White Paper: How CAD Systems Vary by Agency Size

How do CAD requirements vary by agency size?

by Bill Rendina of Valor Systems

Large and small public safety agencies have many of the same basic requirements when selecting CAD software. But some processes, the number of field units and geographic size of a jurisdiction can require very different screen layouts and different available functions. Every agency is unique, but we can take a look at some of the more common ways agencies have answered this question for themselves.

Roster Size

By first looking at a small agency, we can see how a CAD system changes with agency size. A good modern CAD system has a console divided into multiple windows, allowing a dispatcher to view various areas or functions of telecommunications, without losing site of critical data that may help determine a specific response.
The City of Midlothian is a small agency, which dispatches Police, Fire and EMS, with all these units showing in "available units." For example, in figure A we see a small agency with all available units grouped together. With a slightly larger agency, it can be useful to separate these responders into different views. This is true in figure B, where a larger agency has added tabs for each category of responder. In fact this agency has added tabs for different types of police unit, such as Community Service Officer (CSO). This approach allows tabs to be clicked much like an Excelä spreadsheet to see custom views, making it easier to manage resources.

As the agency size increases further and multiple dispatchers are working different events, ideally the dispatcher can create a tab called "mine" in the event window. By clicking on that tab, the dispatcher sees only the events he/she is responsible for, and those calls can be prioritized and managed. Click back to the "All" tab to see the big picture of all events in progress.

For even larger agencies, there can be a limit to how many field units will fit on a screen, therefore this is addressed by adding a computer monitor as a dedicated Status Display, with dispatched calls on one side, and available roster on the other. Just as before, custom views can be created to make the job easier. This second computer monitor can be added by installing a "dual-head" video card, available from several video card vendors. It's a good idea to check with your CAD vendor regarding ease of configuration for a dedicated Status Display.

Another configuration many large agencies use successfully is the addition of call-takers, who answer the 9-1-1 call, initiate the CAD event, and transfer the caller to the appropriate dispatchers. This is useful for routing calls when there are separate dispatch teams for Police, Fire and EMS within the same center, or when the dispatchers are in remote response sites throughout a multi-agency/multi-jurisdiction region.

Details help larger agencies

With a larger agency it becomes more efficient to track details within the CAD system. A small agency might know a unit is busy on lunch, but in a larger agency it can be harder to rely on memory or handwritten notes. The solution is to allow more detail in CAD, such as custom status codes.
A good CAD system will also provide a "Notes" field within the active event to help keep track of details, and time-stamp each note entry with the person's ID.

Silent dispatch capability also provides a level of detail to the field unit's laptop. This helps in a busy agency because a responding unit won't need to verify the address over the radio. Police Dispatcher Adrian Barker of Woodridge, IL also takes advantage of keyboard shortcuts when doing silent dispatch. "I can dispatch several units much faster if I don't have to reach for the mouse. The command line and shortcut keys can make a big difference when all the phones are ringing."

The Response Matrix and Mutual Aid

Another interesting difference between agencies is how the Response Matrix is defined. Frequently a bound SOP manual will spell out the specifics for various fires. In a small agency this may be adequate. For example, if a rural Wyoming town has a 3-alarm fire call, the dispatcher knows by heart how much equipment is available, and probably knows who to call for additional equipment. In a larger municipality this becomes a more complex issue, and thumbing through a manual to determine recommended equipment can take minutes. If additional equipment is needed from a neighboring municipality (mutual aid), this may also require a manual lookup of equipment information.

Further, the response recommendations may be different by time-of-day or day-of-week. This is where a CAD system can save valuable minutes. In this scenario, the dispatcher enters the event type, then clicks on "Recommended Units" (in figure B) and the CAD system uses preset rules to indicate which units should be dispatched. If the CAD system sees the address is a large industrial structure, the system may recommend a HAZMAT team and an additional pumper. If it is 5pm on a Friday, the system can suggest calling the fire house in the neighboring municipality, because it will take them less time to reach the fire based on traffic conditions. That equipment info appears on-screen, again saving the time of looking up response information.

"The power of a CAD system's response matrix depends on the rules the fire agency has built into the system," says Rick Heinrich, Deputy Coordinator of Lakes Region Mutual Fire Aid Association, New Hampshire. It can take over a month to think of all the event types and add rules for time-of-day, etc. And there is a cost associated with this feature, not only in time to enter rules, but in additional cost to purchase this CAD module, depending on the vendor.

Typically the larger agencies see greatest benefit and reduced response times by implementing a CAD response matrix, but again this depends on the unique characteristics of your jurisdiction. You may work in a mid-size agency with circumstances you want to address in a CAD response matrix, such as the time-of-day when a bridge is heavily congested. If this data is in the CAD system, your dispatcher will immediately see a tailored response plan on-screen, resulting in a better outcome for that event.

Mutual Aid is a CAD feature that is related to the Response Matrix. Again, a large agency is likely to see greater value from implementing this feature in the CAD system. This feature can simply display a recommended unit of equipment from surrounding agencies. In a more elaborate installation, a network connection to the neighboring agency can automatically post your event information to their CAD console. Networking requires an investment in software, integration, and data connections. Setting up a frame relay connection requires a monthly fee, and your CAD vendor may need to design an interface to another agency's CAD system.

Computer integration of mutual aid has greater appeal for a large agency, because with more miles of jurisdiction border there are more events to track along those borders. Additionally, the costs of enabling mutual aid infrastructure are a smaller percentage of the budget in a large agency. Fortunately, costs for mutual aid integration may be decreasing. The U.S. Department of Justice is working to create a standard for inter-agency communication

based on XML. Microsoft is providing tools to enable this standard, through the Microsoft.NET platform and XML Web Services. “As more agencies adopt XML it will be easier and cheaper to connect with them,” according to Jeff Langford of Microsoft’s Justice and Public Safety group.

Mapping and Wireless 9-1-1 support

While many large agencies utilize CAD mapping of event locations, many smaller agencies have not elected to use CAD mapping, primarily because the roads and addresses are second nature in a small municipality. However, support for Wireless 9-1-1 is changing that, and now smaller agencies are seeing value in the mapping function too. When local 9-1-1 systems are upgraded to support XY coordinates for cell phone calls, the data should spill into the CAD system, and the event can be instantly pinpointed on a map.

Not all CAD vendors support Phase II Wireless, so vendor selection is key. The good news is that grant money is becoming available to agencies for Wireless 9-1-1 projects. The Public Safety Foundation of America (PSFA) has established $50,000 grants to start projects, and if the CAD vendor’s mapping feature is Phase II compliant, then this grant money can be applied to a CAD system purchase. You can find more detail on how this pertains to your agency by visiting www.psfa.us

Selecting the right CAD software

After you identify which features are important to your agency, it is important to note that some CAD vendors offer pricing models to meet the needs of individual agencies. This varies by vendor based on how modular their software is. Finally, time to consider hardware platforms. CAD vendors offer varying levels of support for different hardware. Some public safety agencies have significant investments in mainframe or mid-frame hardware, and the CAD software may need to run on that platform. Many agencies are moving to PC-based solutions because they are scaleable, easier to administer, and offer better user interfaces. There is also a resale market for systems such as the AS-400, so if you decide to change to a PC platform you may be able to recoup the investment in your old hardware.
PC’s can make sense for all size agencies, but smaller agencies in particular should see a cost savings with PCs, and rural agencies may be glad they don’t have to find a local programmer who knows the code for their old mid-frame system.

Hopefully this focus on CAD differences by agency size has provided some perspective, and food for thought as your municipality grows. If you would like detail on any of these issues, or if you seek research resources we would be happy to help.

The Author: Bill Rendina is President & CEO of Valor Systems, Inc., a leading vendor of CAD and RMS software since 1994 based in Illinois. Bill can be reached at mailto:brendina@valorsystems.com