

61 Hot Tips on GIS/LIS

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Hot Tips 1-6

During more than 15 years in mapping and surveying Mr. Rex W. Cowden has developed GIS programs or played an integral role in more than 100 municipal GIS projects, over 25 military GIS projects, and more than 50 GIS projects for private agencies and utility companies. Mr. Cowden is a Partner, and Director of Geographic Information Services Div. at Woolpert, 513-461-5660.

Be a GIS/LIS champion, or find a champion with credibility and decision-making ability. GIS projects often last for years, and it takes courage and hard work to get them done.

List exactly what you want the GIS/LIS to do, and the results you want from it. Design to meet the most important requirements, to fit your needs. Without a clear vision or goal, a lot of time and money can be spent without success.

Design and build with maintenance in mind. As with any information-based system, the real costs of a GIS/LIS lie in keeping the data current. Do not include any features or information in the original system which you cannot afford to maintain. Otherwise, people may lose confidence in the system.

Avoid the bleeding edge. GIS is not new technology. Unless you have a sound reason to be the "first kid on the block" to buy a system, go with a system that has proven capabilities for the applications most needed. Join a user group for help with problem solving. Let someone else suffer the failures of being on the bleeding edge.

Be a GIS/LIS champion.

Build for network capability. The age of the stand alone GIS is over. Keep network limitations in mind when you design the system. How far and how fast will the data, images, and text need to travel? How will you accommodate re-

mote sites and wireless links? If you don't build for the network, you'll miss the real paybacks of GIS/LIS - sharing data.

Always associate costs with the progress made. Most financial people are familiar with physical assets: chairs, tracks, things like that. Give them confidence in spending money on information by identifying the completion of a project phase or task with each invoice or purchase order.

Document resource responsibilities.

Hot Tips 7-12

Loy B. Wiley manages the Integrated Information Services Department within Woolpert's GIS division. She has had extensive experience in designing, managing, and organizing information systems for both federal and local government.

Document and publish the benefits and features of your GIS/LIS. Determine the cost of spending three hours getting information together for your primary responsibilities.

Determine the savings of having that information at your fingertips. Do not forget the downstream benefits to others who request the information. Make the results known. Document the features, too. Let people know how they can use the GIS, and they will use it. As more people use the system, the benefits will spread - and so will the converts to the GIS/LIS technology.

Document resource responsibilities. Clearly identify roles and responsibilities at the beginning of the project, and then at frequent intervals during the project. Who are the players? What will each player do? Who is paying for what? Tie resources to every event in your schedule

Confusion costs money.

and monitor it constantly. If you do not,

you will end up with overlaps or gaps in the things that need to be done. Confusion costs money.

Reengineer. Technology alone does not make you more efficient. Review both your organization and your process, in addition to looking at technology as a reengineering tool. As information sharing increases, you will find new ways to be more effective.

Design and build for integration. Work toward an open system concept. Set standards for an integrated system, and then accommodate variety to the extent that it is economical. You must allow other people to buy systems that work for their applications, but you can work together to maximize their needs within a set of standards that make integration efficient.

Hot Tips 13-25

David S. Woods, Manager, Technical Services, Aerial Systems, Eastman Kodak Company.

Capture the image on film, and gain the added flexibility of being able to digitize only as and when you need to. Many scanning systems are available that can convert a film image to a digital database - from "ortho-rectified" systems that allow users to simply take a quick look. GIS/LIS files captured on film are very durable. Ten or more years from now, it will be possible to transfer the original film to some newly-developed media or software system with practically no loss of data. Film provides an archivable, long-term record which will probably outlive the digital products it is transferred to.

Use black-and-white images for storage of GIS products unless colour is really necessary - you save by a factor of three.

Look at the entire image chain. Capturing an image is only part of the imaging continuum. Often, the image must be manipulated, processed, stored, retrieved, and, eventually, distributed.

Determine in advance how the information will be used, as this will determine selection of digital, file, "hybrid" or mixed media storage. Film is the cheapest: it costs seven to eight times more to store the same amount of information on a 5.1/4 inch disk, and twenty to thirty times more on magnetic media. Digital-based media rank high when images must be transmitted in real time. Consider future as well as immediate needs. Needs change, and detail or resolution which was not recorded cannot be added later.

Maintain a film archive of your original rolls under recommended storage conditions. Consider the advantages of CDs. CD writable technology offers a very low cost and effective means of distributing and archiving digital data from a GIS/LIS system.

Consider the data processing system when deciding how large a data file to use. Also, take into account data processing time and file size when assessing colour versus black-and-white, and resolution needs and levels.

Use multiple pixels when scanning. When scanning an image, place multiple pixels on top of the smallest object of interest, to ensure that no valuable information and detail is lost.

Consider compression/decompression variables. Depending on the level of band-width compression (which allows users to pack and store more data on similar media), image artifacting may occur. To simplify the process, a decompression scheme must always be placed with the data file to be decompressed.

Understand what is limiting resolution. When trying to assess resolution, a number of variables come into play. To better manage the quality of the end product, understand which variable - the film, the camera and the acquisition configuration, the scanner, the data processing algorithms used - is the limiting factor.

Understand the difference between the various resolution metrics that are used, especially between lines per millimetre and line pairs per millimetre. There is a factor of two difference between them.

Understand what is limiting resolution.

Hot Tips 26-35

Susan Nolen is a marketing manager for Intergraph's Mapping Sciences Division.

Training is often the first expense cut, yet it is typically the reason projects fail.

Plan your project to demonstrate success quickly. Show the benefits that justified the costs by starting small and growing at a pace success can follow.

Training is often the first expense cut, yet it is typically the reason projects fail. All projects bring change, you must value your human resources and be sensitive to the organizational impact a GIS usually has.

Accepting anything less than the most current technology puts your project at risk.

Data is the most important and the largest investment a project will undertake. Shop around for digital sources, look for productive conversion techniques, and keep it current.

Data accuracy is important; however, accuracy should be in proportion to the size of a project and/or the long term plans related to the end users needs for data. Prior to purchase, invest in an organized approach, establish clear expectations, and document participation.

Invest in your database design; it typically gets lost in vendor purchase decisions. Consider the future: select technology that is open and based on industry standards. Accept no vendor products that do not promote open systems.

Document your workflow early in the process. Use the opportunity to identify overlap and sharing opportunities.

Hot Tips 36-43

Jon Clark, of Sokkia Corporation, can be reached at 913-492-4900.

Design your GIS data collection system around an attribute solution. A complete attribute collection solution provides user-definable electronic checklists to steer the field technician through a re-

quired, standardized attribute data entry process.

Don't skimp on batteries and memory when you purchase your system. The extra dollars spent will be returned many times over by minimizing your downtime in the field.

The value of data degrades with time. To maintain the value of your GIS, plan on re-collecting data periodically based on the nature of that data. Stuff happens to stuff in the field.

Make sure that your system meets the needs of both field and office personnel. The most successful GIS implementations occur when the field and office work together as a team.

Choose a GIS with the shortest possible learning curve for your staff.

The most successful GIS implementations occur when the field and office work together as a team.

Carry out a "hands-on" evaluation before purchase, to make certain that a particular GIS data collection system meets your needs.

Some GPS antennas perform better than others in foliage. Evaluate your potential system in foliation that is representative of what you will actually be working in.

Look for a system that is easily adaptable to multiple applications within your business.

Hot Tips 44-51

Michael L. Hut, Manages the Geodetic Division at John E. Chance & Associates, Inc. (JECA), and can be reached at 303-220-1323.

Determine the overall goal(s) of implementation in order to define the necessary objectives/strategy.

Geodetic control is the basic foundation on which all GIS/LIS positional accuracies can be measured.

Define the positional accuracy requirements of your GIS/LIS project before any field work is performed.

Evaluate the many data acquisition "tools" available, in order to choose the one best suited to your needs.

Choose a qualified and experienced company.

Define and identify the sources of existing information. Evaluate the usefulness and the compatibility of integration into the GIS/LIS. Keeping accuracy in mind, the chain is only as strong as its weakest link (the accuracy of existing data).

Thorough specification (i.e. detailed and specific Scope of Work) for all activities to be performed are a must. Continued maintenance of positional information enhances the overall effectiveness of a GIS/LIS program.

Project reporting and error reconciliation help to mitigate later discrepancies.

Hot Tips 52-61

ASPRS - member Brent Mainzinger supervises software product development for clients of The Sidwell Co. and can be reached at 708-231-0206. He conducts presentations on GIS technology, assists in sysadmin for internal computer operations, and performs R & D.

Data and people are the most important aspects of a GIS. Technology provides only the tools with which GIS data is analyzed. Data acquisition should be the focal point of GIS planning. Accurate, well researched map data is worth the investment.

It is much easier to teach a mapper how to use GIS tools, than it is to teach a technician how to make maps.

Needs must be separated from "wants". Few can afford to include every desired type of data in a GIS, and so data types must be prioritized.

Balance the level of accuracy required against the cost. If \$200,000 buys a level of accuracy that satisfies 80 percent of your needs, and \$500,000 buys a level that satisfies 90 percent, is the extra \$300,000 in expenditure justifiable?

Data and people are the most important aspects of a GIS.

Base selection of software on the needs of the users and the vitality of the data. Select hardware last, basing your choice on the ability of the hardware to run the selected software efficiently.

Data maintenance and drafting functions are very important components of GIS software. At Sidwell, less than 10 percent of time is spent performing data analysis, whereas 80 percent is spent on data maintenance.

On-line storage of digital aerial photography, which may comprise huge data sets, may be a problem. Keep on-line digital photography for high growth and urbanized areas only. Bring other images on line as needed.

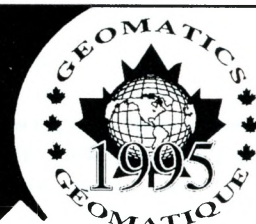
Write RFP specifications that emphasize what you want the GIS to do, and what data it must maintain. Ask vendors to tell you how they would approach the project, and compare.

The needs of agencies who are funding the project outweigh the needs of non-funding agencies. The price of GIS data varies greatly. Usually, you get what you pay for.



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