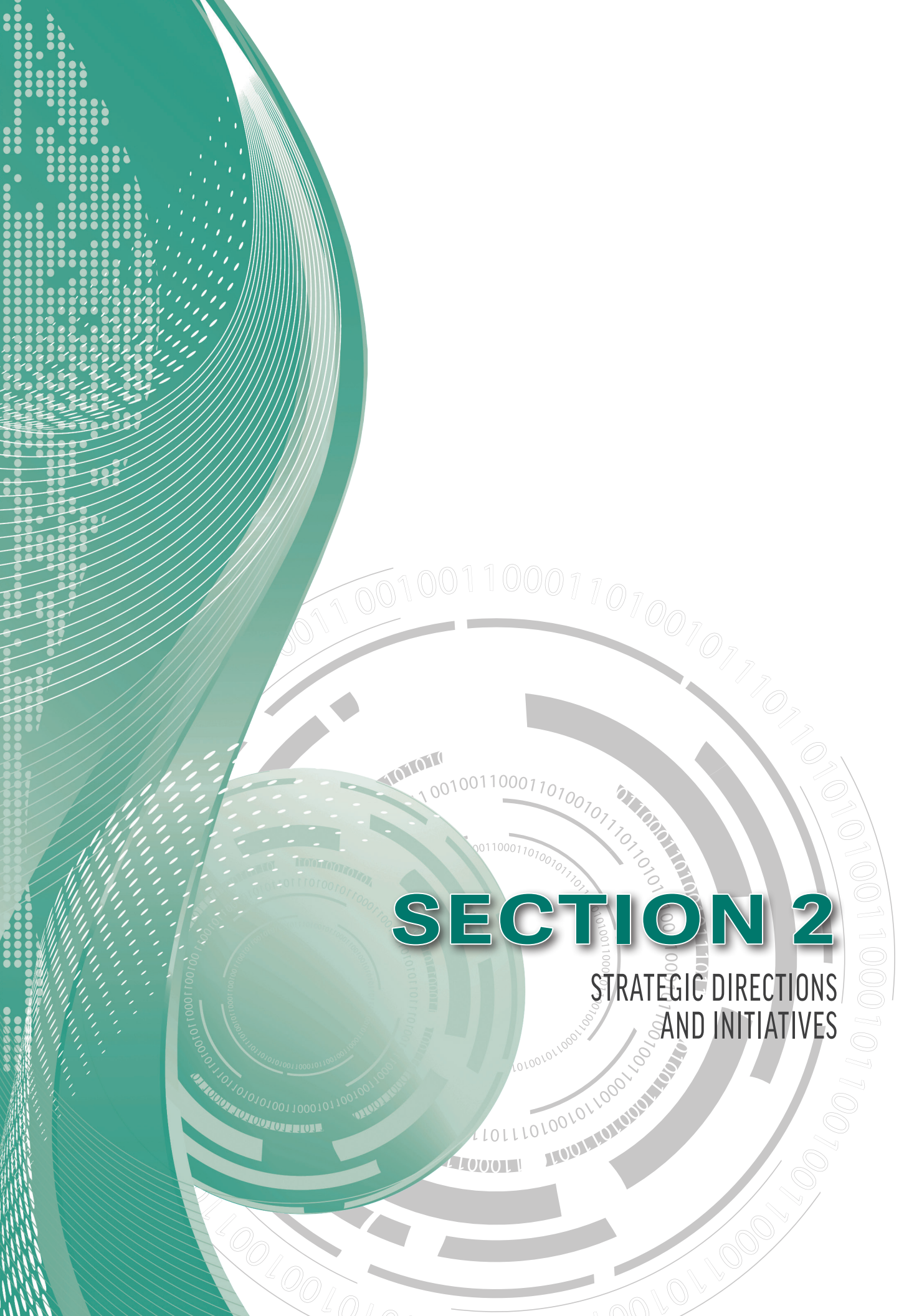

SECTION 2

STRATEGIC DIRECTIONS AND INITIATIVES

STRATEGIC DIRECTIONS AND INITIATIVES

SECTION 2 STRATEGIC DIRECTION & INITIATIVES

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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 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.

Fairfax County's 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, and 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 customer-oriented services for internal government constituent engagement.

2.1 Digital Government/e-Government

The e-Government (e-Gov) initiative is a foundational program supporting the County's goal of a "government without walls, doors, or clocks", consisting of many channels, policies and processes that integrate all platforms, both for internet as well as intranet. The strategy includes initiatives for expanding channels using new media capabilities and improving mobility, and citizen engagement and experience. The comprehensive strategy includes an inclusive set of channels, using enabling technology, policy and processes and the technical foundation for the County's open government and transparency goals, as well as enabling County agencies' operational efficiency, mobile workforce, emergency management, and Continuity of Operations Plans (COOP).

The e-Gov program develops the architecture for the WEB, other public channels and internal WEB portals, and includes the website https://www.fairfaxcounty.gov/, online services, mobile, social media, web-based applications, Interactive Voice Response (IVR), Cable TV, the County's Public Access sites in Libraries and Access Fairfax sites, and other tools across over fifty agencies to enable comprehensive

and cohesive access to County information and services. In addition to efforts of on-going improvements 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. The overall digital government strategy also supports Board priorities regarding public engagement, and other County initiatives associated with technology innovation in public service including, land use, Next Generation 9-1-1, Human Services Integration Initiatives, Customer Relationship Management (CRM), mobility, and transparency.

A governance body, the e-Gov Steering Committee (see Section One) develops strategy and goals for this program. The Department of Information Technology and Office of Public Affairs jointly work on design, navigation, content management and social media integration aspects of the WEB site, and provide guidance to county Web developers and content publishers in county agencies. Popularity and use of the e-Gov capabilities continues to expand. Here's a sampling of significant stats:

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Website Visits	19,252,748	19,105,379	19,311,840	18,160,887	16,314,450
Facebook Reach	11,603,306	28,313,758	58,827,954	91,759,813	66,317,648
YouTube Views	159,919	225,120	285,815	305,436	318,264
Emergency Blog	499,967	349,977	347,896	98,362	161,696
SlideShare Views	1,029,807	1,209,467	482,708	1,265,402	491,250
Twitter Impressions	14,746,461	23,550,698	56,295,975	69,575,979	62,923,888
TOTALS	47,292,208	72,754,399	135,552,188	181,165,879	146,527,196

Sec 2. Table 1 - Number of visits, views, impressions made with Fairfax County's social media.

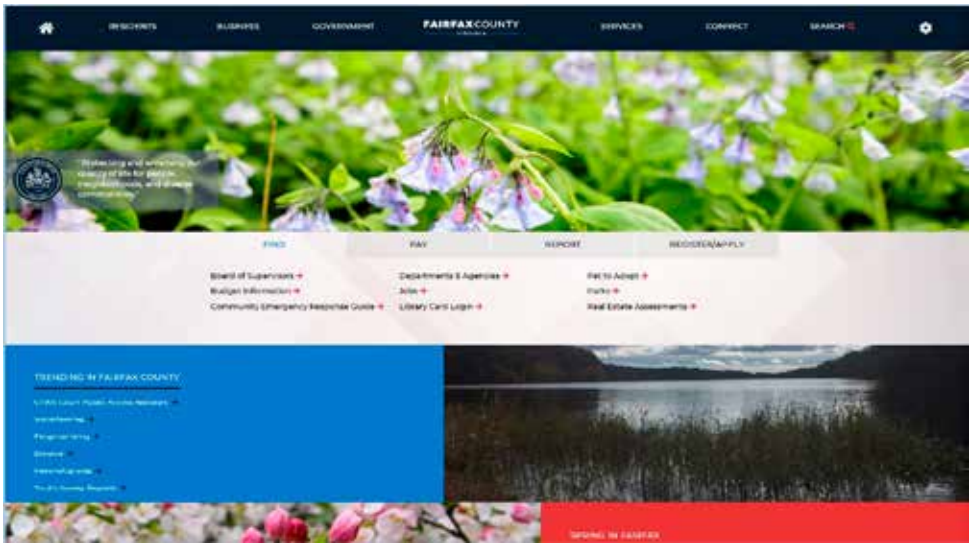
The County has achieved much success and acclaim for its e-government focus in integrating the WEB and IVR platforms to offer a wide variety of channels for complete on-line public access to services and programs, and its success in incorporating social media capabilities in a thoughtful way that enhance service delivery. Fairfax County and the city of Alexandria shared the Virginia Coalition for Open Government's Freedom of Information Award in the government category; and Fairfax County was also recognized by Public Technology Incorporated (PTI) for engaging the public as a regular part of the budget development process using extensive outreach through social media platforms. Fairfax County has consistently received

national recognition from the Center for Digital Government as one of the top ranking localities in the US, placing in the **top ten** for the past fifteen years, **top five** in fourteen of those years, and **#1** four times including 2015 and 2016.

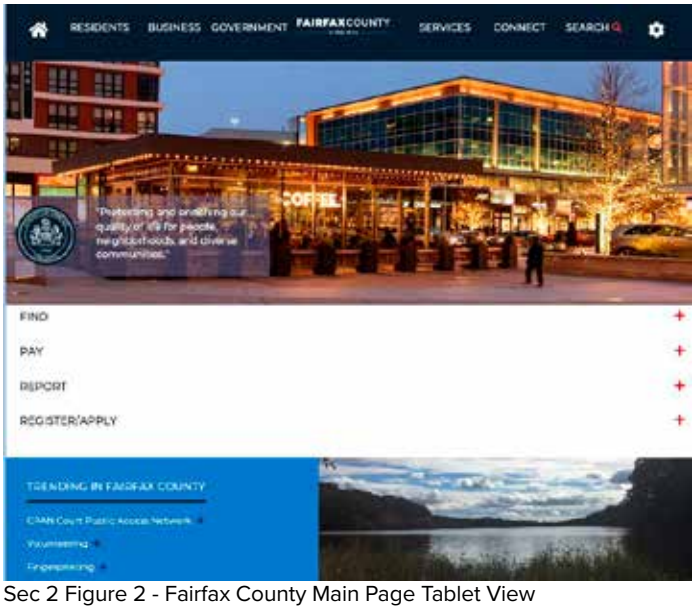
Over twenty-five County agencies have deployed a variety of Social and New Media apps to support their programs and services. In FY 2018, the County launched a redesigned modern, topic-oriented website. In FY 2019 - FY 2020, the County continues to add new online services, enhance County mobile apps, increase integration with social media, and continue to integrate the public website with new technologies. The e-Gov program will also continue to work with the Commonwealth of Virginia, regional partner municipalities, and federal government agencies in interoperability of common service portals and developing web service standards to enable cooperative access and seamless integration of information and services regardless of the origin or the source.

WEBSITE

In an ongoing effort to create a more user centric website and to promote transparency, a major e-Gov initiative to reconstruct the County website started in FY 2017 and was launched in FY 2018. The initiative included replacing and implementing of a new Enterprise Web Content Management System to enable better integration with new technologies such as social media, refining the current site's information architecture to enhance usability, redesigning the entire website with a more modern look and "mobile first" approach, as well as improving search functionality. The new site, launched in December 2017 showcases a more topic oriented structure with improved business delivery model, enhance search engine optimization, generate better information indexing, and eliminate data silos, thereby promoting transparency on the County's web site. The redesign effort was based on industry best practices, metrics and public engagement. The refresh and redesign is an ongoing effort of the e-Government Program



Sec 2. Figure 1 - Fairfax County Website



Sec 2 Figure 2 - Fairfax County Main Page Tablet View

to keep pace with evolving internet technologies and improvements in use, search, engagement, and open government initiatives.

The current family of homepages on the County's primary website at https://www.fairfaxcounty.gov/ uses responsive design to render seamless information across three device types: desktop, tablet and mobile. Design considerations included highlights of the key services the public is looking for online along of a pictorial representation of the County activities which was based on analysis of years of captured metrics. The most accessed services are featured prominently and easily available on the top in the "Find, Pay, Report" section of the homepage, based on the current website usage and metrics. A comprehensive review of the web content was conducted, based on data and usage patterns during the website redesign initiative to determine navigation and over-all usability of the site resulting in fresh, attractive design with new functionality, content enhancements, and innovative features. The Website and CRM solutions are part of the County's overall service improvement and customer engagement enhancement initiatives and support the goals of cross-agencies' services integration and improvements projects such as in land development and social services.

As metrics show, more than half of the traffic to https://www.fairfaxcounty.gov/ comes from search, so e-Gov will continue to invest in this important aspect, and continue to optimize web content so commercial search engines find County content. 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 Site Search is used to augment the overall search functionality of the website. In addition to the benefits for on-line services efficiency, the public website is also a part of the County's "Going Green Initiatives". The County website is translated into multiple languages using machine translation powered by Google Translate. For website accessibility, website pages are tested for compliance with **Section 508 of the Rehabilitation Act of 1973** (https://www.section508.gov/manage/laws-and-policies) and the Americans with Disabilities Act (ADA) by passing through the County's automated compliance checking tool.

While initial e-Gov efforts were largely focused on providing access to services, Fairfax County has expanded 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's "Online Services" is a centralized location for access to over fifty online and interactive services offered to the public to complete routine transactions such as payments, applications, and reporting with ease. In FY 2014, the County augmented its online services portfolio a number of key services like the online Courtroom Reservation, enhancements to Building Permits application, and Financial Transparency – a joint initiative with Fairfax County Public Schools which provides transparency to the public for both County government and public schools on their respective websites as well as on all mobile devices to view budget & expenditure data and specific vendor payments thereby promoting open disclosure.

The county will continue to invest its efforts in integrating Artificial Intelligence concepts to provide more efficient services to the public.

MOBILE

Acknowledging the widespread growth of mobile technology which added the convenience of using mobile devices from anywhere at any time, a mobile version of the County website was launched in 2011 thereby increasing the value of Fairfax County's e-Government efforts with the add-on of mobile apps for free download on all platforms like iPhone/ iPad, Android and Blackberry. 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. The County's public website is accessible via wireless devices at https://www.fairfaxcounty.gov/topics/mobile, sample of the mobile apps include:

- **Alerts -** Offers the latest updates about major incidents or weather events including text/e-mail 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.

Sec 2 Figure 3 - Fairfax County main page Phone view

- **NewsWire -** Each business day, Fairfax County's NewsWire features the latest headlines from County departments.
- **Contact Us -** One-touch calling of the main 703-Fairfax phone number, critical emergency

phone numbers, libraries, parks, and courts listed by department/program.

- **Calendars -** Browse upcoming public meetings, community events, tax deadlines and more.
- **Library -** Patrons can browse the online catalog, get hours, locations, check reviews, place holds for pick up, modify hold requests, check account status, and renew material. Additionally, the 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 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 residents 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), 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: https://www.fairfaxcounty.gov/topics/mobile. The Fairfax County Mobile App has been downloaded over **39,000** times since its launch, in FY 2019 – FY 2020 the County will release a new re-imaged official mobile app.

NEWS

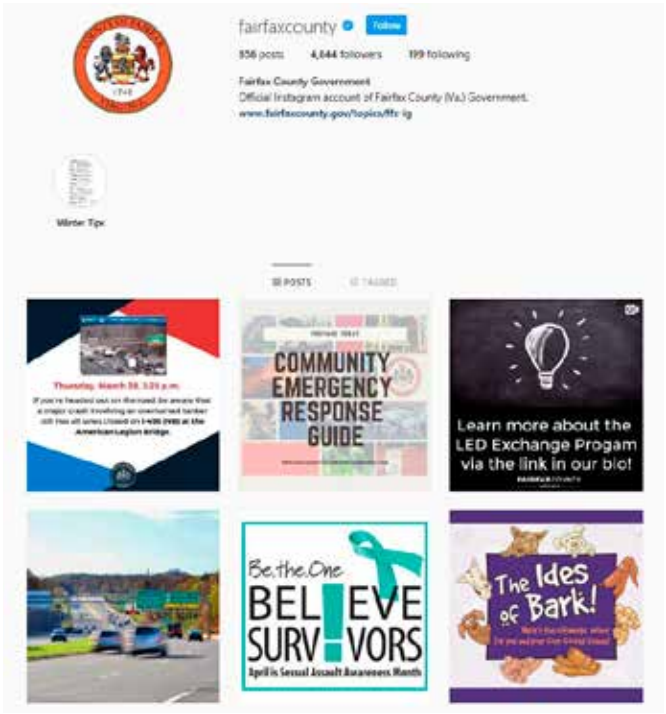
NewsCenter (https://www.fairfaxcounty.gov/news2/) is the County's one-stop news shop, which focuses on the delivery of news and information to the public: residents, businesses and other interested groups. NewsWire is a comprehensive site, that consolidates all the ways residents and employees can stay connected with the County, including: the social networking sites, information available on 703-Fairfax, E-Government services, podcasts, RSS feeds, Weekly Agenda and emergency alerts. NewsCenter is published on the website, and provides a central location for engagement and communication with the community and its residents.

Sec 2 Figure 4 - NewsCenter Page

Ask Fairfax is an online discussion forum that has hosted hundreds of questions through the years for dozens of chat topics with County experts. This has proved to be an invaluable tool for engaging the community.

SOCIAL MEDIA

Social media in Fairfax County has been a significant success to engage and provide services. It continues to grow, proving the county is engaging its residents on platforms people use daily. News articles published on the website are integrated into Facebook, Twitter, Nextdoor, Instagram Flipboard, Apple News and Google News. The County currently has 23 Facebook Pages, which reached over 66 million people in FY 2018, a 500 percent increase from FY 2014. The number of County Twitter followers has exponentially increased across 19 County accounts from 23,550,698 in FY 2015 to 62,923,888 in FY 2018 with Twitter impressions growing from 14 million in FY 2014 to 62 million in FY 2018 – an increase in 170 percent from FY 2015. The use of these tools is critical to providing two-way information with the County community. A centralized social media content management system is in place, along with a comprehensive social media policy that can be found at: https://bit.ly/2K10k0r.



Sec 2 Figure 5 - Fairfax County Instagram Account

The social media management system's user interface takes the form of a dashboard, and supports social network integrations for various social networks like Facebook, Twitter and You Tube etc. This system has helped build an engaging presence on social media with the ability to manage all our social networks and

schedule messages for future publishing. Additionally, the real time analytics provided by this tool gives an in-depth view on the dashboard of how well the County's social media efforts are being received by the public with the ability to visualize the metrics in one easy place. The tool also helps monitor social media conversations that matter to the County, identify its influences and observe emerging trends.

In coming fiscal years, the use of social media beyond communications will be important. The e-Gov plan will further integrate social media into operational aspects of agency lines of business to ensure cross-platform sharing as needed. Social media tools will continue to evolve as the leading e-Gov tools of choice in the years to come.

AUDIO AND VIDEO

Sec 2 Figure 6 - Fairfax County Sound Cloud Account

In FY 2014, Fairfax County launched an Internet streaming radio station simply named Fairfax County Government Radio. The County owns and produces large amounts of audio content for the County's SoundCloud social media account. The public can listen online (https://www.fairfaxcounty.gov/publicaffairs/radio) as well as on mobile devices providing additional avenues for across to County information 24 hours a day, seven days a week. During emergencies, the station is used to share important emergency information in an audio format, similar to the way the County currently uses other platforms such as the emergency alert system (https://www.fairfaxcounty.gov/alerts) where residents can sign up to receive emergency alerts by both text and e-mail.

The use of videos has continued to expand beyond the County's existing cable TV channel. Fairfax County YouTube channel views grew by 41% in FY 2015 and videos for the intranet have led to greater engagement among employees.

The e Gov program will continue to affirm the County's strategic vision and goals, with continual enhancement of services and focus on improving online service delivery along with a coordinated process for implementation and to keep in alignment with the Customer Service and Engagement efforts. Focused efforts on re-architecting information, modifying layout and presentation of content on the County website will continue to be of prominence. Emphasis will be placed on providing information based on topics key to the public, which will be based on metrics and usage patterns of the website. The following tables provide a snap shot of some key metrics and agency specific services available via various e-Gov channels:

Customers Served	
IVR:	13 million since FY 2004
Web:	181,160,887 visitors which equates to 58,267,578 page views
Unique visits:	7,565,613 i.e. user access multiple pages or conduct business
E-services:	125

Information and Services Available	
Adult education classes	Web
Ask Fairfax - Online Chat with Fairfax Government	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, IVR
Financial Transparency	Web
iCARE DTA Real Estate Assessment and Information Query	Web
Library Picture Books	Web
Public Meeting Calendar	Web
Frequently Asked Questions	Web
Health Information	Web, IVR
Inspection scheduling	Web
Information for victims of crime	IVR
Job opportunities	Web
Library information line	IVR
Multi-jurisdictional information	Web
My Neighborhood	Web
Newcomer information	Web
NewsCenter	Web
Parks/Recreation information	Web
Public safety information	Web
Podcasting	Web
Real estate property assessment & tax information	Web, IVR

Information and Services Available	
RSS Feeds	Web
Seniors information and programs	Web
Voting	Web

Sec 2 Table 2 - List of services available through a website or IVR

Doing Business with the County	
Access Health Department food inspections database	Web
Access GIS aerial photography with pan and zoom	Web
Apply for building permit (pay and print	Web
Apply for County jobs	Web
Apply for a library card	Web
Athletic Facilities Application Request (AFAR)	Web
Board of Supervisors compliant forms	Web
Building Permit Fees Estimate	Web
County contract information and registration	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
Library Audio Books	Web
Obtain permit/plan status	Web
Pay taxes with credit card	Web, IVR
Pay taxes via eCheck	Web
Pay traffic tickets with credit card	IVR
Query current site information	Web
Query current position on the Housing Waiting List	IVR
Query current real estate property & tax information	Web, IVR
Query Human Services Online " Resource Guide"	Web
Query specific court case information	IVR
Query status of an inspection, permit, or plan	Web
Query Victim Services data for offender release date info	IVR
Register a vehicle	Web
Renew a pool license	Web
Request faxes of court fees and procedures	IVR
Request land use code enforcement	Web
Reserve a golf tee time	Web
Reserve/renew Library books – search catalogue	Web

Doing Business with the County	
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
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
Therapeutic Recreation Service Information and Registration	Web
Volunteer to help in the Library or Parks	Web
Zoning and Noise ordinance compliant form	Web

Sec 2 Table 3 - List of services constituents can find online

2.2 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, related products and data that provide the foundation for ongoing integration of GIS into county operations as well as enabling new developments.

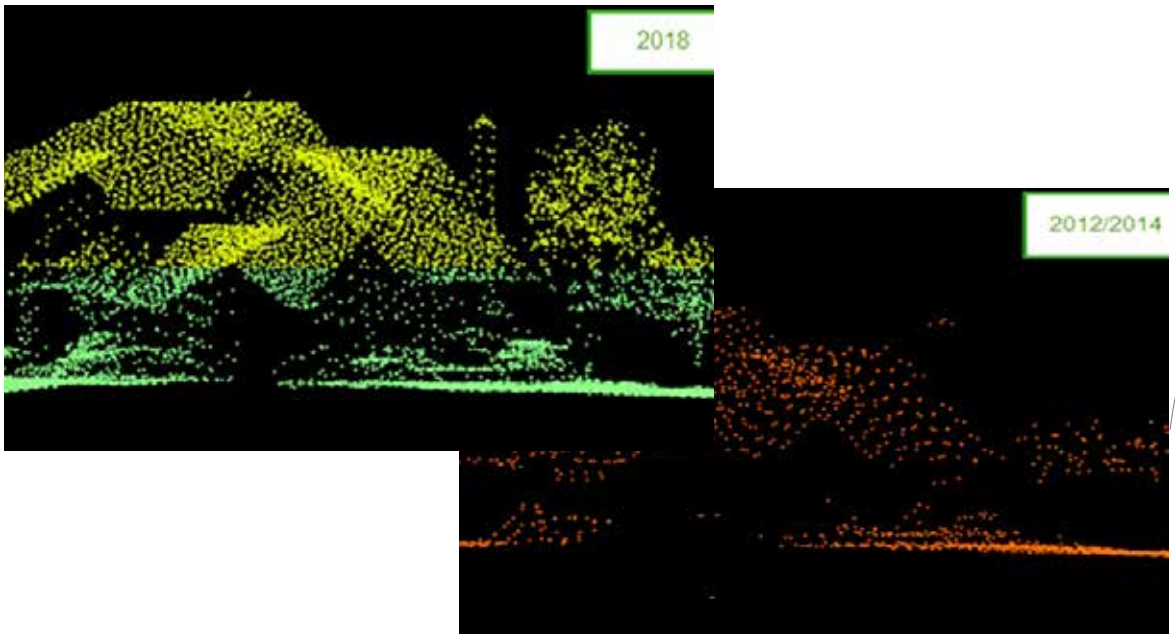
Web-based GIS applications have become more pervasive over the past several years, with a trend towards increasing utilization on the County's web site and in agency field operations. One example is the election results viewer, this application has been used since its release in November of 2014 to display ongoing vote tallies throughout the evening of Election Day. Another web based application, the revamped Virtual Fairfax was released in 2016. The area of the County that now has 3-D building data totals some 62.44 sq. km (38.8 sq. miles). A total of 5.7 additional square kilometers were captured in 2018 and 56.74 kilometers of 3D modeled structures were refreshed during the same period. The latest version of Virtual Fairfax provides a range of new analytical tools, enabling users to create slope maps (slope with directional arrows) terrain profiles and 3-D view shed, as well as measure distances, areas, and elevations among other features offered. The latest version also enables users to link to the Police Crime Reports, the Land Development Information Warehouse, My Neighborhood, Property Assessment in the– iCARE-revenue system, and land development information in the County's current LDSNet. The Park Authority, Urban Forestry, Health Department, and the Fire and Rescue Department use mobile applications to

Sec 2 Figure 7 - shows views from Tysons Corner in Virtual Fairfax in 3D

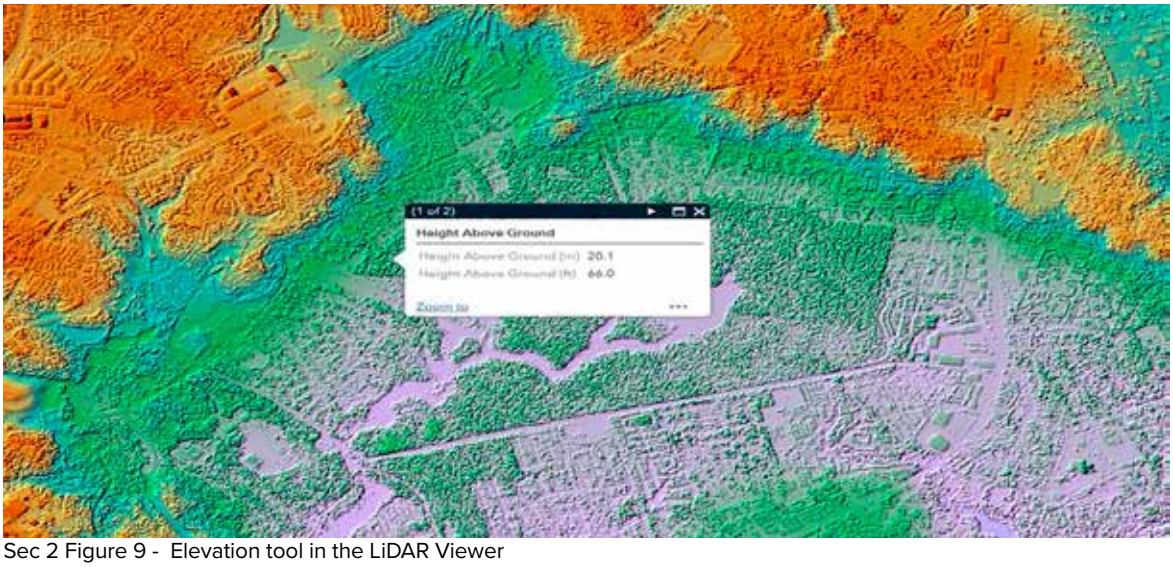
collect and analyze information on invasive species, trail erosion, mosquito infestations and treatments, and fire hydrant locations.

The release of a GeoPortal (https://www.fairfaxcounty.gov/maps/interactive-map-gallery) on the County's website provides a single location for accessing the growing number of GIS enabled web-applications. The portal now hosts sixty-three applications with varying themes. Including a 3D LiDAR Viewing application, The Richmond Highway Embark Project Viewer, a Transportation Priorities Plan viewer as well as many agency business specific applications available for public consumption. Cumulatively, these applications have had over 952,027 views.

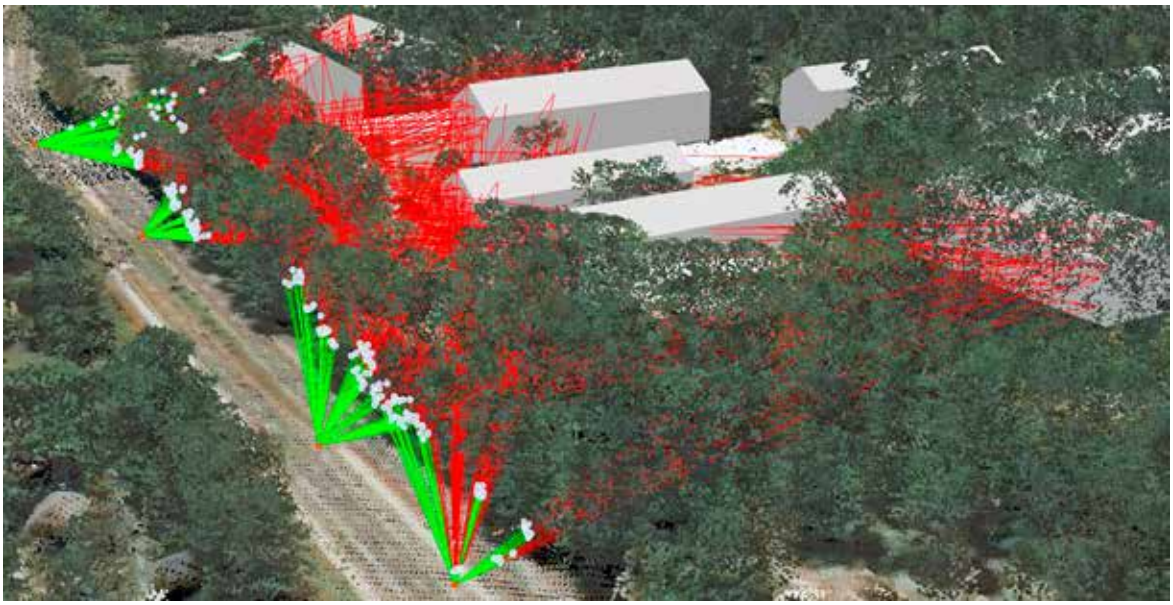
For the first time in 2015 the County obtained LiDAR (Light Detection and Ranging - a remote sensing method used to examine the surface of the Earth) for the entire County. Acquired in partnership with the US Geological Survey and the Department of Public Works and Environmental Services (DPWES), this immensely detailed data set contains over 9,000,000,000 data points (250 GB of data), approximately 2 per sq. meter, that provide elevation data of the surface of the entire County, including, trees, terrain, and the built environment. Fairfax County continued this partnership to collect even more highly detailed surface data in calendar year 2018. The LiDAR images below depict the improvement in LiDAR capture density. A house is shown with the resolution from the earlier collection versus the collection in 2018. In another example (Sec 2 Figure 9), a screen shot from the publicly available LiDAR Elevation Viewer shows how anyone can determine elevations of terrain and objects using the application. Recently, LiDAR has been used in line of site analysis for impact analysis of a proposed development on the old Northern Virginia Training Center Site. The image (Sec 2 Figure 10) shows how standing trees block line of sight to the new proposed structures.



Sec 2 Figure 8 shows improved LiDAR cloud density 2018 vs 2014



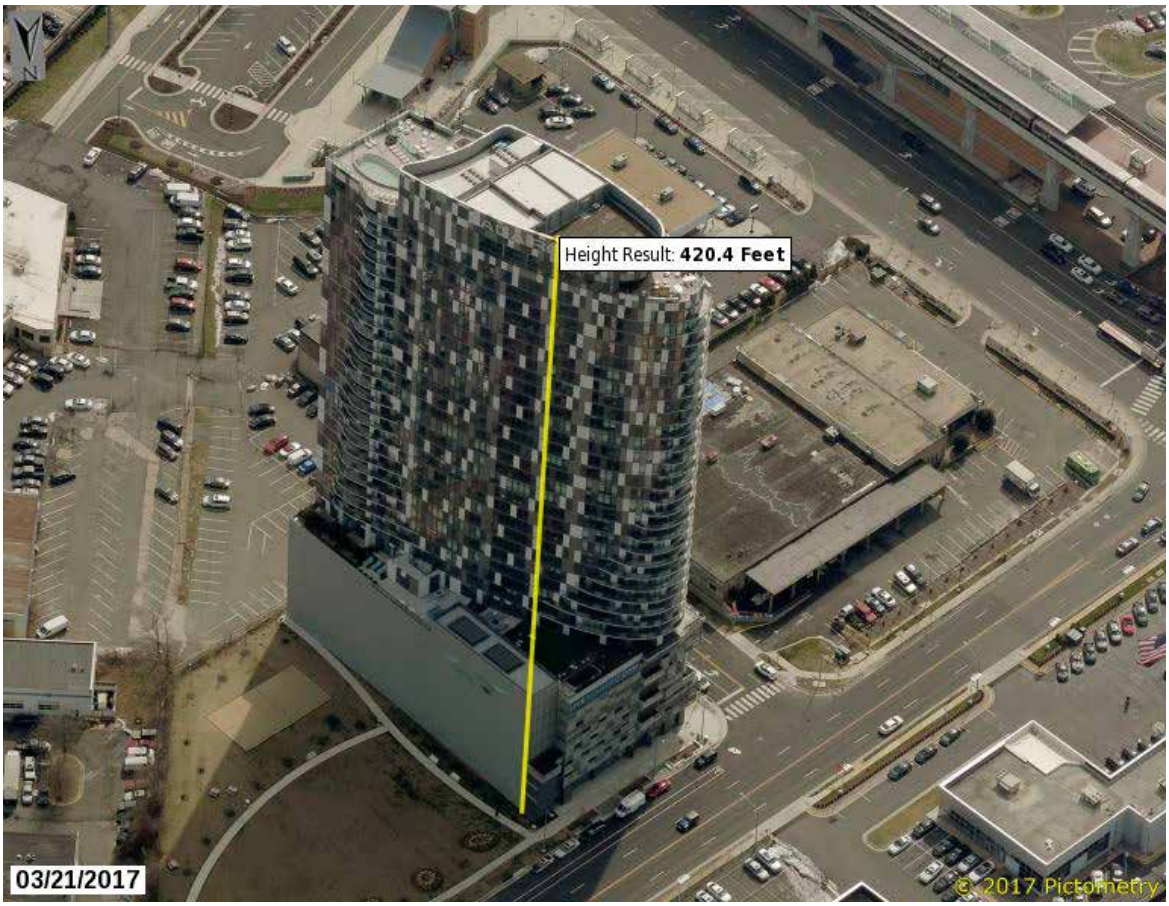
Sec 2 Figure 9 - Elevation tool in the LiDAR Viewer



Sec 2 Figure 10 - Line of Sight Analysis at defunct NVTC

Oblique imagery and its related software constitute one of the County's core GIS data sets and technology. Originally implemented in 2003, it is a key tool for multiple County agencies. Among may other users oblique imagery is integrated into CAD/911 operations, Department of Tax Administration assessment processes, the Geographic Exploration & Mapping (GEM) application, and also serves as the source data used to derive the 3-D buildings in Virtual Fairfax. The newest oblique Imagery was delivered in the summer of 2017, with the next acquisition scheduled for spring 2019. Below is also an example of oblique imagery for Tysons Corner, oblique imagery and associated tools allow for the measurement of heights.

Web-based tools were implemented to simplify viewing and use of the Oblique Imagery for County staff; these tools are simpler and available on desktop and mobile devices. Plans are underway to enable public web-users to view the Oblique Imagery as well.



Sec 2 Figure 11 - Oblique Imagery in Tysons Corner

Planimetric data is another foundational data set for almost all County GIS applications. Accurate planimetric data depends on high resolution and high accuracy Ortho-Imagery. The County partners with the state every four years to purchase new Ortho-Imagery, this partnership significantly lowers the cost of the imagery which is used on the web and as a foundation for nearly all GIS data layers. The Planimetric Data Update was jointly funded and completed through a partnership with the DPWES. The work significantly expanded the planimetric features in the GIS data warehouse: over 13 million new planimetric features were added to the GIS planimetric data – an increase of over 400%. The County's GIS Office collaborates with DPWES to determine the optimum refresh cycle and funding approaches. In 2017 the County partnered with the State of Virginia to obtain the imagery. The update to the planimetric process kicked-off in spring 2018 and uses the 2017 imagery. At this stage the update is approximately 35%

complete and will finish by 2021. Below is an image of the 2017 ortho photos, the planimetric data derived for that area and a 3D depiction of the same building created from the planimetric data.

Sec 2 Figure 12 Air photo to planimetric extraction to 3D extrusion

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 land development and tax administration systems. The MAR is the authoritative source of parcel (sites) addresses in the County, and is essential for effective operation of the CAD/911 system. It now has over 369,000 unique addresses.

The availability of key County data digitally through the GIS provides a range of benefits to constituents and County staff. Digital Ortho-imagery 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 parcel map changes are posted to the internet daily, providing web users of the Digital Map Viewer (DMV) 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 with added features such as the new symbolization of zoning patterns. 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, on average, over 13,000 DMV maps are viewed or downloaded per month.

The County's Geographic Exploration & Mapping (GEM) application is heavily used by county staff. The GEM is a web based light GIS that has replaced expensive desktop software for many with an easy to use and informative application that supports various county business lines, especially land development. Many work groups use the GEM to answer questions about geographic phenomenon on the ground

relevant to business. In response to requests from the Environmental Quality Advisory Committee and county agencies, a public version of the GEM will be released in CY 2019.

Working towards improved government interoperability is a significant and ongoing strategic activity for the GIS Division, both within Northern Virginia and regionally through the Washington Council of Governments (COG). Interoperability across National Capital Region (NCR) 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 (NCR GDX) through its membership in the project's executive committee and project management. The project went live in spring 2012 and has transitioned from custom software to an industry standard, ArcGIS Online. Users of the system can exchange contextual or event related geographic information between emergency operations centers, command posts, or fusion centers. It was a valuable asset for interagency collaboration for presidential inaugurations since January 2013, allowing sharing of more spatial data among federal and local agencies than was possible in the 2008 elections. NCR GDX was successfully used in the 2015 World Police and Fire Games, which were held across the region. Plans are underway in Northern Virginia and the Washington Council of Governments to include regional data sharing (via NCR GDX) as part of emergency training and drills. Additionally, the NCR GDX program conducts its own "community" drills to ensure the readiness of the operators and familiarity with the tools to enable the GIS community across the NCR in collaboration with federal agencies to support a regional emergency response.

The CAD2GIS project was established as part of the NCR GDX program. CAD2GIS establishes geospatial data feeds from live CAD2CAD data. This data offers a near real time geospatial view of Fire and Rescue unit and incident locations to provide situational awareness at a regional level. The geospatial data can be consumed and integrated into existing applications by participating jurisdictions within in the NCR to support both local and regional emergency preparedness and response operations.

Interoperability is crucial in Northern Virginia as emergency response personnel regularly crosses jurisdictional boundaries. Access to accurate street centerline data is particularly important to the Fire and Rescue personnel who may have to cross jurisdictional boundary lines when responding to an incident since there are a number of locations where the neighboring jurisdiction's fire station or equipment in route is closer to the event. The GIS office maintains Fairfax's street centerline data used in the CAD/911 system and provides the data to the Commonwealth of VA which aggregates Fairfax County's data into a state-wide centerline file. The Northern Virginia Regional Routable Centerline (NVRRCL) project has been an important and ongoing project enabling centerline data sharing for the CAD/911 system. The Regional Routable Centerline project was funded by a grant from the State's Wireless 911 Board. The project established a common street centerline data model to support vehicular routing and enables participating

jurisdictions to share current street centerline data to support vehicular routing, and enables member jurisdictions (Loudoun, Prince William and Arlington counties and the cities of Alexandria, Falls Church, and Fairfax) to share routable centerline data across Northern Virginia and the Commonwealth. GIS support for the CAD/911 system is a core GIS office responsibility, involving data maintenance requirements which continue to be a significant effort. With the transition to NG9-1-1, regional data plays a critical role. In addition to road centerline requirements, NG9-1-1 requires multiple boundary files which will require regional coordination and collaboration to ensure seamless interoperability.

Next Generation 9-1-1 (NG9-1-1) is a total re-engineering of the underlying telecommunications and operations of 9-1-1 by moving it to an internet-based system. The National Capital Region (NCR) is in the process of replacing its 40-year-old legacy 9-1-1 system with NG9-1-1 which will allow seamless interoperability across the region in addition to allowing transmission of voice and text to 9-1-1 and digital media such as video and photos to 9-1-1. NG9-1-1 is dependent upon GIS data to route 9-1-1 calls to the proper PSAP (Public Safety Answering Point) or 9-1-1 center with greater accuracy than today's legacy system, which relies on service provider tabular databases called the MSAG and ALI to route 9-1-1 calls. NG9-1-1 utilizes geospatial call routing which uses GIS data to validate address locations and perform spatial queries to determine the proper responding agency. As a result, supporting GIS data must be regional in nature requiring a greater dependency on regional coordination and collaboration. As part of the GIS data readiness efforts, the NCR underwent a 2-year data validation and synchronization process to analyze and review GIS address point and centerline data to the tabular service provider databases to ensure readiness to support NG9-1-1 geospatial call routing with a goal of a 98% match rate between the datasets. At the conclusion of this task, the NCR was able to achieve over a 99% match rate exceeding national recommended guidelines. Fairfax County will be the first in the NCR to deploy NG9-1-1 with anticipated implementation to occur in CY2019. As other jurisdictions begin to implement and maintain geospatial data to support NG9-1-1, continued collaboration with neighboring jurisdictions will be critical to ensure seamless interoperability across the region.

GIS technology continues to be an important asset in emergency management. The GIS office has a team of analysts trained to respond and assist the Office of Emergency Management during an emergency. With the Geographic information system and its associated data questions can be answered that inform emergency managers and responders. For instance, how many people are estimated to be in a particular area, how many homes are impacted by a power outage or a boil water order, which homes will be impacted by a sewage pumping station issue, etc. are now answerable with GIS. On May 7, 2018 as part of emergency preparedness, GIS analysts drilled with other county agencies in an emergency exercise called Operation Atlantic Fury and plans are in place for a summer 2019 exercise for GIS staff.. GIS was a key component of situational awareness throughout the May 2018 event and worked closely with the Situation Unit to keep the emergency operations staff informed and working from a common operating picture.

The volume of GIS information continues to grow in Fairfax County. The GIS data warehouse holds over 1400 layers of Fairfax County data and over 400 more of neighboring jurisdictions. The overall size of the

vector data in the enterprise GIS database stands at over 150 GB, and the raster data is now over 15 TB and includes both orthoimagery and oblique. The LiDAR data has added over 400 GB of data and with the new acquisition due to be received in 2019 will put the size at over 1.5 TB. As a result of new software tools, more imagery and historic maps will also be available. The volume of data in the digital map viewer grows annually as new sets of property and zoning maps are added. Currently there are nearly 50,200 pre-made maps and images of historic maps available on-line. The table below lists the number of features in some of the categories and their change over time.

Data Layers	FY 2009	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Parcel	358,300	358,140	358,630	358,765	359,610	360,472	360,668	361,246	362,257
Addresses	365,100	365,669	366,295	366,488	367,130	369,972	368,281	369,254	370,218
Building outlines	257,300	264,361	267,729	274,078	273,960	273,817	275,547	275,556	275,557
Miles of roads (County)	4,736	4,825	4,904	4,943	4,959	4,982	4,993	5,002	5,006
Miles of roads (regional)		7,628	7,652	7,729	8,240	8,313	8,841	12,552	12,753
Number of streetlights	59,937	60,448	60,557	60,825	61,257	61,373	61,866	62,144	62,288
Linear miles of sanitary sewer lines	3,390	3,410	3,424	3,440	3,455	3,466	3,478	3,543	3,595
Miles of trails and walkways						4,800	4,804	4,780	4,782

Sec 2 Table 4 - Some of the significant layers in the GIS database

In addition to the GIS Office, over 25 County agencies use GIS in their operations. Some use examples include:

- **Northern Virginia Soil and Water Conservation District –** The soil maps (both the 1990 and 2011) are available with seven other digital map series on the County's web site. The 2011 soil series maps were added to the digital map viewer in FY 2010 and updated with a new base map in 2018. The most current soil data based on the County wide soil evaluation program conducted jointly with the federal Natural Resource Conservation Services and the Northern Virginia Soil and Water Conservation District is available free

of charge through the viewer. Sales of the printed property and zoning maps has fallen steadily as more users turn to the free, digital online maps. The soils data is regularly used internally for site review and is available publicly via the County's Open Data Portal.

- **Public Safety –** The street centerline GIS file was modified to reflect Northern Virginia's common centerline elements and made available to all County agencies. It has been substantially enhanced with additional data needed for CAD and for regional routability of emergency response vehicles. Communications, first responders, and the GIS Division maintain the centerline on a daily basis to incorporate changes identified in the field. Additionally, Public Safety is one of the heaviest users of oblique imagery (at call taker and dispatch workstations) as well as planimetric features (in over 1,400 emergency response/public safety vehicles).

- **Through ongoing collaboration the Department of Public Safety 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. As new customers are added to the service, routing is adjusted for maximum efficiency.

- **DPWES Stormwater Management –** GIS technology has enabled the stormwater group to produce a number of applications to manage and make field work more efficient. Using mobile GIS, Stormwater Management has automated end to end solutions for its snow clearing activities ans asphalt trail inspections as part of its multiyear implementation plan is researching a number of other mobile applications. Stormwater Management also uses GIS to help analyze the age of the stormwater infrastructure to identify areas that are reaching their end of service lifetimes and need replacement or maintenance. Additionally, for watershed analyses, some of the analyses time has been cut in half using planimetric data, LiDAR and satellite imagery. LiDAR is also used to project scoping of water feature maintenance and improvement activities saving considerate field time and providing detailed terrain information that could otherwise have only been obtained from detailed ground surveys. The GIS also enables the Stormwater Management Branch to track easements around storm water facilities, and maintains maps of the County's stormwater features making them available via the Digital Map Viewer.

- **DPWES Urban Forestry Program –** Used mobile data collection and GIS to effectively track the emerald ash borer. Directly collecting data into the GIS database which enabled more efficient and detailed data collection. Based on the analyses, new and accurate, treatment thresholds for infestations have been identified.

- **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. Planning for waste water system capacity is another area where GIS has provided great benefit in the past and present. Lastly GIS is also used to help call takers identify problem areas phoned in from the public and prepare work orders.

- **DPWES Stormwater Planning Division –** Used GIS to analyze flood inundation areas

from possible dam breaches and to identify properties at risk of inundation.

- **Land Development Services (LDS) –** This agency added GIS analyst to its staff and has made great progress in a short time. As part of their planning for GIS LDS conducted a study of current uses of GIS and training needs. This document has helped guide their prioritizations and made a ready list for implementation by the new analyst. LDS has engaged the public with applications designed to help in the Land Development Application process. The critical structures section inspection areas application assists applicants with finding the right inspector for their area and is available on line. Other GIS initiatives has resulted in the creation of a new County wetlands indicator map that each site plan submittal will need to consult.

- **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. Also, 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. They are now using mobile GIS tools to improve tracking and abatement of mosquitoes. The tools have dramatically reduced printing and research as well as finding and treating the over1,400 dry ponds in the county's stormwater system.

- **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, County wide park network maps; park trail maps; as well as in analyzing candidate properties for addition to the park system. Parks also released a web-based mobile application for navigating County trails. Mobile GIS is used in assessment of invasive species and carrying out trail condition assessments. 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 an overwhelmingly manual effort in the past. The assignment of regional transportation analysis zone numbers to each of the County's 360,000 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, on-site and vector). The Health Department is now using mobile GIS tools to improve tracking and abatement of mosquitoes. The tools have dramatically reduced printing and research as well as finding and treating the over 1,400 dry ponds in the county's stormwater system.

- **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 County wide analysis of identifying five-minute response time areas for fire stations – a factor crucial to establishing areas within response time limits. 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 worked with the Department to implement a total new Police Incident viewer which will include a substantially larger map and faster response time. A mobile version is available. 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 technology continues to be a critical asset in emergency management. The GIS Division has a team of analysts trained to respond and assist the Office of Emergency Management during an emergency response. In addition, the GIS division supports agency specific activations by having personnel available and on call throughout the duration of a departmental activation. With the Geographic information system and its associated data questions can be answered that inform emergency managers and responders. As part of emergency preparedness and regional response, the GIS Division participates in County and Regional exercises conducted annually. The GIS

Division works closely with the Situation Unit to inform emergency operations personnel through the use of a common operating picture. The GIS Division established the EOC Viewer to provide regional situational awareness throughout an emergency event. The viewer provides geospatial intelligence about the locations of key resources such as public safety facilities, critical infrastructure, transportation, etc. Additionally, users are able to enter dynamic data for support purposes such as incident specific data such as road closures, damage areas, etc.

- **Department of Management and Budget, Demographics section –** 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 Strategic Management for Human Services –** Has produced a number of public facing applications for the Office of Strategic Management for Human Services, that inform both the public and staff about conditions on the ground in Fairfax County. The Medallion applications provide users with tools designed to query and visualize demographic variables in Fairfax County. The mapping applications are organized into three primary categories: Demographics, Income, and Health. All variables, except for Free and Reduced Price Lunch, are aggregated to five different geographies: elementary school attendance area, middle school attendance area, high school attendance area, ZIP codes, and supervisor districts. This application provides a window into the underlying community characteristics of various Fairfax County geographies giving insight to residents, staff and decision makers.
- **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 CY 2018 the National Association of Counties granted Fairfax County its 2018 Achievement award for its program "Customizing Data for Health and Human Services Planning", which was GIS-based and helped drive zoning and development decisions.
- In CY 2015, Fairfax County was ranked #1 for jurisdictions with population over 500,000 in the Digital Counties Survey of the "Most Innovative, Pioneering Counties". The award specifically referenced a GIS application developed by the Department of Neighborhood and Community Services. That application was also a winner of one of the Counties GIS excellence award the year before.
- In FY 2014, Fairfax County was awarded a Special Achievement in GIS award by Environmental Systems Research Institute (ESRI) for its contributions to ESRI's national community mapping service. Now a highly-detailed base-map is available for all users of ESRI's tools.

- 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 ESRI Special Achievement in GIS (SAG) Awards for both the GIS Branch work and the county wide 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, which is part of Virginia integrated Services Program), and now directly participates in the Emergency Operations Center when it is activated. The County is also a member of NACo's GIS committee which looks at key GIS issues affecting counties nationally. Additionally, each year, GIS hosts "GIS Day" which promotes the use of GIS and development of new GIS applications through county wide competition and awards.

2.3 Customer Relationship Management (CRM)

Expectations for modern access and interaction with government services continue to expand dramatically. Agencies need automated ways of capturing interactions, providing and tracking response to inquiries, requests for services and complaints, and the enterprise needs a common solution that integrates with e-government capabilities and the Web, enables improved customer experience and public engagement, and provides an enterprise-wide view of constituent needs and concerns, and County response. Fairfax County continues to respond to this growing need through 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. Current solutions in place that have served a variety of agencies' needs for tracking interactions, response to citizen inquiries and requests, as well as issues management include Internet Quorum (IQ), and Siebel commercial-off-the-shelf (COTS) products. These solutions were successfully implemented over time for a variety of applications 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; and 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.

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 knowledge base to support consistent distribution of information.

The Office of Public and Private Partnership (OP3) is the clearinghouse for partnership information in Fairfax County. CRM efforts in OP3 have consolidated disperse contact lists of 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. 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.

Staff continues to meet the County's goals in CRM implementation across County agencies. The team's efforts, accomplishments, and plans in supporting the County's strategic initiatives, budget endeavors, and challenges faced during the fiscal year focused on the implementation of the unanticipated legislative mandate for a VFOIA solution. Implementation of the Virginia Freedom of Information Action (VFOIA) CRM solution was the most significant project effort during the first half of FY2018. The solution was delivered in three phases, with the main VFOIA department going online first, followed by 50+ end users across all county agencies online approximately six weeks later. The DIT-CRM team implemented the final release on January 2nd, 2018 totaling approximately 120 users. The Board of Supervisors (BoS), Mount Vernon and Lee District Offices, were migrated to the BoS consolidated CRM organization. These phases focused on data migration efforts from Mount Vernon and Lee District's three legacy systems (IQ, Constant Contact, and Voter Registration) to CRM. Enterprise-wide 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, live Call Center agent, mobile devices, and most importantly going forward - Social Media. Goals for the refreshed strategy include enabling screen pop interaction with case record information, contact interaction records, transparent case escalation, and consolidation of the legacy 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. 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 determined that Microsoft Dynamics to be the best overall fit for integration with the County's enterprise information systems environment, user friendly screens and navigation, flexibility and overall cost. Cloud version is also used for on-demand, as needed CRM requirements.

CRM day to day support for the migrated and solution implementation for Department of Tax Administration, Office of Public Private Partnerships, Office Of Public Affairs VFOIA, Front Desk, Media relations, and other Board of Supervisors' Offices areas consist of an estimated 200+ users with of expected 51% growth by the end of the fiscal year. The implementation for VFOIA has grown and allowed the County to respond to 8,469 requests with an average response time of three days. The new fiscal year the project will work to incorporate an additional DTA Target functionality along with Department of Human Resources, Department of Cable and Consumer Services, and migration of the Legislative Monitoring system from IQ to the current CRM platform.

2.4 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 to have 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 handle legal mandates for records retention and retrieval associated with case management, FOIA and e-Discovery as well as to enhance 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

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. In FY2019 Fairfax County's Department of Finance and Fairfax County Public Schools' Financial Services collaborated on a strategic initiative that supports migration and conversion of existing accounts payable data from the existing legacy document management system to Open Text, the County's new enterprise document management platform, including implementation of the Vendor Invoice Management (VIM) system.

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.

IDM is also an important technology for other agencies supporting major programs such as the Department of Family Services in the Self Sufficiency and Children, Youth and Family programs. 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 other agencies. The Juvenile and Domestic Relations Court and the General District Court are collaborating with the VA Supreme Court on workflows and document management for court files and possible integration with the state's case management system. Future strategy includes interfaces with Circuit Court systems.

Fairfax County continues to expand Enterprise Content Management System (ECMS). Department of Planning and Zoning determined that an ECMS and Scanning would afford the best solution for automating 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, shelving, and storage of paper documents. DPZ will continue to develop the ECMS. The on-going strategy also includes integration with the County Archivist goals for over-all records management both in-house flow from agencies and also using cloud based solutions.

New contracts for Records and Archival Document management system, cloud, and related professional services were awarded in FY 2015. The new solutions will accelerate the ability for agencies to streamline processes across various agencies and allow the user community to retrieve and view records on demand.

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.

2.5 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 to be agile 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, partnership with commercial hosing and 'cloud' providers, and automating processes while ensuring visibility, security, and accountability. This strategy has been recognized by the County's ITPAC (see Section 1), national IT research firms, and industry providers as a well-developed capability with a resulting competitive overall cost (TCO).

Virtualization and Consolidation

Virtualization and Cloud Computing technologies serve as the fundamental foundation for this strategic direction. In FY 2007 - 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 virtualization 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 decreased total cost of ownership (i.e. predictable costs, streamline of upgrades), but also reduced power, cooling, and physical server hardware footprint in the data center, thereby contributing to County wide "Going Green Initiative". These resource efficiencies also allowed Fairfax County to optimize management of resources, maximize data throughput, increase control over delivery of IT services, simplify administration, and ultimately has established a foundation for the virtualization and standardization of other infrastructure components and cloud technology.

In FY 2008 - 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 the next phase of the 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 has been further improved with the ultimate goals of reducing cost and providing highly available infrastructure without compromising the quality of services. Several key examples include:

- Self-Service Virtual Resources - With an automated workflow, platforms and associated resources (OS, Storage, Network, Virtual Service Machines, etc.) will be preallocated for users to choose from service catalogue. With the design and deployment of self-service provisioning resources, the County and agencies will gain great efficiency, visibility and flexibility into supporting business needs through the use of IT.
- Highly Available/DR Ready Virtual Infrastructure - Started in FY 2013, critical services and systems were identified for high availability and for the ability to sustain unplanned events such as data center outage. Such services are designed to serve customers in a distributed/load-balanced mechanism, rather than standby/failover. The completion of production failover, in the event of an unplanned outage, for the County's ERP system (i.e. FOCUS) was completed successfully. DIT is continuing to expand this HA/DR capability for County mission critical systems and agency applications to be able to failover to an off-site data center.
- Verisign Identity Protection (VIP) - Application installed on County-owned or employee-owned desktops and mobile devices provides two-factor authentication for remote connection to County computer resources. VIP improves convenient and safe remote accessibility for employees.
- Microsoft Skype for Business - A collaborative tool that has the ability to improve efficiencies and communications. This best-in-class communications application is an instant messaging client with video conference capabilities, online meeting, and telephony that enables real-time unified communication and resource sharing between employees at work and from remote locations. Along with PC's, Skype for Business can also be accessed from smart phones and tablets for increase mobility, allowing for increased productivity and support for agencies delivering services to its citizens. The implementation of Skype for Business' enterprise-wide Unified Communications (UC) platform for IM, conferencing, video, and Enterprise Voice will give the County a feasible future transition from the current voice platform, allowing for a reduced Total Cost of Ownership of IT communications. Primary business drivers for the deployment of Skype for Business included improved communications; increased collaboration; Enterprise Voice (EV) and Unified Communications (UC); reduced TCO of IT; increased mobility and; improved business integration.

Cloud Computing

In FY 2010, the County considered the potential benefits of an 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.). Complimentary technologies such as enterprise data backup/recovery, mirroring, clustering, data de-duplication, replication, centralized infrastructure management tools, 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.

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.). The remote access portal that went live in 2014 enhanced employee access to the County's ERP system FOCUS (based on their security profile) from anywhere over any device securely. The data renders itself to the appropriate form factor.

The County also integrated selected Public Cloud services as part of the effort to increase the quality of service, security and reduce cost; for example, Symantec VIP is a cloud based service that has replaced hardware token and serves as a second factor of authentication. With these enhancements, the County will meet its strategic goal for an agile infrastructure architecture meeting 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.

In FY 2020, DIT will start transitioning the 'data center' out of the County government property to a secure, commercial host/co-location site. Part of this strategy includes transitioning standards-based virtualized applications to 'cloud' infrastructure-as-a-service providers such as Azure, AWS, Google or others based on best fit and alignment.

Microsoft Office 365- Cloud Collaboration and Productivity Services

In order to provide business productivity solutions to County users and agencies, DIT deployed a solution which allows users to write documents, create spreadsheets, develop presentations, and transparently collaborate to carry out agency business functions, as well as cross-agency business functions.

In FY 2015, DIT began deploying Microsoft Office 365, a cloud-based suite of business productivity and collaboration services which the County has adopted to help meet its needs for robust security, reliability, and user productivity. Office 365 combines the familiar Microsoft Office desktop suite with cloud-based versions of Microsoft's next-generation communications and collaboration services—including Microsoft Exchange Online, Microsoft SharePoint Online, Office Online, and Microsoft Skype for Business Online—to help users be productive from virtually anywhere through the internet.

The deployment of this cloud-based business productivity technology solution will allow for integrated document collaboration, Skype for Business Messaging, e-mail, content storage, and online learning for County personnel to expand their skills to stay competitive in an increasingly technology-based environment. Most importantly, Office 365 has enabled the County to deliver increased redundancy of services to agencies and end users, as well as cloud-based storage, providing significant cost-savings for IT storage of County data.

Enterprise Communications Integration

Contemporary voice communications integrated with data, video, presence and messaging is an organizational requirement in today's technological landscape. 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 implemented Session Initiation Protocol (SIP) provider network trunking services replacing legacy carrier circuits, and implementation of pure IP connections to the carrier cloud. These will yield a communications architecture that is secure, robust and scalable at a lower cost than traditional Public Switched Telephone Network (PSTN) connections and enable advantages in functionality and features this leading-edge technology provides. The strategy leverages the County/Schools fiber I-net infrastructure which connects over 400 sites.

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, was implemented as a pilot in selected County facilities, with wide-scale implementation imminent. The integration of the Avaya platform with Microsoft Skype for Business creates a seamless work environment where information and communications share common attributes

and interwoven capabilities. The integration of voice and the Enterprise Microsoft messaging platforms will result in a Unified Communications (UC) capability, enabling agency end users to make phone calls from Microsoft Skype for Business on mobile devices, to ultimately reduce traditional desk telephones. Additional benefits include opportunities to deploy and integrate with commercial wireless platforms for smart-phone Windows Surface and iPads.

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. Fairfax is one of the first localities in CoVA to implement FirstNet as part of the broadband strategy.

Mobility

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. Due to dynamic change in the marketplace in end-user devices, the strategy focus has shifted from the device to data. Enterprise Mobile Device Management (MDM) solutions are policy and configuration management tools 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's mature 'private' enterprise Cloud, this technology was adopted and is being implemented and integrated with the enterprise network (see Section 5). In assessing the most optimal tools, 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. AirWatch Enterprise Mobility Management (EMM) enables balance for overall security, flexibility, device support and cost containment needs.

"Big Data"

Given the interdependencies and shared business drivers of the cross agency applications and information, DIT's "Big Data" initiative started in 2012 and 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 Oracle and SQL databases, GIS, the WEB, and 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 to meet Board of Supervisor Land Information Accessibility goals.

Citizen/industry accessibility options to the GIS based warehouse and transaction-specific systems include, smart phone resident applications that allow citizens to apply for permits, schedule inspections, report alleged land use code violations, and assess prospective property procurements for compliance with County codes. The 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.

In 2016, a new initiative was started to harness the enormous amount of data in dozens of systems in the Health and Human Services agencies. The Human Services Integrative Strategy developed a common data model and framework for data analytics (read more in Section 2.).

FY 2018 - FY 2019 data initiatives include digital dash boards for agencies’ Senior Management to assess agency operational efficiency 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. As part of a strategic project to enhance cross-agency business processes, the County will continue to evaluate and plan for the next generation of web-based public sector permitting and inspections technologies that use more contemporary technical architecture and viable SaaS offerings. This strategy includes GIS and WEB capabilities and reporting through data analytics tools such as (current) Business Objects, SAS, MarkLogic, and Microsoft Power BI. Thus, an overall integrated approach continues to evolve with more sophisticated data analytics products on the market, fueling the opportunity for streamlined business processes, service delivery, transparency and citizen engagement.

The strategy includes partnerships with commercial data service providers for enhanced analytics served through the WEB with enhanced on-line reporting. Continuing in FY 2020, enhancements to the enterprise data architecture, standards and governance frameworks are advancing.

2.6 Integrative Health and Human Services Model and Information Technology

The field of health and human services (HHS) is rapidly evolving. Changes to demographics, economies, practices, and technologies are creating a demand and an opportunity for a new model of health and human service design, delivery and management. Individuals and families served by the HHS system often have multiple needs addressed by multiple programs and services. For instance, an older adult, experiencing health and mobility limitations who wants to remain in his home may need at least seven services that currently span four Fairfax County HHS agencies – medication management, nutrition guidance, "meals on wheels", home based support services, senior housing, transportation support, and adult day health care.

With this in mind, the County has been engaged in efforts over the last several years to develop a conceptual foundation and business model which tie together the work of various health, housing and human services agencies in efforts to achieve specific outcomes related to the health and well-being of the County's clients and community. A holistic approach to addressing needs along the spectrum of crisis to self-sufficiency to sustainability, as well as strong communication, coordination and collaboration across programs and agencies are key factors in successfully addressing their needs. The leadership of **Fairfax County Health and Human Services (FCHHS), hence referred to as 'HHS'** recognizes that the HHS needs to update its approach to service delivery and management. There is an imperative and an opportunity to move forward with a new model that:

- Strives for integrated delivery, management and evaluation of health and human services,
- Is built around a shared vision that focuses on people and their strengths and needs, rather than individual programs, and
- Increases the County's ability to assess program performance, identify long-term trends, and create efficiencies.

The ultimate outcome requires shared planning, robust data, and information exchange in order to shape policies and future actions focused on improved outcomes and shared accountability. The new model also increases the County's ability to assess program performance, identify long-term trends, and create efficiencies. The **Health and Human Services Integrated Business Model** initiative has the ultimate goal of delivering person-centered services to County residents enabling a cross-sectoral exchange of process and data that better leverages resources and supports the County's overall goals for individuals and families to be safe, be healthy and realize their potential.

Information technology (IT) is an essential tool to attain a comprehensive view of a client's comprehensive need and to drive greater efficiency to comprehensively address those needs. IT will also be a critical enabler of improved collaboration across agencies and external providers and between Fairfax County, the Commonwealth of Virginia and other localities and associated programs. Finally, IT will enable Fairfax County to fully leverage the power of analytics to inform performance evaluation, policy analysis, program

planning and budgeting activities. Currently, there are over 70 information systems used to support the many programs and functions across the eight agencies including approximately 20 distinct information systems used for client intake spanning the eight health and human services agencies. Very few of these information systems are currently set up to exchange information, and many of the information sharing processes remain fragmented. All of this creates increased challenges for clients navigating the current collection of programs and services and for staff coordinating services within and across those programs. The components in the IT Roadmap serve as an enabler of reengineered, optimized, client-centered Integrated Business Model processes.

Through the effective use of information technology, the County has the opportunity to deliver a scalable set of coordinated services, improve service quality with more accurate and timely data, bridge service "silos" while increasing administrative flexibility and sustain cost-effective IT assets and services. The Integrative System initiative began moving forward with the establishment of the **Fairfax County Health and Human Services IT Governance Board (HHS ITGB)** in 2014. In its work, the HHS ITGB convenes County executive staff, information technology senior leadership, and human service department heads to identify and examine technology trends, programs, practices and operational requirements affecting human services programs. It establishes strategic direction, policy and priorities for technology initiatives and investments across the Health and Human Service agencies and related partner organizations, promotes an enterprise-level approach and collaboration, and state, inter-jurisdictional, and Federal interoperability opportunities. The HHS ITGB focuses on how the delivery of a consistent level of human services to the citizens of Fairfax County can be influenced and improved by deployment of specific information technologies and data governance. The HSITGB seeks to break information silos through the use of technology and coordinated agency practices to more efficiently and effectively provide services system- wide.

In 2015, the HHS ITGB approved a 5 Year IT Strategic Plan, and in 2016 approved an **Integrative System Information Technology Roadmap ("IT Roadmap")** that outlines the prioritized, deliberately sequenced series of IT projects that will enable the County to build out the proposed IT foundation. The Roadmap projects are described as "components": groupings of functionality designed to address a particular Integrative System data management, transaction management, communications or analytics need. Key components of the Roadmap prioritized for implementation in the first wave of functionality are:

- Document Management
- System-Level Analytics
- Constituent Interaction Management
- Eligibility and Enrollment Management
- Client Register/Master Client Index
- Service Information Exchange, and
- Security and Access Management.

Acknowledging that this is a complex venture, the goal is **not** to build or buy a single, all-encompassing, monolithic IT solution that will address the functionality needs of multiple agencies and the programs they

manage. Instead, the aim is to be strategic about County IT investments, planning, and commitment to IT resources. Establishing the foundation for how information technology will be used across the health and human services system is the first step towards a multi-year effort enabling the programmatic innovation envisioned for the system.

Developing and Implementing the IT Roadmap: Progress to Date

The Roadmap adopted by the HHS IT Governance Board reflects an agreement in principle on how the agencies that make up the FCHHSS will operate as an Integrative System and how IT will serve as an enabler of optimized, client-centered processes. Furthermore, the Roadmap is based on business-driven functional capability expectations and best practices for IT architecture, acquisition and management; as such it neither prescribes specific IT products or solutions, nor does it advocate for products or solutions from specific vendors. Those details will be fleshed out prior to engaging in specific IT solution acquisitions or build projects. As such, the Roadmap is purposely designed to communicate future IT capabilities and needs in a compelling manner to a wide variety of stakeholders.

The IT Roadmap represents the viewpoints and captures the input of multiple stakeholders including but not limited to:

- Seven Capability Expectation Teams (CETs), comprised of program management staff from all eight FCHHSS agencies, that met over the course of three months to formulate capability expectations across seven functional areas that future IT solutions would need to meet in support of the Integrative System.
- A Process and Data Optimization (PDO) Workgroup, comprised primarily of deputy directors of the eight FCHHSS agencies that met over the course of five months to examine various issues around implementing an IT roadmap including information access, use and sharing; and critical factors for successful implementation of Roadmap projects.
- The Department of Information Technology (DIT), which is responsible for county-wide shared platforms and technology infrastructure and developed IT architecture and management expectations for future FCHHSS IT solutions and conducted reviews of existing information systems.

The IT Roadmap incorporates key takeaways from the Health and Human Services IT Showcase, an event held in November 2015 and January 2016. During the Showcase, several jurisdictions spread geographically across the U.S. – New York City, Allegheny County (Pennsylvania) and Pima County (Arizona) – shared IT initiatives they undertook to achieve greater integration across their respective health and human services agencies and, in the case of Pima County, beyond those agencies by also achieving greater connectivity with law enforcement and criminal justice agencies. The Showcase also featured presentations from information exchange organizations and IT vendors that offer solutions that have been instrumental in the implementation of health and human service integration initiatives in states and counties.

The IT Roadmap is inherently iterative: it will evolve and become more detailed and prescriptive based on solution acquisition strategies that explore various options that include leveraging existing County enterprise-wide platforms, build vs buy decisions, and open source arrangements for capabilities for other jurisdictions. It is predicated on the need to increase agility in the implementation, management and use of IT; specifically:

- Create a more nimble, responsive approach to IT implementation and provide for a gradual/ progressive approach to IT innovation;
- Incorporate "component based" and "service oriented" IT solutions that are designed to interoperate and support various programs/ lines of business: wherever feasible, work off common IT components that can interoperate and be replaced or upgraded over time without compromising the functionality and performance of other components;
- Ensure IT supports more rapid, timely changes to policies, business rules and processes;
- Enable greater workforce mobility, user access and self-service where allowable; and
- Enable more significant, ideally real-time interaction across the FCHHSS agencies and programs and with FCHHSS external stakeholders.

Commonwealth of Virginia (CoVA) engagement is also an important part of inter-jurisdictional collaboration and is on-going. The outcome of these discussions will determine the extent to which the FCHHSS will be able to consolidate certain functionality and how to both feed and take feeds from Commonwealth systems as opposed to the less attractive and efficient approach of entering data separately into Commonwealth systems.

During FY 2019, the following Roadmap implementation activities have been completed:

- ✓ Redefined implementation plans for several high priority components
- ✓ Implementation of the first phase of the Document Management component. Using Open Text, the County's enterprise-wide document management platform and a taxonomy developed based on input from all HHS agencies, a document management platform has been developed and implemented for two large HHS divisions. The project includes a mandatory upload to the Virginia Department of Social Services' document management system, completed by July 1, 2019. Additionally, the project includes a large data migration from an outdated document management platform, modernizing the technology and business process for programs within the two divisions. Next phases of the component will include expanding and extending the existing platform to other divisions and agencies.
- ✓ Completion of a pilot of the System Level Analytics component and demonstration to the HHS IT Governance Board. The creation of an HHS data warehouse, a common data model and the use of Microsoft PowerBI dashboards have led to the successful integration and analysis of client-level data within programs that span distinct HHS agencies. Next phases will incorporate data from additional systems and programs over time, enhancing analytics insights across the organization. Completion of the pilot included recommendations on data governance within the HHS organization. Those recommendations are currently being worked on.
- ✓ Formal kickoff of the Constituent Interaction Management component and implementation of a pilot with two distinct HHS agencies. The pilot standardizes a business process and data collection for light interactions with individuals in a call center or front desk situation. Evaluation of the pilot will occur by January 2020 and will include decisions about extending the component to users in other programs and call centers.
- ✓ Formal kick off and implementation of the first phase of the Client Register/Master Client Index Component. The HHS data warehouse is validating client identity and creating/validating a registry number to ensure clients are uniquely identified which in turn increases efficiency in the delivery of HHS services. Near-term future phases will connect these services to the Document Management and Constituent Interaction Management components.

2.7 Planning and Land Use System Modernization

The departments supporting Fairfax County's land planning and development processes have initiated a major strategic initiative to improve the speed, consistency, and predictability of the development review processes, and improved access to data and reporting. The initiative supports County plans to advance economic development and competitiveness, enhance business processes, provide better customer service, and achieve increased reliability in plan review, approval, permitting, and inspections. This project will be a catalyst for enhanced service efficiency. The Planning and Land Use System (PLUS) Modernization initiative and associated projects seek to implement the best fit IT solution to meet the overall objectives for business functionality, customer service, and technology capability needs of

County departments involved in the regulatory land use and development processes, and modernize and enhance the County's land use business architecture and its underlying technologies.

This initiative also supports Fairfax First and Economic Success strategies, and aligns with the Board of Supervisor Public Engagement and County Web-site redesign goals. Fairfax First, will transform the findings of the strategic assessment into tactical recommendations to improve the speed, consistency and predictability of Fairfax County's Land Use processes, and serve as the primary business driver of the Land Use System Modernization initiative.

Executive sponsorship for the initiative and governance for associated projects is the Deputy County Executives for Land Development and Information, and a Senior Executive Steering Committee comprised of the Chief Technology Officer, IT Program Directors for Solutions and Land Development, GIS and Web Competency Centers DIT, and agency heads of the five major agencies associated with the land use process. This group provides leadership and strategic direction for the project including goals, timeframes, and priorities. Key leadership for the business scope and process improvement opportunities and goals is provided by the Department of Planning and Development (DPD) and Land Development Services (LDS). Other core stakeholder departments include Fire and Rescue – Fire Prevention (FRD), the Health Department – Environmental Health (HD), and Department of Code Compliance (DCC). County staff has selected a software platform and implementation service provider, conducted an initial fit-gap analysis, defined a comprehensive inventory of 217 records, and established 5 environments on the county IT infrastructure. Design workshops were conducted for 166% of the records, and baseline configuration and development activities started. In 2017 County staff conducted an independent assessment of current procedures and processes, benchmarking the County against other best practices, identifying opportunities for improvement, obtaining input from the development community, developing recommendations to improve services and operational execution; and an in depth market scan for solutions.

The Department of Information Technology provides the technological leadership and works closely with the above core departments to modernize and replace most of the legacy systems and supporting system silos that support land planning and development, inspections, and code compliance processes, and provides contemporary capabilities for Web, mobility, and data analytics.

Current Systems

Fairfax County's land use agencies rely on the legacy custom developed Land Development System (LDS) and the Fairfax County Inspections Database On-line (FIDO) system (an older generation Commercial-off-the-Shelf (COTS) applications), and an assortment of independent sub-systems and interfaces to support Fairfax County residential and commercial development activities since 1996 and 2003, respectively. Both systems are based on old land use services business process models that will be updated as a result of alignment of projects related to Fairfax First, and aligned with new technology solution opportunities

in the IT system replacement project, named PLUS (Planning and Land Use System). The current systems operate on obsolete technology architectures no longer supported by the COTS vendor, and numerous complimentary systems with custom interfaces had been developed to meet evolving business requirements over the past two decades.

The Planning and Land Use Systems Modernization IT project will replace and consolidate these aging systems with a modern technology platform that is driven by re-engineered, streamlined and integrated business processes across the five major land use stakeholder agencies. This project will work in tandem with the ongoing LDS and DPZ Electronic Plan Submission Projects (ePlans) to ultimately deliver seamless technical integration and functional interoperability. Since 1996, the LDS system and its subsystems have supported commercial and residential plan review and approval activities at LDS and DPZ for dozens of plan and application types. Subsystems include ZAPS (zoning applications), PAWS (plans and waivers), and LDSNet (porting the original application to operate on the Internet and FairfaxNet intranet). All zoning, site, building plans, and applications are reviewed at the five core agencies to help ensure compliance with the Zoning Ordinance, the state building code, and the state and local fire and health codes.

Internal agency staff reviews and other plan status information are available for public access 24 x 7 via LDSNet's web portal, which includes magisterial district-specific plan aggregates and LDS building permit issuance reports.

The FIDO system supports the issuance of building permits, licenses, and field inspections for LDS, DPZ, HD, FRD and DCC. FIDO's web portal also provides the public with 24 x 7 public access to a variety of land use services and information such as online building permit applications, inspection scheduling, and land use code complaint submissions.

FIDO and LDS systems have been expanded to interface with the new LDS and DPZ ePlans systems that provide digital plan submission, review and approval capabilities for the land development industry. The new ePlans systems have completed their pilot phase in 2016, and new plan types were added in 2019. DIT will continue to expand ePlans capabilities as part of the Land Use System Modernization initiative.

Looking Forward

Although the FIDO and LDS systems have provided a set of technology programs customized for County land use agencies, they are very old, have obsolete technical architectures, and can no longer be modified to holistically accommodate the rapidly increasing changes in land planning and development business processes. All together, these are no longer technologically sustainable and inhibit efficient implementation of new business models and best practices opportunities. Whereas; new technology offers numerous additional capabilities and flexibility for today's required innovations and the ability to meet the County's changing demands.

The project is to replace the old systems with an integrated enterprise platform that will:

- Modernize the land use technology system to enhance customer service and improve operational execution, as identified in the ongoing Land Use and Development Services Strategic Assessment;
- Support a service delivery model focused on customer outcomes and more consistent, transparent service delivery to streamline plan, permit and inspection time frames and outcomes;
- Replace and consolidate the county's aging land use systems with a modern technology platform that meets business and customer needs, is maintainable and robust, and is adaptable to changing business needs.
- Consolidate and provide modern WEB and mobile portals for business and citizen use.

In addition to replacing LDS and FIDO, the new system will also replace over a dozen complementary systems that have been developed over the years to meet business requirements for new capability. Initial review of the modernized platforms offered by software vendors have shown very robust and feature-rich product offerings that will help the County achieve the recommended improvements in the Strategic Assessment. An iterative configuration approach phased over two years began in FY2018 for the core systems transition. IT solutions for this initiative will leverage county platforms, standards, cooperative contracts, and associated applications such as document management, data analytics, GIS, WEB and Mobility capabilities that will be used by staff and the development community.

A Future Vision deliverable from the Land Use and Development Services Strategic Assessment codifies the project goals for organization, business process integration and technology, providing critical input to the definition of requirements, business use cases, and the service delivery model for Land Use System. This initiative will enable improved data analytics, transparency for customers and staff, GIS integration, mobile applications, and iterative organizational changes and process enhancements into the future.