Gathering Data

We have several different tools that we use to gather the information about our system. Some examples are GPS (Global Positioning System) Technology, as-built drawings and field knowledge of our crews. Some assets are captured using GPS, which uses satellites to record the coordinate location of each feature collected. More detailed information, such as the fire flow of a hydrant or the depth of a water valve, can also be recorded. The GPS unit is then brought back to the office where the information is downloaded and the points are plotted on a map.

Details about our infrastructure are also entered into GIS based on as-built drawings. These drawings provide specific information about the installed infrastructure, including type, size, depth and location.

Finally, we rely heavily on the knowledge of our field crews to let us know when map updates are necessary. Together, all of these tools play an integral part in keeping our maps as accurate and up to date as possible.

These are just a few examples of how we use GIS. The Water Services Department is continually looking for new ways to utilize GIS to improve the efficiency of our crews and maximize the effectiveness of our budget.

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City of Bryan Water Services and GIS

CITY OF BRYAN
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What is GIS?

GIS (or Geographic Information Systems) is a computer-based tool used to display features on a map. In addition to storing the physical location of features, GIS also enables the user to store detailed information about each feature, making it more powerful than a simple map. The stored information can be updated and analyzed as needed, and is presented in a way that is quickly understood and easily shared. By combining the ability to store details with the visual-aid of a map, GIS is a very powerful tool.

Mapping Our Infrastructure

One way that we use GIS in Water Services is to map the location of our infrastructure and input detailed information about each asset, such as pipe material, depth and size. (See Figure 1).

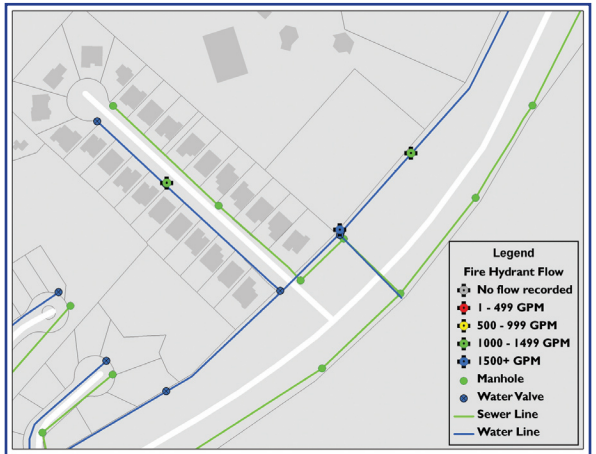

Figure 1 - Sample map showing our water and sewer lines. The hydrants are color-coded based on gallons per minute of measured flow off the water line at each hydrant.

Since most of our assets are located underground, having a map of where things are located is crucial, especially when it comes to repairing leaks or replacing pipe. For example, knowing where the water valves are located helps us isolate a section of line in order to make a repair, rather than shutting off water to the entire system. Also, knowing information about the pipe itself saves times by ensuring our crews have the necessary equipment on hand to complete the job.

Another benefit to having our infrastructure mapped in GIS is that other departments within the City can also utilize the information. The City of Bryan Fire Department can access our water hydrant data en route to a fire and see where the closest hydrant is before arriving on the scene. In emergency situations, every second counts and knowing the closest hydrant location is critical.

Mapping Work Orders

In addition to storing information about our water and sewer infrastructure, we also utilize GIS to map our work orders. By incorporating our work order system with GIS, we are able to map the work orders by address and then customize the symbols based on the type of work done. (See Figure 2). Plotting the work orders on a map in this manner allows us to see how the work orders are distributed throughout the city and if there are any patterns or areas where we need to concentrate our maintenance efforts.

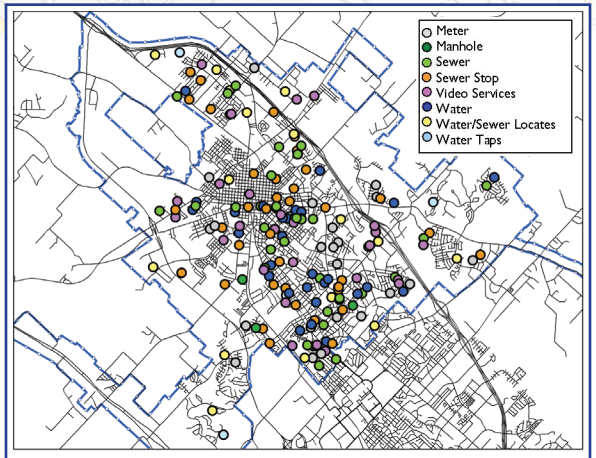

Figure 2 - Sample map showing open work orders throughout the City. Each color represents a different type of work done.

For instance, if we see that we have a sewer line that frequently overflows due to grease build-up in the line, then we can schedule preventative maintenance to clean the line on a regular basis so that the grease doesn't have a chance to build-up. In addition, we can educate the citizens in that particular area on alternative ways to dispose of grease and how they can help prevent grease build-up from occurring.

Seeing the work orders on the map also helps us prioritize our Capital Improvement Projects based on need and helps us determine the most efficient fiscal expenditure of public funds. If we have a line that has frequent problems or has numerous point repairs in a short period of time, we can evaluate on-going maintenance costs vs. capital expenditures to determine the best and most cost-effective solution. In some instances, it may be more cost-effective to replace the line rather than repair it.