Geospatial Technologies for Campus Safety

The Geo-Enabled Plan for Incident Management & Coordination

Jessica Valenti

Manager Facilities Information Systems

University of Massachusetts Lowell

For the Campus FM Technology Association

January 2017

Contents

Geospatial Technologies for Campus Safety
The Geo-Enabled Plan for Incident Management & Coordination

Purpose

A white paper on how the campus facilities management (FM) technology professional can apply geospatial technologies to assist in the planning, response and recovery of campus emergency events. There are many aspects of campus safety including mass notification systems, security technologies, threat assessments and formal response plans. These technologies are beyond the scope of this specific paper, and are likely being considered by campus police or emergency and risk management departments. The intent of this white paper is to highlight where the GIS or FM technology professional can participate in the process. Here, the focus is on how one can geo-enable the campus safety plan through data awareness and data accessibility. The following paper was developed by Jessica Valenti, the Facilities Information Systems (FIS) Manager at UMass Lowell, after participation in the 2016 National Alliance for Public Safety GIS Foundation's National Geospatial Preparedness Summit, held in in partnership with the Department of Homeland Security. Much of the white paper content was gathered through formal presentations as well as conversation with the 180 public safety and emergency preparedness attendees. Additional resources are cited throughout the paper and include but are not limited to the Federal Emergency Management Agency (FEMA), Disaster Resilient Universities Network, as well as collaboration with regional emergency management agencies.

This white paper was created in partnership with the Campus FM Technology Association (CFTA) on behalf of the CFTA Grant Review Task Force. For information on this task force and how to apply for future CFTA grants, visit www.cfta.org.

Defining the Need

Given the number of incidents that have occurred on college campuses over the last decade, many have become keenly aware of the importance of working closely with public safety and campus safety organizations. One of the hallmarks of that collaboration is the dissemination and sharing of key data about campus facilities, both internally with campus safety and with the outside organizations that may be responding to an event. These organizations could be local police and fire, state police, ambulance services, and state and local emergency management agencies. In times of great need, this list also includes federal responders and FEMA. At the 2016 CFTA Conference, several institutions discussed the need for more information about how FM professionals can gain the knowledge and experience to work effectively with the public safety side of campus management. While many of the technology providers and their partners in the marketplace have a safety or emergency management offering, few are addressing the specific needs of the campus environment, specifically, the challenges associated with managing the interior spaces of buildings in emergency planning.

Much of the basic data that supports campus emergency management serves multiple strategic needs and regulatory requirements. These include institution accreditation, master planning, capital project planning and construction, operations, services, facilities management, deferred maintenance, and local or National Fire Protection Association (NFPA) code and standards. Multiple departments throughout a

university require, or would benefit from, the timely access to and reliability of accurate and up to date facility data, including maps and building floorplans. The collection and harvesting of this data into an accessible map or data source generates benefits well beyond that of the risk reduction in life safety and emergency management. Additionally, the efforts taken with the accumulation of this data has long-standing benefits in business continuity and preparation for employee attrition. Often the data and information about buildings and the campus framework is internalized in the minds of first responders and building or facility management. Collaboration between the two for assembling the knowledge of both can build a complete picture or map of campus operations and related response efforts. This is true in the case of something as common as a snow emergency as well as with incidents as life threatening as an active shooter. Campus mapping can capture and improve the speed and clarity of communication during any size or magnitude of campus emergency response. Campus facilities management and the related data or information is intimately tied to the efforts of campus emergency preparedness and response.

Why This Topic is Important to Campus FM

The campus environment is not unlike a fully contained city. We see this idea when thinking about how the FM professional manages utility infrastructure, building and room locations, and other campus assets.

Campus FM professionals manage information about where students live, learn, and play throughout the academic year. Many employees are aware of the locations of highly specialized laboratories and chemicals. Facilities departments have floor plans with details including the door swing; mechanical, electrical, and plumbing systems; vertical penetrations and closets. Some employees know the exact occupant of a space or what types of access doors have. There are many employees that know exactly where every single closet or small storage space is located within millions of square feet of building space.

This type of information is invaluable in the event of a major incident on campus. Having an accurate map or information available to the first responders provides them with situational awareness, or intel that can be used in response efforts. It is likely campus security or police know the layout of most campus buildings, but does the local fire or police department have access to that information?

Evaluating Impact: Risk Reduction & Cost Avoidance

The involvement of facilities management data and maps can have a direct impact on risk management in campus safety. Dissemination of accurate facilities data can mean an emergency responder knows exactly where the shutoff valve is or where all the doors into and out of a building are located. Business continuity is an important topic at universities. The FM technologies professional must be able to answer the questions about facilities if the network goes down. The university may have backup systems, but are they available immediately? Many municipal emergency operations centers (EOC) have complete offline backups of their GIS data, which is certainly a practice that can be implemented within

facilities management. It may seem sufficient if your document management and building archives are backed up regularly or even hosted in the cloud, but how valuable is that if your network is expected to be down for an extended period? A simple solution is quarterly backups to a secure laptop or hard drive, or more sophisticated fully automated backups to a portable server. Consider the most cost effective solution that meets the potential needs of response on your campus. Understanding the existing infrastructure in the university EOC will also direct the decision making for data resiliency needs and related solutions.

An effective solution for data management and dissemination of facilities data to campus emergency management has financial incentives. Building life safety information is included in project closeout documents, but is this information being maintained and checked for accuracy? A good example would be the receipt of as-builts upon commissioning of a new building, with no fire damper information included. There are two parts to this, one being the availability and access of this critical data, two being the management of it within the annual cycle of damper inspections. Is the data available to those responsible for life safety on campus? FM technology solutions such as GIS or CAD provide a home for this data and a framework for maintaining the information. Campuses have regulatory requirements to manage their fire suppression systems with annual inspections, but do campus safety and FM personnel know where all of those fire doors are located, or what their ratings are? Do they know which buildings have fire pumps and the last time they were tested in an easily retrievable interface? Having a framework for data management can save on annual inspection costs. More importantly having the data digital and retrievable on a map means it's not just in a Word document on a file server. Additionally, and perhaps more importantly, offering a visual representation of data is often easier to understand and comprehend in an emergency situation. Often multiple departments are dependent on this information and may be managing it simultaneously while being entirely out of sync. For example, elevator inspection data; the compliance department depends on it, operations managers rely on it, and certainly campus planning and capital projects need that information to be accurate and accessible.

When it comes to risk management, life safety is the critical factor. Having a system in place to collect, manage, maintain and distribute information about emergency plans and life safety systems on campus is an invaluable resource.

Where to Begin?

[redacted]

Key Decision Points

Common Gaps

Life Saving is Over, What Now?

[redacted]

Data Points to Consider

[redacted]

Examples: What You Can Do within Campus FM

While an attempt has been made to be technology agnostic, there are dominant players in the emergency management industry. Many federal, state and local municipal governments are using Esri's ArcGIS Online. However, it is fully open data capable so if you are not using Esri technologies find out how you might be able to exchange data and information with those who will require it. Is the authoritative data reaching first responders and key decision makers? Give emphasis and consideration to the environment end users will operate in and the skills of those reading the data. The manner that information reaches users is of less importance. Access to reliable, up-to-date PDFs may suffice, or sophisticated web viewers with editing capabilities and content collaboration may be better. Consider the security implications of your solutions as well, who needs floorplans of the reactor or animal research labs, and who is responsible for establishing security and access rights.

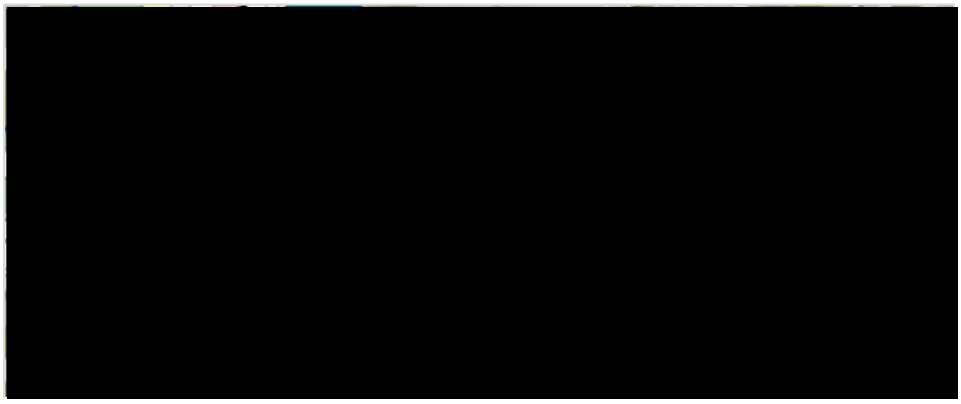
See map examples on following pages

MAP EXAMPLES

Ex 1: **Emergency assets and fire connections provided to the local fire department**

Ex 2: **Floorplan for Commencement with EMS and Police locations**

Ex. 3: **Situational awareness map with police details, parking, shuttle routes, and links to event operations and emergency plan documents**



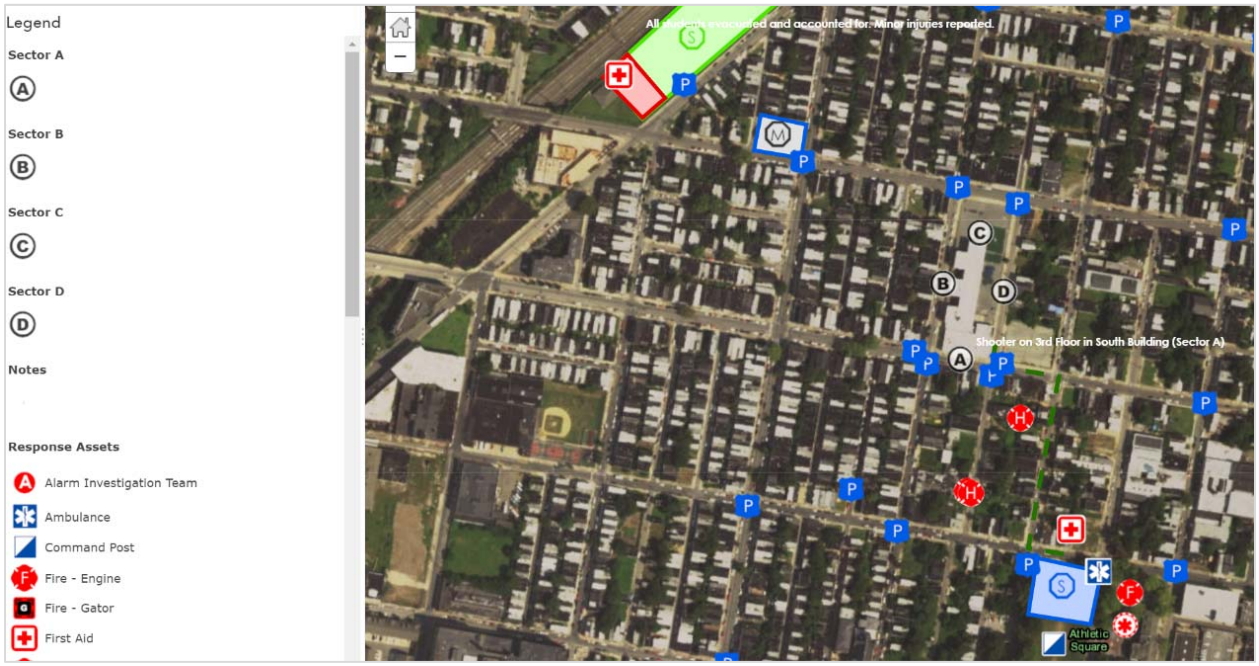
Ex. 4: **Information about your spaces such as scheduling, occupants, and photos**

Ex. 5: **Police Department specific information around camera locations and blue phones**

Ex. 6: **EOC incident coordination**

Using GIS or facilities management technologies in emergency management and life safety efforts is about creating a system of engagement through organizing and managing the geographic context of available resources. The process leverages information that already serves multiple departments and meets numerous requirements across the campus community. There are many ways to do this, in the shape of a simple paper map, a mobile data collection app for damage assessment, geographically enabled survey tools to collect field data in a "digital clipboard", and through elaborate operations dashboards to communicate between the EOC, public information officer, and mobile staff and resources. Online Esri StoryMaps also offer a quick way to share information with the public in an easy to understand format. Mobile data collection and simple data editing applications can empower life safety and emergency managers, giving them the tools to manage the information they already need to reference. By being involved in the information gathering process, users will have far more confidence in the utilization of that information and technology during response efforts.

Training and Educational Opportunities



Example: **NAPSG Pre-Planning web map template**

NAPSG offers many resources for best practices and standards. They provide online training resources and standard operating guide templates for a handful of incident specific scenarios. One of their most impressive resources is a symbol library with widely recognizable and standardized symbols:

[redacted]

[redacted]

Introductory Courses by Topic

[redacted]

Example Courses by Position and Purpose

[redacted]

Resources and Other Organizations