Comprehensive Park Tree Inventory

The City of Plano is currently working under a Texas Forest Service grant to conduct a comprehensive geographic information system (GIS) based tree inventory of its park land. It is important to inventory our urban forests so that we can evaluate its qualities in order to determine how it should be managed.

Data is collected to serve several purposes. The main purpose is to create a GIS layer of the trees. This layer is a digital point coverage file that can be used as a map overlay in mapping software such as ArcView. The following is information that we use to develop in-house work plans and management plans:

- Species
- Diameter
- Health
- Insect
- Disease
- Cavity location
- Weak fork
- Percentage of deadwood
- Type of maintenance
- Removal priority
- Site problem

We also collect data for processing in CityGreen5, an ArcView extension created by American Forests and ESRI. CityGreen5 calculates the amounts of environmental benefits trees provide such as air pollution removal, carbon storage, storm water abatement and energy conservation. It also calculates the dollar values of these environmental benefits. CityGreen5 will also growth model up to 50 years and project the environmental benefits in those future years. The following data is collected in order for CityGreen5 to perform its calculations:

- Species
- Diameter
- Radius of the canopy
- Height
- Health
- Growing conditions

For trees that are greater than 8” in diameter, they are appraised using the Trunk Formula Method per the Guide for Plant Appraisal, 9th Edition by the Council of Tree and Landscape Appraisers, published in 2000 by the International Society of Arboriculture. We also use the Texas Supplement to the Guide for Plant Appraisal, published in November 2003 by the International Society of Arboriculture, Texas Chapter. The following items must be included when conducting a tree appraisal:

- Species
- Diameter
- Structure & health of roots
- Structure & health of trunk
- Structure & health of scaffold branches
- Structure & health of small branches & twigs
- Health of foliage and buds
- Site rating
- Contribution rating
- Placement rating

Looking at all of the data on the trees statistically, we have been able to make several general conclusions about the trees we have surveyed thus far. We have found that generally the parks' trees are in good condition. We have also found that insects that feed on trees are not a serious concern at this time. Most cavities that occur on park trees are buttress cavities that are caused by mechanical damage or construction damage and are often sites of decay. About 40% of the trees in parks contain some level of deadwood, and the most prevalent type of maintenance needed is crown cleaning. And, we have found that in most parks there is a need for more tree planting.

Since starting the project in March of 2003, we have collected data in more than 75 parks totaling over 2700 acres. We have collected data on over 12,000 trees. Using CityGreen5 we have found that the value of the air quality benefits provided by the trees inventoried is worth more than $190,000 a year, and the annual value of storm water runoff benefits is worth more than $3.9 millon. The tree appraisals reveal that the trees inventoried thus far have a value of more than $110 million.

We are looking forward to a positive impact on the community with the information we have generated from the tree inventory. With the information generated, citizens will gain new insight into the diverse ways that Plano's park trees provide environmental benefits and how they are valued. In addition, the appraised value of the trees inventoried is a significantly new way to look at the values of trees. And finally, the inventoried trees are slated to receive improved care, which provides for longer lived trees, more aesthetically pleasing trees and for a safer place for people to recreate.