

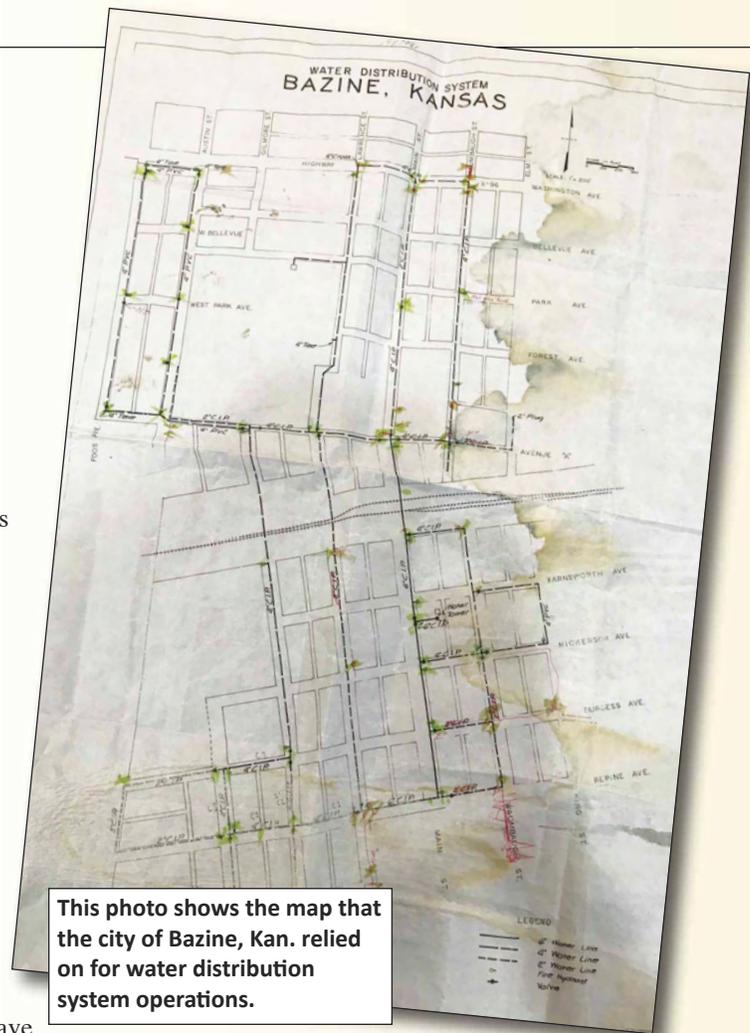
# City of Bazine Invests in GPS Mapping

**T**he city of Bazine is located in west-central Kansas in Ness County, and has a population of approximately 330 people. As with most small western Kansas communities, the population has been declining gradually over the years. Continually losing utility customers and tax dollars causes a continual shrinking of the city budget. Many small communities in these situations also have aging, and sometimes failing utility infrastructure. Setting aside the fact that funding replacement of aging infrastructure is expensive, keeping track of what has been replaced with what and where on a map can be difficult. It's my opinion that the city has done a good job of gradually replacing troublesome areas of their water system over the years without borrowing a lot of money. Recently, the city asked KRWA to create an accurate map with GPS and GIS so that future generations will have a much greater ability to manage the system.

The water system in Bazine was installed in 1935. It consists of cast iron and galvanized steel water pipe. With the life expectancy of galvanized steel waterlines being 40 years, and cast iron 50 to 100 years, leaks became a common problem for the city. Some of the original lines have remained trouble free and are still in place, but almost 50 percent have been replaced with PVC pipe.

Bazine's water system today consists of 234 water meters, with 177 of those being active, 92 valves, 29 fire hydrants, four wells, and one storage tank and pump house.

Bob Black has been the Utility Superintendent for the city since 1980, and has been in the trench on every water line replacement project that has occurred. Prior to 1980, all of the leak troubles had just been patched here and there, and all the prior operators' average tenure was usually no longer than five years. All but one of these projects were paid for with internal city funding with a local contractor doing all of the excavating. The one project that did require outside funding was a new well project. The project was necessitated because of high nitrate levels in the groundwater. The resolution was for the city to construct two new wells and the existing well water having to be piped over to the new wells to be blended. Funding for this project came from the Kansas Department of Commerce and Housing Community Development Block Grant Program.



Over the years, the city had replaced nearly half of the water mains. All but one of the projects was funded internally. However, not all the improvements were reflected on the city's distribution system map. But updates to the existing system maps were minimal. Bob, having been the manager on all these projects, knows where everything is throughout the system without having to refer any maps. As is the case with scores of water systems in Kansas, current operators like Bob are wanting to retire within the next few years. Bob saw the need that the next operator would not have a very good idea of where the system infrastructure was located based on the existing maps.

Having digital maps, or GIS that shows an operator exactly how and where the newly installed PVC lines tied into the old cast iron system will be greatly beneficial for future staff. When new leaks need to be repaired or a new meter is installed, staff will know the plumbing supplies needed to make the repair or installation without having to excavate the area first to figure it out. Reading meters will not be as difficult for a new person either, as having Google Earth on smart phones will make it drastically easier in locating all the meters. The same can be said for locating valves when a pipeline needs to be shut down. As of July 2019, KDHE requires that all valves in systems be exercised once a year. Documentation of this practice is also required, and systems that have a GIS are already equipped to provide a



The graphic shows an updated mapping of the city of Bazine. The city serves 234 water meters with 177 of those being active, and has 92 mainline valves and 29 fire hydrants.

spreadsheet or other documents revealing all of the valves and their locations, making it easy to log which valve was exercised by date.

At KRWA's hourly rate of \$50 per hour, I estimated this project for the city to cost just under \$6,000. My estimates are generally fairly conservative to make sure RWD boards of directors and city council members aren't surprised at the final bill. For instance, the data collection part of the project for Bazine was estimated at taking 30 hours, when it actually took 16 hours. Data collection at Bazine was very time-efficient; this was due to Bob knowing where all the meters, valves, etc. were located. Having an operator who knows the exact locations is not the case for many communities. Some systems require much more time and we begin with a metal detector searching for valves and other system infrastructure.

Bob Black and council members of the city of Bazine have shown that even with a declining population and

revenue, investing in infrastructure is still possible. And it's necessary. By investing in GPS mapping of the water system, the transition from Bob to the next person will go a lot smoother, as the new operator will not be going into the job blind.

I encourage readers to give KRWA a call if anyone would like to discuss digital mapping. It's a tremendous asset to have mapping systems in electronic format. It's best to complete the data collection while those who have worked there for decades can help verify the locations.

*Mark Thomas has been a GIS Mapping Tech since September 2006. Mark has a bachelor's degree in geography from Kansas State University and has specialized studies in ESRI's ArcView and ArcPad software.*



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