

70-02-Geographic Information Systems

Fund/Agency: 001/70	Department of Information Technology	
Personnel Services	\$1,103,178	<p>CAPS Percentage of Agency Total</p> <p>94.7%</p> <p>5.3%</p> <p>■ GIS ■ All Other Agency CAPS</p>
Operating Expenses	\$665,765	
Recovered Costs	(\$45,294)	
Capital Equipment	\$400,000	
Total CAPS Cost:	\$2,123,649	
Federal Revenue	\$0	
State Revenue	\$0	
User Fee Revenue	\$46,583	
Other Revenue	\$19,867	
Total Revenue:	\$66,450	
Net CAPS Cost:	\$2,057,199	
Positions/SYE involved in the delivery of this CAPS	20/20	

► CAPS Summary

The Geographic Information Systems Branch (GIS) provides high quality geo-spatial infrastructure, innovative analytical applications products, and mapping services to Fairfax County government agencies and the public.

It updates, maintains, and publishes the parcel and zoning maps for the County, and is responsible for assignment of the unique Parcel Identifier Numbers (sometimes called map numbers) for every parcel in the County. It also maintains and produces the large format wall maps, of which approximately 10,000 are distributed annually. All of the data for these maps, as well as many other categories (or layers) of information are now maintained by GIS for the entire County in a highly accessible GIS data warehouse. The core spatial data warehouse includes digital aerial photography parcel information, zoning and over 100 additional layers. The Data Warehouse is discussed in a following section.

Department of Information Technology

In addition to continuing to provide the historic and mandated baseline of parcel and zoning mapping, aerial photography, and zoning research, the GIS has dramatically expanded data and mapping services to the County overall during the last five years, with the same level of staff support.

Agencies Served

The GIS Branch provides mapping and data to essentially all of the County agencies. The most active users of GIS are contained in Table 1.

Table 1 - Most Active Users of GIS

Table 1:
Board of Supervisors
Department of Human Services – Environmental Health and RAPS, Office for Children
Department of Public Works and Environmental Services – Planning and Design, Urban Forestry
Department of Public Works and Environmental Services – Surveys, Stormwater
Department of Public Works and Environmental Services – Wastewater Management Program
Department of Planning and Zoning
Department of Tax Administration
Department of Cable Communications and Consumer Protection
Fairfax County Economic Development Authority
Fairfax County Public Libraries
Fire and Rescue Department
Office of Transportation
Park Authority – Archeology
Police Department - Crime Analysis and Police Crime Reconstruction Unit
Public Safety Communications Center
Electoral Board and General Registrar
Fairfax County Public Schools
Water Authority

Today, the GIS Branch has the ability to monitor the actual number of different users to track statistics relative to usage and activity. Currently the Branch has 137 unique uses of the centralized Citrix-based GIS software per week and 580 connections to the GIS files server per week.

Thanks to innovative new technology (Citrix), the GIS Branch can now deliver GIS to the desktop of any County employee connected to the County's WAN at no additional hardware or software cost to the end user. Additionally, via the World Wide Web, the GIS Branch is providing hundreds of thousands of maps to the general public. This is a dramatic increase over the number of users that GIS could accommodate in 1996. At that time individuals had to have the proprietary GIS software loaded on their computers to be able to operate it.

Department of Information Technology

GIS Data Warehouse

The GIS Data Warehouse consists of over 200 layers of data that fall into the general themes listed in Table 2. The approximate number of actual GIS layers in each of those themes is also listed. Not surprisingly, the two themes with the largest number of layers are Property and Political Areas. Property's size is due to the complexity of tracking parcels (condominiums, apartments, single family, town homes), and the large number of different political districts (e.g., schools, magisterial, State, Federal).

Table 2 - GIS Layers

General Themes	Approximate Number of Layers
Property	30
Zoning	15
Planimetric	14
Contours	8
Digital Orthophotography	11
Control Points	1
Street Centerlines	3
Sewer/Water Infrastructure	10
Emergency Services Areas	11
Political Areas	25
Other Layers	82

These layers represent a large amount of data. The entire GIS Data Warehouse now has over 50 million data elements on the 399 square miles of land Fairfax County. These elements include over 250,000 buildings, 570,000 contour lines, 3,400 miles of roads, 325,000 parcels, 340,000 addresses, 2,800 miles of waterways across 444 map tiles. Overall, the Warehouse consists of 25 GB of vector data and 350 DB of raster (imagery).

Currently, the GIS Branch is the "owner" of all of the data in the GIS warehouse. The GIS Branch enters its data (parcels, zoning, planimetric data, orthoimagery) into the Warehouse and selectively serves it to both the County staff and to the general public. A number of agencies also provide the data to the GIS Branch for entry. The GIS Branch then digitizes the data, sends it back to the provider agency for quality assurance checks and then posts the updated content to the GIS data warehouse. Over time, certain agencies will be given the ability to directly digitize/enter their data into the Data Warehouse. The GIS Branch will then conduct final quality control tests and publish the data.

GIS in Fairfax County: A Brief Background

The years 2000-2001 have been a milestone period for the GIS Branch. The traditional Mylar maps that the County has maintained for decades, were officially retired. The Office is now digital. The foundation for this transition occurred over 15 years ago when the County started investigating and planning an enterprise GIS project in the mid 1980's. From 1991-1993, the then three-member GIS team conducted a comprehensive applications survey to determine potential uses of GIS and help form a detailed database design. In 1995, the County implemented a project called "Quick Start" that converted 17 small-scale data layers (e.g., Magisterial District, School Attendance Area, Public Facilities Maps) and the implementation of desktop GIS software around the County. In 1997, the County initiated a large-scale data

Department of Information Technology

conversion contract that consisted of the conversion of all parcel, zoning, contours, and planimetric data. Delivery of GIS data from that contract began in 1998. In 1999, Fairfax County implemented a server-based GIS data Warehouse and Application Server that enables any County employee connected to the LAN to access not only GIS data but also the GIS applications. Specifically the Citrix server technology has completely changed the GIS paradigm for the County - and enabled greatly expanded GIS usage with no increase in GIS licensing fees at the desktop. Now, managers do not have the additional burden of upgrading hardware and purchasing software to implement GIS in their offices. Rather, they only need to identify the processes and train the individuals to use GIS as part of their jobs. This removes what had been a significant barrier to the use of GIS in the past.

Since 1995 the use of GIS has grown substantially each year. The statistics from FY 1998 through FY 2002 are listed in the Performance/Workload Section.

GIS Branch Services

The GIS Branch provides a wide range of services to County agencies. These services are tailored to both support the ongoing work of digitizing parcels and foster growth in GIS understanding and use across County agencies. In addition to providing the software, data and server support that ensures GIS is available across the County, the Branch provides a range of specific services for any County Agency. The following is a brief summary list of the GIS Branch Services.

- **Training:** Regular overview and hands-on GIS software training sessions are offered to any County staff. Some of the training is Web-based, while others range from brief overviews, to intensive hands-on training using actual County GIS data.
- **Software Support:** Any County GIS user can call for support on GIS software and mapping issues. At least one GIS staff member is dedicated every day to answering help calls.
- **Database Support:** Many times GIS users need to link their data to the GIS database. The Branch provides them assistance in not only the linking of the data but database selection and design.
- **Project Support:** Many GIS users need only thematic maps for a limited number of projects. The GIS Branch works with these individuals to determine their data and mapping requirements, and then build and print the required maps.
- **Application Development:** The GIS Branch works with other County agencies to develop specific applications for their business processes. It can provide in-house staff and/or contractor programming staff to develop agency specific applications.
- **Spatial Data Updates:** The Branch is also responsible for updating key components of the GIS data warehouse - in particular the digital orthophotography, planimetric, and cadastral data. The GIS staff has expertise in each of these areas, enabling them to draft project proposals and manage the resulting work.
- **Walk-in Customer Support:** The Branch serves dozens of citizen and County agency requests daily through its front desk. Customers are provided copies of maps and property plats, interpretation of maps, aerial photography for environmental and zoning research, and customized mapping through public terminals that are linked directly to the GIS data warehouse and the Branch's high speed plotters. The front desk also provides copies of digital data to the public.

Department of Information Technology

- **Public Support via the World Wide Web:** The GIS Branch now serves both data and software functionality via the Web to County Staff and GIS data via the web to the general public. This service, instituted over the last two years, has provided dramatic growth in functionality. As noted in the Performance/Workload Related Data section, this service is projected to serve over 400,000 map images in FY 2002. This is a service level far beyond anything that could have been provided in the past.
- **Publications:** The GIS Branch Staff has authored six papers in the last two years documenting the proven leading-edge work that they are doing in GIS. The papers have included "Transit GIS Applications in Fairfax County, Virginia" in the Journal of Public Transportation; "Shared Geography: Building a Common Street Centerline Resource to Service State and County Governments", "Achieving Enterprise GIS Data Integration in Fairfax County - Using GIS Every Day", "Implementing a Server Based Computing Solution in an Enterprise GIS", and "GIS Quality Assurance - Data Acceptance Specification and Control", all presented at and published in the URISA 2000 conference and proceedings. "Fairfax County Virginia GIS: Planning, Design and Implementation - The Critical Steps" was presented at the ESRI 2000 User Conference and published in their proceedings. These publications have been widely distributed and requested. We have received inquiries from around the world on their content.

To provide these services, the Branch has organized its staff into four discreet groupings including Systems, Data Acquisition and Maintenance, Applications, and Customer Services.

Accomplishments

Over the past three years as the high resolution, high accuracy GIS data became available, and as GIS implemented new server and software technology, GIS use has grown across the County. The County has also received both national and international recognition for its GIS operations.

The GIS Branch has also inaugurated the GIS Excellence awards, awarded on National GIS Day (Mid-November). The award series is intended to highlight excellence in GIS use across the County agencies. The judging panel consists of senior staff as well as outside participants to objectively judge the submissions.

GIS Awards to the County

ESRI

In 2000, the GIS Branch received awards from ESRI, the world leader in GIS software. Fairfax County was selected from more than 60,000 organizations worldwide to be honored for its work in GIS technology. The Special Achievement in GIS awards were presented by ESRI at its twentieth Annual International User Conference in June 2000 -- the world's largest gathering of GIS professionals.

ESRI awarded Fairfax County two separate Special Achievement awards. One is for the efforts of the GIS and Mapping Systems Branch, and the second is for the countywide utilization of GIS. This is the first time that ESRI has honored a municipal government. The Special Achievement Award honors an elite group of organizations that have embraced GIS technology to better serve the world.

Department of Information Technology

NACo

In June 2001, the GIS Branch received an Achievement Award from the National Association of Counties (NACo) for its collaborative GIS project with the Virginia Department of Transportation.

Begun in 1970, the annual Achievement Award Program is a non-competitive awards program, which seeks to recognize innovative County government programs called County Model Programs. Created as a part of NACo's New County, USA campaign, the Achievement Award Program continues to embody the grassroots and local government energy the program was designed to promote. The main emphasis of the New County, USA campaign was to modernize and streamline County government and to increase its services to its citizens; goals that are still the main emphasis of the Achievement Award Program today.

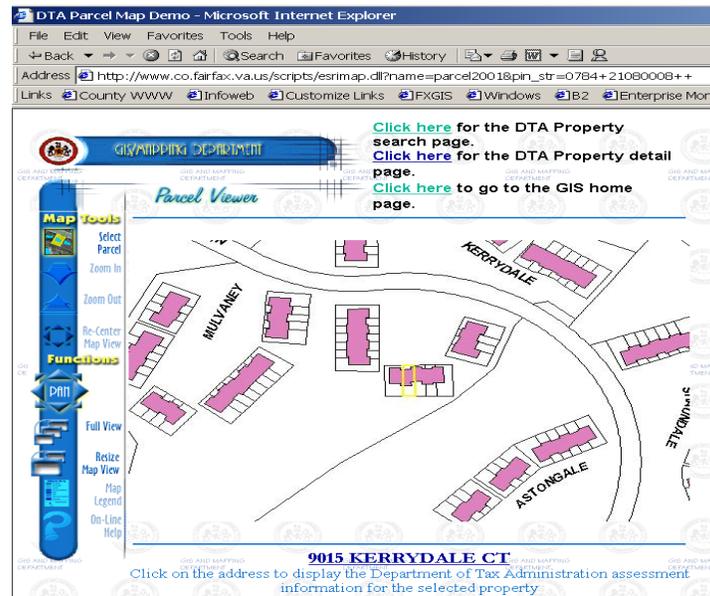
High Profile Achievements with County Agencies

The GIS Branch in conjunction with other County Agencies has established a number of successful GIS projects. In several cases there were significant savings to the County. These projects, along with those listed in the general project section, demonstrate the increasing use that County agencies are making of GIS. In the process they are offering services never possible before, delivering savings in current operations, enhancing existing services, and overall delivering better services to the County. The following are six examples of GIS use within agency programs.

Example 1: Parcel Web Application – Department of Tax Administration

In March of this year the GIS staff produced an interactive Web mapping application that allows people to look up real eState information and then see an associated property map. This application has traditional mapping functionality such as pan and zoom capabilities. The real power is that the application allows citizens to look and select any parcel on the map and see sales, assessment, and building description data. The application can be accessed at: <http://www.co.fairfax.va.us/dta/re/detail.asp>.

A screen shot of the interface appears below.



Example 2: Refuse Rerouting Project – Department of Public Works and Environmental Services

In May of 2000, the County completed work on a 3-year project to re-route the entire County operated refuse collection vehicles. The project was a huge success and GIS was the component that enabled the whole project to take place. A paper detailing the initial phases of this project was presented at the 1999 ESRI User conference. The paper, titled "Optimizing Refuse Collection Routes in Fairfax County, VA" is available for download from the ESRI web site at: http://www.esri.com/library/userconf/proc99/proceed/indices/title_o.htm.

Over a dozen people from around the world have written asking for more information and advice on setting up a similar project in their area. This project was also featured in the August 2000 issue of Government Computer News State and Local.

Example 3: Customized Comparable Property Mapping Application – Board Of Equalization

The Department of Tax Administration has used a customized GIS application since 1996 to create maps presented to an independent panel called the Board of Equalization. Each year citizens have the right to appeal their property tax assessment. Those cases are heard by the 12 member Board of Equalization. For each appeal, County real estate appraisers are required to create a map showing the subject parcel and any comparable parcels used in making the assessment.

Prior to 1996, appraisers spent considerable time hand coloring tax maps and were often required to cut and paste tax map tiles together in order to make a final map. Since 1996 this process has been done using GIS. A new release of the application has been produced each year.

Example 4: Transit/Transportation GIS Usage – Department of Transportation

The Department of Transportation is currently using GIS to support its' transit planning operations. The Transportation Department has just completed digitization of all routes for County maintained and operated buses, and is in the process of conducting a pilot study for collecting bus stop information using GPS receivers. A detailed outline of GIS transit applications has been published in a special GIS issue of the Journal of Public Transportation.

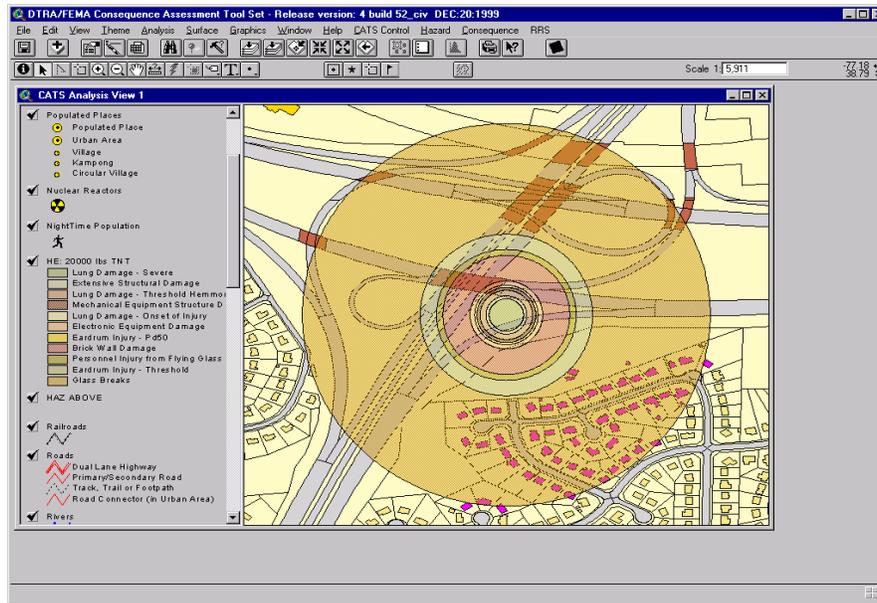
Example 5: Redistricting – Office of the County Attorney and Electoral Board and General Registrar

Fairfax County has completed the reapportionment of its supervisor districts for the upcoming 2001 elections. As part of the process the Board of Supervisors established a citizen advisory panel to propose options for the revised supervisor districts. A news article about redistricting is available under the News section of the County's home page at www.co.fairfax.va.us.

Example 6: Crime Analysis, Emergency Response to Black Powder Incident – Police Department

The Police Department has utilized GIS-based crime analysis successfully too. In several instances Crime Analysts were able to identify probable sites for subsequent crime. Police Officers staked out these sites and arrested the suspects.

In the summer of 1999, a truck carrying high explosives overturned on the northbound exit ramp of I-95 in Springfield, the most congested interchange in the entire County. Police used a mobile GIS terminal to plot maps showing the potential damage area. These maps were used by officers to assist with the evacuation of the danger zone. Refer to the map listed on the next page.

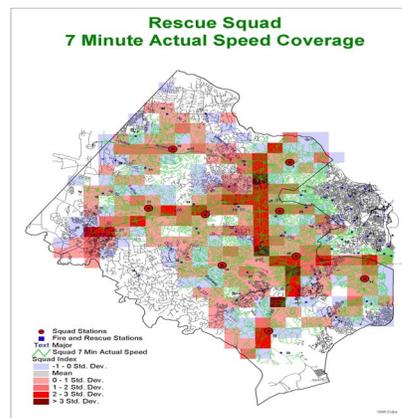


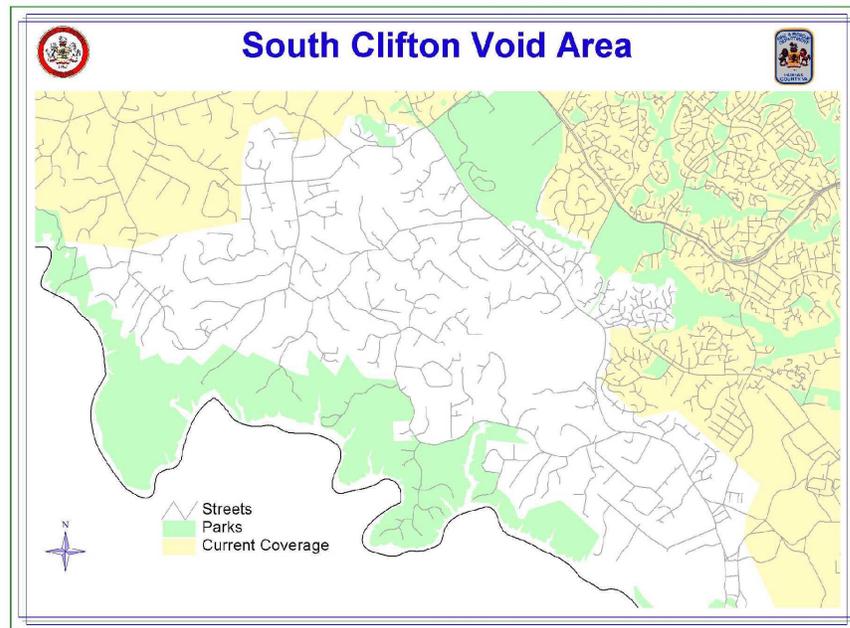
Other Successful Uses of GIS Across the County

This section contains examples of day-to-day use of GIS in other agencies. As discussed previously, the map listed above shows that there is growing understanding and use of GIS, and it is not limited to high visibility, high profile projects.

1 - Fire and Rescue Department. (FRD) - FRD has been an avid user of the GIS since the first GIS data conversion in 1995. Some of the projects completed by the Fire and Rescue Department are:

Response Time/Void Area Analysis – It is the goal of FRD that units are able to respond to any area of the County within 5 minutes. The FRD used the network analysis functions of ArcView Desktop GIS software to calculate void areas in the County. Void areas are those areas the County units could not be expected to reach in 5 minutes. By using this software, staff will be able to plan new facilities easily and with a faster response time. The following maps show a void area for a small section of the County as well as 7 minute response time for special Rescue Squads.





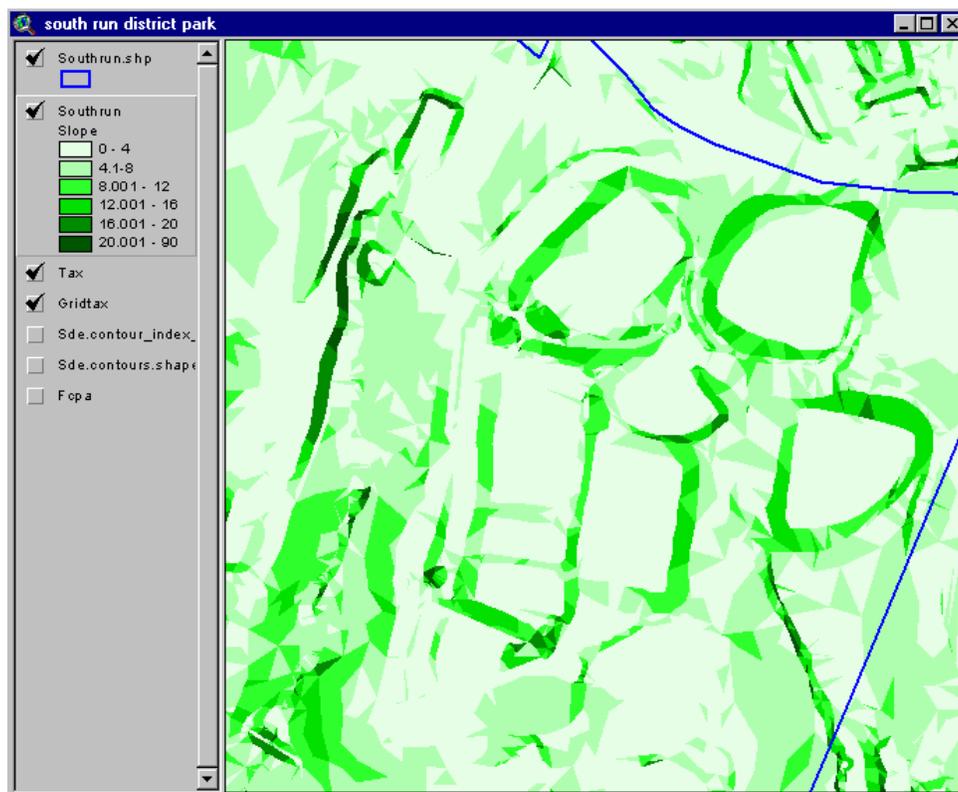
Another use the FRD has used GIS for is to study dynamic equipment allocation. The population of the County generally shifts east during a normal workday and as such a greater number of incidents occur in that portion of the County during business hours. The planning section of FRD has used GIS to model the potential movement of resources to avoid having to build more facilities to respond to these incidents.

FRD has also used GIS to map the location of fire hydrants in the County. This data is fundamental for planning purposes and some of the future applications planned by the FRD. The "fire hydrants" layer has now become a layer available to all users of the GIS data warehouse.

2. - Park Authority (PA) - PA was one of the agencies to make early use of the GIS. In 2000, the Park Authority established a full-time GIS position dedicated to integrating GIS into PA business processes.

- 2.1- Park Registry Database - One of the most interesting projects completed by the PA has been the Park Registry Database and associated data layer. PA staff maintains a comprehensive database of facilities available at each park using Microsoft Access. This database is linked to the GIS layer of park facilities giving users access to all information about any park in the County. This Park Registry database is published along with the associated data layer in the GIS data warehouse.
- 2.2 - Mapping Greenways - Staff members from the Park Authority needed to map Greenways in seven watersheds in order to implement the Park Authority Long Range Plan. Greenways are buffer zones around streams, ponds, and lakes that help preserve the natural habitat for both plant and animal life. A minimum of 300 feet is needed for a Greenway to be successful. Greenways are used to help classify land the Park Authority already owns but also to identify areas that are in need of protection. Ways of protecting these areas include: purchasing the land, establishing a conservation easement, or setting up a cooperative agreement between landowners and Park Authority for land management.

- PA estimated it would take 288 hours to map these areas manually. After making that estimation they determined it was not feasible to complete the entire project and that maybe they could map Greenways for a small section of one watershed. However, when the PA staff contacted GIS staff they were able to use data layers from the County GIS database to complete this project in just 5 hours. Several Arc/Info polygon overlay commands as well as the buffer command were needed to complete the analysis. The Park Authority staff will use 4000 scale Mylar plots of the Greenways plus an ArcView shape file for further analysis and calculations.
- 2.3 - Park Planning: One of the essential tasks of PA personnel is to maximize the recreational space available in County parks. Recently the PA used GIS visualization and analysis tools to help re-organized South Run Park. The following graphic shows a topographic model of the park that was used to determine areas of high slope that would not be suitable for field planning.



3 - Department of Public Works and Environmental Services (DPW&ES) - Apart from the refuse re-routing project mentioned previously, several branches of DPW&ES have gained substantial benefits and are contributing quite a bit of new information to the counties' GIS system. The major efforts organized by branch are:

- 3.1 - Wastewater Management Program - The Wastewater Planning and Monitoring Branch of DPW&ES is responsible for planning and monitoring the County's sanitary sewer system. They are currently using GIS to inventory all existing and proposed sewer lines and facilities, model existing flow rates and capacities to ensure system integrity, and retrieve the records as built in information. They are currently working on a project to convert all Mylar sewer maps to a set of digital GIS layers. They also have a GIS power user developing applications to retrieve and plot this information.

Department of Information Technology

- 3.2 - Stream Protection Branch - The Stream Protection Branch has used GIS to help manage and protect the County stream network. This winter the group published a comprehensive Stream Protection Strategy Report on the County's Internet site. In the report there are several maps made using the County's GIS system. There port can be accessed at:

http://www.co.fairfax.va.us/gov/dpwes/environmental/SPS_Main.htm.

- 3.3 - Urban Forestry Branch - The Urban Forestry Branch is the primary group responsible for controlling the spread of the gypsy moth. A severe problem in the early and mid-nineties, the gypsy moth devaStated some forested areas of the County. The Urban Forestry Branch, formerly the Gypsy Moth Office, mapped a complete data layer of forested areas in the County from 1991 to 1993. From 1993 to 1996 they converted this data to a digital layer in the GIS data warehouse. From 1995 to present the office used GIS to digitize spray blocks (areas to be sprayed by helicopter). From 1995 to present these digital spray blocks have been directly fed into the helicopters on-board spray system. Using the digitized spray blocks on-board the helicopter saved hundreds of thousands of dollars each year. And, it reduced the amount of staff required to spray chemicals from roughly 200 to just a few.

4 - Office of the County Executive (OCE) - OCE has relied on the GIS program to track and support a countywide deer management plan. The office also used GIS to support a major re-development of over 2700 acres reclaimed after the closing of Lorton prison.

5 - Department of Family Services (DFS) - DFS has used GIS extensively since 1995 for client related projects. DFS has also established a full-time GIS position to help integrate GIS and perform special projects. In 1995, GIS was an integral part of a redesign of the food stamp distribution process. Prior to 1995, DFS had distributed food stamps at local government centers. This created long lines, unhappy clients, and bad press. A new program was instituted to distribute food stamps at local grocery stores. The question then became, which grocery stores? DFS used GIS to geocode the location of food stamp recipients and match them up with local food stores.

In 1996 used GIS to map welfare recipients, childcare providers, and childcare centers to assist in a "Welfare-to-Work" program. The data was analyzed with public transit routes to located jobs and childcare services for people who would no longer qualify for welfare.

6 - Office for Children (OFC) - OFC has integrated GIS into their daily business process. This Office provides a major service to the public of finding daycare centers and providers based on desired locations. The GIS Department developed an Internet Application used by OFC staff to locate all services within a user-specified distance.

7 - Board of Supervisors (BOS) - The members of BOS frequently use GIS to assist with public meetings and presentations, determine equitable regions for little leagues, plan and find areas for new recreation facilities, and help determine homeowner association boundaries.

8 - Department of Vehicle Services (DVS) - DVS used GIS to study the feasibility of centralizing maintenance facilities of the County's 4 main maintenance shops.

9 - Electoral Board and General Registrar - The Electoral Board routinely uses GIS to create public display maps to be displayed at polling facilities. This year the Office teamed with the GIS Department and the County Attorney to use GIS for the redistricting effort. Using year 2000 data from the U.S. Census Bureau, the three departments lead a citizen action group to form new legislative districts.

Department of Information Technology

10 - Economic Development Authority (EDA) – EDA uses GIS to create maps to support major marketing efforts designed to attract new businesses to the area. The maps are created using ArcView Desktop GIS software. The EDA also uses GIS to perform site-selection analysis for potential new businesses.

11 - Community and Recreation Services (CRS) Department – CRS is integrating GIS into a new athletic facility scheduling system. In the new system a GIS data layer of facilities is being developed for all ball fields and gyms throughout the County. There are 867 fields and 190 gyms in Fairfax County. The CRS Department schedules activity on 627 fields and all of the gyms. Since the new GIS data layer will have attributes for each facility the Department will be able to better match appropriate facilities to particular sport activities. The data layer developed in support of the scheduling system will also be made available to other County agencies for planning and publication purposes.

The fields that are not scheduled by CRS are not considered suitable for scheduling because of inadequate parking facilities as other deficiencies. CRS is planning to use GIS to prioritize and plan improvements to those fields not currently scheduled.

12 - Department of Planning and Zoning (DPZ) – DPZ was the first County agency outside of GIS to hire a full time GIS person. Over the last 5 years DPZ has used GIS for the following:

- To provide professional quality graphics in support of departmental activity such as Board meetings and Public hearings.
- To conduct and existing and planned trails inventory and assist in zoning enforcement and litigation.
- To perform environmental impact analysis and noise contour mapping.
- To determine service areas for Metro Transit Stations and identify areas for planned development.
- To perform custom desktop mapping ad infinitum.
- To create a countywide comprehensive plan layer.

13 - Department of Tax Administration (DTA) – Aside from the Board of Equalization Map Maker mentioned under example 3, DTA has used GIS to create special assessment maps for each real estate appraiser. Appraisers consider these maps essential to their yearly business process of appraising property. Annual assessments are completed on all properties within the County.

Department of Information Technology

In March of 2001 GIS was used to map out the dramatic changes in assessments from 2000 to 2001. The average assessment went up 11 percent over the last year. The DTA teamed with the GIS staff to create over 170 thematic maps for elected officials showing the percent increase by neighborhood area.

14 - Fairfax County Public Schools - The Schools Planning Office uses GIS to map and create school planning units. These are a unit of geography defined by the schools to assign student population to particular schools. They are used in a similar way that Census Tracts to define districts for elected officials.

15 - Health Department (HD) - HD has used GIS over the years for a number of high profile projects. In 2000, the Department used GIS to help mitigate a rabies problem among raccoons. GIS was used to identify and track sites to orally bait for the animals. GIS was also used to identify and notify homeowners in the project area.

In 1999, the HD teamed with GIS staff to analyze workload among restaurant inspectors. All restaurant locations were geo-coded and potential service areas were created based on network analysis.

Currently, the Health Department is in the processes of performing a pilot project to accurately map well locations in the County and make them available as a GIS data layer. The Department has already documented application uses should such a layer exist.

The Health Department has also used GIS to map the location of naturally occurring asbestos zones. One of the ways the department provides greater access to this information is to generate maps such as the one at the right which is available to customers on the internet. The map which shows orange soil locations was made using the County's standard desktop GIS software package.

GIS is also being used by the Health Department to plan the West Nile Virus response. Spatial location is a key component of the West Nile Virus since mosquitoes carry it locally. Tracking the incidents of West Nile in animals and humans is essential to effectively controlling the disease. GIS enables the Health Department to track not only occurrences but also the treatment areas and optimize the response to the West Nile Virus.

16 - Department of Transportation (DOT) - Aside from the transit applications mentioned previously, DOT has used GIS to map and track road construction projects, perform traffic flow modeling, and create literally hundreds of maps of transportation related data for Board of Supervisor presentations and public hearings.

DOT uses GIS when developing service plans for new bus routes throughout the County. Maps displaying proposed routes are helpful for planners, elected officials and the public to view before implementation. The routes are displayed, reviewed and published in a report, individually and comprehensively, so any unforeseen patterns are revealed thus targeting problems before new bus service starts. Through GIS, visual representation of proposed bus routes enables planners to effectively speed up service to our number one users- the customer.



► **Method of Service Provision**

The GIS Branch uses virtually every possible means and medium to deliver GIS services to County staff, walk-in customers, and residents.

Maps and Publications Office: Traditionally GIS has provided printed wall maps to County staff and the public. The public can purchase the wall maps in the County Central Store in the Government Center's first floor. Also available there are the printed parcel and zoning books. Overall about 10,000 of the maps are delivered annually.

GIS Office Front Counter Support: The GIS Branch provides walk-in support and research to County staff and residents. On average over a dozen walk-in customers are served each day. These services include aerial photography research, parcel research, flood plain information, soil data, zoning and parcel map interpretation and hands on GIS support.

Web Services and Applications: The GIS Branch now delivers all of its applications via either web-delivered or web-based applications. The general public can view parcel and aerial imagery, download pre-made maps, and data. County staff can directly access GIS software applications via their intranet based web-browser. Growth in the use of this medium has been explosive – as illustrated in the Performance/Workload section.

LAN based applications: Selected GIS applications are also available directly over the County's LAN, however the majority of the applications work is via Citrix through the Web.

Consulting to Other Agencies: The GIS Branch provides GIS consulting and application development support to any County agency. This is done with existing staff, contract programmers or a combination.

Special Services: The GIS Branch also provides special GIS services to County agencies. The most recent example is the planning, design, and support of the GIS Services and training for the Citizen's Advisory Committee on Reapportionment. This required a wide range of services from many of the GIS staff for an extended period of time.

Department of Information Technology

► Performance/Workload Related Data

Title	FY 1998 Actual	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate
Front Counter ¹	4,338	4,308	3,852	3,343	2,942
Agency support (Traditional – Paper Based) ²	6,034	6,487	5,404	5,265	4,910
Agency support (digital) ³	35	50	3,356	7,729	10,048
Internet support (public) ⁴	N/A	50	29,005	352,615	486,200

¹ Includes cash sales and hard copy information requests.

² Annual map orders, right of way projects, zoning projects, DTA projects, and PIN assignments.

³ GIS licenses, Citrix usage, SDE data warehouse sessions, and helpQ calls for support.

⁴ CD sales, "maps" served via GIS Internet applications. These figures are for the public applications as used by County staff and the public. The FY 2001 increase in Internet support is due in large part to introduction of the "DTA Parcel Viewer" Application.

Discussion

The traditional front counter interactions are gradually decreasing, while the total amount of service delivered via the internet has dramatically increased. We expect a gradual decline in front counter/public access service, along with a shift in the services provided through it. Specifically, as the Branch brings its custom mapping application on line, users will be able to create and plot very large maps in minutes, on demand. This has never been done in the County to date. We expect these applications to experience increasing use over time.

The maps served over the Web will continue to increase, and in 2003, could dramatically increase again, as more of the County's Web site becomes spatially enabled and can put data onto a map for users to view. New GIS applications are planned for the Web, in particular a routing program to enable users to quickly plot routes across the County.

The dramatic increase of data served over the Web also has revenue implications for the GIS Branch. The increasing availability of free data on the Web will reduce the need for some of the traditional map products from GIS, and thereby reduce revenue.

Department of Information Technology

► **User Fee Information**

Subobject Code	Fee Title	FY 2002 ABP Fee Total
0644	Sales - Mapping Division	\$46,583
Current Fee		Maximum Allowable Fee Amount
Fees range from \$0.40 per copy of record plats and plans from files to \$2,850 for an All Digital GIS Data Countywide 3 CD Set.		None
Purpose of Fee: Primarily to recover costs of reproduction. For those items, which are requested in CD format, additional charges are included to cover pro rate data charges and labor to produce and mail.		
Levy Authority	Requirements to Change the Fee	Year Fee Was Last Adjusted
Code of Virginia 2.1-340.1	None	2000
Other Remarks:		