

DAKOTA COUNTY ARCGIS ONLINE PORTAL

GIS News

Winter 2013

GIS 101

Mobile GIS at Dakota County

by Randy Knippel, Dakota County Office of GIS

Dakota County is providing mobile applications through ArcGIS Online, a new subscription service from Esri, Dakota County's GIS software provider. Carver County has already realized benefits from a similar initiative, and Dakota County expects to achieve similar results, primarily by merely leveraging existing investments in GIS data, servers and software. The additional small investment in an ArcGIS Online subscription simply adds a universal mechanism for organizing, discovering and accessing web maps for Dakota County.

The Property Information web map provides access to the same information available in the other GIS applications on the County's website. This required no additional work, since the same web mapping services created for those applications are simply reused. Therefore, all the information provided through any of the GIS options will always be consistent, and any enhancements will benefit all of them. Use the QRcode on the right with your mobile device to access Dakota County Property Information (hint: you need a QRcode reader app).

Two free options

Esri has two free options for providing custom mobile apps. The first is a mobile-friendly version of the web viewer built into ArcGIS Online. The second is a mobile app called ArcGIS for Mobile, available for all mobile devices (smartphones & tablets) for all mobile environments (iOS, Android, Windows). Both options provide core functionality to identify features, turn layers on and off, and use your GPS locations. You can select from a variety of base maps published by Esri, to add an aerial photo background or display street names and place names and more (Figure 1). Optionally, layers can be configured to allow editing.

The web viewer operates within a web browser. This means that it runs as a website and can be used in a desktop or laptop web



Scan with a QRcode reader on your mobile device to access Dakota County Property Information



Figure 1 – Base Maps

environment (Figure 2). However, as is becoming more commonplace, the website also has a mobile version that is automatically activated when that option is set in a mobile web browser (Figure 3). Although it lacks some interactive options found in mobile mapping apps, it provides most of the same capabilities and does not require any software to be installed.

ArcGIS for Mobile is an app available for free on all mobile platforms providing the same capabilities as the web viewer and more. First, you have to find the app in your app



store and install it. Search for "ArcGIS".

Then, it can be configured to your preferences, adding base maps and web maps published on ArcGIS Online and in other places. To add the Dakota County Property Information, you need to find it using the "Find Maps" function. Search for "Dakota County MN" for best results. This will return multiple web maps, including one called "Dakota County Property Information". Select it and add it to your favorites so you can easily find it again in the future. Then open it and use the zoom, pan, and search features to find your area of interest. Parcels will appear when you have zoomed in close enough for them to turn on automatically. Select a parcel by pointing at it to see the associated ownership and value information. Hyperlinks are also provided for the property card, tax statement, and tax stub.

These first steps are only the beginning. Additional web maps will be created to streamline specific business processes, allowing real-time access to GIS data anywhere. Security will be added to allow editing of specific layers by specific individuals, greatly improving the ability to

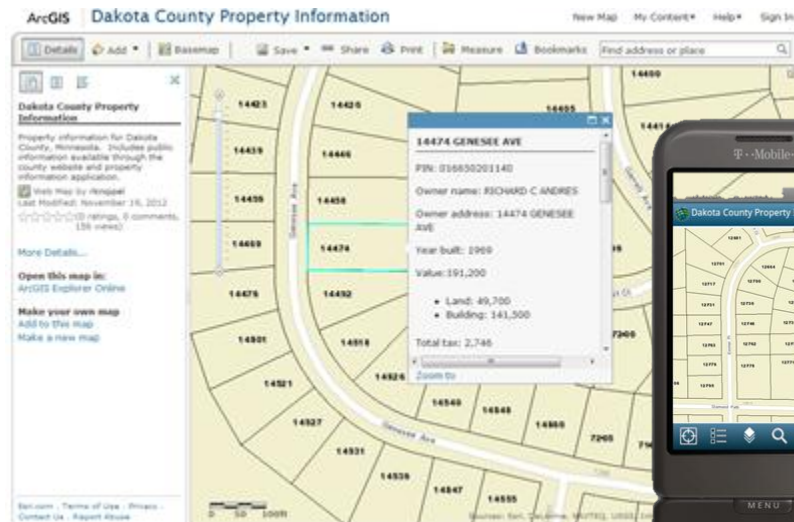


Figure 2 – Desktop / Laptop Browser



Figure 3 – Mobile Browser

collect data in the field. This is all possible with very little effort and expense, leveraging the investment already made in GIS data, servers, and software, with staff who likely already have a smartphone or tablet, or can easily justify one with the improvements and savings realized.

HOW TO ADD PROPERTY INFORMATION TO ARCGIS FOR MOBILE

1. Install ArcGIS app from your app store
2. Start ArcGIS
3. Use "Find Maps" and search for "Dakota County MN"
4. Select "Dakota County Property Information"
5. Add it to your favorites and open it
6. Pan and zoom to area of interest
7. Zoom in until parcels appear
8. Select a parcel for property information



CARVER COUNTY ARCGIS ONLINE PORTAL

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DEPARTMENT SPOTLIGHT

Mobile GIS at Carver County

by Peter Henschel, Carver County GIS Office

Carver County, located in the southwestern part of the Twin Cities metro area, has embarked on an expedition using ArcGIS Online to meet some of the data collaboration and collection needs within the county. This has led to the deployment of cost-effective mobile solutions in several areas including Assessors, Emergency Management, Water Management, SWCD and Public Works.

What is ArcGIS Online?

ArcGIS Online is defined by Esri as, "a cloud-based, collaborative content management system for maps, apps, data, and other geographic information." It is offered as a subscription, providing a portal from which web maps can be defined, discovered and used. Standardized base map services are provided, covering the entire United States, and even the entire world. Additionally, application templates allow focused applications to be quickly created, using standardized techniques.

The Carver County GIS Office administers and manages the use of the ArcGIS Online subscription within the county through a customized Carver County Portal. During this initial implementation, ArcGIS Online was first rolled out to power users in different

departments. ArcGIS Online allows the users to create web maps and in turn, build simple applications that they use for managing and displaying their GIS data. One of the primary benefits of using ArcGIS Online is its ability to work well with most mobile devices. Configure your web map, share it, and anyone can view it with a mobile device.

As ArcGIS Online has evolved, support for feature services was added, enabling the ability to edit GIS data through web maps. ArcGIS Online also supports security, requiring users who are accessing web maps to login with their credentials, providing security to the GIS data sitting on the county's server. During the course of the implementation of ArcGIS Online, GIS staff has created 25 new feature services for use in different applications on ArcGIS Online.

Examples of successful implementation of ArcGIS Online

County Assessor

Photo collection is now done through ArcGIS Online utilizing iPhones and iPads for data collection in the field (Figure 1). A photo is attached to a point on the map and



Figure 1 – Assessor's Property Information and Photo Collection

information about the photo is captured through the online editing application. In order to maintain data integrity, a nightly spatial-join process ensures that the parcels and photos are linked together. This used to be a 5-step process that is now down to one step because the field data is submitted directly back to the GIS data server utilizing a wireless internet service.

Emergency Management

Utilizing ArcGIS Online and their iPhones to expedite damage assessment during a county weather event. In late spring, parts of western Carver County had been impacted

by a spring storm resulting in home owner and infrastructure damage. In order to help with the damage assessment process, the GIS Office created an editable feature service which was used in an ArcGIS Online web map to collect damage information and attach photos. The GIS data now tracks the location of the damage, date of the storm and photos for reference. This data can be shared with other organizations like the National Weather Service.

Water Management

Using ArcGIS Online to manage lake and storm water monitoring sites. They've found it very easy to collect and manage their GIS data using mobile devices like an iPad. One of the keys to their success has been well-designed data fields where users can pick values from dropdown lists. This has helped promote data quality and uniformity.

Public Works

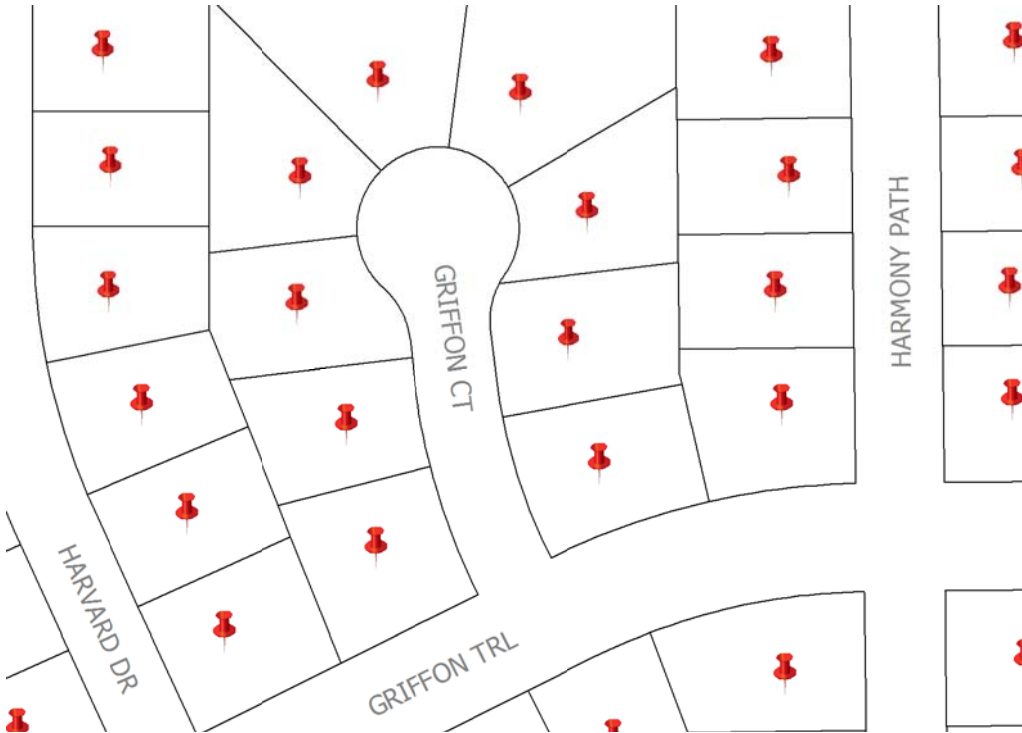
Several different ArcGIS Online web maps that have greatly improved field data collection and reduced their reliance on paper maps and redundant collection practices. They have used ArcGIS Online in the field for DNR LiDAR verification, roadway planning, traffic counts (Figure 2), construction project updates, culvert inventories, and geodetic monument maintenance

Explore More Web Maps

More web maps continue to be developed as more people become aware of the benefits and efficiencies. Explore more Carver County web maps on ArcGIS Online at <http://www.arcgis.com/home/gallery.html> and search for **Carver County**.



Figure 2 – Public Works Signals and Turn Lanes



BETTER GEOCODING

DESKTOP GIS

New Composite Geocoding Service

by Dan Castaneda, Dakota County Office of GIS

With the transition to ArcGIS for Server a few years ago, the Dakota County Office of GIS published a composite geocoding service. This service allowed users with ArcMap the ability to geocode a list or spreadsheet of addresses to find their geographic location. This is extremely helpful when trying to locate clients, or for verifying an address. The first service used limited data sources and required a particular address format to achieve the best results. In October, the Office of GIS published an additional service that references more data sources along with other improvements which should make geocoding more accurate.

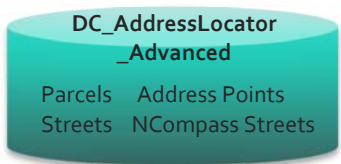
geocoding. The new, recently published service includes 16 locators which use four separate data sources. In addition to the Dakota County parcel and street data, we have included the Address Point data for Dakota County and the NCompass street data.

Is it W Burnsville Pkwy or Burnsville Pkwy?

Sixteen locators were included in the new service to help increase the number of matched records. Slight misspellings and address standardization issues should no longer cause the locator to return an unmatched result. Locators were set up for each data source with lower thresholds for spelling sensitivity to help the user spend less time correcting the address list before geocoding. Additional locators were also set up with the pre- and post-directional fields switched, to help minimize the number of unmatched address when the address list contains variations. For example, the

How they differ

The initial geocoding service uses two locators that each point to their own dataset, one to Dakota County parcels and the other to streets centerlines. These datasets are only county wide and require near perfect spelling and formatting of addresses to return a match when



DC_AddressLocator_Advanced has 16 locators accessing four separate data sources.

initial geocoding service would return an unmatched result for the address 990 W. Burnsville Pkwy. This occurs because the directional (W) is placed before the street name (Burnsville Pkwy) instead of after. By swapping the directional fields in the locator, the geocoder will return a matched result for the same address with a high score. Locators for postal and municipal cities have also been included in the new service for each data source, when applicable.

Better Results

Each locator has also been assigned a unique name, and organized in a method to establish a hierarchy. Address data, which is our most comprehensive source of addresses, is at the top of the hierarchy, followed by parcel data, and street data. The hierarchy will allow the user to assess the level of accuracy and perform a detailed analysis of the results if desired.

In a sample dataset of over 3,000 records, the unmatched results were reduced from 28% to 1% by using the new geocoding service.

How to connect to the locator

The service is available for use by connecting to our ArcGIS Server through ArcCatalog using the URL <http://gis2.co.dakota.mn.us>. Once connected, the service can be found in the Locators folder, and is called DC_AddressLocator_Advanced.

FAST FACTS



72%

*Percent geocoded with original locator service
DC_AddressLocator.*



99%

*Percent geocoded with the new locator service
DC_AddressLocator_Advanced.*

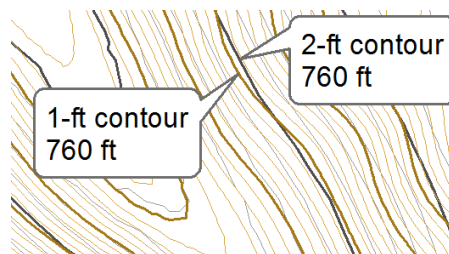
1-Foot Contours

by Joe Sapletal, GISP, Dakota County Office of GIS

We have 1 and 2-foot contours in DCGIS. If you happen to display them at the same time you might wonder why they aren't coincident at the two-foot interval. And you might wonder why do they kind of look different? And you certainly might wonder, which one can you trust?

Which can I trust?

Both . . . and neither . . . it depends. How's that for an answer? These contours are created from very accurate, very dense LiDAR data and are great for preliminary design work and estimation, as well as visualizations. They are not a replacement for a final field survey. Planning a road and parking lot in a new park? This data is perfect for that. You get a great sense of the lay of the land, can make some excavation estimates and use the data to get started on your decision-making processes for things like finding the best location for the driveway and parking lot. Using a surface (TIN or DEM) or contours from LiDAR over a large project area is far more economical, and includes many more data points, than a survey does, so it is better for your preliminary design work.

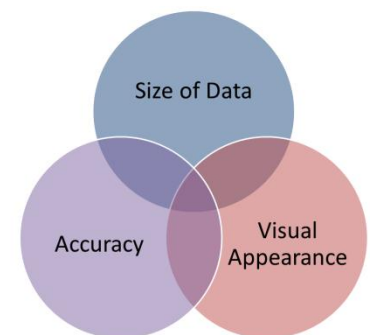


A difference in processing leads to differences in representation

Why don't the 1-foot and 2-foot contours have coincident lines? Why do they kind of look different?

When creating contours, especially contours from a source like LiDAR, you can end up with some very jagged-looking contour lines. When making contours, you are looking to have balance between the size of the data, the accuracy of the data and the visual appearance of the data. In the attempt to balance between these goals for the 1-foot and 2-foot contours, there are two slightly different processes one can follow.

To create the 2-foot contours, the MN DNR took the LiDAR data and converted it into a



Balancing Size of Data, Accuracy and Visual Appearance makes great contours.

1-meter DEM, which they then generalized to a 3-meter DEM, which they then smoothed using focal statistics. Generalization reduces data quantity without losing much accuracy, while smoothing improves the visual quality. The resulting 2-foot contours accurately represent the general trends of the terrain; although nooks and crannies are eliminated.

When the Dakota County Office of GIS decided to create the 1-foot contours, our process began with the same 1-meter DEM that the DNR used to create the 2-foot contours. But to create the balance between

the size of data, the accuracy of data and visual appearance that was worthy of being 1-foot contours, the generalization to a 3-meter DEM was left out. Instead, we smoothed the initial 1-meter DEM using focal statistics and then used it to create the 1-foot contours.

How do I find these contours?

They are in [DCGIS](#)! The final versions of the LiDAR data, 1-meter DEMs, and 2-foot contours were recently approved and released by the DNR. We ran our process to create 1-foot contours and then add them to [DCGIS](#) in the **Elevation** folder. The 2-foot contours were replaced with the new 2-foot contours from the DNR. Finally, new 10-foot contours were generated from the 1-foot contours and were added in the folder as well. The Elevation Surface and Elevation Hillshade were also updated using the new data.

Surface and Hillshade combined to make visually appealing and easily interpreted surface representation.

