



# GIS Easy to Love... Hard to Implement

Advice on overcoming barriers to GIS implementation for small communities.

By: Gene Del Greco, GISP

GIS Manager, K.E. McCartney and Associates, Inc. (KEM)  
gdelgreco@kemccartney.com T: 419-545-3872

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These days, GIS is not a hard sell with communities. Modern GIS systems have been around for two decades, and even those in small cities and counties realize the cost effectiveness of implementing a GIS system. Nevertheless, there are still a few barriers standing in the way of GIS development in small and medium size communities. K.E. McCartney and Associates (KEM) is familiar with these barriers and can help build a GIS system that is sized to fit your community's needs.

The benefits to GIS are easy to see. Local governments are huge users of geographic data. Their day-to-day operations require them to use a wide range of maps including road, water, and sewer maps, zoning, floodplain and wetland maps, parcel maps, land-use and soil maps and a host of district maps such as ward boundaries, voting districts, fire zones, police zones, etc. Governments also keep reams of data related to geographic features such as soil types and characteristics, line sizes, ownership data, maintenance records, assessment values, and more. In the past, all of these maps and data were stored in cumbersome map cases and filing cabinets which made them very hard to access, organize, update, and maintain. The marriage of maps plus data in a GIS has revolutionized the way governments create, manipulate, and store their data. Most map

changes and additions can be done with little effort and can be distributed almost immediately. Maps can be shown at different scales, and multiple map layers can also be overlaid on top of one another. Most importantly, a whole city's worth of maps and related data can be stored and accessed on a desktop computer, lap top computer, or even on a mobile device. These maps can even be made public via a web mapping service.

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There are, however, several obstacles that many communities encounter in adopting GIS. There are also several myths that can slow or derail development efforts. Examples include:

### Expense

The expense of purchasing computer hardware and GIS software is usually the first thing cited as a major barrier to GIS adoption in small communities. This, however, is more of a myth than an actual barrier. Most "basic" desktop GIS programs will run on

computers purchased within the last five years or so, although a few older computers might require an inexpensive upgrade in memory and storage. Not all GIS systems require an expensive dedicated server. There are plenty of communities that distribute data updates to their departments on CD via interdepartmental mail.

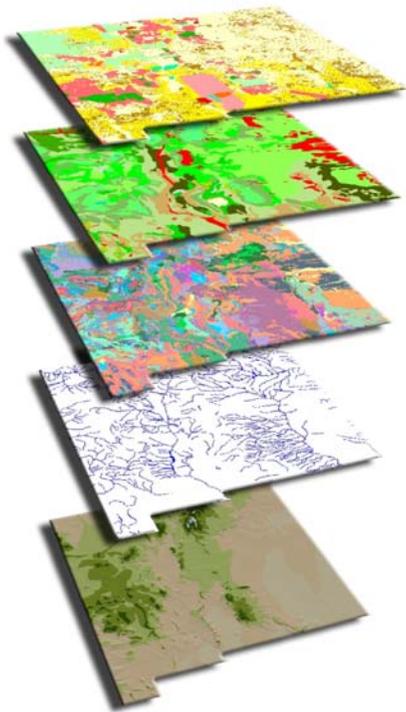
The price of purchasing GIS software is also less expensive than you might think. One desktop license for ArcView GIS, which is currently the most popular desktop GIS software, is approximately \$1,500. That is a good deal for very comprehensive GIS software that will allow you to do hundreds of geospatial tasks. On the other hand, the price-tag can be considered expensive if you have 6 or 12 machines to equip with GIS. The truth is, there is no need to put top notch software on everyone's desktop. Most of your users will not need all of the sophisticated tools. They could get along well with software that allows them to view, overlay query, and manipulate maps along with a few other basic GIS functions. The good news is that over recent years several cheap (or even free) GIS software has been developed such as Arc Explorer, Christine GIS, Accuglobe, and Quantum GIS. These programs allow for functions suitable for the "light" GIS user. Many communities are also using web mapping applications. Many small municipalities use the strategy of purchasing one high-

end GIS license for one machine to handle the more complex GIS tasks, and then deploy the free or less expensive software throughout the organization. Some communities will just use the less expensive software and rely on consultants like KEM to do the heavy lifting.

KEM has helped small communities assess their hardware and software needs. We have also assisted in deploying systems throughout organizations. In addition KEM has a wide range of advanced GIS software to perform more complicated GIS tasks and analysis for clients.

## Data Layers

The difficulty of finding data layers to run on a GIS can also seem like a stumbling block for small cities. These days, however, there are many developed data sets from state and federal sources that are free to the public or can be obtained at little cost. In Ohio and some other states, high quality aerial orthophotography is public. Many states and federal agencies



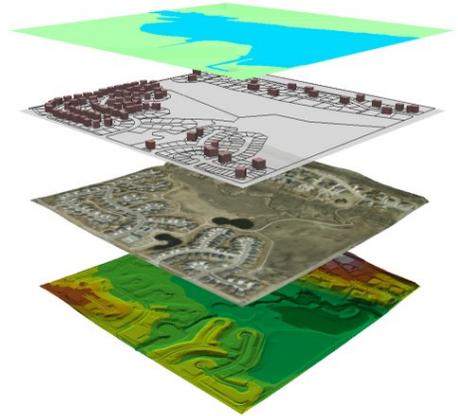
have GIS data clearinghouses that allow you to do one stop shopping for a wide range of data that pertains to your local area. It is just a matter of knowing where to look. A few cautions concerning this data, however, should be mentioned. Much of the data is presented in different coordinate systems and projections so some data will need reprojection and datum transformations to make layers fit in the same geographic space. Also, since these public layers have been collected at different scales using different accuracy standards, a knowledge of these matters is also important when interpreting the data layers.

KEM services include data compellation and reprojection. Our staff has done the leg work for communities by searching for, locating, and obtaining pertinent data layers from disparate sources and packaging them in a readymade collection of maps perfect to jump start a GIS system. KEM staff also has the necessary software and the wherewithal to deal with data transformation and projections as necessary.

## Map Creation / Conversion Expense

This is no myth. Even with free data most municipalities will be faced with building some of their own map layers. Depending on the kind of layer to be created, this can be expensive. Water and sewer map conversion in particular can be costly and time consuming. Here there are many decisions to make on what route to take for the conversion. Do you have your existing maps scanned and digitized, or do you GPS your facilities and build your map from scratch? Another very important decision is whether you hire a company to complete the conversion or do it in house. The big questions you should be asking

are do you have someone on staff who understands GIS standards enough to set up and supervise the process, and if you are using field personnel to gather data, do they



really have the time and training to do it? Using interns to build your GIS can sometimes lead to some inept results and many a small community has seen its in-house conversion efforts postponed or derailed because their field personnel were too busy legitimately performing their primary responsibilities and responding to emergencies.

KEM staff has a great deal of experience working with communities to accomplish map conversions. We can assist a community in planning a conversion program, advise them on map standards and procedures, and assist them with choosing a process that will fit their needs and budget. KEM's trained and experienced field personnel have successfully completed map conversions for many public agencies.

## Staffing and Training

Staffing and training requirements can also slow down the implementation of a community's GIS. If you have the funds to hire a dedicated GIS person, you should do it. GIS takes expert knowledge to run and maintain throughout an organization. Do not make the

mistake of assuming that your GIS needs can be met by an organizational IT employee. GIS is a specialized information system that has much more to do with cartography and geography than with computers. Most IT people don't know GIS and don't want to know it. They already have their hands full keeping systems running. Some small communities

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subsist with their in-house staff assigning one person in each department to assume GIS responsibilities. This can work well in some departments where you have a staffer that has fallen in love with GIS. This person realizes the benefits, is fascinated by the systems and is willing to put in the time on and off the job to learn GIS. If you have an employee like this, encourage this person and try to clear time for the employee to experiment with the GIS system. That is the best way to learn it. More often than not, however, GIS use will lag behind in many departments because the staffer assigned will be too busy doing his or her primary job and does not have the time or inclination to learn the GIS.

Perhaps the best solution to GIS staffing needs in small governments is to hire a part time GIS manager. This could be a private consultant or someone you share with another government.

( For example, some counties have GIS Consortiums, which is a very good deal if it is available.) Like a circuit riding city manager, a part time GIS manager can schedule time in each community to update data, make sure the system is running correctly, and train staff in its use. Because the GIS manager is a trained GIS specialist he or she will be able to handle the more difficult types of spatial analysis that is usually beyond the understanding of the non specialist. Some examples of these advanced applications include water and sewer network analysis, watershed modeling, facilities location studies, public safety response studies, fleet management, and mobile GIS.

GIS is very much like other forms of information technology. It revolutionizes the way we do things and completely replaces the tools we previously used. Map cases and cabinets stuffed with files are going the way of typewriters, Kodachrome, and the tape deck. As very large users of maps and spatial data, small governments need to build an effective GIS development strategy for the future.

The KEM staff is experienced in helping communities develop GIS on a shoe string budget leveraging existing resources wherever possible and in utilizing existing personnel. KEM's primary goal is to find ways for small communities to implement this critically important technology. GIS is the way of the future and all communities deserve access to the tremendous benefits associated with it.

For additional information regarding KEM's GIS Services please feel free to contact Gene Del Greco at 419-545-3872 or via email at: [gdelgreco@kemccartney.com](mailto:gdelgreco@kemccartney.com).

## Gene Del Greco Expands KEM GIS Services to OH, WV & PA

Over the past 10 years Geographic Information Systems (GIS) have grown to become the mapping tool of choice for both public and private sector clients. In response to this KEM recently expanded its GIS department and established a new satellite office to undertake GIS services in Ohio, West Virginia and Pennsylvania. In February of 2012 Gene Del Greco joined the KEM Team; Gene brings 35 years of experience working with local governments in three states. Over the past 20 years Gene has been closely involved with development and deployment of GIS systems for municipal and county operations. As GIS Manager for Richland County, Ohio GIS Consortium (2000-2011) Gene guided the efforts of a 22 member GIS Consortium. Gene worked with county and municipal governments to plan, design and implement a GIS system that supported a wide range of government services, and as Development Director of Weirton, West Virginia he coordinated the citywide GIS System.

Gene is a Certified Geographic Information Professional GISP and has been an active member of the GIS professional community for over 20 years. In Ohio he served as Chairman of the Ohio Chapter of URISA and was also Chairman of the Ohio Geographically Referenced System statewide GIS Forum for two years.

In addition Gene has received several GIS awards both individually and as part of a team. Said commendations include the OGRIP Best Practices Award to the Richland County GIS Consortium and URISA Outstanding Chapter Award Honorable Mention. In November, 2011 Gene was recognized by the Ohio Chapter of the URISA and the OGRIP Forum for outstanding contributions to the GIS Community in Ohio.

Gene will run the newly established KEM office in Weirton, WV with the focus being implementation of GIS services to the tri-state area.