

Most Cities and RWDs Not Realizing Full Benefits of Their GPS Mapping Projects

GPS mapping continues to draw interest from water and wastewater utilities throughout Kansas. Many city and RWD personnel realize that keeping accurate utility maps up-to-date is a necessity. However, after completing a large number of mapping projects it is evident that many utility staff only seek to have new paper maps. Due to a lack of understanding or information about current technological concepts, those staff members often seem disinterested in utilizing the new data in a digital format. Having the data in a digital format could take each of these system's mapping capabilities to the next level – a Geographic Information System, or GIS.

At the completion of every mapping project by KRWA, the new printed mapbooks and other map products are provided to the utility. KRWA includes a DVD containing the digital data. Most systems do not have map editing software to maintain the data, so they download free viewing software, typically either Tatum or ArcExplorer, via the Internet. Such software does not enable the users to edit their mapping project, such as to re-draw water lines. However, those systems that have taken advantage of the viewing software have found it to be very useful. Paper maps only reveal a small amount of information to an operator or others who are locating a water line or doing other work such as planning an extension. The free viewing software allows users to zoom in to certain areas and measure distances from road center lines, corners of houses, or other visible features to locate the utility's infrastructure. This type of locating capability is a great resource for cities and RWDs. However, a GIS can be much more than a locating tool.

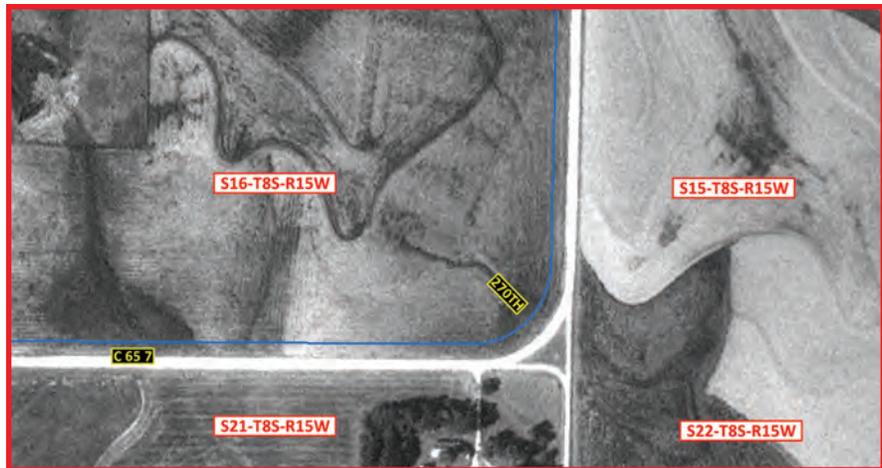
Each water meter, valve, waterline point, sewer manhole, etc. that KRWA collects is tied to a database containing

information about each particular point. This is known as attribute data. An extremely large amount of data can be incorporated into the attribute table associated with a layer. Depending on the file type, you could enter an entire Gigabyte of information! That doesn't include any hyperlinks to photos or external databases! The attribute

table is a database that is linked to the geo-referenced data layer. And, each layer has its own attribute table. KRWA creates a very basic attribute table for the data layers that are collected. The table only contains brief descriptive data about each point, for example, each water meter or valve. The KRWA water meter attribute table contains the following: Meter ID or Account Number, Meter Size, Address, and Comments. Time in the field can be minimized by simply entering the

Meter ID. Using ESRI's Arcview editing software, we can take the system's meter billing data and join the two databases using the Meter ID field. All of the system's billing data is then automatically entered into the geo-referenced attribute table of the meter layer. The same can be done for every layer of the project. Though few RWDs or

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Graphic 1 shows an intersection with an adjacent 2-inch waterline in a rural water system in north-central Kansas. The aerial photograph was taken in 1991.

cities keep a spreadsheet of every valve or hydrant that has been installed in their system, it wouldn't require much effort to create such tables and enter the information. The only rule to ensure this all functions is to be absolutely sure that the ID numbers that are entered during data collection correspond with the system's ID numbers in the spreadsheet.

There is a virtually limitless amount of data that can be included in an attribute table. A system can include many possibilities when creating a spreadsheet such as: Install Date, Valve Brand, Last Exercise Date, Tracer Wire, Pipe Material, Manhole Depth, Location, Measurements, Installer, Comments, etc. A photo can be linked to the respective lines or points. Some people might question how joining all this data to their GPS mapping project can benefit their city or district. One answer is that it saves time. People can

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be very productive by being efficient. For example, if a system is undergoing a capital improvement project and intends to replace all 1 1/2-inch solvent/weld pipe, an operator can determine how many feet of that pipe is in the ground in a couple of minutes, if that attribute data is included in the table. It's as simple as running a query of the attribute table to show all the 1 1/2-inch pipe, and calculate the sum of the "pipe length column". This process beats flipping through old system maps or paperwork with a pen and pad trying to tabulate such information.

Water systems and other utilities change – very few are static. Edits will need to be made to the spreadsheets that



Graphic 2 displays the same intersection in an aerial photograph from 2009. The county has reconfigured the intersection; subsequently the RWD had to move its water line. This image shows the old location of the water line at the new intersection.



Graphic 3 reveals the updated location of the water line with the same 2009 aerial photograph. By keeping track of updates with GPS and measurements, future locating of pipelines will be much easier.

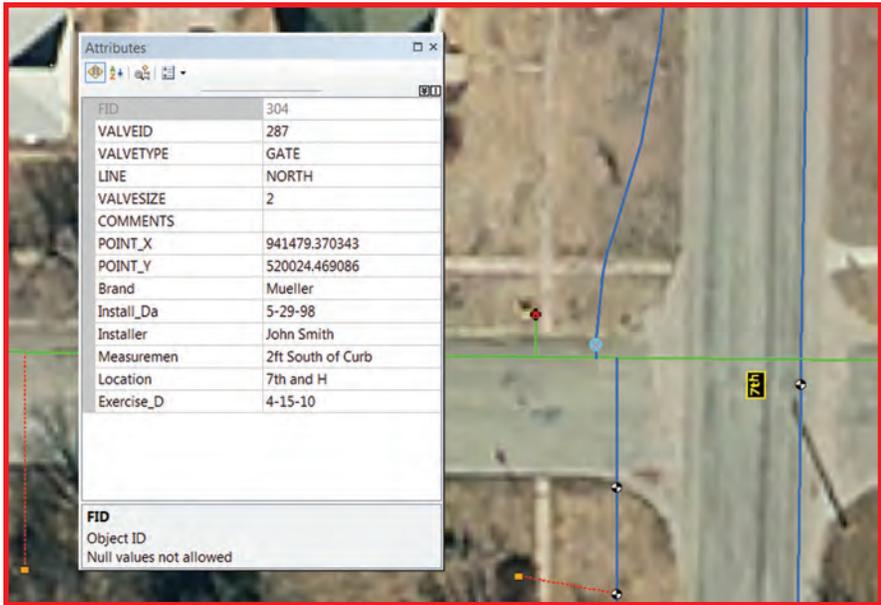
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Graphic 4 shows "attribute data" associated with a typical valve installation. This is an example of the type of information that can be archived, joined to, and displayed in the digital map. Most cities and rural water systems are not utilizing this feature of GPS mapping to the fullest extent.

contain the information about the various valves, hydrants, meters or other features. If a road or intersection changes, the measurements for the water line or valve locations will change too. Keeping up-to-date with this information is crucial to maintaining a GIS. Without accurate and up-to-date data, it is more difficult to determine solutions for queries.

having new paper maps. Water and wastewater utilities are generally not taking advantage of the digital capabilities of creating and using a GIS. A minimal investment of time will provide a beneficial return when archiving many years of what otherwise will be "soon-to-be-forgotten" information. There's no time like now to begin.

If anyone needs help or wants further information as to how systems should get more out of their GPS mapping project, send an email to me at mark@krwa.net or call KRWA at 785-336-3760. Also I encourage readers will attend the annual KRWA Conference & Exhibition, March 25 - 27, at Century II Convention Center in Wichita. There are many sessions that should be of interest to anyone. It's a fabulous conference; hope to see you there. We can talk "mapping" and help you set sail for the future.

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.



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