

## **Survey & Engineering GIS Summit Paper 2176**

### **Why I should Record My Survey**

Michael L. Binge, PLS GISP

Patrick Bresnahan, Ph. D. CMS, GISP

### **Overview and Purpose**

The intent of this paper is to emphasize the value of GIS to Surveyors as well as the value of Surveyors to GIS. The underlying theme is the desire for a “Spatially Accurate” multi-purpose cadastre. GIS Professionals require an accurate land base to work from. The responsibility for the accuracy of that landbase with respect to ownership rests in the hands of Land Surveyors.

The resultant data from a survey can only be shared if there is a vehicle for making that possible. A uniform method of recordation benefits both parties. It gives GIS Professionals spatially accurate land ownership lines. And when the database is kept current, it greatly improves research capabilities for Surveyors.

Many states require Land Surveyors to record their property surveys. Some don't, and there is resistance to implement recordation. And that raises a fair question. Why isn't recordation of property surveys more universally accepted?

### **The Accuracy Premise - Spatial Accuracy Versus Survey Accuracy**

All users of GIS data desire accuracy. But accuracy is a relative term. There is a difference of opinion about what “accuracy” means when it comes to spatial accuracy. Accuracy is use driven. Spatial accuracy with regard to GIS is always finite. Values are understood to be absolute. Absolute, that is, with respect to the application of the data. In the ever expanding universe of geospatial data applications, “usefulness” is what drives users to an application while “accuracy” gives the user some feeling of comfort with the results.

Surveyors understand values to be transient. Measurements of lines will vary over time. That needs to be clearly understood by both parties. Narratives in legal descriptions do not always match the evidence on the ground. And that very often adds to the confusion.

### **The Legal Description**

In theory, properties always adjoin. It's just the surveys that sometimes don't. The resultant disputes are typically about exactly where they do adjoin.

There is a widely held belief that the property description contained in a deed is the defining entity for the location of that property. Descriptions contain both numerical values and narrative. The narrative can often be at odds with the numerical values. At that point it becomes a matter of interpretation.

Survey maps and plats often contain references to previous measurements that differ from current observations. What happens after that can be problematical.

### **Sound Reasons Property Surveys Should Be Recorded**

Surveyors don't work in a vacuum. Their product has impacts. In the past many believed the world of private land surveying involved two parties exclusively, the surveyor and the client. That is simply no longer the case, if in fact it ever was. There was always an unnamed third party, the public, usually represented by the local municipality.

The history of keeping public land records is not a novel concept. It dates back Millennia. What has changed is the method and technology.

### **Benefits of System**

The benefits to the Surveyor are significant. When we build a central data repository not only do we have a shared research volume, we have security and oversight. And in some measure we have a level of accountability that did not previously exist.

### **The spatially accurate Cadastral Parcel Base**

The consumer/client benefits from an accurate public records system. It protects the client because the process is open. It needs to be uniform and clearly defined as well. A well-managed public record can offer a degree of protection against future title claims.

The review process can efficiently identify and process the affects of public safety, flood, seismic, covenant and easement issues.

### **The Reverse Argument - What are the best reasons not to record your survey?**

*It saves the client money.*

Does it? Land development fees are a modern fact of life. They aren't going away. And they are not likely to go down.

*Other people can use my survey data without charge.*

This is not true. Only the geometry of a property survey ends up in the GIS. CAD files are never redistributed. Copies of surveys are made available in paper or raster format for research purposes.

### **How Much Does A Survey Cost?**

Surveyors frequently compare themselves to other professionals as they wrestle with the issue of their professional image. The most often used match or mismatch is: Why don't surveyors have the same prestige as doctors and lawyers? For that matter, why don't we have the same prestige as engineers?

So, how much should a survey cost? Well it would seem the doctors and the lawyers have surveyors at a disadvantage. How much does it cost to cure cancer? And, how much is your freedom worth if you are charged with a crime? Those are powerful messages to be sure. But then, how much does a bad survey cost?

It can cost a client a lot. It can cost a surveyor his license. Having a data base to check work result against is a very good insurance policy.

### **It's About Change**

*“Change has considerable psychological impact on the human mind. To the fearful it is threatening because it means that things may get worse. To the hopeful it is encouraging because things may get better. To the confident it is inspiring because the challenge exists to make things better. Obviously, then, one's character and frame of mind determine how readily he brings about change and how he reacts to change that is imposed on him.”*

King Whitney Jr., President, Personnel Laboratory Inc.

To a sales meeting, quoted by Wall Street Journal 7 Jun 67

### **The Geospatial Professional**

The role of the Surveyor in modern Land Development practices is changing. To be sure, it is not getting any easier to be a Land Surveyor. Property values have soared. And along with those increased values is an increase in liability. In many locales the Surveyor has to help guide his clients through an ever increasingly difficult Land Development process.

This situation is not unusual in some areas:

#### **Developer Fees**

Planning Application	\$8000.00
Environmental Review...	\$7000.00
Fish & Game	\$2000.00
Subdivision Review	\$3600.00
Park Impact	\$10,000.00
Survey Review	\$1000.00

These fees are a significant investment to a developer client. The sooner that client begins to get some return on that investment the more satisfied he usually is. “E Business” utilizing digital documents is a modern reality. And in the world of Land Development it is a powerful tool to expedite the process when properly implemented.

### **The Many Benefits to Governments and Citizens**

Local governments have already realized significant benefits to cooperating with the surveying community in establishing a survey data submittal process. A few of the documented benefits include:

Provide County personnel with the ability to efficiently and quantitatively evaluate individual site plans. Digital files can be used within GIS-based engineering and planning applications to determine compliance and impact.

Provide/promote the capability to evaluate site-specific plans within the larger context of County-wide planning, development, water quality, and services.

Promote interdepartmental and inter-agency communication and information exchange. Spatially referenced plans can be viewed by numerous permitting personnel simultaneously within their existing GIS databases.

Create (digital) repository of development plans that s network accessible by all government departments. Such repositories allow archiving and recovery of plan documents.

Improve 911 capabilities. Assignment of street names, address ranges, and addresses prior to occupancy (which could take years) defines location for dispatching of emergency services. Without early addressing, dispatching to construction sites requires verbal description of location.

Improve planning with visualization of pre-construction developments. Landscape impact and build-out scenarios are used by government engineers, planners, and elected officials to evaluate future projects.

Provide increased community awareness of development with visual display of submitted, approved, and existing development. Internet-based map display of proposed and approved development keeps citizens and stakeholder groups involved in the growth process.

### **Digital Submittals**

Many believe the best way for Surveyors to participate in the management of the land base is through digital submittal of plats. Submitting surveys digitally does two things. It saves costs by reducing the labor of placing the geometry of the survey in the GIS. The other thing it does is reduce the time between recordation and document retrieval.

### **Where it Works**

Orange County California was one of the first municipalities to recognize the importance of an updated land records system with public access. They began requiring digital versions of survey documents in the early 1990's. Today, Orange County maintains a fully web enabled enterprise GIS from which digital images of survey documents may be accessed.

### **No Free Ride**

Other local governments have realized numerous benefits from digitally submitted surveys. Although the list of benefits continues to grow, it must be noted that use of digitally submitted survey data is not a "free ride" for government GIS. Use of digitally submitted surveys will NOT eliminate manual manipulation of data. Digital submission will, however, limit the amount of redrafting required to evaluate plans or update the parcel layer. Surveyors must also be assured that their submitted survey is not being manipulated. The submitted survey file is maintained in its original form and entirety. Most often, the survey file is stored on a server only to be accessed in rare occasions as a reference to parcel mappers and is NEVER distributed. The parcel fabric is what is manipulated in GIS. Lines must be adjusted to create and maintain the seamlessness of

the layer. Fundamentally, this is why the GIS parcel layer is more aptly described as “spatially accurate” not “survey accurate.”

### **The Spatially Accurate GIS**

The City of Encinitas, California GIS Group views the need to have a spatially accurate basemap as a high priority. Their lead analyst David Van Pelt explains it this way.

*"Many departments within the city rely on our GIS, so our basemap must be configured correctly," says VanPelt. "The cadastral maps of the past were not created with the degree of care and precision that is required in today's environment. They need to be more spatially accurate so they align better with our aerial photography, infrastructure, water, and sewage map layers in our GIS. Cadastral Editor is an easy solution to a complex problem. It is well designed and will help us build and maintain a new and robust cadastre that will continue to work effectively in our enterprise environment as our data improves."*

There are numerous methods and procedures local governments use to create and maintain geospatial data related to taxed property. Each method entails differing levels of spatial accuracy from accommodating how decisions are made to present a seamless layer of parcels. Although an audit or “construction” layer of parcels may be maintained that represents more accurate but non-seamless parcels, the objective for local government GIS is to maintain and present a seamless plain of taxed and addressed property.

Even if a local government has maintained a relatively accurate base layer of parcels, importing digital surveys provides spatial accuracy that helps improve GIS with time. Some have called this concept the “self-healing parcel map.” The concept accepts initial inaccuracies within the data layer and anticipates improved accuracy over time as survey references are added.

The objective of the government GIS is to support all service departments while providing useful information for citizens and businesses. Departmental support includes taxation as well as planning. Thus, the accuracy of the final parcel product is driven by its intended purpose. Success or quality of your local GIS is subjective relevant to a user perspective. From recording property transfers, updating zoning changes, and assigning tax value to calculating hospitality tax per commissioner district, the parcel maintenance process is highly transactional and benefits many users. The overwhelming majority of those users are adamant in their demand for data usefulness and accept the relative accuracy of discrete features.

### **Spatial Reference**

As with all other professional collaborations, the Surveyor and the local GIS must communicate with detail and standards to make certain that anticipated benefits are realized. Without an understating of the reference system used and appropriate translations, the survey data may not even be viewed within the local boundary extent.

Thus, the rookie question of “why is this survey showing up in the middle of the Atlantic?”

Many successful GIS operations work with the local surveying community to establish reference standards prior to system development. The definition and publication of projection, datum, unit of measure, and other specifics are mandatory if surveys are to be submitted digitally. Cooperation between surveyor and GIS starts in system development with standards.

### **Cooperation Pays**

For digital submittal of survey documents to benefit the surveyor, the government GIS operation and the citizens, cooperation is essential. Local governments considering digital submittal must recognize the importance of a supportive survey community. There are many documented methods local GIS operations have employed to encourage participation and elicit support from surveyors. Although some of these efforts require significant financial investment, others are simple but effective.

As a benefit to local surveyors, some local government GIS operations have funded elaborate monumentation projects. Creating and maintaining a survey monument network is a task GIS shops can only undertake with leadership from professional surveyors. Establishing and ‘blue-booking’ a monument network is a significant financial investment by a local agency but the resulting return on investment is equal in significance. Reference to the established monument network is but one necessary parameter for efficient processing of submitted survey data. Assumptions that such a network is unnecessary and that all surveyors use the latest GPS technology is a prescription for failure in many parts of the country. In several locales, the GIS and surveying communities have entered into cooperative programs in which local surveyors install and establish monuments with the local government picking up the cost of materials.

Other offerings to the local professional community include free seminars. Local governments that contract for aerial imaging can include requirements in the contract for the vendor to provide static displays of digital imaging and lidar equipment during non-peak flying periods. Such requirements often carry limited costs as the private firms are often eager to display their equipment and give presentations on the technology. In addition, by partnering with contracted vendors, seminar agendas can be submitted by the local agency to the state licensure board to provide attendees with required contact or professional development hours. In the long run, the agency benefits from submitted surveys, the vendor benefits from increased business exposure, and the local surveyor gains free contact hours required annually for maintaining licensure.

### **Why Aren’t More Surveyors Involved In GIS?**

This is a frequently asked question. The answer is both simple and complex. GIS is not just new technology, it is a new way of thinking about the way many of us do business. The reluctance of surveyors to record their surveys has been documented in the numerous

locations in the country that have begun such programs. The concerns of surveyors are often addressed with open communication.

Focusing on the benefits to all, surveyors are starting to embrace the practice:

The Spartanburg Herald-Journal (October 26, 2004)

*“County officials have met with a group of local surveyors to negotiate what information would be included in these digital plats. Trey Blackwood, an engineer with Blackwood Associates, represented some of the surveyors' concerns at a recent meeting of the County Council's Land Use Committee. ‘You're always going to have some bumping and groaning,’ Blackwood told council members. ‘But I think the benefits would far outweigh any groaning that would be done.’”*

James P. Weidener, P.L.S., CE News (November, 2001)

Regarding Miami-Dade County, FL plats requiring state plane coordinates FL DOT requiring Digital (FTP) data submission

*“This is work for surveyors, and the developers can afford it since they pass the cost along to the home buyers. It is useful and cheaper (not counting the potential savings to the taxpayer) than trying to reproduce the same thing later. Yet, unbelievably, some surveyors oppose this regulation. Are we such poor business people that we cannot see the value?”*

GIS is a concept whose time has come in the world of surveying. Digital submittal of survey data is just one facet of a growing integration among professions and technologies.

Michael L. Binge PLS GISP

GIS Consultant

11087 via San Marco

San Diego, CA 92129

(619)985-4582

[m.binge@worldnet.att.net](mailto:m.binge@worldnet.att.net)

Patrick Bresnahan, Ph. D. CMS, GISP

Mountain House Consulting

18 Maple Leaf Dr.

Etowah, NC 28729

(828) 393-0030

[Patrick@Bresnahan.com](mailto:Patrick@Bresnahan.com)