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Report on Dispatch in Reno/Washoe County

**Prepared for REMSA
Reno, NV**



FITCH & ASSOCIATES, LLC

2901 Williamsburg Terrace #G ■ Platte City ■ Missouri ■ 64079

816.431.2600 ■ www.fitchassoc.com

CONSULTANT REPORT

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Executive Summary

The purpose of this report is to provide recommendations based on the dispatch performance of the City of Reno Emergency Communications Center (ECOMM) and Regional Emergency Medical Services Authority (REMSA) Dispatch, and to contrast the dispatch operations of ECOMM to that of REMSA Dispatch and best practices. The report provides an overview of dispatch operations specifically related to calls for emergency medical services (EMS).

Observations are drawn from a summary data analysis delivered to Fitch & Associates (Fitch) by Tri-Data Consulting and from an onsite evaluation of ECOMM conducted in the spring of 2012. The consultants conducted an onsite review of EMS dispatch operations at REMSA and reviewed REMSA system data. Fitch & Associates compared ECOMM and REMSA dispatch operations to industry best practices.

Fitch & Associates has performed assessments of EMS systems and developed readily applicable service delivery options for nearly three decades in 49 of the 50 states in the US and 13 countries across the globe. Fitch & Associates is the leading research, writing and education organization in EMS today. In the mid-80's, Dr. Jay Fitch worked closely with county officials to design the Reno/Washoe County EMS system. Guillermo Fuentes conducted this project's research. Before joining the firm he previously supervised dispatch centers in major cities and served as the Chief Administrative Officer of the Niagara (Ontario) Regional Police Agency.

Key recommendations and findings are summarized below.

Recommendations

- We recommend that ECOMM not expand its functions to include dispatch operations for all emergency medical calls. The result would be *increased* costs to taxpayers and a *decreased* level of service to patients. There would be no benefit to the Washoe County EMS system and more importantly, no benefit to patients who are already well served by REMSA Dispatch.
- To meet the standard of performance already in place at REMSA Dispatch, local governments would need to hire additional dispatchers and staff, pay for Emergency Medical Dispatch (EMD) training of dispatchers, implement the Medical Priority Dispatch System and replace ECOMM's antiquated Computer Aided Dispatch (CAD) system. The costs and time needed to achieve these steps are substantial.
- ECOMM should immediately transfer medical calls to REMSA Dispatch. The current practice of ECOMM's interrogation on medical calls using dispatchers who are not EMD certified, conflicts with the National Academies of Emergency Dispatch (NAED) guidelines/best practices and unnecessarily delays the delivery of care to patients. This practice places both patients and ECOMM at risk.
- We recommend that ECOMM be compelled to operate to the same standards of performance, accountability, verification and penalties under which REMSA already performs.

- Physical co-location of public safety access points (PSAPS) or 911 intake and dispatch is not recommended. Co-location is no longer necessary and, in fact, may be counterproductive. Instead we recommend a communications link between the various CAD systems in Washoe County. The link would be efficient and cost-effective and is a priority to achieve system-wide dispatch accountability.

Findings

- ECOMM affirmatively meets only one (1) of 13 best practices; ECOMM's dispatch procedures are in conflict with nationally accepted standards (see Appendix A).
- ECOMM's dispatch performance is significantly *slower* than is acceptable according to National Fire Protection Agency (NFPA) 1221 standards and negatively impacts the system's ability to achieve rapid response to patients in need.
- ECOMM does not meet the National Academies of Emergency Dispatch (NAED) accreditation standards that require: dispatchers to be EMD certified, dispatching be conducted under explicit medical protocols, and actual performance be monitored using stringent quality assurance processes.
- REMSA Dispatch meets 13 of 13 best practices for dispatch centers and has been awarded Accredited Center of Excellence (ACE) accreditation by NAED.
- REMSA prioritizes calls to determine those that are the most life-threatening in order to provide the highest level of response; they provide medically driven pre-arrival instructions to callers and patients, which has been shown to save lives and improve patient outcome.
- REMSA Dispatch annually (2011) handles 52,400 emergency calls for service, dispatches Care Flight Medical Helicopters, and schedules 8,200 non-emergency calls to move patients within the region's healthcare systems. The center employs 28 EMD certified dispatchers. REMSA Dispatch is not supported by taxpayer funds.
- Economies of scale, to be achieved by combining police, fire, and medical dispatch under the auspices of ECOMM are unrealistic. A one-dispatcher-does-all policy is impractical and laden with liability. Police dispatch focuses on officer safety and legal requirements. Fire dispatch gets the units moving and assesses the event only after arrival. Medical dispatch is unique in requiring EMS certified dispatchers to provide pre-arrival assessment and instructions to the caller as well as pre-arrival updates to the responders.

Police, Fire and Medical Dispatch Needs

Emergency communication centers were originally simple structures that performed only two functions: complaint-taking and gathering the location of the complaint. Dispatch centers then broadcasted the information and field personnel decided on the response needed. This method is often called the taxi model of call taking.

Over time, the emergency services branches; fire, emergency medical and law enforcement, recognized that dispatch centers could serve two additional functions: 1) as an initial filter to distinguish calls of more and/or less critical nature and 2) to provide for more efficient resource distribution to prevent clustering of response units.

Each of the emergency services use these functions differently and while all dispatch centers fundamentally perform the functions noted above, the reality is that they implement them in a very different manner. More recently, the advent of specific technologies to assist with dispatch tasks and the adoption of specific practices, legislation and guidelines have raised the performance and quality bar for dispatch centers. From the dispatch viewpoint; police, fire and ambulance services have evolved differently to accomplish their specific missions, mandates and to provide for the best service outcomes.

Different Dispatcher Focus

The police service dispatch centers are focused on officer safety and legalistic review. This means that the number of questions and the time required to get to a satisfactory determination of the situation is not measured. It is paramount that a responding officer is fully aware of the situation and the potential for danger. In keeping with this philosophy, there are no national, international or even local response time requirements for police service responses.

A second and growing concern is that case law is starting to build on voluntary disclosure at the point of dispatch. Clearly, if a person calls 911 to report a domestic issue (or any call) in which they are implicated, then the person taking the call should caution the caller to their right to counsel (the sixth amendment in the United States). This right has to be given to the person by a peace officer and it has to be done in a timely fashion. Admissions at the point of 911 calls, which often launch investigations and are used as evidence in court, are becoming increasingly problematic.

In contrast, speed is paramount for both emergency ambulance and fire service responses. Medical emergencies benefit from medically driven pre-arrival instructions to the caller while the ambulance is en route. Medical responders can be updated with medical information while en route. Fire event assessments are typically conducted on scene, which means that fire dispatch is less interested in gathering additional information from the caller about the event.

Different CAD Infrastructure Needs

Computer aided dispatch companies recognize the difference between the three public safety systems and have tailored the technologies to suit the specifics of each service.

Police CADs became records management oriented and heavily involved in officer safety with the first call taking screen dedicated to officer safety. Also, because of the problem detail needed, the Police CAD has many free text fields that require strong data entry skill sets for the Police call takers.

EMS technologies evolved around vehicle locations and optimized placement of vehicles against historical call demand, resulting in dynamic unit deployment. EMS relies heavily on technology to achieve response times and optimize resources.

Fire CADs are similar to EMS CADs except the principal function is managing apparatus complexity. Unlike EMS, fire has a multitude of static units that are stationed throughout the system and must be inventoried and placed at strategic locations depending on incidents. Managing ladders, pumpers, and support vehicles is the principle function of a fire CAD. The deployment of apparatus to effect move ups of units is an essential function a fire CAD.

The dispatch needs for law enforcement, fire and medical emergencies are significantly different. Trying to find a singular technology that embraces all concepts well and delivers optimal performance for all three services is not practical. Fire and EMS would not require the heavy records management back end of a police CAD; police do not need the deployment capabilities of an EMS or Fire CAD; EMS and police do not require the complex deployment plans and move ups of Fire. For this reason, there are few sophisticated 911 centers of comparable size to Reno/Washoe that combine the dispatch tasks for the three public safety needs.

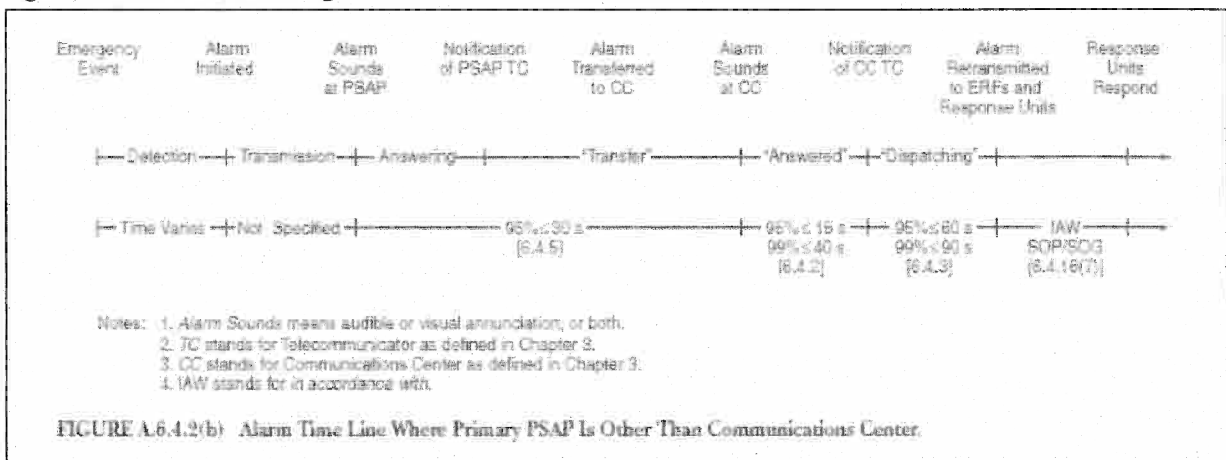
Appendix B provides a discussion of police, EMS and Fire dispatch technologies.

911 Emergency Call Processes and Standards

The processing of a 911 call is the key component of effective dispatching as well as cost efficiency. Each dispatch task is complex and requires different talents and training. Structures and technologies that recognize both the differences and similarities in different dispatching tasks are able to maximize efficiencies. Those that do not tend to run slower and cost more.

The natural anatomy of a call starts with an individual observing the need for an emergency intervention; the individual initiates a 911 call; a 911 call taker receives the call and identifies the primary agency required to treat or handle the call (ambulance, police or fire) and transfers the call to that agency. The call taker from the responding agency uses experience, guidelines or protocols (considered best practice) to define both the category of call and the urgency of the call and finally the information is handed to a dispatcher to dispatch the appropriate response units. Figure 1 below depicts the typical flow 911 call.

Figure 1. 911 Call Processing



Two organizations, the National Fire Protection Association (NFPA) and the National Emergency Number Associations (NENA), set standards for emergency call processing. NFPA norms/standards on dispatch (NFPA 1221) define both the flow of calls and the allotted time for high performance dispatching. A summary of relevant NFPA standards regarding dispatch process and performance is provided in Table 1 below.

Table 1. NFPA 1221 Dispatch Standards

NFPA 1221 Section #	Standard
Section 6.4.1	All calls/alarms to be recorded and tabulated to indicate origin of call.
Section 6.4.2	95% of calls to be answered within 15 seconds; 99% within 40 seconds.
Section 6.4.3	95% of emergency dispatching shall be completed within 60 seconds.
Section 6.4.4	For law enforcement, the jurisdiction with authority determines standards for dispatch completion. ¹
Section 6.5.4	95% of calls shall be transferred from the PSAP within 30 seconds (10 seconds for ring answer and 20 seconds for identification of primary resource required).

NENA standards are consistent with NFPA 1221 with some additional detail as noted in Table 2 below.

Table 2. NENA Call Taking Operational Standards

NENA 56-005 ²	Standards
Master Glossary 00-001	90% of all PSAP calls to be answered within 10 seconds during the busy hour ³ ; 95% of all calls should be answered within 20 seconds.
Page 8 of 12	911 call taker limited to <i>very few questions prior to transferring the call to the agency that will dispatch the call</i> . This is done in order to reduce the delay of the responding agency which will ultimately deal with the crisis.
Section 3.3	All 9-1-1 calls at a PSAP shall begin with "9-1-1." The correct statement is "Nine-One-One", never "Nine Eleven". Additional information or questions may be added, as in: "9-1-1, what is the emergency?" ⁴ , or "9-1-1 what is the address of the emergency?" ⁴

The standards summarized above will be referenced in the review of ECOMM's performance.

NFPA and NENA standards reflect to the need for rapid and accurate dispatch to medical emergencies. Appendix D includes a discussion of first responder and ambulance response times and the impact on cardiac arrest patients.

¹ There is no national or international or even local response time requirement for Police service response.

² NENA Call Taking Operational Standard/Model Recommendation NENA 56-005 June 10, 2006 Page 8 of 12).

³ The hour each day with the greatest call volume, as defined in the NENA Master Glossary 00-001.

⁴ This is directly from the Operational Standards and cannot be modified. Other information, such as the operator identification number or that the line is recorded may also be added. It is recommended that the agency not be identified when answering emergency lines to avoid confusing the caller and delaying response to alternate routed calls.

Reno Emergency Communications Division (ECOMM)

The ECOMM Dispatch center is a state-of-the-art modern building that is fully disaster recoverable. It is a large facility that has good space distribution for workers and at the time of the observations was being remodeled in order to accommodate the Washoe County Sheriff's personnel. On the day of observation many of the consoles were being swapped out for modern dispatch consoles and the physical hardware was being replaced with newer installations.

The Reno Fire Department and the Reno Police Department currently share dispatch services. Recently, the decision was made to co-locate County Sheriff personnel in the ECOMM facility. This co-location is likely to introduce new complexities for personnel. County and city employees will be working side-by-side performing similar work tasks but for differing rates of pay and benefits.

As of July 1, 2012, Washoe County terminated a long-standing contract with the City of Reno for fire service. Existing unincorporated fire services have been merged into the new Truckee Meadows Fire Department. Critical mutual and automatic aid issues are currently being worked out between the City of Reno and Washoe County.

During the year of transition, REMSA was considered as a potential dispatch center for the new county fire service. However, the County's final decision was to maintain the dispatch function with the City of Reno and co-locate the Sheriff's law enforcement dispatch functions within the ECOMM dispatch center.

ECOMM Call Processing Model

Call taking at ECOMM is done through a "receive and hold" model, which means that the 911 operator retains the call if it is either a police or fire call and will transfer the call if it is a medical emergency. However, on medical emergency calls the ECOMM 911 operator will ask questions to allow for a fire first response assignment prior to transferring the call to REMSA.

This practice is in direct conflict with the NENA standards as noted in Table 2 NENA Call Taking Operational Standards, above.

Significant challenges and even potential dangers, as noted below, exist with the "receive and hold" model used by ECOMM:

- Call taking is significantly longer and requires more call takers to ensure that the phone lines are answered within 10 seconds per NFPA and NENA standards;
- If all lines are busy then the caller will be placed on hold or will receive a recording of some type until a 911 caller becomes available;
- Call takers in the ECOMM model are more costly than the more typical 911 call taker operators;

- ECOMM call takers are required to master the differences between police, fire, and medical call protocols which are very distinct, require different training and experience and carry high risk and liability for errors;
- The pre-questioning of medical calls by 911 call takers to determine the requirement of fire first response is contrary to best practice and NENA standards:
 - a. It creates confusion and frustration for the caller; they will be asked similar or same questions twice.
 - b. The practice of double questioning delays EMS service response to the patient.
 - c. The practice does not gather sufficient information to ensure the responder safety.
 - d. The practice triggers unnecessary responses by fire/police responders, increasing risk to the public unnecessarily and depletes a resource that may be needed minutes later to a true emergent call (a severe medical, fire call, or police response).

Recent ECOMM changes in 911 call transfer procedures further compound the potential liabilities. Because there is no CAD-to-CAD link, ECOMM currently remains on the line to assure that the transfer to REMSA Dispatch is completed.⁵ According to the new procedure, ECOMM will no longer monitor the call assignment of the ambulance over the radio, thus not receiving the updates and not updating the first responder. The procedure is contrary to best practice as well as common sense and public safety.

Best practice uses technologies to bridge this gap. Links from computer aided dispatch (CAD) systems to CAD systems allows for simultaneous dispatch at the appropriate time. This practice not only improves clinical outcomes through faster call processing, but also reduces cost by assigning first response units only when required. Appendix C provides a more detailed description of a CAD-to-CAD link suggested for the Reno/Washoe EMS system.

ECOMM Performance and Technical Competence

The data made available from ECOMM for evaluation was severely limited.⁶ Due to our experience with dispatch systems, we know that the data is in the system, however ECOMM staff is apparently unable or unwilling to provide data extracts.

Basic dispatch performance data that is and should be made readily available to elected officials and the public includes the following:

1. Call response time (from first ring to phone answer),
2. Call handling time (time the caller takes to evaluate caller need),

⁵ REMSA has urged the City/County to implement and CAD-to-CAD link for several years. REMSA will bear the cost. The link will provide accountability throughout the system and improve dispatching.

⁶ The ECOMM data had substantial variability. More than 7,000 of the 36,000 calls evaluated had no associated time count. Call clusters or standard deviations on a Gaussian distribution were at 12-minute intervals. This means that many calls are taking a significant time to transfer to the primary responding agency. A number of prior consultant reports have noted ECOMM's deficiencies producing verifiable data.

3. Call handoff time (the time it takes the secondary public safety answering point to respond to the call and to receive the transfer of the caller).

The data that was provided to the consultants was for the period 01/01/2011 to 12/31/2011 and was an aggregate data set that folded all three metrics into one. Thus, the evaluation can only indicate ECOMM's basic performance metric. The analysis is only for calls that were handed off to REMSA for ambulance response.

Table 3 below summarizes the results of the ECOMM performance for the data set made available from the time a 911 call is received until the call is handed off to REMSA.

Table 3. ECOMM Aggregate Dispatch Performance

Metric	ECOMM Performance	NFPA 1221 Standard
Average or 50% of calls	57 seconds	95% within 30 seconds
90% of calls	1 minute 45 seconds	95% within 30 seconds
Number Calls Reviewed	7,564	

ECOMM dispatch performance is significantly longer than is acceptable for either the NFPA or NENA standards that call for the transfer of calls from the PSAP to occur within 30 seconds on 95% of calls. On average (half of all calls), ECOMM call takers use close to one minute to hand calls off to the REMSA and when measured for 90% of calls, they use one minute, forty-five seconds to hand off calls. This analysis was done prior to a fire department policy change to do preliminary evaluation of medical calls through the 911 call taker. The policy change will undoubtedly increase the call handling time of the 911 call center and thereby unnecessarily lengthen an already unacceptable call processing time.

ECOMM's poor dispatch performance takes up the first minute and a quarter before the EMS provider is notified. The Washoe County EMS system cannot meet NFPA standard (Section 6.4.3) that states that 95% of emergency dispatching shall be completed within 60 seconds; due to ECOMM's lengthy and unnecessary call processing times. This poor level of performance should be great cause for concern as it negatively impacts the overall EMS system's ability to provide rapid service to patients in need.

REMSA Dispatch

The REMSA Dispatch facility is a state of the art dispatch center that is located within a cluster of REMSA buildings east of the Reno-Tahoe International Airport. REMSA's dispatch equipment and systems include strong geospatial capabilities and mapping, the latest version of the Tritech CAD system, the Marvillis system and FirstWatch bio-surveillance systems. All REMSA vehicles are equipped with Automatic Vehicle Locators (AVL) and GPS tracking devices that allow dispatchers to visualize unit locations system-wide. REMSA dispatch technology is several generations beyond that utilized by ECOMM.

REMSA Dispatch coordinates regionally across two states for ground ambulance responses to emergency calls and arranges for the non-emergency transfer of patients to and from health care facilities in the greater Washoe County region. REMSA's Care Flight helicopter transport is also coordinated and dispatched by REMSA Dispatch. In 2011, dispatchers handled 52,400 emergency calls for service and 8,200 calls for inter-facility transfers.

Dispatch staff meet daily to review the prior day's events, refine deployment and review any operational concerns. Every patient transported by REMSA receives a survey on REMSA's performance including the dispatch process. The surveys provide a continuous feedback loop for improvement throughout the organization.

During major disasters, REMSA Dispatch is the primary coordination point for emergency services. The Reno Air Race crash in 2011 is an example of the effort and expertise necessary to successfully manage a large-scale, multi-casualty event.

Dispatchers

REMSA requires all dispatchers, prior to employment, to be either Emergency Medical Technicians-Intermediate (EMT-I) or Paramedic certified. Most of the REMSA dispatchers have previous experience working in EMS field operations. New hires receive four to six months of internal training and preceptorship and are trained and certified as Emergency Medical Dispatchers. This level of training allows dispatchers to provide pre-arrival instructions to callers based on strict protocols. Dispatchers receive 24 hours per year of continuing education as a requirement to maintain EMD certification.

ACE accreditation

The REMSA Communications Center was first awarded an Accredited Center of Excellence (ACE) accreditation from the National Academies of Emergency Dispatch (NAED) in 2001 and the Center has maintained accreditation over time. The goal of accreditation is to improve care and maximize the efficiency of 911 centers. Patients and callers receive professionally practiced dispatch life support,

receive consistent, medically-correct and time-proven pre-arrival instructions and the most appropriate EMS response.

NAED sets minimum standards for national dispatcher certification (EMD certification) as well as standards for dispatch center accreditation. NAED provides separate accreditation processes for medical, fire and police dispatching. Requirements for ACE Accreditation are comprehensive and reflect the effort required to achieve and maintain accreditation. Even for the best dispatch centers, accreditation is typically a multi-year process.

Table 4 below articulates the 20 NAED points of excellence that must be formally documented, described and verified as part of the medical dispatch accreditation/re-accreditation application process.

Table 4. Dispatch Center Accreditation Requirements⁷

Formally describe and document the following —
1. All medical dispatch call-taking, dispatching and supervisory workstations.
2. Current Advanced Medical Priority Dispatch System (MPDS) licensing of each EMD position.
3. Current Academy certification of all EMD personnel.
4. How Academy certifications and case review will continue to be maintained.
5. Full activity of Quality Improvement (QI) committee processes.
6. EMD quality assurance and improvement methodology.
7. Case review at the Academy's recommended number and percentage of randomly reviewed cases.
8. EMD quality assurance and improvement database.
9. Consistent, cumulative MPDS case review at or above the following percentages: 95% - Case Entry protocol compliance; 95% - Chief Complaint selection accuracy; 90% - Key question protocol compliance; 90% - Post dispatch instruction protocol compliance; 95% Pre-arrival instruction protocol compliance; 90% - final code selection accuracy; 90% - cumulative overall score
10. Correct case review and QI procedures validated through independent Academy review.
11. How EMS field personnel were oriented to the proper use of the MPDS and feedback report.
12. Local policies and procedures for implementation and maintenance of the EMS program.
13. Current Continuing Dispatch Education (CDE) and EMD recertification program functions.
14. How police and fire dispatchers were oriented to the proper use of MPDS (S.E.N.D. protocol).
15. Properly established local configuration of all MPDS response assignments.
16. How MPDS response assignments will be regularly reviewed and recommended changes approved.
17. Incidence of all MPDS codes and levels.
18. Specific medical director oversight and involvement in EMD activities.
19. Sharing of non-confidential data with the Academy.
20. Support of the Academy's Code of Ethics and practice standards.

Accreditation requires top-notch systems, reporting and processes and ultimately benefits patients and the community-at-large. REMSA Dispatch has maintained accreditation for the past eleven years and as such, serves the community well.

⁷ National Academies of Emergency Dispatch, Twenty Points of Accreditation Excellence, www.emergencydispatch.org.

Oversight

Clinical oversight of REMSA Dispatch is provided by a full-time medical director, who has direct involvement with the center's performance and personnel. He, along with the Quality Assurance (QA) officer review calls and follow QA processes as prescribed by NAED. The QA officer is part of the REMSA Education and QA division and provides REMSA Dispatch with internal independent QA review.

The Washoe County District Board of Health has jurisdiction over all public health matters in the Health District and as such provides policy oversight for REMSA and REMSA Dispatch. The Board of Health is designated to oversee REMSA's operational performance, to set performance and response time standards, and monitor response time performance. The Board was granted specific authority from the City of Reno, City of Sparks and Washoe County to grant and oversee the ground and helicopter ambulance franchise the Board awarded REMSA in 1987. The seven-member Board is comprised of two representatives each from Reno, Sparks and Washoe County and a Nevada licensed physician. The Board meets monthly in a public-meeting format.

REMSA's Board of Directors provides business advice, clinical oversight and overall strategic planning to move the organization forward with a focus on patients and the community at large. Board members' expertise and experience include the areas of accounting, law, consumerism, and health care.

The Washoe County District Board of Health appoints three members with expertise as follows:

- Accounting
- Legal
- Consumerism

Three area hospitals come together to appointment one additional consumer representative. Those same hospitals (Renown, St. Mary's, and Northern Nevada Medical Center) each appoint a representative of their own to the Board. The Board totals seven individuals and is very active with respect to REMSA's activities and performance.

Health Care Innovations Grant

REMSA was awarded a three-year Innovation Grant in June 2012, with the objective of implementing projects that aim to deliver better health, improved care and lower costs to people enrolled in Medicare, Medicaid and Children's Health Insurance Program. The program, funded by the federal Centers for Medicare and Medicaid Services, recognized organizations that can implement the "most compelling new ideas" to deliver better health care services.

The grant project is titled "Community Health Early Intervention Team (CHIT)" and is being conducted in concert with Renown Medical Groups, Northern Nevada Medical Center, Saint Mary's, the University of Nevada-Reno School of Community Health Sciences, the Washoe County Health District, and the State of Nevada Office of Emergency Medical Services. The Intervention Team is to respond to lower acuity and

chronic disease situations in urban, suburban, and rural areas of Washoe County. The project is designed to reduce unnecessary ambulance responses, as well as hospital admissions and readmissions while improving patients' health care.⁸

The grant award recognizes the creativity, solid systems and management expertise needed to accomplish the grant objectives and to work with community partners to shape the future of health care. This is a particularly noteworthy accomplishment since over 3000 individual applications were put forward for evaluation and only 107 applications were deemed to have the necessary requirements to merit investment. Even more importantly REMSA received the largest grant (in terms of dollars) associated with EMS.

⁸ Centers for Medicare & Medicaid Services, Center for Medicare & Medicaid Innovation, Health Care Innovation Awards: Nevada. www.innovations.cms.gov/initiatives/Innovation-Awards/nevada.html.

Recommendations to Improve Reno/Washoe Dispatch

The consultants noted a number of deficiencies in ECOMM dispatch operations. These deficiencies result in delays in 911 call handling and ultimately delay response times to patients in need.

A number of consultant studies over the past few years have also concluded that ECOMM is effectively unable to provide reliable, verifiable data. This deficiency chokes ECOMM's capacity to monitor its own performance and that of area fire departments. The lack of solid data stifles any measure of system accountability.

The recommendations below are focused changes that will benefit patients, serve the community well and reduce or at minimum, contain costs.

1. ECOMM should immediately stop the practice of questioning callers that require medical response and immediately transfer the call to REMSA.
2. Transfer all 911 medical calls "county-wide" (including Incline Village) to REMSA's accredited medical dispatch center for questioning, administering pre-arrival medical instructions, and requesting appropriate additional resources. REMSA's computer matrix program allows for quality performance monitoring, reporting, and continual evaluation/enhancement. This should be combined with an external oversight, which is in place via the Washoe County District Health Department, Medical Director, and REMSA's quality assurance staff.
3. Install the CAD-to-CAD link between REMSA and ECOMM for automated allied service requests. This will allow the system to triage the calls first, determine if first response is required (sophisticated algorithms like differential in response times ensure only calls that require first response get first response) and both ambulance and fire are dispatched simultaneously.
4. Send an ambulance on all medical emergencies but limit fire responses only to medical calls where their assistance is truly needed and can impact patient outcome. This will preserve fire's capacity to respond to wildland and other fire events that can overwhelm the system.
5. Reduce the use of lights and siren responses (fire and medical) to medical calls that are deemed non-emergent. Lights and siren responses would be reserved for only high priority (life-threatening) calls and will thereby reduce liability and improve safety for the community at large.
6. Measure and report all dispatch performance metrics system-wide and by individual agency to assure timeliness of call handling and hand-off to the appropriate service.
7. Ensure that all calls of a medical nature are immediately handed to REMSA for evaluation of severity and a structured system response. Every medical call will have a paramedic ambulance sent, but only a small segment of calls require additional resources from fire or police.

Use of a highly structured medical protocol system with major quality assurance components, external medical oversight, and computerized alerting technologies will ensure not only the quickest response, but also the right resources, at the right time. It will reduce workload for the ECOMM 911 center allowing better handling of incoming calls with limited resource staff, save dollars by reducing unnecessary fire and police responses, preserve resources for when they are truly needed, and reduce risk to the public of having an accident when a response was unnecessary.

APPENDIX A

ECOMM and REMSA Dispatch - Best Practice Comparison

APPENDIX A: ECOMM and REMSA Dispatch - Best Practice Comparison

REMSA affirmatively meets *all* of 13 best practices for emergency dispatch centers.

ECOMM affirmatively meets *only one (1)* of the 13 best practices.

Table 5. REMSA and ECOMM comparison

Best Practice	REMSA	ECOMM
1. Call taking done by specialized personnel	YES Paramedics with field experience handle call taking to ensure optimal patient contact	NO Call takers not specialized; not required to have field experience; they perform for all three disciplines: 911, police, fire; results in skills retention issues
2. Protocol based call taking	YES Use Medical Priority Dispatch System (MPDS), a standard of care protocol for medical emergency triage and pre-arrival instructions to patients/callers	NO No protocols, loose guidelines and civilian experience to answer callers and determine response ⁹
3. Quality assurance program with calls reviewed for call taking accuracy	YES REMSA Dispatch is NAED accredited which involves a strict quality assurance program	NO No quality assurance program; no accreditation; personnel not certified for emergency medical dispatch
4. External oversight	YES Independent medical director for dispatch	NO No medical director involvement for dispatch
5. Time measurements and reporting	YES Call handling and response time performance is determined by Board; reported monthly; failure to meet response time results in financial penalties	NO No accountability, no performance requirements by oversight body, no apparent reporting and no consequences for poor performance
6. Computer aided dispatch (CAD) with mapping	YES Strong geospatial capabilities; up-to-date mapping; latest version of CAD system	NO End of life CAD, no integrated mapping
7. AVL/GPS, automatic vehicle location, global positioning system	YES All vehicles equipped with AVL/GPS; dispatcher can see the resources on the CAD	NO None

⁹ During the consultant's on site visit, he witnessed the same caller call about the same issue three times, answered by three call takers and given three different sets of instructions. This chart is done based on the best information that could be ascertained at the time, the consultant recognizes that situations are evolving and may have changed post the writing of the report.

8. Mobile data terminals communicate with CAD	YES Currently being installed	NO Only with police not with Fire
9. Radio/Radio interoperability	YES	YES
10. Drag and drop dispatching, ensures proper time stamps	YES Calls are placed on units in a windows based environment that ensures that call times are logged accurately	NO Relies on radio dispatch and free text fields for updates
11. Prescribed continuous training for call takers	YES 24 hours of bi-annual continuing education is required	NO None prescribed
12. Personnel mobility	YES Fully trained paramedics can be promoted both internally and externally	NO Personnel limited to dispatch functions
13. Field and Dispatch SOP, standard operating procedures, up to date	YES Staff meet daily to refine deployment and other operational concerns including policies and procedures	NO No system to update the procedures was given to the consultant, several changes in management in the last few years

APPENDIX B

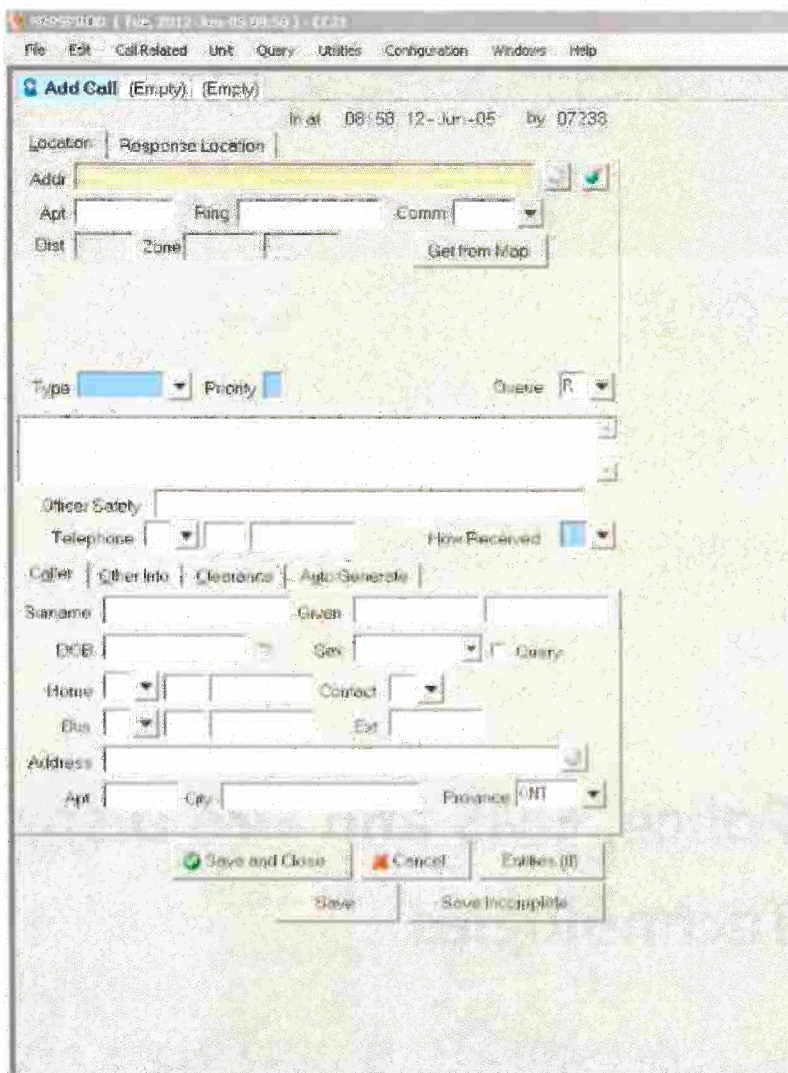
Police, EMS and Fire Dispatch Technologies

APPENDIX B: Police, EMS and Fire Dispatch Technologies

Computer aided dispatch (CAD) companies early on recognized the difference between the three public safety systems and tailored the technologies to suit the specifics of each service.

Police CADs became records management oriented and heavily involved in officer safety. The first call taking screen is dedicated to officer safety. Figure 2 below is a sample of a typical Police service CAD screen.

Figure 2. Typical Police Service Dispatch Intake Screen



Also, because of the detail needed to describe the problem, the Police CAD has many free text fields that require strong data entry skill sets for the Police Call takers.

EMS technologies evolved around vehicle locations and optimized placement of vehicles against historical call demand. Figures 3 and 4 below reflect the complexities involved the dynamic deployment of ambulances to emergency medical calls.

Figure 3. CAD Components for Emergency Medical Call Dispatch

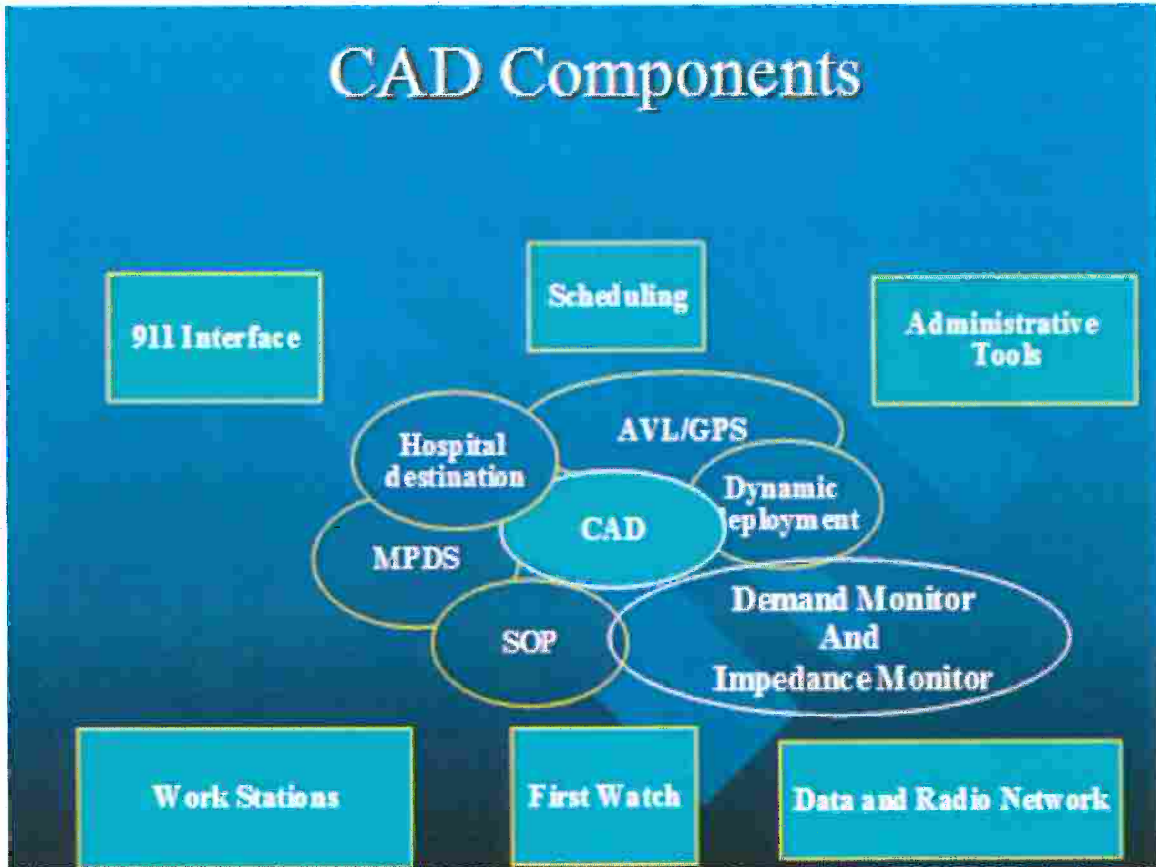
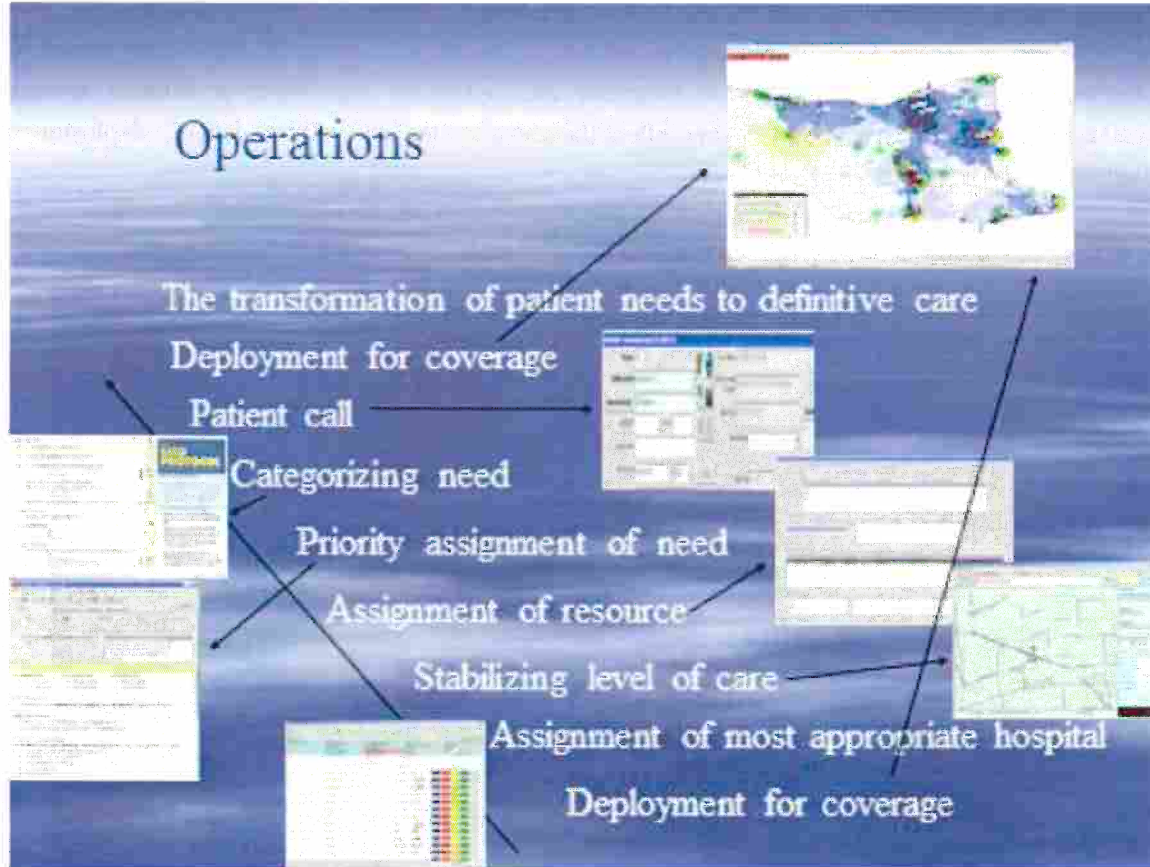


Figure 4. Considerations During Dispatch of Emergency Medical Calls



EMS relies heavily on technology to achieve response times and optimize resources to better serve patients.

Fire CAD design is similar to EMS CAD design except that the principal function for fire is managing apparatus complexity. Fire has a multitude of static units that are stationed throughout the system and must be inventoried and placed at strategic locations depending on incidents. Managing ladders, engines, pumpers, heavy rescue, foam trucks and support vehicles is the principle function of the Fire CAD. The deployment of apparatus to effect move ups of units is how Fire Cads are designed.

Figure 5 below is a sample of the unit complexity of a large metropolitan fire department.

Figure 5. Sample of Units to Be Managed By a Fire CAD

	Quint 1, Rescue 1, Battalion Chief 1 1	Quint 5 1	Quint 6 2	Quint 8 1	Quint 10, Rescue 2 2	Quint 11 1	Quint 12 2	Quint 13, Rescue 3 3	Quint 14 1	Quint 15 1	Quint 16 2	Quint 17 3
Battalion 1 (Suburban)	Air Light 11 (Rehab & Mobile Air Unit)	Engine 6 (1250gpm Class A pumper)	Engine 8 (1250gpm Class-A Pumper)	Engine 10 (1250gpm Class-A Pumper)	FRV 11 (500gpm First Response Vehicle)	FRV 12 (500gpm First Response Vehicle)	FRV 13 (500gpm First Response Vehicle)	Feraro (Q- 14) (2000), 1996	FRV 15 (500gpm First Response Vehicle)	FRV 16 (500gpm First Response Vehicle)	Engine 17 (1250gpm Class-A Pumper)	
Battalion 1- Res. (Tahoe, Reserve piece)	Electrical Trailer 5 (Electrical Equipment)	Quint 6 (105' Rear- mount Aerial)	Foam Tanker 8 (Foam Unit)	Quint 10 (105' Rear- mount Aerial)	Quint 11 (75' Rear- mount Aerial)	Quint 12 (75' Rear- mount Aerial)	HazMat 2 (HazMat Box Truck)	Pierce (FRV) (500) (1998)	Quint 15 (75' Rear- mount Aerial)	Quint 16 (75' Rear-mount Aerial)	Quint 17 (75' Rear- mount Aerial)	
Engine 1 (1250gpm Class-A Pumper)	Engine 5 (1250gpm Class-A Pumper)		Quint 8 (75' Rear-mount Aerial)	Rescue 2 (Heavy Rescue)			HazMat 3 (Research and Response Unit)	Fire Prevention (Trailer) (1996)		Fuel Truck 16 (Fuel Delivery Truck)	Brush 17 (300gpm Brush Truck)	
	Quint 1 (105' Rear-mount Aerial)	Quint 5 (95' Mid- mount Platform)		Technical Rescue 2 (Box Truck)			Quint 13 (105' Rear- mount Aerial)					
Rescue 1 (Heavy Rescue)	Utility 5 (Utility Van)											
Water Rescue 1 (Specialty Piece)	Utility Truck 5 (Box Truck)											

A Fire CAD must consider this level of complexity to dispatch units and manage the move up of units within the system to provide coverage.

APPENDIX C

CAD-to-CAD Link: CADPortal

APPENDIX C: CAD-to-CAD Link: CADPortal



12-111 Fourth Ave, Suite 354,
St Catharines, ON
CANADA L2S 3P5
Phone: 905-646-5172
Fax: 905-646-6564
Web: <http://www.cadnorth.com>

CADPortal

Allied Agency Notification Interface

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CADPortal Allied Agency Interface by CAD North Inc.

The CADPortal application monitors all incidents created in the customer CAD system and notifies the appropriate Fire Service when fire response is required based on medical and operational criteria. CADPortal notification is automatic and occurs as soon as the incident is created in the customer CAD system (i.e.: at Send-to-queue).

The CADPortal application is made up of the CADPortal Server that will run at the customer site and monitor its CAD system, and the CADPortal Client that will run at the Fire Service alarm rooms.

Starting CADPortal Client:



To launch the CADPortal Client (the Fire side of the interface) double-click the desktop icon.

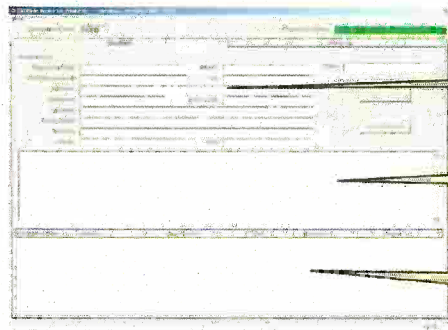
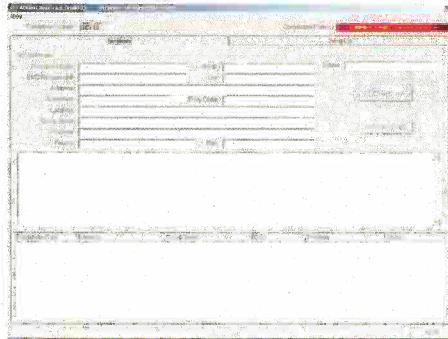
When the CADPortal Client starts up, it will automatically connect to the CADPortal Server running at the customer site. The connection status will initially display "CONNECTING" in red, indicating that a connection has not yet been established.

This status panel will indicate "CONNECTED"

Connection Status

and turn green once a connection is established. If the connection is ever

interrupted during operation, the CADPortal Client will automatically attempt to re-establish its connection without the need for the fire dispatcher to take any action. While the connection status is RED, the client WILL NOT receive notifications or updates from the customer CAD system.



Incident Details

Incident Comments

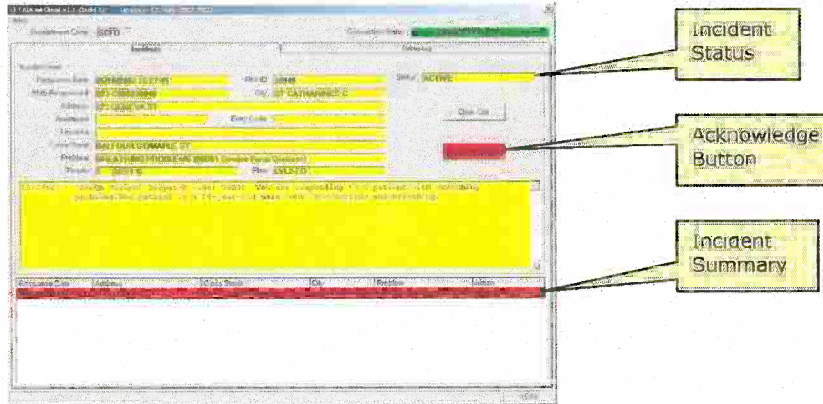
Incident Summary List

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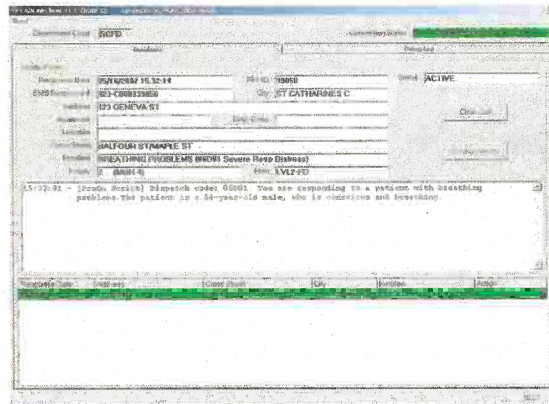
New Incident Notification:

When a new incident is created in the customer CAD system for which Fire response is required, the CADPortal Client will display an incident summary in the Incident List portion of the form and an audible alert will sound. When the dispatcher selects the summary with the mouse, the incident details will display in the Incident Details portion of the form and the "Acknowledge" button will turn RED. (Note: The incident details will display automatically if there are no other incidents in the summary list.)

The Fire Dispatcher must acknowledge the incident notification in order to silence the audible alert. Once acknowledged, the background of the incident details reverts to white and the incident summary line changes to GREEN. If the notification is not acknowledged within a timeout limit, the incident status will switch from "ACTIVE" to "ACK TIMEOUT" and the incident summary line will turn BLUE.

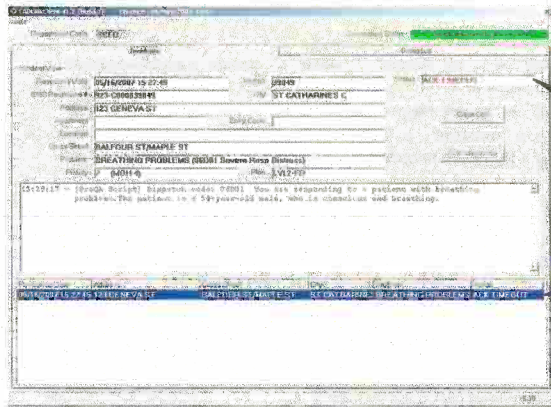


New Incident Notification



Acknowledged Incident

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Incident Acknowledge Timeout

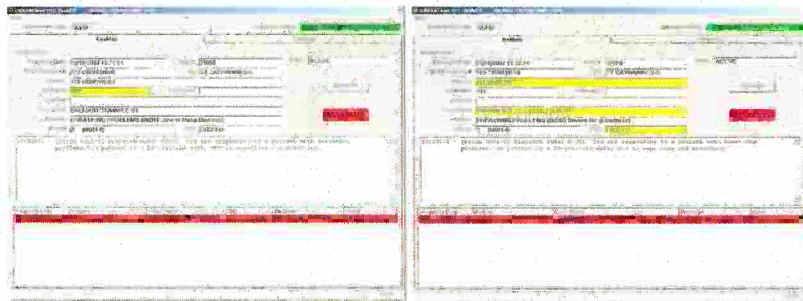
Incident Updates:

Whenever updates are made to an incident on the customer CAD system, these updates are automatically forwarded to the CADPortal Client at the Fire service.

Critical Updates:

If the update relates to a critical component of the incident, such as Address (or any address component), Priority, Problem or Plan, the incident summary line and the "Acknowledge" button will turn RED and the alert tone will sound. The updated fields will be displayed with a YELLOW background to highlight the changed information.

As with a new call notification, the Fire Dispatcher must acknowledge the incident notification in order to silence the audible alert. Once acknowledged, the background of the incident details reverts to white and the incident summary line changes back to GREEN. If the critical update is not acknowledged within the timeout limit, the incident status will switch from "ACTIVE" to "ACK TIMEOUT" and the incident summary line will turn BLUE.



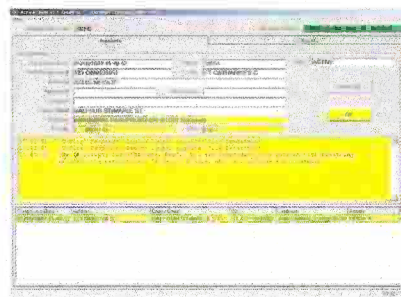
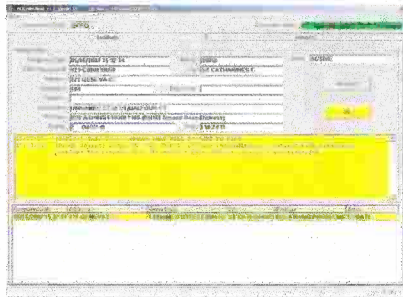
Examples of Critical Incident Updates

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Non-Critical Updates:

Certain non-critical updates are also forwarded to the CADPortal Client at the Fire Service. These non-critical updates are related to situations where a comment marked for forwarding to Fire has been added to the customer incident or where a change to the priority or problem of the customer incident indicates that Fire response is no longer required (by the customer). (Note: Local Fire policies will determine what will occur when EMS incidents are downgraded in this manner.)

When the CADPortal Client receives non-critical updates the Acknowledge button will display "OK" rather than "Acknowledge" and will turn YELLOW. The Fire dispatcher must acknowledge the update, but this acknowledgement is not subject to a timeout.

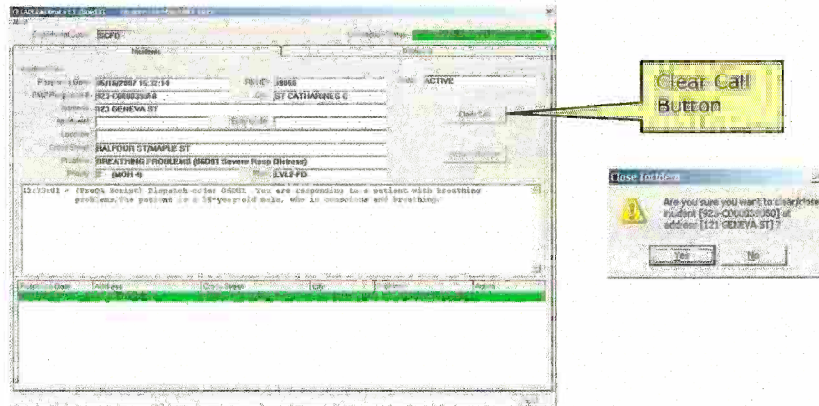


Examples of non-critical updates.

Clearing Calls:

At any time after receiving a new incident, the Fire dispatcher can clear the incident from the CADPortal Client.

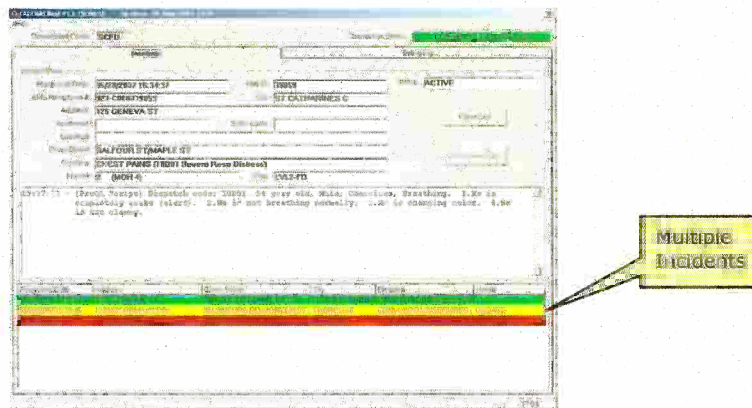
To clear a call, select the Incident Summary Line to display the incident detailed and then click the "Clear Call" button. The CADPortal Client will display a Close Incident dialog to confirm that the Fire dispatcher wishes to close the call. Selecting "Yes" will remove the incident from the CADPortal Client display. Note: Once an incident is closed on the CADPortal Client, no further updates will be sent, even if the incident is still active on the customer CAD system.



Multiple Incidents:

The CADPortal Client will display multiple incidents and allow the Fire dispatcher to select which incident to view. Incidents Summaries are listed in the order they were received by the CADPortal Client. The Fire dispatcher displays the details of each incident by clicking on the summary line with the mouse. When an incident is selected and displayed, the text of its summary line will displayed in **BOLD**.

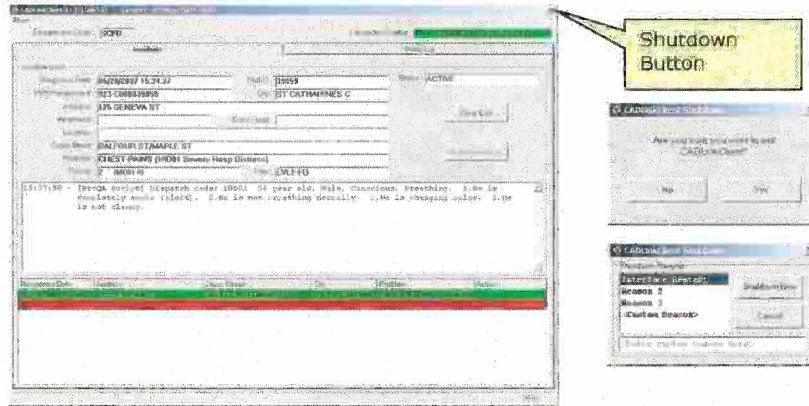
Note: New calls must be selected and displayed before they can be acknowledged.



Shutting down CADPortal Client:

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In order to shut down the CADPortal Client, click the shutdown button in the top right-hand corner of the CADPortal Client form. The CADPortal Client will display a confirmation dialog to ensure that the shutdown request was not made in error and will request a reason for the shutdown prior to exiting.



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Incident Notification Scenarios:

Send-to-Queue

CADPortal evaluates each incident as it arrives in the VisiCAD Waiting Incident Queue and automatically notifies the appropriate allied agency based on the incident's response plan. No action is required on the part of the local dispatcher, except to check incident comments for the allied agency acknowledgement.

When a notification is sent to the Allied Agency, the comments field will be updated to indicate that the allied agency has acknowledged the notification.

Each CADPortal comment entry will have the initials "**INT**" and will be prefaced with "[CADPortal]". Error conditions will be prefaced with either "[CADPortal WARNING]" or "[CADPortal FAILED]" followed by an explanation of the error.

New Incident Acknowledgement

Additional Information		Assignments	Call Activities	Call Backs	Comments/Notes	Edit Log	Incident Times	Transport Info	User Data
2007-07-10	10:08:51	"INT"	[CADLink] - (Updates acknowledged by [SCFD])						
2007-07-10	10:07:34	E911	[E911 ALERT] 2105 was ALERTED with info: [E911 ALERT:2105] 190 KING ST, ST CATHARINES C (0.2 kms SW of KING ST/CHURCH ST) DST: 1.3kms 2105 0.9 / 1.3KM (04:05) @ 721 01 Ontario [BSE] 2104 0.9 / 1.3KM (04:05) @ 721 01 Ontario [BSE] 2106 3.3 / 5.3KM (06:44) @ 721 14 Walnut [BSE]						

Normal Alert Acknowledgement

Notification Failed – Allied Agency Application Shut Down or Network Problem

Additional Information		Assignments	Call Activities	Call Backs	Comments/Notes	Edit Log	Incident Times	Transport Info	User Data
2007-07-10	10:33:36	SS7	[ProQA Script] Dispatch code: 29B06 Age unknown, Gender unknown, Consciousness unknown, Breathing status unknown; 1. The accident involves multiple vehicles. 2. It is not known if chemicals or other hazards are involved. 3. It's not known if anyone is pinned. 4. It's not known if anyone was thrown from the vehicle. 5. It's not known if everyone is completely awake (alert). 6. The type and nature of their injuries are not known.						
2007-07-10	10:33:33	"INT"	[CADLink FAILED] - (No fire clients at [SCFD] are listening, update MANUALLY)						

CADPortal Failed comments notification

Notification Warning – Allied Agency did not Acknowledge Update

Additional Information		Assignments	Call Activities	Call Backs	Comments/Notes	Edit Log	Incident Times	Transport Info	User Data
2007-07-10	10:33:21	"INT"	[CADLink WARNING] - (FIRE failed to acknowledge update in time (Address Update))						
2007-07-10	10:09:45	SS7	[ProQA Script] Dispatch code: 10D01 65 year old, Male, Conscious, Breathing. 1. He is completely awake (alert). 2. He is not breathing normally. 3. He is changing color. 4. He is clammy.						
2007-07-10	10:07:34	E911	[E911 ALERT] 2105 was ALERTED with info: [E911 ALERT:2105] 190 KING ST, ST CATHARINES C (0.2 kms SW of KING ST/CHURCH ST) DST: 1.3kms 2105 0.9 / 1.3KM (04:05) @ 721 01 Ontario [BSE] 2104 0.9 / 1.3KM (04:05) @ 721 01 Ontario [BSE] 2106 3.3 / 5.3KM (06:44) @ 721 14 Walnut [BSE]						

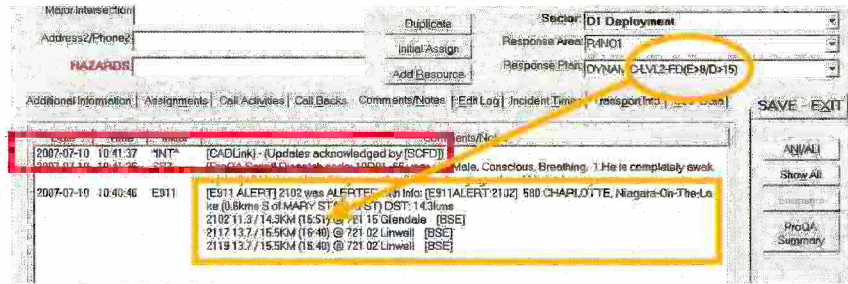
CADPortal Warning comments notification

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Notification Scenarios (continued):

Response Plans with Response Time Criteria

When CADPortal encounters an incident which has a response plan containing response time criteria, it requests an ETA calculation from the CAD North HeadStart911 interface. If the calculated ETA of the closest EMS unit is greater than the limit for the response plan, the allied agency is notified.



Response Time Criteria Notification

Address Updates, Response Plan Updates, Priority Changes

Once an incident notification has been sent to the Allied Agency, any changes to the address information, the priority or the response plan for the incident are sent to the Allied Agency for relaying to their responding crew(s). Acknowledgements for these updates are recorded in the incident comments and activity log.

Incident Comments

In order to prevent an allied agency from being overwhelmed by incident comment updates, CADPortal will not send Comments to the allied agency by default. If the local dispatcher wants to send a particular comment to the allied agency, the comment must be prefixed with "[ToFire]". A shorthand comment can be created to insert this note (e.g.: "/fd" = "[ToFire]").



Allied Agency No Longer Required

If updated information from the caller or from the responding crew causes a reconfiguration of the incident to a response plan that no longer requires allied agency response, then CADPortal will update that allied agency automatically.

Occur	Time	Unit	Comments/Notes
2007-07-10	10:19:12	"INT"	[CADLink] - (Updates acknowledged by [SCFD])
2007-07-10	10:19:06	"INT"	[ToFire] Response plan no longer requires Fire Department
2007-07-10	10:18:01	"INT"	[CADLink] - (Updates acknowledged by [SCFD])
2007-07-10	10:17:54	SS7	[ToFire] This comment will go to the fire department
2007-07-10	10:13:21	"INT"	[CADLink WARNING] - (FIRE failed to acknowledge update in time [Address Update])
2007-07-10	10:08:51	"INT"	[CADLink] - (Updates acknowledged by [SCFD])
2007-07-10	10:08:45	SS7	[ProQA Script] Dispatch code: 10D01 85 year old, Male, Conscious, Breathing. 1. He is completely awak a (alert) 2. He is not breathing normally. 3. He is changing color. 4. He is flimmy
2007-07-10	10:07:34	E911	[E911 ALERT] 2105 was ALERTED with info [E911 ALERT:2105] 190 KING ST, ST CATHARINES C (E2 kms SW of KING ST/CHURCH ST) DST: 1.3kms 2105 0.9/1.3KM (04:05) @ 721 01 Ontario [BSE] 2104 0.9/1.3KM (04:05) @ 721 01 Ontario [BSE] 2106 3.3/5.3KM (06:44) @ 721 14 Walnut [BSE]

Incident Closed by Allied Agency

At any time, the allied agency can decide to close their copy of the incident. Typically, this will occur when their involvement in the incident is finished, but it can occur at any time after they acknowledge the initial notification. Once they close their copy of the incident, no more updates to that incident will be forwarded by CADPortal even if significant changes occur on the local system.

Occur	Time	Unit	Comments/Notes
2007-07-10	10:20:19	"INT"	[CADLink] - ([SCFD] closed call, no further updates will be sent)
2007-07-10	10:19:12	"INT"	[CADLink] - (Updates acknowledged by [SCFD])
2007-07-10	10:18:01	"INT"	[CADLink] - (Updates acknowledged by [SCFD])
2007-07-10	10:17:54	SS7	[ToFire] This comment will go to the fire department
2007-07-10	10:13:21	"INT"	[CADLink WARNING] - (FIRE failed to acknowledge update in time [Address Update])
2007-07-10	10:08:51	"INT"	[CADLink] - (Updates acknowledged by [SCFD])
2007-07-10	10:08:45	SS7	[ProQA Script] Dispatch code: 10D01 85 year old, Male, Conscious, Breathing. 1. He is completely awak a (alert) 2. He is not breathing normally. 3. He is changing color. 4. He is clemmy
2007-07-10	10:07:34	E911	[E911 ALERT] 2105 was ALERTED with info [E911 ALERT:2105] 190 KING ST, ST CATHARINES C (02

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APPENDIX D

Understanding the Impact of 1st Responder and EMS Response Times on Patients

FITCH

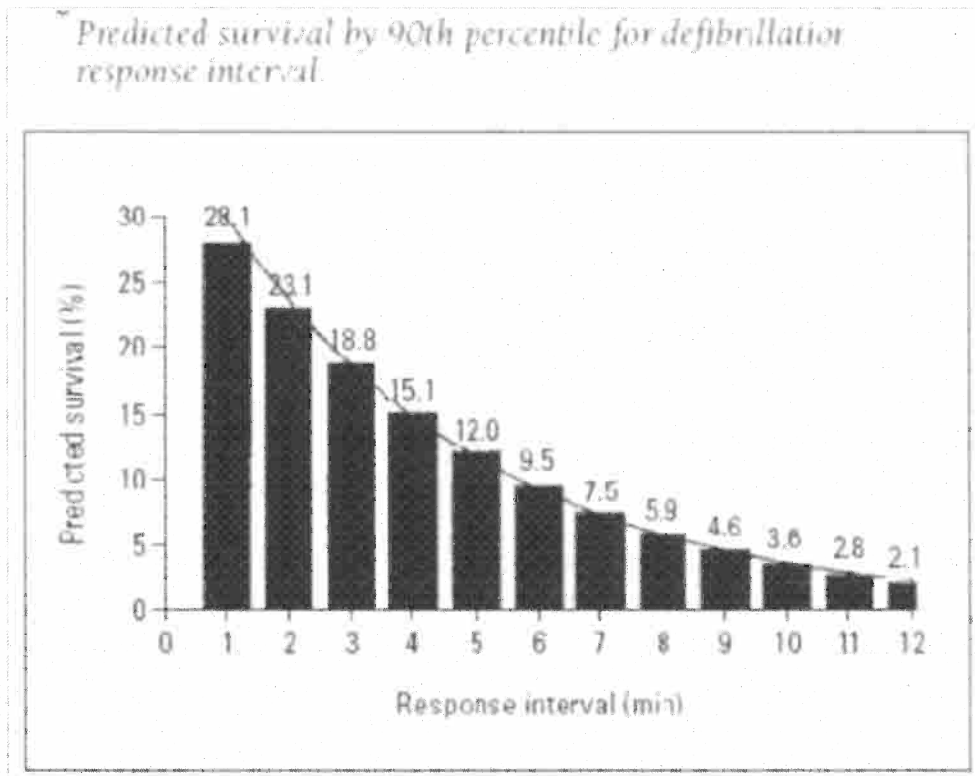
• ASSOCIATES

APPENDIX D: Understanding the Impact of 1st Responder and EMS Response Times on Patients

EMS response times are designed to reduce patient morbidity and mortality. This principle has been well established and sought after for more than 30 years.

The Ontario Prehospital Advanced Life Support system (OPALS) conducted a definitive study in Ontario, Canada on response times and the related outcomes. The study, which focused on cardiac arrests and survival rates, allows us to understand the relationship between speed of response execution and patient morbidity/mortality. The study included more than 18,000 cases and was conducted over a 10-year period.¹⁰ Figure 6 below reflects one outcome of the OPALS study.

Figure 6. Cardiac Arrest Survival Rate and Response Time Relationship



It is important to note that the survival rate for patients suffering a cardiac arrest declines dramatically the first 4 to 5 minutes *after the event*. The key finding is that improved survival rates depends on extremely early defibrillation that only be met by bystander intervention.

Several conclusions from the OPALS Study are relevant to the Washoe County EMS system:

¹⁰ OPALS Prehospital Research Group. Annual Statistical Report, January – December 2003: Cardiac Arrest Study Committees.

- If there is any hope of a first responding unit providing early defibrillation, then dispatch time is crucial and cannot be wasted.
- Survival rates for cardiac arrests are dismal if CPR or defibrillation is not administered within 4 to 5 minutes of onset. No first response system can respond consistently to a cardiac arrest within 4 to 5 minutes.
- REMSA's sophisticated dispatch operations provide medically based pre-arrival instructions to callers which effectively converts the caller to a first (and early) responder to provide CPR or defibrillation if a device is nearby.
- Outcomes are best improved through intensive public education, medical pre-arrival instructions to callers and extensive disbursement of automatic external defibrillators (AEDs) to public areas and law enforcement vehicles.¹¹

Fire departments have adopted National Fire Protection Agency (NFPA) 1710 response standards, which state that career fire departments (volunteer departments have a different standard) are to achieve an 8-minute overall response or reflex time as summarized in Figure 7 below:

Figure 7. NFPA 1710 Response/Reflex Time for Career Fire Departments

Total Reflex Time:	
Call Processing	1:00 minute
Turnout Time	1:00 minute
Travel Time	<u>3:00 minutes</u>
Response Time	5:00 minutes
EMS Set up (1 min.)	6:00 minutes Initiated
FIRE Set Up (2.5 min.)	7:30 minutes Initiated

The response time standard for fire was developed based on the fire flashover point. Fire growth occurs exponentially and fire doubles itself every second of free burn that is allowed. Fire services focus on quickly moving several units to a fire to contain the fire's spread. Fire dispatch services strive to minimize call-handling time as much of fire assessment occurs on scene.

EMS and ambulance services, for the most part, have adopted similar response time goals, but for clinical reasons. REMSA and other large metropolitan EMS services typically adopt performance goals of 8:00 to 8:59 minutes for the life-threatening emergencies occurring in defined populated areas.

The OPALS study, which is important due to the number of cases and the duration of the study, looked at the difference in response time between first responders (fire) and ambulance services in Ontario.

¹¹ The roving nature of law enforcement vehicles/officers provides a response typically faster than fire or ambulance. Numerous cities have placed AEDs with trained officers to improve survival rates.

Figure 8 on a separate page, reflects the analysis of response times in OPALS system. The data showed that the average response time to the same calls of the combined fire and ambulance service was 8 minutes 10 seconds. The two services on average were each less than one minute from this median time.

To compare the OPALS response time outcomes for the Reno/Washoe EMS system, the consultants analyzed data for the period January 1, 2011 to October 26, 2011. Data was from the REMSA Dispatch system and only calls for which Reno Fire Department (RFD) and REMSA were dispatched were included in the data set. The entire data set included 12,585 calls. Of this, 4,970 calls were Priority 1 (life-threatening) to which both REMSA and RFD units arrived at the scene. The analysis results are noted below:

- RFD was first on scene for 2,762 or 56% of calls
 - REMSA arrived within 2 minutes 27 seconds
- REMSA was first on scene for 2,208 or 44% of calls
 - RFD arrived within 1 minute 49 seconds

We see from the OPALS study of cardiac arrests that a response time greater than 4 to 5 minutes has little positive impact on the patient's survival rate. We conclude the following based on the OPALS study and the analysis of Reno/Washoe Priority 1 fire and ambulance response times:

- A double assignment of fire and ambulance is not likely to result in a patient outcome difference as both services typically arrive with a couple of minutes of each other and *both are outside the statistically significant response time to impact survival.*
- The first response (i.e., fire) system has to be rethought based on very high acuity (life-threatening) calls where a very few minutes make a difference.
- Again, survival rates for cardiac arrest are best improved through intensive public education, medical pre-arrival instructions to callers and extensive disbursement of automatic external defibrillators (AEDs) to public areas and law enforcement vehicles.

