White Paper:

CAD-to-CAD Interoperability

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Introduction

This white paper is intended for agencies engaged in providing 9-1-1 Dispatch services as part of a Public Safety Answering Point (PSAP). It will examine how sharing data and resources can benefit not only the PSAPs and the agencies they serve, but can have a direct correlation to faster response time and saving lives.

In the context of this white paper the roles of call-taker and dispatcher are referred to as telecommunicator, and the terms Emergency Response Operations Center, Emergency Response Coordination Center, or 9-1-1 Center are generally referred to as the PSAP.

This paper will also explore how an integrated data sharing solution can ease the complexity and cost of implementing Next Generation 9-1-1 (NG9-1-1) initiatives such fire and burglar alarms, car telematics, video feeds, texting, panic buttons, ShotSpotter, smart phone applications, social media, etc., as well as exploring the benefits of data sharing, the types of data sharing options and the reasons why data sharing is gaining momentum.

What is PSAP Interoperability?

There are several interpretations of what PSAP interoperability is and does, but for our purposes it is defined as the electronic exchange of data/information between two or more PSAP's CAD systems.

Part of a seamlessly integrated PSAP solution is the ability for a telecommunicator to work within their CAD system and have access to qualified incidents and resources from all participating PSAPs in the region.

This type of integration is the cornerstone of what might be described as virtual PSAP consolidation. Each PSAP, while autonomous, is at the same time, part of the regional PSAP community with the ability to view, dispatch and interact with all resources and incidents.

This powerful solution raises the productivity and awareness of all participating PSAPs to a whole new level. Not only can PSAPs transfer phone calls seamlessly between each other, using current CPE equipment, but they can now transfer the call content along with it. Furthermore, resources can now be deployed using closest car/unit calculations across the entire region, instead of just localized to one jurisdiction.

A concern we often hear is the PSAP losing control of their data and not wanting to use CAD-to-CAD for every incident. A CAD-to-CAD system allows each agency to decide what incidents they

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want to include, what information they want to share and with who. An agency could decide to share everything with one agency and perhaps only three things with another agency in the region. The PSAP has total control of their data.

In the San Diego metropolitan region, they have been using a data sharing initiative since 2008. They dispatch all fire and EMS units utilizing closest unit/resource calculations. The fire and EMS departments have seen their average response time reduced by over two minutes across all fire and EMS responses. While the police departments in the region have not yet fully embraced the closest car/unit initiative, they are actively evaluating it. While the response reduction for police departments utilizing closest car/unit calculation throughout a region isn't as dramatic as for fire/EMS, being able to respond to calls during large events such as the Super Bowl, large conventions, and disasters such as a bridge collapse, tornados or snow storms, knowing the location(s) of the closest resource(s) is critical.

Furthermore, situational awareness of all resources within a region provides the Emergency Operations Center (EOC) or Command Center the ability to mobilize resources based on known location of each resource within the region. This can dramatically reduce the response time to a call in volatile or disaster situations. The resources that are tracked utilizing a shared system go beyond just police, fire and EMS units, and can include private ambulances, snowplows, buses, power and cable company vehicles, etc. In situations such as we've seen recently in Texas and Florida with massive hurricanes, having a view and access to all of the known resources visible and available can make the difference between life and death.

CAD-to-CAD Interoperability

The term CAD-to-CAD has evolved over the years to mean different things, but for the most part, it refers to the exchange of data between two or more CAD (Computer Aided Dispatch) systems. The CAD systems can be from the same CAD vendor or multiple CAD vendors, and they don't need to be on any particular software platform. Some might say that the CAD-to-CAD solutions interconnect PSAPs and their various CAD systems by providing various levels of data sharing capabilities.

There are four different CAD-to-CAD Interoperability models available to PSAPs in the Public Safety marketplace:

1. **Consolidation Model** – Multiple PSAPs join together to utilize a single CAD System.
2. **Point-to-Point Interface Model –** Two PSAPs with different CAD vendors' contract each CAD vendor to create a custom interface between the two CAD systems. This type of an interface does provide full integration between the participating CAD systems, but it's

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typically expensive and difficult to maintain, because it does not utilize a standard Application Program Interface (API) to connect the different CAD systems. Not only is this type of CAD-to-CAD interface difficult to develop, it is extremely expensive to maintain, because every time any of the CAD systems are upgraded the custom CAD-to-CAD interface must be tested and re-implemented over and over again with each upgrade; and if one of the PSAPs switches their CAD system to another CAD vendor, then a new custom interface has to be developed from scratch.

3. **View Only** – This option allows incident and resource information to be extracted and provides a view into the incidents and resources of the participating PSAPs, and the agencies they serve. This is sometimes referred to as a view-only or one-way CAD-to-CAD interface; and while it's a very good first step to interoperability, it provides limited data sharing. It does provide situational awareness and gives PSAPs the ability to call each other, request additional resources, or respond to major events in a more coordinated manner, albeit manually.
4. **Intelligent Hub Model -** Two or more PSAPs with different CAD vendors' contract with a third- party vendor to create an intelligent hub that acts as a transfer and translation agent to deliver complex and configurable CAD information between each participating CAD system.

   This type of CAD-to-CAD interface is highly configurable, allowing each PSAP to maintain their autonomy and identity, and allows seamless data-sharing to occur between all participating PSAPs and the agencies they serve. This CAD-to-CAD interface allows each PSAP to maintain their unique incident types, priorities, and resource-naming conventions and utilizes a translation table, to translate information to all of the participating PSAPs CAD systems. Think of it as a language translator, with each PSAP speaking their own language and the CAD-to-CAD system translating between them.

   This ensures the uniqueness of all resources and incidents throughout the region, without compromising the individuality and naming convention of each PSAP. This is a very good interoperability solution that provides situational awareness with the ability to manage incidents and resources regionally. Once the proper MOUs or MOAs are signed by all participating PSAPs/agencies, closest car/resource dispatch can also become a reality.

When evaluating the four options, PSAPs and agencies must fully understand the benefits, costs and limitations of each option in order to select the one that works for them.

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CAD-to CAD is Not Just for Public Safety Agencies

A CAD-to-CAD system, as mentioned earlier in this paper can be used by non-public safety entities such as your Department of Transportation or local energy company. Most CAD-to CAD vendors provide applications or interfaces that can be used if the user does not have a CAD system. It allows them to receive requests for service and to update the sender's CAD system. For example, the PSAP needs assistance from their energy company for wires down. From their CAD system they can send the message to the energy company, the company can acknowledge and provide an ETA to the requesting agency. Imagine during a major snowstorm and the PSAP receives the report of a vehicle in a ditch and all of their officers are tied up on other incidents. The telecommunicator could look at the regional map and see a DOT snowplow close to that area. The telecommunicator could send a request via their CAD system to DOT requesting that the snowplow truck check on the status of that vehicle in the ditch. The driver stops and finds the car empty. They advise the PSAP and the PSAP is able to remove that call from their pending window.

Statewide CAD-to-CAD

Can a CAD-to-CAD system be implemented statewide? The answer is absolutely, and there are a handful of states considering such a project. Many states have a statewide radio system for voice communication, and they have a statewide 9-1-1 system for telephony communications, so the only thing they are not able to share is data. Incidents occur near the border on a daily basis and without interoperable communications including **both** voice & data coordinating a response can be problematic.

Rural areas of the state would benefit greatly from a CAD-to-CAD system. It is not unusual for an emergency call to occur in an area where the closest unit would actually be from another agency. State Police are often the only back up unit for a sheriff officer responding to a domestic. With a CAD-to-CAD system, the PSAP in both of these situations would be able to see the closest unit and from their CAD system request assistance without having to waste valuable time by trying to contact the responding agency via radio or telephone.

Next Generation 9-1-1 (NG9-1-1) Initiatives

PSAPs are aware of the NG9-1-1 initiatives such fire and burglar alarms, car telematics, video feeds, texting, panic buttons, shot spotter, smart phone applications and social media.

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- If a confirmed fire alarm creates a fire incident in CAD with all relevant information such as business location, type of structure, type of alarm, contact information of owner, lock box information, hazardous material information, etc., and the incident is automatically routed to the fire telecommunicator to dispatch the appropriate fire apparatus based on that location's run card, without a telecommunicator having to manual enter the information.
- If a confirmed panic button alarm creates a medical incident in CAD, with all relevant information such as caller location, name and medical information, and makes it available to the first responder in the field without the telecommunicator entering it.
- If the telematics information from a car crash is electronically transferred to CAD along with location, make and model of the car, car owner name and medical information, and automatically creates a car-accident-with-injuries incident without a telecommunicator having to manually enter the data.

Where do We Come In?

Winbourne Consulting is one of the leading public safety communications systems consulting firms in the world. Winbourne Consulting has been very active in assisting agencies, regions and states in developing needs assessment, governance documents, technical requirements, RFPs, vendor selection and project implementation on CAD-to-CAD projects and are well known as the Subject Matter Experts for CAD-to-CAD. We have assisted and or are assisting on seven CAD-to-CAD projects throughout the United States.

About Winbourne Consulting

We have provided consulting and project management services to nearly 250 public safety agencies in the United States and 20 countries. Our clients include 8 of the 10 largest public safety agencies in the U.S.

For more information on how we may assist your agency, please contact: info@w-llc.com, or phone: 703-584-5350.

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