WISCONSIN DEPARTMENT of HEALTH SERVICES

Division of Public Health

Wisconsin Emergency Medical Services Communications Plan

Wisconsin EMS Section

Wisconsin State Patrol

Foreword

This document is a communications plan for EMS providers. The plan provides requirements for local EMS providers to assure that statewide communications are in place to address daily needs as well as large-scale multi-casualty situations. The plan was originally created in 2002 with input from an ad hoc committee attached to the EMS Board. Subsequent versions of the plan were adopted as changes in rules and communication technologies occurred.

This current plan blends the original information and guidance with the new interoperability planning document and other technical documents released by the Governor-appointed Interoperability Committee (IC).

This document is intended to serve four purposes:

- Provide an overview of EMS communications.
- Provide specific information on EMS communications in Wisconsin.
- Serve as a user manual for providers in creating and maintaining their EMS communications.
- Provide an update to current EMS providers on new communication channels and technologies.

In the document, Section 1 provides general information on what is involved in communications between pre-hospital health care providers, emergency medical personnel, and the other entities, such as hospitals, other EMS providers, and public safety agencies.

Section 2 addresses specific information about EMS in Wisconsin. It includes an overview of how communication occurs, the radio channels, and Federal Communications Commission (FCC) rules that apply to Wisconsin EMS providers.

Section 3 is a guide for EMS providers on the laws and provider requirements that govern EMS communications. This section includes information on required radio channels, recommended equipment needs, and a set of questions for providers to consider in setting up their communication system.

Section 4 describes and defines new emerging communications technologies and strategies in Wisconsin and the impact that these will have for the Wisconsin EMS system.

Table of Contents

Additions and changes to the 2025 EMS Communications Plan

- Updates to Glossary
- Updates to Section 2—State EMS communications plan
  - 2.0 Administrative overview and state authority
  - 2.4 Interagency communications for resource and disaster coordination
    - Intercept and air medical
  - 2.6 Frequencies, talk groups and tones for EMS communications
  - 2.7 FCC license requirements
- Updates to Section 3—Local EMS provider and system standards
  - 3.1 EMS provider requirements—radio frequency capabilities
  - 3.2 EMS equipment needs and requirements
  - 3.3 Considerations in setting up your communications system
- Updates to Appendix C—EMS and preparedness resources
- Updates to air medical and mutual aid communications and coordination
- Updated contact information for EMS section
- Updated website for information on preparedness resources

General Updates and Revisions

- PL tone and talk group information removed to enhance operational security.
- Appendices reordered to account for removals of PL tones and talk groups.
- WISCOM replacement information added including recommending radio updates as needed.

Glossary

911: A three-digit emergency telephone number accepted and promulgated by the telephone industry as the nationwide emergency number.

911 Enhanced: A three-digit emergency telephone number that has additional features such as automatic phone number identification and automatic location identification.

Advanced life support (ALS): Use, by appropriately trained and licensed EMS personnel, in prehospital and interfacility emergency care and transportation of patients, of the medical knowledge, skills, and techniques included in the department-approved training required for licensure of emergency medical technicians-intermediate and paramedics under Wis. Admin. Code ch. DHS 110.

Base station: An item of fixed radio hardware consisting of a transmitter and a receiver.

Basic life support (BLS): Emergency medical care that is rendered to a sick, disabled, or injured individual, based on signs, symptoms, or complaints, prior to the individual's hospitalization or while transporting the individual between health care facilities and that is limited to use of the knowledge, skills, and techniques received from training under Wis. Stat. § 256.15 and Wis. Admin. Code ch. DHS 110 for emergency medical technician licensure.

Call sign: Federal Communications Commission assigned identifying letters and numbers used for identification of a radio station, transmitter, or transmission.

Cardiopulmonary resuscitation (CPR): An emergency procedure that combines chest compressions, with artificial ventilation, to manually preserve brain function and profusion.

Communications system: A collection of individual communications networks, transmission systems, relay stations, control and base stations, capable of interconnection and interoperations that are designed to form an integral whole. The individual components must serve a common purpose, be technically compatible, employ common procedures, respond to control, and operate in unison.

Continuous Tone-Coded Squelch System (CTCSS): A system in which radio receiver(s) are equipped with a tone-responsive device that allows audio signals to appear at the receiver audio output only when a carrier modulated with a specific sub-audible tone is received. The tone must be continuously present for continuous audio output. CTCSS functions are sometimes referred to by various trade names such as Private Line or PL (Motorola), Channel Guard or CG (L3 Harris), or Tone Call Guard or TCG (JVC Kenwood).

Coverage area: In a radio communications system, the geographic area where reliable communications exist, usually expressed in terms of miles extending radically from a fixed radio station.

Digital Private Line (DPL): A Trademarked name for the digital version of CTCSS which uses a burst of digital information rather than a continuous sub-audible tone.

Direct dispatch method: A system in which all 911 call answering and radio dispatching is performed by the personnel at the public safety answering point.

Emergency medical dispatch center: Any agency that routinely accepts calls for EMS dispatcher assistance from the public that dispatches prehospital emergency medical personnel and equipment to such requests.

Emergency medical dispatcher (EMD): A trained public safety telecommunicator with additional training and specific emergency medical knowledge essential for the efficient management of emergency medical communications.

Emergency medical responder (EMR): A person who provides emergency medical care to a sick, disabled, or injured individual prior to the arrival of an ambulance.

Emergency medical service (EMS): Services used in responding to the perceived individual need for immediate medical care in order to prevent loss of life or aggravation of physiological or psychological illness or injury.

Emergency medical technician (EMT): An individual who is licensed by the Department of Health Services to administer basic life support and to properly handle and transport sick, disabled or injured individuals.

ESInet: Emergency Services IP-based network, a standards-based "network of networks".

Federal Communications Commission (FCC): A board of commissioners appointed by the president under the Communications Act of 1934 to formulate rules and regulations and to authorize use of radio communications. The FCC regulates all communications in the U.S. by radio or wireline, including television, telephone, radio, facsimile, and cable systems.

Fire Ground: A series of VHF and 800 MHz radio channels that are designated statewide for use as on-scene tactical communications for fire, rescue, EMS, and MABAS operations.

FirstNet: First Responder Network Authority provided through AT&T.

Frequency: The number of cycles, repetitions, or oscillations of a periodic process completed during a unit of time. The frequency of waves in the electromagnetic spectrum (radio waves) is designated in hertz, kilohertz, or megahertz (Hz, KHz, or MHz). One hertz is equivalent to one cycle per second.

Frequency coordination: The cooperative selection and allocation of radio frequencies such that all systems can operate with minimum interference.

IFERN: Interagency Fire Emergency Radio Network.

Intercept: The transfer of care of a patient between an ambulance and an air medical provider or ALS provider that can provide a higher level of medical care.

Interoperability Council (IC): A council appointed by the governor to address the public safety communications interoperability issues in our state and to develop a solution.

Land Mobile Radio Subcommittee (LMR SC): A subcommittee under the IC that develops, manages, and maintains policies, plans, and documents to foster radio communications interoperability between all public safety agencies.

MED Pair: The 10 MED radio channels are designated for EMT-intermediate and paramedic care. The MED channels are dedicated to communications among ambulance and hospital personnel directing patient care prior to arrival at the hospital at a paramedic and intermediate level. The channel is for emergency medical care and telemetry and should be limited to this purpose. A secondary use for air medical dispatch is acceptable if it does not interfere with the ability to communicate to provide patient care. FCC licensing of these channels is required.

Medical control or online medical control: Voice communicated medical direction from a physician to EMS personnel to assist in the care provided by EMS personnel in the field.

Mobile station: A two-way radio station in the mobile service intended to be used while in motion or during halts at unspecified points.

Mutual Aid Box Alarm System (MABAS): A method developed for mutual aid and communications support during incidents requiring a large, multi-agency response.

Mutual Aid Radio Channel (MARC): Any one of several statewide interoperability frequencies (MARC 1, 2, 3, or 4). The MARC 1 channel operates as a repeater pair for temporary or portable repeater use during an event.

Paging: A one-way communications service from a base station to mobile or fixed receivers that provides signaling or information transfer by means such as tone, tone-voice, tactile, optical readout, or otherwise.

Pre-arrival Instructions: Instructions given by a dispatcher to the caller to assist in keeping the patient from injuring themselves further and to give the caller life-saving information and instruction to potentially aid a patient in a life-threatening situation prior to the arrival of medically trained professionals.

Private Line (PL): A trademarked name for a Continuous Tone-Coded Squelch System (CTCSS).

Project 25: Project 25 (P25) is the standard for the design and manufacture of interoperable, digital, two-way wireless, including conventional and trunked radio systems. VHF and 7/800 MHz P25 trunking capable radio equipment is recommended for current and future operability and interoperability.

Public Safety Answering Point or Public Safety Access Point (PSAP): A 911 call center responsible for receiving calls from the public for emergency assistance from law enforcement, fire, or emergency medical help.

Radio: The transmission and reception of signals by means of electromagnetic waves without a connection wire.

Regional EMS system: An emergency medical services area (trade, catchment, market, patient flow, geographic, or governmental) that provides essentially all the definitive emergency medical care for all emergencies and for the most critically ill and injured patients within the area.

Repeater: A base station radio that receives radio transmissions from weaker mobile and portable radios and simultaneously re-transmits the communications over a much larger area. This method uses two separate channels or frequencies, unlike simplex.

Simplex: Radio to radio communications that use the same frequency to both transmit and receive.

Tactical: Communications that take place over short distances, often at the scene of an incident involving public safety responders. These communications are usually operations based.

Talk group: A term given to assigned groups on a trunked radio system. Unlike a conventional radio that assigns users a certain frequency, a trunked system takes several frequencies allocated to the system. Then the control channel coordinates the system so talk groups can share these frequencies seamlessly.

Tone code: A specified character of transmitted tone signals required to affect a particular selection or function.

Telecommunicator Assisted CPR: The ability of a PSAP to deliver CPR instruction via telephone when appropriate to non-trained 911 callers.

Trunking: A technology that forms "talk groups" instead of discreet channels on computer-controlled communications systems and infrastructures. The chief advantage is a greatly increased loading capacity on the system.

Ultra-High Frequency (UHF): Frequencies between 300 and 3000 MHz.

Very High Frequency (VHF): Frequencies between 30 and 300 MHz.

Voice Over Internet Protocol (VOIP) or Radio Over Internet Protocol (ROIP): This is a method of transmitting and receiving voice communications, either telephony or radio frequency (RF), over Internet Protocol (the internet) to achieve interoperability between noncompatible systems.

Wisconsin Interoperable System for Communications (WISCOM): A shared statewide VHF trunked communications system that public safety personnel in communities across the state will use to communicate during a major disaster, large-scale incident, or in day-to-day use. WISCOM is used by various entities and the Wisconsin State Patrol as their primary radio system.

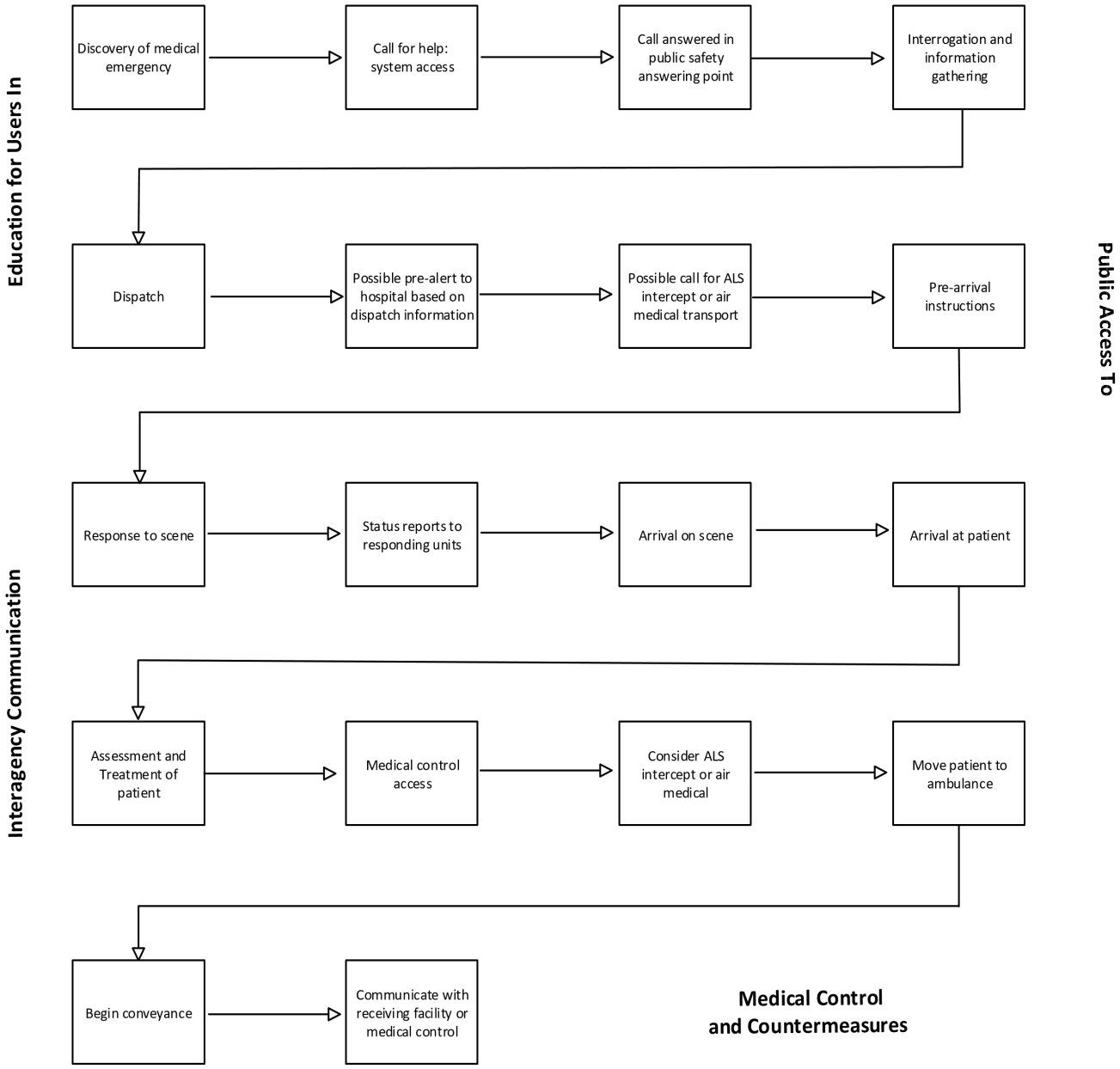
WISCOM Subcommittee: Advises and makes recommendations to the Interoperability Council in all areas related to WISCOM. It ensures reliable and responsive statewide communications interoperability between fire, law enforcement, rescue, emergency medical services, emergency management and other governmental services.

Section 1—Communications system components

1.0 Introduction—system components

An Emergency Medical Services (EMS) communication system must take into account many factors. The goal of being able to exchange key information for the EMS system to function is dependent on a system that takes into account five key components:

- Public access to EMS after discovery of a medical emergency
- Education for users
- Dispatch and coordination of response
- Interagency communication (for resource and disaster coordination)
- Medical control communications



1.1 Public access to EMS after discovery of a medical emergency

An essential component of an EMS communications system during a medical emergency is public access to the three-digit public safety phone number 911. This is achieved by 911 public safety answering points (PSAPs), which route all emergency calls to the appropriate agency. All Wisconsin counties are equipped for enhanced 911 operations. Enhanced 911 (E911) has the following additional features beyond the basic 911 system:

- Selective routing of the call to the appropriate center based on originating location.
- Automatic number identification (ANI) and automatic location identification (ALI) of the caller.

Cellular telephone access to 911 is still problematic because enhanced 911 features are not functional without additional infrastructure. Quite often, the location of the caller and routing of the message to the appropriate EMS provider are still dependent on spoken information from the caller, which may lead to delayed response times. The evolution of Next Generation 911 in Wisconsin will allow for a much more robust access system, using current digital technologies.

1.2 Dispatch and coordination of EMS response

After notification that a call has been received, the next component is to dispatch the appropriate EMS unit to the scene. There are a variety of dispatch methods in Wisconsin. Law enforcement agencies or agencies with combined law enforcement, fire, and EMS responsibilities provide the bulk of EMS communications. Many (approximately half) of the persons providing these services in Wisconsin have completed some type of formal training as an EMS communicator.55f

Central medical dispatch's primary function is service coordination. This includes:

- Access to EMS personnel from the incident.
- Timely dispatch and coordination of EMS resources.
- Coordination with medical facilities.
- Coordination with other public safety services.

Pre-arrival medical instructions are an important aspect of EMS communications. However, it may be difficult for a communicator in a multifunctional agency to provide pre-arrival instruction while simultaneously being responsible for other functions. The time and cost of training associated with the provision of pre-arrival medical instructions requires an additional commitment from the dispatch center that includes initial and continuing education and quality improvement activities. Because the provision of pre-arrival instructions constitutes indirect patient care, the Wisconsin EMS Board recommends EMS dispatch centers use an emergency medical dispatch (EMD) system. Further, this EMD system should be approved and monitored by the dispatch center's medical director, and the telecommunicators using the system should be certified in its use.

Ambulance and field personnel should also be trained in the use of communication equipment. Training would include at least the following capabilities:

- The ability to use all the communication equipment for the ambulance.
- The ability to communicate accurate patient care reports.
- Use of new digital communication technologies and appropriate use of new mutual aid channels.

1.3 Medical control communications

Medical control communications provide field personnel with a direct link to relay information and receive medical advice from a hospital or other health care facility. In some cases, these communications might also include biomedical telemetry of electrocardiogram (EKG) information directly to the facility while the patient is in route. Medical control communications have been accomplished primarily by radios in the past, but cellular telephones are being used in more cases today (for cellular phone communication, see Section 3.3 Considerations in setting up your communications system).

The degree to which medical control communications are used varies by areas of the state. Factors that influence how much medical control communications are used include geographical factors and the degree to which standing orders through patient care protocols are used by the EMS provider's medical director.

1.4 Interagency communication (for resource and disaster coordination)

Interagency communications are needed primarily for resource and disaster response coordination, to optimize the ability to communicate with other agencies when necessary but avoid interference with other agencies when a response is specific to only one agency.

The need for interagency communications can be illustrated by possible communication paths:

- Hospital to hospital
- Ambulance to hospital
- Ambulance to ambulance
- Ambulance to dispatch
- Hospital to dispatch
- Emergency medical responder or other non-transporting EMS provider to medical control
- Emergency medical responder or other non-transporting EMS provider to ambulance
- Emergency medical responder or other non-transporting EMS provider to dispatch
- Helicopter to hospital
- Ambulance to helicopter
- Helicopter to dispatch
- Telemetry from ambulance
- Medical control to ambulance
- Communication between all public safety agencies

1.5 Education for users

Communication system users need to be educated in each component of the system for it to work as efficiently as possible. In the case of EMS communications, knowledge of how and when to access the system and activate an EMS response is essential. Continued public education efforts are needed to help in this area.

Section 2—State EMS communications plan

2.0 Administrative overview and state authority

Wisconsin Stat. § 256.08(4)(a) establishes the Wisconsin Department of Health Services (DHS) as the lead state agency for EMS. Wisconsin Stat. § 256.08(4)(g) provides substantial authority for the promulgation of administrative rules to plan and implement guidelines for EMS systems and to provide technical assistance to local EMS agencies. Wis. Admin. Code DHS § 110.34(12) requires all EMS providers to maintain a communication system that complies with the Wisconsin EMS Communications Plan.

Statewide planning for coordinated use of radio frequencies for EMS communications is necessary so individual efforts do not become counterproductive to the system. FCC rules require frequency coordination to comply with state EMS communications plans where they exist.

The EMS section, in cooperation with the Wisconsin State Patrol (WSP) spectrum manager, currently provides limited assistance to Wisconsin EMS providers and agencies in applying for radio licensing and frequencies. FCC license applicants for EMS frequencies submit a request for a letter of support to the EMS section describing their proposed application. If the proposal is in conformance with the state EMS communications plan, the EMS section will provide a letter of support, which the applicant then submits to their national frequency coordinator. Technical questions or additional support requests can be addressed to the WSP spectrum manager.

Specific information on FCC license requirements and steps to follow in obtaining a license can be found in Section 2.7 FCC license requirements of this guide and Appendix F—EMS and other mutual aid channel use.

Goals for a state EMS communications system

Five fundamental goals identified in the National EMS Directors Planning Guide for Emergency Medical Communications[1]:

1. EMS communication systems should meet the needs of emergency medical systems and nationally accepted standards of functional performance.
2. Local EMS communications should be compatible with, and should not interfere with, EMS communication systems in neighboring or adjacent areas and within the state or in other geographical areas.
3. Local EMS communications systems should be compatible with, and should not interfere with, other types of communication systems that are used by non-EMS agencies.
4. EMS communications should make maximum use of state and other common resources, where this approach is appropriate and cost-effective.
5. The EMS section acts as the representative of local EMS systems in dealing with federal agencies and national organizations.

[1] Planning Emergency Medical Communications, National Assoc. of EMS Directors and National Highway Traffic Safety Administration, June 1995

Taken together, these goals have the following implications for Wisconsin:

- Local services need to follow some minimum standards that ensure communications can occur.
- There is oversight of how communications occur on a regional and statewide basis to avoid conflicts and allow for interagency communications.
- Communication costs are high and resources must be shared to implement and maintain a communications system.
- The EMS section must serve as a partner and communications conduit between federal agencies and local systems.

The following parts of Section 2 describe the key elements of the Wisconsin EMS Communications Plan. The EMS communications system must provide the means emergency medical resources can be accessed, mobilized, managed, and coordinated in both day-to-day and disaster situations.

2.1 Public access to EMS after discovery of a medical emergency

The goal of the Wisconsin EMS communications system is to assure a system in which anyone should be able to summon help rapidly in an emergency whether for medical, police, fire, rescue, or other emergency need.

The entire state has access to the 911 system. E911 (enhanced 911) coverage is available in all counties. Work is underway to equip PSAPs with the ability to receive 911 texting. The 911 system is the recommended means of accessing the EMS system for medical emergencies.

2.2 Dispatch and coordination of response

There are a variety of dispatch methods in Wisconsin. Law enforcement agencies or agencies with combined law enforcement, fire, and EMS responsibilities provide the bulk of EMS communications. Many of the persons providing these services in Wisconsin have completed some type of formal training as an EMS communicator.

The communication center's primary function is service coordination. This includes:

- Access to EMS from the incident.
- Dispatch and coordination of EMS resources.
- Coordination with medical facilities.
- Coordination with other public safety agencies. Recent emphasis on National Incident Management System (NIMS) compliance will assist communications and coordination at large events.

The Wisconsin EMS Board has recommended that EMS dispatch centers use an EMD system. Further, this EMD system should be approved and monitored by the dispatch center's medical director and the telecommunicators using the system should be certified in its use.

2.3 Medical control communication

The EMS communications system must provide EMS field personnel (Advanced and Basic Life Support) with a channel for communication that permits the exchange of vital medical information between EMS responders and medical control and the receiving medical facility (if different from medical control). This channel can be provided through a variety of mechanisms (radio frequencies and cell phones) and may be dependent on local needs and resources.

Although patient care protocols may be executed by standing orders, contact with medical control is still needed or required for certain procedures or conditions. When to contact medical control is determined by the ambulance service medical director and approved by the EMS section as part of the EMS provider's patient care protocols or operational plan required under Wis. Admin. Code § DHS 110.35.

The ability to communicate with medical control is a requirement for all ambulance services. The ability to talk with medical control from the patient's side is an additional requirement at the EMT-intermediate and paramedic levels.

2.4 Interagency communications for resource and disaster coordination

EMS communication systems should provide a means of communication to enable medical and logistical coordination between EMS field personnel, emergency department personnel, and other agencies. Additionally, regional or statewide coordination may be necessary based on the EMS operational plan submitted by the EMS provider to the EMS section. Below are several examples.

Local coordination

The EMS communications system must have the capability to communicate between agencies using mobile and portable radios. EMS communication systems should be able to describe their communications capability with mutual aid responding units when an emergency requires a multiple EMS agency vehicle response.

Regional coordination

EMS providers should establish resource coordination (for example, emergency medical responder, ambulance, and other EMS resources) to ensure that the highest level of care required is available to the patient. The EMS communications system should provide for coordination of EMS resources. EMS providers should consider their role in large-scale disasters and anticipate the need for interagency communications. Preplanning with local emergency management agencies is an important aspect of interoperability for agencies' communication systems.

Intercept and air medical

The local ambulance service provider must be able to describe how communications take place for ambulance intercepts and air medical transports. This includes a means of communication between units once they are dispatched and the ability to communicate to arrange for the transfer of patient care. In the case of air medical transports, this includes a means of communication between air and ground units once they are dispatched.

The Land Mobile Radio Subcommittee (LMR SC) received requests from the field to adopt a statewide change from Mutual Aid Radio Channel (MARC) 2 due to both possible and actual interference with MARC 1 use during events around the state, and to add an 800 MHz option for those areas of the state that do not utilize VHF on a primary basis. Upon approval of the LMR SC and the Interoperability Council (IC), the following channel(s) are now adopted and strongly recommended for air medical communications with ground units while the air medical unit is on the way to the landing zone:

- Legacy Primary VHF: MARC 2

- New Primary VHF: FG GRAY
- New Primary 800: 8TACGRAY
- New Secondary VHF: FG BLACK
- New Secondary VHF: 8TACBLACK
- EMS C may continue to be used as a tertiary option (only if needed).

At the time of IC approval in November 2020, the timeline for this implementation was set for no earlier than September 23, 2021, and ending by September 23, 2025. However, given delays in this process, the LMR SC will be considering extending the end date to 2027 or beyond. The EMS section realizes there may be implementation delays. However, a best effort should be made to comply with these changes as soon as practicable. As this is a transition period, the next revision of this plan should be able to provide the latest information on this topic.

Nothing in this plan shall remove the preceding requirement for access to the MARC 1 and MARC 2 channels until such time all EMS providers in the state can comply with the changes listed above in this section.

It is the strong recommendation of the EMS section that all interoperability channels shown in the Wisconsin Field Operations Guide (WI-FOG), based on which frequency bands the provider radios can support (minimally VHF), be programmed in all radios. WI-FOG information is available in Appendix B.

Contact the WSP spectrum manager for any technical questions pertaining to the possible licensing and implementation of base stations on these new air medical channels such as has been done on the legacy channels in the past.

Backup communications

The concept of back-up communications is to provide redundancies in case of equipment failure during disaster scenarios. Concerning EMS communications specifically, the concept of back-up communications as applied to base station or other fixed radio equipment means they must provide the following capabilities:

- Enable dispatch and response communications to continue despite outage of the primary dispatch and response radio base station.
- Enable local medical coordination communications to continue despite outage of the primary base hospital.
- Minimize the need for additional, widespread training and maintain needed flow of EMS personnel.
- A communications failure plan must include provisions for these critical functions:
- Medical control
- Dispatch
- Interagency coordination

The requirement for each ambulance service provider to have four basic frequencies creates a mechanism for back- up communications (more detailed information on the required frequencies can be found in Section 2.6 Frequencies, talk groups and tones for EMS communications).

Telephone interconnection

Cellular phones may be used as a primary communications method for ambulance service providers. However, because of limitations, cellular phones cannot take the place of required radio equipment and frequencies (a more detailed list of the pros and cons between cellular phone and radio use can be found in Section 3.3 Considerations in setting up your communications system). Communication during interfacility transport is one area in which cell phones may have an advantage over radios because cell phone use avoids the need to program separate radio channels for large numbers of hospitals. EMS providers may also wish to provide telephone interconnection capability with specialty information and treatment centers (like poison centers and burn centers) that may have statewide contact numbers.

2.5 Ambulance licensure and frequency authorization

State approval for an EMS provider license includes authorization for the ambulance service provider to operate on all EMS frequencies as part of the state FCC license. Ambulance service providers have permission to use EMS frequencies as outlined and approved as part of their required operational plan.

2.6 Frequencies, talk groups and tones for EMS communications

Standard EMS channels are 155.340, 155.400, 155.280, MARC 1, MARC 2, FG GRAY/8TACGRAY, FG BLACK/8TACBLACK and the UHF MED Pairs.

All EMS transport providers must have the capability to communicate on all these channels except for the MED Pairs and 155.280.

EMS providers that do not currently have this capability must add it when purchasing new equipment or when they reprogram equipment. The above requirement applies regardless of which technology or communications system is used locally.

DHS recommends all EMS providers have the capability to communicate on 155.340, 155.400, 155.280, and all channels listed in the WI-FOG that. Use of these frequencies should be coordinated with the local ambulance provider and other related public safety agencies.

There may be existing local systems that will be exceptions to the normal use of these frequencies as explained below. These exceptions should be taken into consideration in terms of how they may affect other agencies and when planning for county and regional communications needs.

While not mandatory, the WISCOM trunked radio system may also be utilized for EMS communications. At the July 22, 2021 meeting of the IC, the following talk group recommendations from the WISCOM Subcommittee was adopted for EMS use, for those EMS providers that want to utilize WISCOM:

- HSEMS1
- HSEMS2
- HSEMS3
- HSEMS4
- HSEMS5

The appropriate WISCOM regional RCALL or RTAC interoperability talk groups and recommended HSEMS channel use layout is shown below for providers that want to utilize WISCOM:

- HSEMS1 Air Medical Coordination
- HSEMS2 Landing Zone Coordination
- HSEMS3 Ground Units Coordination
- HSEMS4 Ground Unit Operations
- HSEMS5 Alternate/Spare

Note: The HSEMS usage recommendation above is not mandatory and is provided for guidance only for general talk group use deconfliction.

While the use of the WISCOM system is allowable, all ambulance service providers are still required to maintain radio frequency compliance with the rest of this section.

EMS B (155.340 MHz)

Dedicated to basic life support (BLS) and advanced life support (ALS) communications with a primary purpose of communications between EMS field personnel and hospital personnel directing patient care prior to arrival at the hospital. A secondary purpose is on-scene medical coordination for mobile-to-mobile medical communications. This second use should be reserved as a last resort, after first attempting to use alternate frequencies (local, 155.280, and MARC 3 or 4, in that order). The EMS B channel is for emergency medical care and should be limited to this purpose.

All ambulances licensed in Wisconsin are required to have the capability to communicate with their receiving hospitals and medical control hospitals on 155.340 MHz. All hospitals are also required to have the capability to communicate on this channel so ambulances from any area can contact the facility. This can be accomplished through direct 155.340 MHz communications or through a patch from a central dispatch center.

EMS A (155.400 MHz)

Dedicated to communications among ambulance and hospital personnel directing patient care prior to arrival at the hospital while using advanced life support skills. The primary and secondary use of this frequency should be for any ALS communications. This channel is for emergency medical care and should be limited to this purpose. Proper use includes communications for ALS intercepts and air medical contact.

EMS C (155.280 MHz)

The primary purpose of EMS C is for communications between hospitals to provide a backup to the public telephone system, particularly in times of disaster. A secondary purpose is for coordination of landing zone operations for air medical providers, or for interagency EMS field coordination for disasters. This frequency is optional for hospitals that have other means of inter-hospital communication.

Hospital tones and codes

Each hospital in Wisconsin is assigned an analog CTCSS (PL) tone or, more recently, a digital CTCSS (DPL) tone due to the PL tone congestion that now exists. These tones are coordinated to allow communications with just the needed hospital and not with other local facilities. Tones for

EMS B, EMS A, and EMS C are the same for any given facility. A digital tone code, D156, is also assigned for statewide mutual aid use to allow multiple users and agencies access at the same time. This applies to all three channels—EMS B, EMS A, and EMS C. Providers and hospitals are urged to program this digital tone code for transmit at their next opportunity.

Mutual Aid Radio Channels: MARC 1, MARC 2, MARC 3, and MARC 4

The Mutual Aid Radio Channels are statewide interoperability channels. These channels are to be used for communications between public safety agencies and providers of any discipline. Note that MARC 1 is configured for wide area repeater usage at numerous locations around the state.

Note: MARC channels cannot be used for any ground or air operations outside the boundaries of Wisconsin and caution should be used by air operations near the state boundaries.

IFERN (154.265 MHz)

This channel is for any EMS, fire, or rescue use in mutual aid operation. This channel is part of the MABAS system and is often used for MABAS dispatch functions.

UHF MED pairs

The 10 MED channels are designated for EMT-intermediate and paramedic care. The MED channels are dedicated to communications among ambulance and hospital personnel directing patient care prior to arrival at the hospital at a paramedic and EMT-intermediate level. The channel is for emergency medical care and telemetry and should be limited to this purpose. A secondary use for air medical dispatch is acceptable if it does not interfere with the ability to communicate to provide patient care.

MED 9 and MED 10 are used primarily for dispatch. Note that these 10 pairs of channels are configured for repeater usage. The MED Pair channels need to be coordinated in a geographical area. A requesting provider will normally be approved for MED Pairs 1-8, but normal use is usually limited to either MED Pairs 1-4 or MED Pairs 5-8. Use of these frequencies must be coordinated by the state EMS communications coordinator in conjunction with the dispatch center and ambulance service providers in areas of requested use.

Trunking systems

Trunking systems are being used more frequently, especially in urban areas, due to the loading, traffic, and management advantages that this technology offers. For instance, the state's WISCOM trunked communications system is at maturity with over 150 sites around the state. These systems are generally all-discipline in nature and can be used for ambulance communications between ambulance service providers and hospitals. However, because ambulances need to be able to communicate with any hospital in the state, the required VHF channels still apply as an adjunct to communication.

Air medical frequency recommendations

Local EMS providers must be able to describe how communication takes place for air medical transports. This includes a means of communication between air and ground units once they are dispatched. Often, the air provider cannot land unless a communications link is established with on-scene responders on the ground. The recommended channel for air medical communications on the

way to the landing zone is moving away from MARC 2 and over to FG GRAY or 8TAC GRAY. There are several reasons for not using MARC 2 anymore:

- Interoperable channel access and capacity has greatly increased since MARC 2 was adopted.
- MARC 1 repeater use around the state is still significant and causes interference to air/ground communications, especially to air medical providers when airborne.
- FG GRAY and 8TACGRAY are universal public safety frequency within Wisconsin that can be used by all landing zone personnel (emergency medical responders, EMS practitioners, fire, and law enforcement).
- Designating FG GRAY/8TACGRAY as the standard frequency (depending on radio band available) will avoid confusion in searching for the frequency to hook up the air and ground units.
- Some areas of the state use the WISCOM trunked radio system based on their local needs.

A tertiary VHF frequency choice for air medical communications would be EMS C (155.280). Regional plans should have the flexibility to use this option if it is a more practical frequency than FG GRAY/8TACGRAY or FG BLACK/8TACBLACK. Use of any other channels must be documented in the air medical provider's operational plan, which also must address that these other channels are in addition to the required channels.

2.7 FCC license requirements

Overview of regulations

The FCC regulates all radio communications within the United States. Radio communications are controlled by requiring licensure of all radio transmitters. FCC rules govern who is eligible to license a transmitter and the specific frequencies and equipment configurations allowed for each frequency or service group. FCC rules are available on the FCC's website.

Prior to operating a radio transmitter, the provider must obtain a license from the FCC. A license can be obtained by completing Form 601, "FCC Application for Wireless Telecommunications Bureau Radio Service Authorization." Frequency concurrence for the license application is obtained by contacting the EMS section (see Appendix G—WISCOM overview for further details).

EMS providers and hospitals are required to obtain an FCC license for operating a base station (fixed location radio) and for mobile radios that are not covered by another license. Mobile and portable units operating on all frequencies can legally use a frequency through any of the following licenses:

- Holding their own FCC license
- Hospital license from medical control hospital
- County-wide license
- Statewide license (DHS or WSP held).

EMS providers licensed by the state have permission to use the required EMS channels (EMS B 155.340, EMS A 155.400, FG GRAY/8TACGRAY and FG BLACK/8TACBLACK) in mobile and portable radios, as well as EMS C 155.280. The authorization to use these channels is part of approval for the EMS provider license and applies to all mobile and portable radios but does not apply to base (fixed) stations. In cases where the hospital uses additional frequencies, EMS mobile and portable radios can operate with authorization under a hospital's license. EMS providers can contact those hospitals with which they routinely communicate and request authorization under their license.

Providers requiring an FCC license should do the following:

1. When applying for a Public Safety Pool frequency that was formerly included in the EMRS (this includes EMS B 155.340 MHz, EMS A 155.400 MHz, EMS C 155.280 MHz, and the MED channels), first request a letter of support from the EMS section. This request should include the following information:
   - That the applicant provides ongoing BLS or ALS (if applying for 155.280, 155.340, 155.400, or the Med channels).
   - That the application is in conformance with the Wisconsin EMS Communications Plan.
2. File FCC Form 601 and the letter of support from the EMS section with the national frequency coordinator. Contact the EMS section or WSP spectrum manager for further details regarding this process:

Electromagnetic Spectrum Operations
Wisconsin State Patrol
Bureau of Network Engineering and Data Infrastructure
(608) 709-0095
dotdspstatewidefrequencycoordinator@dot.wi.gov

Section 3—Local EMS provider and system standards

Systems required are described in this section. EMS providers are responsible for developing a communications plan compliant with the Wisconsin EMS Communications plan. Each EMS providers will attest to their compliance as part of its operational plan.

3.0 Overview and laws

There are required operational plan and tactical elements for every EMS license level. The references to EMS communications in Wis. Admin. Code Ch. DHS 110 are as follows:

- **DHS 110.04 (76):** "Wisconsin Emergency Medical Services Communications Plan" means the written plan for emergency medical services communications throughout the state that specifies what communication equipment is required on all ambulances.
- **DHS 110.34 (12):** Maintain a communications system that allows communication between medical control and EMS personnel and complies with the Wisconsin EMS Communications Plan.
- **DHS 110.44 (10):** Description of onsite communications between the event manager, event staff, dispatch, and 911 dispatch.
- **DHS 110.44 (11):** Explanation of how medical control will be contacted for onsite medical direction at the patient location.

There are also requirements in Wis. Admin. Ch. TRANS 309 for the communications equipment in an ambulance. The two specific requirements are as follows:

- **TRANS 309.18 (1):** Each ambulance shall have a permanently mounted radio in the cab of the ambulance capable of contacting the hospital emergency department of the hospital it serves. In the rear compartment of the ambulance there shall be two-way communication in the form of a radio capable of communication with the hospitals it serves. The radio shall comply with Wis. Admin. Code ch. DHS 110.
- **TRANS 309.18 (2):** Each ambulance service provider operating ambulances staffed either wholly or partially with EMTs practicing advance skills shall have remote two-way communications for personnel when they are away from the ambulance.

3.1 EMS provider requirements—radio frequency capabilities

EMS providers

As described in Section 2.6, standard EMS frequencies are EMS B, EMS A, EMS C, MARC 1, MARC 2, FG GRAY/8TACGRAY, FG BLACK/8TACBLACK and MED Pair channels. All EMS providers must have the capability to communicate on all these channels except for the MED Pairs and 155.280 (EMS C). EMS providers that do not currently have this capability must add it when purchasing new equipment or when they reprogram equipment as part of an upgrade in level of care. It is recommended that all emergency medical responder or other non-transporting EMS providers have the capability to communicate on 155.340, 155.400, 155.280 and all interoperability channels shown in the WI-FOG. Use of these frequencies should be coordinated with the local ambulance provider and other related public safety agencies to avoid congestion on these frequencies.

3.2 EMS equipment needs and requirements

Ambulance

Must have a primary and back-up means of communication. Must have a VHF radio with the following specifications:

- VHF radio with the required VHF frequencies in Section 2.6. P25 trunking is recommended.
- PL, local, or statewide - Must have PL tones for local hospitals, hospitals in adjacent counties, and hospitals for which you routinely do emergency transports. Providers do not need to have PL tones for all hospitals in the state; the statewide D156 code should be programmed for mutual aid operations. Interfacility transports can be done by cell phone or WISCOM on the appropriate talk group.
- Required radio equipment compliant with Wis. Admin. Code ch. TRANS 309.
- 25-100 watts depending on what is appropriate for the area served. Higher power is recommended for rural services with large coverage areas or services that have unique radio coverage issues.

Note: Any VHF radio programmed with WISCOM trunking system talk groups must be programmed to transmit no more than fifty (50) watts of effective radiated power (ERP). ERP includes the sum of transmitter power and antenna system gain. This limitation is in effect statewide as a requirement of how WISCOM is licensed with the FCC.

Hospital

Must have a VHF radio with EMS B (155.340). EMS A (155.400) and EMS C (155.280) are optional but recommended for ALS communications and coordination. Local and statewide PL codes should be programmed (See Hospital Tones and Codes in Section 2.6 Frequencies, talk groups and tones for EMS communications for further details). The ability to operate on, or at least monitor, other local public safety channels should be considered, although this may take coordination with other agencies. The ability to monitor the local EMS/fire paging channel will provide lead time for the emergency department in case of a mass event. An emergency department phone number for ambulance contact is also recommended. P25 trunking is recommended.

3.3 Considerations in setting up your communications system

This subsection provides questions you must consider in completing the communications component of your EMS operational plan. Although not all these questions must be addressed in the operational plan, they should all be considered as you set up your communications system.

Dispatch considerations

1. How do citizens access EMS?
   - E911
   - 911
   - Wireless E911
   - NG 911
2. How are you dispatched?
   - Radio or pager
   - Telephone
   - Mobile data terminal
3. Who does your dispatching?

- Law enforcement
- County public safety
- Other _____

4. Are your dispatchers trained to give pre-arrival instructions?
   - If yes, what system or method to provide consistency is in use? If yes, who provides medical direction for the dispatch agency?
   - If no, do your dispatchers provide CPR instructions to the 911 caller?

Response considerations

1. What is your communication link to other public safety agencies such as law enforcement and fire departments (method and frequency)?
2. Do you have intercept agreements with ALS? If yes, how do you communicate with them? (method and frequency)?
3. Do you use air medical for transports? If yes, how do you communicate with them? (method and frequency)? **FG GRAY/8TACGRAY is recommended.**
4. Do you have telecommunications ability with your emergency medical responders or other non-transporting EMS providers? If yes, how do you communicate with them (method and frequency)?
5. If you provide service for special events outside your primary service area, what is the method of contact with the local provider, hospital, dispatch center, and medical control for special events?
6. If you provide service for interfacility transports outside your primary service area, what is the method of contact with the receiving hospital and medical control during transport?

Medical control considerations

1. Describe method(s) for contact with medical control:
   - 155.400
   - 155.340
   - MED Pairs
   - Cell phone
   - WISCOM
   - Other _____
2. What is the method to contact the receiving hospital during interfacility transports if it is different from method to contact medical control?
3. If applicable, what is your method for data transmission?

Communications equipment considerations

1. How large is your coverage area, and will your equipment cover that entire area? How did you test your coverage area to determine the extent of communications coverage?
2. Are there any unique geographical characteristics that may affect communications coverage? (Such as forests, hills, buildings, or other barriers)
3. Did you consider both daily needs and "worst case scenarios" in determining your communication needs, including a back-up means of communication?
4. What frequencies and codes do you need programmed into your radio, in addition to

the four required frequencies?

- Local hospital tones
- Regional hospital tones
- Statewide code
- Dispatch frequency
- MED Pairs
- WI-FOG interoperability channels
- Others _____

Radio vs. cellular telephone use

Pros—Two-way radio communication	**Cons—Two-way radio communication**
• Local control • Paging • Monitor other agencies • Broadcast capabilities • Multi-channel • Direct contact on talk-around channels • Once in place, ongoing costs are minimal • Priority access	• Cost of implementation and operation • Communications can be monitored • Coverage area dependent on related equipment (for example towers) • Cannot provide telemetry • Interference from other users
Pros—Cellular phone	**Cons—Cellular phone**
• Good voice quality in strong cell area • Large number of available channels • Communications are not monitored • Can provide limited telemetry • Access to translation services	• Dependent on location and availability of tower • Can only talk to one location (cannot broadcast) • Cell system will be overloaded in a disaster • Cannot interrupt an ongoing conversation • Vulnerable to availability of an open phone line • Battery life • Beyond local system control

Section 4—Emerging technologies

This section describes and defines new communications technologies and the positive impact that will be realized by the EMS system.

4.0 ESInet, GIS, and NG911 implementation

ESInet, GIS, and NG911 implementation and impact to EMS

The existing 911 infrastructure in much of the United States is utilizing outdated technologies. Next Generation 911 (NG911) is an initiative to update existing 911 infrastructure into an Internet Protocol (IP) network known as an Emergency Services IP-based network (ESInet) that will interconnect 911 centers, improve location information of emergency callers, and enable media and text messages to be sent from citizens to telecommunicators. According to the National Emergency Number Association (NENA), an ESInet is defined as a standards-based "network of networks" that is designed with a high level of redundancy and resiliency to ensure that the network can continue to operate (deliver 911 calls) even if some of the circuits or end points are no longer functioning. NG911 cannot be deployed and operate without an ESInet.

Another important element to NG911 is Geographic Information System (GIS) data. In NG911, GIS is used to validate the location of emergency calls and to route the emergency calls to the correct 911 center. To accomplish this, the preparation and ongoing maintenance of GIS data for use in NG911 begins at the local level and must be accurate, standardized, timely, and complete. At the state level, local GIS data layers must be collected and integrated into standardized database structures for inclusion into the NG911 system. A coordinated statewide approach to developing GIS data and services needed by the NG911 system will yield significant cost savings and statewide standardization of data.

According to the National 911 Program, housed within the National Highway Traffic Safety Administration's Office of Emergency Medical Services, there are several benefits that NG911 will bring to the EMS community including:[1]

- **Improved location accuracy** to reach citizens sooner to ultimately improve outcomes and save lives.
- **Continuity of patient data** by increasing access to more detailed patient medical history and integrating medical data with 911 call data.
- **Multi-agency interoperability** for natural disasters and other large-scale emergencies by protecting against call overload at 911 centers and allowing for better communication with first responders.
- **Accurate pre-arrival data** that gives responders access to time-sensitive patient health data and incident information before arriving to a scene.
- **Better crash data** through technology like vehicle telematics that can notify 911 when a crash has occurred and provide important data like location, airbag deployment, and other information.
- **Increasing EMS provider safety** with more critical data from the incident before arriving to better plan for response and provide for more situational awareness.

FirstNet

The First Responder Network Authority (FirstNet) was established by Congress in the Middle-Class Tax Relief and Job Creation Act of 2012 to create and implement the nation's first Nationwide Public Safety Broadband Network (NPSBN) dedicated to public safety and first responders. In March 2017, FirstNet Authority chose AT&T as their commercial partner through a competitive bidding process to build out the NPSBN in each state and territory and begin selling FirstNet services. AT&T will also receive $7 billion over the life of the 25-year contract, part of which will be used to improve network coverage throughout Wisconsin.

Some of the benefits of FirstNet include priority and preemptive access to the network during times of congestion, device applications specific to public safety, and high-speed data services. FirstNet will provide priority access and improved coverage, so the EMS community can provide the best prehospital care possible. FirstNet can help:[2]

- Transmit images in real time from new diagnostic tools, such as ultrasound and CT.
- Exchange real-time audio/video feeds with hospitals and physicians while on the scene and during transport.
- Send sensitive patient data securely.
- Use patient tracking and bed management software for real-time monitoring.

LMR integration to FirstNet and MCPTT

Public safety Land Mobile Radio (LMR) systems provide mission critical communications for first responders and are considered essential to manage day-to-day agency operations and response to emergency incidents. More than 60,000 public safety agencies nationwide providing law enforcement, fire, and EMS providers are served by some form of public safety LMR system which includes Push to Talk (PTT) voice communications. The Nationwide Public Safety Broadband Network (NPSBN) being implemented by FirstNet will be the first fully interoperable LTE network supporting data, voice, and video for all first responders in the U.S. One of the proposed new services is Mission Critical Push to Talk (MCPTT). The phrase "mission-critical push-to-talk" (MCPTT) refers to a PTT product functionality that meets the requirements of public safety mission-critical voice communication, which includes high availability and reliability, low latency, support for group calls and 1:1 calls, talker identification, device-to-device direct communications, emergency calling, clear audio quality, and other features.[3] These developments mean that public safety agencies may be conducting some communications on both LMR and LTE networks.[4]

The transition to widespread use of MCPTT is not expected to be immediate, with LMR systems continuing to be the primary technology for public safety voice communications for the foreseeable future. All PTT applications will need a way to interface with the agency's public safety radio system in order to exchange two-way traffic between the user's smartphone or tablet device and the LMR system. The two primary integration modes are via an Inter-RF Subsystem Interface (ISSI) or a conventional interface. The ISSI was originally developed to integrate two P25 radio systems. The PTT application vendors have leveraged this interface as a means of passing radio traffic between a P25 system and a PTT service by emulating the signaling provided by a P25 system to make the system think it is communicating with another Project 25 system. The primary benefit of an ISSI interface is that a larger number of talk groups can be passed from the system to the PTT service without additional equipment required for each talk group. In addition, an ISSI supports additional features such as unit IDs, emergency alarms, and encryption that are not available through other interfaces. One limitation of ISSI interfaces is that such interfaces only are available for trunked P25 systems.[5]

[1] "Next Generation 911 for Leaders in EMS", National 911 Program Office, 2018. https://www.911.gov/pdf/National_911_Program_NG911_Guide_for_Leaders_in_EMS.pdf

[2] "FirstNet and Emergency Medical Services", https://firstnet.gov/sites/default/files/FN-EMS-ServicesFactsheet_180912.pdf

[3] What is MCPTT- An Introduction, Page 2 https://kodiakptt.com/downloads/resources/What_Is_MCPTT_Kodiak-whitepaper-FINAL.pdf

[4] Public Safety Land Mobile Radio(LMR) Interoperability with LTE Mission Critical Push to Talk, Page 2 http://npstc.org/download.jsp?tableId=37&column=217&id=4031&file=NPSTC_Public_Safety_LMR_LTE_IO_Report_20180108.pdf

[5] The Case for Commercial PTT APPS in Public Safety-Mission Critical Communications https://mcp911.com/pdf-links/public-safety-push-to-talk-apps/

4.1 Using and incident radio communications plan (ICS 205)

An Incident Radio Communications Plan, commonly referred to as an ICS 205, provides responders with a list of predefined channels and their assigned function to use during real life dynamic incidents, pre-planned events, or exercises. The ICS 205 is normally prepared by a Communications Unit Leader (COML), who has extensive training and knowledge of the interoperable communications capabilities between various law, fire, and EMS responders who may be involved.

A pre-established ICS 205 will reduce, and possibly eliminate, initial communications confusion during an incident or event and is scalable to adapt to the communication needs of the incident or event. A pre- established ICS 205 for an agency, region, or event can identify interoperable channels by listing the channel name, talk group, and frequency for each channel's function and assignment. Some examples of the various functions include *Command Net*, *Tactical Net*, *Air-to-Ground Net*, and *Logistics/Support Net*. Some examples of assignments include *Landing Zone*, *Medical Triage*, and *Medical Transport*. Assignments can also be a geographic location.

ff

INCIDENT RADIO COMMUNICATIONS PLAN	Incident Name: Jefferson Marsh Incident	Date/Time Prepared: 04/19/18 1500	Operational Period Date/Time

	Function	Channel Name/Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode A, D or M	Remarks
1	COMMAND	IFERN	In-Coming	154.2650 N	210.7	154.2650 N	210.7	A	To Div 118 & Staging
2	FD COMMAND	EMCOM1	On-Scene	155.7750 N	103.5	158.7900 N	103.5	A	IC to Div 118 & Branches
3									
4	FD Tactical	FG RED	NE Branch	153.8300 N	69.3	153.8300 N	69.3	A	
5	FD Tactical	FG WHITE	NW Branch	154.2800 N	74.4	154.2800 N	74.4	A	
6	FD Tactical	FG BLUE	SE Branch	154.2950 N	85.4	154.2950 N	85.4	A	
7	FD Tactical	FG GOLD	Branch	153.8375 N	91.5	153.8375 N	91	A	
8									
9	Air-Ground	FG BLACI	Gro	154	94.8	1 27 N	4.		
10									
11	EMS Tactical	EMS C	EMS Rehab	155.2800 N	D156	155.28 N	D156	A	
12									
13	SPARE RPTR	MARC1		151.2800 N	136.5	153.8450 N	136.5	A	
14									
15	FD Tactical	MABAS1	MABAS Coord	WISCOM TRS				D	Badger Red

SPECIAL INSTRUCTIONS

Command Post located at: GALLITZ GRADING, W4546 HWY 18, JEFFERSON (.1 mile east of Christburg Rd)

Staging located at:

JEFFERSON FIRE STATION located at: 351 E Racine St

SPECIAL INSTRUCTIONS: XXX

Prepared By (Communications Unit): Todd Lindert, COML (920) 210-0000 RADIO 4848

Incident Location: USH 18 AT CHRISTBURG RD

County: JEFFERSON State: WI Latitude: N Longitude: W

The convention calls for frequency lists to show four digits after the decimal place, followed by either an "N" or a "W", depending on whether the frequency is narrow or wide band. Mode refers to either "A" or "D" indicating analog or digital (e.g. Project 25) or "M" indicating mixed mode. **All channels are shown** as if programmed in a control station, mobile or portable radio. Repeater and base stations must be programmed with the Rx **and Tx reversed.**

Appendix A—Detailed table of EMS communications channels

Channel Name	Frequency	Tone	Call Sign	Primary Use	Secondary Use
EMS B For local hospital and statewide use. **EMS Required**	155.340 MHz **Local Hospital Use** 155.340 MHz **Statewide Mutual Aid**	Varies (transmit) Varies (receive) D156 (transmit) None (receive)	Varies KH4762	BLS and ALS contact with hospitals for medical care.	On-scene medical coordination from mobile to mobile (should be done on other channels, if possible).
EMS A (Former State ALS) For local hospital and statewide use. **EMS Required**	155.400 MHz **Local Hospital Use** 155.400 MHz **Statewide Mutual Aid**	Varies (transmit) Varies (receive) D156 (transmit) None (receive)	Varies KH4762	ALS contact with hospitals for medical care.	This includes ALS contact for intercepts.
FG Gray (VHF user) **8TAC Gray (800 users)** (Primary) **FG Black (VHF user)** **8TAC Black (800 user)** (Secondary) **EMS Required**	154.2875 MHz 853.9500 MHz 154.2725 MHz 853.4500 MHz	136.5 (TX/RX) 156.7 (TX/RX) 94.8 (TX/RX) 156.7 (TX/RX)	KO2099 WQJX638 KO2099 WQJX638	Statewide landing zone interagency communications.	FG GRAY (Primary) FG BLACK (Secondary) Used for fireground operations around the state; local coordination strongly recommended
EMS C Hospital base station coordination; landing zone tertiary use	155.280 MHz	D156 (TX/RX)	KH4762	Communication between hospitals. Use may be limited due to non-EMS users.	Field coordination between public health agencies. Landing zone coordination tertiary use

EMS RECOMMENDED

Channel Name	Frequency 463 (receive) 468 (transmit)	Tone	Call sign	Primary use	Secondary Use
MED 1	463.000 / 468.000	Transmit - Varies by hospital. See Appendix E	Varies by hospital	Paramedic and EMT-Intermediate to base for medical care.	Air-medical dispatch in some areas.
MED 2	463.025 / 468.025				
MED 3	463.050 / 468.050				
MED 4	463.075 / 468.075				
MED 5	463.100 / 468.100				
MED 6	463.125 / 468.125				
MED 7	463.150 / 468.150				
MED 8	463.175 / 468.175				
MED 9	462.950 / 467.950				
MED 10	462.975 / 467.975				

Appendix B—Wisconsin mutual aid channels

In 2021, the Wisconsin Office of Emergency Communications (OEC) published a modernized update of the Wisconsin Field Operations Guide (WI-FOG). The WI-FOG is the culmination of decades of work in the communications interoperability field within the state and regionally, allowing for one standardized location for all interoperable communications resources to be listed.

All VHF, UHF, 700 MHz and 800 MHz public safety interoperability radio channels are listed in the WI-FOG, along with reference information that may be needed in the field by public safety practitioners.

Please refer to the WI-FOG for technical data pertaining to the EMS radio channels listed in this plan, as well as all other interoperability channels that should be programmed into EMS provider radios around the state.

The WI-FOG can be found online.

The WI-FOG is also now available as a mobile application for cellular devices. It can be accessed for free through the Cybersecurity and Infrastructure Security Agency's (CISA's) Public Safety Library application, available from the Google Play and Apple App stores.

General questions about the WI-FOG can be directed to:

Wisconsin Office of Emergency Communications
Interoperability Program
interop@widma.gov

Technical or licensing questions about channels in the WI-FOG can be directed to:

Electromagnetic Spectrum Operations
Wisconsin State Patrol
Bureau of Network Engineering and Data Infrastructure
(608) 709-0095
dotdspstatewidefrequencycoordinator@dot.wi.gov

Appendix C—EMS and preparedness resources

For general inquiries regarding the Wisconsin EMS Communications Plan, EMS provider licensure, or EMS operations, please contact:

Emergency Medical Service Section
Office of Preparedness and Emergency Health Care
Division of Public Health
Wisconsin Department of Health Services
(608) 266-1568
dhsemssmail@dhs.wisconsin.gov

Information on preparedness programs through the Office of Preparedness and Emergency Health Care is available at https://www.dhs.wisconsin.gov/preparedness/index.htm.

Appendix D—Wisconsin hospital tones for EMS B 155.340 and EMS A 155.400 channel use

The listing of PL tones is not publicly listed in the interest of operational security. Please contact the WSP spectrum manager for any inquiries, updates, or new hospital PL tone requests:

Electromagnetic Spectrum Operations
Wisconsin State Patrol
Bureau of Network Engineering and Data Infrastructure
(608) 709-0095
dotdspstatewidefrequencycoordinator@dot.wi.gov

Appendix E—WISCOM local hospital tones and EMS talk groups

The listing of WISCOMM talk groups is not publicly listed in the interest of operational security. Please contact the WSP spectrum manager for any inquiries, updates, or new hospital PL tone requests:

Electromagnetic Spectrum Operations
Wisconsin State Patrol
Bureau of Network Engineering and Data Infrastructure
(608) 709-0095
dotdspstatewidefrequencycoordinator@dot.wi.gov

Appendix F—EMS and other mutual aid channel use

The use of mutual aid channels must be authorized. All two-way public safety radio use is controlled by the Federal Communications Commission (FCC).

Authorization for the use of those channels covered by the FCC state license call sign KO2099 or authorization for use of those EMS required channels covered by the FCC state license call signs KH4762 and WNPG812 is granted when the EMS provider license is granted. Without the EMS provider license, channel usage may be obtained by making written request to:

Electromagnetic Spectrum Operations
Wisconsin State Patrol
Bureau of Network Engineering and Data Infrastructure
(608) 709-0095
dotdspstatewidefrequencycoordinator@dot.wi.gov

Except for the EMS channels, EMS A, EMS B, and EMS C, the use of mutual aid channels is granted for mobile or portable use only. Base station usage of EMS channels must be licensed by the hospital or provider (see Section 2.7 FCC License Requirements for further details).

All EMS providers and hospitals in Wisconsin are encouraged to implement the statewide common EMS and mutual aid channels. Adopting the Wisconsin EMS Communications Plan will foster further interoperability among all EMS responders in out-of-service area mutual aid situations and foster communications between EMS and responders from other disciplines.

In some cases, local assignments may conflict with the Wisconsin EMS Communications Plan. It is highly desirable for these situations to be integrated into the state plan. The State Frequency Coordinator will work with those county and local EMS agencies affected to address these situations.

Appendix G—WISCOM overview

Most local emergency responders communicate with responders from neighboring communities by programming their public safety radios with a small number of shared mutual aid channels. This approach works well for routine incidents but does not support emergency communications between agencies outside these established networks, resulting in communication failures when coordination is especially critical, and time is of the essence.

The Wisconsin Interoperable System for Communications (WISCOM) is a shared system that first responders in communities across the state will use to communicate during a major disaster or large- scale incident. WISCOM will support up to four simultaneous conversation paths during an incident, dramatically increasing the current capacity available with statewide mutual aid channels and allowing responders from any area of the state to assist another community without losing communications capabilities.

EMS providers should strongly consider adding WISCOM-capable equipment to their fleet of radios.

At the time of publication of this version of the Wisconsin EMS Communications Plan, the Wisconsin Department of Military Affairs (DMA), with assistance from the Wisconsin Department of Transportation, is currently in the procurement process to replace the current WISCOM radio system.

The new radio system will be a 700/800 MHz P25 Phase II trunked radio system statewide and will include a 3 channel VHF conventional overlay for those who are unable to access the trunked network.

It is encouraged to start the planning to replace radio equipment to be compatible with this new statewide trunked radio system, including features like being dual band VHF & 7/800 MHz, P25 Phase II, P25 Trunking, AES multikey encryption and at least 512 channels.

Please contact DMA with any WISCOM project questions at:

Wisconsin Office of Emergency Communications
Interoperability Program
interop@widma.gov