

Case Study

Washington, D.C., center consolidates public safety dispatch operations



Consolidation of all 9-1-1 and non-emergency communications functions into a single state-of-the-art command and control center in Washington, D.C., is yielding impressive safety benefits for the city's residents, daytime workforce and tourists. In less than four years, the percentage of 9-1-1 calls answered within five seconds has increased from 65% to 96%, with less than 3% going into a waiting queue.

Opened in September 2006, the \$116 million Unified Communications Center (UCC) successfully brought the District of Columbia Metropolitan Police Department (MPD), Fire and Emergency Medical Services (FEMS), Homeland Security and Emergency Management

Agency (HSEMA), and the Mayor's Citywide Call Center under one roof for the first time. In addition to shaving precious seconds off emergency response times, the UCC has reduced unnecessary duplication of communications resources and enhanced coordination among the numerous municipal and federal public safety entities operating in Washington, D.C.

Before the integration of personnel, equipment, and technology, the city maintained separate call-taking and dispatch facilities for its MPD, FEMS, and non-emergency customer service operations, formerly known as the Mayor's Citywide Call Center. While the advantages of sharing resources was evident during studies begun in the late 1990s, the reality of merging for-

merly separate functions presented many challenges, and participants give credit for the successful integration to the Office of Unified Communications (OUC), created in 2004.

The key to the OUC's significant achievements is its stature as an independent office reporting directly to the mayor. OUC is mandated first and foremost with providing a high level of public safety and customer service to the people of the nation's capital. But it has also been tasked with equal support of the individual protocols and operations of the multiple agencies it represents. With an

eye toward balancing the operating requirements of police, fire, and medical departments with non-emergency services, the OUC has overhauled the city's traditional approach to call taking and dispatch.

"The OUC is truly where public safety meets public service," said OUC Director Janice Quintana. "Our business model has succeeded through simplification of operations, consolidation of functions and restructuring of our organization through thoughtful decision making based on empirical data and industry best practice information. All of these measures have been undertaken to ensure that the OUC is highly productive and efficient, which has resulted in superi-

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or, easily accessible and reliable service to the community. We remain committed to maintaining the public's trust in our agency and will continue to provide the world-class service that the nation's capital and its residents and visitors deserve."

One important way that OUC has successfully met the diverse needs of its constituent agencies is through implementation of the latest communications, computer-aided dispatch, vehicle tracking, mobile computing, and other automated technologies. These have streamlined overall emergency response operations while providing a high level of interoperability with the mission-specific databases and systems that support the unique activities of police, fire and emergency medical personnel.

Taking Incoming Calls

As 9-1-1 emergency calls and 3-1-1 information requests come into the UCC, the automatic call distribution PBX routes them to the appropriate call takers. On the

3-1-1 side, the call taker has access to a variety of automated applications and information databases available through a computer terminal. For example, a request to repair a pot hole or fix downed power lines can be entered by the call taker through a client relationship manager (CRM) package. Other automated applications relating to public health and motor vehicles can also be accessed by the call taker.

Incoming emergency calls, on the other hand, are all managed through a centralized computer-aided dispatch system accessible to 9-1-1 call takers and dispatchers. The system chosen for this critical role is Intergraph's Computer Aided Dispatch (CAD) product. The D.C. Metropolitan Police had used an earlier version of it since 1999. Fire and EMS each previously used other CAD products, but as the UCC was being planned, the decision was made to standardize on the Intergraph CAD, based on its functionality, cost and ease of implementation.

Rethinking response

Establishment of the Office of Unified Communications compelled Washington, D.C., officials to rethink traditional procedures for handling requests for city services, both emergency and non-emergency, according to Jim Callahan, OUC telecommunications and technology manager.

In the past, the public called the Mayor's Call Center where information requests were handled relating to inclement weather closures, seasonal events, and general city operations. Separate numbers had to be dialed to obtain specific services such as the Department of Motor Vehicles, Department of Health or Public Works.

"Those calls and requests are now all handled by 3-1-1, which is the one-stop number for city services," said Callahan, adding that Washington, D.C. received nearly 1 million calls for city services and information in 2007.

The 3-1-1 operators are trained to take calls for information and city services, which include reports of vandalism, stolen autos, minor vehicle crashes, petty theft and other non-life-threatening situations. Previously, such calls were routed to 9-1-1 call takers, but this burden has been removed to sharpen focus on incidents that require MPD or FEMS to respond on site. "Streamlining the 9-1-1/3-1-1 call flow is already starting to show signs of helping emergency call takers become even more effective," Callahan said. ■

OUC currently has 16 servers running the Intergraph CAD system on 150 workstations split between two facilities. The UCC is the blast-hardened primary dispatch center in southeast D.C., while a backup facility known as the Public Safety Communications Center is maintained across town with 100% redundant capabilities. The single CAD system serves both facilities either simultaneously or independently as needed.

In a typical scenario at the UCC, emergency calls are received by the call taker seated at a PlantCML Sentinel call processing workstation, which instantly populates the CAD interface screen with ANI/ALI information relating to the caller location. The CAD uses the ANI/ALI address and/or latitude-longitude coordinates to mark the incident location on a GIS-based map displayed on the workstation screen. As the call taker confirms the location verbally, he can correct the address if necessary, and the CAD re-centers the map.

"It is important to note that once the call taker gets a description of the emergency from the caller and enters it into the CAD, the CAD automatically assigns a priority and forwards the information to either a MPD or FEMS dispatcher, or possibly both," said Jim Callahan, OUC telecommunications and CAD technology manager. "There is no handoff of the caller from dispatcher to dispatcher."

This allows the emergency call taker to stay on the line, gather more information, and provide verbal instructions to the caller as the

dispatch procedure is progressing. At this point, the call taker may utilize two important subsystems that have been seamlessly integrated with the CAD as a result of business alliances with Intergraph. The first, initiated for emergency medical situations, is the ProQA application from Priority Dispatch Corp.

Running inside the CAD, the ProQA application presents a series of questions the call taker can ask the caller. The responses enable the application to assign an accurate incident code to the situation, which assists the CAD in prioritizing, and possibly even re-prioritizing, the call in the dispatch queue.

requires EMD certification above and beyond normal call taking and dispatch training."

As the call taker moves through the assistance protocols, the CAD continually feeds the progress to the dispatcher, who in turn keeps the medical personnel informed while they are in transit. Upon arriving at the scene, the EMT knows precisely what treatment has already been rendered and can continue from that point.

The second capability the call taker may tap into is advanced mapping functionality that currently only a handful of emergency call centers have. Intergraph has inte-



Once the call is defined, the application then walks the call taker through a script of National Academy Protocols to guide the caller in providing supplementary medical aid until the EMTs arrive.

"Approximately two-thirds of the 9-1-1 call takers in Washington, D.C.'s Office of Unified Communications are certified emergency medical dispatchers," Callahan said. "That

grated an oblique imagery viewing system into the CAD, allowing the call takers and dispatchers to look at archived aerial photographs of the scene along with a GIS line map.

The viewing system is provided by Pictometry International, which acquired oblique aerial photos over the entire city.

Oblique photos differ from standard aerial images in that they are

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acquired at shallow angles from the aircraft instead of straight down. Usually acquired from four viewing directions, oblique imagery reveals the facades of structures on all sides and peers down narrow alleys and streets, even behind and between tall buildings.

For most uses, the call taker has a split map screen on the workstation, one side showing the aerial imagery and the other displaying the line map. Because the Pictometry viewing software is integrated into the CAD, the oblique photography display synchronizes with the GIS line map, so the call taker can scroll around the map looking for an address and have the air photos track along with the search.

According to Udell Mentola, OUC contractor and CAD project manager, the oblique viewing system offers valuable logistical information for the call takers and dispatchers to pass along to the first responders. The ability to view a building from all sides allows them to let police and fire crews know how many ingress and egress routes there are. In addition, the viewing software has built-in measuring tools that enable the call taker or dispatcher to measure the height of a building or width of an alley so that fire crews know what equipment can best access the scene. Call takers can even measure vacant lots to determine if there is room for a helicopter to land.

"When we turned the oblique viewing capability on for the first time [in late 2007], our people were using it within minutes, and they were amazed," said Mentola, stressing that the air photos are archived and not real-time pictures of the scene.

Dispatching Police, Fire and EMS

All dispatchers are located in a single room so they can coordinate with each other in the event of a large incident. As noted above, the CAD forwards information to the appropriate dispatcher, either MPD or FEMS, as soon as the call taker enters the description of the emergency. The dispatcher is seated at an identical workstation and can view all of the same CAD information as the call taker with the significant addition of CAD-generated dispatch recommendations.

"The fire dispatcher clicks on the call, and that's when the magic of the CAD solution comes in," Callahan said.

For fire calls, the CAD has been customized with all of the response protocols developed by the D.C. Fire Department. Based on the geographic location of the incident, the CAD determines which station should respond. Ethan Goldberg, the OUC CAD administrator, works daily with FEMS liaisons to assure that CAD programming meets the latest FEMS protocols and response requirements.

"Through the protocols that the fire department has set up, the CAD also determines the number of engines, ambulances, battalion chiefs, and support vehicles that are needed based on the type of incident, as input by the call taker," Mentola said.

Next, the system utilizes a CAD module that tracks the real-time locations of each fire truck and ambulance using onboard GPS receivers. The status and location of each vehicle is taken into account by the system as it determines precisely which units should respond to the incident. The fire dispatcher receives these recommendations

onscreen and can use them to alert the designated stations and vehicles, or the dispatcher may override the suggestions based on personal insights and experience.

"Once the fire dispatcher assigns the units to respond to the call, the vehicle tracking module in the CAD calculates the shortest route for each vehicle to reach the incident," Callahan said.

The alert triggered by the dispatcher sends electronic instructions to each station. It gives the address of the event and assigned units. Currently, the primary method of communicating with the fire and ambulance vehicles is by voice radio. Each vehicle is equipped with a digital entry key that enables the crew to respond non-verbally and notify the dispatcher of its status.

"OUC is considering installing computer terminals in all emergency vehicles so the crews can have access to CAD maps and tracking details," said OUC Chief Information Officer Teddy Kavaleri.

While the vehicles are en route to the scene, the dispatcher may relay the CAD-generated driving directions to the crews by radio. In many cases, the dispatcher will also tap into the oblique aerial photos to gather vital pre-planning instructions that can also be passed along. In the event of a fire, for instance, the dispatcher will typically use the photos to determine if the burning structure is brick or wood and note its height and floor plan.

Police dispatching follows a slightly different procedure. Washington is divided into seven police districts, each staffed in the UCC at all times by numerous individual dispatchers who are each responsible for their own district. The CAD uses the geographic loca-

tion of the emergency to route the incoming call to the appropriate dispatchers.

Intergraph has integrated the OUC CAD with an MPD database called the Washington Area Law Enforcement System (WALES), which allows the dispatcher to search for warrants and run license plate checks for the officers in the field. This information is usually passed on by voice radio the responding officers. However, the D.C. Metropolitan Police Department is in the process of equipping every cruiser with a mobile data computer that allows the officers to access the CAD, WALES/NCIC and other databases directly from their vehicles via wireless intranet access using a module called I/Informer.

An Interoperable Future

"Interoperability is the focus of public safety technology right now," Callahan said. "We are promoting interoperability among CAD systems."

Callahan explained that

Washington, D.C., may have a greater need for such interoperability than any city in the country. With 40 federal and local public safety agencies operating in the city, such as the U.S. Capitol Police, Secret Service, and Park Service Police, there is an enormous need to coordinate personnel and other resources in the event of a national, regional, or citywide crisis.

OUC has entered into discussions with the U.S. Capitol Police to make each other's CAD systems interoperable through the implementation of Intergraph's InterCAD product. This interoperability would benefit both agencies by allowing them to have closer coordination of resources and responses, particularly in a crisis situation. Depending on the degree of integration set up between the two CADs, the MPD and the Capitol Police will be able to view and even dispatch one another's vehicles through their existing systems.

"If a patrol car is in another jurisdiction and there is an officer down, you don't care which department is involved; you want the closest unit

to respond," Callahan said. District officials look forward to the two CADs sharing unit and event information in the future. OUC has entered into informal talks with other agencies in the city to determine if integration with other CADs will occur.

As for other ongoing upgrades within the District, all D.C. MPD cruisers should be equipped with mobile data computers by the end of 2008, and the implementation of similar hardware in the FEMS units is already under way.

The OUC is also aggressively pursuing mobile deployment solutions with Intergraph's I/Mobile product, with an anticipated Phase 1 deployment between 2008 and 2009. It is the OUC's hope that tight integration between the Intergraph I/Mobile software and existing OUC I/CAD solutions will make for more efficient public safety services. ■

Photos by Brett Drury Architectural. Photography courtesy of Intergraph.



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