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GIS
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Awards
2020
December 16, 2020
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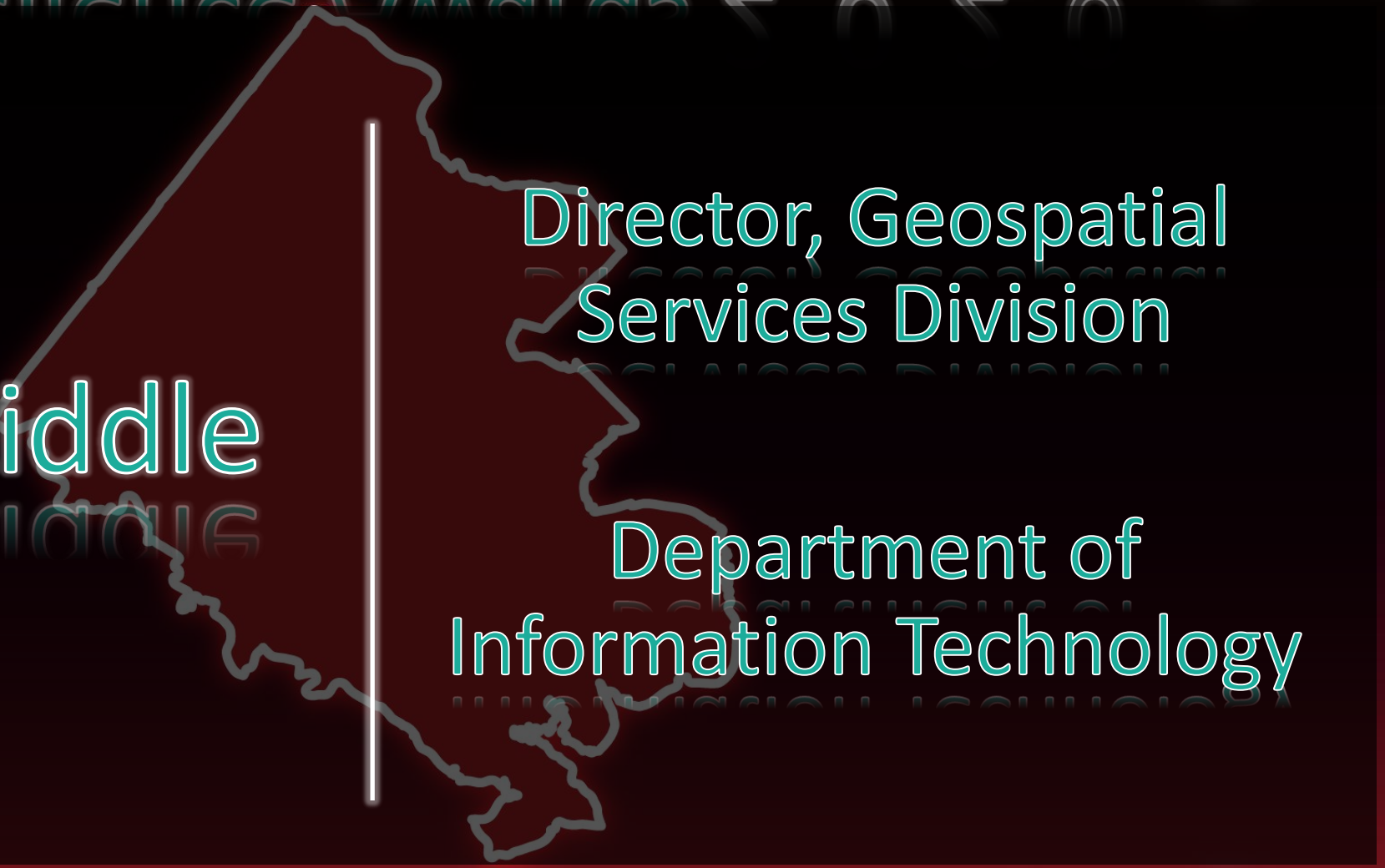
GIS Excellence Awards 2020



Michael Liddle

Director, Geospatial Services Division

Department of Information Technology

GIS Excellence Awards 2020

Agenda

Introduction

Michael Liddle, Director

Geospatial Services Division

Department of Information Technology

Featured Speakers

Gregory Scott, Chief Technology Officer

Department of Information Technology

Jeffrey C McKay, Chairman

Fairfax County Board of Supervisors

Presentation of Awards

Michael Liddle

Sandra Woiak

Closing Statements

Michael Liddle

GIS Excellence Awards 2020

Gregory Scott

Director / Chief Technology Officer

Department of Information Technology

GIS Excellence Awards 2020

Chairman

Jeffrey McKay

Fairfax County
Board of Supervisors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GIS Excellence Awards 2020

Entries (alphabetically by title)

2019 - 2020 South County Site-Specific Plan Amendment Process – Department of Planning & Development; Marshall Keeney, Graham Owen

COVID-19 Vulnerability Index – Office of the County Executive; Katherine Miga, Robin Wilson

Development of a Point Layer of Stream Roadway Crossings to Support Floodplain Mapping – Stormwater Management; Dipmani Kumar, Elfatih Salim, Chip Galloway

Election Day 2020 – Polling Location Awareness – Office of Emergency Management; Paul Lupe, Avery Church, Matthew Miller (DIT), Judy Lamey-Doldorf (DIT), Mei Wang (DPSC)

Eviction Prevention Dashboard – Office of Strategy Management; Terry Reardon, Alexandra Krafchek, Stephanie Calderon (DIT), Daniel Cabrera (DIT)

Fairfax County Animal Shelter – Expanding Community Outreach – Department of Animal Sheltering; Melanie Leopold, Sandra Woiak (DIT)

Fairfax County Congressional Districts and Supervisor Districts – Department of Information Technology; Daniel Cabrera

Fairfax County Food Resources Map – Department of Neighborhood and Community Services; Caroline Rankin, Matthew Miller (DIT), Judy Lamey-Doldorf (DIT), Franz Arend (DIT), Melanna Forys (DIT), Diane Bentley (DIT), Kathy Ryan (Fairfax County Public Schools)

Fairfax County Houses of Worship – Department of Neighborhood and Community Services; Caroline Rankin, Ramona Carroll, Gregory Bacon (DIT)

Fairfax County Park Authority Data Contribution – Park Authority; Andrew DeLuca, Justin Roberson, Fariss Agatone, Lynne Johnson

Fairfax County Senate Districts and Supervisor Districts – Department of Information Technology; Daniel Cabrera

Fairfax County ZIP Codes and Post Offices – Department of Information Technology; Daniel Cabrera

Fairfax County's Department of Public Safety Communications NextGen 9-1-1 Efforts – Department of Public Safety Communications; Raleigh Maier

FCDOT – Existing Bicycle & Pedestrian Network Dataset – Department of Transportation; Thomas Wampler, Zachary Krohmal, Lindsay Marfurt, Nicole Wynands

Fire Box Web Swipe App – Fire and Rescue Department; Katherine Good, Eric Fisher

Fire Data Changes in 2020 – Fire and Rescue Department; Katherine Good

Fires from Improperly Disposed of Smoking Materials – Fire and Rescue Department; Eric Fisher

FY2019 RECenter Scholarships with Vulnerability Index – Park Authority; Farris Agatone, Joshua Colman

Health and Human Services Needs Assessment (2019) – Office of Strategy Management; Susan Shaw, Alexandra Krafchek, Michelle Gregory (DMB), Sophia Dutton (DMB)

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Entries (continued)

Historical Gypsy Moth Egg Mass Distribution and Abundance in Fairfax County – Urban Forest Management; Patrick Obrien, Joan Allen, Daniel Bluntzer, Rachel Griesmer, Rachel Habig-Myers, Katherine Layton

Know the Score: Restaurant Inspection Reporting – Health Department; Lauren Lochstampfor, Adrian Joye, Srijana Tuladhar (DIT), Gregory Thomas (DIT), James Callahan (DIT)

Laurel Hill – Detangling the Knot – Capital Facilities; Yilia Vega-Claudio, Vickie McEntire Anglin, Leanna O'Donnell, Alan Weiss, Christopher Jensen, Luis Benitez Ayala

Mapping Laurel Hill's Lorton Prison Complex/GSA Transfer Proffers – Support for Highest Use Negotiations – Capital Facilities; Yilia Vega-Claudio, Vickie McEntire Anglin, Leanna O'Donnell (DPD), Christopher Jensen, Luis Benitez Ayala, Alan Weiss (OCA)

Mosaic District Cyberpunk Map – Department of Information Technology; Daniel Cabrera

Police Data Transparency Initiative – Police Department; Jeffrey Gallagher, Carolyn Kinney, Kathy Pham, Amy Milliman, James Krause

Potomac River 1945 USGS Map with 2018 Digital Elevation Model Overlay – Stormwater Management; Chip Galloway

Reston Data Visualization Implementation Hub Site – Department of Planning & Development; Daniel White, Beth Elliott, Arpita Chatterjee (DOT), Michael Garcia (FRD)

RISE Grant Program Awards – Department of Economic Initiatives; Scott Sizer, Ingrid Abernathy, Wendy Lemieux, Chase Suddith, Theresa Benincasa, Tanya Burrell (DOF), Stephanie Calderon (DIT), Elliott Stroud (DIT), Patricia McCay (OCA), Andrew Janos (DPMM), Donna Hurwitt (EDA), Dana Mariano (Community Business Partnership)

Site Records Viewer – Utilizing GIS and OpenText to Map Site Records – Land Development Services; Brett Martin, Bill Edwards, Bushra Khan, Jose Baez, Pragnaya Katiki, Matthew Logie, Julia Ward, Radha Avala (DIT), Harish Reddy (DIT)

Supporting Return to School – Department of Neighborhood and Community Services; Muhammad Jahangir, Philethea Duckett

The Fairfax County LiDAR Resources Hub Site – Department of Information Technology; Gregory Bacon

Tree Canopy and Impervious Surface Estimator Application – Department of Information Technology; Gregory Bacon

Web Based Drainage Area Delineation Using LiDAR – Land Development Services; Brett Martin, Gregory Bacon (DIT)

Where Can I Picnic in Fairfax County, You Ask? Let Us Show You! – Park Authority; Fariss Agatone, Morgan Chapin

Where Should We Plant Trees? – Department of Public Works and Environmental Services Director's Office; Yeoanny Venetsanos, Juan Reyes, Brian Keightley (UFM)

Ye Olde Map(e) of Fairfax(e) – Department of Information Technology; Daniel Cabrera

GIS Excellence Awards 2020

Categories

- Best GIS Cartographic Product/Presentation
- Best Use of GIS for Analysis
- Best Web Application
- Best Use of GIS for Public Outreach
- Most Significant Data Contributor
- Best GIS Integration

GIS Excellence Awards 2020

Best GIS Cartographic Product/Presentation

This award is intended to showcase the power of GIS tools in creating accurate, instructive, and visually pleasing printed maps. The map must have been or planned to be used for Fairfax County business, and an original design is required (i.e. the map must not be based on any commonly used templates). 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

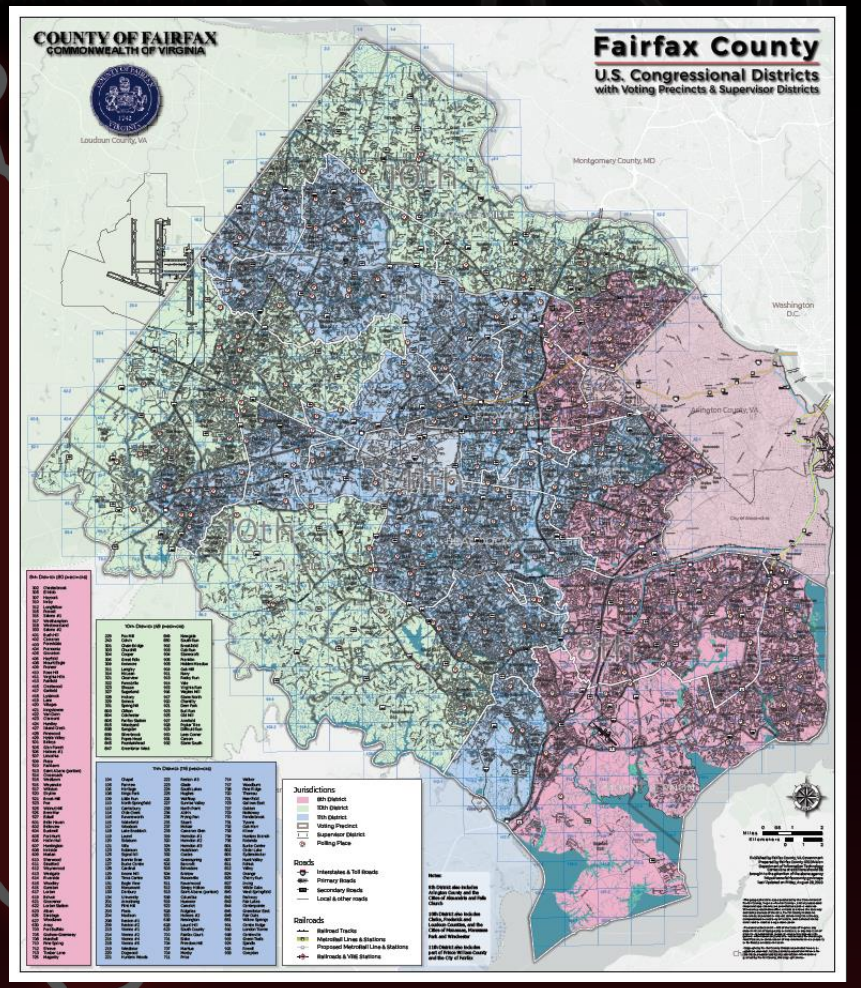
GIS Excellence Awards 2020

Best GIS Cartographic Product/Presentation

Fairfax County Congressional Districts and Supervisor Districts

Department of Information Technology

Daniel Cabrera



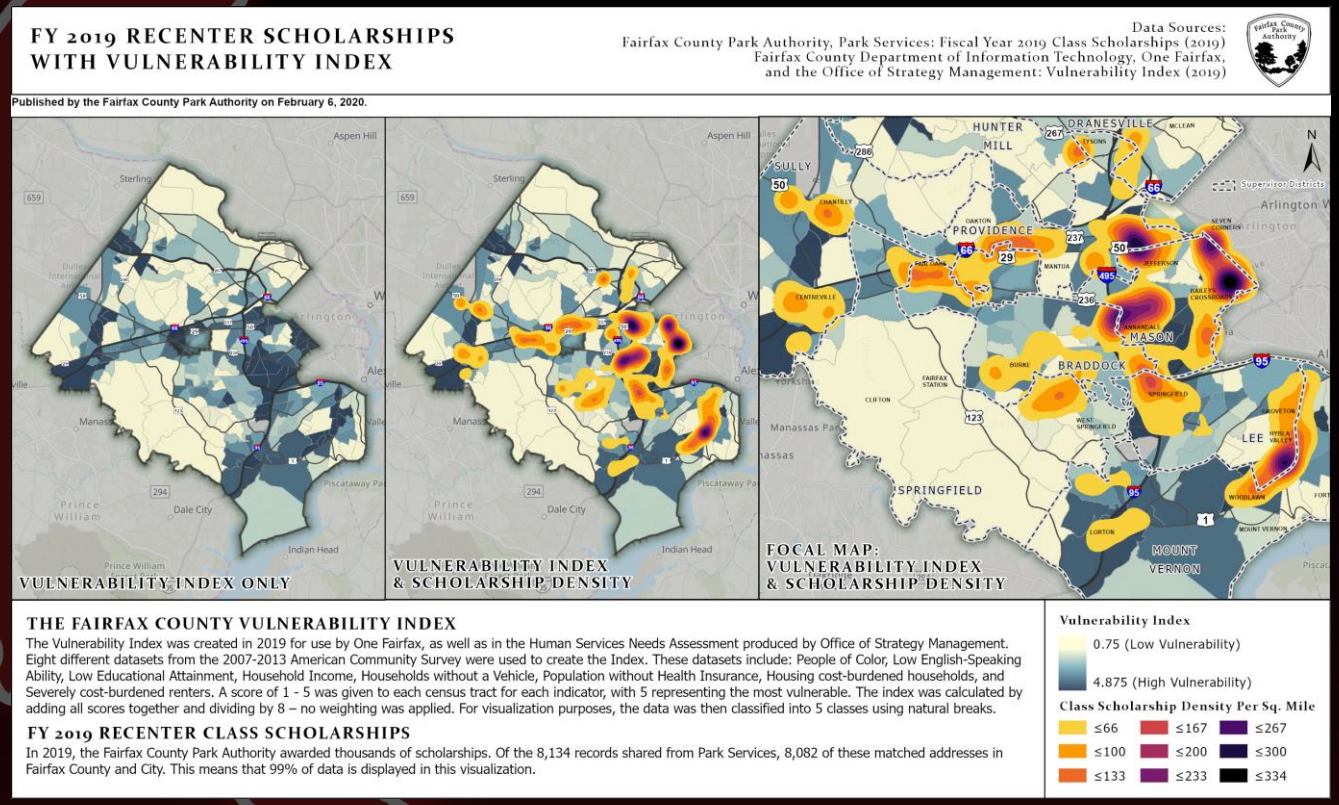
GIS Excellence Awards 2020

Best GIS Cartographic Product/Presentation

FY2019 RECenter Scholarships with Vulnerability Index

Park Authority

Fariss Agatone, Joshua Colman



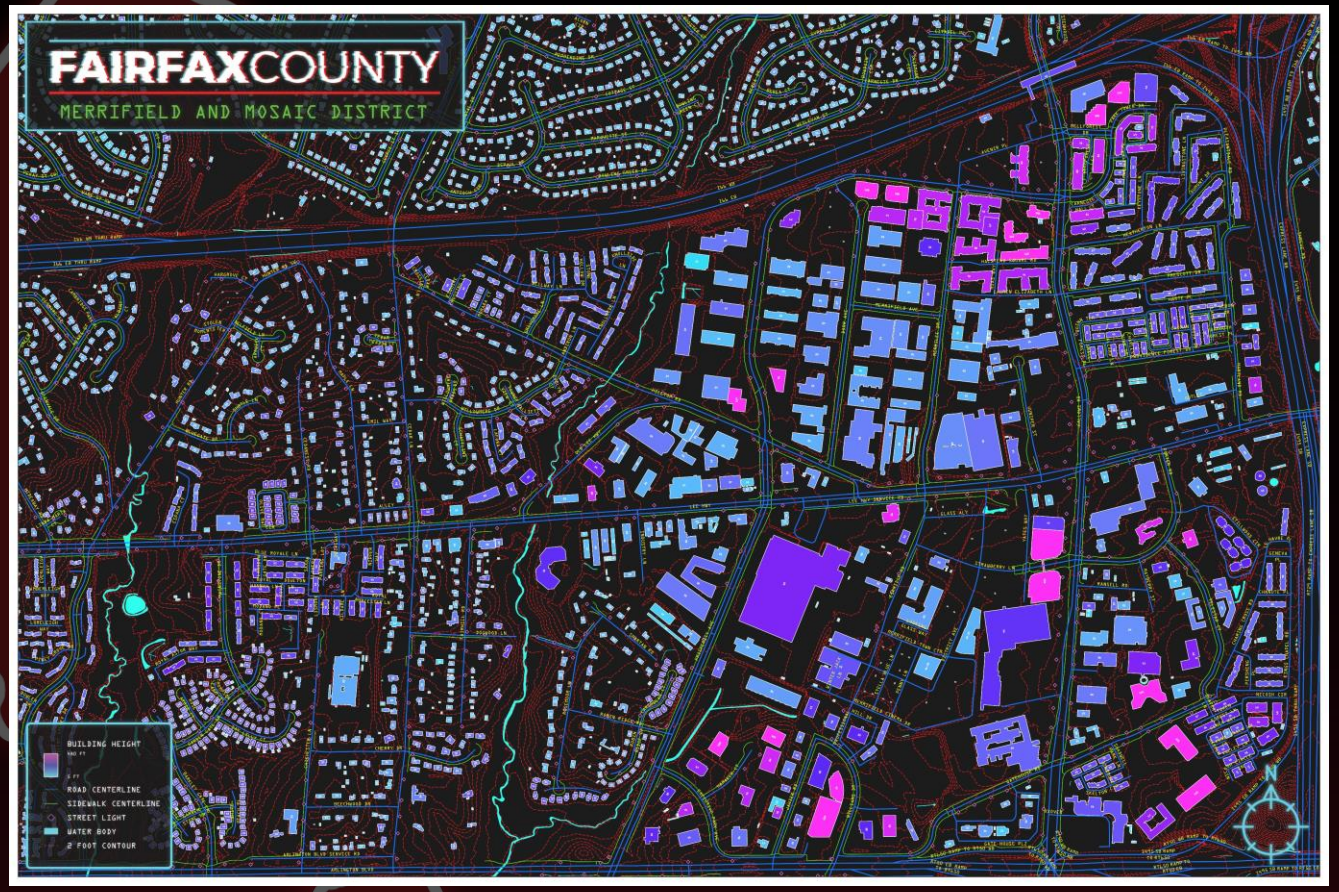
GIS Excellence Awards 2020

Best GIS Cartographic Product/Presentation

Mosaic District Cyberpunk Map

Department of Information Technology

Daniel Cabrera



GIS Excellence Awards 2020

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)

GIS Excellence Awards 2020

Best Use of GIS for Analysis

Development of a Point Layer of Stream Roadway Crossings to Support Floodplain Mapping

Stormwater Management

Dipmani Kumar, Elfatih Salim, Chip Galloway

Development of a Point Layer of Stream Crossings in Fairfax County to Support Floodplain Modeling

The Stormwater Planning Division has initiated a project to map regulated floodplains in the County, backed by limited-detail hydraulic models utilizing estimated ultimate development flows. In order to (i) establish the level of effort and cost of developing hydraulic models, and (ii) locate points where bridge or culvert geometric data would be needed for the hydraulic models, it was first necessary to create a countywide point layer of stream crossings.

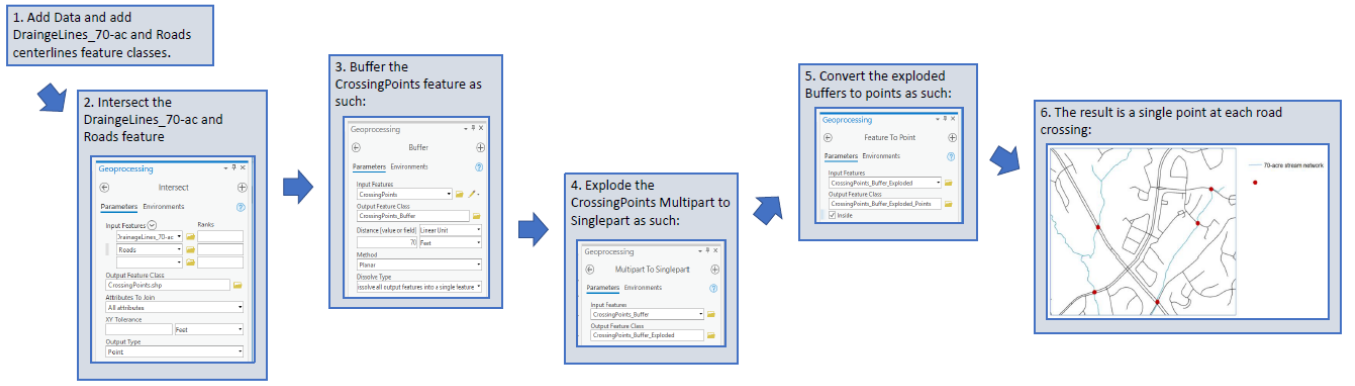
It was determined that a simple intersect of existing stream hydrography and the roadway centerline would result in identifying additional crossings that were not needed for the hydraulic modeling because the stream hydrography extends well upstream of the 70 acre threshold of regulated floodplains. An additional complication is that many major divided roadways are represented with two lines in the roadway centerline feature.

In order to obtain the desired point layer of stream crossings, the following analytical procedure was adopted:

1. A 70-acre stream network was first identified utilizing Spatial Analyst functions within ArcGIS Pro, which consisted of the following steps:
   a) Using the CON function and an existing Flow Accumulation Grid derived from the most recent County Digital Elevation Model, a raster linear network grid that started at a 70-acre drainage point was created.
   b) The raster linear network was vectorized using the Stream to Feature tool within the Hydrology toolset available with ArcGIS Pro.
2. The 70-ac stream network created in the previous step was intersected with the roadway centerline, and a series of geoprocessing functions (buffer, multipart to singlepart, and featureto point) utilized to eliminate multiple intersection points on divided highways and major roadways as shown in the attached document.

The final crossings point layer contains 2,455 points representing the intersection of regulated floodplain streams and roadways. This layer will be used to develop initial cost estimates for hydraulic modeling to support the mapping of regulated floodplains in the County. Additionally, this point layer will be utilized to locate available sources of geometric data needed for the hydraulic modeling of crossings such as VDOT, existing FEMA models, or models previously created to support management plans for the County's designated watersheds.

Steps in ArcGIS Pro



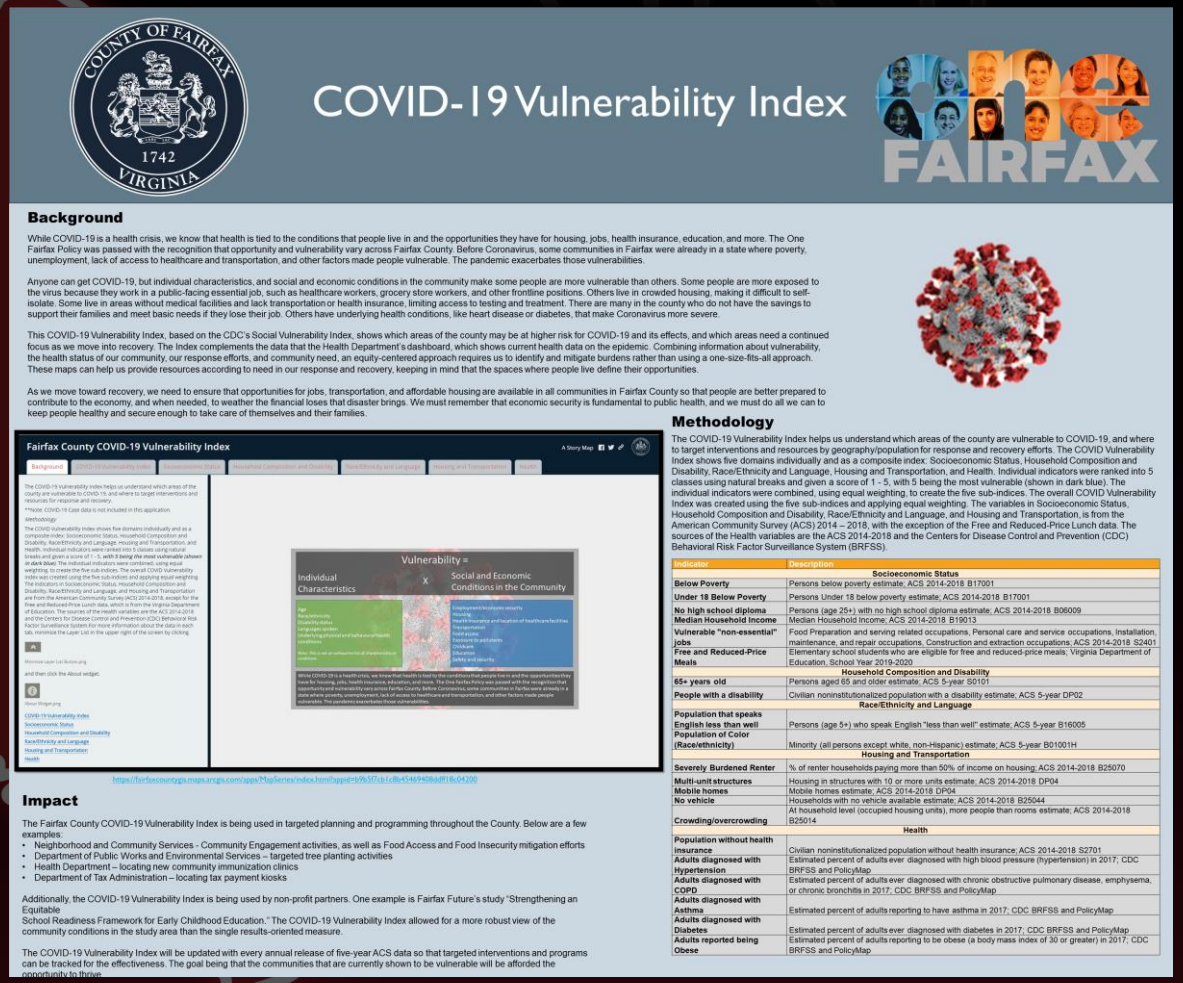
GIS Excellence Awards 2020

Best Use of GIS for Analysis

COVID-19 Vulnerability Index

Office of the County Executive

Katherine Miga, Robin Wilson



COVID-19 Vulnerability Index

FAIRFAX

Background

While COVID-19 is a health crisis, we know that health is tied to the conditions that people live in and the opportunities they have for housing, jobs, health insurance, education, and more. The One Fairfax Policy was passed with the recognition that opportunity and vulnerability vary across Fairfax County. Before Coronavirus, some communities in Fairfax were already in a state where poverty, unemployment, lack of access to healthcare and transportation, and other factors made people vulnerable. The pandemic exacerbates those vulnerabilities.

Anyone can get COVID-19, but individual characteristics, and social and economic conditions in the community make some people are more vulnerable than others. Some people are more exposed to the virus because they work in a public-facing essential job, such as healthcare workers, grocery store workers, and other frontline positions. Others live in crowded housing, making it difficult to self-isolate. Some live in areas without medical facilities and lack transportation or health insurance, limiting access to testing and treatment. There are many in the county who do not have the savings to support their families and meet basic needs if they lose their job. Others have underlying health conditions, like heart disease or diabetes, that make Coronavirus more severe.

This COVID-19 Vulnerability Index, based on the CDC's Social Vulnerability Index, shows which areas of the county may be at higher risk for COVID-19 and its effects, and which areas need a continued focus as we move into recovery. The Index complements the data that the Health Department's dashboard, which shows current health data on the epidemic. Combining information about vulnerability, the health status of our community, our response efforts, and community need, an equity-centered approach requires us to identify and mitigate burdens rather than using a one-size-fits-all approach. These maps can help us provide resources according to need in our response and recovery, keeping in mind that the spaces where people live define their opportunities.

As we move toward recovery, we need to ensure that opportunities for jobs, transportation, and affordable housing are available in all communities in Fairfax County so that people are better prepared to contribute to the economy, and when needed, to weather the financial loses that disaster brings. We must remember that economic security is fundamental to public health, and we must do all we can to keep people healthy and secure enough to take care of themselves and their families.

https://fairfaxcountygis.maps.arcgis.com/apps/MapSeries/index.html?appid=b9b5f7cb1c8b4546940bddf18c04200

Methodology

The COVID-19 Vulnerability Index helps us understand which areas of the county are vulnerable to COVID-19, and where to target interventions and resources by geography/population for response and recovery efforts. The COVID Vulnerability Index shows five domains individually and as a composite index: Socioeconomic Status, Household Composition and Disability, Race/Ethnicity and Language, Housing and Transportation, and Health. Individual indicators were ranked into 5 classes using natural breaks and given a score of 1 - 5, with 5 being the most vulnerable (shown in dark blue). The individual indicators were combined, using equal weighting, to create the five sub-indices. The overall COVID Vulnerability Index was created using the five sub-indices and applying equal weighting. The variables in Socioeconomic Status, Household Composition and Disability, Race/Ethnicity and Language, and Housing and Transportation, is from the American Community Survey (ACS) 2014 – 2018, with the exception of the Free and Reduced-Price Lunch data. The sources of the Health variables are the ACS 2014-2018 and the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS).

Indicator	Description
Socioeconomic Status	
Below Poverty	Persons below poverty estimate; ACS 2014-2018 B17001
Under 18 Below Poverty	Persons Under 18 below poverty estimate; ACS 2014-2018 B17001
No high school diploma	Persons (age 25+) with no high school diploma estimate; ACS 2014-2018 B06009
Median Household Income	Median Household Income; ACS 2014-2018 B19013
Vulnerable "non-essential" jobs	Food Preparation and serving related occupations, Personal care and service occupations, Installation, maintenance, and repair occupations, Construction and extraction occupations; ACS 2014-2018 S2401
Free and Reduced-Price Meals	Elementary school students who are eligible for free and reduced-price meals; Virginia Department of Education, School Year 2019-2020
Household Composition and Disability	
65+ years old	Persons aged 65 and older estimate; ACS 5-year S0101
People with a disability	Civilian noninstitutionalized population with a disability estimate; ACS 5-year DP02
Race/Ethnicity and Language	
Population that speaks English less than well	Persons (age 5+) who speak English "less than well" estimate; ACS 5-year B16005
Population of Color (Race/ethnicity)	Minority (all persons except white, non-Hispanic) estimate; ACS 5-year B01001H
Housing and Transportation	
Severely Burdened Renter	% of renter households paying more than 50% of income on housing; ACS 2014-2018 B25070
Multi-unit structures	Housing in structures with 10 or more units estimate; ACS 2014-2018 DP04
Mobile homes	Mobile homes estimate; ACS 2014-2018 DP04
No vehicle	Households with no vehicle available estimate; ACS 2014-2018 B25044
Crowding/overcrowding	At household level (occupied housing units), more people than rooms estimate; ACS 2014-2018 B25014
Health	
Population without health insurance	Civilian noninstitutionalized population without health insurance; ACS 2014-2018 S2701
Adults diagnosed with Hypertension	Estimated percent of adults ever diagnosed with high blood pressure (hypertension) in 2017; CDC BRFSS and PolicyMap
Adults diagnosed with COPD	Estimated percent of adults ever diagnosed with chronic obstructive pulmonary disease, emphysema, or chronic bronchitis in 2017; CDC BRFSS and PolicyMap
Adults diagnosed with Asthma	Estimated percent of adults reporting to have asthma in 2017; CDC BRFSS and PolicyMap
Adults diagnosed with Diabetes	Estimated percent of adults ever diagnosed with diabetes in 2017; CDC BRFSS and PolicyMap
Adults reported being Obese	Estimated percent of adults reporting to be obese (a body mass index of 30 or greater) in 2017; CDC BRFSS and PolicyMap

Impact

The Fairfax County COVID-19 Vulnerability Index is being used in targeted planning and programming throughout the County. Below are a few examples:

- Neighborhood and Community Services - Community Engagement activities, as well as Food Access and Food Insecurity mitigation efforts
- Department of Public Works and Environmental Services – targeted tree planting activities
- Health Department – locating new community immunization clinics
- Department of Tax Administration – locating tax payment kiosks

Additionally, the COVID-19 Vulnerability Index is being used by non-profit partners. One example is Fairfax Future's study "Strengthening an Equitable School Readiness Framework for Early Childhood Education." The COVID-19 Vulnerability Index allowed for a more robust view of the community conditions in the study area than the single results-oriented measure.

The COVID-19 Vulnerability Index will be updated with every annual release of five-year ACS data so that targeted interventions and programs can be tracked for the effectiveness. The goal being that the communities that are currently shown to be vulnerable will be afforded the opportunity to thrive.

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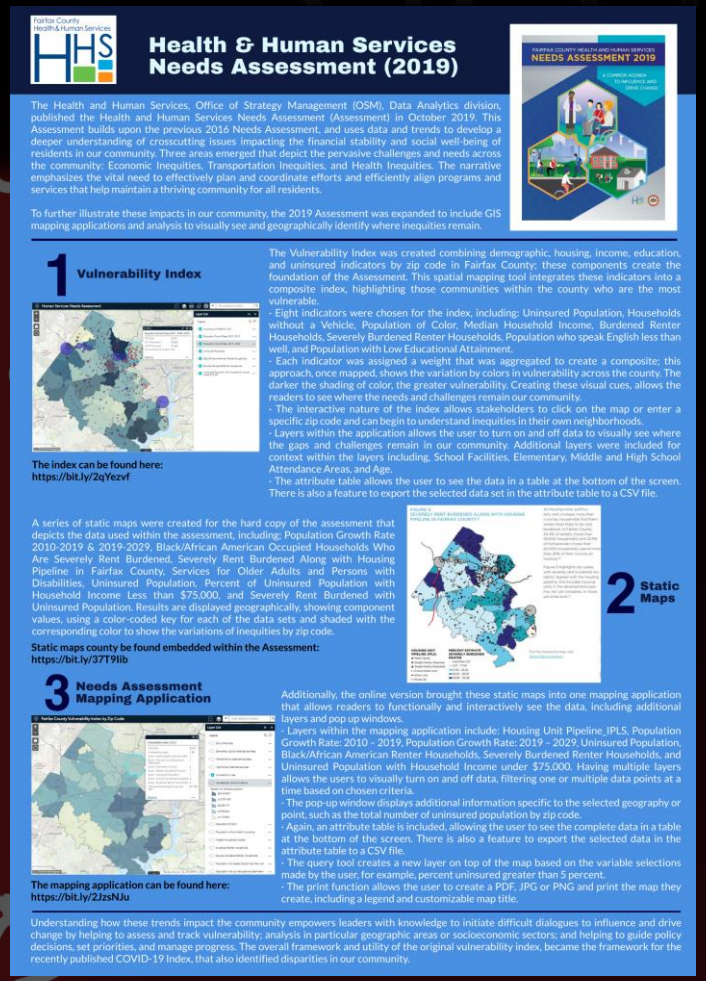
Best Use of GIS for Analysis

Health and Human Services Needs Assessment (2019)

Office of Strategy Management

Susan Shaw, Alexandra Krafchek, Michelle Gregory (DMB), Sophia Dutton (DMB)



Health & Human Services Needs Assessment (2019)

The Health and Human Services, Office of Strategy Management (OSM), Data Analytics division, published the Health and Human Services Needs Assessment (Assessment) in October 2019. This Assessment builds upon the previous 2016 Needs Assessment, and uses data and trends to develop a deeper understanding of crosscutting issues impacting the financial stability and social well-being of residents in our community. Three areas emerged that depict the pervasive challenges and needs across the community: Economic Inequities, Transportation Inequities, and Health Inequities. The narrative emphasizes the vital need to effectively plan and coordinate efforts and efficiently align programs and services that help maintain a thriving community for all residents.

To further illustrate these impacts in our community, the 2019 Assessment was expanded to include GIS mapping applications and analysis to visually see and geographically identify where inequities remain.

1 Vulnerability Index

The Vulnerability Index was created combining demographic, housing, income, education, and uninsured indicators by zip code in Fairfax County; these components create the foundation of the Assessment. This spatial mapping tool integrates these indicators into a composite index, highlighting those communities within the county who are the most vulnerable.

- Eight indicators were chosen for the index, including: Uninsured Population, Households without a Vehicle, Population of Color, Median Household Income, Burdened Renter Households, Severely Burdened Renter Households, Population who speak English less than well, and Population with Low Educational Attainment.
- Each indicator was assigned a weight that was aggregated to create a composite; this approach, once mapped, shows the variation by colors in vulnerability across the county. The darker the shading of color, the greater vulnerability. Creating these visual cues, allows the readers to see where the needs and challenges remain our community.
- The interactive nature of the index allows stakeholders to click on the map or enter a specific zip code and can begin to understand inequities in their own neighborhoods.
- Layers within the application allows the user to turn on and off data to visually see where the gaps and challenges remain in our community. Additional layers were included for context within the layers including, School Facilities, Elementary, Middle and High School Attendance Areas, and Age.
- The attribute table allows the user to see the data in a table at the bottom of the screen. There is also a feature to export the selected data set in the attribute table to a CSV file.

The index can be found here:
https://bit.ly/2qYezvf

2 Static Maps

A series of static maps were created for the hard copy of the assessment that depicts the data used within the assessment, including; Population Growth Rate 2010-2019 & 2019-2029, Black/African American Occupied Households Who Are Severely Rent Burdened, Severely Rent Burdened Along with Housing Pipeline in Fairfax County, Services for Older Adults and Persons with Disabilities, Uninsured Population, Percent of Uninsured Population with Household Income Less than $75,000, and Severely Rent Burdened with Uninsured Population. Results are displayed geographically, showing component values, using a color-coded key for each of the data sets and shaded with the corresponding color to show the variations of inequities by zip code.

Static maps county be found embedded within the Assessment:
https://bit.ly/37T9lib

3 Needs Assessment Mapping Application

Additionally, the online version brought these static maps into one mapping application that allows readers to functionally and interactively see the data, including additional layers and pop up windows.

- Layers within the mapping application include: Housing Unit Pipeline_IPLS, Population Growth Rate: 2010 - 2019, Population Growth Rate: 2019 - 2029, Uninsured Population, Black/African American Renter Households, Severely Burdened Renter Households, and Uninsured Population with Household Income under $75,000. Having multiple layers allows the users to visually turn on and off data, filtering one or multiple data points at a time based on chosen criteria.
- The pop-up window displays additional information specific to the selected geography or point, such as the total number of uninsured population by zip code.
- Again, an attribute table is included, allowing the user to see the complete data in a table at the bottom of the screen. There is also a feature to export the selected data in the attribute table to a CSV file.
- The query tool creates a new layer on top of the map based on the variable selections made by the user, for example, percent uninsured greater than 5 percent.
- The print function allows the user to create a PDF, JPG or PNG and print the map they create, including a legend and customizable map title.

The mapping application can be found here:
https://bit.ly/2JzsNJu

Understanding how these trends impact the community empowers leaders with knowledge to initiate difficult dialogues to influence and drive change by helping to assess and track vulnerability; analysis in particular geographic areas or socioeconomic sectors; and helping to guide policy decisions, set priorities, and manage progress. The overall framework and utility of the original vulnerability index, became the framework for the recently published COVID-19 Index, that also identified disparities in our community.

GIS Excellence Awards 2020

Best GIS Web Application

This award is intended to showcase the ever-increasing presence of GIS web applications. These applications are a significant foundation for bringing maps, geospatial data, and analysis/data collection tools to a varied audience of county staff and residents. Criteria used to evaluate the entries include:

- effectiveness of the web application in meeting stated purpose
- benefit to the public and/or agency
- incorporation of application into business practices
- aesthetics and ease of use
- use of well-thought-out cartography
- inclusion of innovative and unique tools

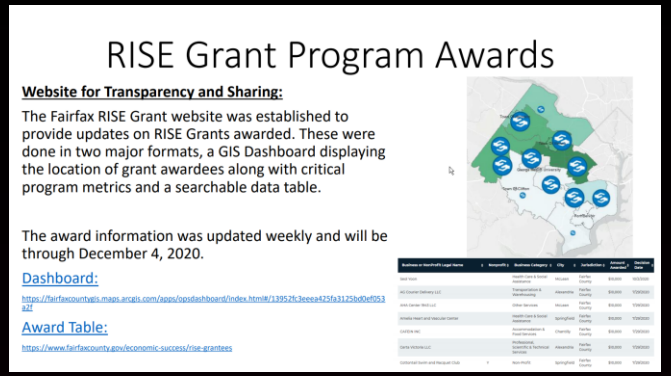
GIS Excellence Awards 2020

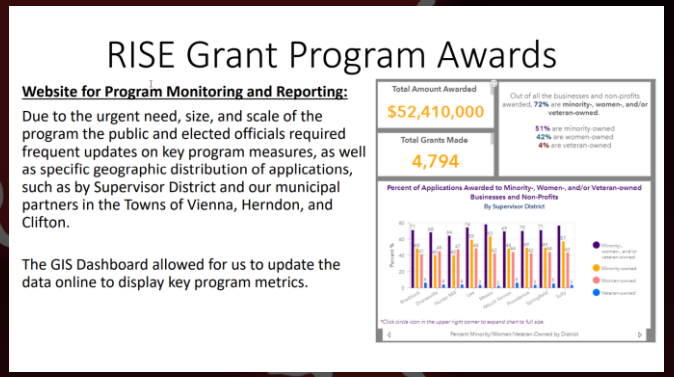
Best GIS Web Application

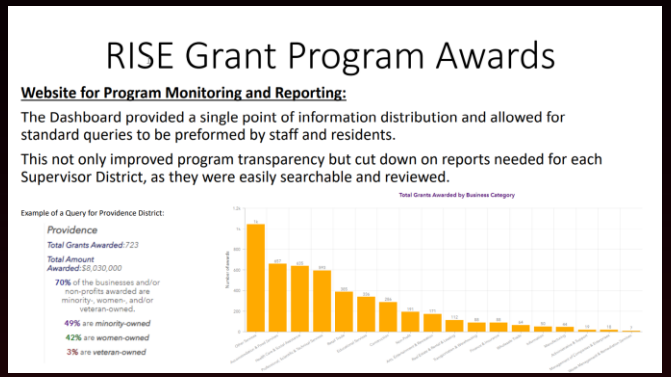
RISE Grant Program Awards

Department of Economic Initiatives

Scott Sizer, Ingrid Abernathy, Wendy Lemieux, Chase Suddith, Theresa Benincasa, Tanya Burrell (DOF), Stephanie Calderon (DIT), Elliott Stroud (DIT), Patricia McCay (OCA), Andrew Janos (DPMM), Donna Hurwitt (EDA), Dana Mariano (Community Business Partnership)







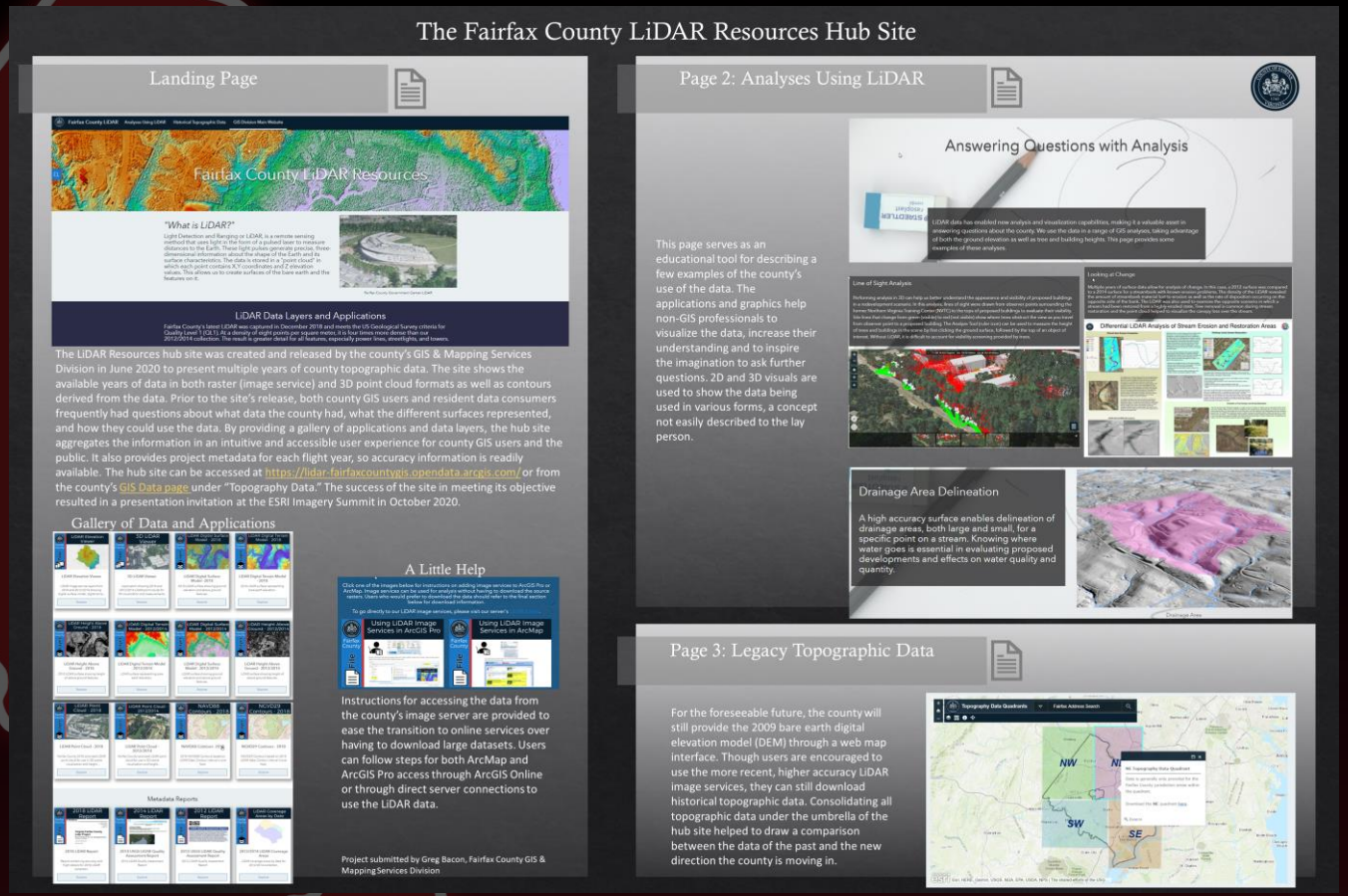
GIS Excellence Awards 2020

Best GIS Web Application

The Fairfax County LiDAR Resources Hub Site

Department of Information Technology

Gregory Bacon



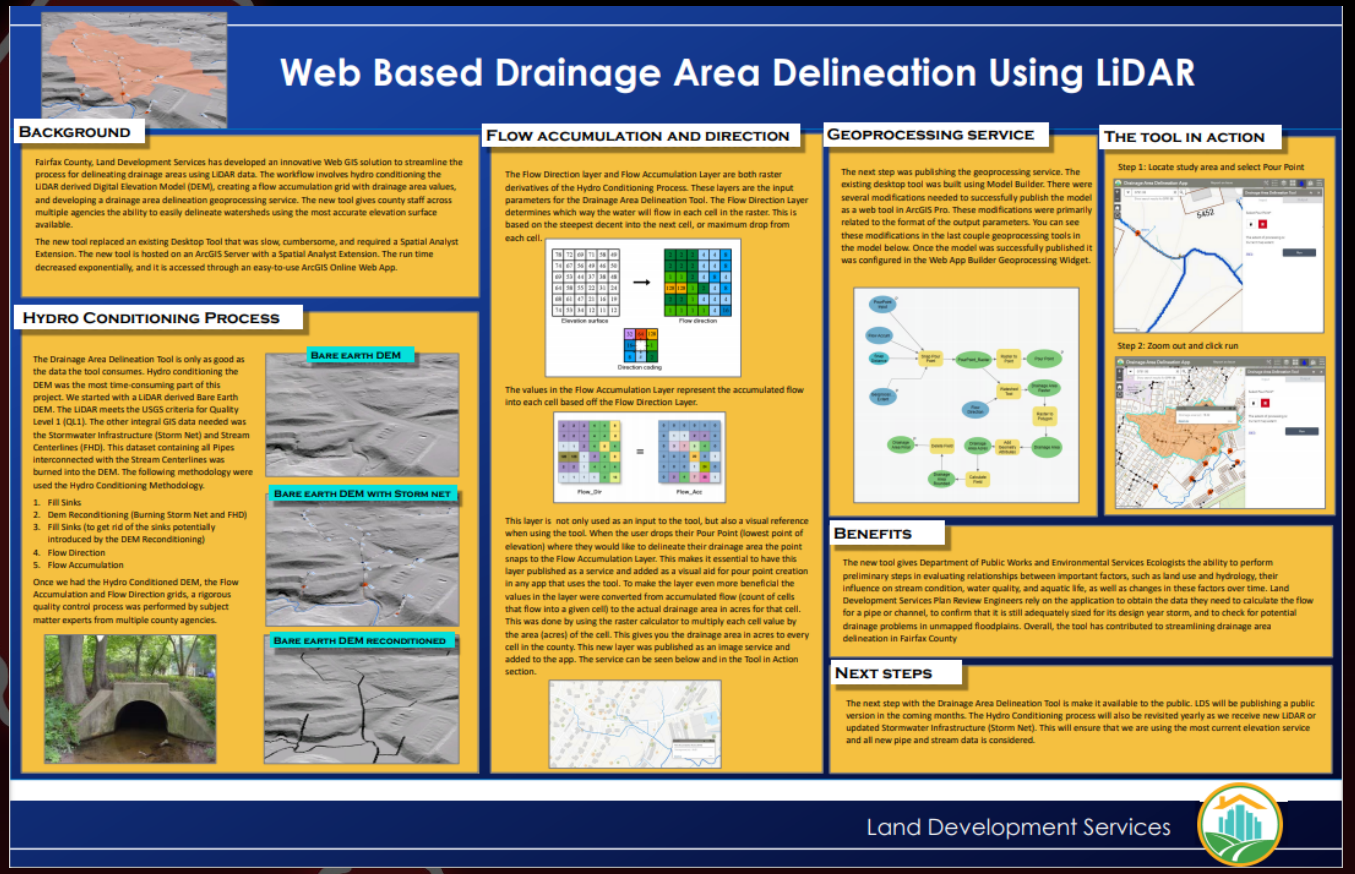
GIS Excellence Awards 2020

Best GIS Web Application

Web Based Drainage Area Delineation Using LiDAR

Land Development Services

Brett Martin, Gregory Bacon (DIT)



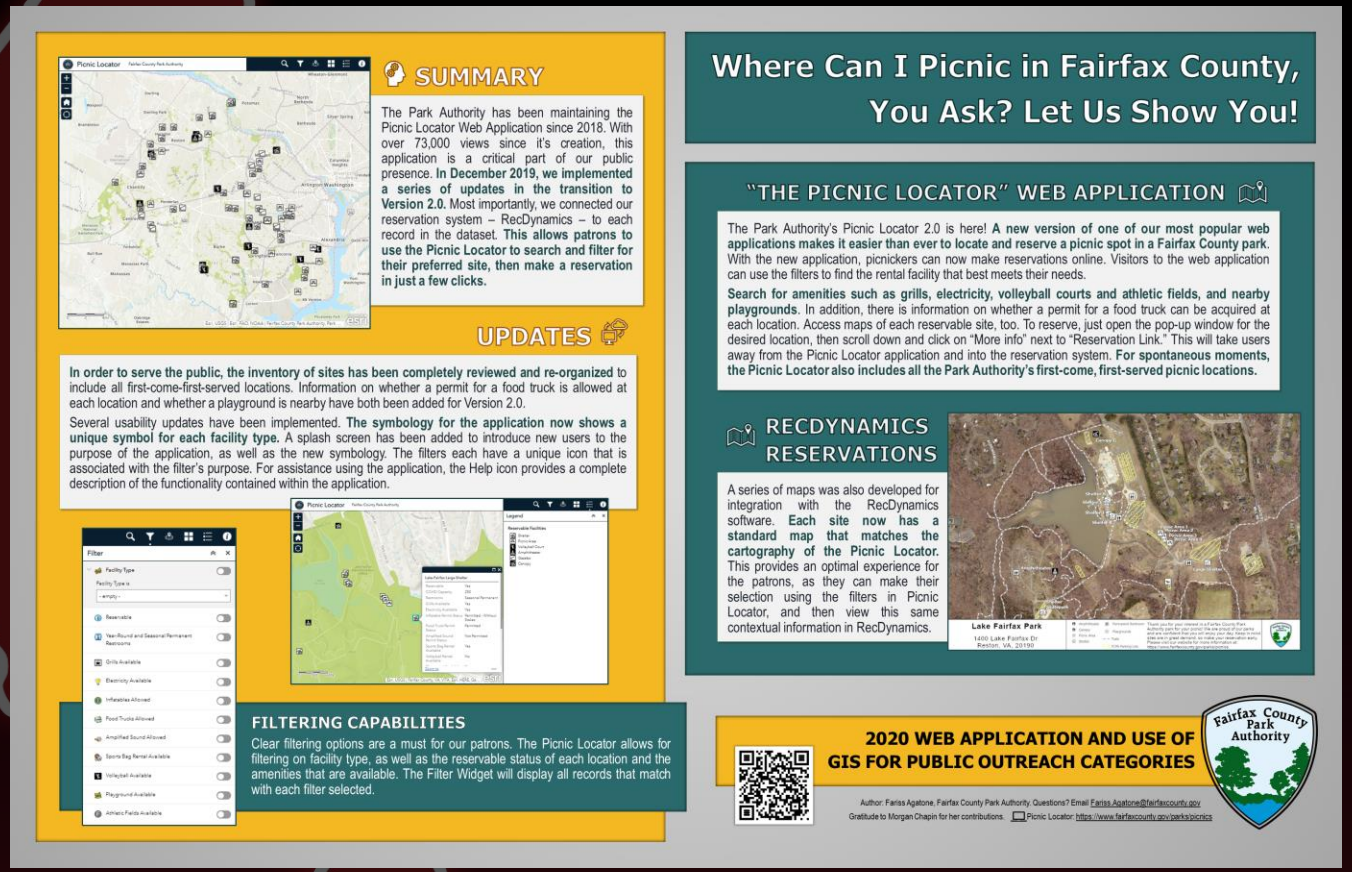
GIS Excellence Awards 2020

Best GIS Web Application

Where Can I Picnic in Fairfax County, You Ask? Let Us Show You!

Park Authority

Fariss Agatone, Morgan Chapin



GIS Excellence Awards 2020

Best Use of GIS for Public Outreach

This award is presented to the agency that best utilizes GIS to serve the public with map documents, customer service operations, press relations, or public events. A totality of an agency's GIS public outreach efforts over the last 12 months will be evaluated rather than just one specific project. Criteria used to evaluate the entries include:

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

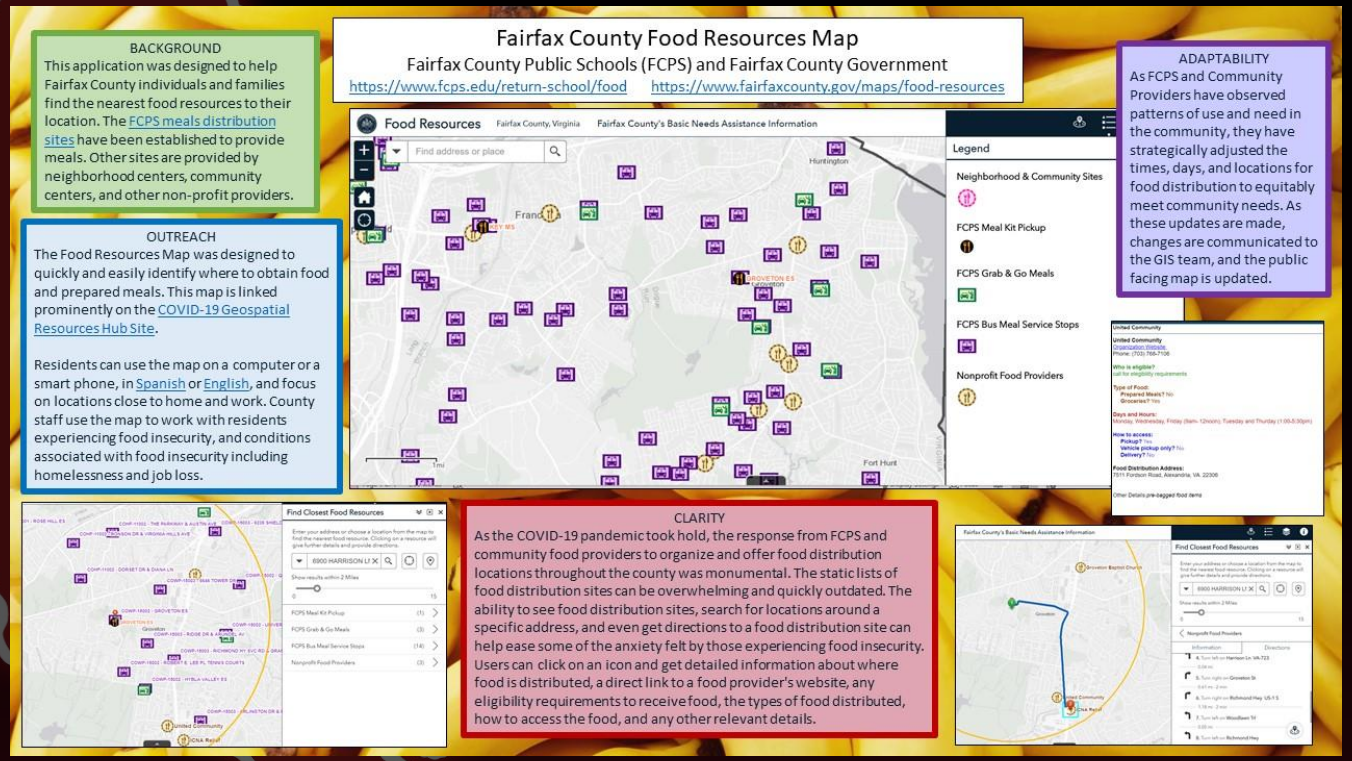
GIS Excellence Awards 2020

Best Use of GIS for Public Outreach

Fairfax County Food Resources Map

Department of Neighborhood and Community Services

Caroline Rankin, Matthew Miller (DIT), Judy Lamey-Doldorf (DIT), Franz Arend (DIT), Melanna Forys (DIT), Diane Bentley (DIT), Kathy Ryan (FCPS)



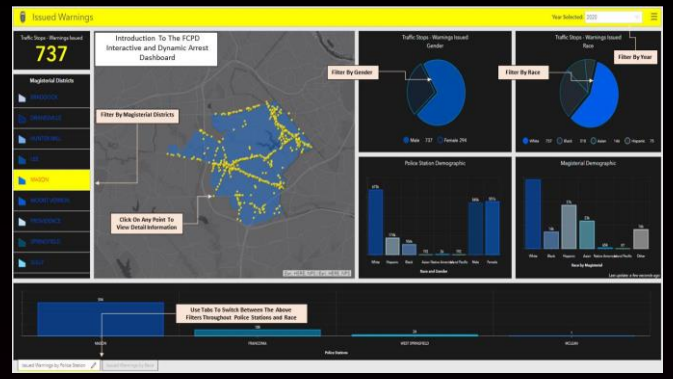
GIS Excellence Awards 2020

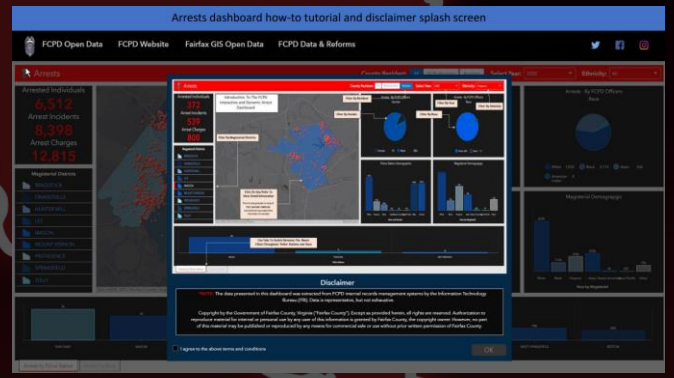
Best Use of GIS
for Public Outreach

Police Data Transparency Initiative

Police Department

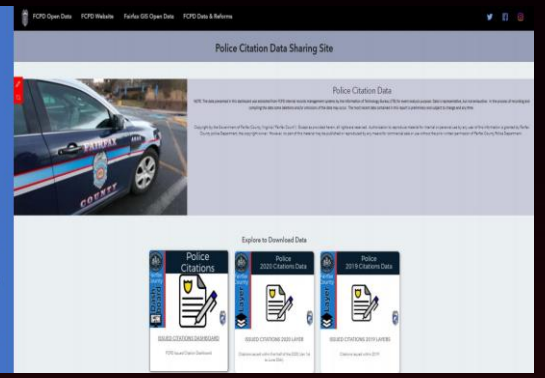
Jeffrey Gallagher, Carolyn Kinney,
Kathy Pham, Amy Milliman, James Krause





Police Issued Citation Hub Site

Site follows a similar feel throughout to provide the feeling of uniformity. Tabs below allows the user to select either the Issued citation dashboard or the individual datasets years that makeup the dashboard.



GIS Excellence Awards 2020

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

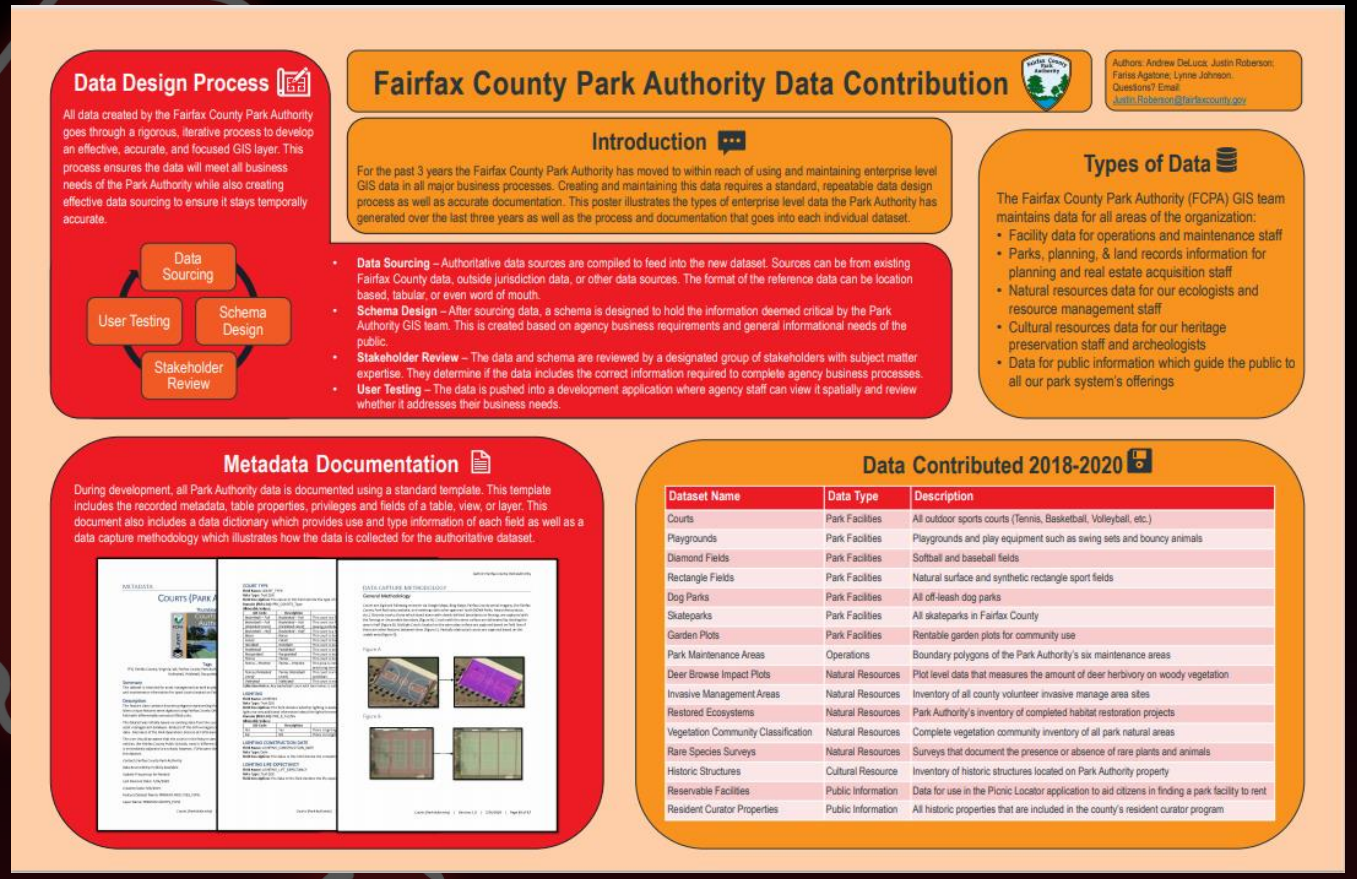
GIS Excellence Awards 2020

Most Significant Data Contributor

Fairfax County Park Authority Data Contribution

Park Authority

Andrew DeLuca, Justin Roberson, Fariss Agatone, Lynne Johnson



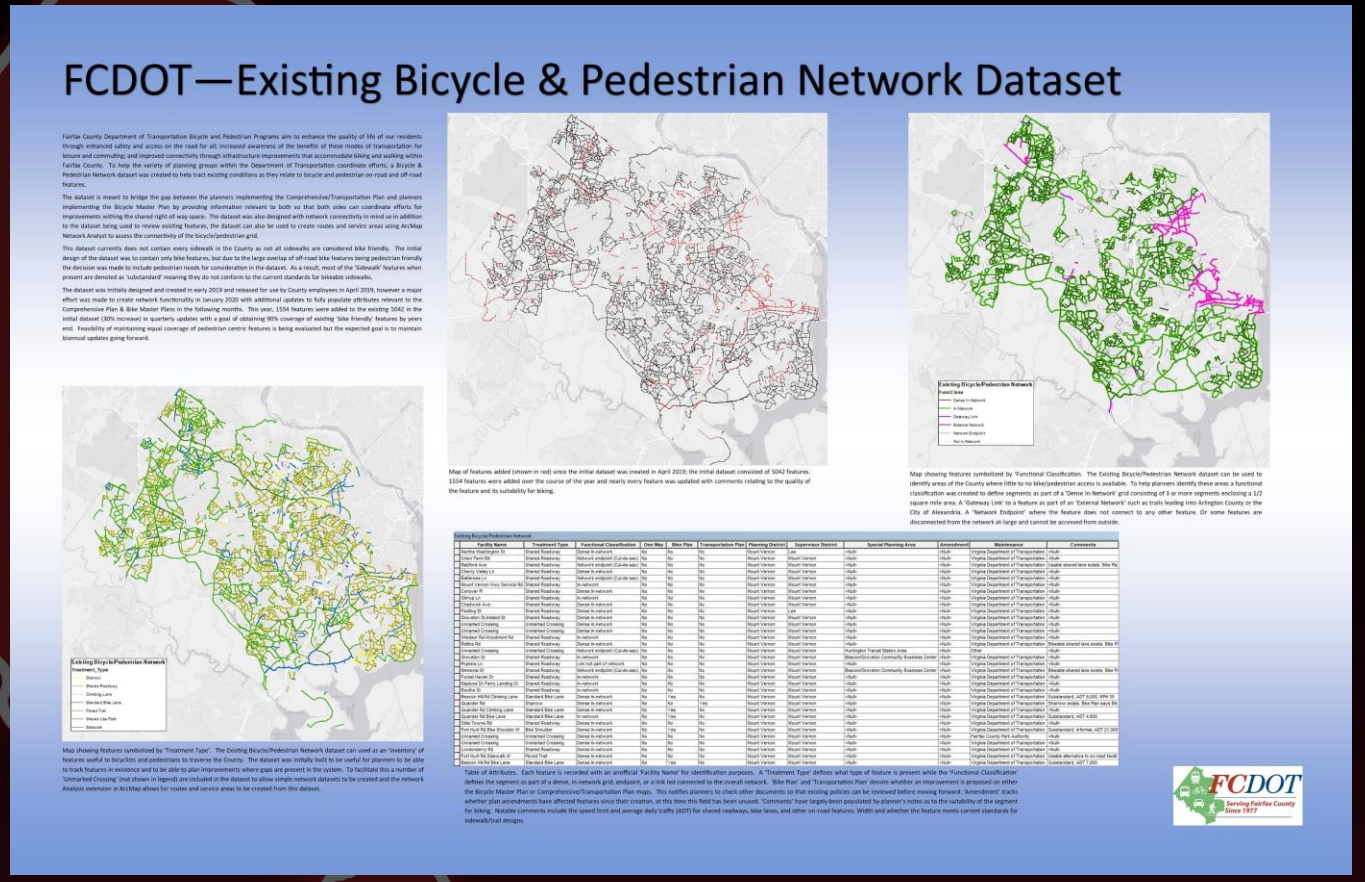
GIS Excellence Awards 2020

Most Significant Data Contributor

FCDOT – Existing Bicycle & Pedestrian Network Dataset

Department of Transportation

Thomas Wampler, Zachary Krohmal, Lindsay Marfurt, Nicole Wynands



GIS Excellence Awards 2020

Most Significant Data Contributor

Fire Data Changes in 2020

Fire and Rescue Department

Katherine Good

Fire Data Changes in 2020

Fairfax County Fire and Rescue Department

New Fire Station 444, 1775 Old Meadow Ln, McLean, VA 22102

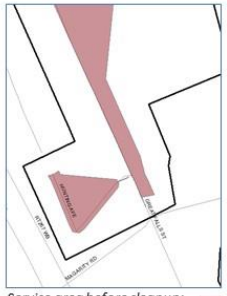
**Department Abbreviations:*
DIT GIS: main GIS Office in the Department of Information Technology
DTA: Department of Tax Administration
LDS: Land Development Services
DPSC: Department of Public Safety Communications
FRD: Fire and Rescue Department

The opening of a new fire station requires a team effort. The station must be built and furnished, emergency vehicles must be purchased or transferred, personnel must be hired or transferred, computer systems installed, and new GIS based data added to the Computer Aided Dispatch System (CAD) for 911 calls.

Many departments are involved with new GIS data: DIT GIS* enters the station driveway and commonplace name, LDS creates the address point, DPSC & FRD staff at DPSC enter the station definition and assign emergency units to the station. FRD GIS staff create the GIS data for the fire station, fire facility, fire box areas, and other data, as required.

The first due area is based on the streets and addresses assigned to the closest (by time) fire station. This is determined using Esri's Network Analyst Service Area Solver.

Service area determination of new fire station area.



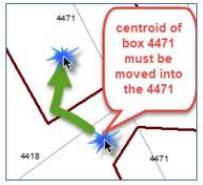
Service area before cleanup:
After cleanup:

The service area output data is adjusted such that the property, address point, buildings and corresponding street fall into the same polygon. This creates the First_Due data layer.

The fire box area is based on the 3 closest fire stations by time. This is determined over the new first due area by eliminating the first due fire station and rerunning the Service Area Solver. This process is repeated after eliminating the second and first due fire station. Further refinements are made for the break points (of the 3 closest stations) using the Closest Facility Solver, also a part of Network analyst.

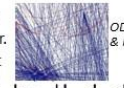
Using all this information, the fire box boundary is drawn using editing tools in ArcMap. Common tasks involve splits, merges, and reshapes in the original fire box data. At the same time, various attributes are changed so a record of the old values are kept and records needing mass updates are flagged for future updates.

A centroid is generated for each fire box. Each centroid location is reviewed in relation to fairness to all responding fire stations.



A complete run order (order in which every fire station would arrive to the center of each box) is created using Esri's Network Analyst OD Cost Matrix Solver.

Times are calculated from every fire station to the centroid of each fire box area. The times are ordered from shortest to longest.



OD Cost Matrix Graphic & Reformatted Outputs

Box	1	2	3	4
40141	401	444	108	429	103
40142	108	103	401	106	102
40143	401	106	108	444	103
40144		108			

40141,401
40141,444
40141,108
40141,429
40141,103
40141,106

These become the backup run order in CAD if the Automatic Vehicle Location (AVL) dispatch fails. In addition, a human readable list is generated using Power Tools then reformatted in Excel. Finally, an opposite fire box list and run order is created for areas over the interstates. The lists and fire box GIS data are major components of CAD.

GIS Excellence Awards 2020

Best GIS Integration

This award is presented to the agency that has integrated GIS into their operations to the greatest degree. Agencies that have a long history of GIS, as well as agencies that are in the beginning stages of GIS integration, will be evaluated separately. Criteria used to evaluate the entries include:

- effectiveness of the integration in meeting its stated goal
- increased use of GIS in the agency, either directly or through agency-generated GIS products
- increased agency efficiency as a result of GIS
- demonstration of significant effort to train staff in GIS
- ingenuity/creativity/originality of GIS methods utilized
- ability to gain insights into data/project/issue as a result of the integration
- potential for further GIS-related growth

GIS Excellence Awards 2020

Best GIS Integration

Fairfax County Animal Shelter - Expanding Community Reach

Department of Animal Sheltering

Melanie Leopold, Sandra Woiak (DIT)

Fairfax County Animal Shelter – Expanding Community Reach

Late in 2019 the Department of Animal Services reached out to the GIS Division to assist in visualizing the services we provide to the community. The result was three interactive mapping applications focused on the location of residents utilizing our services. These apps have been hugely helpful in understanding the distribution of our customers as well as in planning to better serve our community.

This mapping has been instrumental in helping us understand our reach into the community – both areas we are serving well and other areas where there is great potential. We are looking at surgeries and vaccinations since 2016 and we update the information quarterly. Analyzing this data in a visual format has been very helpful in easily seeing where we are strong and where we have room to grow. The clustering functionality allows us to easily identify areas where we have a strong presence and, conversely, where we do not.

Understanding our reach in the community and where our animals are going when adopted is incredibly helpful. With this information we are targeting our Outreach and Community programs to areas where adopted animals are living. It has also helped us identify areas where potential adopters may not know about us and the resources we provide. In the two examples you can easily see the benefits of filtering the data – it makes the data so much clearer and actionable. In the first screenshot all adoptions for all years are shown. The second screenshot filters the view to just Domestic Rabbits that have been adopted within the county in 2018.

Low Cost Rabies Clinics are held several times a year at different county locations. Mapping of the addresses of participants over the last three years contributed to a change in clinic locations for our 2020 program. The ability to filter by clinic location and animal type allowed us to design a schedule more aligned with residents using the clinic, adding locations in underserved areas. Not all of our plans were put into place due to COVID-19 but we are ready to proceed once it is safe.

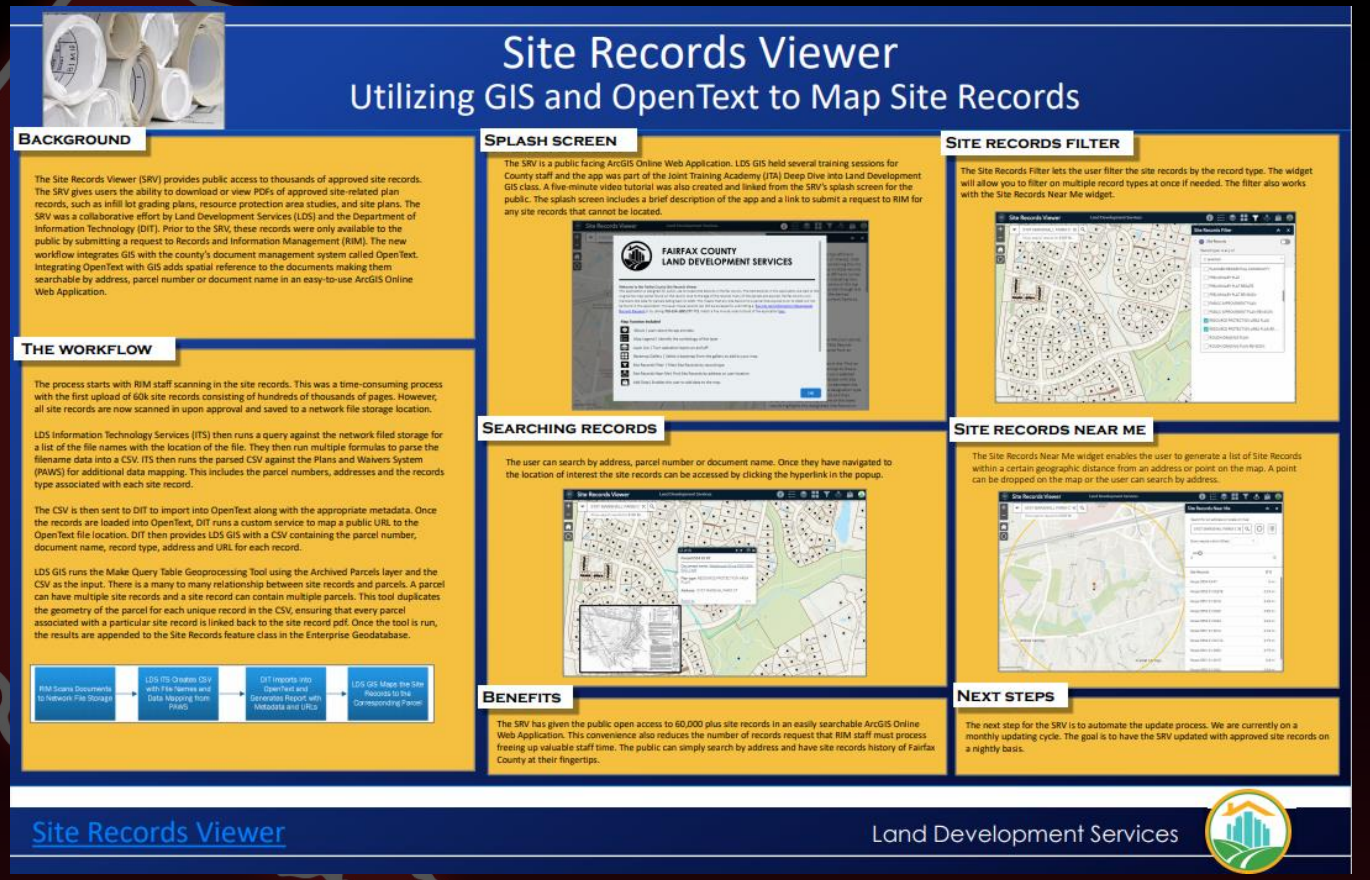
GIS Excellence Awards 2020

Best GIS Integration

Site Records Viewer – Utilizing GIS and OpenText to Map Site Records

Land Development Services

Brett Martin, Bill Edwards, Bushra Khan, Jose Baez, Pragnaya Katiki, Matthew Logie, Julia Ward, Radha Avala (DIT), Harish Reddy (DIT)

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GIS Excellence Awards 2020

Judges (alphabetically by last name)

Sue Carlson - GIS Web Administrator, Loudoun County GIS – Sue has been with Loudoun County for 13 years. She has a master's degree in GIS from the University of Redlands and is a GISP.

Tom Conry - GIS Manager, Fairfax County (retired) – Over the course of Tom's 20-year career with Fairfax County, the GIS Department evolved into one of the most respected local government GIS offices in the country. He has a B.A. in Chemistry from LaSalle University, an M.S. in Chemistry from the University of Maryland, and an M.S. in Computer Science from John Hopkins University. Tom retired to the Palmetto state in 2019 and spends much of his time traveling.

Tim Ernest - GIS System Administrator, Arlington County GIS – Tim has been with Arlington county's GIS program for 29 years in various roles. He started his GIS career in the Army as a military geographer and analyst. In '90 he left the Army to work for Arlington and became the County's first Cartographer in '93 and then their GIS System Admin in 2000.

Kathryn Kearanen - HS Program Coordinator, James Madison University – Kathryn is an instructor at James Madison University and the co-founder of the dual enrollment Geospatial Semester. She taught GIS at Thomas Jefferson High School for 7 years before retiring from Fairfax County Public Schools. She is a Wake Forest University graduate, a certified K-12 Esri trainer, and has co-authored six training manuals for Esri Press.

David Khoeler – IT Program Manager, DC Department of Public Works – David is a certified GIS Professional with 26 years of experience in the field of GIS and information technology. He works with other GIS team members at DPW and throughout District government to develop and maintain applications that capture data and track operations in the field, to provide data analysis opportunities, and system integration capabilities for DPW and coordinating agencies.

Ken Lanfear - USGS (retired)– Mr. Lanfear was a leader in introducing Geographic Information Systems (GIS) within the U.S. Geological Survey (USGS) and built some of the earliest spatial data sets of the U.S. watersheds. He developed USGS's Advanced Arc/INFO training course and trained many of USGS's top GIS scientists, and was the founding chair of the Federal Geographic Data Committee (FGDC) Spatial Water Data Subcommittee. He currently is the Hunter Mill representative on the Environmental Quality Advisory Council.

Billie Leff – Cartography and Information Products Lead, Esri – Billie has been with Esri Professional Services for 10 years. She is a graduate of the University of Wisconsin – Madison, with a master's degree in remote sensing and geospatial information technology. She also holds degrees in environmental science, anthropology, and business administration. Prior to working for Esri, Billie was the GIS manager at National Geographic for 6 years, managing the team which provided all content for Society-created maps.

Greg Licamele - Public Information Officer, Fairfax County Office of Public Affairs – Greg leads digital content strategy for the county website and social media. He has served the county for nearly 15 years in a variety of public affairs roles. He holds a bachelor's degree in journalism from St. Bonaventure University and two master's degrees (media/public affairs and homeland security/emergency management) from The George Washington University.

GIS Excellence Awards 2020

Judges (continued)

Dawn Matasic - Account Manager, Esri – Dawn is a senior account manager with Esri's Local Government Team. She has over 22 years of experience in the GIS industry and over 13 years of experience working with Esri. She has been working with Fairfax County since 2016.

Anthony Myers - Solution Engineer, Esri– Anthony is a team lead on the Local Government Team. He has a Masters of Geospatial Information Science & Technology and has Esri certifications for System Design, Enterprise Geodatabase Management, Enterprise Administration, and Desktop. He has worked in City government and the AEC industry prior to joining Esri. He has been with Esri for eight years where he focuses on web GIS technology to support government operations

Dieter Pfoser - Professor, George Mason University – Dr. Pfoser is Chair of the Department of Geography and Geoinformation Science at George Mason University. He received his Ph.D in computer science from Aalborg University, Denmark. His research interests include data management and data mining for spatial and spatiotemporal data, graph algorithms for dynamic networks, and mining user-generated content.

Michael Smith - Division Chief, IT Services Department, City of Alexandria – Michael has 20+ years of experience, predominantly in local government. During his tenure with Alexandria, he has directed and managed the strategic GIS implementations of the City's asset and work order management system (Cityworks), the 911 CAD system (TriTech), the permitting and land use system (Energov) and the custom developed Stormwater Utility system. He leads a team of GIS Analysts who are responsible for nearly 500 GIS data elements that support more than 20 City departments and the public.

Jason Smolinski - Teacher, Fairfax High School – Jason teaches Geospatial Analysis at Fairfax High School. A former GIS analyst at SAIC, he earned his master's in education in 2012 and his bachelor's degree in information technology in 2005 from George Mason University.

Ian Stack – Chief, GIS Services, Fairfax Water Authority – Ian has been at Fairfax Water since 2007 primarily responsible for GIS Enterprise architecture, managing GIS data collection and dissemination solutions, end user support, and staff management. He graduated from the University of Maryland in 1993 with a degree in Civil Engineering and obtained his Master's Degree in Civil Engineering, Water Resources in 2006 also from the University of Maryland.

Rachel Weeden - Mid Atlantic Regional Manager, Esri – Rachel's role with Esri allows her to combine her interests in geography, applied technology and improving government services. Prior to Esri, she worked for the City of Philadelphia and Chester County PA as a GIS Specialist, a career path introduced to her as a Geography undergraduate at Penn State University.

Daniel Wickens - Solution Engineer, Esri – Daniel has worked for Esri for over four years and is a graduate of the University of Pittsburgh with a degree in environmental studies and GIS. In his role as solution engineer for Esri's Philadelphia regional office, he works extensively with local and state governments to implement Esri's new ArcGIS Hub technology, which helps organizations bring people, data, and engagement tools together to accomplish initiative goals.


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