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G. I. S. - APPLICATIONS IN THE PHOENIX FIRE DEPARTMENT

Abstract: Public safety interest in G.I.S. is rapidly expanding. Software programs offer the ability to track incidents by type, such as heart attacks or shootings. Elongated response times for police and fire units can be plotted to determine the placement of new stations in those areas which have an above average response time. Fire companies that have an unusually high number of incidents in their area (3500 or higher) can have those incidents plotted on a map in a matter of minutes. Management can then review that information and make decisions on the allocation of new or existing resources to help with the increased workload. This paper will look at many possibilities of G.I.S., both as a management tool for planning and as a resource to provide day-to-day operational information.

INTRODUCTION

The Phoenix Fire Department has recently completed the purchase of a computerized Geographic Information System (G.I.S.). The Department had several items to consider in the requirements area:

1) The system must be user friendly
2) The system should provide expandability (how many applications can we have?)
3) The system should provide compatibility with change (can we add/delete features we need for future use or delete facilities as we consolidate into a more centralized data environment?

The Department is one of the major participants in the Maricopa County E-911 system; it dispatches incidents for six other municipalities within the metropolitan area. Therefore it was determined that the G.I.S. should include most of the County's 9200 sq. miles.included in the County. Therefore the applications were divided to include Fire Department use and assistance with the street files data base maintenance program.

Phoenix Fire Department

The Phoenix Fire Department currently serves an area of 422 sq. miles with a population of 978,088. Forty two fire stations in 1989 responded to 102,789 incidents in Phoenix. As mentioned above, the Fire Department also dispatches for and has automatic aid with the following cities; Tempe, Glendale, Peoria, Sun City, Tolleson and the Laveen Fire District. Total Fire and EMS incidents in 1989 were 128,892. Total population served is approximately 1,300,000 and the area covered is nearly 700 miles.

A brief description of automatic aid states that, "jurisdictional boundaries are abolished and that the closest fire or paramedic unit will respond into another municipality". This concept is predicated on the premise that the personal welfare and safety of the citizenry will override existing municipal dialogue.

With the decentralization of more than 50 fire stations under the jurisdiction of the dispatch center and more than 20 stations responding on 3000 or more incidents each year, a plan was established whereby tracking of incidents by type and/or time was implemented with information plotted on a monthly and daily basis. Projected trends can be analyzed and relief brought into high incident areas. The plotting of incidents on a video terminal reinforced the opinion that a high number of incidents were occurring in a 100 sq. mile area. However, while these incidents constituted a major portion of the daily experience, they received a unit on the scene in a relatively short time (3.5 to 4.5 minutes).

The dilemma came at the other end of the scale. Units in some of the perimeter areas were not as busy (2500 - 3000 incidents vs 3000 - 4000 incidents) and the response time was elongated because fire stations were located further apart. Consequently response times were greater even for first responder units providing basic and advanced life support systems. Areas which involved a response time of five minutes or greater are identified and future fire stations can be planned for those areas.

Another application in the near future deals with the Juvenile Fire Setter Program the Fire Department has implemented. We will have the ability to match trouble areas with large dollar loss due to fire activity and concentrate on arson - vandal concerns in these areas.

As each of us looks upon tough budget times in the workplace, an interesting capability has come from G.I.S., the ability to focus data based on legislative boundaries. Several cities in Maricopa County are changing from an at - large council system to a district system whereby individuals are elected for a specific area and the constituent (voters) hold that individual responsible for solutions to concerns. Data can be related to neighborhood plight or sanitation concerns as well as public safety issues.

Maricopa County E-911

The Maricopa County Sheriff's Office is the default answering point for E-911 telephone emergencies. E-911 is an enhanced emergency telephone system whereby the telephone customers name, address & phone number are displayed for an emergency dispatcher. The Sheriff's office also coordinates new street listings for cities within the county street network. Municipalities funnel street information to the Sheriff's Office where it is placed into a data base for the entire county. Municipalities are purchasing G.I.S. to link these streets together into a common data base rather than each city having its own isolated street file. Cities will be able to update their own street file and simply pass data on by diskette to a central data base.

Hardware

1. Compaq PC 386/20 with 40 mb Hard Disc
   5.25" High Density Floppy Disc
   Track Cassette Tape Drive

2. Compaq UGA Color Display

3. Samsung Monochrome Display

4. Epson EX-1000 color printer

Software

Land Trak version 3.4.4 is the foundation of the current G.I.S. used by the Phoenix Fire Department. Land Trak is marketed by Geo-Based Systems Inc. in San Diego. The street file data base was built using the latest version of the "DIME" file for address locations.

Future plans include adding a second generation of computer-aided dispatching and using an Automatic Vehicle Location (AVL) system for emergency apparatus, with an integrated program which will pinpoint the exact location of an emergency incident on a map display. This will help dispatchers guide responding units into large apartment complexes as well as complicated industrial and commercial facilities.

Conclusion

A centralized custom G.I.S. has been identified for use within our countywide E-911 system. Large scale G.I.S. can often supplement this system with a broader range of data. As environmental questions arise the use of G.I.S. can identify potential topography and hazardous spills concerns. Decentralized municipal offices and resources can be identified and maximum use effected from those sites based on G.I.S. data.

References

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