



GPS technology is the most advanced tool available in the process of mapping and relocating utility infrastructure. The ability to collect GPS coordinates, process the data (locations) for better accuracy, load the data into a GPS unit and navigate to those points is unparalleled. Many municipal and rural water operators and those who worked to construct systems wish that this technology could have been available decades ago. Locating pipelines today would be much easier and more accurate. Even today, there is no mandate by anyone to utilize this technology.

In 2008, the Kansas Water Office recognized that GPS mapping was superior to other methods of mapping infrastructure. The agency set aside funds to subsidize the costs for those rural water districts and cities that wanted to begin to update map products. The result? Since October 2008, 123 cities and RWDs have applied for and been approved to receive a maximum of \$4,000 to offset the costs of GPS mapping of their water systems! Seventy-eight of those have already received subsidies totalling \$236,792. The remaining forty-eight cities or RWDs are in some stage of mapping of their utility; they

will receive their subsidy grant upon completion of their projects. Guidelines for participation included these requirements for water systems:

- ▲ Serve fewer than 1000 meters;
- ▲ Have a current water conservation plan;
- ▲ Collect data for at least seventy percent of the system;
- ▲ The subsidy was to be applied to water systems only;
- ▲ Purchase of hardware, software or equipment not allowed;
- ▲ Complete the project within two years from date of approval;
- ▲ Use or employ the services of a company that used an approved method of mapping (i.e, GPS data collection, or data collection in conjunction with heads up digitizing in a compatible format).

Recently, the 1000-meter cap was removed so that larger utilities might also be encouraged to improve the accuracy and quality of their map.

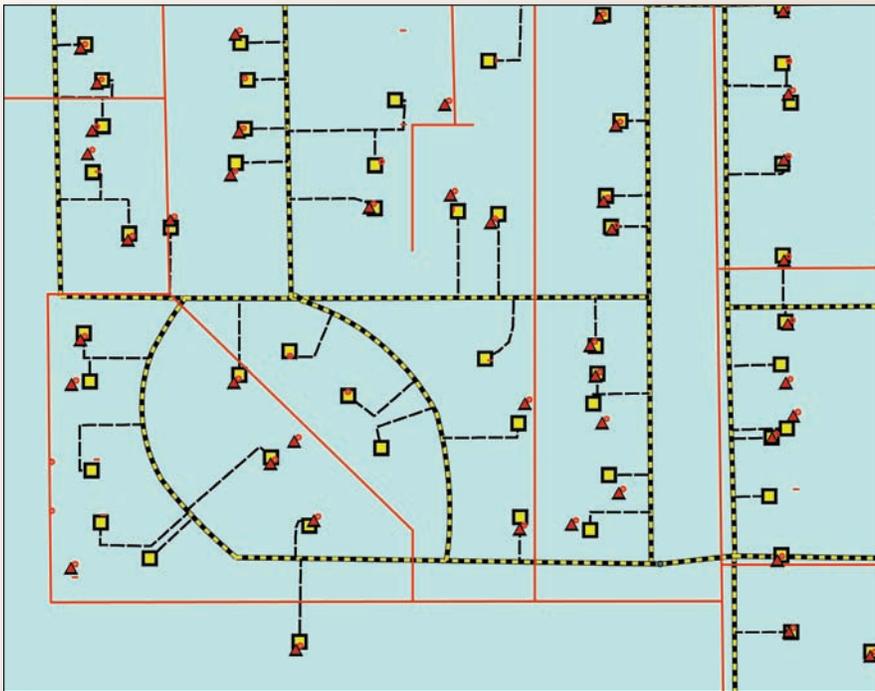
More than just new maps

GPS data collection isn't just for printing maps anymore. The accurate data allows engineers to conduct hydraulic models for capacity studies. When layered onto a topographic map, the data can be used to determine

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pressure in given areas. Such modeling is used to identify the correct location of a new water tower or booster station. Analysis can be conducted by the utility to determine age of infrastructure and need for maintenance. And most commonly, digital records can be kept and linked to locations that reflect previous leaks and line repairs. Copies of this data can be easily distributed via email, or data disc to inform utility personnel of future plans, daily duties and general information.

The Kansas Water Office subsidy is a benefit of the Clean Drinking Water Fee. This program has allowed many small utilities to take advantage of the benefits of having their system collected with GPS. Many system



As a comparison of the accuracy between 'as-built' maps and GPS mapping, the red lines and red triangles denote line and meter locations on the project as-built maps. The yellow and black lines and squares identify actual GPS locations of features.

maps do not reflect the location of recent installations such as new valves, cleanouts, hydrants or pipelines. The long-time operator knows where those facilities are located, but the “mental notes” are never transferred to updated maps. The future only holds disasters with excavation after missed locates.

Don't just recreate mistakes!

The “normal” process of recreating maps had a flaw and still remains for those systems scanning existing maps. The problem with scanned maps is that mistakes that are on the original maps are transferred to new maps. Unless the mapping company, or engineer makes the effort to verify the actual locations, there is no improvement other than to get new lines on new paper. GPS data collection and digital attribution correct that by actually collecting a GPS coordinate that marks the exact location of an exposed line, a valve riser or meter pit. Although GPS mapping is sometimes considered “on-going”, updates can be recorded and archived for future generations to access without the burden of finding a retired operator, translating notes on a

operators have told me that without the grant, their board or council would not have even considered collecting data and printing new maps. Too often, I have heard an operator or board member say, “it sounds great, but it just isn't in the budget.” The subsidy has made mapping more affordable and has allowed the collection of data that will be used for system management for years to come.

There are two common denominators with most water systems in Kansas, and across the country: 1) their existing system maps are often in desperate need of updating and replacement; and, 2) the operator/manager or key staff

may be nearing retirement. The information that is stored in the minds of retiring operators is invaluable to new operators and managers! Often,

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worn set of maps or relying on a questionable locating practice such as witching, much less original as-builts which frequently are rife with error.

The amount of data that has been collected for RWDs and cities in Kansas is impressive. At KRWA, the subsidy program has helped pay for the collection of almost 100,000 water system infrastructure points. Roughly 51,000 of those points are meters! This is data that would probably never have been collected without the assistance of the Kansas Water Office's program.

Today's GIS software is very powerful but still can be extremely challenging to someone without training in its uses. I believe that as the software and technology advances, versions will become available that will automatically import data that has already been collected and use that data to perform such maintenance tasks as valve exercise scheduling, meter replacement alerts, possible leak identification, tower maintenance advisories and billing. With the recent

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requirements that RWDs be members of Kansas One Call, those systems that have their mapping data in a digital format have found the transfer to One Call be effortless.

Knowing where pipelines and facilities are located is imperative for every city and water district. That's just as simple as it gets. Having accurate maps might not be seen as an important budget item and investment to some – but neither is having to spend four or five hours with a

backhoe and two or three people searching for a waterline. Worst case is having someone else tear through an 8-inch transmission line, putting customers out of service and losing perhaps 100,000 or more gallons of water. Unfortunately, the person(s) who do not support improved mapping are typically not involved in doing system locates or repairs.

I hope that you will attend the KRWA conference in Wichita, March 29 – 31. There are many sessions that can benefit cities and RWDs. And if you are interested in GPS mapping, stop by the KRWA booth to see some example projects of other systems. It will be a good investment of your time.

Pete Koenig is a GPS/GIS Tech at KRWA where he has been employed since 2004. He also supports the KAN STEP program and other KRWA initiatives.



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