GIS: The "GO TO" for Asset Management

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As new technology continues to explode, asset managers have moved towards implementing web-based, Geographic Information Systems (GIS) as a solution to help oversee their assets. GIS helps managers identify, catalog, assess, track and maintain any number of assets, from street signs to piping, and in a variety of public and private industry settings including infrastructure, utilities, governments, schools, or corporations. GIS enables asset managers to view a spatial representation of their assets, embedded with a rich amount of data that is accessible from the convenience of a smart phone, digital pad or computer with a click of a mouse.

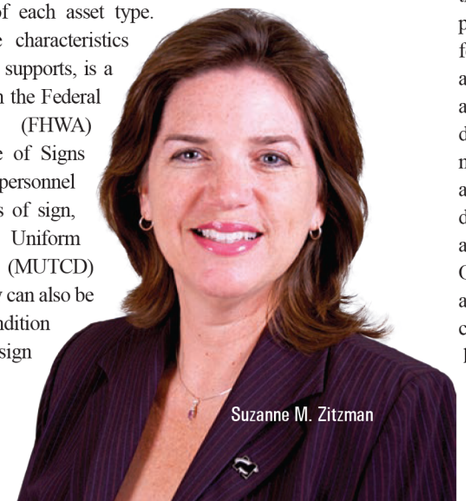
History

During the 1980's, we used drafting techniques to draw "to-scale" maps of surface and subsurface features for clients responsible for maintaining sewer collection systems, roads, drainage systems and treatment plant facilities. Conventional survey methods were used to collect information in the field using hand written field books to note asset features with station and offsets to a set surveyed baseline. As the maps were hand-drawn from this information, corresponding tables were typed out, showing coordinate locations (x,y,z), materials of those assets, and sizes of pipes. These maps and tables, would be delivered to a client and stored in a manageable fashion, either rolled up in tubes or in space-eating flat files. Detailed asset maps had corresponding key maps showing the spatial location of each feature and could entail upwards of 200 detailed sheets. As the digital revolution took hold, it subsequently changed the way we do everything, including advancing survey and engineering grade mapping into the digital world.

From the introduction of personal computer, Smartphones, and digital everything, the 1980s brought a revolution in software development and many of the technologies and techniques that we currently use in the GIS industry. Today's surveyors use Global Positioning System (GPS) total stations to collect digital data about assets then feed this information into GIS programs that produce highly accurate digital mapping that can be easily accessed by managers. During this era, Environmental Systems Research Institute (ESRI), an international supplier of Geographic Information System (GIS) software, web GIS, and geodatabase management applications also introduced its first international user conference which was one of many factors that helped further the development of technology by connecting people and ideas globally.

Verification

While digital techniques enable field personnel to collect an abundance of asset data, they also enable field crews to verify characteristics of existing assets. This is a huge advantage because as this information is verified, data models are also in place to enable field personnel to collect asset locations and inventory, as well as the individual characteristics of each asset type. For example, one of the characteristics captured for signs and sign supports, is a requirement to comply with the Federal Highway Administration (FHWA) Standards for Maintenance of Signs and Sign Supports. Field personnel can now log characteristics of sign, based on the Manual on Uniform Traffic Control Devices (MUTCD) code compliance. Inventory can also be made on the type of post, condition of sign and post height of sign and other details.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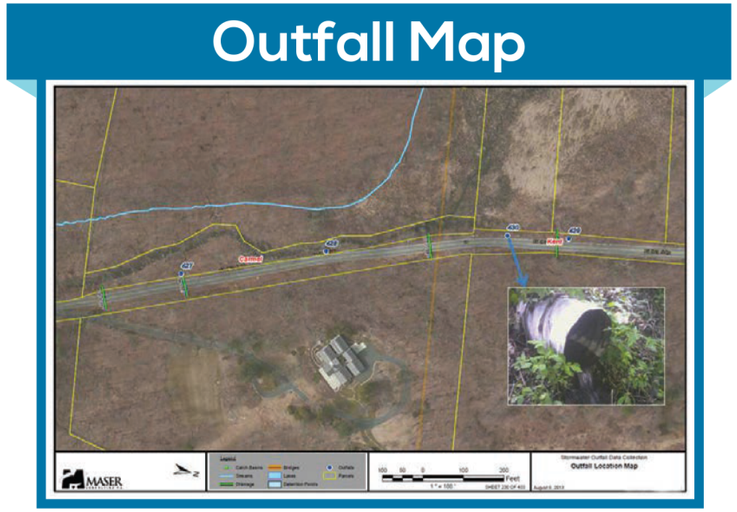
Assets, such as drainage outfall structures, can undergo an inventorying of the outfalls' characteristics to meet the National Pollutant Discharge Elimination System (NPDES) permit program standards. Field personnel can log the type of outfall, stream, or water body receiving runoff discharge, the presence of illicit discharge, and overall condition of outfall.

The migration of digital data from GPS collection into a GIS program leverages existing asset data and new asset collection into the same coordinate system and accuracy level. This enables data technicians to create a system of overlay mapping that enables asset managers to view multiple layers containing a vast amount of information about their assets including updates simultaneously. GIS programs are also a valuable tool to the engineering industry because they offer design tools for the creation of construction documents and as-built plans.

Digital Management

Today, GIS technology's continued development enables us to maintain and manage a larger amount of asset data, more efficiently and accurately than ever before. To fully reap the benefits of GIS asset management solutions, asset managers need to review their existing asset data, including manually drawn record maps, CAD as-built plans, GIS data files, construction plans, condition and inventory database files, and migrate them into a GIS asset management program. A full review of this information for accuracy needs to be performed, such as when the last update was completed and how accurately the information is displayed in the spatial world, since maps could have different spatial accuracies where overlaying these record documents alone would not produce a clear representation of your assets. Once reviewing the collection of new asset locations, and inventorying asset characteristics based on federal, state and local regulations, data can then be fed into web-based asset management application enabling end-users to access, edit, and manage the operation and maintenance of their assets. Web-based solutions also enable all parties to view the same data 24/7 eliminating the potential of accessing outdated information. Off-the-shelf software products that overlay onto standard GIS platforms, such as ESRI ArcServer and ArcGIS Online, create a user-friendly environment for managers to make informative decisions about the operation and maintenance of assets.



Efficiency

GIS management programs go even deeper than just mapping assets alone. GIS programs are highly configurable to your specific needs and tasks, including planning and prioritizing work activities; tracking progress and costs; triggering work orders that automate the process for reoccurring maintenance; and notifying crews to perform work through smart phone and digital pads being used in the field. As a result, work crews experience a more efficient response time, when having access to asset mapping, historic records, digital work orders, and inspection forms from their field vehicles. Field crews can also close out their work orders and inspection forms in the field, sending notification to managers, through the GIS asset management program that work has been completed.

As the asset management program is populated with operational and maintenance activity, asset performances can be analyzed. Time-based analysis allows managers to report on costs associated with assets located within a spatial region (i.e. service district, municipality), or report on assets of a certain characteristic (i.e. sign failed reflectivity assessment, outfall suspected of illicit connection).

Conclusion

Using GIS asset management solutions in your business provides one access point for viewing, maintaining, and managing your assets. Employing the use of web-based GIS asset management programs, managers are supplied with an invaluable tool that can help support budgeting for future rehabilitation projects through informative maps showing failing assets thematically, with construction and/or rehabilitation cost estimate reporting. Asset managers can reap benefits through better customer response, and increased life expectancy of assets, while maintaining compliance with agency regulations. While the initial implementation of a GIS application takes a little leg work to set up, once it is up and running, it is well worth the effort over the long term to have the depth of detail regarding your assets and improvement in your ability to manage them. CR