by the building official chief arborist to be healthy may be used to satisfy the site tree requirement, in accordance with the tree credit chart below:

CALIPER OF RETAINED TREE	NUMBER OF SITE TREES CREDIT GIVEN FOR RETAINED TREE
Less than 2 inches	0
2 inches or more but less than 8 inches	1
8 inches or more but less than 14 inches	2
14 inches or more but less than 20 inches	4
20 inches or more but less than 26 inches	8
26 inches or more and less than 32 inches	10
32 inches or more but less than 38 inches	18
38 inches or more	20

(4) Street trees. A large tree must be provided for each 50 feet of frontage, with a minimum of two trees being provided. These trees must be located within 30 feet of the projected street curb. The trees may be located in the public right-of-way provided that all private licensing requirements of the city code and charter are met. For purposes of this paragraph, "projected street curb" means the future location of the street curb consistent with the city thoroughfare plan as determined by the director of public works and transportation. Should these requirements conflict with utility easements or utilities both above and below ground, the city arborist is authorized to approve a modified plan that meets the spirit of this section, including but not limited to, relocation the trees on the property or allowing for trees with shorter mature canopies to be planted in utility easements. Approval of these modifications to the landscape plan does not require the approval of the board of adjustment.

(5) Parking lot trees.

(A) No required parking space may be located more than 120 50 feet from the trunk of a large canopy tree. Each tree required by this subparagraph must have a caliper of at least two three inches and may not be planted closer than two and one-half four feet to the paved portion of the parking lot including the back of curb.

(B) An industrial use in an IM or IR district need not comply with Subparagraph (A) if it provides at least one tree meeting the requirements for street trees in Paragraph (4) for each 25 feet of frontage.

(6) Minimum sizes. Except as provided in Subsections (a), (b)(3), and (b)(5) of this section, plant materials used to satisfy the requirements of this division must comply with the following minimum size requirements at the time of installation:

(A) Large trees must have a minimum caliper of three inches, or a minimum height of six feet, depending on the standard measuring technique for the species.

(B) Small trees must have a minimum height of six feet.

(C) Large evergreen shrubs must have a minimum height of three feet.

For purposes of this paragraph, "height" is measured from the top of the root ball or, if the plant is in a container, from the soil level in the container.

(7) Buffer plant materials.

(A) If a fence with a buffer strip is required along any part of the perimeter of a lot, the buffer strip must contain either one large canopy tree or two large non-canopy trees at a minimum average density of one large canopy tree or two large non-canopy trees for each 50 linear feet of the buffer strip, with new trees spaced no less than 25 feet apart.

(B) In all other cases, a landscape buffer strip provided to comply with this section or Section 51A-10.126 must contain one of the following groups of plant materials at a minimum average density of one group for each 50 linear feet of the buffer strip:

(i) One large canopy tree and one large non-canopy tree.

(ii) One large canopy tree and three small trees.

(iii) One large canopy tree and three large evergreen shrubs.

(iv) One large canopy tree, two small trees, and one large evergreen shrub.

(v) One large canopy tree, one small tree, and two large evergreen shrubs.

(iv) Two large non-canopy trees. (Ord. Nos. 19455; 19786; 20496; 22053; 24731; 25155; 26333)

(c) Exemptions to Mandatory Landscape Requirements. The city arborist has the authority to modify or make exception to any or all mandatory landscaping requirements should the site conditions make the specific requirement(s) impractical (i.e. non-traditional lots, conflicts with utilities, front or back of lot size too small for required number of trees)

SEC. 51A-10.126. DESIGN STANDARDS.

An applicant shall comply with at least two four of the following design standards:

(a) Enhanced perimeter buffers. An applicant may enhance the perimeter landscape buffer strip to a minimum average width equal to or greater than 15 feet.

(b) Street buffers. An applicant may provide a landscape buffer strip along public street frontage. The landscape buffer strip must:

(1) be provided along the entire adjacent public street frontage, exclusive of driveways and accessways at points of ingress and egress to the lot; and

(2) have a minimum width of 10 feet or 10 percent of the lot depth, whichever is less.

(c) Screening of off-street parking. An applicant may provide screening for all parking lots on the building site or artificial lot, whichever is applicable, from all adjacent public streets in accordance with the following paragraphs.

(1) The screening must be voluntary (not required by ordinance).

(2) The screening must extend along the entire street frontage of the parking lot, exclusive of:

(A) driveways and accessways at points of ingress and egress to and from the lot; and

(B) visibility triangles.

(3) The screening must be at least three feet in height.

(4) Underground parking is considered to be screened for purposes of this subsection.

(d) Enhanced vehicular pavement. An applicant may provide enhanced pavement. This pavement must be at least 25 percent of all outdoor vehicular pavement area on the lot. The same pavement cannot satisfy both Subsections (d) and (e). (Note: All vehicular pavement must comply with the construction and maintenance provisions for off-street parking in this chapter.)

(e) Permeable vehicular pavement. An applicant may provide permeable enhanced pavement. This pavement must be at least 25 percent of all outdoor vehicular pavement on the lot. The same pavement cannot satisfy both Subsections (d) and (e). (Note: All vehicular pavement must comply with the construction and maintenance provisions for off-street parking in this chapter.)

(f) Pedestrian facilities. An applicant may provide publicly accessible special pedestrian facilities and features such as plazas, covered walkways, fountains, lakes and ponds, seating areas, and outdoor recreation facilities. These facilities and features must occupy at least five percent of the lot area.

(g) Foundation planting strip. An applicant may plant large shrubs along the foundation of the main building. The planting area for the shrubs must be a minimum of three feet in width and extend along at least 50 percent of the portion of the foundation that faces a street. The shrubs must be spaced no more than six feet apart measured from trunk to trunk.

(h) Understory preservation. The applicant may preserve existing healthy understory. The preserved understory must occupy at least five percent of the lot area.

(i) Enhanced pedestrian walkways. The applicant may provide enhanced pedestrian walkways. These walkways must consist of enhanced pavement intended for pedestrian use and occupy at least five percent of the lot. (Ord. Nos. 19455; 20496; 22053)

SEC. 51A-10.127. WHEN LANDSCAPING MUST BE COMPLETED.

(a) Except as otherwise provided in Subsection (b), all landscaping must be completed before the final inspection of any building on the lot. If there is an approved landscape plan for the lot, the landscaping must comply with that plan before the final inspection.

(b) If the property owner provides the building official chief arborist with documented assurance that the landscaping will be completed within six months, the building official chief arborist may permit the property owner to complete his landscaping during the six-month period. For purposes of this subsection, "documented assurance" means:

(1) a copy of a valid contract to install the landscaping in accordance with the landscape plan within the six-month period; or

(2) a set of deed restrictions containing a covenant to install the landscaping in accordance with the landscape plan within the six-month period. The deed restrictions must:

(A) expressly provide that they may be enforced by the city of Dallas;

(B) be approved as to form by the city attorney; and

(C) be filed in the deed records of the county in which the land is located.

(c) If, at the end of the six-month period, the landscaping has not been installed in accordance with the landscape plan, the owner of the property is liable to the city for a civil penalty in the amount of $200 a day for each calendar day thereafter until the landscaping is properly installed. The building official chief arborist shall give written notice to the property owner of the amount owed to the city in civil penalties, and shall notify the city attorney of any unpaid civil penalty. The city attorney shall collect unpaid civil penalties in a suit on the city's behalf.

(d) The civil penalty provided for in Subsection (c) is in addition to any other enforcement remedies the city may have under city ordinances and state law. (Ord. Nos. 19455; 20496; 22053)

SEC. 51A-10.128. ENFORCEMENT BY BUILDING OFFICIAL CHIEF ARBORIST.

Whenever any work is being done contrary to the provisions of this division, the building official chief arborist may order the work stopped by notice in writing served on any person engaged in the work or causing the work to be done. A person issued this notice shall stop work immediately until authorized by the building official chief arborist to proceed with the work. (Ord. 25155)

Division 51A-10.130. Tree Preservation, Removal, and Replacement, and Transplantation.

SEC. 51A-10.131. APPLICATION OF DIVISION.

This division applies to all property in the city except for:

(a) lots smaller than two acres in size that contain single family or duplex uses; and

(b) lots in a planned development district with landscaping and tree preservation regulations that vary appreciably from those in this article X, as determined by the building official chief arborist.; and (Ord. Nos. 22053; 25155)

(c) lots in a urban forest preservation district established by the property owners in the district, with landscaping and tree preservation regulations that vary appreciably from those in this article X.

SEC. 51A-10.132. TREE REMOVAL APPLICATIONS.

(a) When a tree removal application must be approved and posted. A responsible party must post either an approved tree removal application in accordance with this section, or a building permit, demolition permit, a grading permit, or a flood plain fill permit in a conspicuous place at the entrances to the lot or tract, before removing or seriously injuring a protected tree on that lot or tract.

(b) Application for review. An application required under this section must be filed with the building official chief arborist on a form furnished by the city for that purpose. No fee shall be associated with an application for tree removal on a lot with single family use or duplex use if the application is not associated with a building permit, grading permit, demolition permit or flood plain fill permit. The application must include the following:

(1) The name, address, telephone number, and signature of the applicant. If the applicant is not the owner of the lot or tract, he shall submit a letter from the owner authorizing him to act on the owner's behalf.

(2) The name, address, and telephone number of each owner of the lot or tract.

(3) The street address of the lot or tract.

(4) A tree survey that shows the location, caliper, and name (both common and scientific) of all trees eight inches in caliper, on the lot and on adjacent lots when the critical root zone spans the property line, or tract artificial lot, or tract (trees in close proximity that all have a caliper of less than eight inches may be designated as a "group of trees" with only the number noted), or an estimate of the total caliper inches of protected trees, calculated and documented in a manner determined by the building official be reasonably accurate. The survey does not have to be prepared by a registered surveyor, architect, or landscape architect. Trees not proposed for removal or serious injury, or located within 50 feet of proposed construction activity need not be shown on the survey unless the building official determines it would help evaluation of the application.

(5) A copy of all All permits and approvals related to floodplain, wetland, or escarpment regulations required by other city departments, or other county, state, and federal agencies.

(6) Any other reasonable and pertinent information that the building official determines to be necessary for review.

(c) Form of approval of tree removal application. A tree removal application is not approved until it has been signed by the building official chief arborist.

(d) Separate offense for each tree removed or seriously injured without a permit. A responsible party commits a separate violation of this section for each tree removed or seriously injured without properly posted authorization by a building permit or approved tree removal application that is posted at the lot or tract.

(e) Decision of the building official chief arborist. The building official chief arborist shall deny a tree removal application if the removal or serious injury is not in the public interest. This decision must be based on the following factors:

(1) The feasibility of relocating a proposed improvement that would require the removal or serious injury of the tree.

(2) The cost of preserving the tree.

(3) Whether the lot or tract would comply with this article after the removal or serious injury.

(4) Whether the removal or serious injury is contrary to the public health, safety, or welfare.

(5) The impact of the removal or serious injury on the urban and natural environment.

(6) Whether an economically viable use of the property will exist if the application is denied.

(7) Whether the tree is worthy of preservation.

(8) Whether the tree is diseased or has a short remaining life expectancy.

(9) The effect of the removal or serious injury on erosion, soil moisture retention, flow of surface waters, and drainage systems.

(10) The need for buffering of residential areas from the noise, glare, and visual effects of nonresidential uses.

(11) Whether a landscape plan has been approved by the board of adjustment, city plan commission, or city council.

(12) Whether the tree interferes with a utility service.

(13) Whether the tree is near existing or proposed structures.

(14) Whether the proposed mitigation for tree removal or serious injury is sufficient. (Ord. Nos. 22053; 25155)

SEC. 51A-10.133. RESERVED. (Ord. 25155) TRANSPLANTATION OF PROTECTED TREES

A protected tree, deemed healthy by the chief arborist to be transplanted to a location noted on an approved landscape plan, may be approved as a replacement tree. Transplanted trees may be relocated to a holding area until the site is readied for planting. All plans for tree transplantation shall be noted on the tree conservation plan. Mitigation for successfully transplanting an existing tree to another location on the site shall be 2 caliper inches per 1 inch transplanted. If the transplanted tree is moved solely for the purpose of mitigation, the tree must survive a minimum of three years. Should the tree be planted as part of a required landscape plan, and die, it shall be replaced with a tree with a minimum of 3 inches in caliper, with the remainder of the transplanted inches fully mitigated.

SEC. 51A-10.134. REPLACEMENT OF REMOVED OR SERIOUSLY INJURED TREES.

If the tree removal application is approved, one or more healthy replacement trees must be planted in accordance with the following requirements.

(1) Quantity. The total caliper of replacement trees must equal or exceed the total caliper of the protected trees removed or seriously injured. Should the protected tree be a Heritage Tree, the total caliper of replacement trees must equal or exceed three times the total caliper of such tree. Should the protected tree be a Historic Tree, the total caliper of replacement trees must equal or exceed five times the total caliper of such tree.

(2) Species. A replacement tree must be one of the following trees listed in Table B., and n No one species of tree may constitute more than 30 percent of the replacement trees planted on a lot, artificial lot, or tract without the approval of the chief arborist.

APPROVED REPLACEMENT TREES

SCIENTIFIC NAME	COMMON NAME
Acer barbatum var. *Caddo*	Caddo Maple
Acer grandidentatum	Bigtooth Maple
Acer buergerianum	Trident Maple
Carya illinoensis	Pecan
Cercis canadensis	Redbud
Chilopsis linearis	Desert Willow
Diospyros texana	Texas Persimmon
Diospyros virginiana [male only]	Common or American Persimmon
Fraxinus americana	White Ash
Fraxinus texensis	Texas Ash
Gleditsia triacanthos var. *inermis*	Thornless Honeylocust
Gymnocladus dioicus	Kentucky Coffeetree

Ilex decidua Possumhaw or Deciduous Holly

Ilex vomitoria Yaupon Holly

Juglans microcarpa Texas Black Walnut

Juniperus ashei Ashe Juniper

Juniperus virginiana Eastern Red Cedar

Lagerstroemia indica Crepe Myrtle

Liquidambar styraciflua Sweetgum

Magnolia grandiflora Southern Magnolia

Pinus eldarica Eldarica, Mondell, or Afghan Pine

Pinus nigra Austrian or Black Pine

Pinus thunbergii Japanese Black Pine

Pistacia chinensis Chinese Pistachio

Prosopis glandulosa Mesquite

Prunus mexicana Mexican Plum

Quercus buckleyi Texas Red Oak

Quercus durandii Durrand Oak

Quercus fusiformis Escarpment Live Oak

Quercus macrocarpa Bur Oak

Quercus muhlenbergii Chinkapin Oak

Quercus shumardii Shumard Oak

Quercus virginiana Live Oak

Sapindus drummondii Western Soapberry

Sideroxylon lanuginosum Chittamwood or Gum Bumelia

Sophora affinis Eve's Necklace

Taxodium ascendens Pond Cypress

Taxodium distichum Bald Cypress

Ulmus crassifolia Cedar Elm

Ulmus parvifolia Lacebark Elm

Viburnum rufidulum Rusty Blackhaw

(3) Location. The replacement trees must be planted on the lot from which the protected tree was removed or seriously injured, except as otherwise allowed by Section 51A-10.135. Replacement trees may not be planted within a visibility triangle, a water course, or an existing or proposed street or alley.

(4) Minimum size. A replacement tree must have a caliper of at least two inches.

(5) Timing.

(A) Except as otherwise provided in Subparagraphs (B) and (C), all replacement trees must be planted within 30 90 days after the removal or serious injury of the protected trees.

(B) If the property owner provides the building official chief arborist with an affidavit that all replacement trees will be planted within six months, the building official may permit the property owner to plant the replacement trees during the six-month period.

(C) If the property owner provides the building official with a performance bond or a letter of credit in the amount of the total cost of purchasing, and planting, and maintaining replacement trees for a period of three years, the building official may permit the property owner up to 18 months to plant the replacement trees, with the following restrictions:

(i) for single family or multifamily developments, at least 50 percent of the total caliper of replacement trees must be planted before 65 percent of the development has received a final building inspection or a certificate of occupancy, and all replacement trees must be planted prior to the completion of the development; and

(ii) in all other cases, the replacement trees must be planted prior to the issuance of a certificate of occupancy.

(D) A replacement tree that dies within two three years of the date it was planted must be replaced by another replacement tree that complies with this section. (Ord. Nos. 22053; 25155)

SEC. 51A-10.135. ALTERNATIVE METHODS OF COMPLIANCE WITH TREE REPLACEMENT REQUIREMENTS.

(a) If the building official chief arborist determines that, due to inhospitable soil conditions or inadequate space, it would be impracticable or imprudent for the responsible party to plant a replacement tree on the lot where the protected tree was removed or seriously injured (the "tree removal property"), the responsible party shall comply with one or more of the following requirements:

(1) Donate the replacement tree to the city's park and recreation department. If the director of the park and recreation department does not accept the tree, the responsible party must comply with one or more of the other alternative methods of compliance listed below.

(2) Plant the replacement tree on other property in the city, public or private, that is within one mile of the tree removal property, as long as the responsible party obtains the written approval of the building official chief arborist for:

(A) a site plan indicating the location of the tree to be removed or seriously injured, the address of the property where the replacement tree will be planted, and a site plan indicating the location of the replacement tree; and

(B) a written agreement between the owner of the property where the replacement tree will be planted and the responsible party, to assume mutual responsibility for the replacement tree under this article.

(3) Make a payment into a special city account, to be known as the Reforestation Fund, in accordance with Subsection (c).

(4) Grant Designate a conservation easement to the city in accordance with Subsection (d) and the following paragraphs:

(A) The conservation easement area must contain protected trees with a combined caliper equal to or exceeding the caliper for which replacement tree credit is being requested. to receive full mitigation credit.

(B) If the conservation easement area is 25 percent or less than the area of the tree removal property, the responsible party will get credit for trees in the conservation easement area, on an inch for inch basis, up to a maximum of 50 percent of the total caliper of replacement trees required.

(C) If the conservation easement area is more than 25 percent and less than 50 percent of the area of the tree removal property; the responsible party will get credit for trees in the conservation easement area, on an inch for inch basis, up to a maximum of 65 percent of the total caliper of replacement trees required.

(D) If the conservation easement area is 50 percent or more of the area of the tree removal property, the responsible party will get credit for trees in the conservation easement area, on an inch for inch basis, up to a maximum of 80 percent of the total caliper of replacement trees required.

The replacement trees that cannot be planted on the tree removal property, and for which credit cannot be given through a conservation easement under this paragraph, must be replaced by other methods set forth in this subsection, such that the replacement trees equal in total caliper the total caliper of the trees removed or seriously injured.

(b) Use of other property for tree replacement. A responsible party who obtains permission to plant the replacement tree on other tree replacement property in the city shall ensure that the planting and maintenance of the tree on the other tree replacement property complies with the requirements of this article. The building official chief arborist shall maintain a list of publicly or privately owned properties for which replacement trees are sought by groups such as, but not limited to, homeowner's homeowners' associations or school districts.

(c) Reforestation fund.

(1) The director of development services chief arborist with the assistance and advice of the city forester and the director of park and recreation department, or a representative thereof, shall administer the reforestation fund to the restricted purchase of trees to plant on public property, or to acquire conservation easements, or wooded property urban forest. The fund shall be held in a separate city account and shall be audited by the city auditor at the end of each fiscal year. Interest accrued at the end of each fiscal year may fund urban forest public education, urban forestry staff in-service education, and the purchase of non-budgeted, urban forestry related equipment.

(2) The amount of the payment required is calculated by using the formula for appraising the value of a tree, as derived from the most recent edition of the *Guide for Establishing Values of Trees and Other Plants* published by the Council of Tree & Landscape Appraisers, unless another publication is designated by the building official chief arborist. If more than one tree is being removed or seriously injured or not planted, the values of the trees are added when calculating the payment required.

(3) All property purchased through this fund must be must be in or partly in the city of Dallas and may not extend further than five miles from the Dallas city limit.

(d) Conservation easement.

(1) The city manager is authorized to accept and approve on behalf of the city a conservation easement to conserve trees and other natural features, upon:

(A) approval as to form by the city attorney; and

(B) a determination by the building official chief arborist that the easement area is suitable for conservation purposes, based on:

(i) the likelihood that the proposed conservation easement area would preserve vegetation on a parcel otherwise attractive for development;

(ii) the overall health and condition of the trees on the conservation easement property;

(iii) the suitability of the area as a wildlife habitat; and or

(vi) other unique features worthy of preservation, e.g. water channels, rock formations, topography, or rare herbaceous or woody plant species.

(2) The conservation easement may be structured to be monitored and managed by a nonprofit association dedicated to the conservation of land, with the city as a joint grantee having the right, but not the duty, to monitor the management of the conservation area. The joint grantee of a conservation easement may be an eligible grantee such that the grantor will have the option of receiving a property tax benefit on the assessed value of the conservation easement area.

(3) Should the The city manager choose to may not accept a sole or joint conservation easement on behalf of the city, unless and until the owner shall provides the building official chief arborist with:

(A) a tree survey as set forth in Section 51A-10.132, or an estimate of the caliper and type of protected trees documented in a manner determined to be reasonably accurate by the building official chief arborist; and

(B) a preservation strategy for the conservation easement area.

(4) No person may place playground equipment or park amenities in a conservation easement area unless the building official chief arborist, in consultation with the city forester and the director of park and recreation, has made a written determination that the amenities indicated on a site plan are unlikely to be detrimental to the conservation easement area.

(5) Conservation easement areas must be fully within the in or partly in the city of Dallas. and may not extend further than five miles from the Dallas city limit. (Ord. 25155)

(e) Quality Tree Conservation and Sustainable Development Incentives

[Note from the Committee: Quality Tree Conservation and Sustainable Development Incentives document is currently not included as part of this draft document. However, a draft of that document is to be posted in conjunction with this posting.]

SEC. 51A-10.136. PRESERVATION CONSERVATION OF PROTECTED TREES DURING CONSTRUCTION OR OTHER DISTURBANCE PERIOD.

Where a property owner or other responsible party plans to retain protected trees, protected and non-protected, on a site to be developed, redeveloped, or otherwise disturbed in a manner that requires a building permit, demolition permit, grading permit, or flood plain fill permit may affect protected trees, the following requirements must be met:

(a) Tree protection conservtion plan. A tree protection conservation plan submitted to the building official chief arborist must include the following:

(1) A site plan drawn to scale, indicating the location of land disturbance, clearing, grading, trenching, tree protection conservation zones, proposed underground utilities, staging areas for parking, material storage, concrete

washout, and debris burn and burial holes where these areas might affect tree protection, and areas where soil compaction is likely to occur in a tree protection conservation zone due to traffic or materials storage, and tree protection for critical root zones of trees on neighboring properties.

(2) A complete tree survey in accordance with the requirements set forth in Section 51A-10.132.

(3) An irrigation plan showing by what method and schedule conserved trees are to receive supplemental watering during the course of the disturbance. Should the disturbance result from a demolition permit, grading permit, or flood plain fill permit the conservation plan must provide for irrigation until the property is developed.

(3 4) Detailed drawings of any of the following tree protection measures that will be used during development the disturbance period.

(A) Tree protection fencing. Tree protection fences must be a minimum of four five feet high, constructed with adequate, durable material (e.g. galvanized chain-link orange plastic construction fencing) approved by the building official chief arborist, and located at the drip line or the edge of the critical root zone, whichever is farthest from the trunk, unless the building official chief arborist determines that a fence line closer to the trunk will not be likely to result in damage to the tree. For purposes of this subsection, "drip line" means a vertical line that runs from the outermost portion of the crown of a tree to the ground. Fencing shall not be removed, relocated, or disturbed during the course of the project without approval of the chief arborist. Plastic fencing (e.g. orange or green plastic construction/safety fencing) is not permitted for tree protection purposes.

(B) Erosion control fencing or screening. All protected trees or stands of trees, and tree protection zones must be protected from the sedimentation of erosion material. Silt screening must be placed along the outer uphill edge of tree protection zones.

(C) Tree protection signs.

(D) Transplanting specifications.

(E) Tree wells and aeration systems.

(F) Staking specifications.

(b) Implementation of tree protection conservation plan.

(1) The responsible party must install and maintain all tree protection measures indicated in the approved plan prior to and throughout the all land disturbance processes and the construction phases.

(2) No person may disturb the land or perform construction activity until the required tree protection measures have been inspected by the building official chief arborist.

(3) The responsible party must mulch areas where soil compaction is likely to occur as indicated on the plan with a minimum four-inch layer of processed pine bark or shredded wood chips, or a six-inch layer of pine straw, or other materials subject to the approval of the chief arborist.

(4) If a cut is made to the root of a tree that is not intended to be removed or seriously injured as indicated on the plan, the cut must be made at a 90 degree angle.

(5) The responsible party must tunnel utilities if utilities are to run through a tree protection zone, rather than being placed along corridors between tree protection zones.

(c) Damage to protected trees. Where the building official chief arborist has determined that irreparable damage has occurred to protected trees within tree protection zones, the responsible party must remove and replace mitigate for those trees. (Ord. Nos. 22053; 25155)

SEC. 51A-10.137. VIOLATION OF THIS DIVISION.

Whenever any work is being done contrary to the provisions of this division, the building official may order the work stopped by notice in writing served on any person engaged in the work or causing the work to be done. A person issued this notice shall stop work immediately until authorized by the build official chief arborist to proceed with the work. (Ord. Nos. 22053; 25155)

SEC. 51A-10.138. APPEALS.

In considering an appeal from a decision of the building official chief arborist made in the enforcement of this division, the sole issue before the board of adjustment shall be whether or not the building official erred in his or her decision. The board shall consider the same standards that the building official was required to consider in making the decision. (Ord. Nos. 22053; 25155)

SEC. 51A-10.139. FINES.

A person convicted of violating this division shall be subject to a fine of not less than $2,000.00 per protected tree removed or seriously injured without authorization, and not less than $2,000.00 per day for any other violation of this division. (Ord. Nos. 22053; 25155)

SEC. 51A-10.140. CRIMINAL RESPONSIBILITY, AND DEFENSES TO PROSECUTION.

(a) A person is criminally responsible for a violation of this division if the person:

(1) removes or seriously injures, or assists in the removal or serious injury of, a protected tree without complying with the requirements of this division; or

(2) owns part or all of the land where the violation occurs.

(b) It is a defense to prosecution under this section that the act is included in one of the enumerated categories listed in this section. No approval of a tree removal application is required if the tree:

(1) was dead and the death was not caused by an intentional or negligent act of the owner or an agent of the owner;

(2) had a disease or injury that threatened the life of the tree, or neighboring trees in the case of oak wilt, and was not caused by an intentional act of the owner or an agent of the owner;

(3) was in danger of falling or had partially fallen and the danger or the fall was not due to an intentional act of the owner or an agent of the owner;

(4) was in a visibility triangle (unless the owner was legally required to maintain the tree there) or obstructed a traffic sign;

(5) interfered with service provided by a public utility within a public right-of-way;

(6) threatened public health or safety, as determined by one of the following city officials:

(A) the chief of the police department;

(B) the chief of the fire department;

(C) the director of public works and transportation;

(D) the director of street services;

(E) the director of sanitation services;

(F) the director of code compliance;

(G) the director of park and recreation; or

(H) the director of development services;

(7) was designated for removal in a landscape plan approved by the city council, city plan commission, or board of adjustment;

(8) interfered with construction or maintenance of a public utility;

(9) was removed or seriously injured to allow construction, including the operation of construction equipment in a normal manner, in accordance with infrastructure engineering plans approved under Article V of Chapter 49 or Section 51A-8.404; or

(10) was removed or seriously injured to allow construction of improvements in accordance with a building permit. (Ord. Nos. 22053; 23694; 25047; 25155)

TABLE A
Protected Trees

All Heritage trees (30 inches in caliper or greater), and all Historic trees.
All trees that are replacement trees and all trees that have a caliper of eight inches or more and are not one of the following trees:

Botanical Name	Common Name	Conditional
Acer saccharinum	Silver Maple	None
Ailanthus altissima	Tree of Heaven	None
Albizzia julibrissen .	Mimosa or Silktree	None
Celtis occidentalis/laevigata	Hackberry or Sugarberry	None
Fraxinus velutina	Arizona Ash	None
Juniperus virginiana	Eastern Red Cedar	caliper of 12" or less
Maclura pomifera	Bois d'Arc or Horseapple	female only
Melia azedarach	Chinaberry	None
Prosopis glandulosa	Mesquite	caliper of 12" or less
Pyrus calleryana	Callery Pear	all cultivars
Salix nigra	Black Willow	None
Sabium sebiferum	Chinese Tallow	None
Ulmus pumila	Siberian Elm.	None

TABLE B
Approved Replacement Trees

Botanical Name	Common Name
Acacia wrightii	Catclaw Acacia
Acer barbatum var. *Caddo*	Caddo Maple
Acer buergerianum	Trident Maple

Acer grandidentatum	Bigtooth Maple
Acer truncatum	Shantung Maple
Aesculus glabra var. *arguta*	Texas Buckeye
Aesculus pavia var. *pavia*	Red Buckeye
Carya illinoensis	Pecan
Cercis canadensis	Eastern Redbud
Cercis canadensis var. *texensis*	Texas Redbud
Chilopsis linearis	Desert Willow
Crataegus reverchonii	Reverchon Hawthorne
Crataegus virdis	Green Hawthorne
Crataegus texana	Texas Hawthorne
Cupressus arizonica	Arizona Cypress
Diospyros texana	Texas Persimmon
Diospyros virginiana (male only)	American Persimmon
Fraxinus americana	White Ash
Fraxinus texensis	Texas Ash
Ginkgo biloba	Ginkgo
Gleditsia triancanthos var. *inermis*	Thornless Honey Locust
Gymnocladus dioicus	Kentucky Coffeetree
Ilex decidua	Possumhaw or Deciduous Holly
Ilex vomitoria	Yaupon Holly
Juglans microcarpa	Texas Black Walnut
Juniperus ashei	Ashe Juniper
Juniperus virginiana	Eastern red Cedar
Lagerstroemia indica	Crepe Myrtle
Leucaena retusa	Goldenball Leadtree
Liquidambar styraciflua	Sweetgum
Magnolia grandiflora	Southern Magnolia
Magnolia soulangiana	Saucer Magnolia
Pinus eldarica	Elderica, Mondell, Of Afghan Pine
Pinus nigra	Austrian or Black Pine
Pinus thunbergii	Japanese Black Pine
Pistacia chinensis	Chinese Pistachio
Pistacia texana	Texas Pistache
Prosopis glandulosa	Mesquite
Prunus caroliniana	Carolina Cherry Laurel
Prunus mexicana	Mexican Plum
Prunus munsoniana	Wildgoose Plum
Quercus buckleyi	Texas Red Oak
Quercus sinuata var. *sinuata*	Durand Oak
Quercus fusiformis	Escarpment Live Oak
Quercus laceyi	Lacey Oak
Quercus macrocarpa	Bur Oak
Quercus marilandica	Blackjack Oak
Quercus muehlenbergii	Chinkapin Oak
Quercus pungens var. *vaseyana*	Vasey Oak
Quercus shumardii	Shumard Red Oak
Quercus sinuata var. breviloba	Bigelow Oak or White Shin Oak
Quercus stellata	Post Oak
Quercus virginiana	Live Oak
Rhamus caroliniana	Carolina Buckthorn
Rhus glabra	Smooth Sumac
Rhus lanceolata	Prairie Flame-leaf Sumac
Sapindus drummondii	Western Soapberry
Sideroxylon lanuginosum	Chittamwood or Gum Bumelia
Sophora affinis	Eve's Necklace
Sophora secundiflora	Texas Mountain Laurel
Taxodium ascendens	Pond Cypress
Taxodium distichum	Bald Cypress
Ulmus alata	Winged Elm
Ulmus americana	American Elm
Ulmus crassifolia	Cedar Elm
Ulmus parvifolia	Lacebark Elm
Ungnadia speciosa	Mexican Buckeye
Vitex agnus-castus	Vitex
Ziziphus jujuba	Jujube

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Quality Tree Conservation and Sustainable Development Incentives Overview

City of Dallas Urban Forest Advisory Committee

December, 2009

The City of Dallas Urban Forest Advisory Committee (UFAC) recognizes that the Dallas Tree Ordinance or Article X of city codes does not adequately conserve trees and more trees were removed than replaced. Currently, all trees can be removed as long as they are mitigated by replacing trees on site or paying into the city Reforestation Fund.

Over three years ago, UFAC invited representatives from the building and development community to meet in an effort to find ways to conserve trees and encourage responsible (or sustainable) land use by finding common ground plus offering incentives. UFAC obtained concerns from the group as well as the public to develop its current recommended changes to Article X.

A part of the discussions included the potential to provide incentives and the first set of recommended changes from UFAC included a "matrix" as a way to encourage tree conservation and responsible land use. In July of 2009, a sub committee was formed under the existing Green Building Task Force to further study the incentive concept. As a result, UFAC is very appreciative of the recent efforts by the Subcommittee in producing the "Quality Tree Conservation and Sustainable Development Incentives" for UFAC consideration. For clarity, the UFAC Chair, Vice Chair and Team Leader for Land Planning & City Codes, served as members of the task force.

The incentives are important because south Dallas has the most undeveloped land however; much of the land is a challenge to develop due to the large number of trees and topography. The removal of a large number of trees can create a high mitigation cost which renders some parcels undevelopable. Also, the hills and cliffs in the area create a challenge to develop responsibly. Traditional methods of building on semi level ground with few trees are not cost effective in the southern sector as a result. The incentives offer a solution and avoid requiring responsible development in the future.

The incentives become more important when you consider that we have serious air and water quality concerns. As current research by Vision North Texas recently concluded, "business as usual" developments create more problems whereas building around our natural areas (or "greenprinting") offers the maximum amount of benefits (www.VisionNorthTexas.org). By building responsibly and conserving trees as well as important ecosystems, we help to offset our environmental footprint. The incentives provide a tool to encourage these types of efforts.

Preliminary input from the development community and city staff is positive but the number of additional trees that may be preserved or replaced is not clear. The offering of incentives is a major change from business as usual for the city. Also, it is not clear if city

officials will approve the incentives or what changes may take place as they go thru the typical city approval process.

Keep in mind that the existing mitigation options and formula would remain intact. The incentives do not replace them but rather offer an alternative. The argument from some is that incentives could greatly reduce or prevent the required tree mitigation, which would be unreasonable. As a result, a "cap" could be established to ensure that only a percentage of the total required mitigation could be reduced by using incentives. The subject currently remains up for debate.

The details of the incentives offered were noted in a document recently produced by the sub committee that should be considered as a part of the recommended changes from UFAC.

Quality Tree Conservation and Sustainable Development Incentives Description From the Article X Subcommittee of the Green Building Task Force

The Green Building Task Force is dedicated to the development of Dallas in a sustainable, environmentally friendly fashion, including the preservation of our quality tree stock. To this end, the Article X Subcommittee of the Green Building Task Force is recommending the adoption of the Quality Tree Conservation and Sustainable Development Incentives (Incentives) as an alternative way for developers to pay for their tree mitigation costs.

The Incentives value a property based upon the quality of the trees that occupy the property prior to development. Then, contingent upon the quality of the development, defined in terms of preserving the highest quality trees and building the project to higher standards than mandated by law, the project is awarded a credit against its tree mitigation costs. The following document is the conceptual worksheet that has been developed by the Article X Subcommittee that both values a property and applies a credit based upon how the project is designed and implemented.

The first step in determining what, if any, credit will be given for a project is to perform an evaluation of the current site. A project is allocated site points based on the total canopy coverage of all trees as well as the percentage of protected trees that are greater than 12 inches in the project area. These site points are used as the basis for determining any potential credits to tree mitigation costs. The more canopy coverage and caliper inches of large protected trees there are on a given site, the higher the points and the threshold for obtaining tree mitigation credits.

A development can potentially earn points to offset its tree mitigation costs through the implementation of sustainable practices that exceed those minimum standards dictated by current ordinances. It can do so in four categories: 1) Education & Implementation, 2) Site Design/Location, 3) Landscaping, and 4) Conservation of Quality Trees. The points earned in each of the categories will be applied against the total site points to determine the total percentage of credits available to offset tree mitigation costs.

Education and Implementation by Contractors: The City of Dallas will design a curriculum that will teach about sustainable development practices as it pertains to trees. Included in the curriculum will be best practices for incorporating tree preservation and protection during the development process. The class will be made available online or via independent providers that have been approved by the City.

Site Location/Design: Using criteria developed by LEED, ISWM and others, points can be earned by a project that incorporate sustainable practices into its building and site plan. This category includes hardscape permeability, storm water management, site location, preservation of natural waterways, usage of renewable energy and the energy efficiency of the building. Additional points are awarded to developments that utilize existing transportation facilities such as rail stations and hike/bike trails.

Landscaping: Points are available for non-turf landscaping, native/drought tolerant turf, trees/shrubs that are at least 75% native/drought tolerant, usage of drip irrigation and protection of tree roots through the use of mulch and/or rock.

Conservation of Quality Trees: Utilizing criteria developed by the City Arborist, points are awarded for the preservation of "Quality Forested Areas" (QFA) and the larger tree specimens. Similar to conservation easements, QFA's will be preserved via deed restrictions and determined on a case-by-case basis with the City Arborist. QFA's will vary from site-to-site, but will, at a minimum, contain a diverse tree inventory along with healthy undergrowth.

Upon completion of a development, the City would confirm the points earned via the Incentives. These points will be applied against the total site points as determined by the original tree conditions. The resulting percentage would by used to offset the tree mitigation costs. The anticipated result will be projects that are built in a more environmentally sustainable fashion, creating a greener Dallas.

Quality Tree Conservation and Sustainable Development Incentives

Project Name: Frank M Moderate Case

		Site Design / Location	
Tree conditions prior to construction			
Tree Canopy Coverage Percentage		**Hardscape**	
Total caliper inches of protected trees		Total area of hardscape	
Quality tree characteristics		Total area of permeable hardscape	
Caliper inches of trees 12 - 24 inches (not in QFA)		**Storm Water Management**	
Caliper inches of trees 25 or more inches (not in QFA)		Does the project meet or exceed ISWM standards?	
Size of Quality Forested Area (QFA) in sq. ft.			
Number of applicable characteristics of quality trees (0-3)		**Site Location / Design**	
Tree conditions after construction		Is the project adjacent to a park or conservation easement?	
Total caliper inches of protected trees			
Caliper inches of trees 12 - 24 inches (not in QFA)		Site located within 1/4 mile of rail mass transit?	
Caliper inches of trees 25 or more inches (not in QFA)			
Size of Quality Forested Area (QFA) in sq. ft.		Does the project have sidewalks that exceed 8ft. In width?	
Education		Is the project located within 1/4 mile of a hike/bike trail?	
Number of people eligible for education certification			
Number of people certified		Does project utilize community units for open space?	
On Site Education completed? (yes or no)			
Caliper inches of trees put at risk during construction		Does project utilize on-site renewable energy sources?	
		Does the building exceed the City's requirements for energy efficiency?	
Landscape			
Total area that is landscaped (sq.ft.)		Does project maintain or revitalize natural waterways?	
Landscaped area that is turf (sq.ft.)			
Area of turf that is native/drought tolerant (sq.ft.)		Does the building meet LEED Silver standards or the equivalent?	
Are trees/shrubs at least 75% native/drought tolerant?			
		Does the building meet LEED Gold standards or the equivalent?	
Does site include drip irrigation?			
		Does the building meet LEED Platinum standards or the equivalent?	
Are mulch and rock covering preserved tree root systems?			

Quality Tree Conservation and Sustainable Development Incentives

Recap

Site Points				**Alternative Mitigation Points**	Maximum pts	Pts Earned
				Education & Implementation of Contractors	15.00	13.50
				Landscape	20.00	15.00
Canopy Coverage of all trees			50.00	Site Design / Location	40.00	40.00
Percent of Protected Trees in excess of 12 inches			65.00	Conservation of Quality Trees	50.00	25.00
Total Site Points			115.00	**Total Alternative Mitigation Points Earned**	125.00	93.50
Alternative Tree Mitigation Credit Percentage		**81.30%**				

Education and Implementation by Contractors	Applicable %	Potential pts	Pts Earned
Certification Points	100%	7.50	7.50
On-site Education	100%	7.50	7.50
Harmful Act Deduction	10%	(15.00)	(1.50)
Total Education Points Earned			13.50
Education Calculations			
Certification Point Percentage			
Number of people eligible for certification		3	
Number of people certified		3	
Percentage of eligible people certified			100%
Harmful Acts Deduction Percentage			
Total caliper inches of protected trees to be preserved		10000	
Caliper inches of trees put at risk		1000	
Percentage of preserved protected trees put at risk			10%

Landscaping	Applicable %	Potential Points	Pts Earned
Potential Points for non-turf landscaping	0%	5.00	-
Potential Points for native/drought tolerant turf	25%	5.00	1.25
Trees/Shrubs at least 75% native or drought tolerant	100%	5.00	5.00
Site utilizes drip irrigation	75%	5.00	3.75
Site covers tree roots with mulch and/or rock	100%	5.00	5.00
Landscaping Points Earned			15

Site Location / Design	Applicable %	Potential Points	Points Earned
Does the hardscape utilize permeable surfaces?	50%	15.00	7.50
Does the project meet or exceed ISWM standards?	100%	10.00	10.00
Is the project adjacent to a park, riparian corridor or conservation easement?	100%	5.00	5.00
Site located within 2000 feet of rail transit?	100%	5.00	5.00
Does the project provide a new link for the City of Dallas Trail Network Master Plan?	100%	5.00	5.00
Is the project located within 2000' of the Trail Network Master Plan system?	100%	5.00	5.00
Does project utilize community units for open space?	100%	5.00	5.00
Does project utilize on-site renewable energy sources?	100%	5.00	5.00
Does project maintain or revitalize natural waterways?	100%	5.00	5.00
RESERVED	100%	5.00	5.00
Do all buildings exceed the C.o.Dallas energy conservation code by 10 %	100%	5.00	5.00
Do all buildings exceed the C.o.Dallas energy conservation code by 20 %	100%	5.00	5.00
Do all buildings exceed the C.o.Dallas energy conservation code by 30 %	100%	5.00	5.00
Maximum potential points		80.00	
Total Site Location / Design points earned			72.50

Conservation of Quality Trees		
Percentage of trees 12 - 24 inches preserved		50.00%
Percentage of trees 25 inches or greater preserved		50.00%
Percentage of Quality Forested Area preserved		50.00%
Average percentage		50.00%
Divided by :		2
Conservation of Quality Tree Points		25.00
Number of applicable sections below:	3	
Protected trees 12 - 24 inches (not in Quaility Forested Area)		
Original caliper inches	10000	
Remaining number after construction	5000	
Percentage of trees preserved		50%
Protected trees 25 inches and larger (not in Quality Forested Area)		
Original number	3000	
Remaining number after construction	1500	
Percentage of trees preserved		50%
Quality Forested Area		
Orginal size (expressed in square feet)	50000	
Remaining size after construction	25000	
Percentage of Quality Forested Area Preserved		50%

Quality Tree Conservation and Sustainable Development Incentives

Project Name:

Tree Conservation		
Tree conditions prior to construction		
Tree Canopy Coverage Percentage		50%
Total caliper inches of protected trees		20,000
Quality tree characteristics		
Caliper inches of trees 12 - 24 inches (not in QFA)		10,000
Caliper inches of trees 25 or more inches (not in QFA)		3,000
Size of Quality Forested Area (QFA) in sq. ft.		50,000
Number of applicable characteristics of quality trees (0-3)		3
Tree conditions after construction		
Total caliper inches of protected trees		10,000
Caliper inches of trees 12 - 24 inches (not in QFA)		5,000
Caliper inches of trees 25 or more inches (not in QFA)		1,500
Size of Quality Forested Area (QFA) in sq. ft.		25,000
Education		
Number of people eligible for education certification, 3 max.		3
Number of people certified		3
On Site Education completed? (yes or no)		yes
Caliper inches of trees put at risk during construction		1,000
Landscape		
Total area that is landscaped (sq.ft.)		500,000
Landscaped area that is turf (sq.ft.)		500,000
Area of turf that is native or drought tolerant (sq.ft.)		125,000
Are trees/shrubs at least 75% native or drought tolerant?		yes
Percentage of irrigation that is drip-type?		75%
Are mulch and rock covering preserved tree root systems?		yes

Site Design / Location	
Hardscape	
Total area of hardscape	100,000
Total area of permeable hardscape	50,000
Storm Water Management	
Does the project meet or exceed the City of Dallas ISWM standard?	yes
Site Location	
Is the project adjacent to a park, riparian corridor or conservation easement?	yes
Site located within 2000 feet of rail transit?	yes
Does the project provide a new link for the City of Dallas Trail Network Master Plan?	yes
Is the project located within 2000' of the Trail Network Master Plan system?	yes
Does project utilize community units for open space?	yes
Does project utilize on-site renewable energy sources?	yes
Does project maintain or revitalize natural waterways?	yes
RESERVED	yes
Building Performance	
Do all buildings exceed the C.o.Dallas energy conservation code by 10 %	yes
Do all buildings exceed the C.o.Dallas energy conservation code by 20 %	yes
Do all buildings exceed the C.o.Dallas energy conservation code by 30 %	yes

Adopt-A-Median

The City of Dallas Street Department is working in cooperation with the City of Dallas Urban Forest Advisory Committee in an effort to encourage the public to plant and maintain trees throughout the city.

Due to declining regional air quality and increasing inner-city temperatures related to the heat island effect, as well as a lack of street trees in many areas and a limited city budget, there is a great need to plant more trees in city medians. Trees offer a great number of benefits to society that researchers are just beginning to quantify. Trees benefit our health and sense of well being, our quality of life, as well as our economic future. Expanding the benefits of an urban forest canopy cover to all citizens is an important goal that requires the full support of the public. Citizens often ask what can be done to help the environment and our air, water and soil quality. The "Adopt-A-Median" program offers the opportunity for individuals, citizen groups (homeowner associations) and corporations to take ownership of a street median as good stewards and/or good corporate citizens of Dallas. With the public taking ownership of these areas, we not only help our environment, we also make Dallas more livable and sustainable. To leave a greener city as our legacy for future generations …is indeed a gift worthy of your consideration.

The Adopt-A-Median program relies primarily on the existing "MOWmentum" agreement to outline the criteria involved in planting trees in a street median.

The "MOWmentum" Volunteer Service Agreement is a joint effort between our city government and residents to keep our right-of-ways and neighborhoods clean and beautiful. The program allows the public an opportunity to adopt portions of public right-of-ways for the purpose of maintaining and improving the property.

For more information about the program guidelines, please visit: www.dallascityhall.org, click on City Departments, then Street Services, then "MOWmentum". If you have any questions or need further information, contact Elizabeth Ponce, Department of Street Services, at 214-670-8621.

To learn more about the Dallas Reforestation Fund, please; visit: www.dallascityhall.org, click on City Departments, then Building Inspection, then City Arborist, then "Reforestation Fund". Please note that trees donated through the Reforestation program are not eligible for reimbursement under the "MOWmentum" funding. Also, if you are an individual who has been approved for the MOWmentum Program, you will not be eligible for the Reforestation Program. For more information, please contact Phil Erwin, Chief Arborist for the City, at 214-948-4117.

To learn more about what to plant and how, please visit: www.dallastrees.org, scroll down the page and click on "Dallas Tree Planting Guide". For more information, please contact Kurt Kretsinger, City of Dallas Urban Forest Advisory Committee, Team Leader for Tree Planting and Transplanting, at 214-321-5224 or Steve Houser, Committee Chairman, at 972-442-1524.

REPORT SUMMARY

DALLAS URBAN HEAT ISLAND

DALLAS SUSTAINABLE SKYLINES INITIATIVE

Prepared by
Houston Advanced Research Center
Prepared for
U.S. Environmental Protection Agency

March 2009

THE SUSTAINABLE SKYLINES INITIATIVE

The Sustainable Skylines initiative is a three-year partnership between the City of Dallas, the U.S. Environmental Protection Agency, and the North Central Texas Council of Governments to promote sustainability within the City via voluntary programs which emphasize air quality improvements.

The Sustainable Skylines Initiative (SSI) at EPA provides a framework that, when implemented in an area, can achieve measurable emissions reductions and promote sustainability in urban environments. Under the SSI, an area can choose to perform projects from seven categories: central city livability, stationary and area sources, energy and climate change, land use transportation strategies, diesel engines emission reduction, green building and green building development, and off-road/non-road sources (emission reductions).

HOUSTON ADVANCED RESEARCH CENTER

4800 Research Forest Drive • The Woodlands, Texas 77381 • http://www.harc.edu

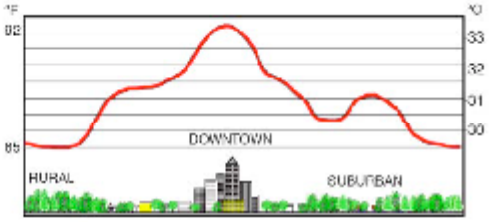
HARC is a 501(c)(3) not-for-profit organization based in The Woodlands, Texas dedicated to improving human and ecosystem well-being through the application of sustainability science and principles of sustainable development. HARC's mission is to move knowledge to action to improve human well-being and the environment.

This report was prepared as part of the Dallas Sustainable Skyline Initiative, a project of the U.S. Environmental Protection Agency.

The report describes Dallas urban heat island effects and options that could be implemented to help reduce these effects.

Many people understand from their own experience that cities are often hotter than rural areas. Research suggests a difference of 6 to 8ºF. As cities develop, trees and vegetated areas are reduced, natural surfaces are paved, and buildings constructed. Together these changes produce the "*urban heat island effect*" illustrated in Figure 1.

Figure 1. Urban Heat Island Effect



Dallas has recognized heat island concerns in plans and discussions, and there are several references in the 2006 Dallas Comprehensive Plan, *forwardDallas!* The plan's *Vision* mentions the heat island effect as a component of policies to help ensure environmental stewardship.[1] Heat island policies are also found in other sections of the plan.

> "Central to this Key Initiative is identifying, inventorying and protecting important natural resources, sensitive ecosystems, open spaces and cherished views. Included are policies to mitigate the urban heat island effect, improve storm water management within the city, reduce smog, expand the absorption capacity of floodplains and allow the restoration and rehabilitation of Trinity River riparian corridors." (emphasis added)

The Dallas Urban Heat Island Study examines how and where heat island effects occur in Dallas and some of the basic tools for reducing impacts, such as expanded tree planting and conservation, use of cool roofing, and application of cool and porous paving. The study describes costs and benefits associated with these tools.

FORMATION OF URBAN HEAT ISLANDS

Urban heat island effects were recognized in the 19th century by climatologists who measured differences in city temperatures and the countryside. Current urban development practices often start with removal of trees and other vegetation. This reduces the cooling effects provided by vegetation and moist soils. This also adds buildings, rooftops, and pavement that absorb, store, and then radiate heat. In areas with tall buildings and narrow streets, heat can be trapped and airflow reduced. In addition, waste heat from air conditioning, vehicles, and industrial processes adds further to the city's heat load.[2]

THE DALLAS URBAN HEAT ISLAND

An urban heat island is often thought to be a summer daytime event, but in reality its most common occurrence is generally before sunrise (Figure 2). At that time, the difference between urban and rural temperatures is often at its peak. There are two basic types of heat islands: *surface* and *atmospheric*. Surface temperature differences occur primarily in the daytime and can range from 18 to 27ºF. Atmospheric differences are primarily at night and can range from 13 to 22ºF. A study of Dallas and Houston found that urban summer nighttime temperatures (atmospheric) were almost 4ºF warmer than rural temperatures (averaged over 2000 to 2006). The greatest differences occurred around 6 a.m. During the day, urban temperatures averaged almost 2ºF warmer.[3] The same study showed that the Dallas daytime heat island was more evident than Houston's.

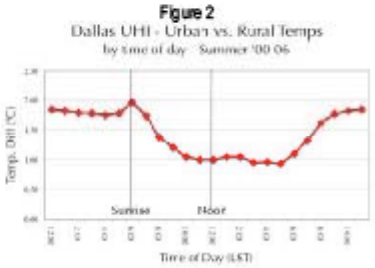
Table 1.
Average Land Cover in U.S. Cities

Surface	Percent	Temp Range °F
Pavement	40%	120-140°
Roofs	22%	150-190°
Vegetation	26%	120-140°
Other	12%	na

Land Cover and Heat Absorbing Surfaces

As land is urbanized, the size of the urban heat island often grows at a similar or faster pace. A study of Houston calculated that its surface heat island increased in geographic coverage by over 38% in the 15 years following the mid-80s, expanding at a faster pace than population growth.[4]

Figure 2



Urban Surface Characteristics

Pavement and buildings occupy over half of the developed surface areas of cities. As shown in Table 1, pavement on average in U.S. cities covers 40% and rooftops 22%.

Commercial and residential areas shown in Figures 3 and 4 are examples of urban surfaces in Dallas. The commercial area (Figure 3) consists almost entirely of pavement and rooftops with an average area surface temperature of 140°F (from thermal analysis in this study).

Figure 3. Dallas commercial site

Two adjacent single-family residential areas developed more than 50 years apart illustrate how tree cover changes over time in urban development. The area on the left was developed in the last three to five years and the other area over 50 years ago. The older area has extensive tree cover, narrower streets (less pavement), and more areas suited for tree cover (larger lots, deeper setbacks). Both areas have alleys and sidewalks.

Figure 4. Newer and older single family residential areas in Dallas

Impacts of Urban Heat Islands

Higher temperatures add to the critical challenges facing Dallas, including rising energy costs, air quality, and health. Higher temperatures require more electricity for air conditioning, with the highest summertime temperatures coinciding with peak electricity demand. For Dallas, the cost of additional electricity from urban heat island effects likely amounts to several hundred million dollars per year based on estimates for other cities.[5] Widespread heat island mitigation measures, such as cool roofs and extensive tree planting, could produce energy savings of $40 to $50 million annually.[6] These savings would be offset somewhat by the costs of implementing these measures, but the net benefit would be substantial.

Higher temperatures are also associated with higher levels of ozone, the key pollutant of concern for the Dallas-Ft. Worth area.[7] Higher temperatures also increase evaporative emissions of volatile organic compounds, such as gasoline, while forcing biogenic emissions from trees to higher levels.[8] VOCs are a key ingredient in ozone formation. Estimates from the heat island Mitigation Impact Screening Tool (MIST) suggest that a 1°F temperature reduction could reduce ozone by as much as 1.2 parts per billion (ppb), equal to 1.6% of the new federal 8-hour ozone standard of 75 ppb.

Higher temperatures, particularly during heat waves, are of concern for human health. Heat related illnesses occur during such events, even in Texas where there is more adaptation by people and buildings to higher temperatures than in cooler climates. Dallas experienced extended heat waves in 1980, 1996, and 1998 with several weeks of 100° and higher

temperatures. Accompanying increases in heat related health impacts included at least 23 reported deaths in the 1998 event.[9]

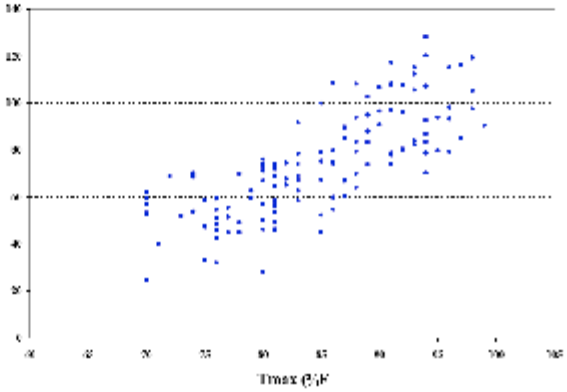
Reducing urban heat island effects can reduce these impacts while providing other benefits. For example, adding trees helps cool the city and, at the same time, assists in the control of urban runoff, improves the quality of life, sequesters carbon emissions, and contributes to human well-being. Cool roofs help cool the city by reflecting solar radiation, and can pay for themselves quickly through energy savings, particularly for older, less energy efficient buildings. The "cooling impacts" of such roofing are essentially free at the same time that the economic viability of the building is improved.

Dallas Air Quality

Ozone is formed in the atmosphere by interactions of volatile organic compounds (VOCs) and oxides of nitrogen (NOx).

Sunlight and heat are part of this equation, with higher temperatures often producing higher concentrations of ozone.

Figure 5.
Scatter plot of daily 8-hour peak ozone over the Baltimore Non Attainment Area versus the daily maximum temperature at BWI Airport for the year 2002 (May-September, N=138, Tmax ≥ 70°F).[10]



DALLAS SURFACE TEMPERATURES

The most prominent high surface temperature areas as shown in Figure 8 include: (1) an area extending northwest from downtown Dallas northwest along the Stemmons Freeway, (2) the two major airports, DFW and Love Field, and (3) several large industrial and warehousing areas. There are also large outlying areas where bare soils reach high temperatures during the day (large, plowed unplanted agricultural areas). It may seem surprising that central Dallas temperatures are lower than some of the outlying areas. This illustrates one of the differences between surface temperatures, which are time-specific and localized, and the urban heat island effect, which is a more complex phenomenon that includes surface temperatures as one component. Surface temperature imagery used in this report provides a useful indicator of urban heat island conditions.

Higher surface temperatures in the warmest part of the day will be found wherever exposed, unshaded pavement and rooftops exist. Some paved surfaces and rooftops cool more quickly after sunset than vegetated areas due to their thermal properties, such as emissivity (the ability of a material to release heat energy) and thermal mass. Surfaces may release heat more quickly after the energy source (the sun) is gone (after sunset). In addition, horizontal and vertical air movement affects overall temperatures.

The cooler daytime surface areas are due primarily to the Dallas urban tree canopy and wetter areas along waterways, such as the Trinity River and all of its tributaries. In general, the more tree cover, the cooler the daytime surface temperatures. Areas with older, larger trees do not reflect a great deal of solar radiation, but shade surfaces that would otherwise absorb and store this energy. In comparison, the air temperature in heavily vegetated urban areas (as opposed to surface temperatures) may stay somewhat warmer during nighttime in the summer due to reduced airflow.

At a more detailed level (Figure 7), hotter surface temperatures can be found throughout the city. These occur in association with commercial areas, schools, and even parks. These smaller "hot spots" exist wherever large exposed expanses of heat absorbing surfaces are found.

Figure 6
Dallas Tree Canopy/Dallas County

SURFACE COVER IN DALLAS

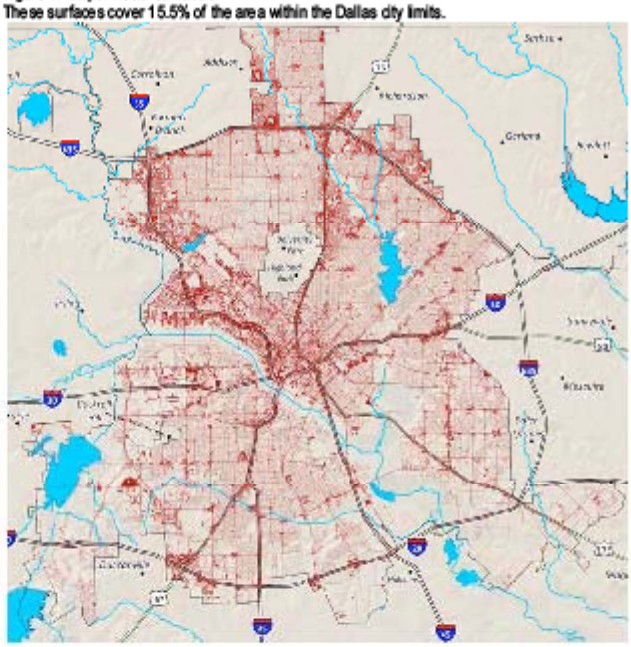
These two maps illustrate the major features of Dallas that affect the urban heat island – impervious surfaces such as paving and rooftops, and the tree canopy.

Concentrated Tree Cover

Residential Neighborhood

Area Parks

Figure 7. Impervious Surfaces
These surfaces cover 15.5% of the area within the Dallas city limits.



Concentrated Areas of Impervious Surfaces

Retail Center

Industrial Area

Page 6

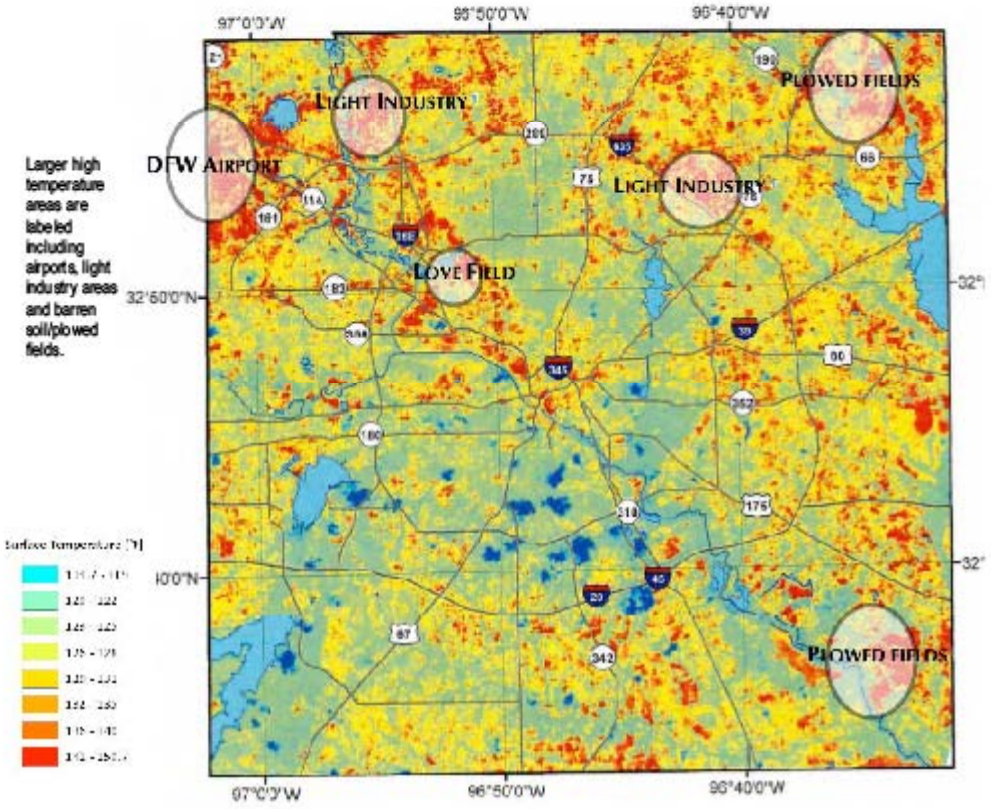


Figure 8
DALLAS SURFACE TEMPERATURES
Kinetic Thermal Corrected Aster Image – September 28, 2006, 5:25 pm

This thermal image of Dallas County surface temperatures was developed from 2006 ASTER satellite imagery . The hotter surfaces, shown in red, range upwards above 150°F. The light blue-green areas are cooler, more vegetated areas, as seen along the Trinity River Basin. The dark blue areas are cloud cover that was present at the time the images were taken.

SURFACE TEMPERATURES AND AIR TEMPERATURES

Air temperatures are usually measured at about 5 feet above the ground, where standard weather observations are gathered, such as DFW International or Love Field. There are not enough locations in most cities to adequately measure the variety of temperatures that occur across the city. Surface temperatures from satellite data show a snap shot in time of various surfaces, particularly flat, horizontal surfaces of rooftops and pavement. Some surfaces, such as barren soil and plowed agricultural land have high temperatures, but change rapidly as crops are grown or soil moisture changes.

REDUCING DALLAS URBAN HEAT ISLAND EFFECTS

"Everyone talks about the weather, but no one does anything about it." When Charles Dudley Warner, the 19th century author made this statement, he was likely unaware of how urban climates have been altered. Urban heat island effects include not only higher temperatures, but also rainfall locations and patterns, windflow, and moisture levels.

Heat island effects are primarily due to the way cities are built and the key surface characteristics. Urban surfaces can be changed to reduce these effects. The primary ways of accomplishing this are:

SURFACE CHANGES REDUCE URBAN HEAT ISLAND EFFECTS	
Trees	Substantially increased tree cover and vegetation to provide shade and natural cooling due to evapotranspiration
Cool Roofs	Use of roof surface that reduce heat absorption through higher reflectivity or with green roofs
Cool Pavements	Use of pavement surfaces that are more reflective or that minimize impervious surfaces

There are other approaches being analyzed, such as reducing waste heat from air conditioning or industrial processes. Even reducing motor fuel use (gasoline and diesel) reduces heat that is generated by car and truck engines. From an efficiency and engineering standpoint, waste heat is energy that could have been used for more beneficial purposes than making the city hotter.

Fortunately Dallas has already recognized many of the principles of urban heat island mitigation in its plans and regulations.

Changing a city's overall temperature is challenging and requires a longer term view and a thorough consideration of the additional benefits that result from mitigation measures. As an example of the magnitude, a multi-city study estimated that almost one million additional trees would be needed in the Dallas/Ft. Worth region to reduce the hottest areas by 1ºF.[11] However, based on a per capita distribution of such planting, the Dallas portion would be smaller. In addition, the time frame for expanding the Dallas tree cover would need to be considered, such as adding trees over a five-year period or setting an equivalent annual tree planting goal. Urban heat islands have been created over decades, and solutions will also take time.

Technologies and methods are available for the most part. *Trees* provide an effective strategy that is welcomed by most. The effects of trees are fairly well understood, they are commonly used, and they are available today. In addition, trees offer many other economic and community benefits, summarized below.

Cool roofing technologies exist for many building applications. This includes highly reflective roofing as well as newer roofing products that increase reflectivity through changing pigment chemistry to reflect infrared rays in the solar spectrum. *Green roofs/rooftop gardens* are also attractive for many applications, although less common in the U.S.

Trees are embedded as a singular feature throughout the Dallas Comprehensive Plan, forwardDallas!.

Cooler, more reflective pavements are already in common use in Dallas, and there are ways of improving their effectiveness further. Many types of *porous or permeable pavement* materials are also available that provide unique attributes to help cool the city while managing stormwater runoff. Engineers and developers are not as familiar with porous paving materials as with more commonly used pavements. There is less field experience that is needed to help overcome uncertainties about such materials.

INCREASING THE DALLAS TREE CANOPY

Dallas has a large and vital tree canopy, and conditions for tree growth are good in most parts of the city, as evidenced by existing tree cover. However, much of today's urban development and redevelopment begins with clearing tree cover and vegetation. Trees are an effective and inviting addition for Dallas, while

Figure 9: Dallas School with Cool Reflective Roof

helping to counteract urban heat island effects. The challenge is to increase tree cover, while also conserving and protecting the existing canopy.

Dallas is currently planting, protecting, encouraging, and requiring trees as part of the urban environment. This report outlines additional options that can be considered for enhancing the Dallas tree canopy. Air temperature data collected across the city in Portland, Oregon found that "the most important urban characteristic separating warmer from cooler regions was (tree) canopy cover, regardless of day of week or time of day." [12]

Implementing Cool Roofs and Green Roofs

Roof surfaces play a large role in heat island mitigation since they cover 20 to 30% of development, and they reach higher temperatures than other surfaces. In commercial and industrial areas, these percentages are even higher. Residential roof surfaces play an important role since they can account for more than half of the total roofing area.

Roof colors and the type of roofing material have the greatest effect on roof temperatures, which rise to more than 150ºF. on clear days. The added thermal load on air conditioned buildings can increase demand for electricity, produce higher peak demand from the electric power grid, and possibly accelerate deterioration of the roof and rooftop equipment.

Cool roofing materials widely available today are highly reflective and installed primarily on low-slope (flat) roofs. Dallas has included cool roofs in recent building code revisions aimed at environmental and energy improvements. There are also cool roof products for sloped roofs, including various tiles, coated metal roofing, and, more recently, reflective asphalt shingles. California has incorporated cool roofs into its statewide building code for low-slope roofs, and is considering requirements for sloped roofing, which would affect the residential roofing market.

Green/garden roofs incorporate vegetation into the roof assembly. A green roof cools the building by shading the roof membrane, which keeps out moisture, and also cools the roof through evaporating moisture from plants and the engineered soils holding the plants. Water quality and management have been the primary driving forces for green roofs in U.S. cities and in Europe. Energy savings and building standards are becoming more important in this regard.

Due to repair or replacement, low-slope roof surfaces are replaced or substantially changed as often as every ten to fifteen years. Maintenance can include changes in surface color and reflectivity over even shorter intervals of five to six years. As such, changing most roof surfaces is achievable in a ten to fifteen year period. Older, less energy efficient buildings particularly benefit from cool roofing energy savings.

Figure 10. Open mesh porous paving supporting vegetative cover

Changing Pavement Surfaces: Cool Paving

Paved surfaces are the largest portion of urban surfaces, averaging 40% in U.S. cities. This includes streets and roadways, but also parking, driveways, sidewalks and other impervious surfaces. Most paved surfaces change at less frequent intervals than roofing, but cool paving can be incorporated in new development or possibly as maintenance occurs. Some paving maintenance and resurfacing occurs at more frequent intervals, providing additional opportunities for creating cooler pavement surfaces. Redevelopment can also include changes to parking design and characteristics.

Cool paving technologies have a more reflective surface and may also include permeable pavements, which allow water to flow through creating a cooler surface. They can include cement or asphalt concrete paving and overlays, and many types of pervious/porous paving products.

Reflective pavements that use lighter color aggregates or bonding agents can be 15% to 30% more reflective. They can reduce surface temperatures by more than 20ºF. However,

Figure 11. Chip Seal Overlay with Reflective Aggregate

higher reflectivity also reduces nighttime lighting requirements for streets and parking areas.

Pervious, cool paving products are made from conventional cement and asphalt sources, but also include a wide variety of other technologies that include pavers, structural meshes, turf, and gravel. Pervious paving allows water to drain through, slowing its movement and helping to control urban runoff. It may also improve runoff water quality in other ways, such as reducing the temperature of runoff. If used as part of an area's drainage system, pervious paving may reduce the amount of impervious surface needed for stormwater detention.

Figure 12. Porous pavement

CONCLUSIONS

Dallas has an urban heat island problem that contributes not only to higher temperatures, but also problems of energy use, air quality, human health, and the quality of life. Dallas has recognized these problems and incorporated provisions in plans and regulations to help mitigate heat island effects.

Dallas has available mitigation measures and technologies that include acceptable strategies for adoption, demonstration, and testing. These include:

- Expanded use and care of trees and vegetation that help cool and green the city
- Cool and green roofs that produce energy savings for the Dallas economy while helping to address air quality concerns
- Paving strategies that can reduce solar energy gain, implement various LEED standards, and address stormwater issues

The benefits to Dallas of these measures need to be meshed within a longer term view that incorporates several policies. Dallas leaders already understand from air quality experience that there are no simple quick-fix solutions. Heat island effects are created incrementally year-by-year over decades and more. Similarly, mitigation measures require systematic actions year-by-year to reverse.

OPTIONS FOR URBAN HEAT ISLAND MITIGATION

The following page briefly summarizes options that can be applied to mitigate Dallas urban heat island effects. Detailed descriptions of these options are included beginning on the pages referenced with each set of options.

OPTIONS FOR TREES AND THE URBAN FOREST

Detailed descriptions of these options are included in the Dallas Urban Heat Island Final Report.

GOALS

- Establish an overall target for tree planting, such as the "Million Trees" initiatives organized in other cities

OUTREACH AND EDUCATION ACTIVITIES

- Consolidate existing information on city-based tree and urban forest activities within a common framework, such as a new tree planting initiative
- Actively include organizations outside of city government in achieving tree planting and conservation goals.

URBAN FOREST MANAGEMENT DATA

- Initiate an on-going tree inventory program to establish baseline data
- Launch an urban forest analysis project

FUNDING FOR TREE PLANTING AND CONSERVATION

- Increase the Dallas Reforestation Fund to leverage additional tree planting and conservation
- Establish capital improvements set-asides for tree planting and landscaping on public projects
- Support establishment of a utility-based, energy savings program to encourage tree planting on private property

REGULATIONS AND INCENTIVES

- Include tree planting and conservation in future State Implementation Plans (SIP) as a voluntary control measures
- Modify landscape and tree preservation ordinances to protect larger trees, increase tree placement, and increase trees planting during development

OPTIONS FOR COOL ROOFING ACTIONS

OUTREACH

- Inform target audiences of cool roof requirements as part of Phase 1 of the Green Building Program
- Through outreach efforts, emphasize the use of cool roofing for all re-roofing of low-slope buildings
- Showcase existing green roofs for their energy and stormwater management benefits

COOL ROOF POLICIES

- Encourage other entities in the region to adopt cool roof requirements and standards
- Consider inclusion of Energy Star cool roof standards for sloped roofs (25% or greater solar reflectance)

INCENTIVES AND REGULATIONS

- Include cool roof requirements in the Green Building Program for re-roofing
- Encourage electric utilities to provide cool roof rebates as part of their energy efficiency requirements
- Create specific provisions in building codes for green roofs
- Use stormwater fees to fund demonstration projects for public sector greenroofs and porous paving
- Support explicit inclusion of cool roofs in the State's energy code

OPTIONS FOR COOL PAVING ACTIONS

DEMONSTRATION AND OUTREACH

- Foster and support cool paving demonstration projects
- Create a database of existing cool paving applications to illustrate current uses
- Provide cool paving product workshops for staff, developers, and builders

POLICIES

- Create a unified cool paving policy that applies to parking, street medians, and freeways. Incorporate existing policies including:
    - Comprehensive Plan – forwardDallas!
    - Green Building Program
    - LEED Rating System provisions
    - Landscape Ordinance
    - Storm Water Management

INCENTIVES AND REGULATIONS

- Provide points in the Green Building program for cool paving
- Ensure supportive provisions in stormwater management regulations
- Add provisions to the zoning ordinance to limit impervious surfaces

ENDNOTES

[1] p. I-17, Dallas Comprehensive Plan, Vision, June 2006.

[2] From EPA UHI website heat island website, http://www.epa.gov/heatisland

[3] Darby, L. and Senff, C. J. Comparison of the Urban Heat Island Signatures of Two Texas Cities: Dallas and Houston. Seventh Symposium on the Urban Environment (Expanded View), 2007.

[4] Streutker, D. R.. 2003. Satellite-measured growth of the urban heat island of Houston, Texas. Remote Sensing of Environment

[5] Based on per capita energy savings for Houston, Sacramento and Baton Rouge from heat island mitigation measures, ranging from $15 to $20 per capita per year. Total heat island effects on energy would be several times this amount since measures in this report affected only part of the building inventory and the measures could reduce temperatures no more than 2ºF. Konopacki, S. and H. Akbari. 2002. Energy Savings for Heat Island Reduction Strategies in Chicago and Houston (Including Updates for Baton Rouge, Sacramento, and Salt Lake City). Paper LBNL-49638. Lawrence Berkeley National Laboratory, Berkeley, CA.

[6] Based on annual kWh savings per capita for Houston, Sacramento and Baton Rouge from Konapaki and Akbari; 295 to 328 kWh savings per capita @ 12¢/kWh for 1.2 million people in Dallas in 2006. Estimates for residential, commercial and office with reflective roofing and added shade trees.

[7] Walcek, C. J. and Yuan, H. Calculated Influence of Temperature-Related Factors on Ozone Formation Rates in the Lower Troposphere. 1995. Journal of Applied Meteorology. Vol. 34, pp 1054-1069.

[8] Scott, Klaus.; Simpson, James R.; McPherson, E. Gregory. 1999. *Effects of tree cover on parking lot microclimate and vehicle emissions.* Journal Arboriculture 25: 129-141.

[9] Emergency Response and Research Institute, http://www.emergency.com/htwave98.htm; 4/22/08 accessed/

[10] Charles Piety. 2007. The Relationship between Urban Tree Cover and Ground Level Ozone, Baltimore SIP submittal weight of evidence report. p. 6.

[11] Akbari, H., Shade trees reduce building energy use and CO2 emissions from power plants. Environmental Pollution, 2002. 116(Supplement 1): p. S119-S126. Estimate from p. S122, Table 1. Ft. Worth, 2.8 million trees for 1.6ºK reduction in hottest simulation cell.

[12] Melissa Hart* and David J. Sailor. Assessing Causes in Spatial Variability in Urban Heat Island Magnitude, Seventh Symposium on the Urban Environment (Expanded View), 2007.

December 18, 2008

The Honorable Angela Hunt
Dallas City Councilmember
1500 Marilla St., Room 5FN
Dallas, TX 75201

From: The City of Dallas Urban Forest Advisory Committee

RE: Young Street Landscape & Maintenance

Dear Councilmember Hunt,

As per your request, the landscape along Young Street in front of City Hall was evaluated with a goal of finding a more sustainable design that reduces the impact to the environment and increases the health of the existing trees as well as plants. As you are well aware, we can do a better job of managing street median landscapes and public areas in a fashion which reduces maintenance costs, water usage and impacts on the environment.

Contrary to popular belief, cost savings can be achieved without sacrificing aesthetic appeal. Establishing a more sustainable landscape does not lead to the conclusion that it will look like a desert. If you study the following photos of what exists and look at the photos of what could exist, you will see a much greater aesthetic appeal.

Depending on the level of sustainability determined to be acceptable for the medians, cost savings can be as high as 85% of the current maintenance costs. If these concepts were applied around Dallas, the annual cost savings could be measured in millions of dollars.

Respectfully,

Steve Houser
Dallas Urban Forest Advisory Committee Chair
Certified Arborist

Bill Seaman
Committee Member
Degreed Horticulturist

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City of Dallas Urban Forest Advisory Committee

Young Street Landscape & Maintenance

Consulting with the Park & Recreation Department regarding the current annual maintenance along Young Street, the following report was provided:

Grounds Maintenance:
Weekly mowing / edging throughout the year
Daily litter pick-up Monday through Friday throughout the year
Shrub trimming three times each year
Annual color program change out twice each year
Over seeding with Perennial Rye

Labor Hours involved:
385.1 hours

Water Schedule:
Three times per week @ 20 min with an average of 1" of water per week.

Cost:
$10,400 average cost to maintain each year.

Cost Considerations

Although the cost calculations above did not provide the details, they do provide a basis for comparison. As a result, the concepts and cost estimates to follow are approximate but they provide options for various concepts that are worthy of consideration.

Sustainability Concepts

The existing landscape offers a manicured look and as a result, any alterations would require a change in the aesthetic expectations and value judgments placed on the area by city officials. While some may value a manicured look, others may be willing to consider other options that are more sustainable in the long term. Which option is a priority and in what area, requires value judgments to be made by decision makers. As an advisory committee, our objective at this point is only to provide concepts to be considered rather than specific planting plans. Once a landscape concept is developed, a person or group with the proper credentials should be engaged to complete a landscape design that expresses the concept. It is important to note that the traditional landscape professional may not have an intimate and working knowledge of all the following concepts and plants.

The first concept to consider is a more sustainable practice relating to the turf areas which currently contain Bermuda grass. Most turf grasses presumably require a great deal of water (one inch of water, three times a week in this case) plus turf requires a great deal of maintenance (once a week mowing, edging and presumably, leaf blowing). Since water is a precious resource to be conserved and the hydrocarbon emissions from a mower, edger or weed eater add to our air quality concerns, turf replacement could be considered or an alteration in maintenance practices. Not only are hydrocarbon emissions from maintenance equipment a concern but also the evaporative emissions from fuel tanks or fuel spills. Another concern is that combustion engines are a major source of fine particle emissions that add to respiratory illness, according to the American Lung Association.

Options for Sustainability

Option 1) Altered maintenance practices could include the following with a potential cost savings of 40-50% or $4,160.00 - $5,200.00.

- Consider removing the Bermuda grass under the drip line of trees and replace it with native chip mulch to conserve water, increase tree health and prevent mower/weed eater damage. Mulch the Holly and color beds for the same reasons.
- Consider reducing the irrigation in turf/tree areas to once a week or every other week and water deeply. Current research from A & M University shows Bermuda can survive up to 145 days without water and still grow back from the roots. Watering three times a week is excessive, encourages shallow roots as well as pathogens and degrades soil health. Irrigation for trees and hollies could be reverted to drip irrigation and watering frequency as well as the number of gallons will be reduced.
- Consider reducing the mowing to every other week.
- Consider not over seeding with Rye Grass.

Option 2) Potential turf grass replacements could include the following with a potential cost savings of 65-75% or $6,760.00 - $7,800.00.

- Consider removing the Bermuda under trees and replace it with native chip mulch as noted in the previous option plus mulch the Holly and color beds.
- Consider removing a portion or all the Bermuda and replacing it with various types of native grasses or groundcovers that would require minimal water to get established and minimal mowing or trimming, once they are established. As only general examples; Sideoats grama, (our state grass), Inland sea oats, or Buffalo grass. Buffalo grass requires mowing only twice a year. Groundcovers could include plants such as Frogfruit, Horseherb or Lambs ears (photos to follow).
- Consider watering grass areas (once converted) only during extended droughts. Irrigation for trees could be converted as noted above and the frequency as well as the number of gallons would be reduced.
- Consider not over-seeding with Rye grass.

Option 3) Consider installing more permanent, low water use plant material (or perennial plants) in place of the plants installed two times a year for color. This would be in addition to the potential option number two previously noted and provide a potential cost savings of an additional 5% bringing the total savings to 70-80% or $7,280.00 - $8,320.00. Many plants can be utilized for this purpose such as Lantana, Turk's cap or Salvia greggii.

Option 4) Consider replacing the Holly with low water usage plants that may reduce maintenance costs and increase the aesthetic appeal of the landscape. This option would require landscape design and installation costs but long term could add an additional 5% to the long term maintenance savings. Assuming all the previous options were instituted, the additional total savings could be 75-85% or $7,800.00 - $8,840.00. Many plants can be used for this purpose such as American beautyberry, EarthKind™ roses or Texas sage. It is **important** to note that including all the options above, the landscape would be compliant with the Integrated Storm Water Management (ISWM) criteria plus use low to no water, require greatly reduced maintenance and have few to no insect or disease problems.

Plant Material Considerations

The following photos provide an idea of the plant material noted:

Grasses:
Sideoats grama

Inland sea oats

Buffalo grass

Groundcovers:
Frogfruit

Lambs ears

Horseherb

Perennial Flowers:

Turk's cap

Lantana

Salvia greggii

Shrubs:

American beautyberry

Texas sage

Texas sage after rain

EarthKind™ roses

Current Condition

The following photos provide a view of the existing median landscape on Young Street from Griffin Street to Ervay Street:

Young Street heading east from Griffin Street

Young Street heading east from Marilla Street

Young Street heading east from Akard Street

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Volunteer Hours and Value Calculations

Monthly Meeting Hours and Value

The total number of volunteers attending meetings was recorded in the minutes of the meetings. The following notes the number of attendees and assumes approximately fifty percent are responsible for management in some form or capacity.

- January (21)
- February (24)
- March (14)
- April (18)
- May (23)
- June (23)
- July (18)
- August (20)
- September (16)
- October (17)
- November (25)
- December (20)
- Total number of those attending meetings during 2009 = 239
- Assuming an average 2 hour meeting, 239 hours x 2 hours = 478 hours
- Assuming an average of a one hour drive time per person, per meeting, 478 + 239 = 717 hours
- Assuming half are managers, 717 ÷ 2 = 358.5 manager hours
- Assuming $85.00 per hour for managers time, 358.5 x $85.00 = **$30,472.50**
- Assuming $20.80 per hour for volunteer time, 358.5 hours x $20.80 = **$7,456.80**
- Assuming 12 monthly meetings with 239 attending with an average of 10 miles of driving for each member = 2390 miles times 14 cents per mile (per IRS regulations for volunteer organizations) = **$334.60**

Total Meeting Hours and Value

$ 7,456.80	(Volunteer Time)	(358.5 hours)
$30,472.50	(Managers' Time)	(358.5 hours)
$ 334.60	(Mileage)	(2390 miles)
$38,263.90	**Total Meeting Value**	**(717 Total Hours)**

Other Management Related Volunteer Hours and Value

Other management related hours include managers in the following areas:

- Citizen Forester Team Leader
- Public Relations and Media Team Leader
- Wood Waste Recycling Team Leader
- Tree Planting/Transplanting Team Leader
- Land Planning, Development and City Codes Team Leader
- Forest Surveys, Inventory & Tracking Team Leader
- Committee Secretary
- Assistant Committee Secretary
- Committee Chair and Personal Assistant
- Liaisons for various community groups

- Total management volunteer hours = **3,592**

- Management volunteer value with an average of $85.00 per hour x 3,592 = **$305,320.00**

Citizen Forester Volunteer Hours and Value

- Hours reported by Citizen Foresters = **1360.20**

- Total volunteer hours at $20.80 per hour = **$28,292.16**

Other Volunteer Time and Value

There are currently 217 members, advisors and supporters which read an average of two (2) committee emails a month from the chair at an average time of 10 minutes each:

- 217 supporters x 24 emails in a year = 5,208 emails received
- 5,208 emails x 10 minutes each = 52,080 minutes
- 52,080 minutes ÷ 60 = 868 total volunteer hours
- 868 total volunteer hours x $20.80 per hour = **$18,054.40**

Total value of other time: **$18,054.40**

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