

Scope of Work – Water Utility Conversion



Purpose

Many cities and water companies rely heavily upon the geographic information contained in the basemap to conduct their daily business. Although mapping data exists in various forms throughout these companies, it is not readily available to those who need it most. Oftentimes when the information does become available, it is outdated, inaccurate, or in a form that is not easily usable. Many companies utilize map books, schematic representations of the water and sewer systems. Unfortunately, these books typically do not have sufficient detail necessary for maintenance and Bluestake activities; specifically, direct reference back to the engineering documents is not provided.

An objective that is achieved by EMS is to provide an added level of detail and a mechanism to directly access engineering documents from any desk or laptop computer.

A primary function of our GIS conversion is to enable the dissemination of this data to all who need it within the cities and water companies. A by-product of the process is the digital archival of all engineering documents. Once archived, many of our clients store the existing documents off site and recapture the space previously used for plan storage.

A properly designed system will:

- Enable the quick and accurate dissemination of utility location information company-wide
- Enable more efficient management of and access to mapping information such as parcel valuation and ownership, fire hydrant locations, and street address data.
- Improve decision-making capabilities in areas such as planning, engineering, capital improvements, public safety, and economic development.
- Enable quicker, more effective response to municipal and emergency response needs.
- Promotes inter-departmental communication and cooperation.

The GIS greatly enhances the performance of city staff by providing an accurate, standard map set throughout the company. Accurate and up to date maps provide management the ability to better assess building and valuation trends.

Utility Conversion Process

The conversion steps are as follows:

1. Obtain the best existing data to establish an accurate base map.
2. Acquire and scan all existing as-built data for the water, sewer and reuse facilities.
3. Convert the as-builts and create map books that are to be used in the field and digitally within the company.
4. Maintain the system by getting feedback from internal staff.

Step 1

Data obtained might be existing data held by the engineers. Alternatively, we can acquire mapping data from the City, or County Assessor's Office. Consideration must be made at this point to address spatial accuracy. It is widely known that existing datasets vary in accuracy which becomes further evident as data is overlaid onto digital ortho imagery.

We will arrange to meet with the client to discuss what specific demands will be placed on the data and determine what level of adjustment, if any, will be necessary.

Step 2

EMS has assisted many companies and jurisdictions to organize, scan, and digitally catalogue plan sets. The digitally scanned plan sets provide the backbone of the engineering document management system. This involves the following steps:

- Identify the desired data fields by which to track and retrieve plans
- Organize and collate all plans
- Scan the engineering documents

- Spatially identify plan locations on the map
- Populate the plan set database for automated retrieval

At the completion of this project, all plan sets will be scanned, identified, labeled with a unique plan set reference number (PLANREF), and returned in the tubes designed for the completed plan sets.

Each PLANREF will have an entry in the Access Database which fully describes the details of the planset. This design will be determined prior to starting and will begin with a suggested set of attributes used by our other clients.

Finally, the map location of the plan set will be determined by a point, line, or polygon on a map. This step is crucial for the GIS since it enables us to spatially search for information once the GIS data sets are fully populated.

Step 3

This conversion step will be done at our offices using all digital data acquired in step 2. This will be done by our skilled technicians and registered engineers who are very familiar with utility information and the particular style used here in Arizona. Since we have converted many of the neighboring communities, we are very familiar with the standards and practices used and can readily anticipate issues with the conversion.

Step 4

Our approach to maintenance will be the same as that taken on conversion; in fact, the same personnel from the conversion process can be on-site to perform these duties.

We incorporate data into the mapping system by laying out the line work off the scanned images. Using EMSFM in one screen and EMSUS (using AutoCAD) in another, we will capture the utility data, place and annotate the graphical entities, and layout easements. All dimensions, where provided, will be included on the final maps.

As-built construction plans lend themselves to graphical layout relative to existing basemap centerlines and right-of-way graphics. Digitizing the data consists of reviewing each map and using AutoCAD to draw the facility in reference to the digital base map. By using the EMS Utility Server, we are assured that the correct symbology and layering is used throughout the project to maintain a consistent map product. As such, quality control is built into the process, making the EMS solution the most refined and free of errors.

QA/QC Procedures

The final step in the facility creation is to thoroughly ensure quality control by plotting and comparing the facility layers to the original drawing(s). Any discrepancies are red-marked and edited for accuracy.

These corrections are then back checked and final plots are created. Information will be reviewed by Marty Shaeffer, P.E. for consistency prior to final incorporation into the GIS dataset. All digital data, when finished, is saved on CD-ROM.

Maintenance and Updates

A successful GIS hinges on the ability to maintain the system. Should the data become stale, users will quickly call into question the data being viewed. This is why we strongly recommend that the client allocate adequate resources towards the maintenance of the GIS mapping system.

EMS has long-standing relationships with several entities across the valley to provide maintenance services. Maintenance funds are not spent unless used and are typically billed on a per-sheet basis which allows for the client to adequately estimate its need for maintenance.

Should this service be required, EMS will establish a separate agreement outside of the initial service proposal.

The EMS Approach

EMS has developed utility GIS systems for many of the entities including City of Avondale, City of Glendale, Town of Buckeye, and the Arizona American Water Company.

The common thread amongst all EMS clients is satisfaction. We encourage you to contact any of our clients and inquire as to their personal level of satisfaction. We pride ourselves in our commitment to excellence and our perseverance to see the job through; ensuring it is accomplished on-time, on budget, and correct.

The EMS staff is flexible to assist as much, or as little, as our clients request. We typically assist with the initial conversion and then the City/Company maintains the data internally; as is done in Yuma, Sedona, Mesa, and Phoenix. Other jurisdictions, such as Surprise and Wickenburg, do not have staff to maintain the incoming data and rely on EMS services to assist them.

Participants, Roles and Responsibilities

Phil Ponce	Engineering Mapping Solutions, Inc. Phone: (602) 870-7811 x 14 E-mail: phil@emsol.com	Project Manager Application Development GIS Implementation
Marty Shaeffer	Engineering Mapping Solutions, Inc. Phone: (602) 870-7811 x 16 E-mail: marty@emsol.com	Utility Management GIS Implementation
Jason Scovill	Engineering Mapping Solutions, Inc. Phone: (602) 870-7811 x 17 E-mail: jason@emsol.com	Application Coding Database Analyst Technical Manager

Responsibilities:

- *Project Manager* – Responsible for producing project management documentation and project resource management. Attends necessary meetings to coordinate and facilitate all activities regarding the project at all levels. Produces all billing and billing coordination with the client.
- *Application Development* – Responsible for facilitating the project and participating in all levels of data deployment and design. Primary resource for defining functional requirements, participates in acceptance testing of all applications.
- *GIS Implementation* – Responsible for design and development of the deployment software used for GIS implementation. Facilitates the installation of software and ensures training needs are met.
- *Database Analyst* – Responsible for defining database standards, facilitating integration with existing systems, data development and management. Coordinates with the City to establish data transfer standards and procedures.
- *Technical Manager* – Evaluates the technical infrastructure requirements for the project, makes recommendations for improvements, prepares specifications for infrastructure improvements and implements infrastructure improvements. Installs and supports all “back end” application components (networking, hardware, operating systems and software).

Contact Information

Phil Ponce, P.E.
Vice President
Engineering Mapping Solutions, Inc
2330 West Mission Lane, Suite 1
Phoenix, Arizona 85021
(602) 870-7811 ext. 14

