by Pete Koenig

Enterprise conducts "alternative" mapping

Enterprise City Superintendent Paul Froelich is progressive in his approach to utility maintenance and management. Early on, Froelich realized the benefits of collecting GPS data for the city's water and wastewater systems. The majority of that data had been collected in 2002 and was recently updated and completed to include line installations and improvements. But unlike most cities that stop with this amount of data collection, Froelich decided to expand the Enterprise database to include something a little out of the ordinary.

In April 2008, KRWA staff traveled to Enterprise, Kan., located in central Dickinson County, a few miles east of Abilene in order to collect GPS coordinates for every power pole in town. "Why map power poles?" Is a question many might ask. It's because GPS data can be used for much more than just printing a map. The GPS coordinates are stored in a shapefile, and the shapefile has an associated attribute table. This attribute table is similar to an attached database. The information list associated with each feature within the table allows the user to access that information about each feature. In Enterprise's case, the attribute table includes information such as pole number, location, transformer size, number of supports, number of insulators, height of pole and other information that helps the city maintain and replace any feature of each pole.

Pete Koenig
GPS Mapping Coordinator

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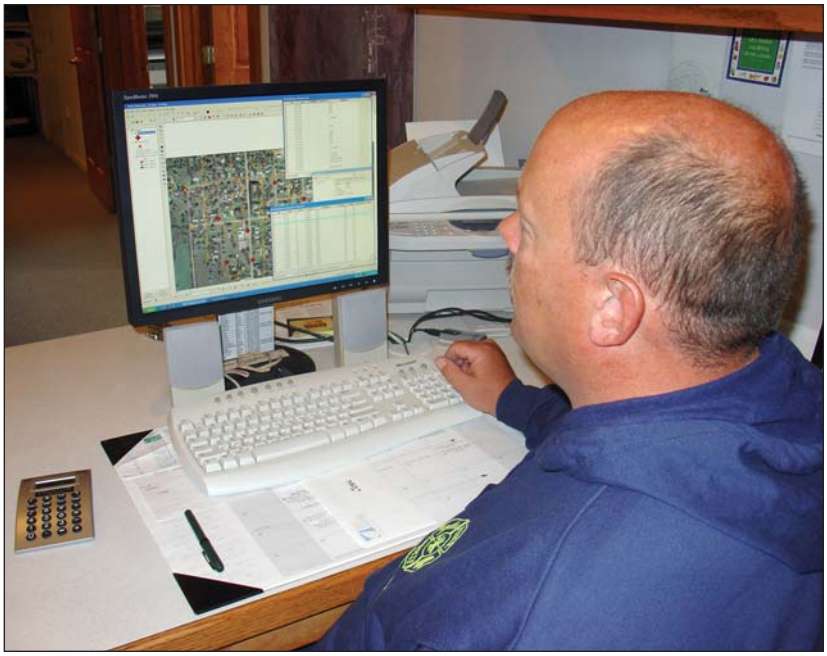
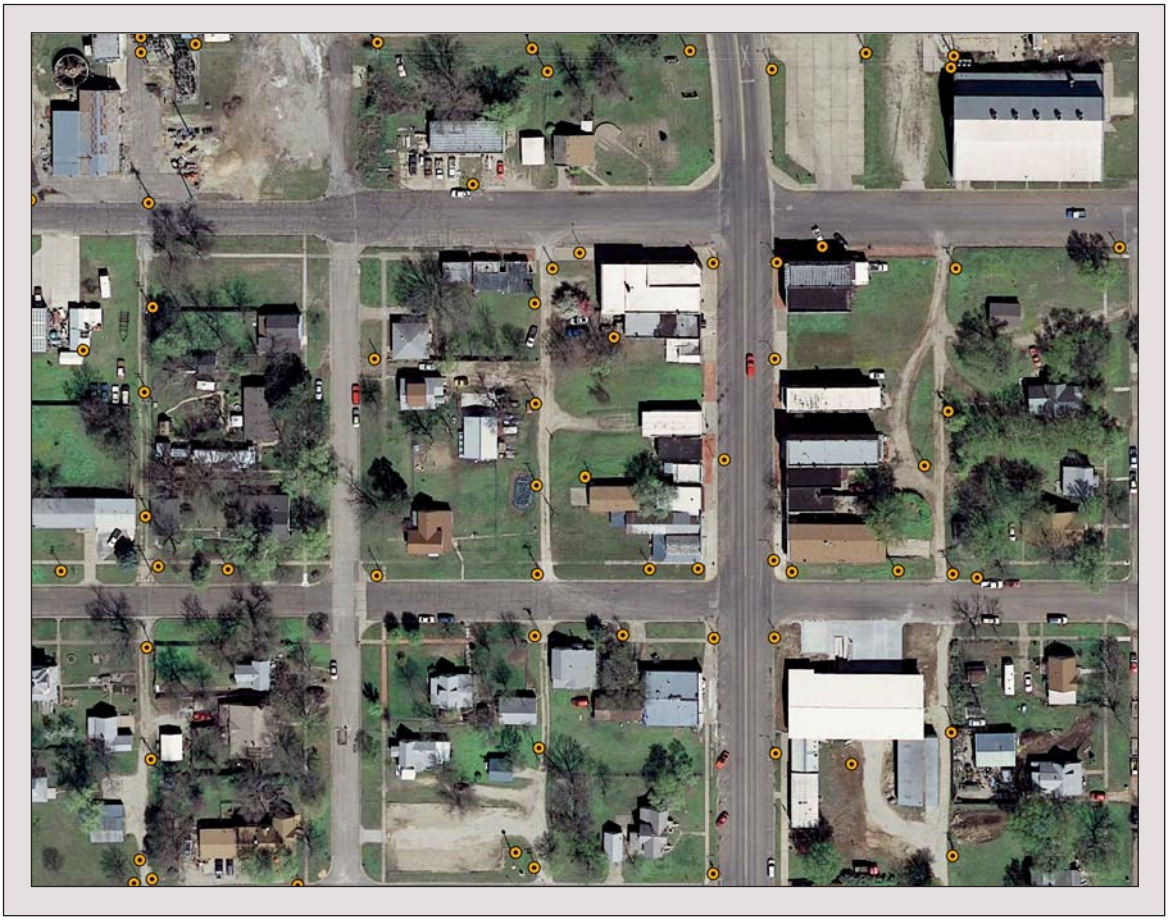
Attribute tables add data value

Although it may appear to be another large requirement of time and effort, adding information to attribute tables does not have to be so laborious. Many towns and RWDs already have various spreadsheets that contain information about meters, owners, or other information applicable to their utilities. Those files can be joined with shapefiles and incorporated into the attribute table. KRWA enters very limited information into the GPS units when collecting data. This allows the process of data collection to proceed much faster. The only data that is entered about a meter in the field is: meter ID, meter size, house number, and comments. By only entering four or fewer fields about each meter, the person collecting the data is



Enterprise City Superintendent Paul Froelich looks over a city utility map file on the computer. When writing a parts list and figuring costs for a utility project, the attribute lists associated with mapped entities can make a usually tedious task go much faster.

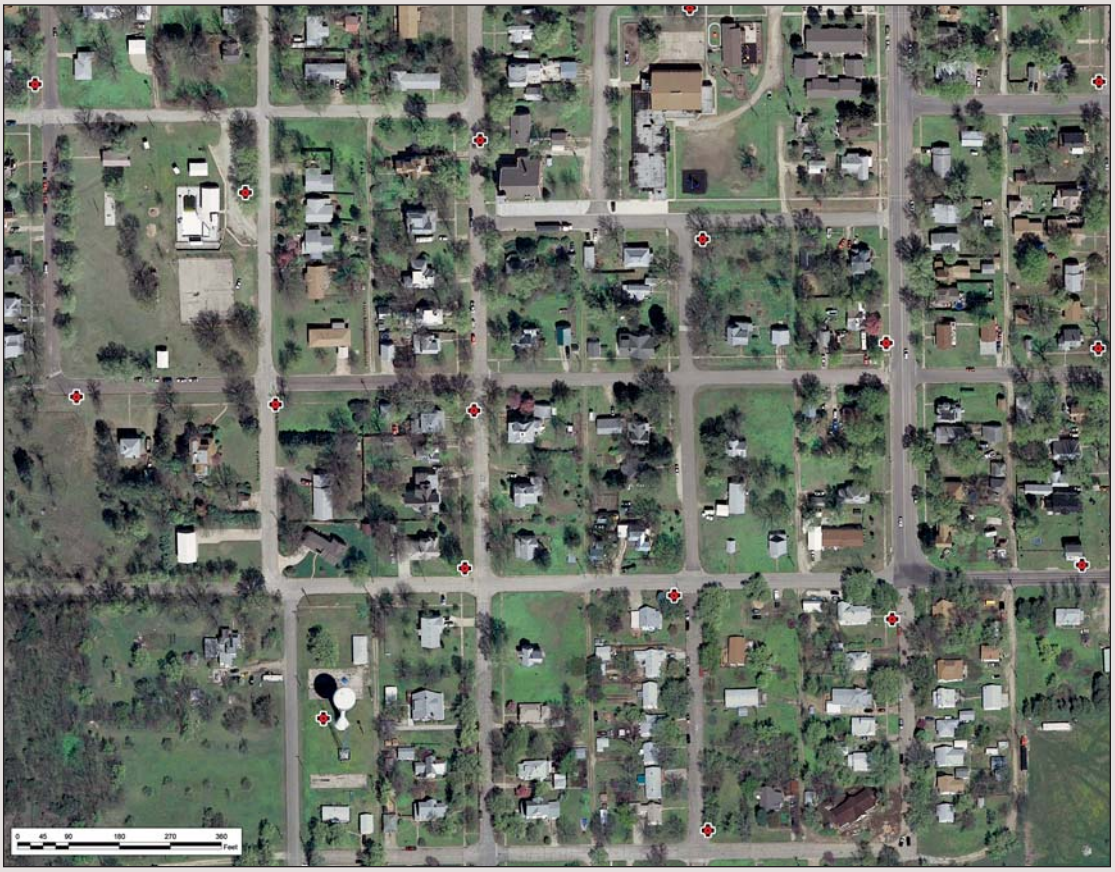


This map page shows power pole locations in Enterprise, Kan. The background is a 2007 high resolution aerial photograph of the city and surrounding area. This mapping system allows city personnel to quickly and accurately identify what poles are on which streets throughout the city.

able to move quickly from meter to meter. That makes the data collection much more efficient. If there is an existing database or spreadsheet about the system meters that data can be joined to the collected data once back in the office.

Typically, a spreadsheet for meter information in a RWD in Kansas consists of: account number or benefit unit number, last name, first name, address, city, zip, meter book (or some billing identification), meter reading route number, map book page number, contact person, status of meter, brand of meter, type of pit, condition of pit, date last changed, date installed, and any other pertinent information.

This data can be incorporated with GPS data into the attribute table of a shapefile and then



This snapshot of the actual 42" x 54" wall map that hangs in the Enterprise Fire Station references fire hydrant locations. The hydrants might also be color coded to indicate line size.

queried. If a worker would like to know how many active meters in a certain zip code that have a Badger brand meter in a plastic pit, the database can be asked or “queried” with that question and the answer extracted. It can even highlight the locations on a map and provide a printed version, complete with addresses!

Enterprise uses GPS data for future disaster planning

In Enterprise, Froelich is looking ahead. He has seen the recent disasters in Kansas and has devised plans to limit any future burdens and headaches for city personnel. By having all of this data catalogued, in the event of a disaster, such as a tornado, Froelich can access this database and find the specifications of each damaged pole to order parts and start constructing new poles

immediately. This will speed up recovery time and reduce the amount of time that the city is without electricity!

Improvement planning can take place in an office rather than in a truck while looking overhead at the pole and all its attachments. With poles mapped and digitally arranged on top of an aerial photograph of the city, Froelich and his staff can plan future improvements or the digital data can be sent to an engineer for study. Due to the usable size of the digital files, they can be easily e-mailed or copied to a disc or thumb drive and sent to anyone anywhere for analysis and input. Froelich's foresight will aid in future disaster relief in Enterprise for all the utilities.

Water system data incorporated

The water system is no exception for improvements because of GPS mapping. Original data collected in 2002 for Enterprise has been merged with new data collected in 2008. The water system data contains hydrant and location information for all city hydrants.

Greensburg experience highlights disaster problems

A major problem noted by KRWA crews working in Greensburg after the May tornado was that undamaged hydrants and meters were buried under tons of debris, hidden from volunteer debris removal crews. When front end loaders started clearing the debris, the unseen hydrants were inadvertently ripped out of the ground, causing extensive damage to the water system. With GPS data for each hydrant, this could have been avoided by assigning location crews to mark hidden hydrants as well as cautioning cleanup crews before they started working. The same was true for Greensburg water meters. As cleanup crews cleared debris, they crushed meter pits with the heavy equipment. As water service was finally being returned and pressure restored to the city water system, pipes to houses that had been torn from their foundations needed to be shut off at the meters, but crushed pits prevented this. Locating the broken lines that could not be turned off, took time, created more mess and lost gallons of water that was already in short supply.

By locating covered pits with GPS data, damage could have been prevented. Greensburg's existing maps identified meter locations with reference to existing structures, but they were of little or no value because structures, address numbers and street signs no longer existed.

If needed, city crews will be able to quickly locate water, wastewater, electric and eventually gas system infrastructure and access information about the valves, meters, lines, poles and all other infrastructure associated with the city utility systems. Power or charged batteries to operate the computer could be an additional issue. Paper maps can still be critical.

Congratulations to Paul Froelich and the Enterprise city staff who have taken the initiative of utilizing the city's digital mapping to its fullest.

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