CASM Data Analysis Report

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1 Introduction

1.1 Background

In July of 2005, the U.S. Department of Homeland Security (DHS), Office of Emergency Communications (OEC)/Interoperable Communications Technical Assistance Program (ICTAP) released the Communication Assets Survey and Mapping (CASM) database for use by Urban Areas that received Urban Area Security Initiative (UASI) grants. Since 2005, the tool has been made available to both states and urban areas as a database to store descriptive information regarding public safety communications assets and the agencies that use them. In addition, CASM offers an analytical tool with mapping functionality to assess the types of communication interoperability available in a given area.

The Indiana Department of Homeland Security (IDHS) and Integrated Public Safety Commission (IPSC) have been a strong advocates for use of CASM in the state of Indiana and has expended significant effort to gather and data enter into CASM information about thousands of Indiana's public safety agencies and their communication assets. IDHS and IPSC engaged Crowe Horwath LLP (Crowe) to perform the following activities:

- Assess the current state of CASM data for Indiana;
- Develop a data entry strategy for the remaining data to be entered;
- Enter the "required" CASM data and "optional" data, when readily available;[1]
- Develop a data integrity strategy for ongoing data entry and updates;
- Conduct webinars regarding CASM use for local and regional stakeholders; and
- Develop a list of Frequently Asked Questions and refresher webinar for future use.

This report provides the results of the assessment of the current state of CASM data for Indiana.

1.2 Methodology

In order to analyze the level of completeness and accuracy of the Indiana data currently in the CASM database, Crowe used a combination of quantitative and qualitative methods of assessment.

First, Crowe examined all required and optional data fields to determine the extent to which the fields were populated. The Crowe team also examined data exports and reports to assess the completeness and accuracy of information related to various types of communication assets and agencies. The data exports used to perform this analysis were point-in-time reports and may not reflect any recent additions to the CASM database.

Second, the Crowe team used the most critical data to populate draft Tactical Interoperable Communications Plans (TICPs) for each of the 10 IDHS Districts. Each plan was provided to the District's Statewide Interoperable Communication Executive Committee (SIEC) member for review to assess how much information might be missing in each District, and how up-to-date or outdated the CASM data for each District appeared to be.

[1] Data are considered required or optional, as defined in the *Communication Assets Survey and Mapping Tool Data Collection Guidance* published by ICTAP on August 26, 2008.

The quantitative and qualitative results of Crowe's review, as well as the feedback gathered from SIEC members, are presented in Section 2 of this report.

1.3 About This Report

The CASM database is highly complex and interrelated. For organizational purposes, Section 2 of this report, *Data Completeness and Accuracy,* is divided into the following sections:

- Agency and Point of Contact Data
- Radio System, Mutual Aid, Channel and Talk Group Data
    - Structures and Repeater/Base Station Data
    - Radio Equipment Data
- Gateway Data
- Dispatch Center Data
- Radio Cache Data
- Agency Talk Partner Data

For each sub-section listed above, a general assessment of the completeness and accuracy of data will be presented.

Section 3 of this report, *Analysis and Findings,* will summarize the results of Crowe's analysis. Crowe is in the process of developing a CASM Data Entry Strategy that will guide the data entry activities of the team during the next few months.

2 Data Completeness and Accuracy

The purpose of the CASM database is to allow states and urban areas to catalog their public safety communications assets (radio systems, dispatch centers, etc.) and allow for the analysis necessary to plan for both day-to-day public safety operations and emergency operations, when inter-county, inter-district, or interstate interoperable communications may be required.

2.1 Agency and Point of Contact Data

Agencies are at the core of much of the communications interoperability analysis performed with the CASM database. Agencies are owners of communications assets, as well as users of the assets. Contact information is particularly important due to the need for first responders and other public safety officials to communicate quickly and effectively with related agencies in an emergency situation.

At the time of Crowe's analysis, there were 2,857 agencies in the CASM database for the state of Indiana. Table 1 below displays the number of Indiana agencies in CASM, by discipline. The agencies with the highest priority in our project are Fire, EMS, Police and EMA (in bold below).

Table 1: Agencies by Discipline

Discipline	Number of Agencies	Percentage of Total[2]
Fire	**924**	**32%**
Emergency Medical Services (EMS)	**881**	**31%**
Police	**621**	**22%**
Health Care	137	5%
Public Works	64	2%
Public Health	61	2%
Public Safety Communications	3	0.1%
Government (Township Trustee)	1	0.0%
Other: Emergency Management Agency (EMA)	**92**	**3%**
Other (excluding EMA)[3]	74	3%

[2] Percentages total more than 100% due to rounding.

[3] "Other" agencies include American Red Cross, Railroads, Higher Education, Indiana Department of Correction facilities, Indiana Department of Environmental Management, Indiana Department of Natural Resources, Indiana Department of Administration, Indiana Department of Homeland Security, Indiana Law Enforcement Academy, Port and Airport Authorities, the Indiana Family and Social Services Administration, Indiana State Fair Commission, U.S. Coast Guard,

Since 2008, IPSC has asked local public safety officials to review the agencies included in the CASM database for their local areas. For each of these agencies, the required information includes the following:

- Agency Name
- Discipline
- Primary Jurisdiction

For each of the 2,857 agencies in the database, all required fields are populated. If additional agencies are identified during the course of Crowe's data validation, collection and entry activities, they will be added to the database.

Optional information for Agencies includes Agency Address (populated for 99% of agencies), Other Entities Served, Comments and Capabilities.

States and urban areas can also enter Points of Contact (POCs) into the CASM database for Agencies. Currently, there are 3,764 Agency POCs in CASM, which are associated with 2,748 Indiana agencies. The vast majority of POCs, 3,630, are listed as Primary POC. Clearly, there are significantly more POCs than agencies, indicating that there is not a simple one-to-one relationship between agencies and POCs. Upon review, many agencies have more than one POC listed, while approximately 100 agencies do not have a POC in the database.

With regard to specific contact information, a phone number is the most commonly available contact information, followed by email address and fax number:

Table 2: Agency Points of Contact (POCs)

POC Contact Method	Number of POCs	Percentage of Total
POCs with Phone Number Listed	3,500	93%
POCs with Email Address Listed	1,918	51%
POCs with Fax Number Listed	981	26%
Total Points of Contact (POCs)	**3,764**	**100%**

As part of the review of data completeness and accuracy, the ten District-specific members of the Statewide Interoperability Executive Council (SIEC) reviewed a draft Tactical Interoperable Communications Plan, populated with their district's CASM data. The majority of District Representatives (60%) reported that agency data for their district was "Mostly Accurate," which is not surprising since IPSC has invested significant time in updating agency data. Only three of the ten districts (30%) reported that their agency data was "Somewhat Accurate" – District 3, District 7 and District 10, while one district (District 5) indicated that their agency data were "100% Accurate."

Indiana National Guard, Indiana Search and Rescue Association, Indiana Dunes National Lakeshore, and Indiana Intelligence Fusion Center.

2.2 Radio System, Mutual Aid, Channel and Talk Group Data

Detailed information about how agencies are using radios to communicate is captured in Radio Systems or Mutual Aid, with associated Channels or Talk Groups. These radio systems provide the primary method of interoperable communication and understanding how localities use their radios is important to both day-to-day and emergency public safety communications.

At the time of Crowe's analysis, there were 1,008 radio systems in Indiana's CASM data. These systems include UHF, VHF Low-Band, VHF High-Band and 800MHz radio systems. (There are no 700MHz systems being used in Indiana today.) The vast majority (80%) of radio systems currently populated in CASM are VHF High-Band radio systems, as illustrated in Table 3.

Table 3: Radio Systems by Frequency Band

Radio Systems by Frequency Band	Number of Radio Systems	Percentage of Total
VHF High-Band Radio Systems	808	80%
VHF Low-Band Radio Systems	5	0.5%
UHF Radio Systems	126	12.5%
800MHz Radio Systems	69	7%
Total Points of Contact (POCs)	**1,008**	**100%**

Indiana's radio systems in CASM are comprised of approximately 700 Radio Systems used by an owning agency with other specific public safety agencies (typically named in CASM using the owning agency), and approximately 300 "shared channels," designated as "Mutual Aid" in CASM, used across agencies and jurisdictions (typically named in CASM using the frequency).

In terms of population of data related to Radio Systems/Mutual Aids, specifically, the required Radio System and Mutual Aid fields are as follows:

- Radio System Name (or Mutual Aid Name)
- Owner/Responsible Agency (Radio System only, as a Mutual Aid channel is not "owned")
- Agency Use of System (Primary/Secondary)
- Frequency Band
- P25 Compliant (Yes/No)

For the 1,008 radio systems in CASM, all required fields above are populated at 100% with the exception of the Owner/Responsible Agency, which is entered for only 69% of the radio systems. It should also be noted that only 47 radio systems are associated with a Point of Contact (POC). In addition, a review of specific radio systems and communications with IPSC reveal that some of the most vital information, which agencies are using these radio systems, may be out-of-date and missing in the many cases. These connections to owner agencies and user agencies will be a primary focus of data collection and validation activities as they relate to radio systems.

For each Radio System or Mutual Aid, specific channels and talk groups are defined in CASM. The required data fields associated with Channels and Talk Groups are as follows:

Channels

- Types of Tones
- Frequencies to be Entered
- Transmit Frequency
- Receive Frequency
- Receive Tone

Talk Groups

- Talk Group ID
- Talk Group Used by All (Yes/No)

For channels, all required information is populated at 100% in CASM, with the exception of Receive Tone, which is populated for just over half of the channels. For talk groups, as well, required information is populated at 100%, in addition to the optional field Talk Group Name.

However, these figures overstate the completeness and accuracy of channel and talk group data in CASM for Indiana. The vast majority of 800MHz information in CASM for Indiana is related to IPSC's Hoosier Safe-T system; in fact, **all** 800MHz talk groups defined in CASM for Indiana are associated with Hoosier Safe-T, although there are other 800MHz radio systems in use in Indiana. It is difficult to know how much information is missing from the database until the data collection effort is complete.

In addition, the most important information related to a channel/talk group is which agencies are using the channel or talk group, and availability of this usage information in CASM can be very spotty. For instance, although there are 4,134 talk groups defined in CASM, and almost 3,000 agencies, only 301 agencies were associated with those talk groups as users at the time of our analysis. This usage information will be a key focus of the data collection and entry effort.

Radio system data was reviewed by the SIEC members in the form of district-specific Communications Resource Availability Worksheets (217a's), as well as an export of Shared Systems and Points of Contact for the district. The most common assessment of the accuracy of 217a data was that it was "Mostly Accurate," which was reported by five of the ten SIECs (50%). Four districts reported that the 217a data was "Somewhat Accurate," while one district (District 5) reported that the 217a data was "100% Accurate."

2.2.1 Structures and Repeater/Base Station Data

Structures (i.e., towers) and repeaters or base stations that support a radio system are also captured in the CASM database, associated with the appropriate radio system. The information related to these structures includes location, equipment type and description. There are over 1,600 structures in CASM for Indiana, as well as 5,275 repeaters or base stations.

Although there are no required fields associated with repeaters or base stations, the required fields for structures include Structure Name, Latitude and Longitude. The required fields are populated at 100% in CASM for Indiana.

These structures will not be a primary focus of the data collection and entry effort; however, if updated or missing information is provided, it will be entered into CASM.

2.2.2 Radio Equipment Data

Radio Equipment owned and used by Indiana's public safety agencies may be entered into CASM in the Agency Usage section of the database. If entered, Make and Model are the only required fields. There was very little, if any, radio equipment data in CASM for Indiana at the time of our analysis, and radio-specific information is not a priority for IPSC and IDHS, in general.

2.3 Gateway Data

Gateways, such as the Motorola Motobridge or the Raytheon ACU-1000, allow public safety agencies using dissimilar radio systems to speak with each other using an audio bridge. It is fairly common for the larger communities across Indiana to have gateways; however, there were only seven gateways in CASM for Indiana at the time of our analysis.

For all seven gateways, the three required fields (Gateway Name, Owner/Responsible Agency and Usage) were completed, in addition to Make/Model. It should be noted that only three of the gateways were associated with an Agency Point of Contact. This review does not reflect all of the gateways that were not included in CASM at the time of our analysis. All readily available information about additional gateways will be entered during the remainder of the project.

2.4 Dispatch Center Data

Dispatch Centers, including Public Safety Answering Points (PSAPs), serve a critical role in public safety, ensuring that emergency responders are sent quickly to incidents. At the time of our analysis, there were 315 Dispatch Centers listed in CASM.

Required fields for Dispatch Centers include the following: Dispatch Center Name, Owner/ Responsible Agency, and Number of Simultaneous Console Patches. In addition, the Address field is populated over 90% of the time and whether the agency is a PSAP is noted in most cases. From early conversations with IDHS and IPSC, and the review of draft TICPs by SIEC members, the team learned that there have been many changes to Dispatch Centers in recent years, and there will be additional changes as the State of Indiana requires counties to limit their PSAPs to two per county. This area of the CASM database will likely receive many updates.

2.5 Radio Cache Data

"Radio Caches" are stores of radios intended for deployment to responding agencies during an incident. Many Indiana communities are unable to maintain such a cache, due to budget constraints. However, there were 12 radio caches entered into the CASM database at the time of our analysis, and we anticipate that we will learn of additional caches during the data validation and collection period.

The required fields for Radio Caches and associated Radio Equipment are as follows:

- Radio Cache Name
- Owner/Responsible Agency
- Radio Make
- Radio Model

For the 12 caches in CASM for Indiana, the Radio Cache Name and owning agency are completed; however, Radio Make and Model are only entered for two-thirds of the caches. Cache Radio Frequency Band is also completed in almost all cases. Only two caches have Points of Contact listed in CASM.

The most common assessment of the accuracy of radio cache data from SIEC members was that it was “Somewhat Accurate,” reported by four of the ten SIECs (40%), followed by “Mostly Accurate,” reported by three of the ten SIECs (30%). The remaining three districts reported that the data were “100% Accurate” (Districts 5 and 6) or “Not at all Accurate” (District 4).

2.6 Agency Talk Partner Data

The CASM database allows agencies to define the level of their “need to talk” with other agencies in their area. For instance, the Adams County Emergency Management Agency can indicate that they talk to Adams County EMS “sometimes” (other options include “rarely/never” and “daily/often”). Although this information is helpful for analysis, it has not been a priority for data entry thus far. Therefore, this information had not been entered into the database at the time of our analysis. This information will be gathered during the team’s data collection effort and entered into CASM.

3 Analysis and Findings

The State of Indiana has been a leader in populating the CASM database with public safety agency and communications equipment information. As a result, at the time of our analysis, there was already a considerable amount of information in the database for the state. However, past efforts to complete the data entry of all information desired by IPSC and IDHS have not been successful. Our analysis of the current state of CASM data for the State of Indiana resulted in the following findings:

- The most consistently entered data into CASM for Indiana include:
  - ✓ Descriptive information about public safety agencies;
  - ✓ Descriptive information about dispatch centers; and
  - ✓ Descriptive and detailed information about radio systems/mutual aid (including frequencies, structures and repeaters/base stations).

- The most commonly missing data for Indiana include:
  - ✓ Agency usage of radio systems and mutual aid (including channels and talk groups);
  - ✓ Gateway information;
  - ✓ Radio cache information;
  - ✓ Point of Contact information for communications assets; and
  - ✓ Agencies' "need to talk."

As IDHS, IPSC and the project team prepare the data entry strategy for the project, these findings will enable the team to design appropriate data validation and collection tools to gather and enter the missing CASM information for the State of Indiana. The result should provide a database for Indiana's public safety leadership that will be an effective tool for future public safety communications planning.