

2015 Achievement Awards Virginia Association of Counties

APPLICATION FORM

All applications must include the following information. Separate applications must be submitted for each eligible program. **Deadline: June 1, 2015.** Please include this application form with electronic entry.


PROGRAM INFORMATION

Locality: Loudoun County
Program Title: The Use of Voluntary GIS to Map Park and Trail Amenities
Program Category: Parks and Recreation

CONTACT INFORMATION

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SIGNATURE OF COUNTY ADMINISTRATOR OR CHIEF ADMINISTRATIVE OFFICER

Name: Tim Hemstreet
Title: County Administrator
Signature: 

The Use of Voluntary GIS to Map Park and Trail Amenities

Abstract

Loudoun County maintains 29 parks and there are other parks that are owned and maintained by the Northern Virginia Regional Park Authority, the National Park Service, not for profit organizations, the County's towns, and the Commonwealth of Virginia. The public may not be aware of the amenities available in any given park, and mapping all of these assets is a massive undertaking beyond the resources of the County alone.

In early 2013, an employee of AOL approached the County offering to provide volunteers for community service as part of that company's Monster Help Day, a world-wide event encouraging volunteerism. The County suggested mapping the amenities along the Washington and Old Dominion Railroad Regional Park (W&OD), a linear, multi-use rail-to-trail park that originates in the County and extends 45 miles to Alexandria, Virginia. The AOL volunteers fanned out along the trail on one day in late May and used their smartphones to map amenities, including recording GPS points, taking photos, and classifying amenities by type via a pick list. Their progress was immediately displayed on their phones from an ArcGIS Online application.

In 2014 the AOL volunteers repeated the exercise, mapping the amenities in Claude Moore Park, and on May 15, 2015 they mapped Phil Bolen Park and eight parks in the Town of Leesburg. This year (2015) the Loudoun County Trails Association (LOCOTA) has volunteered to extend the program County-wide. LOCOTA members include people interested in hiking, cycling, mountain biking and horseback riding. The data dictionary was developed in March of 2015 and field work began on May 8th.

The Problem or Need for the Program

Loudoun County owns 29 parks, both large and small, with over 56 miles of trails, 200 athletic fields, 18 playgrounds, and numerous facilities. Some of these amenities have been mapped, but most have not, and the public lacks a comprehensive resource that shows all of the amenities in a park and their locations. There are also three regional parks in the County, a state park, two national parks, two publically accessible parks owned by foundations, and numerous parks owned by municipalities, all of which lack information about their amenities.

The County is 520 square miles in size, and the sheer magnitude of the problem makes mapping of all these facilities by County staff prohibitive. Instead, the County is relying on volunteers armed with smartphones and with access to an ArcGIS Online application to field collect the information

Description of the Program

The County's Office of Mapping and Geographic Information had mapped sidewalks and trails countywide from 2008-2012 aerial photography. The layer, however, had gaps where trails were obscured by tree cover and the only attributes that could be collected were pavement type and approximate width. There was certainly no information about trail and park amenities.

The County Department of Transportation and Capital Infrastructure (DTCI) was interested in the idea of using volunteers to map amenities because part of its mission is to work with employers to encourage bicycle commuting. An impediment to bicycle commuting for those who haven't tried it is a lack of knowledge about the trail. Where would I be able to rest, get out of a storm, or find water?

The program began in 2013 as a way to provide information that the public could use to better plan for their use and enjoyment of the W&OD. The 100-foot-wide W&OD has been called "the skinniest park in Virginia." But it is also one of the longest parks, 45 miles of paved trail for walking, running, bicycling and skating and 32 miles of adjacent gravel trail for horseback riding. Built on the roadbed of the former

Washington & Old Dominion Railroad, the multi-use W&OD Trail is very popular with both recreational users and commuters.

When volunteers from AOL, a company with a major presence in the County, volunteered to take on a civic project, County staff proposed mapping of the W&OD. It was an opportunity to map the trail's amenities for use by the public using voluntary GIS, allowing volunteers to add content to the County's maps. AOL is a technology company, and the volunteers quickly mastered the process of field mapping.

County staff from Parks, Recreation, and Community Services and the Office of Mapping and Geographic Information prepared a menu of amenities to collect, and Mapping staff created the web service and tailored the free mobile data collection application.

In late May 2013, a staff person from the Northern Virginia Regional Park Authority, the trail owner, met the volunteers at a trail head to get them started. They broke up into small groups, each picking a part of the trail to map. They had previously downloaded the application to their personal smart phones and familiarized themselves with its operation using directions provided by the Mapping staff. They bicycled to each amenity, used the pick list from the app to classify it, collected the GPS point, and took a picture. The County provided lunch, and the resulting map can be viewed on any device by anyone at www.loudoun.gov/wodmap. It can be used to plan an outing on the trail, or by someone already on the trail to see where the next drinking fountain is.

In May of 2014, the following year, the volunteers mapped trails and amenities in Claude Moore Park, a County owned 357 acre facility with eleven miles of trails. Parks, Recreation, and Community Services had experimented in the intervening time and had realized that other facilities, such as pedestrian bridges, could be mapped to help plan and budget for maintenance and replacement. The pick list for the volunteers was expanded. The resulting map can be found at www.loudoun.gov/claudemooresmap.

In late 2014, members of the Loudoun County Trails Association (LOCOTA) learned of the effort and offered to help. LOCOTA is an organization of people interested in cycling, mountain biking, hiking, and horseback riding. The County's Department of Economic Development (DED) had previously been tasked with providing staff support to LOCOTA as part of the County's implementation of its rural economy business strategy. The staff liaison in DED worked with the LOCOTA volunteers to again expand the amenity pick list to take into account all of LOCOTA's interests and needs. Staff from DED and Mapping met with LOCOTA in January 2015 to show them how the process worked and to explain the desired results. Project leaders were identified and GPS data was volunteered. Their field work began in May of 2015. The results of their mapping will be online maps of all the parks in the County as well as dedicated trail maps.

The AOL volunteers mapped Phil A. Bolen Memorial Park in May 2015. This award-winning, 405-acre regional park features baseball, softball, football, lacrosse, and soccer complexes, as well as trails, natural woodlands, picnic areas and a visitors' center. The Department of Transportation and Capital Construction (DTCC) once again provided lunch, and then the volunteers continued down the trail and mapped eight parks in the nearby Town of Leesburg <http://arce.is/1REQJs2>

The LOCOTA volunteers began mapping gaps in the County's sidewalk and trail layer and trail amenities in Edwards Landing Park in Leesburg on May 8, 2015.

Use of Technology

The County used ArcGIS to store and display the mapped features. The mobile application is a free download from Esri's web site. County staff created a custom web service with a pick list. The underlying base map was created using County data served through Esri's Community Base Map. The volunteers use their personal smartphones for data collection using instructions drafted by County staff.

Cost of the Program

The cost of the program is minimal; the only costs came from staff time. The ArcGIS Online licenses are bundled with the licenses for the County's GIS software and do not add any additional cost. The Community base map takes about two hours to pre-process before sending to Esri. This is a once a year event that costs approximately \$131. The base map use is spread out over many different applications, however, and the cost to this program is \$5.25. The smart phones that are used come with no cost to the County.

There were one-time costs for developing instructions for using both Android and Apple smartphones of about \$245, for preparing an illustrated guide of features to be collected of \$257, for setting up the web page of \$161, and post processing the data of \$600. The latter two costs were repeated three times for a total cost to date of \$1268.25.

The Results/Success of the Program

The County's ArcGIS Online map gallery includes maps of the W&OD and Claude Moore Park that display the features collected by the volunteers. It is not known how many people have used these maps to plan their trips, but the former has been viewed 3651 times and the latter (which was just released in February 2015) 61 times. Park managers are now building databases of facilities that will be used for budgeting and scheduling of maintenance. This has been done at little cost to the County.

More importantly, the County's LOCOTA volunteers, together with the County's AOL partner, are supporting and engaging with their community. All of the volunteers benefit from hiking, biking, and riding while accomplishing a vital service at the same time.

Finally, the Northern Virginia GIS Managers established a technical workgroup to coordinate the development of sidewalk and trail data regionally. The process for field data collection and the development of the data dictionary has become the starting point for the regional effort.

Criteria for Selection

This program is both low cost and easily repeatable. All of the components are off the shelf and customized by County staff, and it encourages the use of trails for recreation and commuting. It almost certainly helps to maintain the health of the volunteers who are using their free time to both exercise and contribute to their community. The program, in large part, exists because of an on-going partnership between Loudoun County and AOL, and it has been supported by the Northern Virginia Regional Park Authority and the Town of Leesburg.

The program uses volunteers to map large volumes of data which would otherwise remain uncollected because of the scope of the problem. It helps the County by identifying gaps in its trail system, and is currently being used by one park manager to budget for maintenance. More importantly, it engages citizen volunteers who are excited about what they are doing, while at the same time helping the County's residents to make better use of their parks and trails. Lastly, the program is being used to help establish a model that the regional workgroup can use to create standards for developing a sidewalk and trail network for all of Northern Virginia.

Supplemental Materials

1. Link to the W&OD Trail map- www.loudoun.gov/wodmap
2. Link to the Claude Moore Park map- www.loudoun.gov/claudemooresmap
3. Link to photos of the first Monster Help Day-

<https://www.flickr.com/photos/omagi/sets/72157633546754718/>

4. Sample photos of amenities
5. Loudoun County Trails Association Facebook page- <https://www.facebook.com/loudountrails>
6. AOL Monster Help Day iphone Instructions

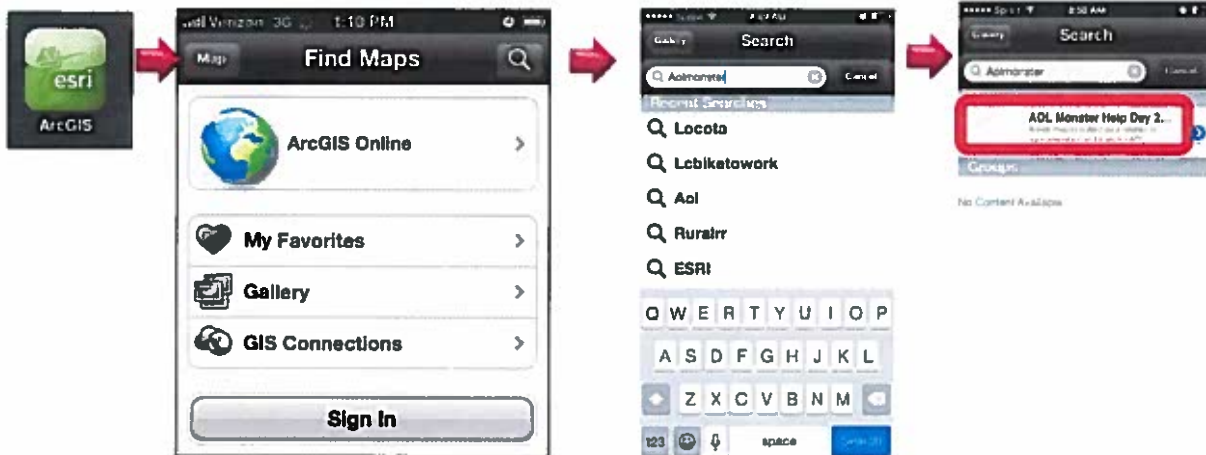
AOL Monster Help Day 2015 data collection – iPhone Users Guide

Download ArcGIS Mobile Application

1. App Store by clicking the icon and search for 'ArcGIS'.
2. Select and click Install.

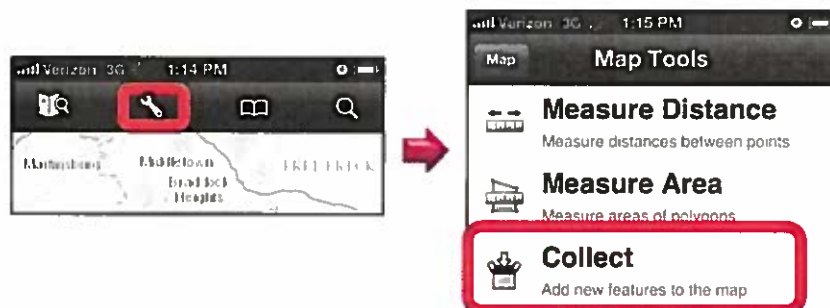
Accessing the Mapping Application

1. Click the **Esri ArcGIS** icon to open the app.
 - Ensure that you have installed the most current version (if you aren't sure, open the App Store and check the 'Updates' icon in the lower right to see if there's a newer version).
2. From the ArcGIS App Home Page, click the **Search** button (magnifying glass) in the upper right hand corner. Search for '**AOLMONSTER**', '**aolmonster**', '**Aolmonster**'
 - (AOL Monster Help Day 2015 map will be listed under the search results.)
3. Select "AOL Monster Help Day 2015" to open.

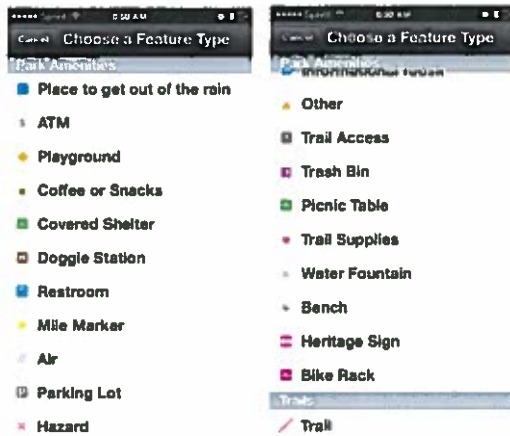


Collect Feature Data

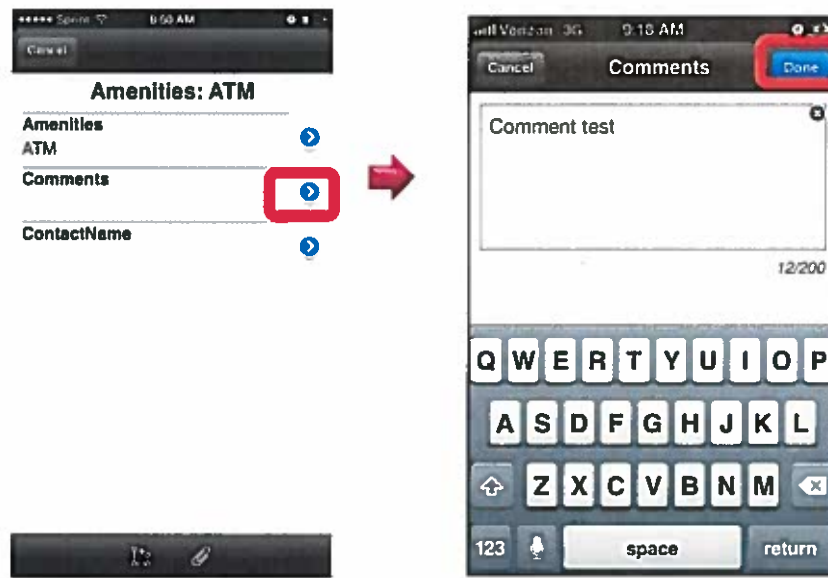
4. Click the **Map tool icon** (the wrench icon at the top of the screen) and then select **Collect** from the menu.



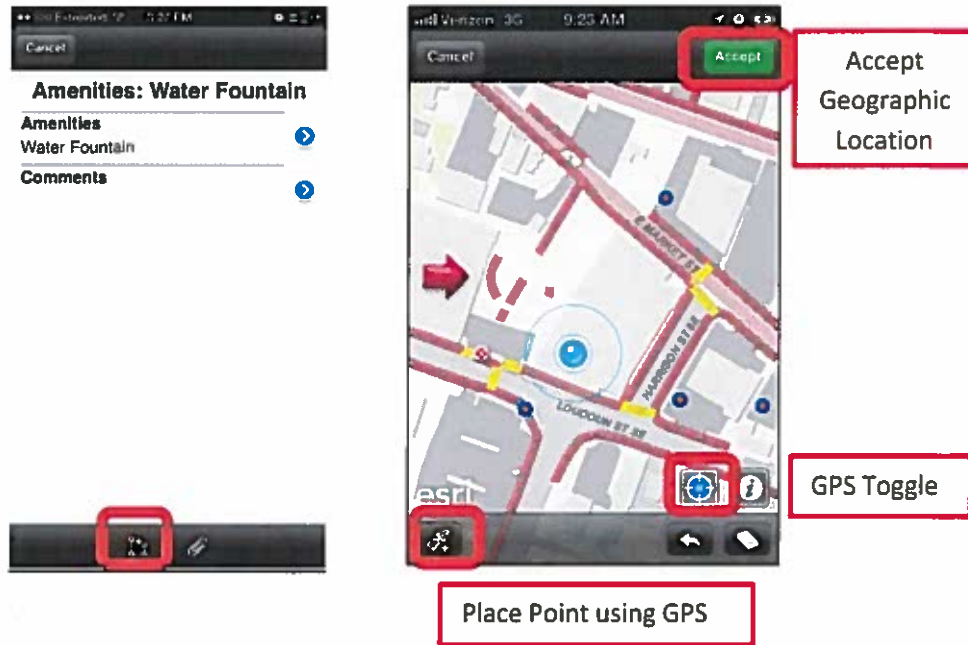
5. Select the type of feature that you would like to collect: "Amenities", "Trail".



6. Once you have chosen your feature type, you will be presented with an attribute window to begin collecting information about the feature. Click the **Right Arrow** beside any of the attributes to fill in details. Once you have filled out information, click **Done** to return to the attribute window and continue entering information.

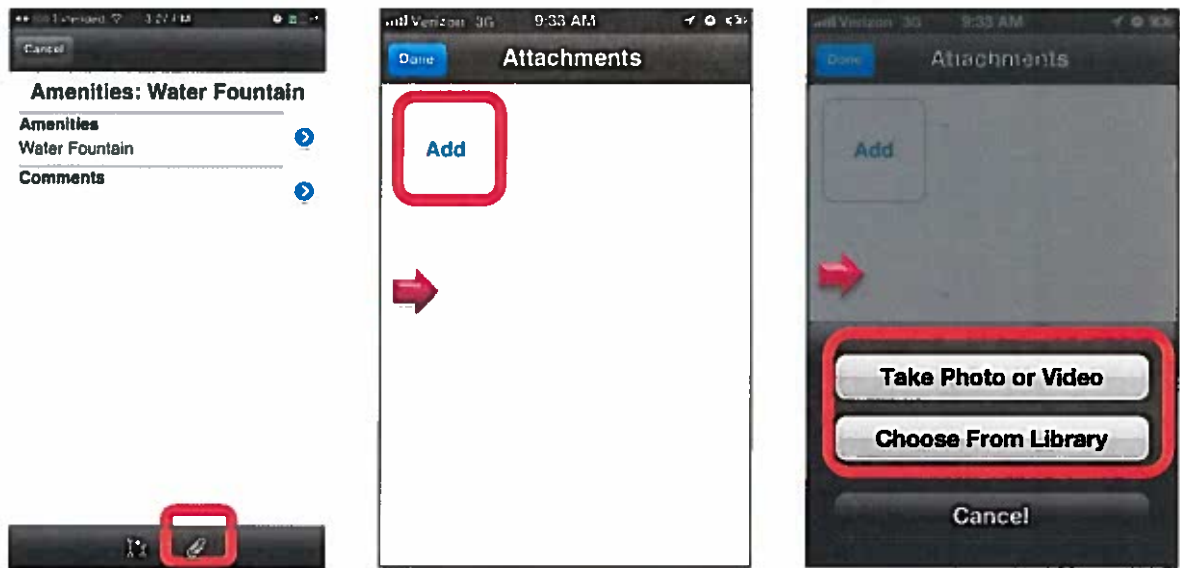


7. Once you have filled in all the appropriate information, the next step is to collect the geographic location of the feature by clicking the **Location** button.
- To utilize the phone's GPS, click the **GPS Location** button. It should appear blue when turned on (ensure that locational services are turned on for the app by opening the **Settings** icon and scrolling down to "ArcGIS").
 - Click the **Place Point** button to add the GPS point.
 - If you are not satisfied with this GPS location, you can turn off the GPS (tap the **GPS Location** button a second time) and simply tap on the screen at the location you wish to place the point.
 - Click the **Accept** button in the upper right hand corner to accept the location.



8. If you would like to collect and attach photos to this feature, click the **Attachments** icon in the bottom tool bar and hold the device such that the volume buttons are pointed down. You can now click **Add**, which will prompt you to:

- “Take a Photo or Video” - use the standard iPhone picture functionality.
- “Choose from Library” – use the standard iPhone picture navigation functionality.



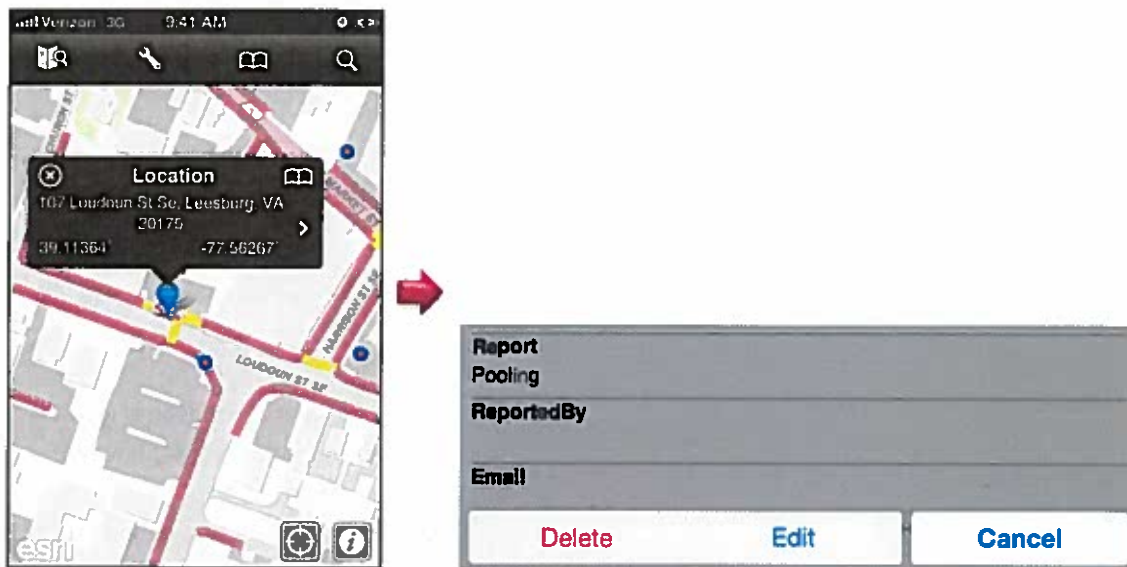
9. Once you have added the necessary information, geographic location, and reference pictures, the Done button in the upper right hand corner is activated. Click Done to complete and save the data collection for this feature.



10. Your feature point, as well as any others collected, will be visible on the map.

Modifying Existing Points

1. Feature Points can be edited by simply tapping on them on your screen. By default, the first information that you will see is basic Geographic information related to the point that was tapped.
2. If you tapped in close proximity to a feature, you can click the **Right Arrow** on the pop-up identify window that will take you the features attributes. This will open a read-only attribute table.
3. In order to edit, click the **Edit** button in the upper right hand corner.



4. Complete your edits just as you would if you were collected a new point, by clicking the **Done** button.



Amenities

Picnic table

Picnic tables are used for dining, resting, and other activities. They may be next to the trail or in an adjacent park.



Water Fountain



Bike Rack



Bench





Informational Kiosk



Covered Shelter



Places to get out of the rain



Restrooms



Air



Points of Interest

Heritage signs



Mile markers



Major unmarked (unsigned) trail crossings



Additional Town Features

Coffee shop or restaurant



Convenience Store