



HIGH PRIORITY INFORMATION SHARING NEEDS FOR EMERGENCY COMMUNICATIONS AND FIRST RESPONDERS



**A White Paper
produced by the Unified
Computer Aided Dispatch Project**

June 25, 2012

U.S. Department of Justice
Office of Justice Programs
810 Seventh Street, NW
Washington, DC 20531

The Honorable Eric H. Holder Jr.
Attorney General

The Honorable Mary Lou Leary
Acting Assistant Attorney General

Denise E. O'Donnell
Director, Bureau of Justice Assistance

Office of Justice Programs
Home Page
www.ojp.usdoj.gov

Bureau of Justice Assistance
Home Page
www.ojp.usdoj.gov/BJA

For grant and funding information contact:
U.S. Department of Justice, Office of Justice Programs Funding
Opportunities
<http://www.ojp.usdoj.gov/funding>

This project was supported by Grant No. **2010-DB-BX-K147** awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, and the Office for Victims of Crime. Points of view or opinions in this document are those of the author and do not represent the official position or policies of the United States Department of Justice,

ACKNOWLEDGEMENTS

The IJIS Institute would like to thank the following contributors and their sponsoring organizations/companies for supporting the creation of this document:

UNIFIED CAD PROJECT COMMITTEE	Evan Bestland	<i>Division Chief, ITS</i>	Palm Beach County Fire Rescue (FL)
	Donald Bowers	<i>Battalion Chief</i>	Fairfax County Fire & Rescue Department (VA)
	Bret Crook	<i>Captain</i>	Woodway Public Safety Department, (TX)
	James W. Dundas	<i>Business Development Manager</i>	Northrop Grumman Information Systems
	Peggy Fouts	<i>Director</i>	Grays Harbor Communications E9-1-1 (WA)
	Karen E. Jacobson	<i>NEMESIS Director</i>	University of Utah School of Medicine (UT)
	Chris Kummer	<i>Manager - Communications</i>	Hennepin Emergency Medical Services (MN)
	Norine Plett	<i>Lieutenant</i>	Los Angeles County Sheriff's Office (CA)
	David Roberts	<i>Senior Program Manager, State and Provincial Police Division</i>	IACP Technology Center
	Mike Roosa	<i>CIO</i>	Maryland State Police (MD)
	Jerry Schlesinger	<i>RegJIN RMS Project Manager</i>	City of Portland, Public Safety Systems Revitalization Program (PSSRP) (OR)
	Matt Schreiner	<i>PremierOne CAD Product Manager</i>	Motorola
	Daniel Stilwell	<i>Senior Dispatcher</i>	Seattle Fire Department, Communications Division (WA)
	Lance Terry	<i>Communication Systems Manager</i>	City of Norman (OK)
	Henry Unger	<i>President</i>	Hitech Systems, Inc.
Dennis C. Wood	<i>Major</i>	Prince George's County Fire/EMS Department (MD)	
PROJECT MANAGEMENT TEAM	Bill Hobgood	<i>Project Coordinator</i>	Association of Public-Safety Communications Officials International (APCO)
	Paul Holcombe	<i>Project Manager</i>	IJIS Institute
	Randy Kent	<i>Project Manager</i>	IJIS Institute
	Scott Parker	<i>Program Manager</i>	IJIS Institute
	Chris Traver	<i>Senior Policy Advisor</i>	Bureau of Justice Assistance (BJA)*
	Stephen Wisely	<i>Director</i>	Association of Public-Safety Communications Officials International (APCO)

Special appreciation is extended to the Bureau of Justice Assistance (BJA) for its support to the justice and public safety communities. This project is one of many activities where the BJA has demonstrated its commitment to cross-boundary collaboration and partnership with the public safety community as a whole by bridging information sharing gaps between traditional justice agencies and first responders.

CONTENTS

INTRODUCTION.....1

HIGH PRIORITY INFORMATION SHARING NEEDS.....2

- 1 – Standardize the EIDD as the Interface for CAD to EMS, FIRE & LE Records Systems 2
- 2 – NG9-1-1 EIDD 2
- 3 – Global First Responder / Emergency Communications Information Sharing (FRECIS) Task Team 3
- 4 – NIEM Emergency Communications Domain 4
- 5 – Situational Awareness via CAD 5
- 6 – Broadband / LTE Application Programming Interfaces (API) 6
- 7 – NSI for CAD 6
- 8 – Standard Functional Specifications for Fire & Rescue RMS 7
- 9 – Standard Functional Specifications for EMS RMS 7
- 10 – Standard License Plate Reader (LPR) Interface / Exchange 8
- 11 – Floor Plan 8
- 12 – Precision Indoor Personnel Location & Tracking Technology (*a.k.a.* Firefighter Tracking) 9

ABOUT APCO INTERNATIONAL 10

ABOUT THE IJIS INSTITUTE 10

LINKS TO MORE INFORMATION 10

INTRODUCTION

This paper identifies high priority information sharing capabilities currently needed for the emergency communications and first responder communities. As a listing of information sharing needs with a simple description and suggested deliverables for each, it is not intended to provide a detailed analysis, exploration, or case scenario of each issue.

Rankings

The Unified CAD (UCAD) Project Committee ranked the needs based on a scoring system. Each member cast votes for the five needs based on which ones they felt were of most beneficial to public safety as a whole. The votes were tallied, and the rankings resulted. The information sharing needs are presented in order of these rankings beginning with the highest priority. Regardless of the ranking, all needs contained in this report are recommended by the UCAD Project Committee.

HIGH PRIORITY INFORMATION SHARING NEEDS

1 – Standardize the EIDD as the Interface for CAD to EMS, FIRE & LE Records Systems

NOTE: Although this is recommended as the highest priority need, the second highest priority need, “NG9-1-1 EIDD” would be a prerequisite.

Information Sharing Need

Once the EIDD¹ exchange is developed, since it includes all relevant CAD fields related to an incident and accommodation for the new NG9-1-1 multi-media attachments to an incident, it could potentially serve as the standard method for sending CAD data to other CAD systems and other RMS, including law enforcement, fire and EMS RMS. This possibility should be explored and, if verified as feasible, then create a standard for this information exchange using the EIDD exchange. The effort should include the creation of a GRA-conformant service specification for this purpose to facilitate implementation and roll-out.

Suggested Deliverables

- CAD-to-RMS Service Specification
- CAD-to-RMS Standard

2 – NG9-1-1 EIDD

Information Sharing Need

NG9-1-1 networks have begun replacing the existing narrowband, circuit switched 9-1-1 networks that carry only voice and very limited data. The IP-based NG9-1-1 network will be providing information such as text messages, images, video, support for hearing and speech impaired users, telematics data, and links to related resources (*e.g.* building plans and medical information) to emergency communications centers. Achievement of a fully featured, truly standards-based NG9-1-1 system, and to reap the cost benefits thereof, will require a focused, managed and collaborative approach to the development of data standards, which must include standards for data exchange.

One of these vitally important standards is a data exchange to transfer emergency incident related NG9-1-1 data:

- Between the disparate manufacturers’ systems (functional elements) located within public safety communication centers;
- From the PSAPs to other public safety communication centers; and
- Between public safety communication centers PSAPs and other relevant public safety agencies and domains.

¹ A full list of acronyms and abbreviations is available in the *Unified CAD Functional Requirements* document.

The NG9-1-1 project's EIDD Work Group has defined the content, parameters and use of the EIDD, and is now ready for their model to be formalized into a data exchange standard. This standard exchange must be developed now to:

- Enable public safety to share and use NG9-1-1 data;
- Avoid further one-off implementations resulting in increased costs of development, implementation, and maintenance; and, perhaps most importantly,
- Seize the opportunity to promote standardized interoperability for NG9-1-1 as it begins its principal rollout.

Work efforts should include the development and implementation of the NIEM-conformant EIDD exchange and the GRA-conformant EIDD SSP. Combined, these will result in the creation of the EIDD Exchange Standard via APCO's ANS process. This standard is the single most critical and necessary component to enable standardized NG9-1-1 information sharing critical to the internal operations of a NG9-1-1 compliant communications center and across multiple jurisdictions (including different levels of government – local, state, federal, and tribal) and across multiple domains (criminal justice, emergency management, transportation, health, and intelligence).

Suggested Deliverables

- NIEM-conformant EIDD Exchange
- JRA-conformant EIDD Service Specification
- Pilot Implementation
- Privacy Guidelines

3 – Global First Responder / Emergency Communications Information Sharing (FRECIS) Task Team

Information Sharing Need

Create the Global FRECIS Task Team to act as an advisory body to Global and to the law enforcement, fire, EMS, emergency management, and emergency communications communities regarding cross-discipline information sharing efforts and standards. The task team will serve as the main collaboration and communications point for information sharing efforts that affect two or more of these disciplines. Specifically, the Task Team would:

- Provide advice and recommendations to Global Initiatives affecting the Emergency Communications for First Responders Communities; and,
- Endorse and support appropriate information sharing initiatives including the Emergency Communications NIEM domain (proposed).

General areas that hold promise for first responder collaboration and coordination include:

- Consolidated Emergency Dispatch Centers and Unified CAD
- NG9-1-1

- Intelligence Efforts
 - Fusion Centers
 - NSI
- Standards
- Training

The efforts of the FRECIS Task Team will leverage recognized and emerging promising practices and Global-supported information sharing policies, practices, technology solutions, and existing reference exchanges. Through their efforts, the Task Team will:

- Have a substantial positive impact across traditionally disparate public safety organizations;
- Enhance the day-to-day operations for emergency communications centers, law enforcement, fire service, EMS, emergency management, and others;
- Improve emergency incident practices; and,
- Enhance operational functions and coordination of incident response.

Potential membership should draw on, but not be limited to, law enforcement, fire, EMS, emergency management, emergency communications, hazardous materials organizations, and industry.

Suggested Deliverables

- Global FRECIS Task Team

4 – NIEM Emergency Communications Domain

Information Sharing Need

Establish a new NIEM domain to support the information sharing needs of emergency communications for first responders. A domain for emergency communications would include data elements to tackle the critical cross-service exchange of information between and among emergency communications and the first responder community (law enforcement, fire and EMS). A corresponding governance committee would also be established and include representation from the emergency communications, law enforcement, fire service, and emergency medical service disciplines. This domain would greatly enhance the ability to construct standardizes exchanges and SOA services across this disciplines.

It is important to note that NIEM does have an Emergency Management (EM) domain. Its description reads:

“The NIEM Emergency Management domain supports community efforts to coordinate and integrate all activities necessary to build, sustain, and improve the capability to mitigate against, prepare for, respond to, and recover from threatened or actual natural disasters, acts of terrorism, or other man-made disasters.”²

² <https://www.niem.gov/about/domain/Pages/about-domains.aspx>

Since the NIEM EM domain is focused on the classic emergency management mission, it excludes many aspects of the emergency communications/first responder information sharing needs, such as typical law enforcement, fire and EMS incidents.

Suggested Deliverables

- NIEM Emergency Communications Domain
- NIEM Emergency Communications Governance Committee

5 – Situational Awareness via CAD

Information Sharing Need

Situational awareness has become an increasingly important tool for homeland security and emergency management agencies at all levels of government. For the public safety community, the importance of maintaining situational awareness has always been an area of interest and challenge. Public safety agencies are committed to finding ways to reduce the time it takes to respond to the needs of the communities they serve and protect. The implementation of the NIMS and increasing interoperability between police, fire and EMS have highlighted the need for more effective tools to manage emergencies and prepare for large scale incident response. The ability to view a common operating picture of emergency incidents can significantly reduce the impact of major criminal, natural disaster, or terrorist incidents.

Today, any one of the approximately 6,500 Emergency Communication Centers (ECC) that serve as our nation's PSAPs could unfortunately be faced with these, or similar, situations. In short, there is an ever-present need for situational awareness by public safety agencies in times of emergency, as well by a number of other public service disciplines (*i.e.* emergency management, health, transportation, public works) that have remained unaddressed from an information sharing perspective. This is an unfortunate and senseless situation as advancements in information sharing and geospatial technological capabilities have made real-time incident information more accessible than ever. There is no better information set for real-time situational awareness for public safety than that found in ECC CAD systems.

ECCs are an overlooked national resource that can provide this critical information to the many public safety, public service, and homeland security disciplines who are seeking this valuable, real-time information, including: state, regional and federal law enforcement agencies, EOCs, emergency management agencies (FEMA and state EMAs), state and urban area fusion centers, transportation monitoring centers, and other local/regional/state incident response organizations.

The proposed Geospatial Situational Awareness Pilot (GSAP), proposed herein, will test the viability of sharing real-time incident data for situational awareness, in a multi-jurisdictional public safety setting, using NIEM and GRA standards. CAD incident information will be shared using open-source geospatial tools. The pilot will demonstrate the capability to transmit a selected set of safeguarded "incident" data set from an existing CAD system to a common network environment, where the incident data will be hosted for sharing by any interested and authorized consumers from the public safety, homeland security, and other related public service disciplines.

Suggested Deliverables

- NIEM-conformant Situational Awareness Exchange
- GRA-conformant Service Specification
- Pilot Implementation

6 – Broadband / LTE Application Programming Interfaces (API)

Information Sharing Need

LTE, which will be deployed in the 700 MHz band dedicated to public safety, supports a wide array of broadband communications features not supported by the narrowband communications systems used by public safety today; for example, through the use of LTE, video, high resolution images, and other multimedia data can be exchanged among public safety personnel in the field and with backend systems and support personnel. Public safety agencies and technology solutions providers have already begun to plan for the deployment of advanced wireless communications systems using this next-generation, IP-based broadband wireless LTE technology. The interoperability capabilities of LTE are anticipated to provide multi-path (primary and backhaul) wireless support to police, fire and EMS agencies across all levels of government, to include data, voice and multi-media communications. In fact, several public safety agencies have already acquired and deployed capabilities in the 3G broadband environment as part of local community broadband initiatives. Given the capabilities and limitations of the 3G technology, many, if not most, will be seeking to migrate to LTE environments.

The use of open API SOA frameworks are accepted industry practices for exposing such network features to new and existing applications. The use of open APIs makes new network features available to the widest community of developer's possible, encouraging innovation and leveraging commercial research and development. Furthermore, open APIs provide a stable interface between the applications and the underlying LTE network, shielding applications from low-level changes and enhancements of the LTE network as public safety LTE networks continue to evolve. Standardized APIs are an essential component for the future LTE interoperability capability—therefore, we recommend the creation of a collaborative program for the development of open, public safety, broadband APIs.

Suggested Deliverables

- Open Source API's for the Public Safety LTE Network

7 –NSI for CAD

Information Sharing Need

The NSI is designed to support the sharing of information about suspicious activities, incidents or behaviors that have a potential terrorism or criminal nexus. The program includes state and major urban area fusion centers and their law enforcement, homeland security, and other information sharing partners at the federal, state, local, and tribal levels to the fullest extent permitted by law. Standardized and consistent sharing of suspicious activity information regarding criminal activity among state and major urban area fusion centers and federal agencies is vital to assessing, deterring, preventing, or prosecuting those involved in criminal activities associated with terrorism. Local information, determined and vetted to be SAR related by the local agency, is provided to the state-designated fusion center via a NIEM-conformant XML data exchange.

Both law enforcement RMS and CAD may have occasion to generate a SAR report.

An example of a SAR Report from CAD would be a CFS event of a suspicious person taking detailed photos (e.g. exits, security cameras, etc.) of a location deemed to be a critical infrastructure target. If the suspicious person is gone on arrival and there are no other witnesses to speak to or leads to follow, then a formal report is unlikely to result; however, this SAR, together with other SAR reports submitted to the fusion center, may assist investigators working on preventing terrorist activity. Alternatively, CAD functionality for SAR may be a flag to require an RMS report based on the type and location of the report (i.e. requiring a report for the scenario presented above). The existing SAR IEPD and service specification should be modified, as needed, to facilitate CAD implementations.

Suggested Deliverables

- SAR Service Specification for CAD
- Pilot Implementation

8 – Standard Functional Specifications for Fire & Rescue RMS

Information Sharing Need

In June 2006, the LEITSC through a grant from the BJA, created the *Standard Functional Specifications for Law Enforcement Records Management Systems, Version 1*, and then followed with a second version in 2008. These documents established a “starting point for law enforcement agencies ... when developing CAD requests for proposal,” “leveled the playing field when working with vendors,” and “promoted system interoperability.” In line with the *Revision Assessment for the Incorporation of Fire and EMS Functions into the Law Enforcement CAD Functional Specifications* (January 2010), the effort to develop similar RMS standards for fire and rescue agencies is required.

Although it would share much of the functionality of the law enforcement RMS standards (e.g. property, person, and vehicle information), there are unique data requirements for fire, rescue, hazardous materials, technical rescue, and emergency medical functions that need to be captured under the NFIRS, and/or a State’s unique version of NFIRS, and thus necessitate the creation of a standalone reporting system.

It is important to note that there are a variety of specific fire and rescue agency functions that are tailored to the service needs of the community; for example, not all fire departments perform swift water rescue, aircraft firefighting and rescue, or wild land firefighting. Not all fire and rescue agencies deliver emergency medical services to their community, and those that do, do so in a variety of levels – from basic life support to advanced care. Therefore, the standard must have the flexibility for an agency to tailor specific data requirements to match their service profile.

There is a need to create standard functional specifications for fire and rescue RMS in much the same way as the standard for law enforcement RMS was created.

Suggested Deliverables

- Standard Functional Specifications for Fire and Rescue RMS

9 – Standard Functional Specifications for EMS RMS

Information Sharing Need

In addition to the above priority need, the development of similar RMS standards for EMS is required. Although it would share much of the functionality of the law enforcement RMS standards (e.g. property, person, and vehicle information), there are unique data requirements for patient care and EMS incident management that require the creation of a standalone reporting system.

Not all EMS provider agencies are alike. Whether a fire-based, hospital-based, private, or independent rescue squad, it is important to note there are a variety of specific functions EMS agencies perform that are tailored to the service needs of the community; for example, some EMS agencies perform technical rescue services, while others perform basic emergency medical and transportation functions. Therefore, the standard must have the flexibility for an agency to tailor specific data requirements to match their service profile and the data elements must conform to the PCR requirements of the authority having jurisdiction.

There is a need to create a standard functional specification for EMS RMS in much the same way as the standard for law enforcement RMS standard was created.

Suggested Deliverables

- Standard Functional Specifications for EMS RMS

10 – Standard License Plate Reader (LPR) Interface / Exchange

Information Sharing Need

Currently, there is no standard exchange and/or service specification for the exchange of License Plate Reader (LPR) data to CAD/RMS, which is resulting in a variety of “one-off” implementations. Since the data sharing needs for a, LPR exchange are definable, standard exchanges and/or service specifications could be created to standardize these interfaces, saving implementation costs.

Suggested Deliverables

- LPR NIEM-conformant Exchange
- LPR GRA-conformant Service Specification

11 – Floor Plan

Information Sharing Need

The NG9-1-1 Public Safety IP Network and the methodologies to connect and utilize floor plan resources in order to make them available to first responders should be examined. A potential exchange and/or service specification could result to make available this capability.

Suggested Deliverables

- Defined Methodology for Floor Plan Inclusion into NG9-1-1
- Floor Plan NIEM-conformant Exchange (potential)
- Floor Plan GRA-conformant Service Specification (potential)

12 – Precision Indoor Personnel Location & Tracking Technology (a.k.a. Firefighter Tracking)

Information Sharing Need

The NG9-1-1 Public Safety IP Network and the methodologies to connect and utilize Precision Indoor Personnel Location and Tracking Technology in order to make them available to first responders should be examined. A potential exchange and/or service specification could result to make available this capability.

Suggested Deliverables

- Defined Methodology for Personnel Location and Tracking Inclusion into NG9-1-1
- Personnel Location and Tracking NIEM-conformant Exchange (potential)
- Personnel Location and Tracking GRA-conformant Service Specification (potential)

ABOUT APCO INTERNATIONAL

The Association of Public-Safety Communications Officials (APCO) International is the world's oldest and largest professional organization dedicated to the enhancement of public safety communications. APCO International serves the professional needs of its 15,000 members worldwide by creating a platform for setting professional standards, addressing professional issues and providing education, products and services for people who manage, operate, maintain and supply the communications systems used by police, fire and emergency medical dispatch agencies throughout the world.

ABOUT THE IJIS INSTITUTE

The IJIS Institute unites the private and public sectors to improve critical information sharing for those who provide public safety and administer justice in our communities. The IJIS Institute provides training, technology assistance, national scope issue management, and program management services to help government fully realize the power of information sharing.

Founded in 2001 as a 501(c)(3) nonprofit corporation with national headquarters on The George Washington University Virginia Science and Technology Campus in Ashburn, Virginia, the IJIS Institute has grown to nearly 200 member and affiliate companies across the United States.

The IJIS Institute also thanks the many companies who have joined as members that contribute to the work of the Institute and share in the commitment to improving justice, public safety, and homeland security information sharing.

LINKS TO MORE INFORMATION

APCO International
<http://www.apcointl.org/>

The IJIS Institute
<http://www.ijis.org>