

# **Improve Incident Rehabilitation Outcomes**

**A White Paper by  
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## Executive Summary

The most important emergency incident outcome is protection of stakeholders; namely first responders and community members. Stakeholder protection requires many sound services on scene. One of the most important, but at times overlooked or considered less important service, is effective incident rehabilitation (AKA – rehab).

NFPA 1500, NFPA 1561, and NFPA 1584 standards and best practices such as those contained within the Emergency Incident Rehabilitation (EIR) document provide guidance. Sound guidance first responders can use for classic self-rehab and more recently recognized “Formal Rehab”. In fact, what needs to be accomplished at the rehab objective and task level is adequately addressed. On the other hand, how to effectively supervise and manage rehabilitation objectives and tasks is not (with the exception of one NFPA 1584 worksheet).

Something more effective than the NFPA 1584 worksheet is needed. Something that meets diverse rehabilitation requirements and practices identified through review of NFPA standards and the EIR.

A comprehensive manual worksheet example is included within this whitepaper to illustrate one type of rehabilitation information system that can be used to better supervise and manage rehab. Benefits and limitations associated with the manual system are also included.

Manual systems are not appropriate for every organization. First responder focused computer hardware and computer software may prove better. One software system with associated benefits is presented.

In any event, few would argue that better rehab supervision and management, tighter rehabilitation integration with the NIMS ICS process, and better support of personnel accountability within the Rehabilitation Group -- all made possible by worksheets or software -- are anything but beneficial. So beneficial in fact that effective rehab supervision and management will better promote first responder safety and survival as well as minimize community losses.

## Purpose

Delivery of sound first responder rehabilitation (AKA – rehab) services can be very straightforward. Rehab can also become a complex boondoggle, something that never quite hits the mark. The actual outcome of rehab services has much to do with:

- the effectiveness of rehab policies or procedures, available rehab equipment, and related rehab skills
- whether the organizational culture holds that effective rehab is truly needed or is nothing more than a distraction
- how effectively the rehab process is supervised at the incident command system (ICS) group level
- whether or not rehab is effectively managed at the ICS command staff level

A plethora of information addresses the first bullet point. Nuts and bolts guidance needed to address bullet points three and four however, is much more difficult to find.

In any event, effective rehab is needed to achieve desired incident or training outcomes. The most important of which are ongoing safety and survival of first responders and effective operations that minimize community losses. Stated another way, highly effective rehab is needed to take care of the most important stakeholders; namely first responders and the community.

With the mentioned outcomes in mind, this paper will present both manual and computer based information systems that can:

- better support effective “Formal Rehabilitation ” services when implemented
- help first responders to better manage personnel accountability within the Rehab Group and on the incident scene
- more tightly integrate rehab into the overall incident command system (ICS) to better support desired outcomes on scene

## Background

Thirty years ago on scene rest and rehabilitation, now known as rehab, was very informal. So much so that few, if any, agencies had anything remotely resembling a comprehensive rest and rehabilitation process or SOP.

Fifteen years ago rest and rehabilitation services were more evolved. Departmental rehab SOPs could be found. Other formal guidance at the time however, was primarily limited to a short rehabilitation document distributed in 1992 by the U.S. Fire Administration (USFA).

Today rehab is substantially more involved and resource intensive, dependent of course upon incident complexity. What may have been considered typical rehab ten or fifteen years ago (e.g. - a salvage cover near the hazard zone with spare SCBA cylinders and a water jug for hydration) is now called “Self-rehab”. The safety bible (NFPA 1500, Standard on Fire Department Occupational Safety and Health, Section 8.9) specifically calls for “Rehabilitation During Emergency Operations”. What needs to be done in rehab is now an NFPA Standard (NFPA 1584, Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises) rather than a recommended practice. The 1992 rehab document has been superseded by a new USFA document (created in partnership with the International Association of Firefighters) titled Emergency Incident Rehabilitation (EIR). In fact, and lest we forget, rehab is so important today that the NFPA 1584 title reminds us that rehab applies during “Training Exercises” rather than at “Emergency Operations” only.

## Challenge

Current standards and best practices provide sound guidance that most organizations can use to develop processes for both self-rehab and “Formal Rehab” services. Appendix B of the EIR even includes a sample rehab SOP. A number of other SOPs and guidelines can be found on line as well. In other words, what needs to be done in regards to rehab is well documented.

How to effectively supervise and manage the process within the ICS system however, is not as well defined. Little in the way of supervision and management oriented tools or



The worksheet provides no way to manage advanced information associated with either of the last two requirements.

A more effective rehab information system is therefore needed. A system that reflects the supervision and management challenges of formal rehab on incident scenes today, supports responder accountability even better than does the 1584 worksheet, and more effectively integrates rehab into the ICS system.

## Manual Worksheet Solution

There are many rehab suggestions in the EIR, and requirements within NFPA documents, as noted previously. So many in fact that creation of a rehab worksheet that goes beyond the NFPA 1584 call to log crews into and out of the “rehabilitation area”, and the NFPA 1561 call for the incident commander to consider the need for rehab should be seriously evaluated. One limited example of a more comprehensive rehab worksheet follows in Figure 2.

Figure 2  
Proposed Rehab Worksheet <sup>1</sup>

Unit ID	Crewmember Name	Entry Point Time IN	R & R Time In	Med Eval/TX Time In	Transportation time In	Ready for Reassignment	Assigned to Incident or Released
E 1	Smith	1500	1505	-----	-----	1535	Inc@1535
“	Brown	“	“	-----	-----	“	“
“	Jones	“	“	-----	-----	“	“
L 3	McGarth	1503	-----	1506	1515		
“	Curley	“	1508	-----	-----	1538	
“	Moe	“	“	-----	-----	“	
“	Larry	“	“	-----	-----	“	
S1	Jones	1515	1518	-----	-----	1538	Rel@1538

<sup>1</sup>Worksheet Sample Provided Courtesy of FieldSoft, Inc

Note how individual resources (AKA – Units) and associated crew members can be entered into the proposed worksheet. Units and crewmembers can then be quickly moved through rehab process areas from Check In/Initial Assessment, through rest and rehydration (R&R) or Medical Evaluation, to either Transportation or Ready for Reassignment. The worksheet even makes the response to a “Call for PAR” more straightforward since the rehab supervisor can more quickly associate listed names with responders present. The Rehab Officer may even be able to use the worksheet to forecast who is coming on deck, and the time of any on deck changes.

Before moving on it is important to acknowledge that there are alternatives to *paper based* worksheets. A whiteboard and water based markers or steel backed board with unit call sign and crewmember name magnets might serve as a viable alternatives to a worksheet. Some might even use computer spreadsheets with custom coded macros or actual computer code to automate the process. In any event, anything that supports more effective monitoring and processing of individuals within rehab may be a very sound investment.

### **Worksheet Benefits**

The first benefit of the example worksheet is that it meets the letter of the NFPA 1584 law to log crews in and out of the Rehab Group. Of course almost any rehab worksheet, marker board or magnet board, can exceed tracking capabilities associated with the 1584 worksheet.

Next, the worksheet allows the Rehab Officer to better track unit resources and associated crewmembers from rehab entry until reassignment. Half the battle of effectively managing on scene resources is to know where those resources are located. A worksheet that progressively tracks responders based upon their rehab process area is the next best thing to placement of a transponder on each individual.

Third, the Rehab Officer can respond more assuredly when the incident commander calls for a PAR (personnel accountability report) Check. Acknowledging PAR in many cases cannot take place until the Division or Group supervisor visually accounts for all members (e.g. – the supervisor can see or touch all responders).

Knowing the location and names of responders in each rehab process area makes accounting for them easier. The result is that a more comprehensive worksheet makes the personnel accountability system in use that much better.

Last, but by no means least, the new form helps the Rehab Officer more effectively support “Command” with resource forecasts as well. How so? The current status of responders in rehab is readily available. So much so in fact that determining who is ready now, who is coming on deck, and the time those soon to be on deck may be ready for assignment is accomplished with a simple glance at the form.

## **Worksheet Limitations**

Limitations to the example form are similar to those of paper based ICS Forms, tactical worksheets and magnet or marker boards. Specifically:

- the ability to keep hand scribbled data legible and timely is limited by the skill of the forms keeper
- working with a single page is straightforward, but gets ever more complex and ever more laborious as an incident progresses and worksheet data is spread across two, three, four or more pages
- real time information sharing via manual worksheets is typically limited to over the shoulder looks at the form, since photocopy technology on most incident scenes is typically limited
- paper and marker boards can provide little if any help with reasonably automating the mechanics of incident command, rehabilitation supervision, or personnel accountability

## **Software Solution**

Computer hardware and proper computer software can help to overcome manual worksheet limitations described above. In fact, proper software can substantially increase effectiveness over that possible with manual worksheets. Moreover, such software can also reduce work required to effectively supervise and manage rehab services. Best of all, the right software allows rehab information (including current and upcoming resource availability) to be shared within rehab, among rehab and the IC, and with other interested parties on and off the incident scene. The claim cannot however, be made for just any software product.

## **Desirable Software Characteristics**

Computer software that can better support rehab supervision, personnel accountability, and the ICS system have characteristics tuned for both incident management in general and rehabilitation services in particular. Specifically, rehabilitation friendly software applications with ideal characteristics are any that:

- are consistent with National Incident Management System (NIMS) concepts and principles
- achieve NFPA 1500, NFPA 1561, and NFPA 1584 requirements
- automatically generate (e.g. – typing and writing not required) “ICS Forms” with ICS Form data
- include one or more clock timer or stop watch like features so as to better ensure that all crews remain within rehab for required minimum durations
- have a graphic user interface (GUI) specifically optimized for use in the field, rather than use in a controlled office environment such as you might find in an emergency operations center
- are field tested and field proven by all types of agencies
- can be used day or night, in rain or shine, and does not require any additional or dedicated personnel for operation
- are configurable by first responders so that the system can be simply and quickly setup to reflect local jurisdictional needs, local policies, and local practices
- are flexible enough in design and operation to take into account both usual and unusual incident scene events
- include a straight forward capability to create and maintain rehab oriented checklists for more complex rehab activities
- GUI control is accomplished through point and click rather than drag and drop, provided that the primary computer input device is a touch screen
- can be interfaced or integrated with other systems such as computer aided dispatching (CAD) systems and wireless accountability systems for example
- provide a fast and simple means to split an individual crewmember from a Unit in the event that a person needs medical treatment

- can function as part of a multi-user network that allows incident workgroups of 2 or more members to share incident and ICS position information among themselves
- the ability to share information among work group members and other authorized parties is possible regardless of whether or not those persons are on or off of the incident scene
- provides a GUI which generally makes rehab supervision and management tasks ***faster, simpler, and easier*** rather than slower, more cumbersome, and more difficult
- automatically date and time stamp activities or events managed through the system and writes them to an automated log that can be viewed during and after an incident
- allows system capability, in regards to features and users, to scale with the incident, regardless of how complex the incident becomes

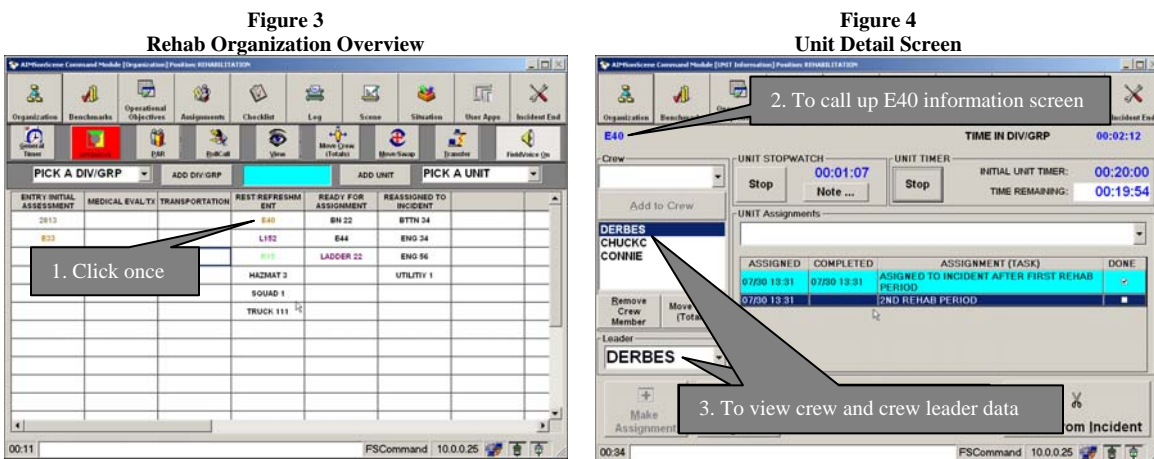
### **Software Features And Benefits**

There is one, and possibly more, software program on the market today that meet all of the above requirements. That product will be used to illustrate the advantages of computer software in relation to rehab Group supervision.

Figure 3 shows how a stand alone ICS software application can be used directly by the Rehab Officer. Note how the GUI closely reflects the sample worksheet proposed earlier. In fact, the system can be configured by local users to reflect local policies and procedures. In addition, it takes but three clicks to move a resource from one functional area to another. Moreover, the movement is automatically written to a comprehensive time and date stamped event log, without the need for keyboard data entry. Arguably most important, the primary advantage to the software based alternative over manual worksheets is that the software is faster, simpler and easier to use.

Software benefits are not limited to hard copy worksheet imitation and simple activity logging. Figure 4 shows why. The screen contains resource E40 (Engine 40) information. The E40 screen in Figure 4 was called by clicking once on the E40 label in

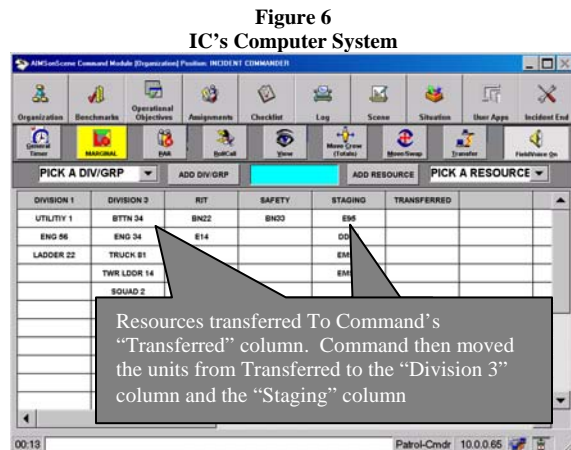
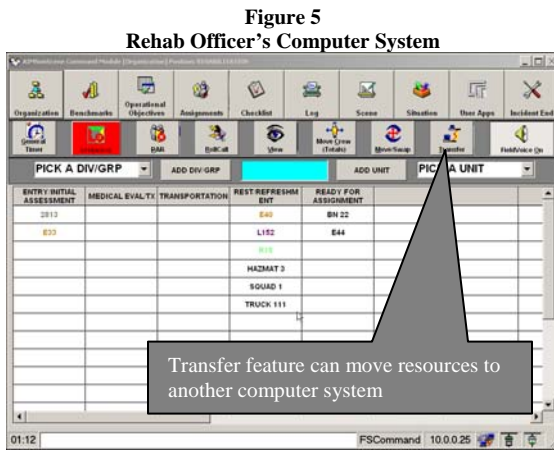
Figure 3. Note that the left hand side of Figure 4 automatically reveals crewmembers assigned to E40; along with the identity of the crew leader as well. We can also see that the Rehab Officer has been using the software “UNIT Assignments” features located within the middle right hand side of the Figure 4 screen to keep track of how often E40 has gone through the complete rehab process. The Rehab officer has even gone so far as to select the “Unit Timer” feature in the upper right hand corner of the Figure 4 screen to ensure the crew remains in rehab a minimum of twenty (20) minutes. The system user could, if desired, use the “Unit Stopwatch” feature to track how long a unit has been assigned to the Rehab Group.



Software available for on scene use can go even further in support of both responder rehabilitation activities and the ICS system. This is especially true if two or more distinct software programs work together to exchange data among workgroup members. For example, Figure 5, on the left, is a screen shot of the computer system in use by rehab, while the IC’s (AKA –Command) computer and software is shown on the right in Figure 6.

Notice how the Figure 5 rehab screen no longer has “Reassigned to Incident” as a column heading as was the case in Figure 3. The reason is that both the IC and rehab are using separate copies of the software that allow data interchange. This means Command can transfer resources needing R&R to rehab. The Rehab Officer can in turn closely monitor units as they move through rehabilitation process areas. He or she can then either directly transfer refreshed units to Command for incident assignments or release the units from the incident.

Let us take a look at another example of how resources can be transferred between software programs. For example, rehab transferred Figure 5 resources (Bttn34 and E95), that were ready for assignment, directly back to the Command Computer shown as Figure 6. Command then moved Battalion 34 and E95 to Division 3 and Staging respectively (see Figure 6) after accepting the transfer.



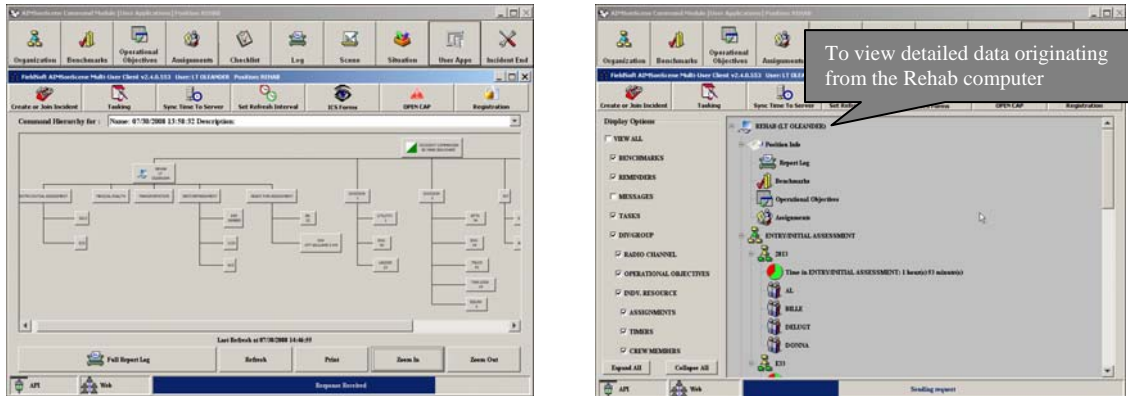
The power of fast, simple and easy to use computer software, optimized for overseeing people, resources and events in accordance with the ICS system, is probably most evident in the following example. In this scenario, the IC is running multi-user networked software on one computer, while rehab uses similar software on another computer. Both client computers are connected to a server computer system via a wireless network such as EVDO. Data from each computer is automatically sent to the database on the server computer. Figure 7 and Figure 8 show two screens accessible from either computer.

In Figure 7 we see merged views of data for *both* Command and rehab computer systems. It is the same data in fact as that shown earlier in Figure 5 and Figure 6.

**Figure 7**  
ICS 207 Form

**Figure 8**  
Drill Down to Rehab Information From ICS 207 Form





In Figure 8 we see how Command can, for example, view even more rehab computer information through a few simple touchscreen or mouse clicks on the icon for “Lt. Oleander”, the “Rehab Officer”. Stated simply, data from two or more computers can be displayed on any one computer via an ICS 207 Form with this particular system.

Note as an aside that near real time and fully automated (e.g. – keyboard data entry or hand scribbling NOT required) updates of the ICS Form 201 Incident Summary are available whenever needed. Note also that the ICS Form 203 Organization Assignment List, the ICS Form 213 General Message, and the ICS Form 214 Unit Log are all currently available within this particular networked, multi-user software system.

Computer software may even prove useful if there is a comprehensive checklist feature that:

- can provide refresher guidance to department members on request
- makes guidance available that may be needed by outside responders not familiar with the local rehab SOP
- helps track how the process is going
- logs completed checklist items to the event log for on scene debrief or follow-up critique purposes

The just mentioned checklist benefits can be viewed first hand in Figure 9.

**Figure 9**  
Computer system Software Checklist



### Software Limitation Misconceptions

There are as many (or more) perceived limitations associated with use of computer software in the field as there are actual limitations. Most perceived limitations however, disappear or are greatly reduced if rational system evaluations are conducted. Discussion of the three most common misconceptions follow.

The most frequently occurring limitation misconception is that computer system cost is too high. This is a typical conclusion probably based upon the costs of current manual systems in the field as compared to computer systems. The costs of current manual information systems for example, are:

- a few dollars or less for typical tools comprised of pens or pencils and worksheets
- less than 100 dollars for colored markers and marker boards
- a similar two or three figure amount for magnets and magnet boards

Manual system costs compared to costs of a computer system however, are not (to use a well know idiom) apple to apple comparisons. Rather, comparisons between computer system technology costs and costs of other technology used by first responders are more germane comparisons. Specifically, responders should compare the total cost of ownership (TCO) for current high tech rehabilitation equipment against computer system TCO. The high cost misconception especially stands out when comparisons to other first

responder equipment are made. Examples of such equipment and associated costs include:

- \$1,000 dollar personnel protective ensembles (not counting helmet, hood, glove and boot costs)
- \$2,000 to \$5,000 digital portable radios (not counting the rest of the radio infrastructure)
- \$2,000 self contained breathing apparatus, on-going maintenance, training and annual FIT tests
- fire service or law enforcement mobile canteens costing hundreds of thousands of dollars
- \$200,000 to \$500,000 (or more) fire apparatus
- computer aided dispatching(CAD) and records management systems (RMS) with costs in excess of \$250,000 (and typically more)

The second misconception typically expressed by incident commanders, other incident command staff, and first response supervisors is the false belief that computer system software is more difficult to use than manual paper or board based systems. They also believe that the difficulty will negatively impact productivity of Command and rehab staff and, by extension, result in first responder harm.

While the difficulty assumption proved true more often than not years ago, such is not the case today when software optimized for first responders is selected. Systems with features and GUIs optimized for first responders in the field are actually faster, simpler and easier to use than most, if not all, manual systems. The faster, simpler, and easier claim can be substantiated through direct manual system to software system comparisons. Specifically, compare time and effort for manual information scribing tasks and task outcomes, to tasks and task outcomes conducted through use of well crafted computer software.

The third most frequently occurring misconception is that computer systems will require dedicated operators who do nothing else but run software. In other words, software use will require more people than are available, so why bother. Here again, such is not the case when software is optimized for in the field use by first responders. Optimized first responder software can be, and is, faster, simpler and easier to use than is the use of manual worksheets or manual marker boards. In fact, Rehab Leader use of optimized software can, and will, result in either a workload no different than that associated with manual worksheet use, or a noticeable workload reduction. In either of the previous cases, enhanced rehab services and better integration of rehab into the ICS system is a natural outcome.

Note as an aside that the dedicated operator assumption is true for many software applications *not* optimized for in the field use by first responders. One example might be critical incident management system (CIMS) software designed for use by dedicated computer operators located within emergency operations centers or other office like environments. Typically, but *not* always, software designed for emergency management support of field operations from a controlled environment (e.g. – 20 inch computer displays, computer mice, comfortable seating, etc.) results in software features and a software GUIs inappropriate for first responder use in the field. In other words, office use software cannot realistically support rehab during an emergency incident or complex training exercise.

Let's again emphasize that inappropriateness for field use is *not* true for every CIMS system. Forewarned is forearmed however, when being pummeled by competing vendor claims.

### **Software Limitations**

There are limitations associated with computer software designed for first responders in the field. Many are the same as those typically associated with fixed computer systems used back in quarters or the office, as well as those that may be associated with mobile computer systems currently in use. Subsequently, this paper will not address those since the information can be found elsewhere. It will however, address a few of the more unusual limitations that impact software use in support of rehab services.

The first limitation is a corollary to the dedicated operator misconception described in the Misconception section. The limitation is typically a personal assumption held by a supervisor or manager. Specifically, the limitation is the belief that the person cannot be expected to operate software while trying to manage people, resources, and events during an emergency or complex training exercise. There is also a straightforward way to address the perceived limitation.

Find out if the person currently uses worksheets or marker boards to successfully undertake his or her responsibilities. If so, the belief is probably invalid, provided that the software GUI and features have been optimized for use in the field by responders. Provide the individual with a hands-on opportunity to evaluate basic computer system features to successfully address the invalid belief.

For the purpose of this paper “basic computer software features” are defined as those three to five activities or processes which are most frequently overseen with worksheets or marker boards. Frequently, a hands-on evaluation focusing on features that address the activities or processes can successfully overcome the misconception that a person is unable to use optimized software.

The second limitation has to do with claims from computer system owners that “the incident is over by the time the software is brought on line”. Under such circumstances end users typically go on to claim that it is faster, simpler and easier to go old school and use a worksheet pulled out of a clipboard located under the seat or in between the seat console.

The claim is typically true, believe it or not. Especially if the computer on which the software is installed is packed up in a box, bag or other container located in the back seat, trunk, or other compartment within the first responders vehicle. Under such circumstances having to find the computer, remove it from the case, boot the computer, and start the software during an incident is just not feasible and places an unreasonable burden on the person otherwise tasked with managing people, resources, and events.

It is therefore very, very important that computer systems intended for use in the field be ready for use now rather than later. In other words, mobile PCs – ruggedized or not – should be should be firmly mounted in the vehicle and powered up for use 24 X 7.

Likewise, computer software should be ready to go as well. One example of a computer system mounted in the incident commander's vehicle is shown in Figure 10.

**Figure 10**  
**PC Ready for Immediate Use**



### **Closing/Call To Action**

This paper has shown how the best of both worlds can be pursued. Namely, immediate rollout of a manual rehab worksheet solution similar to the one presented in this paper, with follow-up selection and roll out of an effective computer system that can do an even better job of rehab support in the short to near term.

Point your web browser to **[www.ImproveICS.com](http://www.ImproveICS.com)** to obtain additional information on the features, benefits, and costs associated with software that helps users achieve better supervision and management of rehabilitation services. Better supervision and management via computer systems optimized for first responders. Computer Systems that more effectively weave rehab into the ICS and personnel accountability system thereby aggressively promoting first responder safety and survival while also minimizing losses within the community.

### **About The Author**

Mark Bouchard is currently President and founder of FieldSoft Inc.

Fire service positions successfully held by Mark over 25 years included Firefighter, Firefighter-Paramedic, Fire Lieutenant, Fire Captain, Support Services Officer, Fire

Prevention Division Chief, Fire Marshal, Shift Commander, Technical Services Division Chief, and Operations Division Chief.

Mark founded FieldSoft in 1998 when he could not find any incident command software to help him more effectively manage incident scenes. The company has since released and has continually enhanced ICS software. The most current ICS software release is called AIMSonScene.

Additional company and software information can be found by pointing your web browser to [www.fieldsoft.com](http://www.fieldsoft.com).

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