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GEOGRAPHIC INFORMATION SYSTEMS DEPARTMENT

Have you ever thought about the qualities that are used in determining a tree planting site or a wildflower planting location? Because the criteria are essentially geographic in nature, selecting planting locations is accomplished with the help of the Infrastructure Geographic Information Systems Department. The District needs reliable data along its channels for selecting such project sites. Geographic Information Systems (GIS) helps in this endeavor. The District's GIS staff has over 40 years of implementation and management experience in GIS.



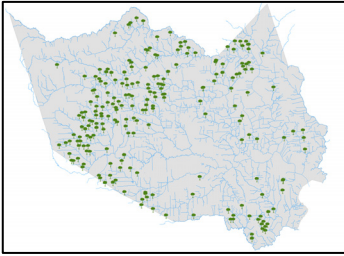
Sample Map in the GIS Software.

What is GIS? GIS is a mapping system that allows users to view, understand, question, interpret and visualize data in many different ways. GIS technology is a computer-based system used to store, retrieve, map, and analyze multiple forms of data from a spatial context such as road networks, subdivision plats, floodplains, governmental agency boundaries, aerial photography, and more. This data can be entered into GIS and analyzed to discover how each layer relates to one another and to give the user a better understanding of a selected area. For example, the District previously recorded information on parcel maps, known as BACA maps, in the office for identifying rights of way. Each parcel, or tract, of land has a numeric identifier (i.e. a plat and lot number). In order to retrieve any details about a particular tract of land, such as the owner's name or address, one would have to search a separate database or hard copy file. With GIS, a map of the parcels and all related information to those parcels are automatically linked. A user merely clicks on a displayed tract of land on a GIS map in the computer to view all information associated with that parcel.

Performing proper GIS analysis requires two basic fundamentals: accurate data and appropriate selection criteria. A good GIS analysis begins with accurate data. Data integrity is essential. In addition, it helps to examine the sites to establish specific selection criteria. These two fundamental components will ensure a high quality analysis. GIS and the Property Management Department are currently working together to

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GEOGRAPHIC INFORMATION SYSTEMS *(continued from page 1)*



Sample GIS tree planting map.

perform comprehensive channel assessments for evaluating vegetation management locations. A specified criterion is used to identify sites for activities such as tree and wildflower plantings. The following criteria are used for tree planting site

selection: the area must be located in the upper end of a channel; the area is actively being mowed; if the site is in a developed area or not (high visibility); and the right of way width must be at least 100 feet. For the wildflower site selection, the District considered locations with high public exposure (i.e. near a park or school, along hike and bike trails, or on District rights of way along a major road). Using these criteria, potential sites are identified as suitable planting locations. Other vegetation management activities analyzed through GIS include herbicide, pruning, and selective clearing locations.

The District collects all the above mentioned data through staff positions known as Outfield Data Collectors. Data collection is the gathering of information to address critical factors that were identified earlier in the process. In 2003, the GIS Outfield team began collecting up-to-date images and information of the District's flood control infrastructure. Over time, all District channels were visited by the Outfield Data Collectors to gather information that can be analyzed and evaluated for

future maintenance activities and project sites. Thus far, the Outfield Data Collectors have compiled over 120,000 features and related images. Data collection is an ongoing process within the District because the information being collected is ever changing. Equipment for collecting data includes items such as geographic positioning systems, laser finders, cameras and mobile handheld computer units. The laser finder is a tool used to measure distances from a specified point. All of these tools are essential in establishing locations and conditions on a channel. Slope failure or inadequate vegetation and soil types are examples of channel conditions that can be identified by the outfield data collectors. A dictionary of all the data terms was established and downloaded into the mobile units allowing the field data collectors to input the data properly.

In summary, the Infrastructure Division's Geographic Information Systems Department is responsible for the development and maintenance of various GIS applications and datasets pertaining to the District's infrastructure. The District is able to analyze information to aid in decision making for each department. These applications and datasets accelerate decision making by providing users a fast, easy and accurate way to pull internal and external information from one source. GIS plays an essential role in the integrity of the District's data. GIS staffers continuously strive to improve data quality by utilizing special GIS tools that validate and manage District information.

COMPLIANCE



District staff correctly using a pole pruner.

The District recently made some modifications to safety procedures regarding hand tools and power tools. The new safety procedures have already been distributed to field personnel. The revisions focus on pre-operational procedures for power tools, mainly the

start-up process. The previous procedures allowed staff members to start a power tool while holding it

in their hands. The new safety procedures require power tools to be on the ground when starting. Also included is a requirement for visually inspecting power tools to make sure they are in good operating condition before starting. The new procedures also emphasize specific uses for each tool, such as pole pruners. Pole pruners are to be used to trim vegetation that is above waist level, not for vegetation at ground level. In February, the District had its first Storm Water Pollution Minimization Plan audit. No major issues or discrepancies were found. The District passed the audit and is in compliance with all storm water protocol.

FLEET MANAGEMENT



District vehicles parked in the shop area at the North Service Center location.

Hurricane season began on June 1. The Fleet Management Department has been evaluating the District's supply needs to prepare for the upcoming hurricane season. There are many supplies that need to be ordered, but two main items are always in the forefront for hurricane supply readiness: pole pruners and chainsaws. All the associated supplies for these two items will also be in stock during the season. Supplies such as chains for the chainsaws, oil, safety glasses, chaps, and empty gasoline cans will be on hand. Fleet Management also completed the preventative maintenance on the

portable generators and air boats as part of preparing for the upcoming hurricane season. The District chose not to purchase replacement vehicles this year. After evaluating the condition of the fleet (passenger vehicles), the District decided to maintain its current inventory of vehicles. All existing vehicles were assessed and found to be in good operating condition. Currently, the District owns 170 vehicles and uses county contracts with various dealerships for maintenance of those vehicles. "It just makes good sense to let the dealerships handle the maintenance and repairs because they already have the certified personnel and the specialized tools that may be needed," stated Lowell Jacobs, Manager of the Fleet Management Department. It also saves the District money in payroll costs to not hire extra personnel with the appropriate expertise to handle any major repairs.

PROPERTY MANAGEMENT



The District's Citizen Service Center staff at work.

The District is prepared for the approaching hurricane season and the Property Management Department's hurricane preparedness plan is in place. Debris collection "hot spots" have been identified as well as all road and bridge crossings throughout Harris

County. A systematic assessment plan has been established to make sure these locations are clear of debris prior to an extreme event. based utility and workflow tool used by the CSC to manage reported infrastructure problems. The new RAP application went online as of December 16, 2009. Service Requests are created and routed electronically increasing efficiency and eliminating massive amounts of paperwork.

Harris County public projects dominated the Development Coordination and Inspection Section (DCIS) activity for the first quarter of 2010. DCIS is working in cooperation with the Harris County Public Infrastructure Department in creating a new process with new District protocols for accepting county drainage facilities into the flood control maintenance program, including channels and basins associated with road projects. The District accepted two facilities during this quarter. The two facilities totaled 10.32 acres. For 2009, the District accepted a total of 151 acres of new facilities into its maintenance program.

MAINTENANCE ENGINEERING



*Sediment accumulation on HCFCD
Unit K149-00-00.*

Sediment is soil, sand and debris that washes from land into a channel, usually after a rain. Over time, accumulations of sediment can reduce the capacity of water in channels, block storm sewer outfalls and effect water flow. The District analyzed sediment accumulations in various channels for possible removal sites. Fourteen channels across the county were selected (ten earthen channels and four concrete channels). The

projects will bid during the second quarter of this year. The construction phase of the projects is anticipated to begin during the third quarter.

Before a sediment removal project can be released for construction, the project must be surveyed and the sediment tested for any toxic or hazardous substances. The absence of toxins in the sediment is verified before the project is transferred to construction for removal of the sediment. All sites were reported as non-hazardous with no toxins present. Preparation costs of survey data and testing of the sediment for these 14 sites are approximately \$205,000. Construction costs to remove the sediment are estimated to be \$597,000.

FACILITIES MAINTENANCE



*Bagged trash waiting to be removed by
the District during Trash Bash 2010.*

The District assisted in trash removal for the 2010 Rivers, Lakes, Bays n' Bayous Trash Bash. The Facilities Maintenance Department picked up large debris, specifically tires, and removed piles of trash from ten specified sites. The 2010 Trash

Bash included a total of 16 separate sites that were cleaned up by local volunteers. District crews hauled away more than 60 cubic yards of collected debris and 31 used tires.

Wildflower season is in full bloom and the District made some major contributions to the planting effort around Harris County. Forty acres of wildflowers

were reseeded this season and 50 additional acres were planted at the beginning of the year.

The District finished planting 26,684 trees at the beginning of April, which included 5,000 trees from a grant by the Apache Foundation. Facilities Maintenance also planted many species of trees from the District tree nursery, including Loblolly Pine, Bald Cypress, Shumard Oak and Red Maple. The newly planted trees will be maintained by the District for two years.

The District not only plants new trees but also relocates existing trees that impede maintenance activities. Twenty-eight trees were removed from a tributary of Halls Bayou (Unit P118-23-00) due to upcoming sediment removal projects. The trees were relocated to other flood control properties, specifically the District's North Service Center.