SECTION 2

STRATEGIC DIRECTIONS AND INITIATIVES

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FEATURED IN THIS SECTION

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The most critical challenge facing organizations today is the imperative to stay current with the rapid pace of change in technology, harnessing innovation that delivers immediate return on investment effectively to realize the organization's strategic goals, optimize service efficiencies, and successfully meet end-user and public expectations in an environment of new fiscal challenges. As a strategic investment of county resources, technology facilitates the delivery of better and faster service and enables the county to effectively respond to growing demand at optimal cost and efficiency, thus critical to ensure investment strategies are in place, balanced and fluid. However, investments in technology can be significant, including capital, initial transformation and incorporation of technology into an organization's business, and sustainment. Without capital expenditures, capabilities can also be enabled through annual operational cost models, such as with technology 'clouds', subscription services, and other infrastructure or software-as-a-service business offerings. However acquired, new technology must be wisely adopted and carefully integrated into the organization's technology and business architecture for optimal impact.

The Fairfax County technology strategy incorporates a thoughtful plan for investments at optimal time and delivery. This has contributed to the county's ability to keep pace with growing demands for services and promoted agility in facilitating response to evolving new needs and opportunities. Additionally, this strategy has helped the county address new economic realities, provide improved communication, information and open government for public engagement, leverage the overall technology portfolio and capabilities on an enterprise scale that meets the diverse needs of a wide variety of operational needs. The following key initiatives are part of the overall strategy and living portfolio of strategic opportunities and objectives on an enterprise scale designed to optimize effective, efficient and customer-oriented services for internal government and constituent engagement.

2.1 e-Government

The e-Government initiative is a foundational program supporting the county's goal of a "government without walls, doors, or clocks". The comprehensive strategy is the foundation for the County's Open Government, Transparency, Customer Service, and Public Engagement strategies, as well as enabling county agencies' operational effectiveness goals, mobile workforce and Continuity of Operations. The e-Gov program develops the architecture for both the public channels and the internal WEB portals.

The e-Gov program includes an inclusive set of channels, using enabling technology, policy and processes that integrates the Fairfax County Web Site www.fairfaxcounty.gov, WEB 2.0, 3.0 and beyond and social media capabilities, Interactive Voice Response (IVR) platforms, mobile applications, Cable TV, the county's Public Access sites in Libraries and Access Fairfax sites (the highly successful CRiS Kiosk program was retired in 2011 given the wide public adoption and commercial use of the WEB and mobile applications). The e-Gov strategy incorporates the county's Communications Plan for comprehensive and cohesive access to information and services that span over fifty agencies. In addition to the on-going efforts to enhance the look, feel, navigation and search capabilities of the Web, and deploying new services, transactions, social media and other content, the strategy also includes CRM and Content Management tools for comprehensive, integrated service options. A governance body, the e-Gov Steering Committee (see Section One) develops strategy and goals for this program.

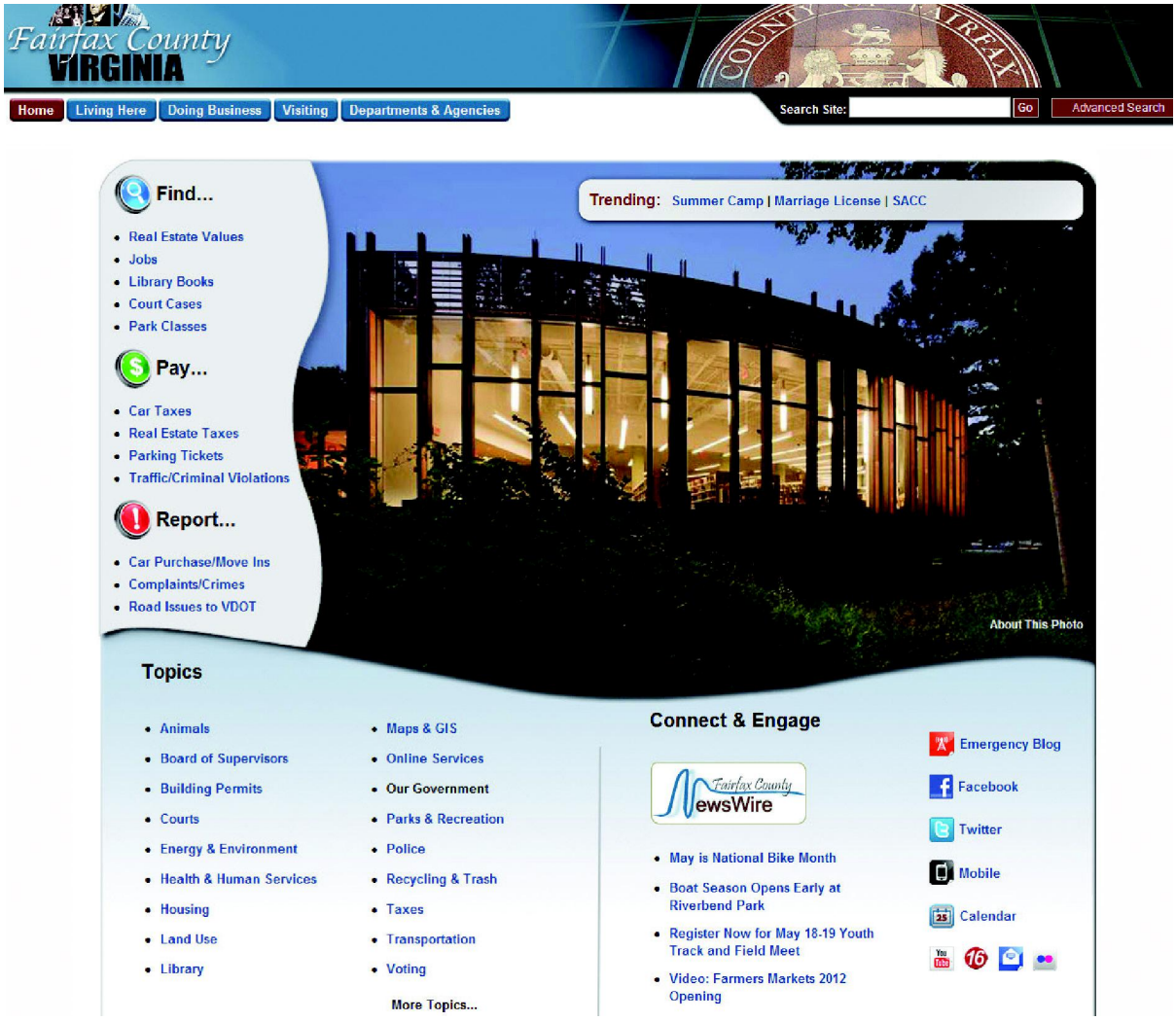
The county has achieved much success and acclaim for its e-government focus in integrating the WEB and IVR platforms that offer a wide variety of channels for complete on line public access capabilities to services and programs, and incorporates social media capabilities in a thoughtful way that enhances service's needs. In FY 2014 the county will continue its efforts to add new services to the e-government channels, including enhanced communications, new transactions, e-payments, enhanced search and integrated social media, blogs, and WEB 2.0 and 3.0 capabilities, and public engagement, transparency, enhanced access, emergency management. Fairfax County continues to incorporate access for all and meet ADA compliance

goals. The e-Gov program will continue to work with the Commonwealth of Virginia, regional partner municipalities, and federal government agencies in interoperability of common service portals and developing web services standards to enable cooperative access and seamless integration of information and services regardless of the origin or the source.

Some of the e-government initiatives include applications such as Special Needs Registry, Social Needs Registry, and Library Audio Books. The county expanded offerings in mobile access by making the county's public website accessible via wireless devices www.fairfaxcounty.gov/mobile which enabled citizens to interact with county government through personal wireless devices.

Periodically a comprehensive review is conducted of the WEB-site for redesign potential to update the look, navigation and over-all usability of the 34,000 page site with new functionality, content enhancements, and innovative features. The website and CRM solutions are part of the county's Customer Services and Engagement Initiatives.

A highlighted news section provides easy access to information categorized by topics and brings into focus county functions, departments and agencies, county-wide initiatives and featured services. The Google Search Appliance augmented the overall search functionality of the Web site. The design won national recognition for being 'Best of the WEB' by the Center for Digital Communities. In addition to the benefits for on-line services efficiency, the public Web site is also a part of the county's **"Going Green Initiatives."**



*picture of Dolley Madison Library, pictures rotate.

While initial e-Gov efforts were largely focused on providing access to services, Fairfax County is expanding its efforts to provide citizens the necessary tools for engagement, interaction and participation with county government in order to improve communication and services (Citizen-to-Government Networking) and greater transparency. The county's website has been one of several channels used for public input into the county's budget planning process.

Fairfax County and the city of Alexandria shared the Virginia Coalition for Open Government's Freedom of Information Award in the government category. Fairfax County was recognized for its efforts to engage the public starting in FY 2010 and FY 2011, and is a regular part of the budget development process which includes extensive outreach through the use of social media platforms such as Facebook, Twitter and YouTube. This program also received national recognition by Public Technology Incorporated (PTI). Over twenty- five county agencies have deployed a variety of Social and New Media apps to support their constituent programs and services.

Multiple tools assist interested citizens learn more about county's operations, programs, and activities. The county has long made it possible for the public to subscribe to information published through e-mail (http://www.fairfaxcounty.gov/email/lists/), and is increasing the breadth of available information through various e-channels. The county provides RSS feeds (http://www.fairfaxcounty.gov/rssfeeds/), which allows users to have information sent to them through tools explicitly designed to track published information. Access to information is also expanded through county podcasts (http://www.fairfaxcounty.gov/podcasts/). Three county-wide pages have been launched on leading social network sites:

- FaceBook (http://facebook.com/group.php?gid=7901829756 – account required),
- Twitter (http://twitter.com/fairfaxcounty) and
- YouTube (http://www.youtube.come/user/fairfaxcountygov). Posting content on these sites allows the county to access an expanded, and potentially younger, audience than it has in the past. The Office of Public Affairs maintains the content for these sites, which is often repurposed from existing material.

The county's Get Fairfax County campaign has been enhanced to incorporate NewsWire (http://www.fairfaxcounty.gov/news/) the county's one-stop news shop, which focuses on the delivery of news and information to the public: residents, businesses and other interested groups. NewsWire is a comprehensive tool, that consolidates all the ways residents and employees can stay connected with the County, including: the social networking sites, information available on 703-FAIRFAX, News to Use, e-government services, podcasts, RSS feeds, Weekly Agenda and emergency alerts.

An online discussion tool (***Ask Fairfax!***) to enable citizen interaction with government on various topics, mobile version of the county website with mobile and iPhone applications to list a few. The county website is also being translated into 12 languages using machine translation powered by Google. In order to empower public services and affirm county's strategic vision and goals, the website has been enhanced with new and updated interactive features and online applications. In an effort to improve website accessibility, all pages on the public website are tested for compliance with Section 508 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) by passing through the county's automated compliance checking tool.

In FY-2012, Fairfax County increased the value of its e-government efforts with the add-on of mobile apps for all platforms like iPhone/iPad, Android and Blackberry for free downloads. By providing mobile accessibility from various devices, further enhances citizens' convenience and reaches a wider user community with the ability to access services and information in the palm of their hands. Samples of the mobile apps deployed include:

- **Alerts:** Offers the latest updates about major incidents or weather events including text/email alerts, social media, emergency RSS news feed, important phone numbers, seasonal preparedness information, recovery resources, mobile weather forecast, and links to Key County, state and federal emergency agencies.
- : Each business day, the Fairfax County *NewsWire* features the latest headlines from county departments.
- **Contact Us:** One-touch calling of our main 703-FAIRFAX phone number, critical emergency phone numbers, libraries, parks, courts and by department/program.
- **Calendars:** Browse upcoming public meetings, community events, tax deadlines and more.
- **Library:** Patrons can browse online catalog, get hours, locations, check reviews, place holds for pick up, modify hold requests, check account status, and renew material. Additionally, Library also has a native iPhone application.

- **Locations:** Use the GPS features of your device to find the nearest library, park, community center, fire station, police station and government buildings.
- **Services:** Key services like **Childcare Central and FIDO** (building permits, applications and complaints) applications. Additional service related applications are in development.
- **Social Media:** Links to the mobile versions of all official county government social media sites on Facebook, Twitter, YouTube, Flickr and podcasts on iTunes. Like us, follow us, watch a video, view pictures or listen to podcasts on iTunes through our coordinated social media efforts.
- **Elected Officials:** Quick access to the ten member Board of Supervisors with links to mobile versions of Board offices' web pages, meeting schedules, agendas and more.
- **Transportation:** Key links to major transportation resources such as the Connector bus, Metro, VRE, bikes, pedestrians, Virginia Department of Transportation and more.
- **VOTE:** check voting places for the Office of the Registrar to include on-going enhancements.
- **Car-Tax:** allows tax payments via e-checks, credit and debit transactions.
- **Tax Evaders:** allows citizens to report vehicles that may not be compliant with tax regulations.

The county's suite of mobile apps, Government in the Palm of Your Hands, was showcased at the Metropolitan Washington Council of Governments (MWCOG), and won awards from the Commonwealth of Virginia IT Symposium (COVITS), and from Public Technologies Inc., and was also recognized by the Center for Digital Government-Digital Counties Survey. Information about the county's Mobile Apps can be accessed on the county's website: http://www.fairfaxcounty.gov/news/mobile/.

In FY 2014, emphasis on citizen/community engagement through multiple communication channels harnessing various Web based technologies will take center stage and help empower the public's connection with the county. As part of the citizen/community engagement initiative, the county's homepage on the public website will be refreshed making it a more visual, intuitive, citizen-centric, and topic driven page. Using responsive design and adaptive approach, the same design and features will be translated to the mobile platform as well. Continuing to build new online service transactions and e-payments, adding additional interactive features, improving navigation and synchronizing content from disparate sources, enhancing search functionality and developing more native mobile application for public consumption will be the key focus of E-Gov. DIT will continue enhancements to the e-government channels for compliance with Section 508 for accessibility; and maintain the ultimate goal of facilitating the delivery of integrated information to citizens via multiple platforms along with implementation of additional web search capabilities. The on-going strategy includes incorporation of more interactive input on WEB site usability and metrics, and WEB 3.O with focus on metadata needed for on-line intuitive search and intelligence.

Customers Served

IVR: 5 million since FY 2005
Web: 34,000 pages – 14,968,148 visitors which equates to 59,001,252 page views
Unique visits: 13,322,116 i.e. user access multiple pages or conduct business
E-services: 125

Information and Services Available

Adult education classes	Web
Becoming a child-care provider	Web
Board Meeting minutes (searchable	Web
Budget information and approved budget	Web
Bus tour schedule	Web
Child-care provider list	Web
Collection of household trash & recyclables	IVR
County Code – full text	Web
County demographics	Web
County maps, scrollable, printable	Web
Courts – Circuit, General District, and Juvenile	Web, IVR
Crime statistics, Wanted List, Neighborhood Watch	Web
DTA EPay	Web
iCARE DTA Real Estate Assessment and Information Query	Web
Library Picture Books	Web
Public Meeting Calendar	Web
Fire & Rescue Media Information	IVR
Health Information	Web, IVR
Inspection scheduling status	IVR
Information for victims of crime	IVR
Job opportunities	Web
Library information line	IVR
Multi-jurisdictional information	Web
My Neighborhood	Web
Newcomer information	Web, IVR
Parks/Recreation information	Web, IVR
Public safety information	Web, IVR
Real estate property assessment & tax information	Web, IVR
Seniors information and programs	Web, IVR
Frequently Asked Questions	Web
RSS Feeds	Web
Podcasting	Web

Doing Business with the County

Access Health Department food inspections database	Web
Access GIS aerial photography with pan and zoom	Web
Apply for County jobs	Web
Apply for a library card	Web
Board of Supervisors compliant forms	Web
Building Permit Fees Estimate	Web
Download request for proposal/invitation for bid	Web
Electronic Mailing List	Web
Estimate Electrical Permit Fee	Web
File complaints about landlord or consumer problems	Web
Find location of closest Library by entering zip code	Web
Register & pay for Park Authority classes, camps, & tours	Web, IVR
Library Audio Books	Web
Obtain permit/plan status	Web, IVR
Pay taxes with credit card	Web
Pay taxes via eCheck	Web
Pay traffic tickets with credit card	IVR
Query current real estate property & tax information	Web, IVR
Query Human Services online " Resource Guide"	Web
Query for current position on the Housing Waiting List	IVR
Query specific court case information	IVR
Query status of an inspection, permit, or plan	Web, IVR
Query Victim Services data for offender release date info	IVR
Register a vehicle	Web
Request faxes of court fees and procedures	IVR
Reserve a golf tee time	Web
Reserve/renew Library books – search catalogue	Web
Reserve a picnic area	Web
Report change of address for tax purposes	Web
Report a lost pet	Web
Report a zoning or noise ordinance violation	Web, IVR
Search for information in historical newspaper	Web
Search for County agency telephone numbers by keyword	IVR
Special Needs Registry	Web
Sheriff Service Civil Process	Web
Subscribe to County publications	Web
Social Needs Registry	Web
Volunteer to help in the Library or Parks	Web
Zoning and Noise ordinance compliant form	Web
Athletic Facilities Application Request (AFAR)	Web

2.2 Fairfax County Unified System

In 2009, Fairfax County government and school system embarked on a multi-year, joint initiative to modernize the portfolio of enterprise systems that support finance, human resources, budget, procurement and related administrative applications with an integrated approach under a single application platform that has the flexibility to meet current and future requirements of both entities. A major investment, the project provided an opportunity to transform administrative operations, enhance use of information for reporting and analysis, reduce overlapping systems and processes, and enable greater value/cost efficiencies long-term. This major initiative also mitigates the risk that antiquated and disjointed systems pose for system failure, incomplete data, and operational integrity. The project is known as FOCUS (Fairfax County Unified System). The system has been in production with its initial base-line core functionality since 2011. Planned non-core developments are on-going that support business strategies such as integrated performance management, e-recruiting, employee development goals, as well as budget formulation, projections, and publication, and enhanced reporting and business analytics for decision-making. The overall solution set integrates with the county's e-government strategy, transparency goals, telework objectives, COOP (Continuity of Operations Planning), and is the foundational corporate system for county business transformation and efficiency opportunities.

A governance body of senior officials of the county and school system stakeholder agencies developed the optimal strategy to take advantage of best practices incompliance, security, e-commerce, and government operational evolution. FOCUS modernizes the underlying enterprise technology architecture with high availability virtual servers; enterprise identity management that provisions secure user access across the county and schools network infrastructure environments; self-service portals for employees to manage their personnel record information, perform transactions, and for public transparency; business intelligence for flexibility in queries, reports, dashboards and business analytics; and integration in financial processing with digitized documents and work-flow, and automatic payment of invoices for received goods and annual payment obligations. The technology also provides the opportunity for rapid deployment of new requirements and mobile applications, further enhancing the county's telework and COOP initiatives. While the main project is complete, on-going work on expanded supplier self-service functionality, performance management and e-recruiting for county government, and transparency as well as continuing opportunities to leverage system capabilities.

2.3 Geographic Information Systems (GIS)

GIS is a strategic foundational technology, integrated with numerous county applications and business processes. It is an essential component of county operations and is heavily used by a wide range of county agencies (some of those activities are highlighted at the end).

The GIS office maintains a range of technologies and related products that provide the foundation for ongoing integration of GIS into county operations as well as enabling new developments. 3-D viewing is the most recent spatial technology. Implemented in 2010, Virtual Fairfax provides users the ability to easily navigate the county and view buildings in the key Tysons Corner and Reston/Herndon areas in 3-D. Figure 1 shows a Virtual Fairfax view of Tyson's corner along with GIS integrated directly. The colored surface demarks the development intensity zones around the Metro stations under construction. The zones determine maximum possible building height. Virtual Fairfax has proven popular as usage increased over 400% in 2012 vs. 2011 and has been maintaining that usage level since 2012.

Modifications were made to the underlying application (http://www.fairfaxcounty.gov/gis/virtualfairfax/) that will enable other county agencies to develop co-branded applications (e.g., Virtual Fairfax – Tysons) to enable customization of business specific content. If these versions are implemented, they will retain the ability for users to access different land information systems (LDSNET, ICARE, and My Neighborhood), and provide easy linkage to information for schools, historic sites and places of interest. GIS has worked with other agencies that have expressed interest in a co-branded site, though there are currently no firm plans to implement a co-branded site. Additionally, due to the intense

development in Tysons Corner and the Reston area, GIS plans to update the 3-D buildings and base imagery of those areas using 2013 Pictometry imagery. Additional areas with 3-D buildings will also be added.

Oblique imagery and its related software is another core technology for GIS and the county. Originally implemented in 2003 with GIS support, it has become a key tool for multiple county agencies. Oblique imagery is integrated into CAD/911 operations as well as the Department of Tax Administration and many others. It also serves as the source of the data used to construct 3-D buildings in Virtual Fairfax. The oblique imagery contract was successfully re-competed. As a result the county will continue to obtain oblique imagery and 3-D objects through Pictometry. The first acquisition under the new contract is planned for 2013. Figure 2 is an example of oblique imagery of Reston Town Center. Note the view of the side of the buildings.

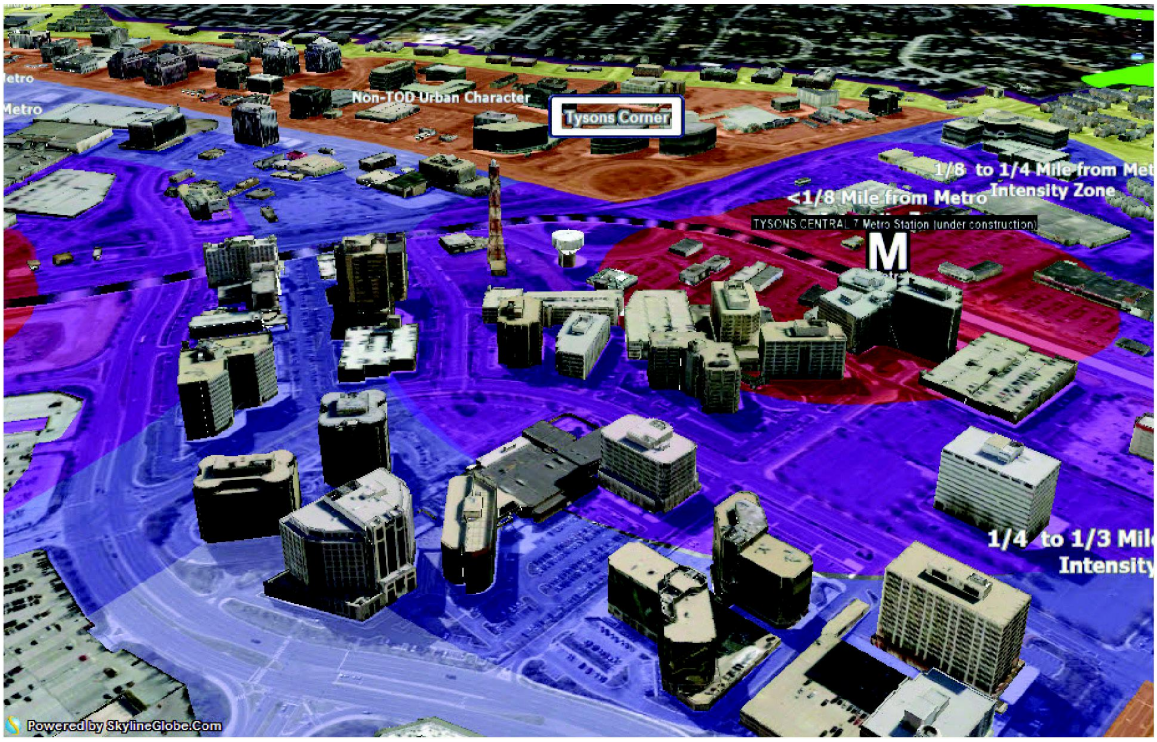


Figure 1: Virtual Fairfax View of Tyson's Corner including development intensity zones.

Figure 2: Oblique image of Reston Town Center.

GIS will obtain the necessary software tools to enable integration of oblique imagery into county web applications as well as implement enhanced web-viewing tools to replace older desktop viewing tools.

Planimetric data is another foundational data set for almost all county applications from Police and Fire and Rescue vehicles, to desktop applications, and Fairfax Mobile application. GIS has partnered with the Department of Public Works and Environmental Services to fund the update to this data some of which is now 16 years old. By July 2013 all of the planimetric data will be updated based on 2009 imagery. Over 13 million new planimetric features will be added to the GIS planimetric data – an increase of over 400%. GIS will work with DPWES to identify approaches that support updating of this data more frequently. Figure 3 is an example of planimetric data (outlines of built features), for part of the Reston Town Center.

Accurate planimetric data depends on having high resolution, high accuracy ortho imagery. The county partners with the state every four years to purchase new ortho imagery for the county. The partnership significantly lowers the cost of the imagery for the county. That imagery is used on the web and as a foundation for all GIS data layers since they can be easily overlaid on the imagery as well as be derived from the imagery. Calendar year 2013 was an acquisition year, and the imagery was successfully captured despite a difficult spring which provided very few windows of good flying conditions. Figure 4 is an example of orthoimagery of the Reston Hospital area. Note the straight down view.

Addresses are essential to almost all county operations. The GIS office collaborated with other county agencies to bring the Master Address Repository online in 2004. GIS maintains much of the data in the system on a daily basis. The Master Address Repository (MAR) project has proved to be invaluable for the CAD/911 system as well as other key county systems such as FIDO, LDS and ICARE. The MAR is the authoritative source of parcel (sites) addresses in the county essential for effective operation of the new CAD/911 system. The joint project with the county's Department of Public Safety and Communication (responsible for the CAD/911 system) to check the MAR addresses against Post Office data and also to cross check against telephone companies' Master Street Address Guide (MSAG) is underway and will wrap up in 2013.

Behind the scenes GIS is implementing more web-based technology. There has been a paradigm shift over the past several years where software companies and the public at large is more web focused. The county is pushing hard in the direction of web-based software that provides GIS as a service. The software now functions well on virtual servers which have enabled implementation of several virtual GIS servers. Many of the county's applications (e.g., iCare, WebEOC) as well as the county's mobile applications now

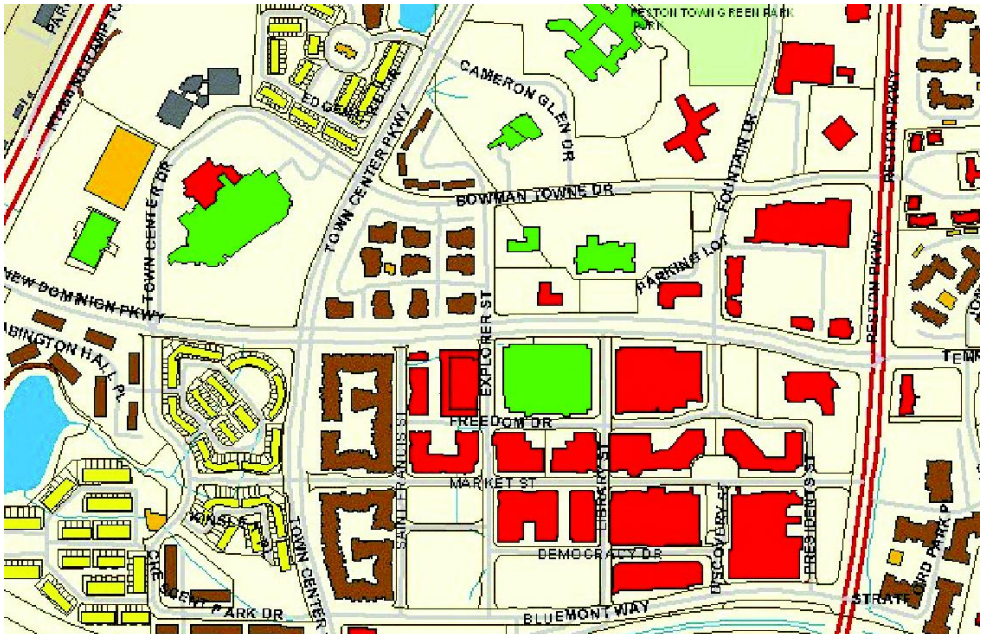


Figure 3: Planimetric Data for Reston Town Center. Buildings colored by zoning.

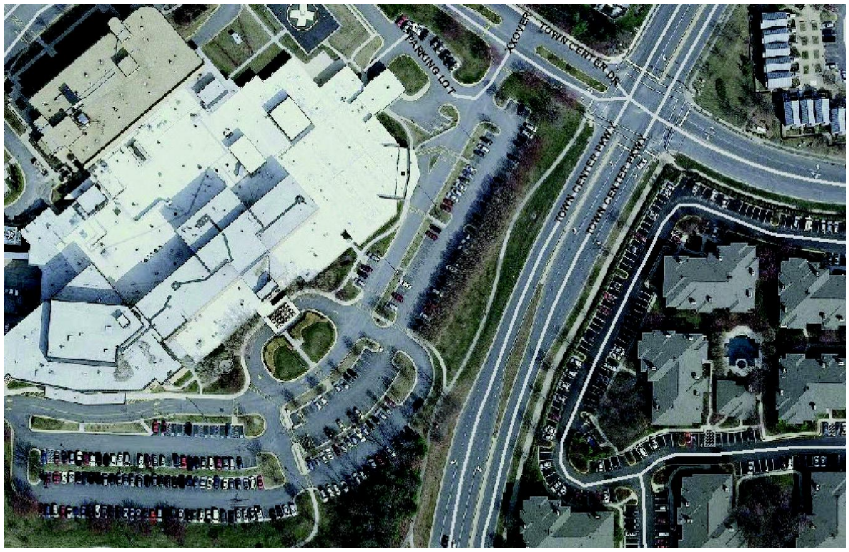


Figure 4: Ortho image of Reston Hospital area.

consume GIS web-services. There are over 70 web services published by GIS with many more expected, which may require additional software and hardware.

Interoperability is a significant and ongoing strategic activity for GIS, both within northern Virginia and regionally through the Washington Council of Governments (COG). Interoperability across National Capital Region (COG) and with the Federal government for emergency response purposes is also crucial. Fairfax is a member of the COG GIS Executive committee and has helped guide the development and implementation of the National Capital Region Geospatial Data Exchange. The project went live in spring 2012. The system integrates with the federally funded Virtual USA network and provides a convenient tool to enable fast exchange of geospatial data to registered users of the system. This proved to be a valuable asset for interagency collaboration for the presidential inauguration in January 2013 – enabling sharing of much more spatial data among federal and local agencies than was possible in the 2008 elections.

Interoperability is crucial in Northern Virginia since emergency response regularly crosses jurisdictional boundaries, particularly with Fire and Rescue it is important to have valid street centerline information for regional neighbors. As the GIS office maintains the street centerline data used in the CAD/911 system, it is working with neighboring jurisdictions to obtain the data. The Regional Routable Centerline project has been an important and ongoing project for the CAD/911 system. Programming work on the software necessary to enable the Centerline Project drew to a close at the end of June 2012 and testing and review will continue. This project was funded by a grant from the State's Wireless 911 Board and will enable Fairfax and its neighboring jurisdictions to share up-to-date centerline data for their CAD systems. It will also enable member jurisdictions (Loudoun, Prince William and Arlington counties and the cities of Alexandria and Fairfax) to have routable centerline data with Fairfax County. Additionally, the state supports this effort in order to gradually build a statewide routable centerline data set. This initiative not only benefits CAD/911 implementations state-wide, but other business processes that need routable data. This project was awarded a Significant Achievement in GIS (SAG) award by Esri in 2011. The SAG awards recognize organizations that have used GIS to improve our world, and set new precedents throughout the GIS community.

GIS support for the CAD/911 system is a core GIS office responsibility, involving data maintenance requirements which continue to be a significant effort. GIS finished major revisions to the road centerline in order to be compatible with the new version of the CAD/911 software which was installed in 2012.

The county's GEM application is now scheduled for a major refresh in 2013 once the necessary software functionality is released by the vendor. The code base will be revised and moved to the latest version of the underlying software (Onoint) also, The Digital Map Viewer

(http://www.fairfaxcounty.gov/gisapps/pdfViewer/default.htm), a heavily used application, has been completely rewritten and was released in 2012.

Over the past year there have been many examples of the importance of GIS technology to county operations. GIS participated in the Derecho, Hurricane Sandy and the Inauguration – each one requiring extensive GIS support. One of the better examples of what a large scale county emergency response would involve was an exercise called Operation Enduring Collaboration. The three day exercise was held from March 19-21, 2012 and was based on the scenario of an F-3 tornado striking the Sully/Springfield area of the county. The intent was to practice a total county response to such a major disaster. In planning for over a year, the exercise involved all county departments that would be involved in a disaster response. GIS played a key role throughout the three day event.

Prior to the start of the operation, GIS staff assisted the event planners and produced the map based exercise control products that would drive the exercise. For instance, a realistic tornado path was created with specific F-level damage zones for use as the ground truth of the scenario (see Figure 5). Using this information, the population of those impacted was estimated and damage assessments were derived. GIS provided some 75% of the information used to run the exercise.

Once the operation began, GIS was tasked with 40+ requests for maps and analyses over the three days. The volume was such that the GIS Branch opened a Departmental Operations Center (DOC) at the GIS office to augment staff and handle the numerous requests. The team's efforts played a large role in helping to guide the decisions that were made by other participants from the operational agencies.

The Director of the Office of Emergency Management (OEM) subsequently noted that "the work between OEM and GIS has quickly become the model in the region and state for WebEOC/GIS collaboration. OEM has been invited numerous times to demonstrate this product to first responders and EOC staff that are always amazed by the work of GIS staff."

While reapportionment of the county's supervisor districts occurred in FY12, it was only the beginning of the process to prepare a complete set of maps for the US Senate and House and State Senate and Delegate districts as well as voting precincts. This has required ongoing and extensive work with the county Electoral Board and General Registrar to refine voting precincts boundaries. Figure 6 is an example of one of the small versions of the VA Delegate Districts (detailed wall maps of these are available on the web at: http://www.fairfaxcounty.gov/maps/gallery_WallMaps.htm).

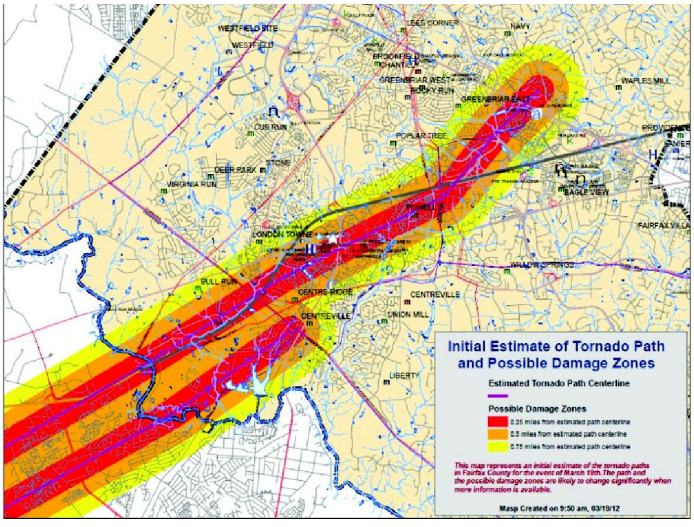


Figure 5: Tornado Path and Damage Analysis

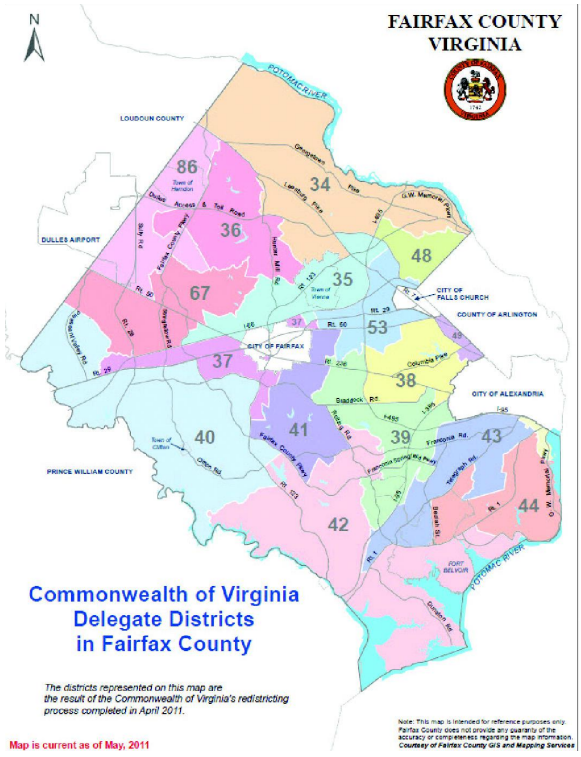


Figure 6: Commonwealth of Virginia Delegate Districts in Fairfax County

The volume of GIS information continues to grow in Fairfax County. The GIS data warehouse holds over 800 layers of Fairfax County data and several hundred more of neighboring jurisdictions. The overall size of the vector data stands at 103 GB (including business data tables), and the raster data is now over 4 TB on line with an additional 3.9 TB currently archived that will be moved to production. As a result of new software tools, more imagery and historic maps will be added and made available. The volume of data in the digital map viewer has increased annually as new sets of property and zoning maps were added. Currently there are nearly 40,800 pre-made maps and images of historic maps available online. Table 1 lists the number of features in some of the categories and their change over time.

Data Layers	FY 2005	FY 2007	FY 2009	FY 2011	FY 2012	FY 2013
Parcel	341,000	356,000	358,300	358,140	358,630	358,765
Addresses	360,000	368,000	365,100	365,669	366,295	366,488
Building outlines	248,000	257,000	257,300	264,361	267,729	274,078
Miles of roads	4,000	4,700	4,736	4,825 (county) 7,628 (regional)	4,904 (county) 7,652 (regional)	4,943 (county) 7,729 (regional)
Number of streetlights		57,939	59,937	60,448	60,557	60,825
Linear miles of sanitary sewer lines		3,350	3,390	3,410	3,424	3,440

Table 1 - Some of the significant layers in the GIS database

The availability of key county data digitally through GIS provides a range of benefits to constituents as well as county staff. Digital orthoimagery is widely used within GIS as well as over the web. With the parcel and zoning data now maintained digitally, production of the county's parcel and zoning books has been greatly accelerated. Time consuming manual steps were replaced with a digital production process enabling staff to capture additional features in the GIS (e.g., more easements, particularly conservation easements). All map changes are posted to the internet daily, providing web users of the Digital Map Viewer with the latest versions of the maps. Prior to these enhancements maps were printed for distribution annually. Digital production has enabled the use of color maps, and development of new symbolization of zoning patterns are added features. The popularity of the frequently updated data is evident by the steady increase in usage of the Digital Map Viewer and reduced demand for the printed books. Currently over 10,000 DMV maps are viewed or downloaded per month on average.

In addition to the GIS branch itself, over 25 county agencies use GIS in their operations. These include:

- **Northern Virginia Soil and Water Conservation District** – the soils maps (both the official 1990 and unofficial 2008) are available with seven other digital map series on the county's web site. The 2008 soil series maps were added to the digital map viewer in FY 2009. The new soil data based on the countywide soil evaluation program conducted jointly with the federal Natural Resource Conservation Services and the Northern Virginia Soil and Water Conservation District was added to the digital map viewer. Sales of the printed property and zoning maps has fallen steadily as more users turn to the free, digital online maps.
- **Public Safety** – The centerline file was modified to reflect the Northern Virginia common centerline elements and made available to county agencies and has been substantially enhanced with additional data needed for CAD and for regional routability of emergency response vehicles. That will continue to change as a result of the regional/state centerline grant. Public safety is the heaviest user of oblique imagery (at call taker and dispatch workstations) as well as planimetric features (in over 1,000 emergency response/public safety vehicles).

- **Department of Public Works and Environmental Services (DPWES) – Solid Waste Division** – Substantial savings are realized in the Department of Public Works and Environmental Services through the use of GIS. The agency was recognized by the State of Virginia for integrating GIS with refuse vehicle routing for additional flexibility and cost savings.
- **DPWES Storm Water Management** – GIS technology enabled the Department of Public Works to complete the mapping involved in the Streams Characterization Project in weeks rather than months. They have been using GIS to help analyze the age of the storm water infrastructure to identify areas where there were lengthy systems that were reaching their service lifetimes and would need replacement or maintenance. The GIS also enables the Storm Water Management Branch to track easements around storm water facilities. It also maintains maps of the stormwater features in the county and makes them available via the Digital Map Viewer.
- **DPWES Waste Water Management** – The Department of Public Works digitized the sanitary sewer lines into the GIS and maintains them regularly. Those maps are available online for viewing and download in the Digital Map viewer. The Department also uses GIS as part of its automated sanitary sewer permit application tool which greatly speeds preparation of the permit by automating cost calculations. GIS is also used to help call takers identify problem areas and prepare work orders.
- **DPWES Storm Water Planning Division** – used GIS to analyze flood inundation areas from possible dam breaches and to identify properties at risk of inundation.
- **The Health Department** – GIS has been a vital part in the planning and response for health issues that include: H1N1 Influenza vaccinations; childhood lead risk evaluations; Medical Reserve Corps staffing; and mapping of private drinking water supplies and sewage disposal systems. Most recently, GIS was used to validate a request for a Governor's Exceptional Medically Underserved Population (EMUP) designation in an area of the county where barriers to accessible primary and preventive health services adversely impact the health status of under and uninsured populations.
- **Park Authority** – uses GIS for a wide range of planning and management activities including conducting existing site condition analysis and impact analysis; identifying environmental and cultural resource features, constraints and spatial relationships; preparing graphics, base maps, countywide park network maps; park trail maps; as well as in analyzing candidate properties for addition to the park system. GIS is an essential tool regularly used in all park planning, resource management and development projects.
- **The Department of Planning and Zoning** – uses GIS programming and analysis to handle tasks that would have been overwhelmingly manual in the past. The assignment of regional transportation analysis zone numbers to each of the county's' 358,000 individual parcels has made this a routine and quick process. GIS streamlines the Area Plan Review (APR) through the use of the Comprehensive Plan Amendment Tracking System (CPATS) which uses GIS to generate notices for plan amendments applications. This has largely eliminated errors and provided easy access to the latest information. GIS is integrated into DPZ's Land Information Systems (DPZLIS) with a number of benefits including, easy and quick access to staff report maps, generating environmental assessments, and custom page size maps of any county location. These specialized features have been particularly beneficial in zoning enforcement issues where the public can now view maps to check permit and enforcement cases via the internet. They have been using 3-D analysis to visualize and analyze building size and impact on neighboring properties and thereby make more informed determinations about proposed construction. Most recently they implemented the Planning and Zoning Map web portal and have implemented an interactive Planning and Zoning map viewer to find the location of zoning applications and are developing an Interactive Comprehensive Plan Map as well.
- **Department of Transportation** – utilized GIS for a variety of agency needs and projects. GIS provided tremendous insight in understanding and predicting commuter use of Park & Ride facilities and helps direct the department to locate and manage new/potential facilities. The Department of Transportation uses GIS technologies for the Fairfax Connector bus system's demographic analysis, route planning, and bus stop management. Many of these techniques are also used for the Employer Services program to best promote commute alternatives for Fairfax employers and their staff. In addition, a number of transportation features, including the Residential Permit Parking Districts (RPPD), Yield-to-Pedestrian, and No Parking inventories are managed through GIS. GIS is used to plan and analyze bus stop locations and pedestrian safety improvements. New uses of GIS include interactive mapping to better aid the public in navigation and identifying recreational features for bicycle riders.

- **Pest and Disease Management** – Rabies, West Nile virus, Tuberculosis, and Lyme disease are compiled and analyzed spatially on a continuous basis using GIS. GIS is also used extensively in the planning, routing, surveillance, and/or enforcement activities for environmental health (food, water, onsite and vector).
- **Fire and Rescue Department** – makes substantial use of GIS and as a result is experiencing significant savings. For instance, in the process of responding to Fire Hydrant and Insurance queries, the GIS saves about 50% of staff time in determining distances. Additionally a 98% staff time savings were estimated in the countywide analysis of identifying five-minute response time areas for fire stations – a factor crucial to establishing areas within response time limits. More recently they contributed to building a routable centerline for the new CAD/911 system which will improve response times. They also used GIS to help evaluate possible alternative locations of a fire station near Herndon.
- **Fairfax County Police Department** – has had significant success in its use of GIS for crime analysis. In multiple instances, the Department's crime analysts identified spatial patterns in crime incidents, successfully predicted subsequent crime locations, and arrested suspects (for instance, GPS larcenies, burglaries). The training of police crime analysts as criminal profilers is heavily dependent on the use of GIS. The GIS Branch is working with the Department on the design of the next version of My Neighborhood's Police Incident viewer. Police also used GIS to plan the county-wide events for the national night out – community watch program. It highlighted all the activities and enabled efficient routing of staff to cover the large number of events in one evening.
- **Emergency Management** – GIS was used extensively in planning the response to flooding in the Huntington area. The GIS maps were helpful for both field personnel and staff in the Alternate Emergency Operations Center. It was also used for the extensive planning for the inauguration of President Obama – since close coordination with federal and neighboring agencies was necessary. GIS also supported '*snowmaggedon*' in FY 2009, superstorm Sandy and the Derecho responses in 2012, and regularly supports the Office of Emergency Management in table top exercises.
- **The Department of Systems Management for Human Services** – uses GIS regularly as part of tracking and analyzing county demographics. Their key system is the Integrated Parcel Life-cycle System (IPLS) which contains demographic information by parcel. Most recently they have used GIS to analyze and demonstrate the wide range of languages spoken in the county, broken out by language, area and are doing ongoing analyses with the 2010 census update.
- **Office of Community Revitalization** – now has a web site with GIS maps as an integral part. The site and its maps provide a geographical context for people interested in revitalization in the county.
- **Government Partners** – The GIS now contains data from Fairfax Water and the Cities of Fairfax and Falls Church on hydrants – an important data element for the CAD/911 maps.

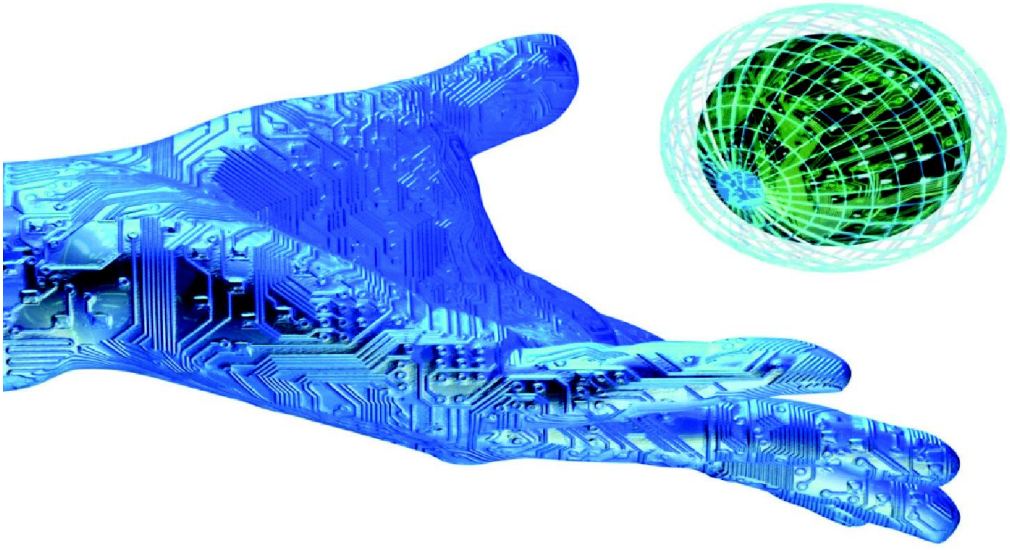
The breadth of GIS utilization across the county, and the extent of its integration into the overall IT architecture are reflected in the award winning plans and efforts of the preceding years. The awards recognize GIS's achievement in fostering and expanding the use of GIS applications to improve county operations:

- In FY 2011, Fairfax County GIS, as part of the regional team carrying out the Regional Routable Centerline project, was awarded a Special Achievement in GIS award by Esri. The award recognizes organizations that use GIS to "improve our world – and set new precedents throughout the GIS community."
- GIS was also the recipient of the 2010 VA Governor's Technology COVITS award for its 'Virtual Fairfax' web based application, also written in the Washington Post.
- County GIS programs received the VA Governor's Technology COVITS award for DPWES' use of GIS in routing refuse collection vehicles.
- In FY 2005 the county's GIS won FOSE's E-Town Award for GIS Integration.
- The county's GIS program received a "Best of Breed" award in the 2003 Digital Counties Survey. This survey and award recognition was conducted by the Center for Digital Government, in partnership with the National Association of Counties.
- Fairfax County's GIS received international recognition via the Environmental Systems Research Institute (ESRI) Special Achievement in GIS (SAG) Awards for both the GIS Branch work and the countywide efforts in GIS.
- The National Association of Counties recognized Fairfax County for its use of GIS in the reapportionment process.

Fairfax County is a member of the Northern Virginia GIS managers group, an informal group that regularly meets

to coordinate activities. The GIS Branch also works closely with the State's GIS agency (Virginia Geographic Information Network, now part of Virginia integrated Services Program), and now directly participates in the Emergency Operations Center when it is activated.

The county is a member of NACo's GIS committee which looks at key GIS issues affecting counties. Each year, GIS hosts "GIS Day" which promotes the use of GIS and development of new GIS applications through countywide competition and awards.



2.4 Customer Relationship Management (CRM)

Expectations for easy access to government services continue to expand dramatically. Citizens look for ways to interact with their government through channels that best suit their needs. Fairfax County continues to respond to this growing need through the implementation of Customer Relationship Management (CRM) technology applications. CRM provides agencies and their staff improved opportunities for providing citizens quick and convenient access to information about county programs and services. The county currently uses Internet Quorum (IQ), and Siebel technologies to enhance tracking and response to citizen inquiries and requests. These solutions were successfully implemented and have resulted in significant staff productivity and efficiency improvements in supporting information exchange with citizens through multiple communication channels: in-person, telephone, e-mail, via the internet and mobile devices.

For example, the Offices of the Board of Supervisors and the Clerk to the Board provided enhanced opportunities to record, route, and manage interactions with constituents and organizations. Subsequent phases have provided expanded capability throughout the county. The web enabled system replaced several custom applications and provides functionality for the Office of Public Affairs, Consumer Protection, Office of Human Rights and Equity Programs Department of Public Works and Environmental Services, County Executive and the County's Legislative function within the County Executive's office, Department of Purchasing & Supply Management, Department of Transportation, and the Alternative Dispute Resolution Program.

The Clerk to the Board of Supervisors uses the IQ Boards and Commissions Module to track appointments and nominations to boards, committees, and councils and maintain a complete correspondence history regarding contact with these individuals. Consumer Protection Division's modules include Complaint Tracking, License Administration and Taxicab Inspections. The systems enable staff to rapidly open and begin investigating cases. By expediting the administrative components of case investigations, the initial response time is reduced, resulting in earlier detection of consumer protection violations. The historical research required to discern how past cases were resolved is now expedited; cross-referencing cases between investigators allows department staff to share online information pertaining to

the same or similar consumer protection violations. Further, the system facilitates collaboration between department investigators on complaints and resolution techniques, and also enables citizens to access complaint histories of businesses online in order to research and determine the pros and cons of doing business with those merchants. In addition, the system allows Fairfax County Police access to license information for all solicitors, peddlers, pawnbrokers, massage therapists, taxi drivers, etc.

The Office of the County Executive uses the IQ Legislative Tracking Monitor application to assist county agencies monitor, review, respond to and track state legislation when the Virginia General Assembly is in session. The system includes the automated downloading of legislative bill information from the Commonwealth's Legislative Information System, thus eliminating the need for a legislative aid to manually track constituent requests. The Human Rights Commission uses the system to create, track and report on case workflows allowing the HRC investigators to meet multiple requirements. The system also streamlines complex discrimination processes and addresses privacy concerns for investigator and conciliators.

Enterprise CRM supports a holistic view which aids in making well-informed decisions about service delivery to the county's diverse population and improves communication through seamless unified access to information via the county's web site, IVR systems, cable TV, in-person, mobile devices, as well as a live Call Center Agent. A project steering committee consisting of DIT and agency staff that use or have interest in call center functionality was established to manage the implementation and integration of the CRM. Initial efforts involved development of the overall framework and pilot application in the Office of Public Affairs and supports Office of Public Affairs customer center sites in several locations. Frequently requested information and telephone numbers for county services and home owner association data is available in a centrally used knowledgebase to support consistent distribution of information. The Office of Public Affairs processed over 33,550 requests for county information and resources since deployment of the CRM application.

Office of Public and Private Partnership (OP^3) is the clearinghouse for partnership information in Fairfax County. CRM efforts in OP3 have consolidated disperse contact list, business partners, and resources enabling staff to utilize the system as a data depository for contacts, accounts, cases, service requests, solutions, correspondence, activities, and allocation of staff and volunteer resources. In January 2010, the Department of Tax Administration (DTA) Audit Division migrated from the use of multiple Microsoft Access databases and Excel spreadsheets to the CRM which offered improved accountability, increased security, and instant interactive reporting tools.

On-going goals include enabling screen pop interaction with case record information, contact interaction records, transparent case escalation, and consolidation of CRM solutions The enhancements will provide cross-browser mobility access to CRM, reduce maintenance, training, and support while increasing productivity in efficient seamless integration with the county's office products. The strategy also includes assessment of the next generation of CRM technology that provides improved native integration with the county's messaging environment, more agile mobile app development and viability for 'cloud' solution opportunities in alignment with county agencies' initiatives. The CRM strategy integrated with WEB, mobility, wireless apps solutions are the foundation for the county's customer service and public engagement initiatives.

2.5 Enterprise Content and Document Management

The county established a strategic approach to content and document management by developing an integrated solution on an enterprise platform. Content Management is the foundation for the organization and use of information from structured data (through business applications), and unstructured data in electronic or imaged documents (word processing documents, spreadsheets, e-mail, and reports).

The county's enterprise information architecture continues to be refined to provide efficiencies and enhanced capabilities to support enterprise document management. This solution enables the county a rich document management and business process flow for retrieval and storage of vast quantities of required paper records. The enterprise document management technology with incorporated workflow solutions improves business process efficiency and productivity by providing the capability to view hard copy records through automated applications in order to provide required services. In addition to fast and reliable business processes, the document management solution minimizes the need for storage of paper records, reduces storage space needs, protects against mounting storage costs, and reduces human and physical plant asset risks associated with handling voluminous stacks of paper.

Content management integrates with document management. For business activities that also rely on a variety of documents, the document management initiative employs technology at the beginning of a document's life cycle (originated as hard and soft copy) using the system to catalogue and track the documents and enable automated workflow processes through the entire life cycle. This comprehensive approach and associated implementation of technology is called Integrated Document Management (IDM). In seeking enterprise technology solutions that satisfied multiple needs, the county found that the best products for content management engines also incorporated document management needs. The integrated solution is more cost-effective, and provides a seamless integration for use of information found in imaged documents and information in databases and other systems required for a complete business transaction. The integrated document and content technology provides the ability to organize electronic documents, manage content, enable secure access to documents, route documents, automate related tasks, and facilitate document distribution.

Document imaging is another component of IDM; which has been embraced to provide a more efficient and effective way to store and retrieve documents for normal work productivity and to be able to handle to legal mandates for records retention and retrieval associated with case management, FOIA and e-Discovery (for example), as well as enhancing information published via the WEB in WEB searches. With the dynamically growing volumes of information, management of paper based documents which often times has extended retention time requirements is not effective and for many processes, not feasible. Consequently, many county agencies are implementing IDM with their business systems to alleviate the demand for increased storage space, improve business processes, and protect against disasters that can potentially destroy important paper documents. Integrated Document Management solutions encompass core business practices, as well as provide better archival and disaster recovery capabilities.

IDM technology has been implemented in a number of agencies over the past five years, for example, document work flow projects in the Office for Children (OFC), multiple initiatives for the Department of Family Services, the Commercial Inspections Division of Land Development Services in the Department of Public Works and Environmental Services to meet the needs of the sewer lateral section and complaints tracking, the core modules of an automated Accounts Payable System in the Department of Finance and on-going work for the Juvenile and Domestic Relations District Court. Although the individual departmental business requirements vary for the use of IDM technology, the following benefits and quality improvements have resulted from these projects:

- Increased staff productivity from employees' ability to share and act on accurate information through the delivery of the right documents at the right time
- Enhanced communication and collaboration through shared information
- Improved speed of information and transaction flow throughout county agencies
- Improved access and security through controlled access to sensitive documents
- Reduced time spent searching for critical documents
- Improved disaster recovery through electronic storage and backup of information that is far more secure than paper
- Reduced clerical, paper, printing and storage costs

In FY 2010 the Department of Family Services implemented IDM solution for Self Sufficiency program and begun the requirements for Children, Youth and Family program. In FY 2014 the county will continue to support the current initiatives of IDM and workflow technology for projects in the Department of Family Services, Office of Children, and the Clerk to the Board. Document management and imaging projects, especially when work flow automation is used, can greatly improve operational efficiency and effectiveness. In addition, these projects deliver enhanced information security. Granular control over each piece of data enables access by authorized users, and only for the specific information they need and are authorized to access. These solutions provide business units with the capability to reduce costs, accelerate business transactions, ensure regulatory compliance, and support cross-department communication.

IDM is an integral part of the county's FOCUS (ERP) project, where images of hard copy documentation that may need to be embedded in an electronic profile or case record. Documentum-Captiva is the primary enterprise-wide platform, compatible for use by the SAP ERP application implemented for FOCUS. The solution is integrated with business processes supporting Accounts Payable, Contracts, and Human Resource Management. First phases went live in 2011 for the accounts payable processes with the Documentum/EMC Invoice Manager and Captiva scanning for invoice processing for the Department of Finance. The integration of the FOCUS SAP financial and procurement modules allow for automated matching of properly submitted vendor invoices against authorized encumbrances and receipts, reducing the amount of time program managers and the Department of Finance would spend approving and paying standard invoices.

While most county agencies have adopted the enterprise-wide solution, smaller scale applications are in use in Laser-fiche from prior legacy applications. In 2011, the Juvenile Domestic Relations and the General District Courts collaborated with the Supreme Court of Virginia in participating as a part of work-flow for case documents and integration with state-wide court case management system. Future strategy continues with interfacing the Circuit Court.

Fairfax County continues to expand Enterprise Content Management System (ECMS) in fiscal year 2014. Department of Planning and Zoning determined that an Enterprise Content Management System (ECMS) and Scanning would afford the best solution for automating the Departments business processes and ending the dependence on ever-expanding physical files. DPZ ECMS will provide immediate access to Planning and Zoning related documentation, record recovery, re-filing process and minimize expenses associated with space and shelving for storage of paper contents. DPZ has completed gathering requirements phase. In next several months DPZ would develop the ECM system and would go in fiscal year 2014. DPZ Staff would start leveraging Enterprise Content Management system for daily business needs.

The on-going strategy includes integration with the County Archivist goals for over-all records management both in-house flow from agencies and also using cloud based solutions.

Content and document management will continue to be a long-term strategy to affect the integration of structured and unstructured electronic and paper-based information and file types in optimizing and enhancing overall information management, transparency and decision processes.

2.6 Technology Infrastructure Initiatives

To ensure continuous delivery of quality services in a cost-effective and resource-efficient manner, Fairfax County's technology infrastructure is designed with the flexibility to respond to the county's evolving technology and business requirements, and to take advantage of new trends that provide improvements in operational efficiencies and cost. The county established a strategic approach to building agile enterprise infrastructure architecture by consolidating and standardizing IT resources, implementing scalable and elastic infrastructure components, moving toward service-based technologies, and automating processes while ensuring visibility, security, and accountability, which has been recognized by The Information Technology Policy Advisory Committee (ITPAC (see Section 1) and industry providers as a well-developed capability with a resulting competitive TCO.

Virtualization and Consolidation

Virtualization and Cloud Computing technologies serve as the fundamental foundation for this strategic direction. In FY 2007-FY 2008 Fairfax County established virtualization as the primary means to deliver server-based (hardware & OS) infrastructure services. The virtualization of server-based infrastructure services introduced technologies such as VMware, Symmetric/Asymmetric multiprocessing, enterprise-class server

hardware, grid computing, etc. The virtualizations of server-based infrastructure not only provided a means to securely and efficiently share server resources ("do more with less"), but the county utilized virtualization to consolidate and standardize the overall server landscape. By implementing virtualization for server infrastructure platform, Fairfax County eliminated and/or consolidated server hardware which not only increased total cost of ownership (i.e. predictable costs, streamline of upgrades), but also reduced power, cooling, and physical server hardware footprint in data center thereby contributing to countywide "Going Green Initiative". These resource efficiencies also allowed Fairfax County to optimize management of resources, maximize application throughput, increase control over delivery of IT services, simplify administration, and ultimately build a foundation for the virtualization and standardization of other infrastructure components.

In FY 2008-FY 2009 Fairfax County continued the move toward virtualization/consolidation of infrastructure architecture by implementing storage virtualization (SAN, NAS, Grid storage), application virtualization (Terminal Services, Citrix), virtual desktop infrastructure (VDI), and network virtualization (VLAN, Load balancers) technologies. Virtualization of the infrastructure architecture has not only improved overall physical and operational efficiencies, but also provided better resource/capacity planning and provisioning of resources. This scalable, resource-efficient, and standardized architecture has become the base for Fairfax County to build out the "dynamic" data center. The dynamic data center provides the enabling infrastructure to move Fairfax County to next phase of strategic goal for the infrastructure architecture which is providing infrastructure as a service or the establishing of an internal private cloud. In FY 2010 Fairfax County received federal stimulus funding for energy consolidation projects of which a portion is dedicated to initiatives related to desktop power management, enterprise server consolidation and telework initiatives designed to lower power consumption, decrease greenhouse gases and reduce the county's carbon footprint. The virtualization/consolidation effort has reduced servers on an average ratio of 60:1.

In FY 2011 IT enterprise platform and infrastructure projects received national recognition for reducing the county's carbon footprint as well as providing operational efficiencies. The 1E PC power management deployment automatically shut down 14,000-plus end-user PCs across 55 offices when not in operation resulting in energy and cost savings. The County also deployed Nomad Enterprise to deliver operating system upgrades, software deployments, and patches to PCs, servers, and sites without disruption. Additionally with implementation of a self-service software deployment portal users can locate and install software without requiring IT staff to leave their office.

The virtual infrastructure environment was further improved in FY 2013, with the ultimate goals of reducing the total cost of ownership and providing highly available infrastructure without compromising the quality of services. The following strategic plan will direct enterprise platform and infrastructure in next fiscal year.

Self-Service Virtual Resources: with an automated workflow, platforms and associated resources (OS, Storage, Network, etc.) will be pre-allocated for users to choose from service catalogues. The county and agencies will gain great efficiency, visibility and flexibility.

Highly Available/DR Ready Virtual Infrastructure: Started in FY 2013, critical services and systems were identified for high availability and be capable of sustaining unplanned events such as data center outage. Such services shall be designed to serve customers in a distributed/load-balanced mechanism, rather than standby/failover.

Cloud Computing

In FY 2010, the county considered the potential benefits of in internal private cloud infrastructure by leveraging features from virtualization/consolidation base and other enterprise infrastructure initiatives (i.e. county institutional network, PSTOC, E-Gov enhancements, etc.). In addition, Fairfax County introduced complimentary technologies such as enterprise data backup/recovery, mirroring,

clustering, data de-duplication, replication, centralized infrastructure management tools, etc in order to enable the county's private cloud capability. In addition to server provisioning services, with the advancement of the enterprise dynamic data center, the county provided additional cloud-based infrastructure services such as storage provisioning, password management, application provisioning, and business continuity. By using virtualization as the base technology, the county's dynamic data center/private cloud is able to have internal and external components that provide different services based on costs, capabilities, needs, and SLAs. This is being aligned with the requirements of agencies and delivers value by enabling improved and incremental solutions, products and services that can be more effectively deployed. With this strategy, county agencies do not need to implement independent infrastructures for most services, and can minimize costs associated with common applications that are not needed by all employees at all times.

In FY 2014 the county will continue to build on the internal private cloud by standardizing and enhancing the dynamic data center infrastructure (i.e. unified network/server/storage infrastructure, more efficient business continuity technologies, enhanced security infrastructure, etc.). Also with the introduction of SAP as the county's ERP solution, DIT will be upgrading the telework/remote access portal to allow personnel the ability to access the ERP system functions (given their security profile) from anywhere over any device securely. The data will render itself to the appropriate form factor. With these enhancements, the county will be able to meet its strategic goal for an agile infrastructure architecture that meets technical and business demands by providing a platform to not only deliver infrastructure services via Internet in a shared, measured, secure, service-based, scalable, and elastic means; but also applications, business processes, and security services.

The county also integrated selected Public Cloud services as part of the effort to increase the quality of service and reduce the cost of ownership. For example, Symantec VIP is a cloud based service and it will replace hardware token and will serve as another factor of authentication. The county will continue evaluate services provided in public cloud.

Mobile Device Management (MDM) and 'Bring Your Own Device' (BYOD)

To enhance the county's goals for mobility, telework, operational cost efficiency, Continuity of Operations

Planning, and environmental stewardship and 'green' IT, a major component of the enterprise technology infrastructure initiatives includes technology that enables secure use of hand-held wireless mobile devices for data and business transactions, to include county issued and as appropriate employee personally owned devices. Enterprise mobile device management (MDM) solutions are policy and configuration management tool that can be incorporated into an organization's enterprise network and platform enabling infrastructure. Today's solutions allow smart-phones, and tablets to include Apple, Blackberry, and Android (for example). The primary solution delivery model is on-premise, but it can also be offered as a service (SaaS), or through a cloud. With the county having a mature 'private' enterprise cloud, this technology has been adopted and being implemented integrated with the enterprise network (see Section 5). In assessing the most optimal tools for use, the county considered lower cost options for casual users of their own devices for enterprise applications such as e-mail and calendaring, and a more robust solution for employees whose daily work is mobile in nature and conduct transactions crossing internal business systems and secure data. In 2011, Symantec's SMM was added to the county's Symantec secure tools already in use, and for complex needs, found to be the most cost effective and deployable given the county's balance for overall security, flexibility, device support and cost containment needs.

Enterprise Telecommunications

Contemporary voice communications integrated with data, video, presence and messaging is an organizational requirement in today's technological landscape. As government agencies are asked to do more with less, they rely heavily on a variety of communications technologies to improve effectiveness in meeting the growing needs of constituents. Integrating voice, video, data and presence information onto a common broadband infrastructure is the new reality. This convergence brings tremendous benefits to geographically dispersed enterprises such as Fairfax County. The near-term strategy is to implement Session Initiation Protocol (SIP) trunking services and benefit from the advantages in functionality and features this leading-edge technology provides. DIT is currently developing implementation plans for creating pure IP connections to the carrier cloud. This will yield a communications architecture that is secure, robust and scalable at a lower cost than traditional Public Switched Telephone Network (PSTN) connections.

The county's strategy for the next generation voice architecture takes into account complex technical requirements for an integrated network strategy. The solution supports a range of configurable telecommunication instruments and communications technologies and also provides a single logical architecture for addressing the business and operational needs of agencies located in multiple locations throughout Fairfax County. Integration of the voice and office productivity platforms, often referred to as Unified Communications, has been implemented as a pilot in selected county facilities, with wide-scale implementation imminent. The integration of the Avaya platform with Microsoft Office Communicator creates a seamless work environment where information and communications share common attributes and interwoven capabilities. This also includes opportunity to integrate with commercial wireless platforms to be deployed as part of smart-phone and 'I' pad device capabilities.

The county is also embarking on a strategy that enhances its wireless communications and broadband capabilities designed for integration with the county's robust, secure fiber infrastructure. This initiative will leverage the county's private voice wireless (radio), network and telecommunications programs for a unified architecture and support scenario. This strategy, designed to leverage federal broadband grant opportunities and public-private partnerships, will provide improved services and better cost efficiency than similar commercially available broadband solutions, especially supporting public safety response operations and regional interoperability.

Big Data

Given the interdependencies and shared business drivers of the cross agency applications and information, DIT resources were leveraged during FY 2012 to maximize benefit-received opportunities for the primary land use audience - citizens, the land development industry, and county agencies.

DIT's "Big Data" initiative focused on the consolidation of structured and unstructured land use data from several disparate land use systems in a GIS & web based data warehouse/business intelligence product. The consolidated data provides land use customers with property development history profiles, and "free style" search capabilities of past, present and future land use activities that drive economic growth.

A plethora of data from several obsolete mainframe VSAM systems, Oracle databases, and office automation documents that included building permits, site development plans, code enforcement investigations, and inspections, were centralized in the data warehouse to provide agencies with a single point of reference to streamline government services, and meet Board of Supervisor Land Information Accessibility directives.

Citizen/industry accessibility options to the GIS based warehouse and transaction-specific systems include, iPhone app store resident applications (with Android compatibility) that allow citizens to apply for permits, schedule inspections, report alleged land use code violations to county agencies, and assess prospective property procurements for compliance with county codes.

Department of Code Compliance and other agency staff can access the warehouse from the field (via VPN & wireless technologies) to enhance "mobile office" capabilities with a streamlined business architecture that includes real time customer property inspection, and construction assessment updates that contribute to sustaining safe and healthy neighborhoods.

FY 2013-2014 data warehouse expansion initiatives include digital dash boards for agencies' senior management to assess agency operational efficiency, Homeowner Association email notification of new

development plans affecting their neighborhoods, and augmenting the warehouse with land use infrastructure metrics.

The initiatives will also involve a pilot program to allow selected industry participants to electronically submit commercial development rezoning plans to the county via the web. Staff will evaluate the relative benefits and costs of the pilot before deciding next steps (i.e. expansion to other plan types and/or the entire industry).

The county will continue evaluation and forward planning for the next generation, web-based integrated government permitting, inspections technology for a strategic project that would include capabilities to further enhance cross-agencies' processes and expanded business needs, as well as more contemporary technical architecture and viable SaaS offerings.