



Minneapolis Fire Staying on the Offensive with GIS

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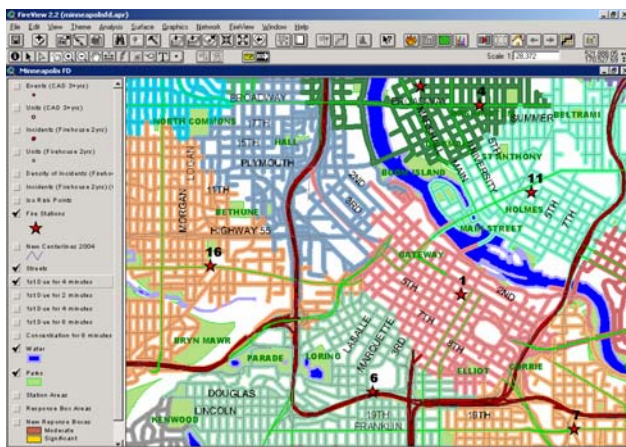
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Fire departments across the country engage in budgetary battles every year. It's no secret that fire station closures and firefighter layoffs are often the outcome. Fire chiefs face the challenge that competition for shrinking funds may leave their departments with a decreasingly effective fighting force. In jurisdictions large and small, metropolitan and suburban, fire managers are using computerized mapping to illustrate to local government leaders the complexity and fragility of fire response coverage and when cutbacks threaten public safety.

The Minneapolis Fire Department (MFD) had no choice but to accept layoffs of 42 firefighters in 2002 and 2003 resulting from the loss of funding from the state legislature caught in its own fiscal crisis. With additional reductions called for over the next couple of years, MFD managers were finding that they had an almost fiduciary like responsibility to demonstrate when the reductions were approaching levels that diminish the firefighting capabilities of their department.

A basic firefighting principle is that an effective response is based on the factors of speed and weight. The speed means how quickly fire suppression resources are deployed to the scene and weight is the magnitude or the number of firefighters that respond within a certain number of minutes. Standard 1710 of the National Fire Protection Association (NFPA) generally requires that four firefighters arrive within four travel minutes of the call and that 14 firefighters be on the scene within eight travel minutes. It also states that a minimum of four firefighters should be dispatched from each station as a "crew." The crew may be split onto more than one apparatus, and each crew needs a company officer. Failure to deploy enough fire resources in the early minutes will often lead to greater alarms and greater damage.

To adequately address the balancing of risks and service levels, MFD turned to the expertise of The Omega Group, Inc., a geographic information system (GIS) public safety consultant and Citygate Associates, LLC, a consulting firm with nationwide experience in conducting resource deployment analysis for fire departments. The charge to the consultants was to develop a deployment model known in the fire services profession as a Standard of Response Coverage (SORC) that would allow MFD to meet and exceed where risk dictates, the minimum benchmarks found in NFPA 1710.



Using Omega's FireView™ application, a software package that combines geographic mapping with dispatch incident data analysis, Citygate conducted an assessment of risk and deployment coverage for MFD. Chief Seal points out that, "FireView allowed us to develop the SORC based on our actual experience showing the areas where we find it harder or easier to meet our benchmarks."

For the risk assessment portion of the study, Citygate used the Risk Hazard and Value Evaluation (RHAVE) database available free of charge from the U.S. Fire Administration and plugged it directly into FireView to immediately produce color-coded maps displaying the varying degrees of fire danger throughout the city. The location of the fire

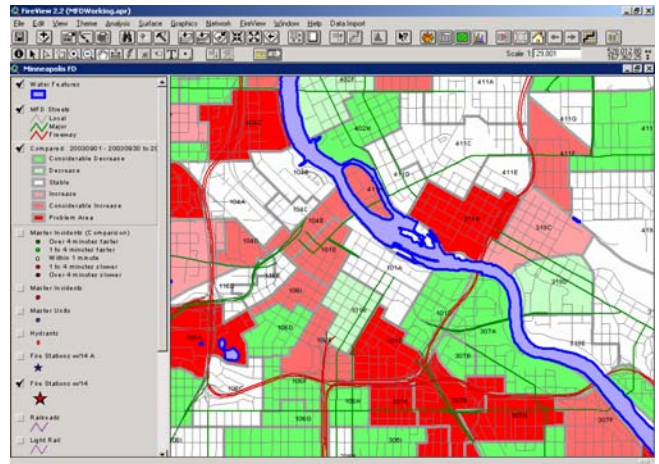
stations could then be examined as to how well the stations were distributed in relation to risk factors. This process resulted in good news in that there did not appear to be any gaps in coverage based alone on location of stations.

Chief Seal cautions that stopping the analysis here would provide a false sense of security. He explains, "It's one thing to take and look at your response times just as everybody in the fire service checks their response times nowadays. But one of the things that is difficult to do unless you have the analytical tools is to track that response time and how it is affected when initial engine companies are out of service covering other incidents." We have to be able to respond at all times. That's what we do." It's this extra step that can only be taken with a SOCR backed by GIS analysis.

The incident data automatically imported to FireView from MFD's record management system showed the Citygate consultants that there was weak coverage regarding the weight of response. While the historical run data demonstrated that MFD was meeting Standard 1710 under routine conditions, it showed that when there was more stress applied to the system such as when call volume spiked or there were multiple calls that engine companies were left without much backup support.

As Chief Seal observes, "FireView gave us the background to show how the standard of coverage was pretty threadbare right now. We get a working fire in the city and we start getting strapped. We get two working fires and we're really strapped. If we get a multiple alarm and say another working fire, then we're hurting. The value lies in being able to look at these things analytically and showing for instance that if we get an emergency medical run in one sector how this affects benchmarks." Fortunately, the Citygate consultants were able to point to a solution contained within the FireView maps.

In the downtown area, two special heavy rescue units were overlapping in coverage almost completely. The Citygate consultants were able to show with FireView that by relocating one of the units south of the downtown core that it would increase the backup coverage to several engine companies while still providing coverage for a portion of the downtown area. Chief Seal points out that this realignment "gave us capability to reach the 1710 benchmark of having 14 firefighters on scene in 8 minutes." Nonetheless, moving the heavy rescue unit would not be enough to meet the workload needs as depicted on the FireView maps. Therefore, Citygate consultant recommended that MFD add back a ladder company as soon as funding allowed in order to solidify weight of coverage.



The standard of coverage developed by Citygate with FireView showed that MFD was operating at the margins. Further cuts would jeopardize its ability to continue to meet NFPA Standard 1710. The study demonstrated that recovering previously eliminated resources was necessary. Indeed, the department was able to restore the previously eliminated 42 firefighter positions. Although things are uncertain for the future, Chief Seal states that the "SORC backed by FireView has facilitated our ability to plan and to show this is what is going to happen if further cuts are made."

MFD knows that hitting the benchmark standards of effective firefighting requires having a standard of coverage plan backed by GIS analysis. The reason is that having such a planning tool in place as the foundation of a department's resource allocation means that the department can demonstrate its operational efficiency. So when fire service managers meet with elected officials and city managers for budgeting, the discussion is not about whether the fire department is using best practices. Rather, the focus is about setting budget priorities for public safety and being very clear about the tradeoffs between reductions and service levels.



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