Virtual Representation of the 18th Century Port Town of Colchester Virginia

Marion Constante

Fairfax County Park Authority
**What is i-Tree Hydro?**

i-Tree Hydro, developed by the USDA Forest Service, is the first vegetation-specific urban hydrology model. It is designed to model the effects of changes in urban tree cover and impervious surfaces on hourly stream flows and water quality at the watershed level.

**Hydro Inputs**

- Hourly stream flow data (USGS gage data)
- Hourly weather data
- Digital elevation model for the desired watershed
- Land cover parameters:
  - Tree and shrub cover (evergreen and deciduous)
  - Leaf area index
  - Water cover
  - Impervious cover
  - Soil cover

**Hydro Outputs**

- i-Tree Hydro models the effects of changes in tree cover and impervious cover characteristics within a defined watershed.
- Resource managers and planners can use Hydro to quantify these changes on stream flow and water quality.

- 10% decrease in tree cover
- 10% increase in tree cover
Migration to and from the Fairfax-Falls Church Area

Paul Maliszewski, Neighborhood and Community Services, Fairfax County Government

International Migration to the Fairfax-Falls Church Area

Migration constitutes nearly 30% of the population growth in the Fairfax-Falls Church Area.

Over 40% of all domestic migrants moved to or from an adjacent jurisdiction.

28,570 immigrants spoke a language other than English at home.

The average immigrant was under 30 years of age and highly educated (61.9% of all immigrants 25 years and older had a bachelor’s degree or higher).

Net in-migration made the area’s population slightly younger (about 1 week).

English Versus Non-English Languages Spoken at Home by Migrants

International non-U.S. citizen immigrants are more likely to be older, female, not in the labor force, and lower income.

Migration has not increased the poverty rate for the Fairfax-Falls Church Area.

Percentage of Migrants, by Type

Non-English Languages Spoken at Home by Migrants

Ability to Speak English among Migrants Who Speak a Language other than English at Home

Annual Domestic Net Migration to and from the Fairfax-Falls Church Area

Percentage of In-Migrants Who Speak a Language other than English at Home

In-Migrant Frequency

College-Age Migrant Frequency

Third Place

Fairfax County Elementary School Students who Speak a Language Other than English at Home

Komail Khaja

Department of Neighborhood and Community Services

http://www.fairfaxcounty.gov/demogph/languagemaps.htm
Second Place
Health Center Program New Access Point

Adrian Joye, Chris Stevens, Rosalyn Foroobar, Nyrma Hernandez

Fairfax County Health Department

Fairfax County
Health Care Program New Access Point (NAP)

These maps show some of the background work that was done in 2012 to identify areas of the county that were medically underserved. GIS was used to validate that poor health outcomes, including quality of life needs, are disproportionately concentrated in sub-county geographic areas. Based on this work, a Governor’s Exceptional MUP designation was granted for the population living in this area.

The screen shots below were taken from the USG Mapper product. The USG Mapper is a mapping and decision-support tool driven primarily from data within the Uniform Data System (UDS), summaries net parking availability at the local level. The USG Mapper is designed to help users understand the current geographic extent of U.S. Federal Health Care Program (HCUP) grants and tools alike, and was largely designed for service areas analysis.

As part of the Health Resources and Services Administration (HRSA) grant application process, a variety of public health data was collected and mapped. The data was then analyzed geographically in order to complete the Need for Assistance Worksheet. The maps below are examples of some of this data.

The net result of this effort was the recent announcement that over $2.4 million has been authorized from the Health Service and Resource Administration to fund a permanent service delivery site in south Fairfax County. This access point will increase access to comprehensive, culturally competent, quality primary health care services.
Constructing a Web Based Mapping Application for Police to Analyze the Efficiency of Patrolling

Jeffrey Gallagher
Fairfax County Police Department
Fairfax Trail Buddy

Fairfax County Park Authority

AGENCY CATEGORY
Best Use of GIS for Public Outreach
Winner

Fairfax County offers over 900 miles of trails, bikeways and sidewalks for non-motorized transportation that have been mapped using a Geographic Information Systems database. Fairfax Trail Buddy is a web-based mapping tool that allows you to discover the extensive network of Fairfax County Park trails. Fairfax Trail Buddy also provides access to the Bike Fairfax Interactive Bike Map, which highlights the most desirable on-road and off-road bike routes for recreational and commuter bikers. The web map is accessible from all types of devices and operating systems.

The creation of this comprehensive mapping tool was the result of collaboration between Fairfax County Park Authority, Fairfax County Department of Transportation and Department of Information Technology Geographic Information Systems and Mapping Branch with data provided by Fairfax County Department of Public Works and Environmental Services, City of Fairfax, Towns of Herndon, Town of Vienna, Northern Virginia Regional Park Authority, The Bureau of Land Management, National Park Service, Virginia Department of Conservation and Recreation, Virginia State Parks, U.S. Fish and Wildlife Service, Reston Association, and George Mason University. This application will evolve and improve over time with feedback from users.

On Trail Use with a Smartphone: Taking the Fairfax Trail Buddy with you on your bike is easy and requires downloading a free mobile application to convert the map functionality to view on a variety of mobile devices. For iPhones and iPad devices, go to the iTunes App Store and search for the ArcGIS application and install it on your device. For Android devices go to Google Play Store and search for the ArcGIS application and install it on your device.


After you have installed the application, open ArcGIS and use the search tool to find the “Fairfax Trail Buddy.” Select the map to immediately view or add to your favorites for future reference. Activate the GPS functionality of your device to dynamically reference your location on the map.

http://www.fairfaxcounty.gov/parks/trails/
The Department of Planning and Zoning (DPZ) Website is focused on providing rapid access to important, relevant and timely Planning and Zoning information by using and incorporating GIS data throughout the site.

The DPZ Map Portal Page showcases DPZ created GIS maps as well as links to county-wide GIS maps on a dedicated page with user friendly access and navigation in a one-stop shop.

These maps are examples of incorporation of GIS into the DPZ website which assist the agency in achieving its goal of efficiently delivering easily accessible, user friendly access to DPZ information and services to the public, development community, staff, county officials and others.

http://www.fairfaxcounty.gov/dpz/maps/
In 2012, the Urban Forest Management Division entered into data exchange with Casey Trees Foundation in order to obtain an updated remote sensing analysis of Fairfax County's tree canopy along with other landcover types. Casey Trees had contracted with the University of Vermont Spatial Analysis Laboratory (UVSAL) to produce a regional tree canopy analysis and was searching for high-quality satellite imagery for Northern Virginia. In exchange for the County's 2011 high resolution satellite imagery, Casey Trees was given rights to the resulting classification data; in return, Fairfax County received a highly accurate landcover classification.

The new classification delineates (1) tree canopy, (2) shrubgrass, (3) roadways, (4) buildings, (5) waterways, (6) impervious surfaces, and (7) bare soil. The remote sensing techniques employed by UVSAL in the classification are considered state of the art.

**ACCURACY**

The new landcover classification indicates that approximately 53% of the County's landmass is covered by tree canopy. An accuracy assessment conducted by GIS/UFMD revealed that a user of the classification would find that 94.0% of the time, a visit to an area mapped as tree canopy would prove to be truly of that class.

**DATA APPLICATIONS**

The countywide tree canopy data was broken down in to all 30 major watersheds and provides a theoretical canopy gain for each watershed which will prove useful in setting meaningful watershed-based canopy goals as recommended in the County's Tree Action Plan.UFMD and GIS and Stormwater staff is currently using the landcover data, digital elevation models and i-Tree Hydro software to model the impacts of tree canopy gain/loss on water quality and stream flow. This modeling may prove useful in developing future land use policies and in setting canopy goals in support of the MS4 Permit and Chesapeake Bay TMDL regulatory requirements.

The classification data is expected to prove useful to multiple agencies involved with land use decision making, natural resource management, land development review, and property management.
AGENCY CATEGORY
Best GIS Integration or Application Development
Winner

Plan & Profile
Waste Water Management Division of the Department of Public Works and Environmental Services
AGENCY CATEGORY
Most Significant Progress

Bike Fairfax
Department of Transportation

http://www.fairfaxcounty.gov/fcdot/bike/bikemap/
Fairfax County Data Visualization and Infographic Gallery
http://www.fairfaxcounty.gov/demogrph/data_visualization.htm

Economic, Demographic and Statistical Research
Countwide Service Integration and Program Management
Department of Neighborhood and Community Services

The Economic, Demographic and Statistical Research (EDSR) group has gone live with its new Fairfax County Data Visualization and Infographic Gallery website. Infographics and data visualizations provide an enjoyable way to learn about complex topics without requiring a lot of reading. These techniques employ graphics and data-rich visuals to help explain patterns and trends. Research suggests that information delivered visually is much more likely than text to be read and understood. Infographics and data visualizations help to convey ideas clearly and effectively in order to educate, inform and showcase key information in an intuitive format to the general public and others who may not be used to working with large quantities of tabular data.

The goals of the Fairfax County Data Visualization and Infographic Gallery are:
- To provide a showcase for data visualizations on a range of interesting and important topics,
- To make data more accessible and understandable to users of the information,
- To provide data in a format that helps to make sense of complex issues, and
- To turn an avalanche of county data into useful and actionable information.

It is hoped that other county agencies will be inspired to create their own data visualizations and share those creations in the web-based gallery. The first five of the infographics in the gallery explore the characteristics of people moving to and from the Fairfax-Falls Church Area; the characteristics of international in-migrants; the characteristics of Fairfax County residents who are age 50 years and older; and the characteristics of county residents living in poverty.

http://www.fairfaxcounty.gov/demogrph/data_visualization.htm
The fire first due or first responding areas for fire vehicles have changed greatly in the last few years. Reasons include: new roads such as slip ramps between the Dulles Toll Road and Dulles Access Road, new ramps to and from the Beltway Express lanes, ongoing construction for the new Silver Metro Line, changes in speed limits, and the opening of a new fire station. The first due changes for a single fire station, Fire Station 429, Tysons Corner are shown here. The color sequence was deliberately changed to reduce confusion between map dates.
Police Incidents Displaying a High Rate of Canine (K9) Unit Response

Description: The website homepage (FCPD Internal) exhibits police responses for incidents (assaults, burglary, motor vehicle theft and robbery) and by police K9 shifts (days, eves and mids). The website homepage allows the canine unit to view all incidents for a designated date, incident type and/or shift. This filter narrows events down by streets listed on the report, includes a heat map (day of week and hour of day) - these events then filter down to the next tab which places the incidents by color, on a geographic map of Fairfax County. Multiple event types can be displayed on the map. The site is live data and is useful for police resource planning and operational awareness.
Counts of 2013 Assaults With a Weapon Event Types Within Proximity to Police Stations.

2013 CFS (Calls For Service) data was collected from the live iLeads database with a OLE connection. The BiSeven_event database was processed and queried to select out all 717 assaults with a weapon event types within 2013. Multiple buffer rings of 0.5, 1.0, 2.0 and 3 Miles were generated from the 8 police station points. With the use of the “Select By Location” tool within ArcMap to highlight all the assaults that fell within the buffer rings. The “Table Join” feature was used to sum up the total within each separate buffer ring distance. This analysis identifies an large increase in the amount of assaults from a distance of 2 miles or further from a police station compared to 0.5 and 1 mile. It could be hypothesized that a police station will have an positive affect in reducing the amount of assaults if a police station has a presence within one mile of the events.

Counts of Assault Types Within a Buffer Distance From Police Stations

<table>
<thead>
<tr>
<th>Buffer Distance</th>
<th>0.5 Miles</th>
<th>1 Mile</th>
<th>2 Miles</th>
<th>3 Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counts of Assaults</td>
<td>45</td>
<td>40</td>
<td>221</td>
<td>225</td>
</tr>
<tr>
<td>Shootings</td>
<td>6</td>
<td>4</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Stabbings</td>
<td>20</td>
<td>15</td>
<td>80</td>
<td>86</td>
</tr>
<tr>
<td>Non-Identified</td>
<td>19</td>
<td>21</td>
<td>125</td>
<td>130</td>
</tr>
</tbody>
</table>
Fairfax County Fire & Rescue Department Safety Officer Staffing

Background:
Currently the Fairfax County Fire & Rescue Department has 2 Safety Officers on-duty at all times. These uniformed officers respond to over 120 high-risk incidents every month; including large fires, major accidents, and hazardous materials situations. Combined, these Safety Officers can only cover 84% of the county within a 20 minute travel time.

In 2012, a study was conducted to examine coverage differences if a Safety Officer was moved to a new fire station planned to open in late 2013.

Purpose:
This study builds upon the 2012 study to determine if a new deployment would provide optimum coverage for the county, whether Safety Officer 401 (SAF401) and Safety Officer 402 (SAF402) should remain at their current home stations, and specifically, how would adding a 3rd Safety Officer affect coverage.

Conclusion:
This analysis demonstrates that an additional Safety Officer will increase the 20 minute travel time area of coverage by 12% at the proposed station location. This study also shows how the administrative first due area for SAF401 and SAF402 would change if the proposed SAF403 Officer were to be put into service.

Projected Travel Times
To conduct this study, surface area and graduated time response maps were created using the ArcGIS 10.1 and the Network Analyst extension. These maps provide an overview of the projected travel times for a Safety Officer if they were available in quarters (responding from their home fire station).

The lists below show the percent of county covered within three projected travel times for the different deployment plans of 2 and 3 Safety Officers.

<table>
<thead>
<tr>
<th>Deployment Plan</th>
<th>6 Minute Travel</th>
<th>10 Minute Travel</th>
<th>20 Minute Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Safety Officers</td>
<td>9%</td>
<td>29%</td>
<td>84%</td>
</tr>
<tr>
<td>3 Safety Officers</td>
<td>14%</td>
<td>44%</td>
<td>58%</td>
</tr>
</tbody>
</table>

Projected 20 Minute Response Coverage
This series of maps show the projected 20 minute travel time area of coverage for a Safety Officer available in quarters (responding from their home station).

Legend:
- SAF401
- SAF402
- Proposed SAF403

Credits: Brian Mikkola, James Madison University, written in GIS under the supervision of John Skelton. GIS Coordinator: Katherine E. Stock. GIS Analyst: and Marcus Murphy. Operations Chief: Engineer Manager. Fairfax County Fire & Rescue Department. ©2013
Rec-PAC Location Analysis

Annandale Terrace Elementary School

Bull Run Elementary School

Freedom Hill Elementary School

Centreville Elementary School

Bren Mar Park Elementary School

Franklin Sherman Elementary School

Graham Road Elementary School

Halle Elementary School
The Fairfax Center Area Study is a multi-phase planning study to examine current recommendations and existing conditions within the Fairfax County Comprehensive Plan. The Fairfax Center Area comprises approximately 5,550 acres west of the City of Fairfax and east of Centerville, generally between Lee-Jackson Memorial Highway (Route 50) and Lee Highway (Route 29).

The map and data in this map are for informational purposes. Please contact the Department of Planning & Zoning for information related to this project. Additional information can be found at: [http://www.fairfaxcounty.gov/dpz/fairfaxcenter/](http://www.fairfaxcounty.gov/dpz/fairfaxcenter/) for further guidance.
2013 DWI ENFORCEMENT PLANNING GUIDE - COUNTYWIDE MAP

Contains activity from the first through third quarters of 2013. For use with fourth quarter DWI enforcement planning. Please see the station area maps for detailed views of individual geographic station areas.

1 - Sully
Number of Sobriety Checkpoints 2
Number of Vehicles Screened 941
Number of DWI Arrests 3
Number of Drug Arrests 2
Number of No OL & DOS Charges 1

2 - Mt. Vernon
Number of Sobriety Checkpoints 2
Number of Vehicles Screened 1384
Number of DWI Arrests 6
Number of Drug Arrests 4
Number of No OL & DOS Charges 9

3 - McLean
Number of Sobriety Checkpoints 2
Number of Vehicles Screened 1480
Number of DWI Arrests 3
Number of Drug Arrests 1
Number of No OL & DOS Charges 13

4 - Mason
Number of Sobriety Checkpoints 3
Number of Vehicles Screened 1977
Number of DWI Arrests 11
Number of Drug Arrests 3
Number of No OL & DOS Charges 16

5 - Reston
Number of Sobriety Checkpoints 4
Number of Vehicles Screened 1866
Number of DWI Arrests 11
Number of Drug Arrests 1
Number of No OL & DOS Charges 23

6 - Franconia
Number of Sobriety Checkpoints 2
Number of Vehicles Screened 1381
Number of DWI Arrests 3
Number of Drug Arrests 2
Number of No OL & DOS Charges 9

NOTES:

DWI arrest: IRB arrest defined as "DRIVING WHILE UNDER THE INFLUENCE."

DWI arrest may have the location listed as the ADC.

DWI Crash: A crash where the driver had an alcohol-factor (i.e. was driving after the consumption of alcohol) as designated by the FR300 crash report. A DWI arrest will not always accompany a DWI crash if the driver was found not to be outside of the legal BAC limit.

Sobriety Checkpoints: Include results for checkpoints run through quarter 3 of 2013. Additional checkpoints may be planned in quarter 4 for station areas.
The listed subscriber’s communication detail record reflects 1,772 cell site activations. 1,047 (59%) of these activations occurred on just five unique cell sites. These sites are located near Long Branch, NJ, near Philadelphia, PA and in Fairfax County, VA (Falls Church and Annandale).

The cell sites near Long Branch, NJ and in Falls Church, VA were activated most frequently and at a rate more than half a standard deviation above average ($x = 160$). Both of these sites were activated with regularity throughout the listed time frame.

1,438 cell site activations (81%) occurred within one-quarter mile of an interstate. This, in combination with the cell site activation frequency on the two most-utilized cell sites in NJ and VA, is indicative of regular travel between the two locations.
How far do my honeybees roam?

And why does this matter?

Although honeybees are workaholics, they will only roam as far as needed to locate good sources of nectar and pollen. It is pretty well established that they will easily travel 2 miles in their search for good food and that they will suffer diminishing cost effectiveness beyond a 4 mile one-way trip.(1)

Pesticide application anywhere within the forage buffer can have a devastating effect on the health of the hive. In addition, the proximity of other managed hives means competition for the best food.

The area covered by honeybees in search of forage seems huge, but large amounts of the area may be unusable. Water, landscaped grass (as in athletic fields), pavement, and buildings take up much of the area. The forests on the Fairfax County side of the Occoquan Reservoir provide pollen but little nectar. Of the remaining area, plants specifically bred for human enjoyment may not provide the nutrition needed by bees.

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Visualizing Population & Employment Growth for Fire Station Planning Symposium
MOTORCYCLE CRASH MAP
Includes 398 Motorcycle and Moped Crashes Occurring in Fairfax County in 2011 and 2012

- Touring = Built for long-distance travel, these are typically heavy bikes with many amenities.
- Cruisers = "Low-style" design, relaxed ride, but new riders may find handling difficult.
- Sport/Standard = Most are intended for high-performance track duty, speed and/or street riding.
- Moped = (3) wheels or less, seat no less than 24" in height, and with less than 50cc engine displacement.

Legend
- Fatal Motorcycle Crash
- Moped Crash
- Motorcycle Crash

To request this information in an alternative format, call Fairfax County Police Department Traffic Division at 703-241-2424
12 MONTHS OF DISTRACTED DRIVING

Reportable Crashes Occurring from July 2012 through June 2013

FACT: DRIVER BEHAVIOR:

THIS MAP REPRESENTS OVER 2,800 DRIVERS WHO WERE INVOLVED IN A REPORTABLE CRASH WHILE DRIVING DISTRACTED.

Legend

DRIVER FATIGUE

○ 1
○ 2

CELL PHONE

○ 1
○ 2

DAYDREAMING

○ 1
○ 2

PASSengers

○ 1
○ 2 - 3

OTHER

○ 1 - 2
○ 3 - 5
○ 6 - 10

EATING/DRINKING

○ 1

ADJUSTING VEH CONTROLS

○ 1
○ 2
○ 3

EYES NOT ON ROAD; LOOKING AT SCENERY OR ROADSIDE EVENT

○ 1 - 2
○ 3 - 4
○ 5 - 6

FATAL CRASH

 HEAD-ON COLLISION

DRIVER CONDITION: DISTRACTED / DRIVING
DISTRAUGHT OVER EMPLOYMENT ISSUES, THE DRIVER MISTAKENLY CROSSED OVER THE MEDIAN LINE BEFORE COLLIDING HEAD-ON WITH AN INFRATRUCTURE VEHICLE.

THE DRIVER AND YOUNG PASSENGER OF THE VEHICLE SUFFERED MINOR INJURIES. THE PASSENGER WAS TRANSPORTED TO THE HOSPITAL. THE DRIVER DIED OF INJURIES SUSTAINED DURING THE COLLISION.

FACT: TEXTING IS NOW A PRIMARY OFFENSE IN VIRGINIA

IN VIRGINIA, YOU MAY NOW BE PULLED OVER BY AN OFFICER IF YOU ARE SUSPECTED OF USING A MOBILE DEVICE FOR TEXTING OR EMAIL.

FACT: THERE ARE THREE MAIN TYPES OF DISTRACTED DRIVING

1) VISUAL: EYES ARE NOT ON ROAD
2) MANUAL: HANDS ARE OFF THE STEERING WHEEL
3) COGNITIVE: MIND IS OFF THE PRIMARY TASK OF DRIVING
SIGNALIZED TRAFFIC INTERSECTIONS
CURRENT BATTERY BACKUP SYSTEM ABILITIES FOR
ALL SIGNALIZED TRAFFIC INTERSECTIONS WITHIN FAIRFAX COUNTY, VA.

Legend
- INTERSECTION: NO BACKUP AVAILABLE
- INTERSECTION: EQUIPPED WITH BATTERY BACKUP

Interstates; Toll Roads
- Parkways; Major Arterials
- Collectors

Information provided is based on current VDOT intersection location information for Fairfax County, VA.

FCPD/GIS/B.HORITA CREATED: 08/2013
Fairfax County Fire and Rescue Department GIS Data Project: Fairfax County Public Schools Exit Door Numbers

184,625 Students
23,831 Staff
196 Schools and Centers
1,633 Exit doors
4 Agencies (FCPS, DPSC, FCPD, FRD)
2 Goals – Safety and Security

Data Sample: Exit doors at Centreville High School
DPZ Web Applications

Welcome to the Planning & Zoning Viewer

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult with Fairfax County and information sources to ascertain the usability of the information, including but not limited to zoning, applications, parcels, Chesapeake Bay Preservation Areas.

Planning & Zoning Viewer:
Provides Information about Zoning Applications and information related to our business process

Welcome to the Zoning District Analyzer

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult with Fairfax County and information sources to ascertain the usability of the information, including but not limited to zoning, parcels.

Zoning District Analyzer:
Allows Citizens, Developers, Real Estate Professionals to analyze where certain zoning districts are in the county.

http://www.fairfaxcounty.gov/dpz/maps/