



# Homeland Security

Science and Technology

U.S. Department of Homeland Security



System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

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This SAVER TechNote was prepared by the Space and Naval Warfare Systems Center Atlantic for the SAVER Program.



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# TechNote

## Computer Aided Dispatch Systems

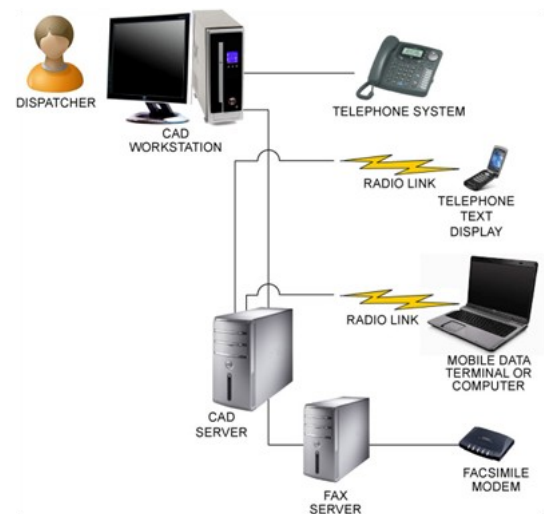
Computer-aided dispatch (CAD) systems are utilized by dispatchers, call-takers, and 911 operators to prioritize and record incident calls, identify the status and location of responders in the field, and effectively dispatch responder personnel. Emergency responders in the field can receive messages initiated by CAD systems via their mobile data terminals (MDTs), radios, and cell phones. CAD systems may also interface with a geographic information system (GIS), an automatic vehicle location (AVL) system, a caller identification (ID) system, logging recorders, and various databases. A unified CAD (UCAD) system interfaces with multiple agencies and/or computer systems that serve law enforcement, fire, and EMS and provides communication across multiple agencies and jurisdictions.

### Technology Overview

A CAD system manages information from many other responder systems to optimize the dispatch of responder personnel. The size and complexity of the CAD system are determined by the needs and requirements of the agency and the existing systems that the agency would like to integrate. CAD implementation involves installation of servers, computers, and software, as well as connection to a variety of other existing systems. CAD systems are usually

located in a central dispatch office or public safety answering point (PSAP). With the support of dispatchers, CAD servers communicate with call center computers/phones, cell phones, MDTs installed in vehicles, two-way radios, and fax servers. This provides dispatchers and field personnel multiple communication options.

The majority of CAD systems can incorporate information from the following systems: records management systems (RMSs), GIS, AVL, and caller ID. RMS provides data relevant to the current service call. GIS provides numerous types of geographical and geospatial data; AVL pinpoints the location of response vehicles, which allows the CAD system to help determine the most suitable unit for response; and caller ID verifies the exact location of an incoming call and/or incident.



A Typical CAD System

Various local, state, and Federal criminal justice databases can interface with CAD systems for relevancy to response and may include data from: a license plate reader (LPR) system; a jail management system (JMS); the National Incident-Based Reporting System (NIBRS); and the National Crime Information Center (NCIC).

## Operation

Typically, when a dispatcher receives a call, the CAD system displays the location of the caller, and the dispatcher can log additional information relevant to the incident. The dispatcher contacts the appropriate agency and closest available personnel to respond via two-way radio, phone, and/or MDT. The response status to the call is logged by the dispatcher from start to finish. Logging recorders can store information such as call time and duration for later retrieval.

A CAD system also provides information to the dispatch center, including:

- Log on/log off times of emergency personnel;
- Time stamping of all communications;
- Case numbers for investigations;
- Assignments of emergency personnel; and
- Incident reports and archives.



**A CAD workstation**

## System Advancements

Advancements in CAD system software provide dispatchers with a more user-friendly CAD system. CAD system software advancements may include touch-screen monitors, multi-color displays, computer icons, and more in-depth and accurate information. This information may include detailed maps, incident history reports, proximity incident reports, and database queries. Newer systems can continuously update and verify information and make

recommendations to the dispatcher on the closest available and most qualified responder (e.g., sending a HAZMAT responder to an environmental incident or a K-9 unit to a narcotics search). The needs of an agency determine the features purchased in the CAD system software. Generally, more advanced CAD systems are used in larger agencies.

## Installation

CAD systems are most commonly installed by the vendor with the assistance of agency employees who are familiar with the agency's infrastructure, network, and systems' configuration. The complexity of the CAD system and the level of integration with existing systems determine the time required for installation.

## Maintenance

Maintaining a CAD system usually requires a trained systems administrator and a CAD administrator. The systems administrator is typically responsible for maintaining the network, servers, databases, and software patches at an agency. Responsibilities of the CAD administrator may include maintaining the response plans, incident types, and paging configurations in the CAD system. Warranties will vary by vendor, and many offer ongoing maintenance and/or technical support options.

## Applications

In addition to routing daily emergency response calls, CAD systems can be used in large, multi-jurisdictional responses, such as when natural disasters occur. For example, during Hurricane Charley in 2004, the Orange County Fire and Rescue Department (OCFRD) Communications Center employed a CAD system with GIS, AVL, and RMS integration capabilities. By utilizing this CAD system, the OCFRD was able to "sort by station" and categorize waiting calls into groups assigned to an individual fire station's response area. This process allowed dispatchers to quickly review all calls in a station's district, prioritize the most urgent calls, and dispatch them to pagers, station alert printers, and MDTs.

## References

Emergency Fire Response Software Tools Guide (January 2007), <https://www.rkb.us/SAVER>