GIS Day Excellence Awards 2016

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Chief Technology Officer, Director,
Department of Information Technology

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Chairman of the Board of Supervisors,
County of Fairfax Virginia

Tom Conry
GIS & Mapping Services Branch Manager

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Tom Conry

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Forward

The use of GIS technologies in the County has led to the work that you see honored here at the GIS Excellence Awards and posted in the Awards Gallery.

As part of the GIS Day celebrations, the GIS Excellence Awards are given annually for outstanding uses of GIS technology by Fairfax County employees and agencies. The awards were created to recognize and celebrate those County employees and agencies that are effectively and innovatively using GIS technology. This year, 34 submissions were received for the seven categories of recognition.

As was done previous years, a judging panel from outside Fairfax County Government donated many hours of their time evaluating the entries. This year, judges were from George Mason University and Prince William County's Geographic Information Systems Division.

The awards have two categories recognizing individual and/or team accomplishments and five categories recognizing agency accomplishments. The following page lists the categories and their descriptions.

GIS Day Excellence Awards 2016

Individual/Team Categories

First, Second and Third Place Awards for Each Category

Best GIS Cartographic Product/Presentation

This award is intended to showcase the power of GIS tools in creating accurate, instructive, and visually-pleasing maps. Criteria used to evaluate the entries include:

- clarity of purpose and intent
- the use of GIS tools, methods, and operations to go beyond basic cartography
- visual balance and appeal
- inclusion of necessary map elements and conventions
- quality control for typos or other errors

Best Use of GIS for Analysis

This award is intended to showcase the power of GIS tools in undertaking sophisticated spatial analyses that aid County operations and answer significant questions. Criteria used to evaluate the entries include:

- complexity of analysis; use of tools, scripting, model-builder, etc.
- ingenuity/creativity/originality of GIS methods used
- project benefits to a team or department
- effective demonstration of the information and insight gained (e.g., diagrams, maps, presentations, report, text)

Agencies Categories

One Award Per Category

Best Use of GIS for Public Outreach

This award is presented to the agency that best utilizes GIS to Serve the Public with map doscuments, customer service operations, press relations, or public events. Criteria used to evaluate the entries include:

- effectiveness of the GIS work to the ourteach effort
- degree to which a difficult message was clearly communicated
- complexity of cartography, data analysis, customization and/or programming
- adapatability to future expansion/modification
- contribution of GIS as a planning tool for the outreach effort

Best Use of GIS on the Web

This award is presented to the agency that best demonstrates GIS interactivity, maps, and/or data on the internet or County intranet. Criteria used to evaluate the entries include:

- effectiveness of web product in meeting stated purpose
- benefit to the public and/or agency
- demonstration of advanced GIS techniques, including complex data analysis, customization or programming
- incorporation of web product into business practices

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Most Significant Data Contributor
This award is presented to the agency that has created or refined the most significant spatial data for the County. Criteria used to evaluate the entries include:

- significance of the data for the county and/or agency
- importance to agency's long-term business processes
- level of effort required to create/maintain the data
- sophistication of process to create/maintain the data

Best GIS Integration or Application Development
This award is presented to the agency that has integrated GIS into their operations to the greatest degree and/or has created a significant GIS software application. Criteria used to evaluate the entries include:

- effectiveness of the application/integration in meeting its stated goal
- demonstration of a labor/time savings for staff or the public
- ingenuity/creativity/originality of GIS methods utilized
- ease of use/intuitiveness of the integration/application
- ability to gain insights into data/project/issue as a result of the integration/application

Most Significant Progress
This award is presented to the agency that has demonstrated the most progress in their use of GIS over the past year. Criteria used to evaluate the entries include:

- increase of use of GIS in the agency, either directly or through agency-generated GIS products
- magnitude of the change in GIS use by the agency
- increased agency efficiency as a result of GIS
- demonstration of significant effort to train staff in GIS potential for further GIS-related growth

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Excellence Award Entries

GIS Cartographic Product Presentation

RPA Coverage on Adjacent Properties - Dan White; DPZ
Sign Enforcement Program - Peggy Delean, James Kerns; DCC
3 Deep Response Maps for Fire Engines - Katherine Good; FRD
Lake Accotink: One-Mile Service Area Using Network Analysis - Dacthien Ngo; FCPA
Geographic Distribution of Drug and Alcohol Related Arrests - Erin Nelson; FCPD
Employer Dot Density Map - Tom Wampler, Marcus Moore; FCDOT
Languages Spoken at Home: FCPS Elementary School Students - Erik Hovland; NCS
Mosquito Trapping Sites, Including BG Traps for Enhanced Zika Surveillance - Dennis Rojsuontikul; HD
Affordable Housing in Fairfax - Peter Uhrmacher; HCD
An Atlas of Transit Stations in Fairfax County, Virginia - Harry Rado; DPZ
Merrifield Suburban Center-Updated maps for the Comprehensive Land Use Plan - Harry Rado; DPZ
Community Business Centers Map - Kristen Hushour; DPZ
Fairfax County Virginia Aquifer Nitrates + Nitrites as N - Paul Shannon; HD

Use of GIS for Analysis

NG 9-1-1 Spatial Interface Project (SI) - Steve McMurrer, Tim Menda, Christopher McCarthy; PSC
Sign Enforcement Program - Peggy Delean, James Kerns; DCC
Using GIS to Identify Optimal Placement of Incident Management Officers - Shelby Zelonis; FRD
Creating Back-up Dispatch Run Orders for Computer Aided Dispatch (CAD) - Katherine Good, Christopher McCarthy; FRD and PSC
A GIS Based Valve Exercise Program - Maria Nieves, Gennady Magilevich; FW
3 Deep Response Maps for Fire Engines - Katherine Good; FRD
Are Fairfax County Students Getting More Sleep? - Sophia Dutton; NCS
Geographic Distribution of Drug and Alcohol Related Arrests - Erin Nelson; FPD
Employer Dot Density Map - Tom Wampler, Marcus Moore; FCDOT
Merrifield Suburban Center-Updated maps for the Comprehensive Land Use Plan - Harry Rado; DPZ
Embark Plan Adequacy Maps - Kristen Hushour; DPZ

Use of GIS for Public Outreach

The Human Services Resource Guide (HSRG) - Sapna Sharma, Phuong Nguyen, Dinesh Pateriya, Terry Reardon, Sophia Dutton, Khamtakone Betts; NCS
2016 Fairfax County Exceptional Design Awards Story Map - Gregory Chase, Marsha Collins; DPZ
Utilizing Story Maps to Inform the Public of Proposed Projects - Brett Martin; DPWES-SWM
Capital Facilities GIS Story Board Initiative - Yilia Vega-Claudio, Vickie McEntire Anglin; CF
Online Fairfax County Police Station Tour using CSV file - Jeffrey Gallagher, Matthew Shelton; FPD
Employer Dot Density Map - Tom Wampler, Marcus Moore; FCDOT
Mosquito Trapping Sites, Including BG Traps for Enhanced Zika Surveillance - Dennis Rojsuontikul; HD
Eye Care Services - Dennis Rojsuontikul; HD
Affordable Housing in Fairfax - Peter Uhrmacher; HCD
Merrifield Suburban Center-Updated maps for the Comprehensive Land Use Plan - Harry Rado; DPZ
Youth Crash Map - Gerald Kirwin; FPD

Use of GIS on the Web

The Human Services Resource Guide (HSRG) - Sapna Sharma, Phuong Nguyen, Dinesh Pateriya, Terry Reardon, Sophia Dutton, Khamtakone Betts; NCS
Fairfax County Office of Elections Absentee Line Length & Mapping Project - George Panagakos, Travis Potter, Victoria Kinsman, Sonia Skipper; Electoral Board
Fairfax County Department of Planning and Zoning's Historic Preservation and Heritage Resources Website - Gregory Chase, Dan White; DPZ
Use of Formcentric GIS Apps for Data Collection - Shelby Zelonis; FRD
Online Fairfax County Police Station Tour using CSV file - Jeffrey Gallagher, Matthew Shelton; FPD
Languages Spoken at Home: FCPS Elementary School Students - Erik Hovland; NCS

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Most Significant Data Contributor

Tysons Development Tracking Tool - Maggie Soffel, Scott Sizer, Brent Payne; County Executive
Sign Enforcement Program - Peggy Delean, James Kerns; DCC
Refuse Collection Truck Re-routing - Tracy Ashton, Conrad Mehan, Colleen Burroughs, Josielyn Rainey, Quentin Marovelli; DPWES-SWM

Best GIS Integration or Application

The Human Services Resource Guide (HSRG) - Sapna Sharma, Phuong Nguyen, Dinesh Pateriya, Terry Reardon, Sophia Dutton, Khamtakone Betts; NCS
Quality Review of Land Valuation Adjustments - Yorka Crespo; DTA
Creating Back-up Dispatch Run Orders for Computer Aided Dispatch (CAD) - Katherine Good, Christopher McCarthy; FRD and PSC
A GIS Based Valve Exercise Program - Maria Nieves, Gennady Magilevich; FW
Use of Formcentric GIS Apps for Data Collection - Shelby Zelonis; FRD

Most Significant Progress

Sign Enforcement Program - Peggy Delean, James Kerns; DCC
Quality Review of Land Valuation Adjustments - Yorka Crespo; DTA
Capital Facilities GIS Story Board Initiative - Yilia Vega-Claudio, Vickie McEntire Anglin; CF
Online Fairfax County Police Station Tour using CSV file - Jeffrey Gallagher, Matthew Shelton; FPD
Eye Care Services - Dennis Rojsuontikul; HD
Planning for the Future: Taking an Enterprise Approach to GIS at the Fairfax County Park Authority - Justin Roberson; FCPA
Growth of Affordable Dwellling Units and Workforce Dwellling Units in Tysons, Virginia - Navneet Sohi; HCD
Refuse Collection Truck Re-routing - Tracy Ashton, Conrad Mehan, Colleen Burroughs, Josielyn Rainey, Quentin Marovelli; DPWES-SWM

Best GIS Cartographic Product / Presentation

Individual Team Awardees

Third Place

Geographic Distribution of Drug and Alcohol Related Arrests

Erin Nelson

Police

This project was initiated at the request of the Community Services Board to assist them in identification of areas within the county most in need of drug and alcohol related services. Three years of arrest data was analyzed (October 2013 – September 2016). The data included any arrest relating to any drug or alcohol charges. There were over 30,000 arrests records in this dataset. The arrests were brought in to ArcGIS and distributed spatially through spatial join in order to create a choropleth map of the arrests by Emergency Service Zone (ESZ). Emergency Service Zones are the smallest geographic level used by the police department and therefore can provide the most precise level of detail. The top ESZs in the county were identified as well as the top ESZs within each Police District Station. The top ESZs were also highlighted in order to make them more easily identifiable. The top ESZs in the county were numbered as well in order to rank the areas where the most arrests occurred during this timeframe. The data was also distributed by Police District Station area in order to identify those stations area where the most drug and alcohol related arrests occurred during this timeframe.

GIS Day Excellence Awards 2016

Second Place

Merrifield Suburban Center-Updated Maps for the Comprehensive Land Use Plan

Harry Rado
Department of Planning and Zoning

Future land use in the Merrifield Suburban Center, a tract of over 1500 acres in the central part of Fairfax County, is described in detail in the Fairfax County Comprehensive Land Use Plan. Over a hundred pages of text and several dozen graphics cover Merrifield, which went through an editorial update during the 2013 to 2016 time period. Text and graphics prepared a decade and a half ago were revised to depict current conditions. Twenty one new maps were drafted for insertion in the Plan showing Land Use Concept, Streetscape Concept Open Space, Building Heights, Revitalization Area and the boundaries of all Land Units. These new GIS-created maps show up-to-date parcels, subdivisions, streets, Metro features, and hydrology. Many other maps, not shown here, were prepared to use for staff analysis and for presentations at community meetings.

The new maps were created using a combination of DPZ-developed SDE layers, new, specially drafted layers created by DPZ, and a supporting geography built from layers on the county's GIS. Input from other agencies helped shape the new maps. The Fairfax County Comprehensive Land Use Plan is maintained as a series of Microsoft Word documents, into which graphics, such as these maps, are inserted as image files, typically jpgs or bmps. The resulting documents are exported as pdfs which are posted on the Department of Planning and Zoning's website and hard copies are run for staff reference use.

The staff report for this update will be found on the DPZ website at: http://www.fairfaxcounty.gov/dpz/comprehensiveplan/amendments/2013-i-ms1_staff_report.pdf

First Place

An Atlas of Transit Stations in Fairfax County, Virginia

Harry Rado
Department of Planning and Zoning

The GIS-created "An Atlas of Transit Stations in Fairfax County, Virginia" was prepared by the Department of Planning & Zoning. The Atlas was published on the web and as a 54-page paper reference document. The Atlas is intended for use by planning staff, the County Attorney's office, the BOS, and members of the public.

The recent passage of legislation by the Virginia Legislature affecting land use in the vicinity of transit stations in Fairfax County placed an intense focus on these areas. Decision makers and the public needed to know in short order the exact location of each of the 14 stations in Fairfax County and the boundaries of their accompanying Transit Station Areas and other legally-defined development centers. They needed to know what surrounding development was in place. This easy-to-use reference document was created to facilitate discussion and research on these Metro stations of Fairfax County.

The Atlas contains a Metro system map, an index, and a street map, aerial, and large-scale close-up view of each of 14 transit stations in Fairfax County. A total of 37 new maps were created using a combination of DPZ-developed SDE layers, new, specially drafted layers created by DPZ, and a supporting geography built from layers on the county's GIS. Map images and other supporting text and imagery were assembled into book format in Adobe InDesign. After careful editing and quality-control cycles were performed the resulting atlas was exported as a pdf document at two resolutions, a high-res version for printing the paper atlas and a minimum-size version that has been posted on the county's website.

We feel the atlas is an example of the kind of useful specialty publication that be put together quickly and easily then published on the web and in paper using today's digital technology.

GIS Day Excellence Awards 2016

Best Use of GIS for Analysis

Individual/Team Awardees

Third Place

A GIS Based Valve Exercise Program

Maria Nieves, Gennady Mogilevich
Fairfax Water

Consistent and timely valve exercising is a critical component for water infrastructure maintenance to ensure a high level of customer service and water delivery. Implementing a systematic valve exercising program for over 110,000 valves spanning nearly 400 square miles presents a challenging task. By leveraging GIS technology within an enterprise level architecture, and defining a set of structured workflows, the necessary information and tools for high quality data collection can be made readily available to field staff responsible for the valve exercising process.

The implemented solution utilizes ESRI's Collector for ArcGIS iOS application and a configurable valve exercise map. Map configuration allows GIS staff to make feature classes and attribute fields hidden, viewable, or editable, providing field staff with all critical information, while limiting their editing rights to information relevant to the maintenance activity. GIS staff then utilize ArcGIS Desktop to review and approve feature class changes made by field staff. In addition, valve exercise tables establish a many-to-one relationship with feature class data, cataloging each maintenance occurrence. QC of these tables is supported using ModelBuilder for ArcGIS scripts to output data entry errors, in Microsoft Excel, to be corrected by field staff.

The Collector App provides a single map-based interface where users can view, edit and create data, and request follow-up work. Follow-up work requests are exported to text files and received by the organizations work flow management system, SAP, where a notification is generated for each request. The ability to use device enabled GPS to zoom the Valve Exercise map to the end-user's location, click on the desired asset, and complete application domain driven forms provides an efficient end-user workflow. The end-user can focus more on capturing accurate information and less on the process of data entry. In addition, with the ability to take the application off-

line, the end-user can continue to be productive in areas of negligible cell coverage.

The organization sees great benefit from this type of application. The end-users appreciate the ability to perform their work from a mapping interface without the need for paper maps and separate data entry forms. While the application focuses on valve exercising, it empowers the end-user to quickly identify and notify GIS staff of any data issues found in the mapping system. This generates an overall higher quality mapping system for all staff within the organization and ultimately a higher level of service to nearly 2 million customers.

Second Place

Creating Back-up Dispatch Run Orders for Computer Aided Dispatch (CAD)

Katherine Good, Christopher McCarthy
Fire and Rescue Department, Public Safety Communications

This project automates the creation of run orders for the Computer-Aided Dispatch System (CAD) using a python script to run the Origin–Destination Matrix Solver in Esri's ArcGIS Network Analyst Extension. Final output is a table that can be loaded into CAD as a back-up for dispatching emergency vehicles in the correct order.

Benefits to Fairfax County include:

- Efficiency: Eliminates need for a separate software package.
- Money: Saves annual software maintenance fees.
- Time: Quicker data preparation and final formatted list turn around. In turn, this leads to a more responsive CAD system as changes occur and more of the surrounding jurisdictions' data are included in Fairfax County's CAD. Staff time is saved in preparing data for the vendor and reviewing the data results and reformatting the final list.
- Increased cooperation between the Departments of Fire and Rescue and Public Safety Communications

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First Place

Using GIS to Identify Optimal Placement of Incident Management Officers

Shelby Zelonis
Fire and Rescue Department

In 2016, the Fire and Rescue Department (FRD) identified a need to establish Incident Management Officers (IMOs) in order to provide assistance to Battalion Chiefs on complex incidents. Initially, FRD could only staff four of the seven Battalion Chief stations in the county with IMOs; resulting in the question – which four of the seven Battalion Chief stations are best suited for optimal placement of the IMOs?

The Location-Allocation solver available as part of the Network Analyst extension in ArcGIS Desktop was used for the majority of the analysis. The purpose of the location-allocation algorithm is to identify facilities that maximize coverage to a set of demand points. For this analysis, we chose the seven existing Battalion Chief stations as candidate facilities (i.e., stations that can be considered for IMO placement). We also had to consider the influence of EMS Captains because they serve as aides to Battalion Chiefs in the absence of the IMO position. As a result, the EMS Captain stations were included as required facilities in the analysis, but could not be chosen as candidates.

To represent demand, we chose the CY2015 response data point locations. This is because demand for Battalion Chiefs/IMOs is where our incidents are located. We also chose a 10 minute travel time to represent coverage.

The analysis was run 52 times; each time using a different criteria based on the CY2015 incidents. The analysis considered coverage to a combination of the following scenarios:

- All incident types;
- Structure fires only;
- Dispatched event types where at least one Battalion Chief was required on the call;
- Dispatched event types where at least two Battalion Chiefs were required on the call;
- Incidents where at least one Battalion Chief actually responded on-scene; and
- Incidents where at least two Battalion Chiefs actually responded on-scene.

Each analysis was run twice; the first time using equal weights on the incidents, and the second time incorporating actual response times as weights (i.e., if an incident response time was high, coverage to that incident was prioritized over one with a low response time).

Each analysis resulted in a list of four stations that are geographically ideal for

IMO placement. We grouped the results into four scenarios: all incidents, structure fire incidents, all incidents with a Battalion Chief required, and structure fire incidents with a Battalion Chief required. When considering all incidents (with or without a Battalion Chief response required), Stations 9, 21, 29, and 32 were selected most often for IMO placement. When considering only fire incidents, Stations 8, 9, 21, and 32 were selected most often. When considering all four scenarios, Stations 9, 21, and 32 appeared in the top four station selections. Because IMOs will be most helpful on all incident types where a Battalion Chief is required, not just on fire incidents, it was recommended that Stations 9, 21, 29, and 32 be considered for IMO placement.
This analysis illustrates how GIS tools can be used to solve complex problems in the FRD. Not only did we consider pure spatial coverage of IMOs, but we also incorporated our own data and knowledge (e.g., incident types, response times, and existing EMS Captain coverage) to further refine the analysis and provide a confident recommendation to our decision-makers.

Best Use of GIS for Public Outreach

Agency Winner

Youth Crash Map

Police

The Chief of Fairfax County Police Department, Colonel Roessler promotes the importance of the Police Department engaging with its citizens to provide a safer community. This union is evident with the Youth Crash Map, made by a local Fairfax County resident Gerald Kirwin. Mr. Kirwin has donated many hours of his time for Fairfax County, helping to make maps that showcase and educate the safety for Officer and his follow Fairfax County residents. Mr. Kirwin engaged with Fairfax County's Crime Analysis Jessica LeBlanc who provided him with the data he needed. With the Police Department's transparency of data Mr. Kirwin was able to construct his map that would aide in bring attention to the abundance youth accidents that are caused by cell phone usage while driving. This map has been featured on the Fairfax County website (http://www.fairfaxcounty.gov/news2/crash-map-shows-locations-of-youth-car-accidents/) and placed within the County's High Schools in an initiative to inform both the parents and the youth on the dangers of texting while driving. Mr. Kirwin's goal is to never have to make this type of maps again, but until that day Mr. Kirwin will continue to educate his fellow Fairfax County residences with the use of GIS and the openness of Fairfax County's shared data.

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Best Use of GIS on the Web

Agency Winner

The Human Services Resource Guide (HSRG)
Neighborhood and Community Services

The Human Services Resource Guide (HSRG) provides information about the wide variety of human services available in Fairfax County to county staff, human services partners and community members. Coordinated Services Planning (CSP) staff in the Department of Neighborhood and Community Services uses this tool to provide information and referral services to assist Fairfax County residents with emergency needs such as food, shelter, financial assistance, clothing, and healthcare. The HSRG, which contains close to 2,000 service records provided by nearly 400 organizations, also aids other service providers, community partners and the residents of Fairfax County in navigating the human services system.

Recent upgrades make the HSRG more visually appealing and user friendly while implementing a proximity mapping for basic needs services. The proximity map allows users to view resources as map points based on service search results. On the main page, a city filter was added to the existing zip code filter which allows users to quickly view services available locally. The HSRG also has a directions function within the application so CSP staff can provide that service to clients, or community users can access that information directly.

The primary purpose of the latest geography-based enhancements, and additional planned enhancements, to the HSRG is to make the database useful to a wider range of users who can apply the mapping and geographic features for planning and strategic decision-making purposes, such as identifying gaps or duplication of services in a particular location. These same enhancements will also provide a level of self-sufficiency for clients and other community users in easily locating community resources.

The mapping feature is integrated with the ASP.NET page. Attribute search for HSRG service returns a list of service locations with addresses on the ASP.NET search result page. The mapping feature uses ESRI online geocoding and mapping services, base maps, and ArcGIS API for JavaScript to locate and display those HSRG service locations with brief service information. ArcGIS API allows users to zoom in/out/pan on the displayed map.

Currently, HSRG provides radius searches of the selected address as well as searches for five basic needs: Food; Financial Assistance-Housing; Financial Assistance-Utilities; Employment; and Healthcare,
On Fairfax Net for the Admin application, Latitude, Longitude, Human Service Region, Supervisory District, School Region and Census Block were new geographic variables added from the GIS services. New canned reports that include these geographies were created to meet the critical planning needs of upper management.

Most Significant Data Contributor

Agency Winner

Refuse Collection Truck Re-routing

Solid Waste Management Division of the Department of Public Works and Environmental Services

The Fairfax County Solid Waste Management Program has made major updates to their GIS data. The program recently completed a project to re-route its fleet of refuse, recycling, and yard waste trucks. As a part of that project several key data layers were created or updated. These data changes have led to an improvement in operations as well as enhanced data sharing with other county users and the public.
A base layer for the Solid Waste program is the sanitary districts layer. This layer was developed with high accuracy as part of the re-routing project by selecting parcels from actual customer locations and including street segments that logically fall within a sanitary district. This resulted in a more accurate representation of the districts. These newly improved data will be leveraged in a searchable interactive map. Residents will be able to quickly learn if an address has county refuse collection. This layer will also augment the report that is available in the My Neighborhood application. The sanitary districts layer also supports a Collection Days map used frequently by county staff and the public. This map will be replaced by an online map and will be more accurate as a result of this data layer update.
A new vacuum leaf collection layer has been created that supports a publically available application to allow residents to quickly determine if they are in a vacuum leaf collection zone as well as the collection schedule. The process to create the vacuum leaf collection layer guided the creation of the new sanitary districts layer. Customer location points were used to select parcels where vacuum leaf collection takes place. The selected parcels were then dissolved to polygons which are symbolized by leaf collection area in a web application.

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One of the by-products of the re-routing project is a new layer of refuse management zones to support field operations. Three field supervisors manage a multitude of collection issues on a daily basis. Prior to the re-routing project their areas of coverage were imbalanced and other support staff struggled to delineate supervisor zones. Using customer location points as a reference a new, simplified layer was created that balances the work load of the field supervisors as well as clearly displays coverage areas. This layer was then fed into the cloud based customer information system (CARTS, Rehrig Pacific Company). Now when a customer calls with a complaint, special collection or other issue, the supervisor management zone is included as part of the ticket.

Additional layers created or updated as part of the re-routing project include a point layer of customer locations that is synchronized with the customer information system and the MAR (Master Address Repository) by address ID. A route areas layer was also created to assist in field operations and customer service. These layers will be included in a web application that will allow all Solid Waste staff to quickly view their base and field data.

A final significant update this past year was the creation of a Debris Management Site Selection layer and application. The Solid Waste Program needed a web map to assist in site selection for debris management in the event a natural disaster produced large volumes of material needing storage or destruction. The criteria for site selection were at least 3 acres according to the deed, at most 25% tree cover, limited coverage by steep slopes, and commercial or residential land use for the following property layers: county property, private property, and FCPA property. The three property layers were joined with tax administration tables to determine deeded acreages, land use types, and owner contact information. Percent tree cover was calculated for each property based on 2011 land cover data derived from satellite imagery and slope classes of 0-10%, 10-20%, 20-30% and 30%+ were calculated based on 2009 digital elevation model (DEM) slope. The layers were published to ArcGIS Online as a feature service and popups were enabled to show the analysis results. Users were given the ability to export properties to CSV files, narrowing their site search from thousands of properties to 161 properties.

Best GIS Integration or Application

Agency Winner

Quality Review of Land Valuation Adjustments
Department of Tax Administration

Single Family and Townhouse Residential properties are typically valued using a Computer Assisted Land Pricing (CALP) model. To apply a CALP model to a neighborhood, land is analyzed on a site basis using primary and secondary valuation rates. For example, in a neighborhood where the typical lot is less than one acre, a primary rate is applied to the first 10,000 square feet of the lot. The secondary rate (usually around 50 cents per square foot) is applied to the remainder of the lot. This method of valuation ensures a uniform and equitable assessment within the neighborhood. There are, however times when the value determined by CALP must be adjusted to account for land characteristics that affect the value of the parcel. Through an analysis of comparable sales and site characteristics, appraisers can make positive or negative adjustments for specific attributes such as lot size, view, and proximity to water, golf course, power lines or heavy traffic. These adjustments are called "spot locations".

Spot locations are reviewed during the annual re-assessment along with many other neighborhood characteristics via the Computer Assisted Assessment download, an Excel workbook. Appraisers review spreadsheets along with maps and aerial imagery and perform field inspections to complet their quality review. Until now, this data was not available to appraisers in a single platform.

CONNECTAssessment and Real Estate Analysis

DTA procured the web based CONNECTAssessment application to ensure data accuracy by identifying changes to properties through the use of aerial imagery. This product allows for our department to upload both real estate data and GIS shape files. In effect, we can repurpose this tool for our own analytical needs by loading existing shape files and creating our own files to load. Files are created by querying our database for pertinent data, such as tax neighborhood, neighborhood sales, dwelling characteristics, spot locations etc. and joining this data to a parcel shape file. The resulting shape file is then loaded into CONNECTAssessment and the symbology, query fields and display fields are selected.

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Spot Pilot Project

A small portion of the county was used as a test area, to determine the ease of use and functionality of CONNECTAssessment for land valuation review. Besides the spot values, several layers were added to the CONNECTAssessment platform such as; utility points and lines, gas lines, flood plain, RPA (Resource Protection Area) and easements. Judi Blaine-Stewart, the Residential Supervisor for this portion of the County and her appraisal staff met as a team to review the data together on one large screen on our training room. Looking for anomalies in the data, the team was able to focus in on specific areas, turning layers of interest on and off and viewing changes to neighborhoods by selecting different image libraries along with the spot location data. Once they determined what areas needed a more detailed review, they went out to the field, loaded the CONNECTAssessment application onto their own smart phones and drove through the neighborhood to confirm whether the land value adjustment was justified and accurate

Most Significant Progress

Agency Winner

Sign Enforcement Program
Department of Code Compliance

In 2013, under Virginia Code § 33.2-1224, the Fairfax County Board of Supervisors authorized the County to remove illegal signs from the public right-of-way ("Illegal Sign Removal Program"). Since that time the Sheriff's Community Labor Force has been removing illegal signs from designated roadways. In 2016 the Department of Code Compliance (DCC) was tasked with expanding the program to include documenting each sign on the right of way using photographs, location, business name, and other pertinent information. In addition, the Department was authorized to send out informational letters and invoices as well as take legal action when necessary to gain compliance.

One of the initial challenges for DCC in implementing the Illegal Sign Removal Program was recording the exact location of an illegal sign. The standard location identifiers such as an address and tax map number were not precise enough. It was imperative to pinpoint the exact position of a sign since only signs located in the VDOT right of way were subject to the regulations.

DCC Code Specialists Taylor Witt and James Kerns found that Solocator, a camera application with built-in compass features, would allow them to capture, not only a

photo of the illegal sign, but the longitude and latitude coordinates as well. Once the photos and GPS coordinates were downloaded into Arc Map, they were able to visually display the precise location of the illegal sign on the VDOT right of way as well as capture other attributes such as type of business and name of the business.

The Illegal Sign Removal Program maps generated by the Department of Code Compliance are used to track, calculate and display recurring violators, types of violators, hot spots, patterns, and other spatial relationships. In addition, it is used for budget forecasting, time management and other beneficial statistical information. Furthermore, GIS has allowed DCC to create maps that can be used as evidence in illegal sign removal cases when legal action is required to gain compliance.

GIS use in the sign removal program is the first time DCC has utilized this technology in daily activities; however, we are only beginning to realize its value. As we become more familiar with GIS and the capabilities it offers, we look forward to incorporating it into our everyday business practices. The information provided by GIS will (among other things) aid in identify trends, managing workloads, increased productivity, and making informed decisions in strategic planning.