

BIOGRAPHICAL INFORMATION

John L. McCoy, PE
GIS Manager
Utility Support Systems, Inc.

Specific Responsibilities

John is responsible for GIS and related technology at Utility Support Systems, Inc. (USS). In this role, he brings almost 20 years of GIS experience to the support of joint use management and field data capture at USS. John also provides consulting in utility technology, including GIS, work management, and outage management.

Past Experience

John began his engineering career at TXU, a large investor-owned utility known as Texas Utilities at that time. He held various positions with increasing responsibility in the areas of Transmission Construction and Operations, System Protection, Bulk Power Planning, Research and Development, and Telecommunications. John began his journey into GIS when he was named project manager for development of TXU's first AM/FM system in 1986.

Following the consolidation of three TXU subsidiaries in the late 1980's, he played a lead role in the development of an integrated GIS and work management solution. John was eventually named project manager for TXU's award-winning Distribution Information System (DIS). The system was enhanced to include gas functionality following another corporate merger in 1997.

John joined Utility Support Systems in 2003 in the role of GIS Manager.

Educational Information

Bachelor of Science in Electrical Engineering, Texas Tech University

Professional Memberships

Registered Professional Engineer, State of Texas
National and Texas Society of Professional Engineers
Institute of Electrical and Electronics Engineers
Geospatial Information and Technology Association

THE COMPLIMENTARY ROLES OF GIS AND JOINT USE MANAGEMENT

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ABSTRACT

The combination of joint use management and GIS can be very effective for utilities faced with pressures on budgets and spending. While insuring the safety of field workers is most important, new revenue opportunities are opened through joint use management, revenue that could be utilized for GIS initiatives. Collection and correction of GIS data can be accomplished as a by-product of the joint use process. Additionally, mature joint use management and GIS can provide the utility with the tools to effectively manage their assets into the future.

INTRODUCTION

The telecommunications explosion of recent years has provided the impetus for many utilities to more effectively manage their field assets. The utility poles that have been providing regulated electric and telephone service to neighborhoods and businesses for many years have become very attractive support structures for second-tier competitive telecommunications services. The attachment of coaxial cable, fiber optics, and wireless transceivers on utility poles is proliferating at a tremendous rate. In Texas alone, the demand for broadband service has increased 8-fold since 1999, and the number of Competitive Local Exchange Carriers has increased from 70 to 490 in just 6 years. In addition, upgrades to existing equipment are occurring as technology breakthroughs are placed into general use. For example, cable companies have traditionally provided only television service through coaxial cables. Now many coaxial routes are being upgraded or replaced with fiber cable as consumers clamor for digital and voice services at proportions that can only be provided through the increased bandwidth capabilities of fiber.

Because of the high demand for pole access, many pole-owning utilities have recognized the need to get their proverbial arms around the situation before it gets out of control. Of primary concern is the safety of the utility and telecommunications personnel who must work in and around the maze of cables and equipment that may inhabit a pole. The pole owner should also assure that

their pole attachment inventory is accurate and that they are receiving the proper level of compensation for the use of their facilities. Utilities may designate internal resources for joint use management, also known as pole space management, or may contract with a number of firms that provide specialized services for managing field assets.

The relationship between joint use management and GIS is perhaps not readily apparent, but the two are in fact very complimentary. A geographic information system can be a powerful tool for joint use management because of the inherent spatial nature of this business process. A GIS can not only manage the collection of field data, it becomes a valuable analysis and reporting tool once the data is collected.

BENEFITS OF JOINT USE MANAGEMENT

The benefits of joint use management can be quite extensive and fall in four categories: safety, risk management, economics, and data integrity. The degree of benefit of course depends upon where a utility is “coming from” in regard to joint use management. A particular utility may not view joint use management as a core competency and historically it may have been neglected. Other utilities with aspects of joint use management already in place may have realized some degree of benefits.

Safety

Improved public and employee safety is perhaps the most important benefit of joint use management. While safe working practices are continually stressed to the personnel of electric and telephone utilities, it should not necessarily be assumed that the same is true for other service providers who utilize utility poles for their facilities. Placing any worker in an unsafe environment on a utility pole is unacceptable and the pole owner would do everything within its power to prevent this from happening. There may also be conditions existing in the field, such as low-hanging cables, that are hazardous to the public. Identification, correction, and on-going prevention of safety violations on utility poles, including those that are the fault of both the pole owner and the licensees, is a fundamental theme of joint use management.

Risk Management

Closely related to safety, risk management refers to the ability of the pole owner to understand and mitigate the risks associated with joint use of facilities. In addition to the identification of safety and compliance issues that are a direct result of the attachments, a utility may uncover maintenance concerns involving their own facilities. Failure to recognize and remedy precarious conditions in the field could lead to litigation and financial consequences.

Economics

A utility's pole attachment agreements, if they exist at all, may not have been reviewed in many years. Additionally, the number of attachments in the field may not be accurately known. Substantial economic benefits can be realized by the utility when contracts are brought up to date with current pole rental rates and permit fees, and accurate attachment counts are obtained. Retroactive billing for unreported attachments may be appropriate and may offset the pole owner's portion of any inventory costs.

Data Integrity

Many pole attachment agreements provide for initial and periodic attachment inventories at the expense of the attaching company. Many utilities choose to leverage the visit to each pole location by obtaining additional data related to their own facilities. For a nominal incremental cost to the owner, not only can the attachment count be verified, but the utility can also collect or verify the attributes of its own facilities. Thus the opportunity is there to create or update an asset repository such as a GIS, physical plant records file, or financial asset database.

THREE STEPS TO JOINT USE MANAGEMENT

Implementation of a joint use management process is typically a three-stage process. Initially, contracts are adopted which reflect contemporary language and fees. Secondly, an attachment inventory is conducted to determine the current state in the field and provide a baseline for maintaining attachment counts going forward. Thirdly, an attachment permitting process is put in place. Utilities may perform joint use management internally or may choose to outsource this function to any one of a number of firms.

Contracts

Experience shows that many joint use contracts were executed during the early days of the cable industry and have been largely neglected since that time. Among the deficiencies in these contracts are obsolete terms and conditions, insignificant pole rental rates, lack of a permitting process for on-going attachment requests, and ineffective enforcement provisions. These contracts provide the foundation for all aspects of joint use management and must be brought up to date before any subsequent work can begin.

Although the term "joint use" is often used generically, from a contractual standpoint, this terminology often refers to a specific type of contract where two or more pole owners agree to utilize each other's poles. This type of arrangement, perhaps more appropriately called a "joint ownership agreement",

allows attachments at no rental fee provided a stated pole ownership ratio is maintained. For example, an electric utility and a telephone company may agree to jointly use poles provided the electric company always owns 55% of the poles, and the telephone company 44%. The two parties would true up the ownership ratio periodically as poles are installed and removed.

Another type of pole utilization agreement provides a license for another party to make attachments to the owner's poles. This arrangement is simply a pole space rental agreement in which the licensee is granted attachment space on the pole in exchange for a rental fee. The licensee is also required to comply with all regulatory standards and with the standards dictated by the pole owner.

Attachment Inventory

After joint use contracts are modernized, it becomes important for the pole owner to determine the number of existing attachments per licensee. Therefore an attachment inventory is performed, normally funded by the licensees, to provide a baseline count for future joint use accounting. As an added benefit, the inventory is likely to produce new revenue for the pole owner, not only from the higher rental rates in the new contracts, but also from previously unidentified attachments. Experience shows that attachment counts for billing purposes are frequently understated.

The inventory may also include a safety audit of the facilities at each pole and at midspan. The vertical separation between the power equipment, each additional cable or device, and the ground is measured for compliance with the National Electric Safety Code and the utility's own standards. The responsible party is advised to correct non-compliant installations. To leverage the visit to each pole, the utility may also choose to inventory its own facilities and their attributes to create or update an asset repository.

Attachment Permitting

When new contracts are in place and a baseline has been established for existing attachments, a permitting process is put in place for all future attachment requests. This process assures that all new attachments are identified for billing purposes and that the attachments are installed according to safety codes and standards.

After receiving an attachment permit request from a licensee, an inspection of the specified poles is performed to determine whether the owner will require any modifications to maintain compliance with codes and standards. In addition, a digital photograph may be taken for future reference. This work is typically referred to as "make ready work", because the facilities must be "made ready" to install the new attachments.

After make ready directives have been identified, an engineering design is performed to specify exactly how the installation is to be configured as well as the materials and cost. The design may include a pole loading calculation to determine whether the existing poles can support the added weight of the new attachments, something that can be very important in dense urban areas where many telecommunications services are offered.

Following the make ready inspection and engineering, the licensee may choose to fund the work as designed, or perhaps choose a less costly alternative route. When the make ready construction is completed, a permit is issued granting permission for the licensee to install the new attachments. An as-built inspection is performed after the attachments are made to verify that the new installation is in compliance with codes and standards. And finally the new attachments are added to the continuing inventory count for billing purposes.

In 1997, a national organization of utilities was formed for the purpose of improving the coordination of joint ventures. The National Joint Utilities Notification System www.njuns.com was created to offer member utilities a tool to communicate and track information on a variety of shared concerns, including pole transfers, joint trenching, and permits for new attachments to poles. The system provides for registering projects, routing work among the affected companies, and producing reports. There are currently over 2000 members in 17 states.

GIS AND JOINT USE MANAGEMENT

The process of joint use management involves utility assets positioned at a physical location on the surface of the Earth, each uniquely described with its own physical attributes. These assets can be pinpointed on a map by applying a coordinate system to the area of interest and determining the x-y coordinate pair necessary to describe the location of each asset. By extending the "map" to a Geographic Information System, a model of the real world is created that represents not only the location of the assets but their associated physical attributes as well. By capturing joint use management attributes in the GIS, its power as an analytical tool can be used to advantage for managing the process and making decisions. As they say, a picture is worth a thousand words.

Quality Control

When field inventory data is viewed and analyzed in the GIS, data quality issues become readily apparent. Positional accuracy judgments can be made through a simple visual inspection of the location of each facility in relationship to its neighbors and to other landmarks. Spatial queries can then be performed to further analyze data quality, perhaps to identify missing or non-conforming data. For example, a spatial query can identify a missing attachment where

neighboring poles all have attachments, or a misplaced attachment of Company A in an area served by Company B.

Work Management

In the attachment permitting process, the GIS can be utilized to manage make ready inspection and construction activities. The poles involved on each permit can be identified in the GIS using a visual attribute such as color or symbol. Similarly, the nature of any make ready work required at each pole could be identified. The status of each permit application throughout its lifecycle could be visually portrayed and notification of overdue work could be initiated. An expanded view could be used to graphically identify the location of all of the permits in a given work area for resource planning purposes.

Management reporting

The spatial query capabilities of the GIS can be utilized to create visual management reports associated with the joint use process. Questions such as the following can be easily answered by performing spatial queries against the joint use field data.

- In what areas are the attachments of various licensees?
- Which poles have safety violations and what is the nature of the violation?
- Where are the violations of each licensee?
- Are there geographical trends in safety violations?
- Which poles require make ready work and what is required?
- Which poles require replacement due to excessive loading?

CONCLUSION

Joint use management can play a major role in a utility's asset management strategy. There are many benefits to be gained in the areas of safety, risk management, economics, and data integrity. At the very least, joint use management leads to greater emphasis on field asset utilization and condition. Many times the utility learns more about the condition of its own assets than those of the licensees.

For those utilities that have yet to realize the full benefits of GIS, the potential new revenue generated by joint use management can provide a source of funding for GIS initiatives. Collection, correction, or augmentation of GIS data can also be accomplished as a by-product of the joint use management process. And finally, the mature combination of joint use management and GIS can provide the utility with the tools to effectively manage their assets into the future.