Advancing Interoperable Communications in Rural Emergency Medicine in Iowa

2023 Rural Emergency Medical Communications

Demonstration Project Grant Proposal

The core mission of emergency medical services is to save lives and promote health through emergency medical care; emergency medical services are at the nexus of public health, public safety, healthcare, and emergency management. Public safety grade communications is an expectation of emergency response providers - that their equipment and systems will remain operational during and immediately following a major natural or manmade disaster on a local, regional, and nationwide basis. Iowa is looking to continually harden its communication network and maintain undisrupted interoperability in rural emergency medical communications. Iowa is the 12th most rural state in the US. Iowa's hospitals and medical professionals serve the 3.2 million Iowa residents, 36% of whom live in those rural communities.

Iowa has built the Iowa Statewide Interoperable Communications System (ISICS) that boasts 95% or better mobile coverage across the state. Currently, ISICS has over 34,000 end-users on the system, with more joining each month. The State of Iowa applied for this grant to further the mission of the ISICS Board; to develop, implement, and oversee policy, operations, and fiscal components of communications interoperability efforts at the state and local level and coordinate with similar efforts at the federal level, with the ultimate objective of developing and overseeing the operation of a statewide integrated public safety communications interoperability system that includes rural emergency medical communications. This grant aligns with our Statewide Communications Interoperability Plan (SCIP) goals to update legacy communication systems in the state.

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REMCDP 2023

Program Narrative

Iowa has built and deployed the Iowa Statewide Interoperable Communications System (ISICS) with over 95% mobile coverage utilizing over 90 state tower sites across 99 counties divided into six homeland security regions (see Fig 1).

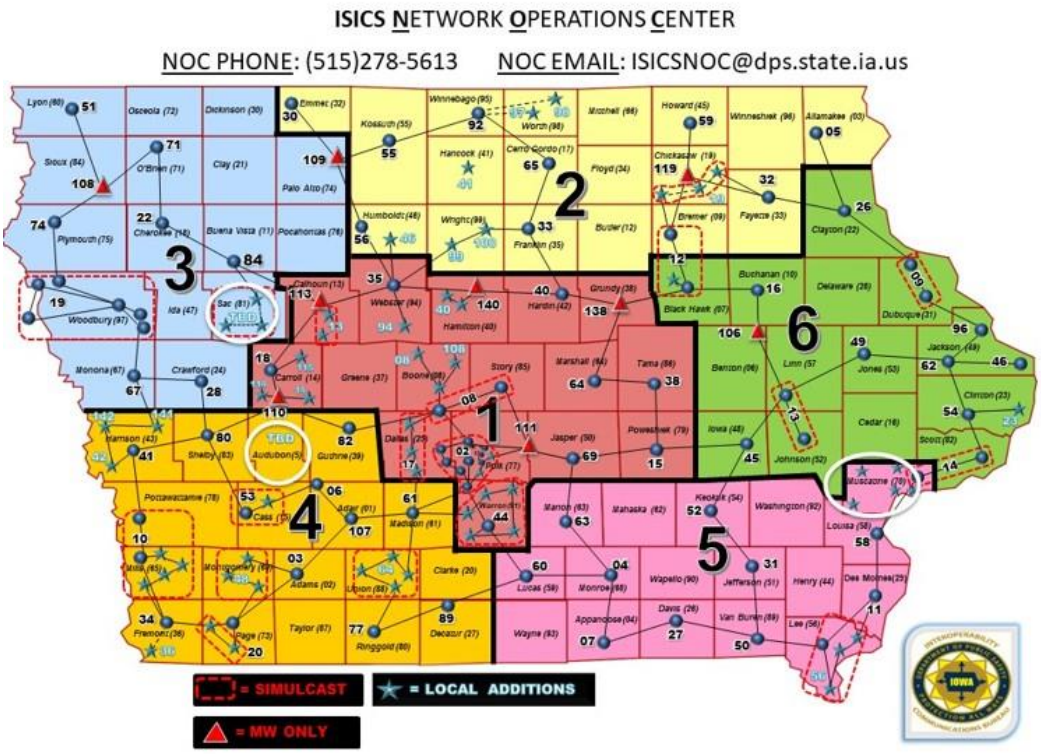

Fig. 1 ISICS Statewide System

A Board of 19 voting members governs the Iowa Statewide Interoperable Communications System. Members represent public safety and public service disciplines and agencies across the state. ISICS is a communications platform for all public safety and public service land mobile radio communications. The system is robust, redundant, well-utilized, and proven to withstand catastrophic natural events such as the derecho of 2020 that destroyed

infrastructure across the entire state; during the derecho, ISICS remained intact and operational, and communications for first responders continued without significant disruption. Our project builds upon the current system by adding radios to facilities and ambulances that aren't currently connected to Iowa's most resilient communications system, providing access to new emerging technology that will allow patient care information to be shared comfortably and efficiently with those essential employees.

According to the Iowa Association of Hospitals, there are 117 hospitals in Iowa, and 180 publicly funded ambulance services across the state. The scope of our proposal is to use the REMCDP funds to impact as many of these agencies as possible, starting in Iowa's Homeland Security and ISICS Region 1. Region 1 experienced 446,241 EMS incidents in 2021 per the Iowa Trauma Registry Report published by the Department of Public Health Bureau of Emergency and Trauma Services in August 2022.

Of Iowa's 99 counties, seven do not have hospitals; with gaps in healthcare and struggles to staff EMS, communications between hospitals and EMS have never been more critical. EMS relies on contact with surrounding hospitals to ensure patients are receiving appropriate care in the field and enroute to the hospital. This communication is of utmost concern to rural areas with critical patients who have prolonged transport times to facilities with higher levels of care.

This project is dedicated to the priorities of the National Emergency Communications Plan including: enhancing effective governance among partners with a stake in emergency communications, embracing a shared responsibility of the whole community from traditional emergency responders and supporting entities to the citizens served, addressing

interoperability challenges posed by rapid technology advancements and increased information sharing, ensuring the most critical information gets to the right people at the right time, and building resilient and secure emergency communications systems to reduce cybersecurity threats and vulnerabilities.

The proposed solutions through this demonstration project will; promote and strengthen interoperability in the rural medical field with public safety and public service across Iowa, demonstrate how emerging technologies and systems ensure successful communications in emergency medical situations, and harden the rural emergency medical communications network into a public safety grade platform reliable in the face of disaster or disruption.

In January 2023, Carroll County, Iowa, hosted a team of subject matter experts (SMEs) from the Department of Homeland Security (DHS) Cybersecurity and Infrastructure Security Agency (CISA) supporting the Interoperable Communications Technical Assistance Program (ICTAP) Operational Rapid Assistance Package (O-RAP) for a site visit. O-RAP achieves the Rural Emergency Medical Communications Demonstration Project (REMCDP) mission to examine communications barriers and identify solutions that enhance existing emergency communications infrastructure to improve the delivery of rural medical care and address National Emergency Communications Plan (NECP) implementation gaps. Gaps and challenges identified by the team included: the lack of uniform application of current radio usage protocols, the lack of consistent adoption of the Iowa Statewide Interoperable Communications System (ISICS) radio platform, the lack of department-level Standard Operating Plans (SOP)/Standard Operating Guidelines (SOGs), end-user reliance on dispatch to ensure interoperability, and end-user reliance on cellular telephone networks for critical

communications. Additionally, the team discussed the outdated statewide EMS communications plan.

O-RAP is a comprehensive technical assistance (TA) package. Carroll County is receiving further aid to complete several needed plans, policies and procedures, and training and exercises identified by the team. ISICS, working closely with Carroll County, UnityPoint, the Iowa Department of Health and Human Services, and the O-RAP team, will use the REMCDP grant funds to close these identified gaps.

Our project aims to continue the core mission of emergency medical services in the 12th most rural state in the nation; to save lives and promote health through emergency medical care. Public safety grade communication is an expectation of emergency response providers - that their equipment and systems will remain operational during and immediately following a major natural or manmade disaster on a local, regional, and nationwide basis. Iowa is looking to continually harden its communication network and maintain undisrupted interoperability in rural emergency medical communications.

Iowa has built the Iowa Statewide Interoperable Communications System (ISICS) that boasts 95% or better mobile radio coverage across the state. This project also aims to further the mission of the ISICS Board; to develop, implement, and oversee policy, operations, and fiscal components of communications interoperability efforts at the state and local level and coordinate with similar efforts at the federal level, with the ultimate objective of developing and overseeing the operation of a statewide integrated public safety communications interoperability system that includes rural emergency medical communications. This project

aligns with our Statewide Communications Interoperability Plan (SCIP) goals to update legacy communication systems in the state and the goals of the National Emergency Communications Plan to build resilient and secure emergency communications systems and finally with the interoperability continuum to create regional and statewide SOPs/SOGs, promote inter-jurisdictional and inter-disciplinary daily use of the communications network throughout the region and state.

This project will be implemented in 3 phases. Phase 1 is the planning phase where a needs assessment will be conducted to identify further gaps and capabilities in Region 1 of Iowa. Phase 2 will be execution in which equipment will be ordered and installed, training will be conducted, and performance of this execution will be monitored. Phase 3 will be the evaluation and review of the project - necessary changes will be implemented and guidelines, policies, and SOPs will be created based on best practices. In this phase Just In Time training will be created and provided to end-users and training materials will be created and distributed to system users. After project close and completion of Phases 1-3, the final goal of this project is to systematically roll out the deliverables from phase 3 to the rest of the state (Regions 2-6).

The 2023 REMCDP grant award in Iowa will focus on Iowa's Homeland Security Region 1; a 16-county area in Central Iowa that includes Carroll County, where work has already begun. Region 1 is representative of the entire state by having large metro areas (Des Moines) and rural communities to prove out policy and procedure changes that can impact the whole of the state.

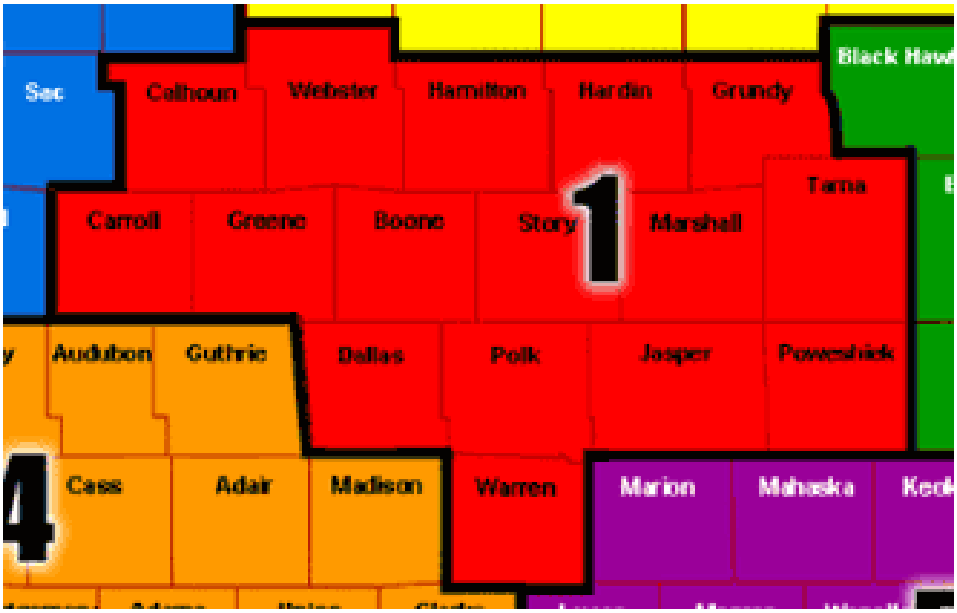

Fig 2. Iowa's Homeland Security and ISICS Region 1

This demonstration project will begin with a needs assessment of the 21 hospitals and 79 ambulance services within the 16 counties within Region 1 (see Fig 2) to discover their current capabilities and identify the gaps that coincide with those found through the O-RAP in Carroll County.

The Iowa Department of Health and Human Services has the Health Alert Network (HAN) secure communications system deployed in Iowa hospitals. The HAN aims to streamline hospital and public health communications in disaster events for bed counts and hospital status during critical situations. The HAN network divides the state into regions that do not coincide with the ISICS regions, which are based on the National Homeland Security Regions. Our project will work to bridge this interoperability gap in the planning phase, with the goal of reprogramming each HAN radio in Iowa's Region 1 to include ISICS interoperable talkgroups and the emergency medical communication fleet map determined in the planning phase.

Iowa adopted the Common Medical Frequency (CMED), also known as VMED28, in 1978. CMED is the current frequency utilized from the field in Iowa for emergency medical services and hospital communications established in the National Interoperability Field Operations Guide (NIFOG) for simplex scene communications. CMED utilizes radio-to-radio communications; as Iowa's first responders and public safety move to the ISICS APCO P25 Digital 700/800 MHz platform, it is paramount that our rural emergency medical responders are included in the transition to advanced digital communication. Our project's goal is to ensure that EMS and hospital communications are integrated into ISICS to ensure resilient public safety-grade communications.

WAVE PTT is a subscription-based group communications service that instantly connects users across different devices and locations. With WAVE, you have the speed and simplicity of a radio system with the ability to share details through text, photos, videos, or file attachments through a smartphone device or computer console. By connecting to the already structured and operable Iowa Statewide Interoperable Communications System, users of WAVE PTT can reach their intended destination no matter where they are in the state. WAVE PTT is a solution to the form factor constraints of large, heavy portable radios in the hands of medical professionals in the hospital setting who are more comfortable using smaller smartphone devices for communications.

This demonstration project will provide access to equipment compatible with the ISICS radio platform inside ambulances and hospitals. It will provide access to emerging technical communication networks to bring interoperability to rural healthcare through Push to Talk (PTT) over the WAVE LTE network. Starting in Carroll and Polk Counties and from there covering

all of Region 1, the goal is to ensure every ambulance has an ISICS mobile radio and every hospital has access to the ISICS interoperable talkgroups with a long-term goal in Iowa to equip emergency responders with a portable radio or device that can access ISICS. The goal is to demonstrate an effective method that can be duplicated in Iowa Regions 2-6.

This project will produce SOPs and SOGs that can be rolled out across the remaining five regions of Iowa. This demonstration project will facilitate work to update the statewide EMS communications plan through a data-driven approach so that the entire state and all emergency medical responders will benefit.

It is recognized that there are barriers to public safety grade adoption of PTT over LTE, but when you weigh the costs of a Land Mobile Radio (LMR) network and factor in the speed at which technology advances, Iowa, through the REMCDP grant project, will be on the leading edge of increasing adoption in new technologies that affect emergency communications for the greater good. By adding a radio network to a device that a healthcare provider is already comfortable with, we can achieve effective communication with a shallow learning curve. Usability is driving our team to focus on comfortable equipment for the end user.

Ambulance crews and in-the-field personnel will benefit from this grant by ensuring ISICS-capable equipment in their ambulances. These mobile radios will be programmed with all of Iowa's interoperable talkgroups and the talkgroups provided through the WAVE licenses, and any local talkgroups needed for daily communications. This equipment will allow secure communications between pre-hospital and hospitals on mission-critical infrastructure.

With WAVE PTX, a smartphone can be a multi-channel communication device. We know that emergency medical personnel rely on cell phones to communicate; often, patient reports are taken over the cell phone from an ambulance crew, and that message is then relayed to others via a radio report or a new phone call. Our project aims to lessen or eliminate the time constraint and loss of information created by the current system by providing a direct communication path between the field responders and the medical staff at the emergency medical facility. WAVE PTX allows mission-critical communications from one to many over established talk paths. We expect to see a benefit to responders with this one-to-many communication method that creates situational awareness that can impact triage, logistics, and patient care.