

## **Maximizing the use of GIS to enhance assessment methods**

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### **Abstract**

Individuals in the assessment industry are still realizing the benefits that wider use of geographic information systems (GIS) technology can bring. This session will discuss how the ability to move seamlessly between a GIS environment and Computer Assisted Mass Appraisal (CAMA) system enhances the assessor's capability to see, query, analyze, and manipulate data in both spatial and database environments. It will argue that assessors need a powerful CAMA system that manages workflow, integrates with GIS, and has the flexibility to value property using industry standard as well as client-specific methodologies to provide the most accurate information and best level of customer service.

### **Introduction**

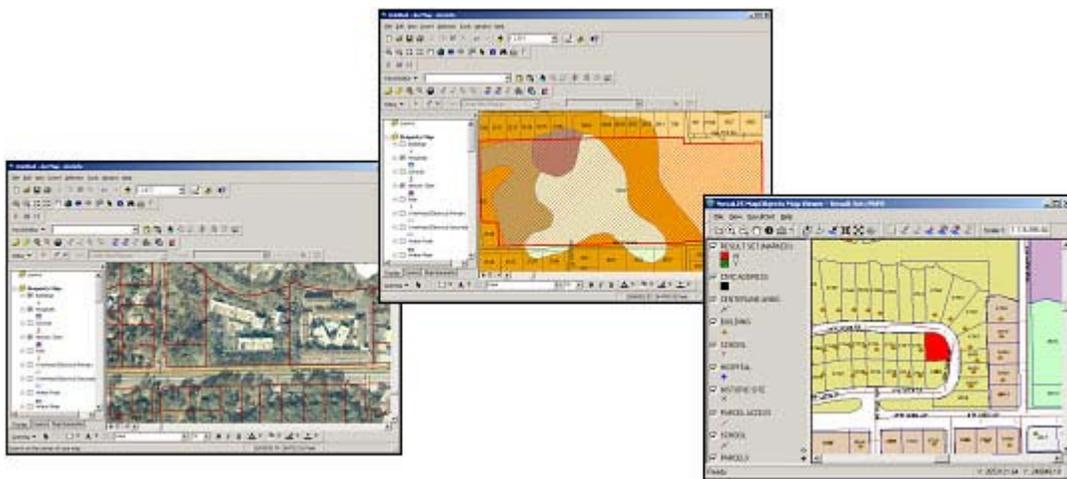
The frequency at which geographic information systems – or GIS – are being used both consciously and unconsciously increases daily. Now more than three decades old, GIS technology is maturing and branching into new areas. As is the case with innovations such as the radio, television, and personal computers, people are constantly finding new and original ways to leverage the power of digital maps and land information, sometimes so seamlessly that we are not even aware of the technology behind the scenes. Whether plotting a driving route for your next vacation, developing a new subdivision, or completing a comparative sales analysis to determine property value, today GIS has a key role to play.

In his book, Beyond Maps: GIS and Decision Making in Local Government, John O'Looney states, "at least 70 to 80 percent of the average local government's work involves land or geographically related issues of tasks." While much has been written about the merit of using GIS in land use planning and the management of government services, there has been surprisingly little written about the value of GIS to the assessor.

Today's communities are in a constant state of change and growth. Assessors must continue to provide accurate and consistent real and personal property valuations while facing challenges such as an increasing number of properties to value, complex tax laws and exemptions, and the need for public access to records. In most cases, this must be accomplished with the same or fewer in-house resources. Individuals in the assessment industry are still realizing how wider use of GIS technology

can help them achieve these goals, and share information more effectively with land agencies that have a similar need for comprehensive and accurate land information.

This paper will discuss how the ability to move seamlessly between a GIS environment and Computer Assisted Mass Appraisal – or CAMA - system enhances the assessor's capability to see, query, analyze, and manipulate land-related data in both spatial and attribute environments. A powerful CAMA system is simply a starting point for today's assessors. In order to provide the most accurate information and best level of customer service, assessors need a powerful CAMA system that manages workflow, simplifies the sharing of information, has the flexibility to value property using industry standard as well as client-specific methodologies, and most specifically integrates with GIS.



***CAMA solutions that provide full integration with GIS products such as ESRI's ArcMap, ArcView, and MapObjects software (images from left) enable assessors to visually select and perform activities such as a comparative sales analysis.***

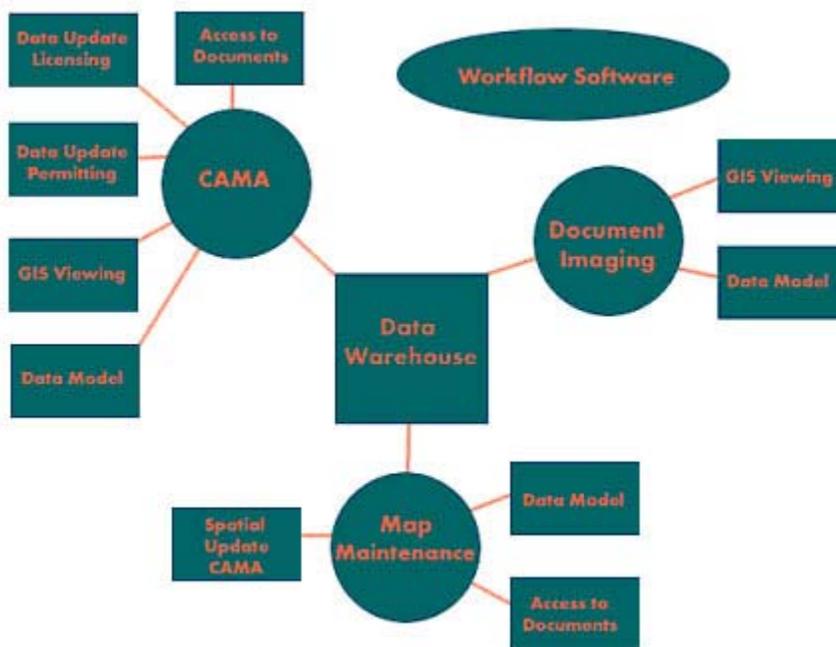
## **The Case for True GIS Integration**

Building GIS into the core business processes of an assessment agency is a tremendous challenge. In order to successfully accomplish this goal, the technologies used in core business processes such as property valuation, appeals management, and task distribution, must be capable of integrating with and using GIS technology. If not, the architecture of these applications becomes an impediment to achieving true GIS integration. If the producer of these applications is not GIS savvy, this poses a more significant hurdle in achieving an enterprise GIS – the need to replace the existing architecture with a completely new system. Despite these and other less substantial obstacles, the value to achieving true GIS integration in terms of time, resources, and money saved far outweighs the initial impediments to implementation.

Once you understand the value that GIS can bring to your assessment system, the next step is to develop a strategy to make it a reality. There are as many definitions of GIS integration as there are vendors on the market. Basically, GIS integration can occur at a number of progressive levels: hardware, data duplication, data access, data sharing, functional, workflow, and inter-departmental. Hardware integration is the most basic, while data duplication, data access, and data sharing each increase in terms of sophistication. These lower levels of integration can bring GIS into the assessment office, but they do not enable “true” GIS integration.

For many assessment agencies, GIS is simply an add-on to an existing system. The two most popular methods of adding GIS to an existing system are simply placing a desktop GIS application on each computer, or providing Web access to the GIS for employees through the business process. While greatly expanding the access to GIS tools, most people do not fully utilize the GIS in this manner because it is not truly integrated. Adding GIS provides assessors with another source of information, but does not make it an integral part of the core business process.

Simply adding GIS on the side poses another challenge that is easy to overlook as a GIS manager. That challenge is the movement of information between the business process in the assessment system and the GIS. With the add-on approach, information transfer is not seamless; it must be manually transferred from one technology to the other. This creates isolated islands of technology and triggers resistance to change and adoption of new technologies.



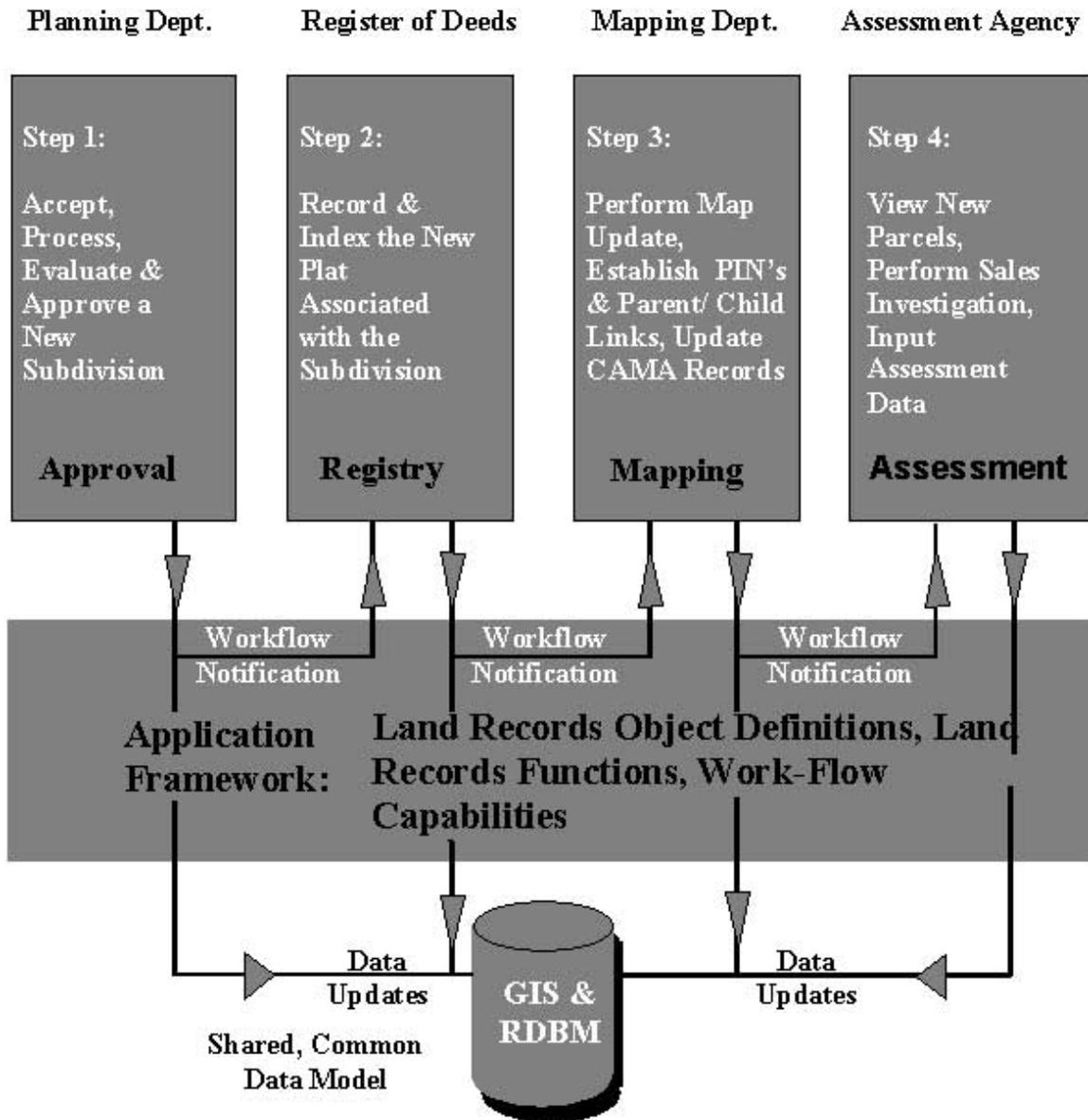
***Islands of technology impede the workflow process, and can prevent true GIS integration in the assessment office***

An example of how islands of technology do not provide true GIS integration is the case of an assessor that wishes to send a letter to all residents within a certain geographic area of the city to notify them that their property is going to be reassessed. The business process for this activity requires selecting the properties from the CAMA system. Once this is complete, the information must be manually entered into the GIS system to confirm that all residences within the geographic area have been included. The labor-intensive movement of data from one system to the other may be just enough to cause someone not to use the GIS. If the assessor makes it this far, the resulting GIS query to notify residents now needs to be fed back into the assessment system to generate a letter containing information about how appraisal are calculated and appealed. This requires yet another manual interaction moving data between systems. These manual moves, an unavoidable consequence of using an add-on approach to GIS, are typical reasons that prevent GIS from reaching its full potential in local government offices. This is just one example and if you use this approach studying your assessment organization's business processes will reveal many instances where information is passed between systems.

It is not until you enter the more advanced levels of integration - functional, workflow and inter-departmental that the obstacles inherent in a system based on islands of technology evaporate. Higher levels of integration provide for improved efficiencies in business processes, reduced costs in on-going monitoring or maintenance of the various systems, easier access to the technologies or data, and generally a more functional implementation. To reach these higher levels and achieve true GIS integration, you must implement business process solutions that utilize GIS as a core component of the solution. The GIS should be another set of data used to facilitate the business process just as entering tabular data, accessing code descriptions, running algorithms, viewing scanned documents, reviewing sketches or CADD drawings or looking at digital pictures. Applications that have GIS built into the core enable the GIS user base to expand to the greatest portion of the organization.

Replacing core business applications or integrating GIS into them is not easy and may not be inexpensive. The simplest approach may be to wait until the natural life of your present CAMA system is nearing an end, and make sure that the new solution is GIS enabled. Implementing an assessment solution that provides full GIS integration at the core business level will enable you to maximize the number of individuals taking advantage of GIS information, and maximize your return on investment made in the GIS. This type of solution places the benefits of GIS into the hands of the people who most need spatial information in making daily decisions. The merits of spatial information in decision-making and integration tasks for assessors will be discussed next.

## GIS-Enabled Business Applications



*This diagram shows a simple view of how GIS and business applications may be integrated to maximize the use of GIS across all government land agencies.*

## GIS and the Assessor

While many assessors can see the value of adding a GIS to their computer assisted mass appraisal (CAMA) system, they are not necessarily convinced that it is a necessity to do their job. If your jurisdiction has just invested a large amount of money into a CAMA system that is not GIS-integrated, you may not be ready to take the plunge. But if you are looking to purchase or replace your existing system, it would be folly not to consider the advantages of moving to a system that offers true GIS integration. Solutions that offer true GIS integration through ESRI technology enable you to move seamlessly between a GIS environment and a tabular environment to see, query, analyze, and manipulate data in both spatial and database environments. Tasks such as neighborhood delineation, comparable sale property selection based on proximity to the subject property, task assignment by geographic area, and soil or land use calculations per parcel are simple in the integrated GIS environment. Because both spatial and attribute information can be stored in a single database, data is accessible and can be updated from either the GIS or CAMA systems.



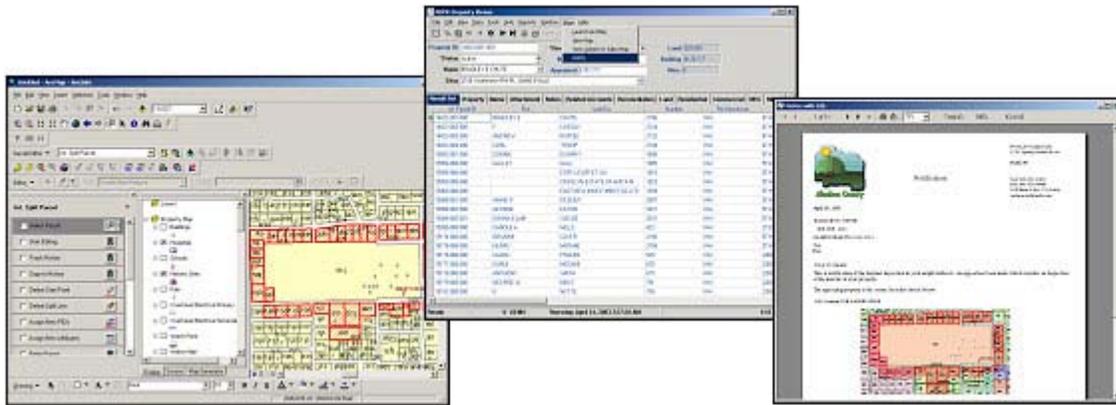
***CAMA systems that offer complete integration with GIS enable you to review land information in many forms such as tabular, spatial, sketches or images.***

The use of GIS in property valuation provides a win-win situation for assessors and the citizens they serve. Whether your office uses cost, income, market, or statistical approaches to valuation, GIS can help enhance your valuation process, reduce the number of appeals due to complaints of unfair assessments. The flexibility of a truly integrated system enables updates to be made spatially and reflected in the CAMA system without need of re-entry. This saves time and ensures that every party involved in the land records management process always has access to the most up-to-date information.

In order to illustrate how GIS improves the assessment and appeal process, let's take the example of the imaginary town of Springfield, Idaho. In Springfield, the city uses the market approach to determine property value, the most equitable and widely accepted system in North America. In this approach, the assessor measures many of the same characteristics as a purchaser. They include the size, layout, shape, age, finish, quality, number of carports, garages, sundecks and condition of buildings. More importantly, available services, location, views, and neighborhood also influence the property's market value. Springfield assessors need to be aware of all real estate sales within their area, and analyze them to develop common units of comparison and corresponding values. These location-based characteristics such as locations, views, and comparable sales are most easily identified and calculated using a digital map. Using a GIS, the Springfield assessor easily views the characteristics that affect the value of a property in order to help determine the most accurate and fair property value.

Critical time and resources can be effectively managed through a GIS integrated workflow processes. Using a system that is not map-based, much time may be wasted by the assessor traveling from site to site. Main Street in Springfield runs many miles. Without the aid of spatial data, the Springfield assessor might be assigned inspections on opposite ends of this street that are miles apart. Due to travel time, the assessor may only be able to assess the two properties on Main Street in one day. If GIS is used to determine the work schedule, the inspector could easily be assigned to a more logical geographic area and conduct twice as many inspections in a day.

Once the new assessments are prepared, Springfield depends on the GIS to quickly select the appropriate properties in which to send out assessment notices. The Springfield system has full integration between the GIS and CAMA systems, so the mailing list generated in the GIS is available in the CAMA system to generate a mass mailing list to affected residents. Because the information can be shared between the spatial and attribute side, the Springfield employee tasked with sending the mailer might not even know they are using GIS. They simply get their job done in an easier, more efficient manner. The Springfield GIS-enabled business application reduced this activity to less than 30 seconds!



***GIS-enabled solutions allow you to quickly perform workflow tasks such as generating notification letters on the fly.***

Once the Springfield residents receive their assessment notice, GIS also aids in the appeal process should they determine the assessed value on their property is not fair. Going on the Web, residents can quickly access and print map information that enables them to visually compare information about their property valuation with others in their neighborhood. In many cases, simply understanding how the new value was determined can reduce the number of appeals. This results in less time preparing for hearings and more time creating the right balance between the citizens desires for low property taxes and the community's property tax requirement for funding schools, police, public transportation, snow removal, and other services.

## **Conclusion**

Assessment and appraisal systems that provide true integration with GIS eliminate the manual or people linked information between the business process and the GIS. A GIS-enabled business application enables you to access any GIS function in conjunction with the business process, while providing the integration of the data electronically and automatically. As a result, GIS technology is not an add-on, but an integral component of the assessment office solution. The ability to view, query, and analyze spatial data enhances the assessment process by making valuation patterns easier to detect inside and among different geographic regions in a community, improves work efficiency through spatial task management, and enables assessors to provide a better picture and service to the community they serve.

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