Goodhue County Environmental Permitting and Tracking Suite: Esri-Leica Smart Communities Challenge Grant

Leanne Knott & Chad Hanson

SE MN GIS Users Group Meeting

June 20, 2017

Presentation

- Business case
- Grant Application Process
- Project Design
- Esri Software Suite
- Leica Geosystems Equipment
- Mobile Demonstration Project Distribution

Business Case

- Goodhue County (population 46,464) is a rural county in southeastern Minnesota with the county seat located in the city of Red Wing. Goodhue County's GIS program encompasses three full-time GIS professionals and resides in the Survey/GIS office.
- Environmental Health is co-located with GIS and includes two full-time well and septic inspectors. Beginning in 2015, staff recognized a need to geographically locate and display wells and septic systems quickly and accurately while sharing this data with appropriate agencies.

Business Case

Grant Application Process

- In September 2016, Esri and Leica Geosystems offered a Smart Communities Innovation Challenge: Mobile Government Edition grant. The grant was an open call for demonstration projects that supported ground-breaking ideas of state and local government.
- Goodhue County staff identified the grant as a potential framework for creating a new environmental permitting and tracking suite.

Grant Application Process

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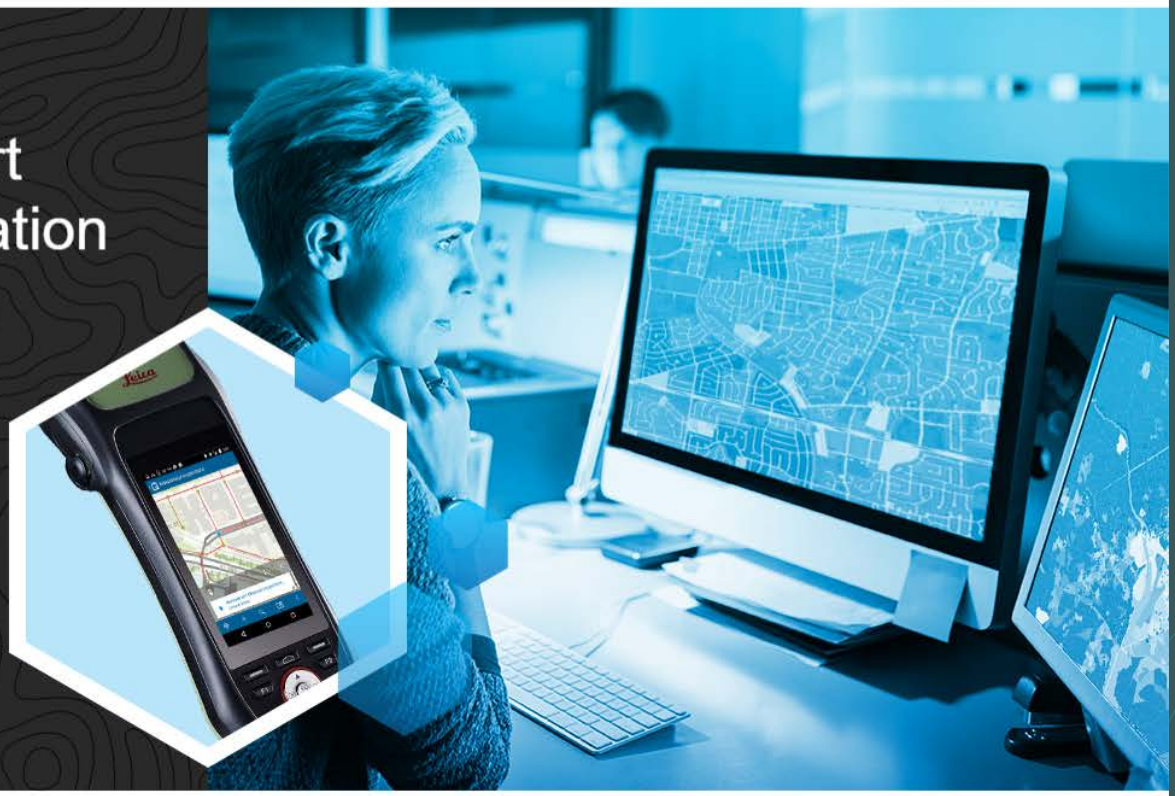
Esri and Leica Smart Communities Innovation Challenge

Mobile Government Edition

Download the Full Grant Prospectus →



The Smart Communities Innovation Challenge is an open call for demonstration projects that supports bringing ground-breaking ideas of state and local government to reality.

Grant Application Process - Goals

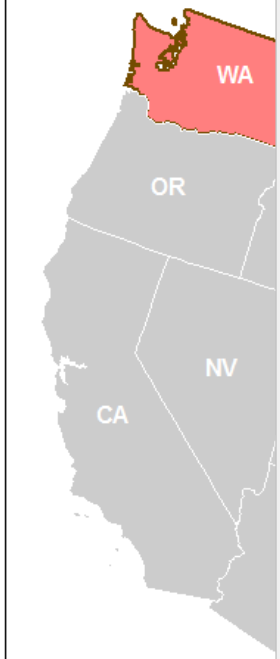
Grant Application Process - Goals

- More accurately locate well and septic locations
- Analyze well and septic data for compliance and effective placement
- Utilize Leica hardware and software for field collection
- Field data and inspections with any wireless device connected through the network

Grant Application Process

- Grant submittal deadline October 14
- Team effort from GIS/Survey/Environmental Permitting staff
- County Board support
- Received grant notification October 31

Grant Application Process



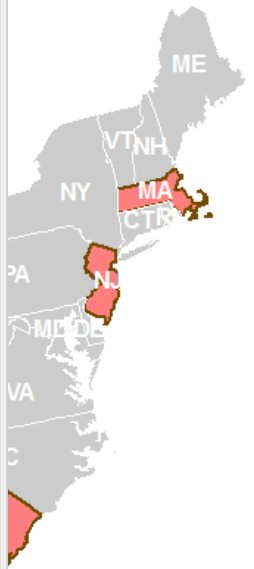
City of Wheaton Public Works Dept.,
North Dakota Department of Health
City of Seattle Department fo Neighb
Merrimack Valley Planning Commiss
Columbus Consolidated Govt. Inspec
Lakewood Township Municipal Utilit
Charter Township of Independence C
Pueblo of Isleta Surveying and Mapp
Goodhue County GIS/Environmental
Missouri Department of Transportati

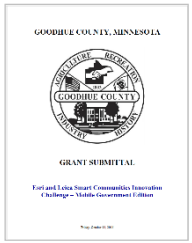
GOODHUE COUNTY, MINNESOTA

GRANT SUBMITTAL

Esri and Leica Smart Communities Innovation Challenge – Mobile Government Edition

Friday, October 14, 2016




GOODHUE COUNTY, MINNESOTA

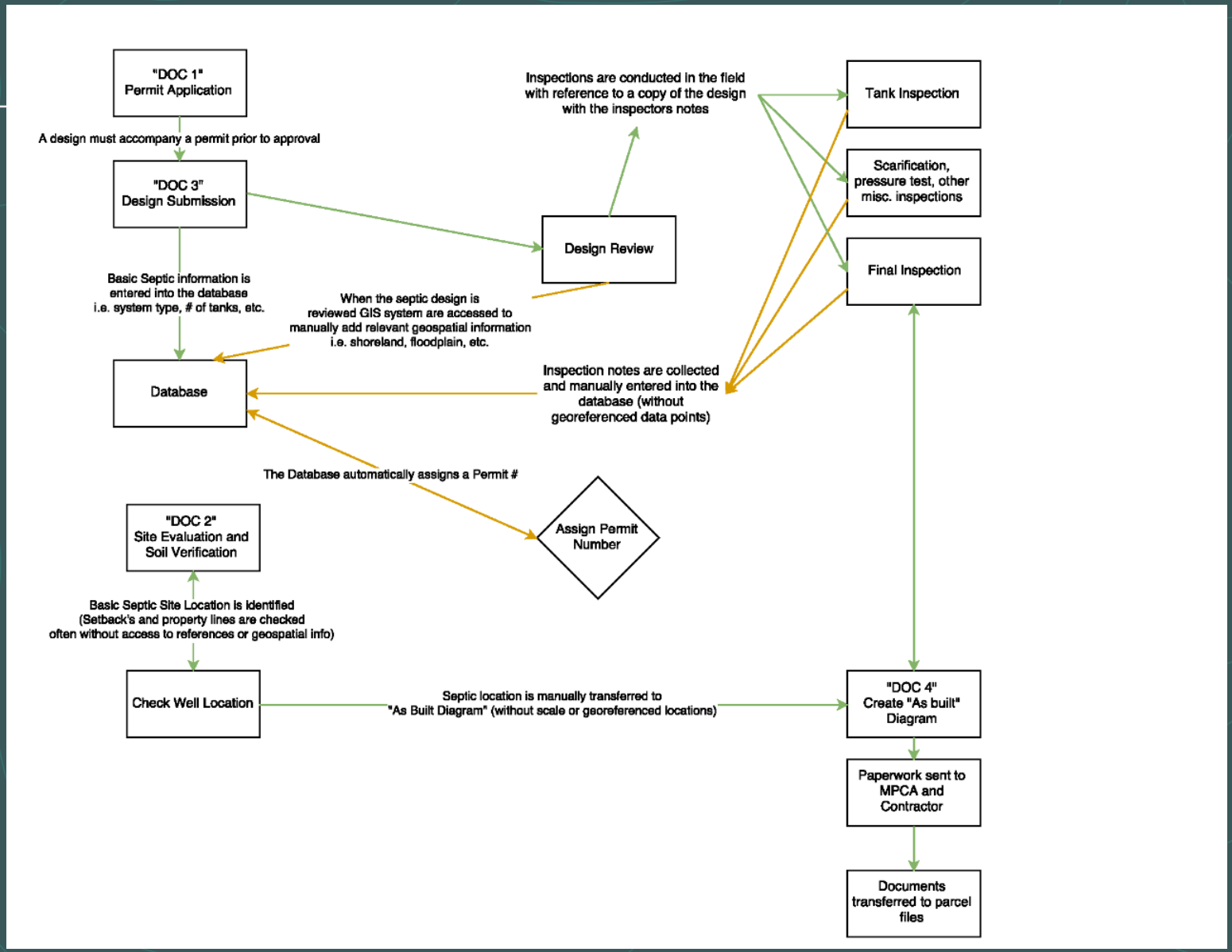
GRANT SUBMITTAL

Esri and Leica Smart Communities Innovation Challenge – Mobile Government Edition

Project Design

- GIS, Survey, and Environmental Health staff met in mid-November 2016 to work on project design.
- Goodhue County's well and septic permitting is limited in a number of ways primarily because it does not utilize modern day capabilities of technology and equipment.
- Only some component locations are identified by estimating the hand drawn inspection records and aerial photography which is less accurate than widely available GPS technology.

Project Design –Previous Process

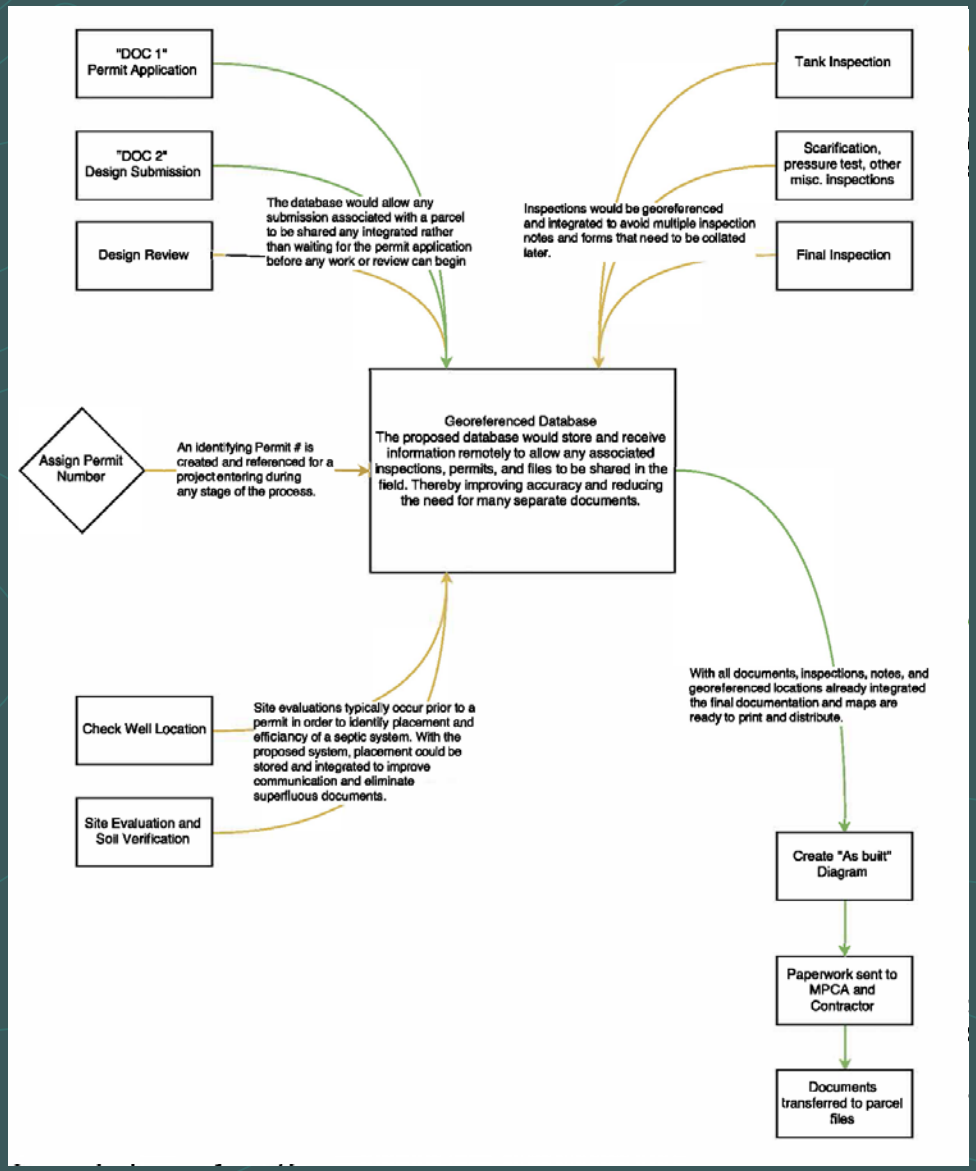


Project Design

- The new procedure will also allow data to be stored geographically and allow indexing for more effective document management and searches.
- Accuracy and functionality of the data share by associated agencies that have required reporting programs by statute or for funding will ensure that the data is received in a form useful to them.

Project Design – Updated Process

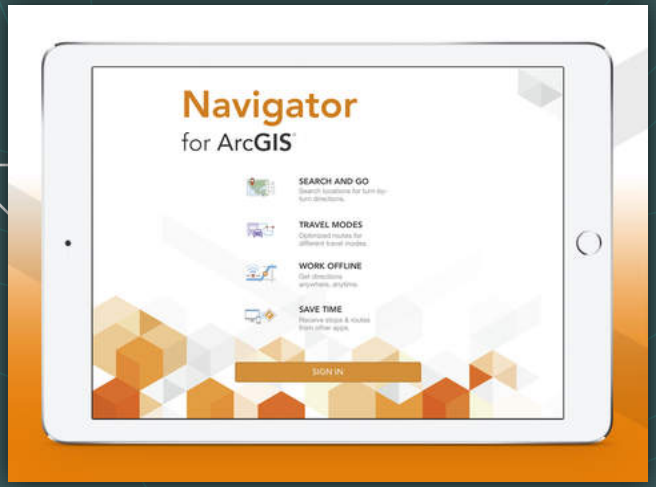
- Data stored geographically
- Allow for indexing
- Accuracy and functionality of data share by associated agencies that require reporting by statutes for funding



Esri Software Suite

- Esri provided a suite of mobile collection and mobile hosting applications for use by grant recipients.
- The applications included ArcGIS Online (including ArcGIS Open Data and ArcGIS data and basemaps), Collector, Navigator for ArcGIS 5-user pack, and Survey123 for ArcGIS Software.
- Operations Dashboard and a customized Esri Web AppBuilder Developer Edition app were also identified as platforms for mobile demonstration project distribution.

Esri Software Suite



esri

Collector
for ArcGIS

GIS > Applications

esri

ArcGIS Online

esri

Operations Dashboard
for ArcGIS

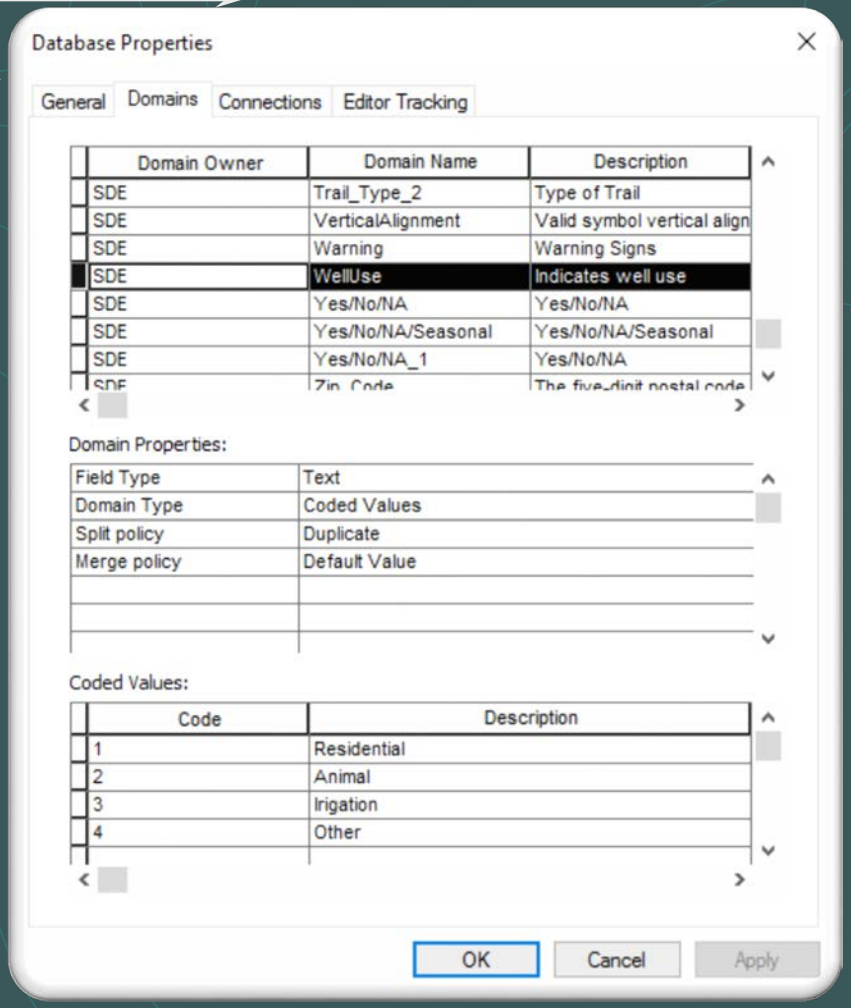
GIS > Applications

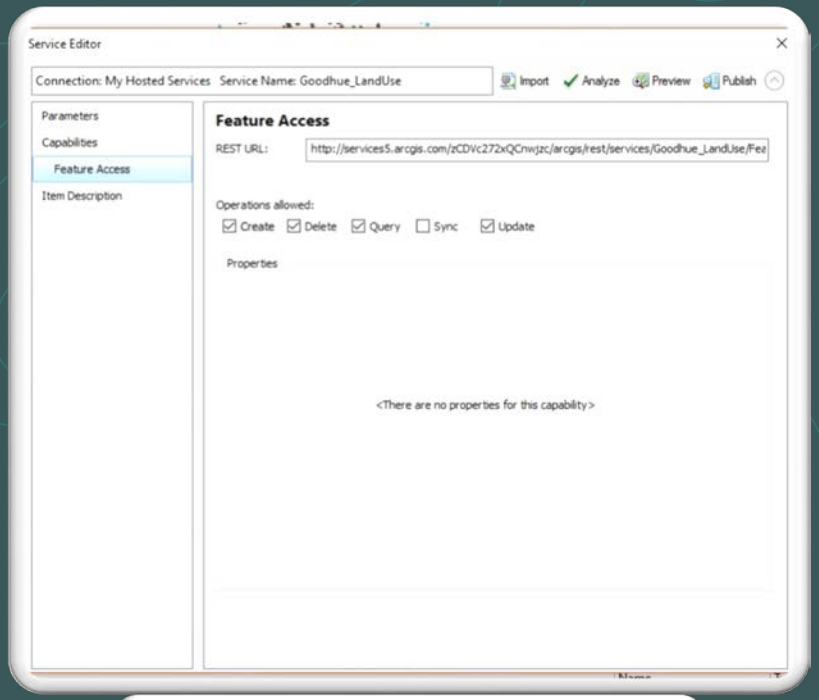
Survey123
for ArcGIS

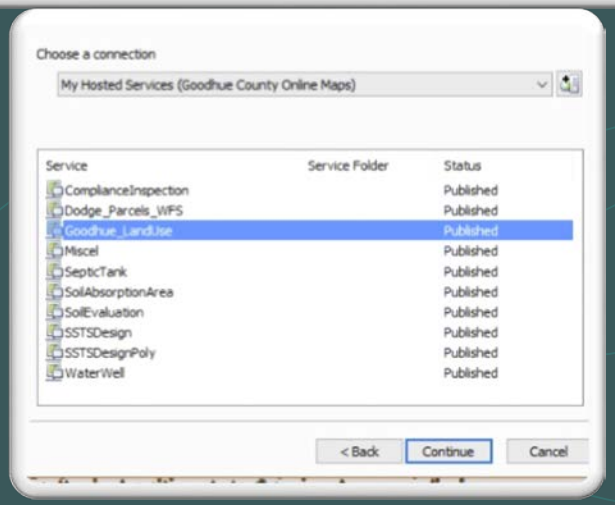
Esri Software Suite

- The first part of the process required setting up new domains in the SDE (Spatial Database Engine) SQL Server database with coded values. Domains were applied to new feature classes as they were created as a requirement for feature access data to be used in Collector.

Esri Software Suite



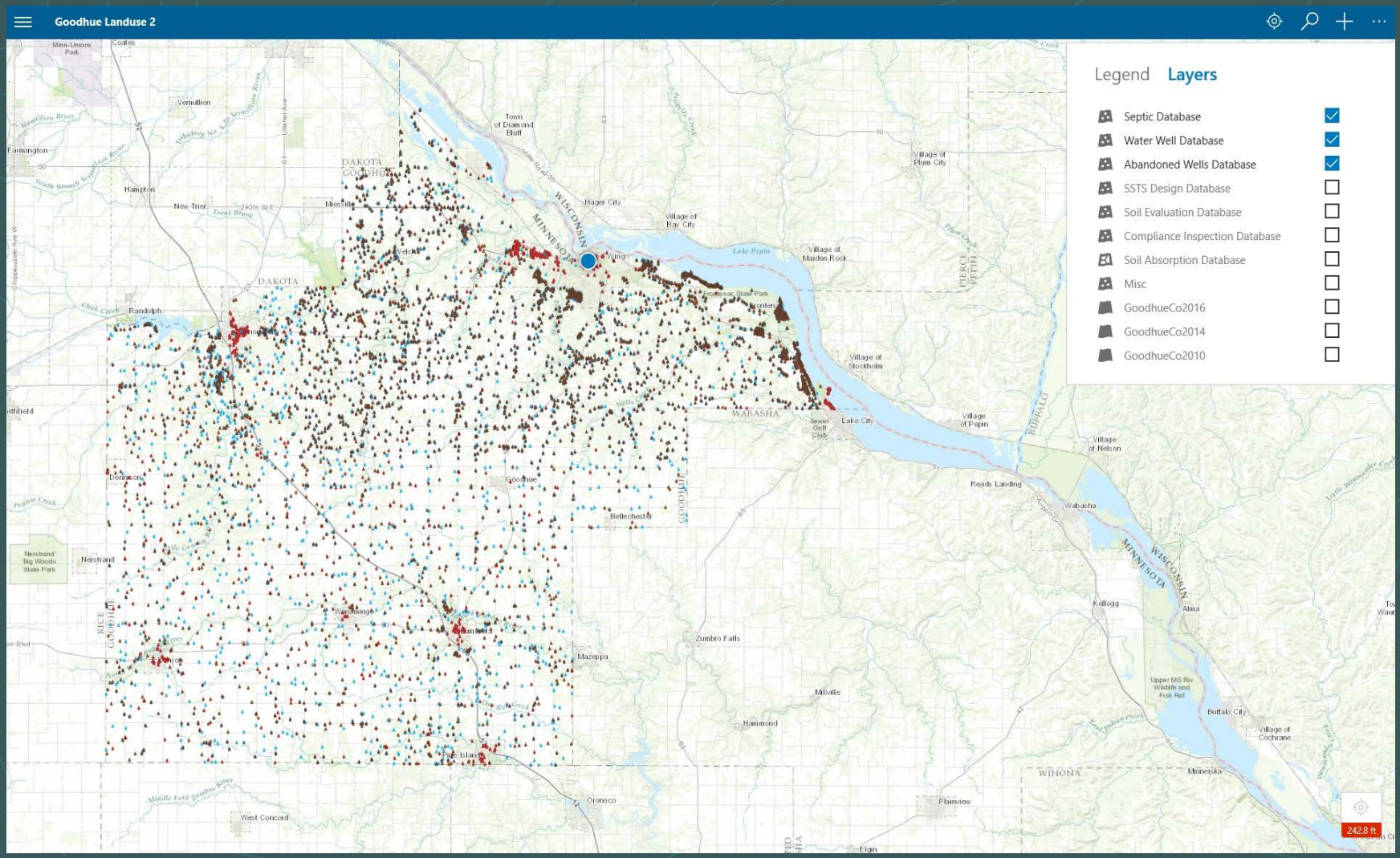




Esri Software Suite - AGOL

- The next step involved creating new a new map and then signing into ArcGIS Online through ArcMap. The map was then shared as a Feature Service and also shared as a map service on the internally hosted GIS server.
- ArcGIS Online was utilized to create a web map from feature layers that were customized and set up to user specifications.

Esri Software Suite - AGOL



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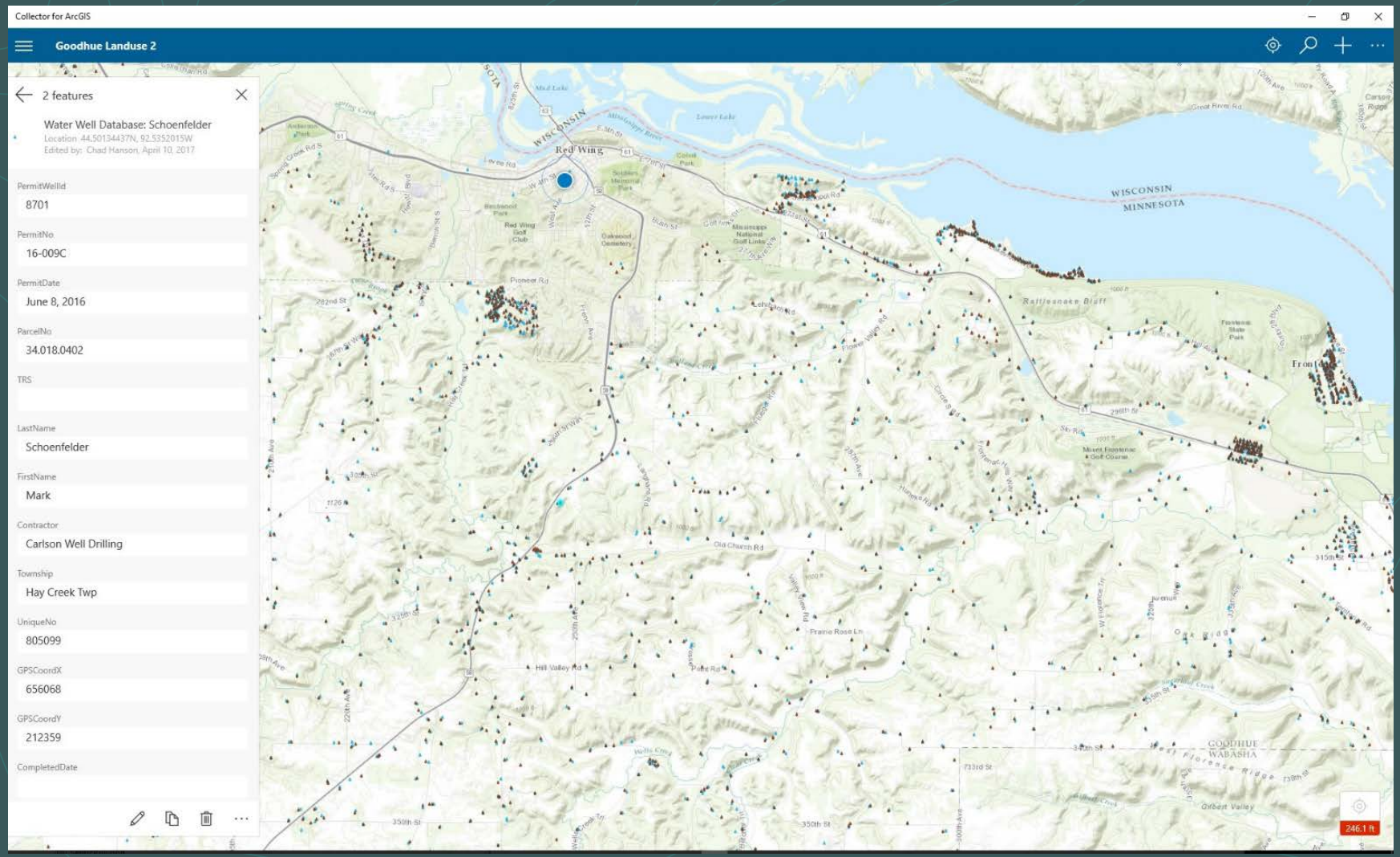
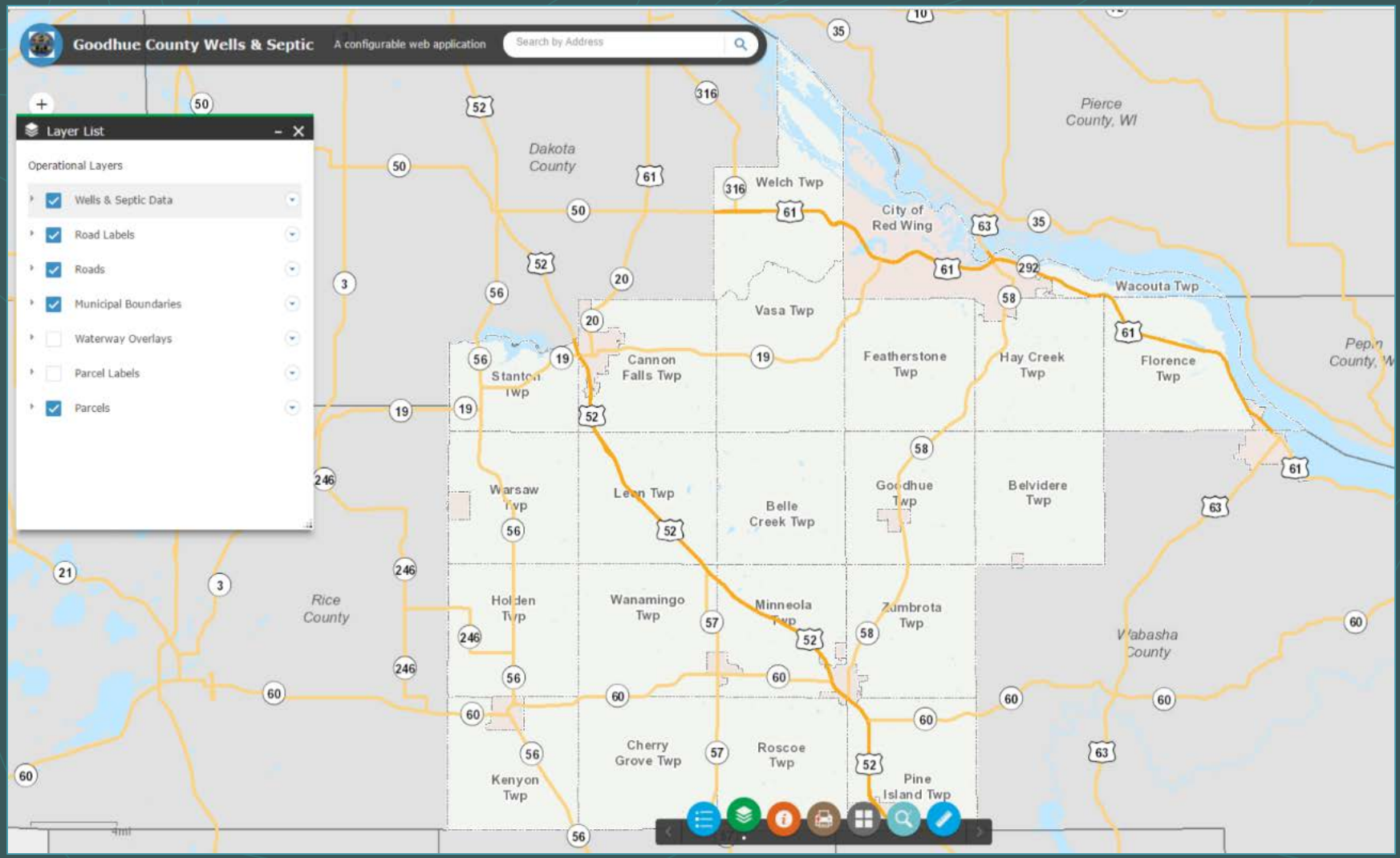


Esri Software Suite – Web AppBuilder

- A customized Web AppBuilder mobile application will be hosted on a public-facing website.
- The application will feature natively developed Goodhue County GIS web map services including vector and imagery basemaps, parcel ownership information, waterway overlays, custom searches by parcel ID number (PIN) and inspection permit number, and an enhanced print widget.

Esri Software Suite – Web AppBuilder

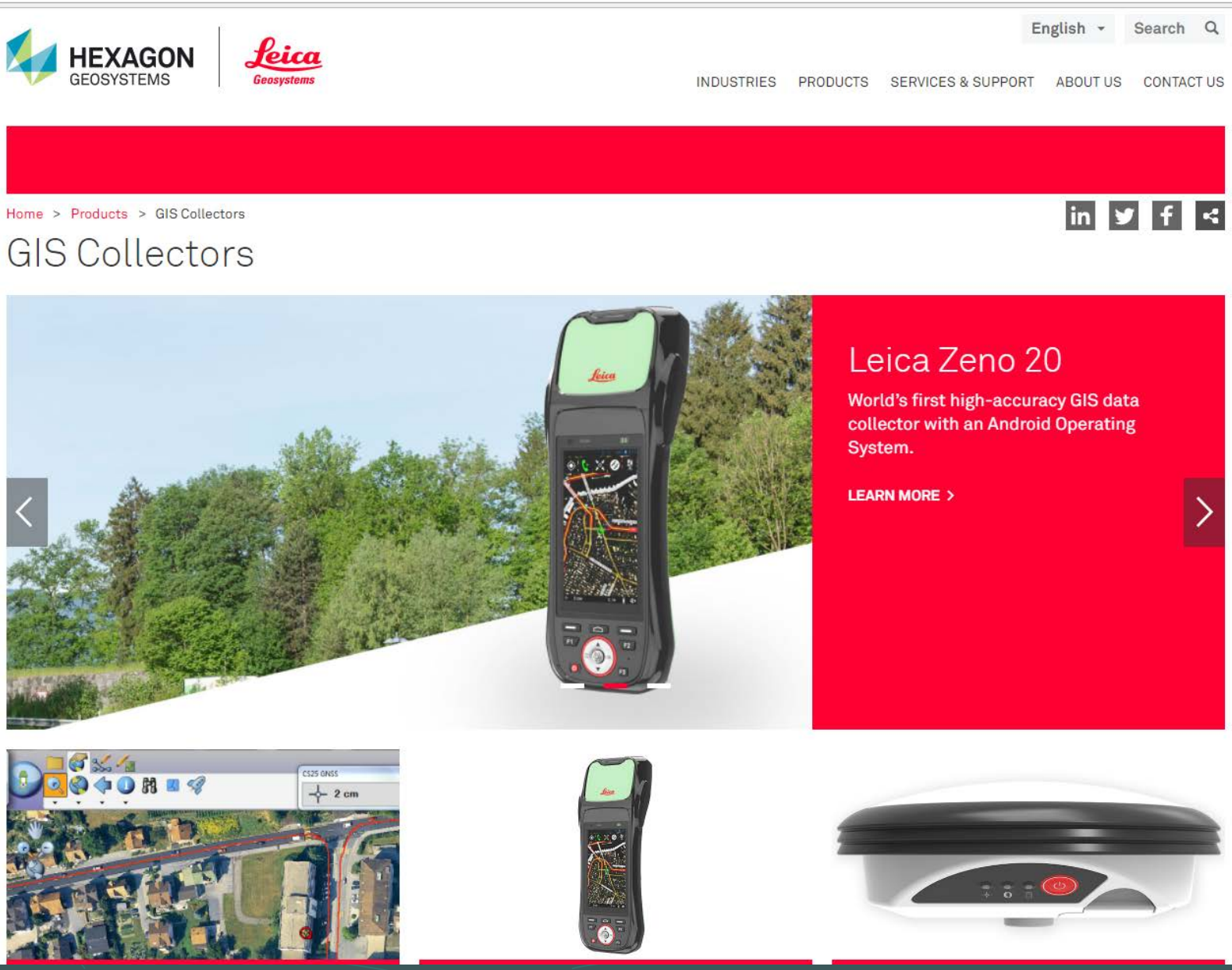


Wells & Septic Collector Demo

Leica Geosystems Equipment

- Grant recipient winners were provided with Leica Geosystems GPS equipment including a Zeno 20 Android CDMA or UTMS, Zeno Connect on Android, L1.L2 GPS/GLONASS, and a two-year Zeno Connect Bronze CC.

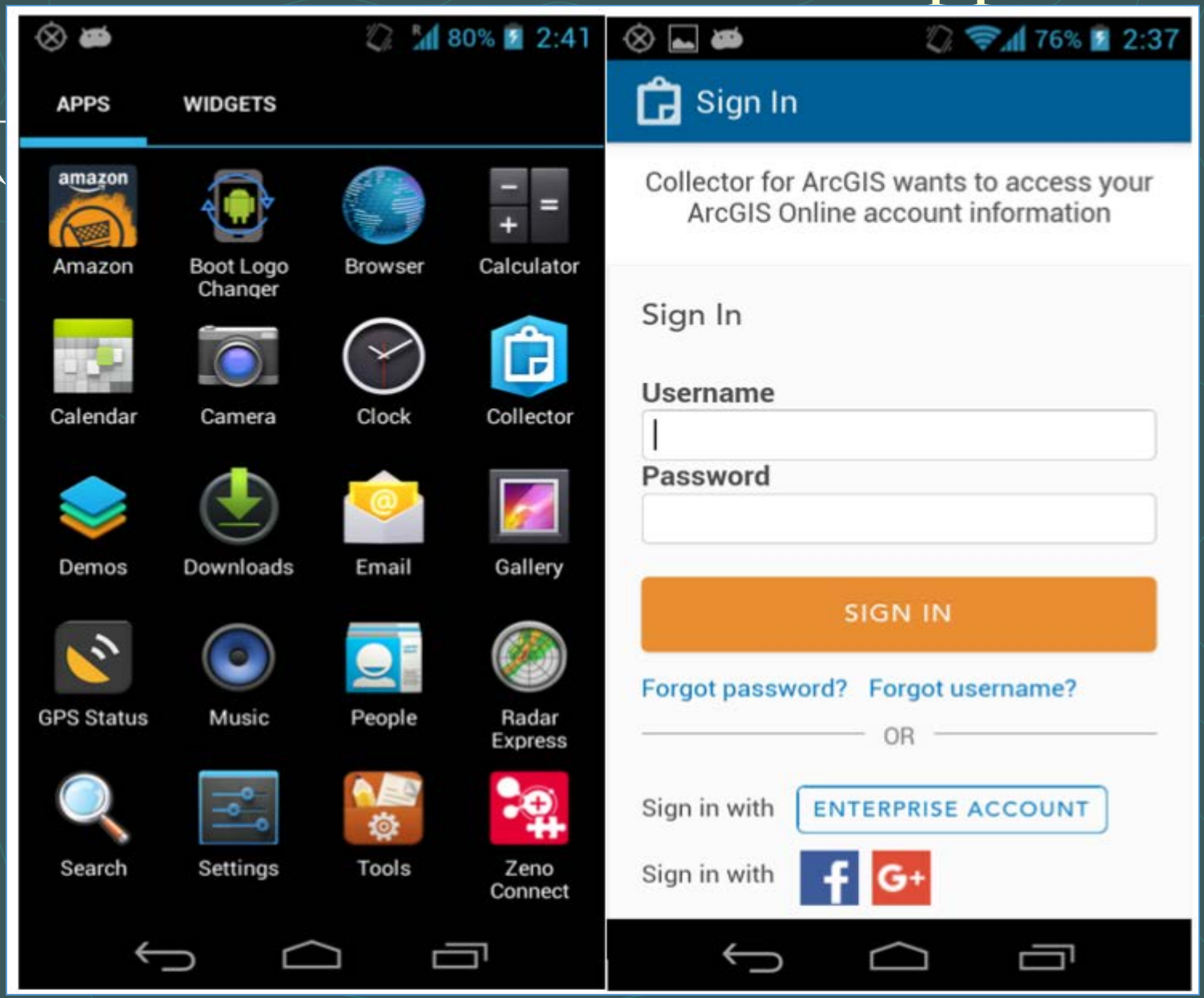
Leica Geosystems Equipment



Leica Zeno 20 Android App

- You can acquire applications for the Zeno 20 at the Amazon App Store.
- To install 3rd party applications, i.e. Esri Collector for ArcGIS, navigate to the Amazon App Store on the device.
- Sign in to your existing Amazon account or create a new account.
- Once logged in, use the search tool within the Amazon App Store to locate the desired software to be installed.
- Tap on the software and complete the installation.

Leica Zeno 20 Android App



Zeno Connect/Collector

- In Collector, data collectors can create a location profile prior to collection and specify the specific datum transformation to use. While creating a location profile, the coordinate systems of both the GPS data and the map are specified. Based on this information, users are presented with only relevant transformation methods, with the recommended method listed first.
- If you are using one of the basemaps provided by Esri on ArcGIS Online, it is in the WGS 1984 Web Mercator (Auxiliary Sphere) [WGS84] coordinate system. Similarly, WGS84 is the default coordinate system for GPS data received in Collector. If you are using an ArcGIS Online basemap and the default location provider, no datum transformations are necessary in Collector.

Zeno Connect

RTK Profile Creation

If you plan to utilize r

1. Navigate to t
2. Tap on GPS C
3. Ensure that S
4. Tap on GPS A
   Depending or
   cut-off angle.

If you plan to utilize r

Note: You need to re

1. Open a Zeno
2. Tap the + sym
   right corner t
3. Name (user d
4. Select Interne

5. Enter the Data Server information (provided by GNSS network service) and then tap Next.

   a) Name (user defined

   b) IP Address

   c) Port

   d) User ID

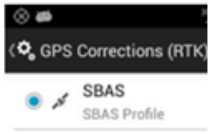
   e) Password

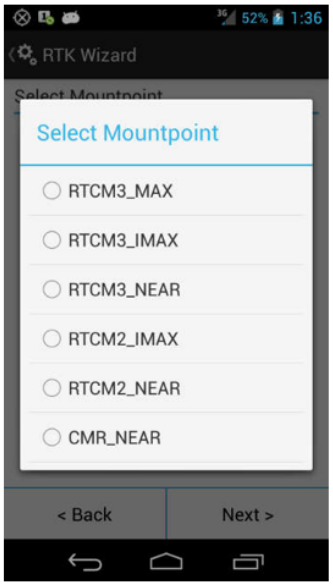
   f) Toggle on "Use NTRI

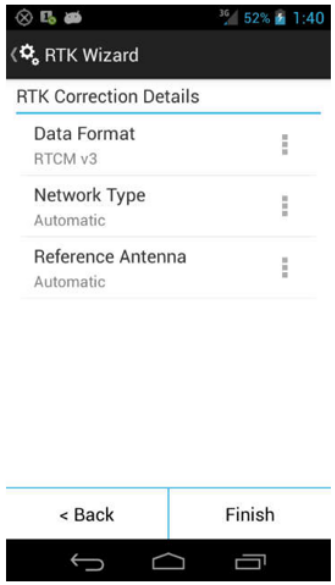
6. Select the mountpoint. You can load via the sourcetable by tapping the menu button.

7. Select a mountpoint, for example, RTCM3_IMAX, then tap next.

8. Enter the Data Format of your RTK correction, Network Type and Reference Antenna. For SmartNet, or another Leica network, you can leave these as default and then tap Finish.



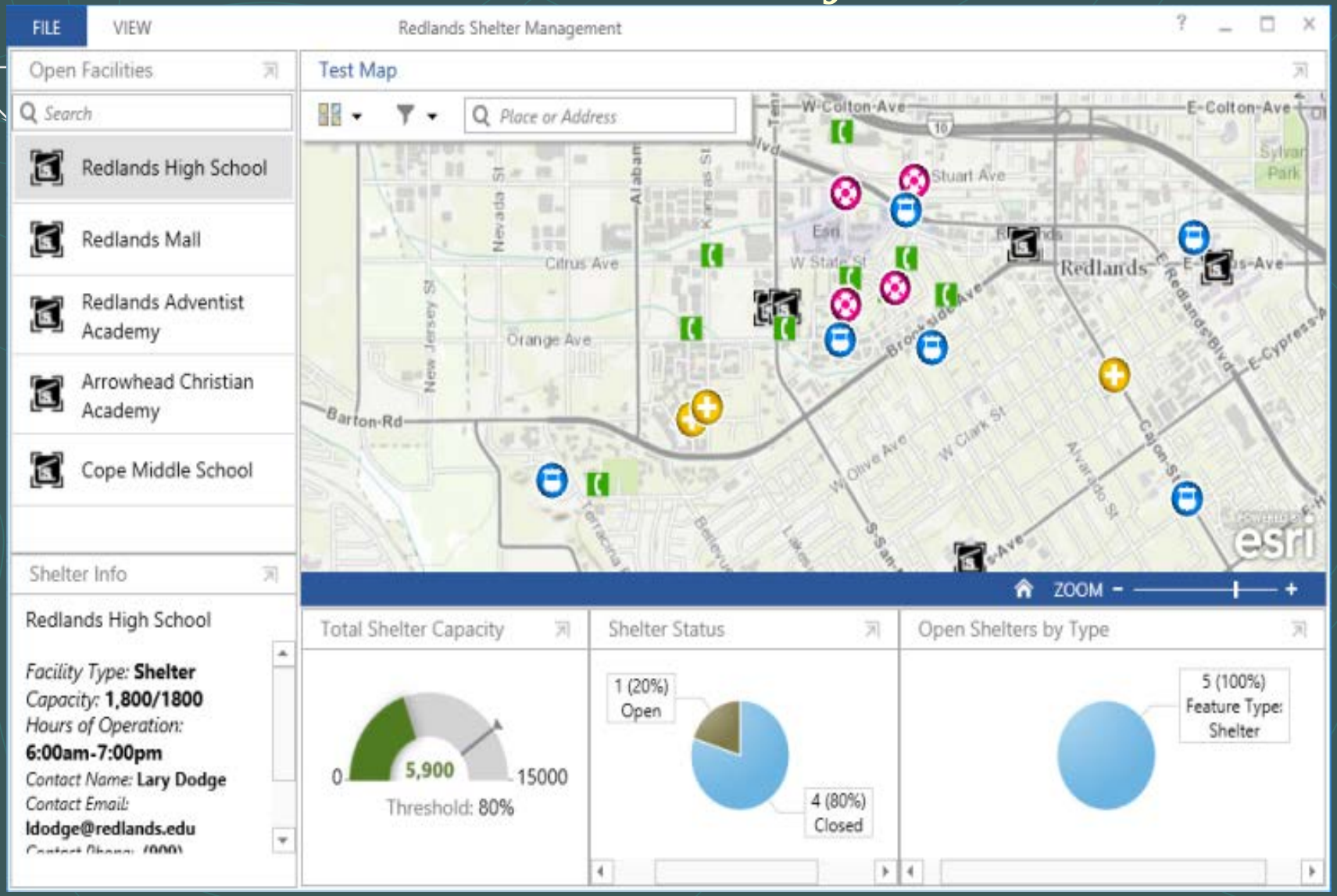




Mobile Demonstration Project Distribution

- Additional distribution will consist of data sharing and collection procedures between City of Red Wing, Dodge County, and other associated agencies.
- Operations Dashboard for ArcGIS will provide a cross-agency platform to display the features with an interactive user interface that will monitor, track, and report real-time data feeds.

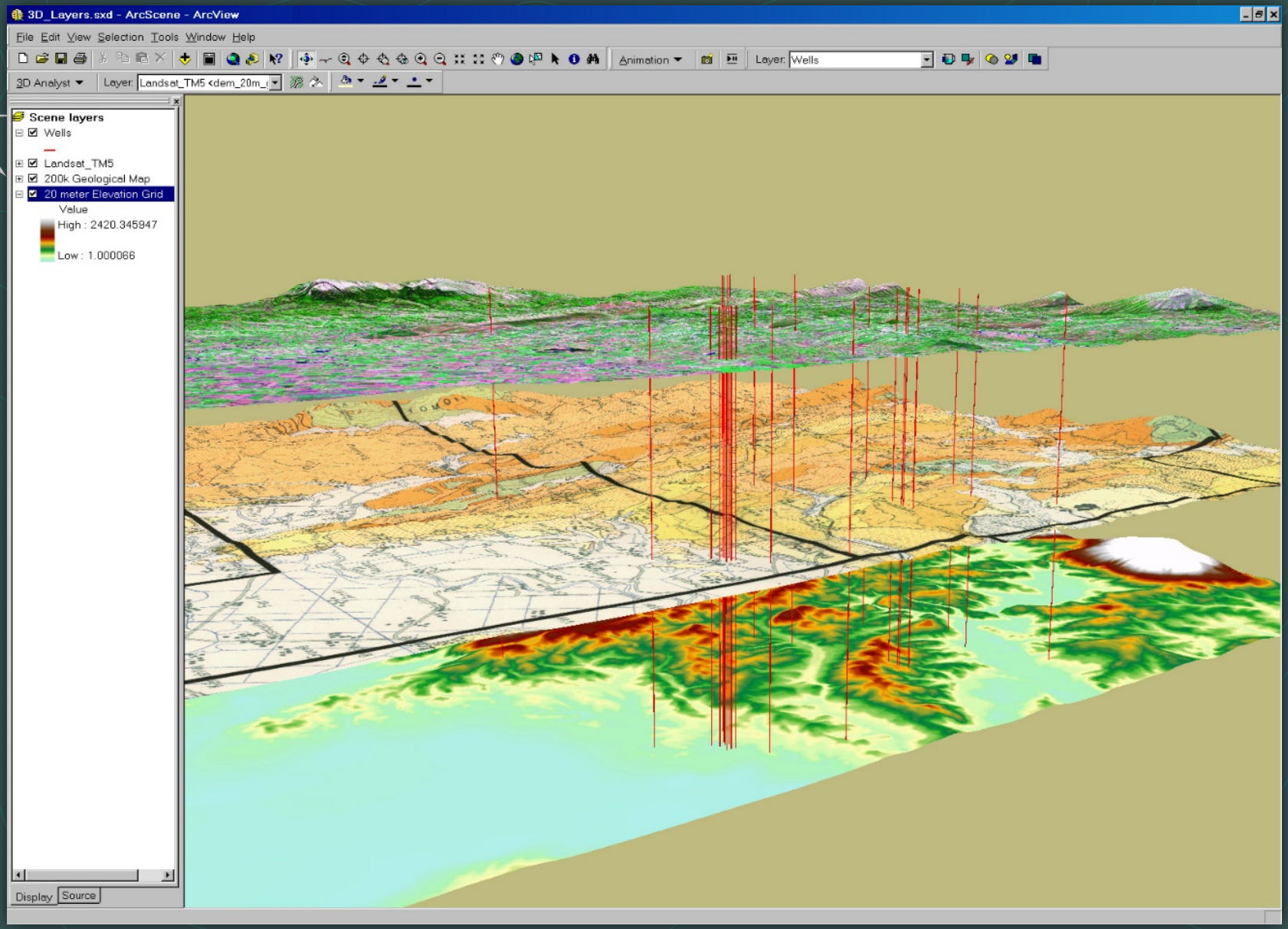
Mobile Demonstration Project Distribution



Mobile Demonstration Project Distribution

- Additional functions of this project could be expanded to include 3D analysis of well data, enforcement tracking, and permitting tools for other departments.
- Analysis and reporting for the gathered data would be faster and more easily customized to fit the requirements of the agency's needs.

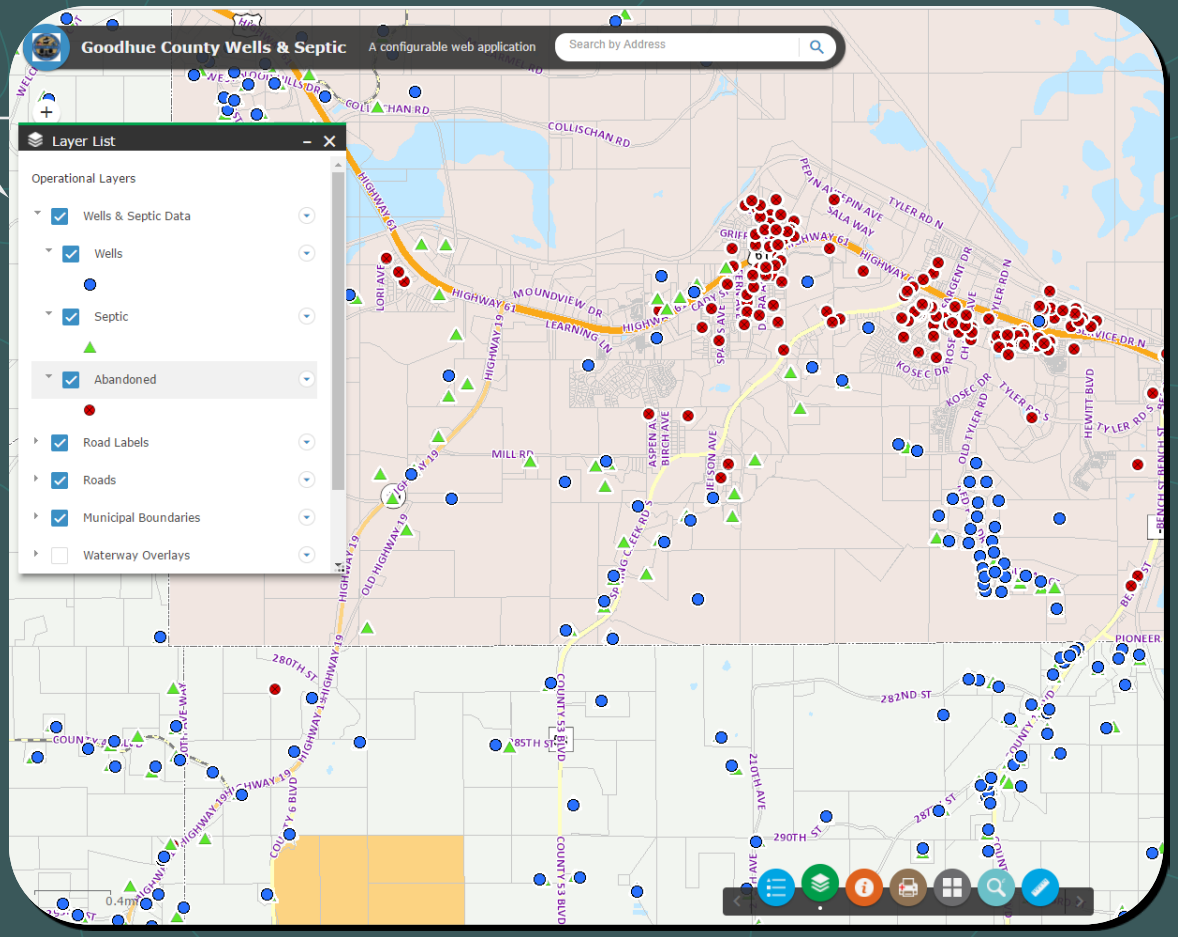
Mobile Demonstration Project Distribution

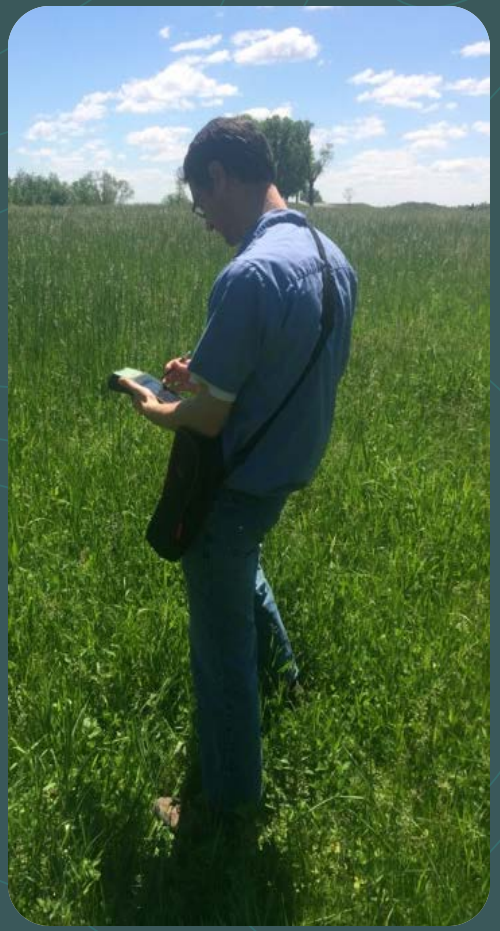


Improved Business Model for Government

- The Environmental Permitting and Tracking Suite streamlines digital permitting procedures and associated data input, minimizes paper documents and organization of related data, more efficiently tracks and analyzes data, simplifies sharing and reporting of mandated information, and is expandable to multiple departments.
- Mobile government models based on Esri ArcGIS Online and Leica Geosystems will continue to provide measureable benefits to Goodhue County staff for many years to come.

Improved Business Model for Government





Questions?

Thank You!

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