



REDUCING YOUR GIS COSTS

UNDERSTAND YOUR CALL CENTER'S MAPPING NEEDS BEFORE YOU THROW MONEY AT GIS TECHNOLOGY.

THROUGHOUT THE PAST COUPLE OF YEARS, EVERY 9-1-1 official across the country has at least heard of GIS mapping. In fact, many agencies have already plugged in *some* kind of mapping application into their PSAP in lieu of the push toward Phase I and Phase II wireless distress call location.

Now that many of these mapping applications have been put into play, various problems are starting to surface. The number one issue, reaffirmed on a weekly basis, is that in order to meet the wireless mandate, agencies have pumped money into a mapping applications based on the recommendation of their trusted equipment, CPE or CAD provider. Then within six months to a year of actively using the system, the mapping either doesn't work, provides bad information or proves itself inadequate to do anything other than the most basic functions.

The core of the issue is that people who are buying and selling these emergency GIS applications don't have a firm grasp on the technology itself; therefore, defining and planning for what an agency needs out of its GIS now—as well as in a few years down the road—is not happening.

A recent study of all GIS applications, not just that of emergency response, found that 45 percent fail to provide the expected results; 87 percent go over budget by more than 50 percent; and 89 percent went over schedule (Hamil, 2002). Emergency response applications are showing themselves to be no different, and are having even worse results due to accuracy needs for emergency response that are 10 times greater than that of other standard GIS applications. So the failures have been more glaring and with far greater consequences.

The fallout from this trend is that dispatchers and field personnel are quickly turned-off to the use of mapping, and agency directors are forced to throw even more money at an application they believed to be taken care of. Even worse, the earliest adopters of mapping have been forced to revisit the mapping issue on not one, but several occasions.

Why does this happen? GIS mapping is so new to emergency services and so much more complex than it initially appears that for the average communications/E9-1-1/EMA director, it is proving difficult to *navigate* the quagmire of sales rhetoric and tackle the learning curve at the same time—all the while handling dozens of other daily tasks. The result is that investments—in many cases significant—are being made on the promises of unqualified personnel or from an uninformed, and oftentimes naive, perspective.

Understanding GIS

GIS has spent the last 25 years developing as a discipline and industry unto itself, complete with a defined academic offering in the universities and a national certification process. Unfortunately, many periphery GIS users (including emergency services) view it

only as a minor add-on to their systems that you simply buy and forget about—for how complicated can a map be? The same could be said of merely dialing 9-1-1, but we all know the complexities and vast technical interplay involved with that seemingly simple act. GIS is no different.

So, the bottom line is that all maps (meaning mapping data, both spatial *and* database) and mapping software *are not* created equal. For emergency response, not just any old mapping and software will do. But yet, these systems are being bought and sold as though they *were* equal—and people are starting to realize that it's not like shopping for the cheapest computer monitor or most economical dispatch furniture.

This problem has only been exacerbated by the 9-1-1 industry itself focusing on price. If you buy cheap data and low-end software, the system won't be able to do much and will most likely, on average bring back bad information. It is unfortunate that the old adage *buyer beware* is true when it comes to GIS needs for a 9-1-1 center.

To explain further, products are being purchased without the knowledge of what an agency may need out of that product in the short- or long-term. According to the Lane Council of Governments, Eugene Oregon (2003), what is being shown to be sufficient merely for the FCC mandate of displaying Wireless Phase II coordinate locations is substantially insufficient for advanced emergency response/law enforcement mapping applications like:

- Automatic vehicle location (AVL, actively tracking emergency vehicle locations)
- Automatic routing (instant best route information)
- Emergency notification (e.g. reverse 9-1-1)
- Crime trend analysis (crime investigation based on geographic location)
- Fire station location modeling (where to build stations within response parameters)
- Risk assessments (analysis of safe release for various risk probationers)
- Address verification
- High-end searching/querying

Since all agencies will be going to these applications sooner or later because of their extensive benefits and also to stave off ever-increasing liability concerns, the issue of having the appropriate geographic data and software is beginning to have significant impacts.

Steps to GIS Success

Most of the problems arising are significant, but could have been avoided fairly easily at the outset. Instead of rushing off and throwing in just anything as long as it is Phase II ready, take a few days

to come to a good understanding of what GIS can do and what your needs are. You may have to talk to a few people, or read a few papers, but this small time investment will pay out largely in the long run. Here are some simplified steps to follow:

Step 1

If you can, try to clearly define what you need a mapping system to do and with what accuracies or level of *fallout* with which you are comfortable. Be forewarned, some of these ideas and preconceptions may change greatly as you learn more about what GIS can really do if given the right kind of information.

Step 2

Give some serious thought to the future. Some extremely powerful advanced applications are just around the corner. If you believe that some of those applications will find their way into your agency, it would be wise to learn what geographic data is going to be necessary to support those applications. This step is the most important when making sure you don't pay for GIS data more than one time.

Step 3

Research the product that fits you best, not necessarily what your equipment salesman is pushing. There are many, many customized 9-1-1 GIS products out there. Some are very good and expensive, and some are so basic as to be almost useless and hence, very inexpensive. Do your homework.

Step 4

Put the time into planning how the system will be rolled out. This is important in making sure the dispatchers and field personnel know what's going on and what some initial problems may be. This way, the mapping application has a chance to work out the initial kinks, and is less likely to get dismissed by those using it right off the bat.

Step 5

The plan for maintaining the data must be in place before you roll it out. It will be a living, breathing system that will need to evolve the minute you activate it. *This step cannot be overstated.* The more accurate your data, the more it will cost to obtain and maintain.

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9-1-1 TALK

Public safety personnel discuss pertinent issues related to the 9-1-1 industry in this regular column.

The 911Talk e-mail list server provides a forum for NENA members to interact with other members and their peers—discussing current events, asking for help with a problem, exchanging ideas and much more. Once you join the list you can send a message that all members of the list receive—no matter where they may be located. Below is a sampling of the many topical discussions found on 911Talk.

For more discussions on 9-1-1 issues go to www.nena9-1-1.org and click on 911Talk E-mail list.

Passing “Hotword” to Employees

I'm looking for brainstorm (and successful procedures) for passing “hotword” and/or roll call kind of information (and maybe even training tidbits) to 9-1-1 Center employees that will “force” or motivate them to read and absorb. The good ‘ol roll call (not everyone goes/absorbs) and/or the roll call folder for folks to read (they can't all read it at once) just aren't proving to be optimal. There's got to be a better way. Who has a great mousetrap?

The technical part might include windows/messages upon logging into the phones and/or CAD (although I don't want a lengthy log-in process to bog down operations) or it might be some e-mail with a reply required and/or maybe even a written response through the Outlook e-mail “voting” mechanism (although we use e-mail lots...no guarantee, though, that folks get to it in a timely manner...they access e-mail when they can on PCs in an anteroom).

John E. Dejung, Minneapolis 9-1-1 Director, Minneapolis Emergency Comm. Center (MN)

Our CAD system has a feature called dispatcher notes. It's a running log of entries made by dispatchers. We use it for shift-change information. Once an item is entered, it's there for 18 months before it disappears from view. There's no automated way to force them to read the notes or to verify that they've been viewed. But we require (by procedure) our oncoming dispatchers to read the recent dispatcher notes as part of our shift change procedure. It works well as long as on-duty dispatchers remember to add appropriate notes and the next

shift follows procedure and actually looks over the notes. Since notes are time-stamped and cannot be changed or erased, it's easy to tell whether proper documentation was done. Multiple dispatchers can access the notes at the same time.

Dwight Purtle, ENP, Johnson County Emergency Communications (Mission, KS)

I'm not sure how feasible this is for you, but we have e-mail accessible to all employees at their workstations, and use it extensively for communicating work-related messages. We have set up a public folder in Outlook that serves as an electronic bulletin board for the dispatchers to post their hot calls of the day, vehicle repossessions, etc. This was an employee suggestion that has taken off and works very well. Of course there is no technical way to force each employee to read it—just a policy that requires each employee check their e-mail at the beginning and end of each shift.

Heather Alex, PSAP manager, St. Louis Park Police Department (St. Louis Park, MN) ENPM

There is a certain cost/benefit point where it becomes too expensive to obtain higher levels of accuracy. Data sharing and cost sharing lowers overall cost while improving the data quality. Maintenance will be an ongoing process, so it's best to have that hammered out before activating it.

Step 6

Train your dispatchers and field personnel on the mapping well. The best data in the world is worthless if the call takers or dispatchers do not understand how to best use the information, or how to interpret situations where the information does not seem correct or could be misleading.

Final Thoughts

Keep in mind that others in local government are using GIS, too. A lot of 9-1-1 agencies are footing the entire bill themselves when they should not be. There is *no need* to have multiple GIS systems developed for the *same* local government. Everybody has GIS needs and some differ from that of emergency response, but if you can define all of the various needs and make sure that the elements and accuracies of the geographic data fit with the other departments, the burden of cost and maintenance can be significantly lessened. And then emergency

agencies won't find themselves forced to rebuild, recreate and re-purchase data layers that should have been taken care of the first time.

No matter where you get your data, you (the local 9-1-1 agency) have to assume responsibility for the accuracy, completeness and currency of the data. One must be GIS savvy, because the buyer must always beware. It is unfortunate that many sources of GIS data will try to sell data without making you aware that it is not suitable for E9-1-1. You must assume the responsibility of checking and re-checking the data for accuracy and completeness. This is why it is important to understand GIS, or to obtain the services of someone who knows GIS.

Sam Wallace has been working with GIS in both private and public sectors for eight years, with the last four focusing on E9-1-1 mapping implementation for local government as a GIS/GPS specialist for Digital Data Technologies, Inc. (Columbus, OH). He can be reached at (888) 800-4003 or via e-mail at swallace@ddti.net.

Acknowledgement

Special thanks to Marc Berryman, of the Greater Harris (TX) 9-1-1 Emergency Network for his valuable input and perspective.

ENPM

9-1-1 Callout

Thousands of 9-1-1 Calls No Longer Traceable

On May 24, new Federal Communication Commission (FCC) rules went into effect that allows consumers across the country to exchange a traditional landline phone number for a cell phone without having to go through the inconvenience of changing to a new number. However, these new number portability regulations can negatively impact the nation's emergency services.

According to Richard E. Dale, chairman and CEO of iXP Corp. (Lawrenceville, NJ)—a national provider of consulting and integration services in the public safety/emergency communications industry—the FCC stated last November that only 18 percent of the country's 6,000+ emergency call centers have the ability to determine the approximate location of wireless calls to 9-1-1.

"People believe they can reduce expenses by not having a landline come into their home and there's a lot of factors that make that idea appealing," he states. "The problem is when 9-1-1 is dialed from a cellular phone, quite frankly, the call center personnel may not know where you are.

"Technology is out there right now that improves this condition, and there are a number of things on the horizon to further improve the overall situation, but as of right now, there is a degradation in the service that people have come to

expect. For example, if 9-1-1 is dialed from any phone today, people take for granted that it's going to work on their cell phones just as it would on the landline. That is absolutely not the case. That is the fundamental problem."

Dale points out that under Phase I wireless location, when 9-1-1 is dialed from a cell phone and it goes into a 9-1-1 center, the operator knows the call-back phone number and what cellular tower it is being picked up on. However, if on average, a cell tower serves a five-mile radius, that is more than a 70-square-mile area that a person in need could be within. "Let's face it, if someone is bleeding and dials 9-1-1 that's a big area to search," he comments.

Under Phase II wireless, the longitude, latitude and the altitude (X,Y,Z coordinates) can be determined, but unfortunately this information can't be transmitted by a number of phones these days.

"When X, Y and Z coordinates are provided to a Phase II-equipped emergency call center, the center can tell within a 50-meter radius where someone is," Dale explains. "Communication centers around the country are trying to migrate to Phase II compliance and some are there, some are not.

"The call centers—if they possess the technology to accept the longitude and

latitude being transmitted by the wireless carrier—can provide a location on a map. Under this scenario, the wireless carrier must provide the longitude and latitude and, in many cases, the carriers are not yet providing this information. And in cases where they are providing these coordinates, we are finding that the accuracy rate is less than desirable. So, even when you get longitude and latitude, it may not be where the caller is located at the moment 9-1-1 is dialed.

"What it all boils down to is this: While local number portability has conveniences, it definitely degrades the ability for someone to be found when dialing 9-1-1," he continues. "The systems that are in place today don't fully support the capabilities that exist on a wire line phone." He also recommends that call centers find an advocate at both the local and state level to push Wireless Phase II through while pressuring local wireless carriers to upgrade their location technology.

"Communication centers need to upgrade their equipment so they are able to process the longitude and latitude information provided over 9-1-1 trunks," Dale says. "Also, a local education initiative needs to transpire. People must understand that when they dial 9-1-1 from a cell phone, they should give their location first, before they state the nature of their emergency."