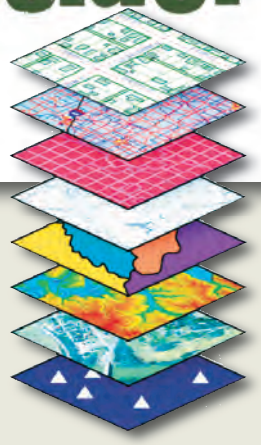
By Mark Thomas, GIS Mapping Coordinator

Good Reasons to Consider GIS-Based Mapping



It often seems to me that prior articles in *The Kansas Lifeline* have covered nearly every aspect of GIS mapping. Then again, I need to remind myself that there are always new readers – and there seems to be a continual change in those who operate public water and wastewater systems, and certainly that is the case for members of city councils and RWD boards. With those in mind, here I go again, in another article touting the benefits of any city or RWD improving their mapping using GIS.

GIS benefits organizations of all sizes and in almost every industry. That is certainly the case with Kansas water and wastewater utilities. Other utilities that KRWA has prepared maps for using GPS include gas systems, storm sewers, street lighting, electrical systems and street signs.

Thanks to the support and encouragement of the Kansas Corporation Commission, KRWA embarked on a GIS mapping program in 2000. The first step in the program was something of a demonstration project to evaluate various methods of taking a utility's existing paper maps and moving those to a GIS-based format. One of the first trials was to "geo-rectify" or conduct "heads-up" digitizing of a utility's existing maps, or as built maps. The process then would have KRWA going out to verify the points. After a very short time taking this approach, it was readily recognized that it was double work: 1) trying to turn existing maps into digital formats; and, 2) then going out for the verifications. It begged the question of why not just go collect the data in the first place.

In my experience, as-built maps vary greatly with accuracy. Some systems have found their as-built plans very useful and accurate, while others have noticed numerous inaccuracies with them. This leads me to believe that these original maps are only as good as the inspector on the job. Also, most as-built plans do not reveal actual meter locations. They'll show a meter on the property, but when it comes to having a new operator go out and try to actually locate these features in the system, it sometimes is not possible.

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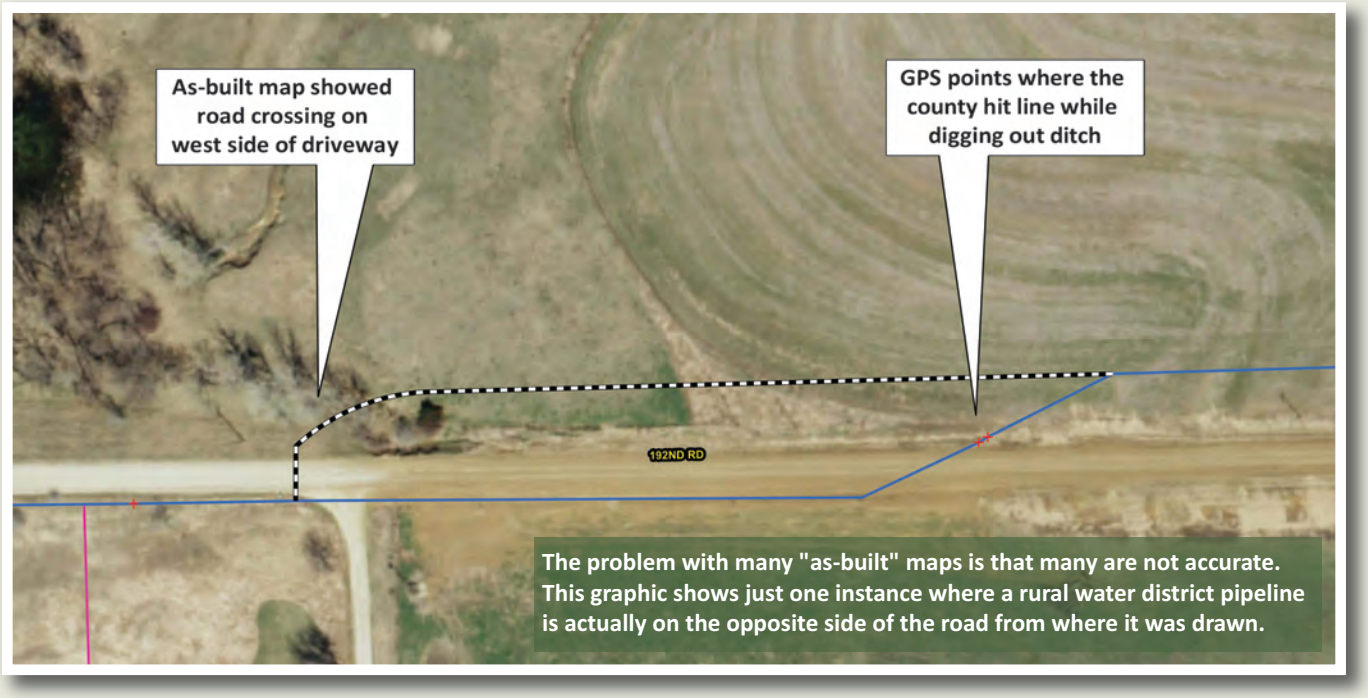
I think that many water systems particularly are recognizing the economic and strategic value of having GIS-based maps.

Recently I attended a meeting of a rural water district in south-central Kansas. There are several new board members and they are pushing the district to improve mapping technologies. I demonstrated the GIS mapping process and how KRWA would approach a project. First, it's essential that the local system representatives know where the facilities are located. KRWA works in partnership with the local operator or others to collect the data. We don't want to be spending time with a metal detector in a RWD or slinging a pic ax on an asphalt city street to verify the location of a valve riser. KRWA charges an hourly rate – and trying to help find the valves, meters and other features adds to the cost. In other words, the utility's preparedness is a big factor in costs.

Improved efficiencies

GIS mapping provides improvements in the efficiency of operating and maintaining utilities and also should help with communications about those utilities. Typically, many communities and RWDs have an operator who has been on the job for many years. In some cases, everything known about the utility is in the operator's head. Old paper maps have not been updated in most cases. It is critical for the utility to have accurate maps in case the operator who has everything stored mentally is not available.



The problem with many "as-built" maps is that many are not accurate. This graphic shows just one instance where a rural water district pipeline is actually on the opposite side of the road from where it was drawn.

Better decision-making

The concern expressed by the board members in the meeting I referred to was that the RWD really does not have good records as to where leaks have been repaired much less what types and distances of pipeline are installed.

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Improved communication

Combining information such as locations where leaks have occurred, e.g., with a correlation to the type of pipeline or area in which those repairs were made in a mapping project would help the governing body and others. GIS-based maps allow users to create visualizations to help people better understand situations.

Better information, recordkeeping

A GIS mapping project is not a one-time event. Paper as-built maps were also not intended to be a one-time event but because the engineering firm had those original maps, many cities and RWDs in Kansas and across the country never returned to the engineering firm to have updates made. With GIS-based mapping, additional points can be collected, then joined into existing data digitally and appropriate updated mapbook pages can be printed.

Conclusion

There are costs associated with developing a GIS-based mapping project. There are greater costs associated with NOT updating maps. I wonder how many readers of this article have been out on a project where there is a major water leak and there is no one available who knows the location of the system valving – or in some cases, what valve controls what?

The Kansas Water Office continues to provide a subsidy of 50 percent of the cost up to $4,000 as a subsidy (grant) for development of GIS maps. As of May 30, 2015, the Kansas Water Office has approved more than $300,000 in subsidies for GIS mapping.

The implementation of GIS-based mapping is not something that KRWA would recommend most local utilities try to do on their own. While there's a great tendency for people to become excited to do their own mapping, the learning curve on the necessary software is extreme, not to mention the cost of the necessary equipment and updates. I would also ask system operators who believe they can do their own mapping what it is that they are presently doing that they will no longer need to do because of embarking on their own program. GIS-mapping requires a much higher discipline than I believe most people appreciate.

KRWA is available to demonstrate GIS mapping at any board/council meeting or other work session. Email me at Mark@krwa.net or call the office at 785-336-3760 if you are interested.

Mark Thomas has been a GIS Mapping Tech since September 2006. Mark has a bachelors degree in geography from Kansas State University and has specialized studies in ESRI's ArcView and ArcPad software. Mark lives in Seneca with his wife Michelle and their sons Trent and Levi.