

# **WISCONSIN EMERGENCY MEDICAL SERVICES COMMUNICATIONS PLAN**



**Department of Health and Family Services  
Division of Public Health  
EMS Systems and Licensing Section**

**Revised 10/2006**

# INTRODUCTION

The Wisconsin Emergency Medical Services (EMS) Communication Plan is both a communications guide for EMS providers and an overview of requirements for local EMS systems to assure that a statewide communication system is in place that can address daily needs as well as large scale multi-casualty situations. The original document was created with input from an ad-hoc committee attached to the EMS Advisory Board and the Bureau of EMS and Injury Prevention, Division of Public Health, Department of Health and Family Services. The committee met for several months in 2001 and 2002 and presented a draft to the EMS Board in July 2002. The EMS Board reviewed the document and added comments, which were either added or addressed in discussions with the Board. The EMS Board officially approved the original version in September 2002.

This current plan, also approved by the EMS Board, takes the same original information and guidance and blends it with the new interoperability planning and other technical documents released from the Governor appointed State Interoperability Executive Committee (SIEC).

The 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's manual" for providers in creating and maintaining their EMS communications.
- Provide an update to current EMS providers on new channels and technologies.

The first section provides general information on what is involved with communications between pre-hospital health care providers, Emergency Medical Technicians (EMTs), First Responders, and the other entities they need to communicate with on a regular basis. This includes communications with hospitals, other EMS providers, and other public safety agencies.

The second section addresses specific information about EMS in Wisconsin. It includes an overview of how communication occurs, the radio channels, and Federal Communication Commission rules that apply to Wisconsin EMS service providers.

The third section is a guide to EMS service providers about 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.

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## 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 or "ALS"** Means use, by appropriately trained and licensed personnel, in pre-hospital 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 under Administrative Code ch. HFS 111 or emergency medical technicians-paramedic under Administrative Code ch. HFS 112 and which are not included in basic life support

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

**Basic life support or "BLS"** Means 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 s. 146.50, Wisconsin Stats. and Administrative Code ch. HFS 110 as a condition for being issued an EMT-basic license.

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

**Communications system** – A collection of individual communication 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-controlled squelch system (CTCSS)** – A system wherein 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 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 Communications & Electronics), Channel Guard or CG (General Electric Mobile Radio Department), or Tone Call Guard or TCG (E.F. Johnson).

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

**Direct dispatch method** – A system in which all 9-1-1 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 and/or that dispatches pre-hospital emergency medical personnel and equipment to such requests.

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

**Emergency medical service (EMS)** – The service 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 – basic** – An individual who is licensed by the Department of Health and Family Services to administer basic life support and to properly handle and transport sick, disabled or injured individuals.

**Federal Communication Commission (FCC)** – A board of seven 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 United States by radio or wireline, including television, telephone, radio, facsimile and cable systems.

**First Responder** - A person who provides emergency medical care to a sick, disabled or injured individual prior to the arrival of an ambulance.

**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** – Inter-agency Fire Emergency Radio Network. Formerly WISTAC 1.

**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.

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

**MARC** - Mutual Aid Radio Channels (MARC 1, 2, 3, and 4) are statewide interoperability frequencies. Used for communication between public safety agencies and providers.

**Medical control or on-line medical control** - Means voice communicated medical direction from a physician to EMT personnel to assist in the care provided by EMT 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.

**Narrow Banding** – The effort underway by the FCC to develop more VHF channels for public safety communications. Current channels are 25 KHz. in width. Narrow band channels will be 12.5 KHz. in width. All public safety radios must comply with narrow banding regulations by the end of 2012.

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

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

**Private line (PL)** – Motorola’s trademarked name for continuous tone-controlled squelch system, CTCSS. DPL, or digital PL, uses a burst of digital information rather than a continuous tone.

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

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

**SIEC** – State Interoperability Executive Council. A council appointed by the Governor to address the public safety communications interoperability issues in our state and to develop a solution.

**Tone code** – A specified character of transmitted tone signals required to effect a particular selection or function.

**Trunking** – A digital technology that forms “talk groups” instead of 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 3000 MHz.

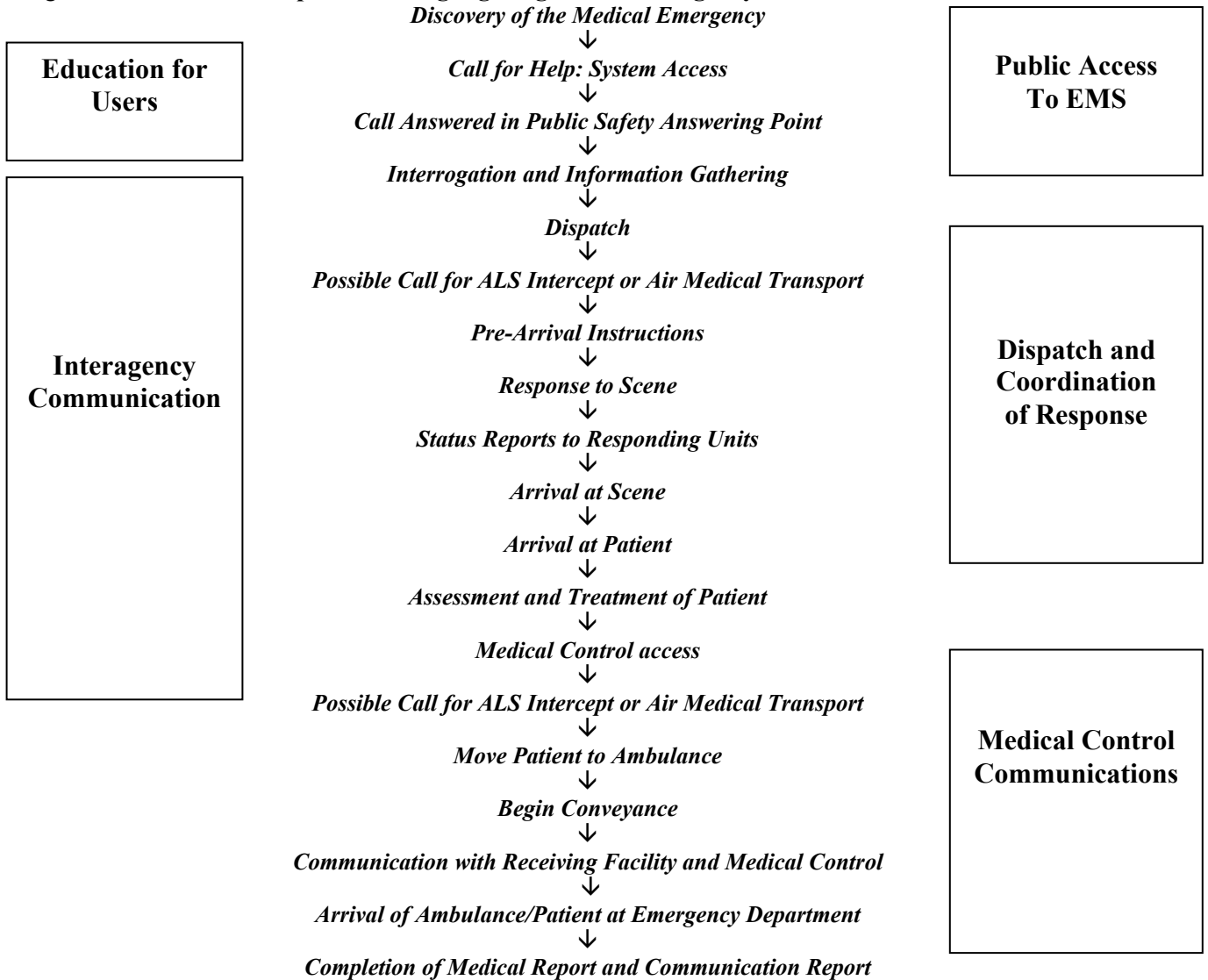
# SECTION 1 – COMMUNICATION SYSTEM COMPONENTS

## 1.0 Introduction

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
- Dispatch and Coordination of Response
- Medical Control Communications
- Interagency Communication (for resource and disaster coordination)
- Education for Users

Figure 1: Flow of Pre-hospital EMS highlighting role of Emergency Medical Communication



## **1.1 Public Access to EMS after Discovery of a Medical Emergency**

An essential component of an EMS communication system during a medical emergency is public access to the three-digit public safety phone number 911. This is achieved through the use of 911 public safety answering points (PSAPs) which route all emergency calls to the appropriate agency. Enhanced 911 (E911) has additional features beyond the basic 911 system that include:

- 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.

Currently, most of the state, 70 counties, is equipped for enhanced 911 operations.

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 service are still dependent on verbal information from the caller, which may lead to delayed response times. Current efforts are underway to equip and fund “wireless PSAPs” one per county, for automatic location and number identification. At the time of this text, fifteen counties in our state are so equipped.

## **1.2 Dispatch and Coordination of EMS Response**

After notification of a call is 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.

Central medical dispatch’s primary function is service coordination. This includes: (1) access to EMS from the incident, (2) dispatch and coordination of EMS resources, (3) coordination with medical facilities and (4) 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 medical instructions prior to the arrival of the ambulance 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 WI EMS Advisory Board has recommended that EMS Dispatch Centers be certified as competent to practice these skills by the State.

Ambulance and field personnel should also be trained in the use of communication equipment. This would include, but is not limited to:

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



### **1.3 Medical Control Communications**

Medical control communications provides field personnel with a direct link to relay information to and receive medical advice from a hospital or other health care facility. In some cases, it might also include biomedical telemetry of EKG information directly to the facility while the patient is in route. Medical control has been primarily done via radios in the past, but cellular telephones are being used in more cases. The pros and cons of cellular phone use are summarized in Section 3.3.

The degree to which medical control communications is utilized varies by areas of the state. Factors that influence how much medical control is used includes geographical factors and the degree that standing orders are allowed by the ambulance service medical director.

### **1.4 Interagency Communication (for resource and disaster coordination)**

There are a number of reasons why coordination of interagency communications is an important piece of the Wisconsin State EMS Communication Plan. Basic reasons for interagency communications include resource and disaster response coordination, which optimizes the ability to communicate with other agencies when necessary, but avoids interference with other agencies when a response is specific to only one agency.

The need for interagency communications can be illustrated by the following list of possible communication paths:

- Hospital to hospital
- Ambulance to hospital
- Ambulance to ambulance
- Ambulance to dispatch
- Hospital to dispatch
- First responder team to medical control
- First responder team to ambulance
- First responder team 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**

A communications system is only as good as the people using it. People 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 - State Authority**

Wisconsin Statutes 146.53 (5)(a) establishes the Wisconsin Department of Health and Family Services as the lead state agency for Emergency Medical Services (EMS). Wisconsin Statutes 146.50(13) provides substantial authority for rule writing to plan and implement guidelines for EMS systems and to provide technical assistance to local EMS agencies. A major component of each of the EMS licensing rules is development and submission of an operational plan for each ambulance service, which include a communication component.

Additionally, statewide planning for coordinated use of radio frequencies for EMS communications is necessary so individual efforts do not become counterproductive to the system. The Federal Communications Commission (FCC) and Emergency Medical Radio Service (EMRS) rules require that frequency coordination comply with state EMS communications plans where they exist.

The State EMS Systems and Licensing Section currently provides limited assistance to Wisconsin EMS providers and agencies with radio licensing and frequencies. FCC license applicants for Emergency Medical Radio Service frequencies submit a request to the State EMS Systems and Licensing Section describing their proposed application and request a letter of support. If the request is in conformance with the state EMS plan, the State EMS Systems and Licensing Section will provide a letter of support, which the applicant then submits to the national frequency coordinator.

Specific information on FCC license requirements and steps to follow in obtaining a license can be found on page 15, and also in appendix E.

### **Goals for a State EMS Communications System**

There are five fundamental goals identified in the National EMS Directors Planning Guide for Emergency Medical Communications.\* The five goals are:

1. EMS Communications 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 communications systems in neighboring or adjacent areas and within the state or in other geographical areas.
3. Local EMS communication systems should be compatible with, and should not interfere with, other types of communications 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 State EMS Systems and Licensing Section acts as the representative of local EMS systems in dealing with federal agencies and national organizations.

In Wisconsin this means that local services need to follow some minimum standards that ensure communications can occur, that there is oversight of how communications occur on a regional and statewide basis to avoid conflicts and allow for interagency communications, that communication costs are high and resources must be shared to implement and maintain a communications system and that the State EMS Systems and Licensing Section must serve as a advocate and communications conduit between federal agencies and local systems.

\* *Planning Emergency Medical Communications*, National Assoc of EMS Directors and National Highway Traffic Safety Administration, June 1995

**EMS communication elements** – The following sections describe the key elements of the State EMS Communications Plan. The EMS communications system must provide the means by which 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 Wisconsin EMS communications system's goal is to assure a system whereby all individuals should be able to summon help rapidly in an emergency situation whether for medical, police, fire, rescue, or other emergency need.

The entire state has access to the 911 system. Statewide E911 or Enhanced 911 coverage is available in all but two counties at the time of this text. Work needs to continue to make E911 statewide & include the ability to locate wireless calls to their actual physical location. The 911 system is the recommended means of accessing the EMS system for medical emergencies.

As mentioned in section 1.2, cellular telephone access to enhanced 911 services is currently in process throughout the state. In most areas, however, the location of the caller and routing of the message to the appropriate EMS service are still dependent on verbal information from the caller, which may lead to delayed response times.

### **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: (1) access to EMS from the incident, (2) dispatch and coordination of EMS resources, (3) coordination with medical facilities and (4) coordination with other public safety agencies. Recent emphasis on NIMS compliance will assist communications and coordination at large events.

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 medical instructions prior to the arrival of the ambulance requires an additional commitment from the dispatch center that includes initial and continuing education and a quality improvement activities. Because the provision of pre-arrival instructions constitutes indirect patient care, the WI EMS Advisory Board has recommended that EMS Dispatch Centers be certified as competent to practice these skills by the State.

### **2.3 - Medical Control Communications**

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. This can be done through a variety of mechanisms (radio frequencies and cell phones) and may be dependent on local needs and resources. Additional means of communication such as digital phones and satellite communications will likely be future options.

Although many protocols are 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 State EMS Systems and Licensing Section as part of the service's operational plan required under Administrative Code HFS 110.08, 111.07 and 112.07.

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 EMT-paramedic levels.

Telemetry– Telemetry uses the assigned radio frequencies for not only voice communications, but also medical data such as EKG rhythms. Such systems can use carrier tones or digital encryption to transmit data. The system must have the ability to establish a baseline data set through the use of calibration signals or error correcting software to ensure data accuracy. Systems using telemetry must also adhere to FCC requirements for data transmission.

#### **2.4 Interagency Communications (for resource and disaster coordination)**

EMS communications systems should provide a means of communication to enable medical and logistical coordination between EMS field personnel, emergency department personnel and other agencies. If necessary regional or statewide coordination may be necessary based on the EMS operational plan submitted by the provider to the Department of Health and Family Services.

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

Regional Coordination - EMS agencies should establish resource coordination (e.g. first 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 agencies should consider their involvement in large-scale disasters and anticipate the need for interagency communications. Preplanning with local Emergency Management agencies is an important aspect of interoperability on agencies' communication systems.

Intercept and Air Medical – The local ambulance service must be able to describe how communications takes 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 recommended channel for air medical communications with ground units while the air medical unit is on the way to the landing zone is MARC 2 or EMS C. See Sections 2.6 and 3.1 for more information.

Back-up Communications - The concept of back-up communications is for disaster scenarios and redundancies in case of equipment failure. With regard to EMS communications specifically, the concept of back-up communications as applied to base station or other fixed radio equipment means to:

- 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 maintains needed flow of EMS personnel.

A failure plan must include provisions for:

- Medical control
- Dispatch
- Inter-agency coordination

The requirement for each ambulance service 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.

Telephone Interconnection - Cellular phone use may be used as a primary communications method for ambulance service providers. However, because of some of the limitations of cellular phone use, cellular phones can not take the place of the required radio equipment and frequencies. A more detailed list of the pros and cons of cellular phone vs. radio use can be found on page 20. Cellular phone use for communication during interfacility transports is an area where cell phones may have an advantage over radios because it avoids the need to program in multiple PL codes for all receiving facilities. EMS providers may also wish to provide telephone interconnection capability with specialty information and treatment centers (ex.: poison center, 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 Provider and First Responders that are approved for advanced skills to operate on all EMS frequencies as part of the State FCC licenses. Ambulance Providers have permission to use EMS frequencies as outlined and approved as part of their operational plan.

## **2.6 Frequencies & Tones for EMS Communications**

Standard EMS channels are 155.340, 155.400, 155.280, MARC 1, MARC 2 channels and Med Pairs. All EMS transport providers must have the capability to communicate on all these channels except for the Med Pairs and 155.280. Services that don't currently have this capability must add it when purchasing new equipment or when they reprogram equipment. The above requirement applies regardless of what technology or communications system is used locally.

It is recommended that all First Responder services have the capability to communicate on 155.340, 155.400, 155.280 and the MARC channels. Use of these frequencies should be coordinated with the local ambulance provider and other related 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 on how they may impact other agencies and when planning for county and regional communication needs.

**EMS B (formerly State EMS channel) (155.340)**– 155.340 is dedicated to Basic Life Support (BLS) and Advanced Life Support (ALS) communications with a primary purpose of communications between emergency medical 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 use should first be attempted on alternate frequencies (local, 155.280, MARC & then 155.340 in that order). The 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 this channel. All hospitals are also required to have the capability to communicate on 155.340 so ambulances from any area can make contact with the facility. This can be accomplished through direct 155.340 communications or through a patch from a central dispatch center.

**EMS A (formerly State ALS channel) (155.400)** – 155.400 is dedicated to communications among ambulance and hospital personnel directing patient care prior to arrival at the hospital while using advanced skills. The primary & 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 would include communication for ALS intercepts and air medical contact.

**EMS C (formerly State Coordination channel) (155.280)** – The primary purpose of 155.280 is for communications between hospitals and provides 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 a CTCSS tone or PL (Private Line). These tones are coordinated to allow communications with just the needed hospital and not other local facilities. Tones for EMS B, EMS A, and EMS C are the same for any given facility. A digital code, D156, is also assigned for state-wide 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 accordingly at their next opportunity. See Appendix D for this list.

**Mutual Aid Radio Channels - MARC 1 (151.280/153.845), MARC 2 (151.280), MARC 3 (formerly WISTAC 2,-154.010), MARC 4 (formerly WISTAC 3, 154.130)** – The Mutual Aid Radio Channels (MARC 1, 2, 3, and 4) are statewide interoperability channels. These channels are to be used for communication between public safety agencies and providers of any discipline. Note that MARC 1 is configured for wide area repeater usage. State interoperability plans include the bolstering of the MARC 1 repeater system throughout the state. See Appendix B for information on the MARC plan.

**IFERN (formerly WISTAC 1) (154.265)** – This channel is for use by any EMS, fire, or rescue use for mutual aid operations and for on-scene tactical use. This channel is part of the MABAS system, and is often used for MABAS dispatch functions.

**UHF MED Pairs** – The ten 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 intermediate level. The channel is for emergency medical care/telemetry and should be limited to this purpose. A secondary use for air medical dispatch is acceptable as long as it doesn't interfere with the ability to communicate to provide patient care.

<u>Med Mobile Receive channel frequencies are:</u>	<u>Med Mobile Transmit channel frequencies are:</u>
Med 1 463.000	Med 1 468.000
Med 2 463.025	Med 2 468.025
Med 3 463.050	Med 3 468.050
Med 4 463.075	Med 4 468.075
Med 5 463.100	Med 5 468.100
Med 6 463.125	Med 6 468.125
Med 7 463.150	Med 7 468.150
Med 8 463.175	Med 8 468.175
Med 9 462.950	Med 9 467.950
Med 10 462.975	Med 10 467.975

Med 9 & 10 are primarily used for dispatch. Note that these ten 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 5-8. Use of these frequencies must be coordinated by the State EMS Communications Coordinator in conjunction with the dispatch center and ambulance services in the area of requested use.

**Trunking Systems (800 MHz/VHF/UHF)** – Trunking systems are in use more and more frequently, especially in urban areas, due to the loading, traffic, and management advantages that this technology offers. These systems are generally all discipline in nature, and can be used for ambulance communications between ambulance providers and hospitals. However, because of the need for ambulances to have the ability to communicate with any hospital in the state, a trunking system can not be the sole method of communication. The required VHF channels still apply as an adjunct to other methods of communication.

**Air Medical Frequency Recommendations** – Local 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 at-scene responders on the ground. The recommended channel for air medical communications on the way to the landing zone is MARC 2. The reasons for using MARC 2 are:

- MARC 2 is a universal public safety frequency that can be used by all landing zone personnel (first responders, EMTs, fire and law enforcement)
- Designating MARC 2 as the standard frequency will avoid confusion in searching for the frequency to hook-up the air and ground units.
- Designating MARC 2 will also avoid the inappropriate use of other frequencies that should be left open for other communication.

Keep in mind, however, that during a mass casualty event, the MARC 1 repeater system may be activated. The use of MARC 2 by in-flight aircraft could interfere with the MARC 1 repeater system due to the increased transmit range an aircraft would have on MARC 2, which is also the input frequency of the MARC 1 repeater.

An alternative frequency choice would be EMS C (155.280). Regional plans should have the flexibility to use this option if it is a more practical frequency MARC.

Use of any other channels must be in the air medical provider's operational plan and must address interface and that these other channels are in addition to the required channels.

## **2.7 FCC Licenses**

Overview of regulations – The Federal Communications Commission (FCC) regulates all radio communications within the United States. Radio communication is controlled by requiring licensure of all radio transmitters. The FCC rules govern who is eligible to license a transmitter and the specific frequencies and equipment configurations allowed for each frequency or service group. A copy of the FCC rules can be obtained from <http://wireless.fcc.gov/rules.html> or:

Superintendent of Documents  
U.S. Government Printing Office  
P.O. Box 371954  
Pittsburgh, PA 15250-7954  
(866) 512-1800 or (202) 512-1800  
Fax (202) 512-2250

Prior to operating a radio transmitter, a license must be obtained 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 Communications Coordinator at the State EMS Systems and Licensing Section, (608) 266-1568. See Appendix E for further details.

EMS service 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 & portable units operating on all frequencies can legally use that frequency through approval of any of the following methods:

- Holding their own FCC license.
- Hospital license from medical control hospital.
- County-wide license.
- Statewide license.

EMS transport & First Responder services that are licensed by the State have permission to use the required EMS channels (EMS B 155.340, EMS A 155.400, MARC 1 and MARC 2) in mobile and portable radios, as well as EMS C 155.280. MARC 1 usage, however, may need to be coordinated with local agencies. The authorization to use these channels is part of approval for the 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. Providers can contact those hospitals with which they routinely communicate and request authorization under their license.



Providers requiring a FCC license should do the following:

1. When applying for a Public Safety Pool frequency that was formerly included in the Emergency Medical Radio Service (this includes EMS B 155.340, EMS A 155.400, EMS C 155.280, and the Med channels), first request a letter of support from the State EMS Systems and Licensing Section. This request should include:
  - That the applicant provides ongoing basic or advanced life support (if applying for 155.280, 155.340, 155.400, or the Med channels).
  - That the application is in conformance with the State's EMS Communication Plan.
2. File the FCC Form 601 and the State EMS Systems and Licensing Section letter of support with the national frequency coordinator. Contact the EMS Communications Coordinator for further details regarding this process:

EMS Systems and Licensing Section  
EMS Communications Coordinator  
1 W. Wilson St, room 131 / 133  
PO Box 2659  
Madison, WI 35701-2659  
Phone: (608) 261-9306  
Fax: (608) 261-6392  
Email: [wittkpv@dhfs.state.wi.us](mailto:wittkpv@dhfs.state.wi.us)

## **SECTION 3 – LOCAL PROVIDER AND SYSTEM STANDARDS**

The system requirements defined in the following section will be part of the EMS Operational Plan submitted to the Wisconsin State EMS Systems and Licensing Section for ambulance provider license approval.

### **3.0 Overview and Laws**

There are required operational plan elements for every EMS license level. The references to EMS communications in Administrative Code HFS 110, 111 and 112 are:

A description of the communication system for providing medical control to EMT personnel. When installing communications equipment in ambulances, the ambulance service provider shall comply with the specifications and standards of the Wisconsin statewide emergency medical services communications system. All ambulances shall have direct radio contact with a hospital emergency department on the designated ambulance-to-hospital frequency.

A description for EMT-intermediate and EMT-paramedic providers for ensuring 2-way voice communication between every ambulance and the medical control physician, including, in addition to a mobile radio in the ambulance, a portable means of communication capable of being operated from the patient's side.

A description of how calls are dispatched, including who does the dispatching, whether or not dispatchers are medically trained and whether or not dispatchers give pre-arrival instructions.

*Reference note: WI Administrative Code HFS 110.08 (2) (f) & (g), HFS 111.07 (2) (f) & (g) and HFS 112.07 (2) (f) & (g).*

There are also requirements in WI Administrative Code Trans 309 for the equipment in an ambulance. The two specific requirements are:

Each ambulance shall have a permanently mounted radio to contact the hospital emergency department of the hospital it serves. There shall be a microphone and speaker permanently mounted in the patient compartment. The radio shall comply with Administrative Code HFS 110.

Each ambulance service provider operating ambulances staffed either wholly or partially with EMTs practicing advance skills shall have remote 2-way communications for personnel when they are away from the ambulance

*Reference note: WI Administrative Code Trans 309.18 (1) and (2).*

NOTE: For a copy of the administrative code, write to the EMS Systems and Licensing Section, Division of Public Health, P.O. Box 2659, Madison WI 53701-2659 or download the information from the DHFS website at [www.dhfs.state.wi.us/DPH\\_EMSIP/index.htm](http://www.dhfs.state.wi.us/DPH_EMSIP/index.htm).

### **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 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. Services that don't 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 First Responder services

have the capability to communicate on 155.340, 155.400, 155.280 and the MARC channels. Use of these frequencies should be coordinated with the local ambulance provider and other related agencies to avoid congestion on these frequencies.

See Appendix A for a detailed table of EMS Communication Frequencies. More information on EMS frequencies can be found in Section 2.6, pages 13-15.

### 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 four required frequencies.
- PL, local or all state – Must have PL tones for local hospitals, hospitals in adjacent counties and hospitals where you routinely do emergency transports. Providers don't 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.
- Required radio in patient compartment.
- 25-100 Watts depending on what is appropriate for the area served. Higher power is recommended for rural areas with large coverage areas or services that have unique radio coverage issues.

**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 section 2.6, hospital tones, 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 these 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.

### 3.3 Considerations in setting up your communication systems and purchasing equipment

These are questions you need to consider in completing the communications component of your EMS operational plan. Although not all of these questions have to be addressed in the operational plan, they should all be considered as you set up your communication system.

#### Dispatch Considerations

1. How do citizens access EMS?

E911

911

Wireless E911

2. How are you dispatched?

Radio/Pager

Telephone

Mobile data terminal

3. Who does your dispatching?

Law Enforcement

County public safety

Private company

Other \_\_\_\_\_

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

**Response Considerations**

1. What is your communication link to other public safety agencies such as law enforcement and fire departments (method/frequency)?
2. Do you have intercept agreements with ALS? If yes, how do you communicate with them (method/frequency)?
3. Do you use air medical for transports? If yes, how do you communicate with them (method/frequency)? *recommendation: MARC 2, then EMS C (155.280)*
4. Do you have telecommunications ability with your first responders? If yes, how do you communicate with them (method/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
  - Other \_\_\_\_\_
2. What is the method to contact the receiving hospital during interfacility transports if it is different than method to contact medical control?
3. If applicable what is your method for telemetry?

**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 areas that may affect communications coverage such as forests, hills, buildings, etc.?
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

State wide code

Dispatch frequency

Med Pairs

IFERN, MARC 3, MARC 4

Others \_\_\_\_\_

Radio vs. Phone use

**Pros and Cons for Radio vs. Cellular phone use:**

<p><b>PROS –Two-way radio communication</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Local control</li> <li><input type="checkbox"/> Paging</li> <li><input type="checkbox"/> Monitor other agencies</li> <li><input type="checkbox"/> Broadcast capabilities</li> <li><input type="checkbox"/> Multi channel</li> <li><input type="checkbox"/> Direct contact on talk-around channels</li> <li><input type="checkbox"/> One in place, ongoing costs are minimal</li> <li><input type="checkbox"/> Priority access</li> </ul>	<p><b>CONS -Two-way radio communication</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cost of implementation and operation</li> <li><input type="checkbox"/> Communications can be monitored</li> <li><input type="checkbox"/> Coverage area dependent on related equipment (towers, etc.)</li> <li><input type="checkbox"/> Can't provide telemetry</li> <li><input type="checkbox"/> Interference from other users</li> </ul>
<p><b>PROS – Cellular phone</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Good voice quality in strong cell area</li> <li><input type="checkbox"/> Large number of available channels</li> <li><input type="checkbox"/> Communications aren't monitored</li> <li><input type="checkbox"/> Can provide limited telemetry</li> <li><input type="checkbox"/> Access to translation services</li> </ul>	<p><b>CONS – Cellular phone</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Dependent on location and availability of cell tower</li> <li><input type="checkbox"/> Can only talk to one location (can't broadcast)</li> <li><input type="checkbox"/> Cell system will be overloaded in a disaster</li> <li><input type="checkbox"/> Can't interrupt an ongoing conversation</li> <li><input type="checkbox"/> Vulnerable to availability of an open phone line</li> <li><input type="checkbox"/> Battery life</li> <li><input type="checkbox"/> Beyond local system control</li> </ul>

**APPENDICES:**

A - Detailed table of EMS communication channels.

B - Wisconsin VHF mutual aid channels.

- Chart with channel name, frequency, tone, primary and secondary uses.
- Text description of channel with further details.

C – Implementation of VHF EMS channels, suggested priority for programming.

D – Wisconsin local hospital tones for EMS B 155.340 and EMS A 155.400 channels.

E – EMS and other mutual aid channel use.

- Authorization procedures.
- Miscellaneous other notes.

**APPENDIX A - DETAILED TABLE OF EMS COMMUNICATION CHANNELS**

<b>Channel Name</b>	<b>Frequency</b>	<b>Tone</b>	<b>Call Sign</b>	<b>Primary Use</b>	<b>Secondary Use</b>
<b>EMS B</b> (Former State EMS) FOR LOCAL HOSPITAL AND STATE WIDE USE.	155.340 (receive and transmit) <b>LOCAL HOSPITAL USE</b>	Varies (transmit) Varies (receive) See Appendix D	KH4762	BLS & ALS contact with hospitals for medical care.	On-scene medical coordination from mobile to mobile (should be done on other channels, if possible).
<b>EMS REQUIRED</b>	155.340 (receive and transmit) <b>STATE WIDE MUTUAL AID</b>	D156 (transmit) None (receive)			
<b>EMS A</b> (Former State ALS) FOR LOCAL HOSPITAL AND STATE WIDE USE.	155.400 (receive and transmit) <b>LOCAL HOSPITAL USE</b>	Varies (transmit) Varies (receive) See Appendix D	KH4762	ALS contact with hospitals for medical care.	This includes ALS contact for intercepts and air medical.
<b>EMS REQUIRED</b>	155.400 (receive and transmit) <b>STATE WIDE MUTUAL AID</b>	D156 (transmit) None (receive)			
<b>MARC1</b>	151.280 (receive) 153.845 (transmit)	136.5 (transmit) 136.5 (receive)	WNPG812	Statewide interagency communications.	MARC 2 for landing zone coordination and air-scene communications.
<b>MARC2</b> Mutual Aid Radio Channels <b>EMS REQUIRED</b>	151.280 (receive and transmit)	136.5 (transmit) 136.5 (receive)	WNPG812		
<b>IFERN</b> (Former WISTAC1)	154.265 (receive and transmit)	210.7 (transmit) None (receive)	KO2099	Mutual aid for EMS / fire/ rescue, on-scene tactical. Usage for all three channels is restricted in some parts of the state. See plan text for further description.	Mutual aid for any discipline.  IFERN receive tone of 210.7 may be required in the future as WISTAC1 / IFERN transition is completed.
<b>MARC3</b> (Former WISTAC2)	154.010 (receive and transmit)	71.9 (transmit) 71.9 (receive)	KO2099		
<b>MARC4</b> (Former WISTAC3) More mutual aid channels	154.130 (receive and transmit)	82.5 (receive) 82.5 (receive)	KO2099		
<b>EMS C</b> (Former State Coordination)	155.280 (receive and transmit)	D156 (transmit) D156 (receive)	KH4762	Communication between hospitals. Use may be limited due to non-EMS users.	Field coordination between public health agencies. Alternate for air medical.
<b>MED1</b>	463.000 (receive) 468.000 (transmit)	Transmit - Varies by hospital. See Appendix D	Varies by hospital	EMT-P & EMT-I to base for medical care.	Air-medical dispatch in some areas.
<b>MED2</b>	463.025 468.025				
<b>MED3</b>	463.050 468.050				
<b>MED4</b>	463.075 468.075				
<b>MED5</b>	463.100 468.100				
<b>MED6</b>	463.125 468.125				
<b>MED7</b>	463.150 468.150				
<b>MED8</b>	463.175 468.175				
<b>MED9</b>	462.950 467.950				
<b>MED10</b>	462.975 467.975				
UHF Med Channels					

**APPENDIX B - WISCONSIN VHF MUTUAL AID CHANNELS**  
**WISCONSIN STATEWIDE VHF PUBLIC SAFETY**  
**COMMON FREQUENCY CHART**

<b>MOBILE RX FREQ</b>	<b>RX TONE</b>	<b>MOBILE TX FREQ</b>	<b>TX TONE</b>	<b>STATE NAME</b>	<b>NATIONAL NAME</b>	<b>STATE CALLSIGN</b>	<b>PRIMARY USE</b>
155.340	None	155.340	D156	EMS B	1EMS14	KH4762	EMS BASIC STATE-WIDE
155.340	None	155.340	See chart D	EMS B	None	KH4762	EMS BASIC LOCAL
155.400	None	155.400	D156	EMS A	None	KH4762	EMS ALS STATE-WIDE
155.400	None	155.400	See chart D	EMS A	None	KH4762	EMS ALS LOCAL
155.280	D156	155.280	D156	EMS C	None	KH4762	EMS COORD & HOSPITAL
151.280	136.5	153.845	136.5	MARC1	None	WNPG812	All
151.280	136.5	151.280	136.5	MARC2	None	WNPG812	All
154.010	71.9	154.010	71.9	MARC3	None	KO2099	All
154.130	82.5	154.130	82.5	MARC4	None	KO2099	All
156.000	136.5	156.000	136.5	WEM CAR	None	KGT483	Emer Mgt.
155.475	CS	155.475	156.7	WISPERN	1LAW16	KA6570	Law
155.370	CS	155.370	146.2	POINT	None	KA6570	Law
154.265	CS	154.265	210.7	IFERN	1FIR7	KO2099	Fire

153.830	CS	153.830	69.3	FG RED	None	KO2099	Fire
154.280	CS	154.280	74.4	FG WHITE	1FIR9	KO2099	Fire
154.295	CS	154.295	85.4	FG BLUE	1FIR11	KO2099	Fire
153.8375*	91.5	153.8375*	91.5	FG GOLD	None	KO2099	Fire
154.2725*	94.8	154.2725*	94.8	FG BLACK	1FIR8	KO2099	Fire
154.2875*	136.5	154.2875*	136.5	FG GRAY	1FIR10	KO2099	Fire
154.3025*	67.0	154.3025*	67.0	IFERN2	1FIR12	KO2099	Fire
155.160	127.3	155.160	127.3	NATSAR	None	KO2099	Search and Rescue
155.7525*	156.7	155.7525*	156.7	VCALL	1CAL18	KO2099	All
151.1375*	156.7	151.1375*	156.7	VTAC1	1TAC5	KO2099	All
154.4525*	156.7	154.4525*	156.7	VTAC2	1TAC13	KO2099	All
158.7375*	156.7	158.7375*	156.7	VTAC3	1TAC22	KO2099	All
159.4725*	156.7	159.4725*	156.7	VTAC4	1TAC23	KO2099	All

**\*NARROW BAND USAGE ONLY**



**APPENDIX B (con't) - WISCONSIN VHF MUTUAL AID CHANNELS**  
**WISCONSIN STATEWIDE VHF PUBLIC SAFETY**  
**COMMON FREQUENCY DESCRIPTION**

Name State EMS Basic (BLS)  
 Acronym **EMS B**  
 Receive Frequency 155.340  
 Receive Tone None  
 Transmit Frequency 155.340  
 Transmit Tone D156 for statewide; each hospital is assigned a tone for local use  
 Primary Discipline EMS only  
 State Callsign KH4762  
 Usage Ambulance to hospital communications.  
 See appendix D for local hospital tones.

Name State EMS Advanced (ALS)  
 Acronym **EMS A**  
 Receive Frequency 155.400  
 Receive Tone None  
 Transmit Frequency 155.400  
 Transmit Tone D156 for statewide; each hospital is assigned a tone  
 Primary Discipline EMS only  
 State Callsign KH4762  
 Usage ALS ambulance to hospital and ambulance to ALS intercept.  
 See appendix D for local hospital tones.

Name State EMS Coordination  
 Acronym **EMS C**  
 Receive Frequency 155.280  
 Receive Tone D156 for statewide; each hospital is assigned a tone for local use  
 Transmit Frequency 155.280  
 Transmit Tone D156 for statewide; each hospital is assigned a tone for local use  
 Primary Discipline EMS, Public Health  
 State Callsign KH4762  
 Usage Hospital to hospital communications, on scene coordination,  
 Alternate for medical helicopter landing zone coordination.  
 Use may be limited in some areas due to non-EMS users.  
 See appendix D for local hospital tones.

Name Mutual Aid Radio Channel 1  
 Acronym **MARC1**  
 Receive Frequency 151.280  
 Receive Tone 136.5  
 Transmit Frequency 153.845  
 Transmit Tone 136.5  
 Primary Discipline All public safety  
 State Callsign WNPG812  
 Usage Wide area interagency communications through repeaters.

Name Mutual Aid Radio Channel 2  
Acronym **MARC2**  
Receive Frequency 151.280  
Receive Tone 136.5  
Transmit Frequency 151.280  
Transmit Tone 136.5  
Primary Discipline All public safety  
State Callsign WNPG812  
Usage On scene tactical incident communications.  
Medical helicopter landing zone coordination.

Name Mutual Aid Radio Channel 3  
(Previously Wisconsin Tactical 2)  
Acronym **MARC3**  
(Previously WISTAC 2)  
Receive Frequency 154.010  
Receive Tone 71.9  
Transmit Frequency 154.010  
Transmit Tone 71.9  
Primary Discipline Fire/Rescue/EMS, alternate for other public safety  
State Callsign KO2099  
Usage Fireground operations, on scene tactical  
Use is restricted in the area of: Eau Claire, Fond du Lac, Green Lake, Manitowoc, Marinette, Milwaukee, Washington, Waushara, Wood Counties, and Gratiot, Linn, Newbold, Westby, Whitewater.

Name Mutual Aid Radio Channel 4  
(Previously Wisconsin Tactical 3)  
Acronym **MARC4**  
(Previously WISTAC 3)  
Receive Frequency 154.130  
Receive Tone 82.5  
Transmit Frequency 154.130  
Transmit Tone 82.5  
Primary Discipline Fire/Rescue/EMS, alternate for other public safety  
State Callsign KO2099  
Usage Fireground operations, on scene tactical. Use is restricted in the area of: Bayfield, Brown, La Crosse, Marquette, Pierce Counties, and Greenwood, Manitowish Waters, Milwaukee.

Name Wisconsin Emergency Management Car to Car  
Acronym **WEM CAR**  
Receive Frequency 156.000  
Receive Tone 136.5  
Transmit Frequency 156.000  
Transmit Tone 136.5  
Primary Discipline Emergency Management  
State Callsign KGT483  
Usage On scene tactical incident communications

Name Wisconsin Police Emergency Radio Network  
 Acronym **WISPERN**  
 Receive Frequency 155.475  
 Receive Tone None until after 06/01/06, then optionally 156.7  
 Transmit Frequency 155.475  
 Transmit Tone 156.7  
 Primary Discipline Law Enforcement  
 Use by other disciplines only if directed by law enforcement  
 State Callsign KA6570  
 Usage Interagency communications

Name Point to Point  
 Acronym **POINT**  
 Receive Frequency 155.370  
 Receive Tone None until after 06/01/06, then optionally 146.2  
 Transmit Frequency 155.370  
 Transmit Tone 146.2  
 Primary Discipline Law Enforcement  
 Use by other disciplines only if directed by law enforcement  
 State Callsign KA6570  
 Usage Base to base interagency communications

Name Interagency Fire Emergency Radio Network  
 (Previously Wisconsin Tactical 1)  
 Acronym **IFERN**  
 (Previously WISTAC 1)  
 Receive Frequency 154.265  
 Receive Tone None until transition from WISTAC1 to IFERN is completed  
 Transmit Frequency 154.265  
 Transmit Tone 210.7  
 Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
 State Callsign KO2099  
 Usage Mutual aid base/mobile dispatch  
 Use is restricted in the area of: Columbia, Marathon, Marquette,  
 Milwaukee, Sheboygan, Wood Counties, and PoySippi.

Name Red Fireground  
 Acronym **FG RED**  
 Receive Frequency 153.830  
 Receive Tone None until after 01/01/07, then optionally 69.3  
 Transmit Frequency 153.830  
 Transmit Tone 69.3  
 Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
 State Callsign KO2099  
 Usage Fireground operations, on scene tactical

Name White Fireground  
Acronym **FG WHITE**  
Receive Frequency 154.280  
Receive Tone None until after 01/01/07, then optionally 74.4  
Transmit Frequency 154.280  
Transmit Tone 74.4  
Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
State Callsign KO2099  
Usage Fireground operations, on scene tactical.

Name Blue Fireground  
(Previously Fire Interagency Radio Emergency Communications)  
Acronym **FG BLUE**  
(Previously FIRECOM)  
Receive Frequency 154.295  
Receive Tone None  
Transmit Frequency 154.295  
Transmit Tone 85.4  
Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
State Callsign KO2099  
Usage Fireground operations, on scene tactical.

Name Gold Fireground  
Acronym **FG GOLD**  
Receive Frequency 153.8375  
Receive Tone 91.5  
Transmit Frequency 153.8375  
Transmit Tone 91.5  
Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
State Callsign KO2099  
Usage Fireground operations, on scene tactical  
Do not use at the same incident as Red Fireground and MARC 1.  
NARROW BAND OPERATION ONLY

Name Black Fireground  
Acronym **FG BLACK**  
Receive Frequency 154.2725  
Receive Tone 94.8  
Transmit Frequency 154.2725  
Transmit Tone 94.8  
Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
State Callsign KO2099  
Usage Fireground operations, on scene tactical  
Do not use at the same incident as IFERN and White Fireground.  
NARROW BAND OPERATION ONLY

Name Gray Fireground  
Acronym **FG GRAY**  
Receive Frequency 154.2875  
Receive Tone 136.5  
Transmit Frequency 154.2875  
Transmit Tone 136.5  
Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
State Callsign KO2099  
Usage Fireground operations, on scene tactical  
Do not use at the same incident as White and Blue Fireground.  
NARROW BAND OPERATION ONLY

Name Interagency Fire Emergency Radio Network 2  
Acronym **IFERN2**  
Receive Frequency 154.3025  
Receive Tone 67.0  
Transmit Frequency 154.3025  
Transmit Tone 67.0  
Primary Discipline Fire/Rescue/EMS, Mutual Aid Box Alarm System  
State Callsign KO2099  
Usage Alternate mutual aid base/mobile dispatch  
Do not use at the same incident as Blue Fireground and 154.310.  
NARROW BAND OPERATION ONLY

Name National Search & Rescue  
Acronym **NATSAR**  
Receive Frequency 155.160  
Receive Tone None or 127.3  
Transmit Frequency 155.160  
Transmit Tone 127.3  
Primary Discipline Search and Rescue  
State Callsign KO2099  
Usage Interface between public safety, search and rescue groups.

Name VHF Calling  
Acronym **VCALL**  
Receive Frequency 155.7525  
Receive Tone 156.7  
Transmit Frequency 155.7525  
Transmit Tone 156.7  
Primary Discipline All public safety, nationwide  
State Callsign N/A  
Usage Public safety interagency calling channel, nationwide.  
Use is restricted in some parts of the state.  
NARROW BAND OPERATION ONLY

Name VHF Tactical 1  
Acronym **VTAC1**  
Receive Frequency 151.1375  
Receive Tone 156.7  
Transmit Frequency 151.1375  
Transmit Tone 156.7  
Primary Discipline All public safety, nationwide  
State Callsign N/A  
Usage Public safety interagency tactical communications.  
Use is restricted in some areas of the state, see plan.  
NARROW BAND OPERATION ONLY

Name VHF Tactical 2  
Acronym **VTAC2**  
Receive Frequency 154.4525  
Receive Tone 156.7  
Transmit Frequency 154.4525  
Transmit Tone 156.7  
Primary Discipline All public safety, nationwide  
State Callsign N/A  
Usage Public safety interagency tactical communications.  
Use is restricted in some areas of the state, see plan.  
NARROW BAND OPERATION ONLY

Name VHF Tactical 3  
Acronym **VTAC3**  
Receive Frequency 158.7375  
Receive Tone 156.7  
Transmit Frequency 158.7375  
Transmit Tone 156.7  
Primary Discipline All public safety, nationwide  
State Callsign N/A  
Usage Public safety interagency tactical communications.  
Use is restricted in some areas of the state, see plan.  
NARROW BAND OPERATION ONLY

Name VHF Tactical 4  
Acronym **VTAC4**  
Receive Frequency 159.4725  
Receive Tone 156.7  
Transmit Frequency 159.4725  
Transmit Tone 156.7  
Primary Discipline All public safety, nationwide  
State Callsign N/A  
Usage Public safety interagency tactical communications.  
Use is restricted in some areas of the state, see plan.  
NARROW BAND OPERATION ONLY

**APPENDIX C - IMPLEMENTATION OF EMS VHF CHANNELS  
SUGGESTED PRIORITY FOR PROGRAMMING**

<b>PRIORITY</b>	<b>EMS</b>	<b>NOTES</b>
1a	EMS B LOCAL A	Same as EMS B 155.340 MHz, PL tone for local hospital A
1b	EMS B LOCAL B	Same as EMS B 155.340 MHz, PL tone for local hospital B
1c	EMS B LOCAL C	Same as EMS B 155.340 MHz, PL tone for local hospital C
1d	EMS B LOCAL D	Same as EMS B 155.340 MHz, PL tone for local hospital D
2	EMS B STATE	Former State EMS channel, with state-wide PL tone
3	MARC1	Wide area mutual aid repeater channel, all discipline
4	MARC2	Medical aircraft LZ coordination, on-scene tactical comms
5a	EMS A LOCAL A	Same as EMS A 155.400 MHz, PL tone for local hospital A
5b	EMS A LOCAL B	Same as EMS A 155.400 MHz, PL tone for local hospital B
5c	EMS A LOCAL C	Same as EMS A 155.400 MHz, PL tone for local hospital C
5d	EMS A LOCAL D	Same as EMS A 155.400 MHz, PL tone for local hospital D
6	EMS A STATE	Former State ALS channel, with state-wide PL tone
7	MARC3	Former WISTAC 2 channel
8	MARC4	Former WISTAC 3 channel
9	IFERN	Former WISTAC 1 channel, interagency fire EMS network
10	EMS C	Former State Coordination channel, now with D156 PL tone
11	FG RED	Fireground operations, on-scene tactical comms, MABAS
12	FG WHITE	Fireground operations, on-scene tactical comms, MABAS
13	FG BLUE	Former FIRECOM channel
14	WISPERN	Law Enforcement
15	POINT	Law Enforcement
16	NATSAR	New channel, national search and rescue coordination
17	WEM CAR	Emergency management on-scene tactical
18	FG GOLD	Fireground operations MABAS, narrow band usage only
19	FG BLACK	Fireground operations MABAS, narrow band usage only
20	FG GRAY	Fireground operations MABAS, narrow band usage only
21	IFERN2	Mutual aid operations MABAS, narrow band usage only
22	VCALL	Tactical on-scene comms, narrow band usage only
23	VTAC1	Tactical on-scene comms, narrow band usage only
24	VTAC2	Tactical on-scene comms, narrow band usage only
25	VTAC3	Tactical on-scene comms, narrow band usage only
26	VTAC4	Tactical on-scene comms, narrow band usage only

**APPENDIX D - WISCONSIN HOSPITAL TONES**  
**FOR EMS B 155.340 AND EMS A 155.400 CHANNELS**

<b>CITY</b>	<b>HOSPITAL</b>	<b>TONE (hz)</b>	<b>TELEPHONE</b>
Amery	Amery Regional Medical Center	131.8	715 268 7151
Antigo	Langlade County Memorial Hosp	88.5	715 623 2331
Appleton	Appleton Medical Center	110.9	920 731 4101
Appleton	St. Elizabeth Hospital	107.2	920 738 2000
Arcadia	Franciscan Skemp Health Care – Arcadia Campus	131.8	608 323 3323
Ashland	Memorial Medical Center	107.2	715 685 5320
Baldwin	Baldwin Area Medical Center	82.5	715 684 3311
Baraboo	St. Clare Health Services	100.0	608 356 5561
Barron	Barron Memorial Medical Center	82.5	715 537 3186
Beaver Dam	Beaver Dam Community Hospital, Inc.	114.8	920 887 7181
Beloit	Beloit Memorial Hospital	118.8	608 364 5151
Berlin	Berlin Memorial Hospital	91.5	920 361 1313
Black River Falls	Black River Memorial Hospital	162.2	715 284 5361
Bloomer	Bloomer Medical Center	206.5	715 568 2000
Boscobel	Boscobel Area Health Care	123.0	608 375 4112
Brookfield	Elmbrook Memorial Hospital	103.5	262 785 2000
Burlington	Aurora Memorial Hospital of Burlington	110.9	262 767 6100
Chilton	Calumet Medical Center	123.0	920 849 2386
Chippewa Falls	St. Joseph's Hospital	114.8	715 726 3220
Columbus	Columbus Community Hospital	136.5	920 623 2200
Cudahy	St. Luke's South Shore	156.7	414 489 4055
Cumberland	Cumberland Memorial Hospital	146.2	715 822 2741
Darlington	Memorial Hospital of LaFayette County	114.8	608 776 4466
Dodgeville	Upland Hills Health Center	206.5	608 930 8000
Durand	Chippewa Valley Area Hospital	186.2	715 672 4211
Eagle River	Eagle River Memorial Hospital	118.8	715 479 7411
Eau Claire	Luther Hospital	110.9	715 838 3242
Eau Claire	Sacred Heart Hospital	110.9	715 839 4222
Edgerton	Memorial Community Hospital	136.5	608 884 3441
Elkhorn	Aurora Lakeland Medical Center	114.8	262 741 2120
Fond du Lac	St. Agnes Hospital	97.4	920 929 2300
Fort Atkinson	Fort Memorial Hospital	97.4	920 568 5000
Friendship	Moundview Memorial Hospital	173.8	608 339 3331



<b>CITY</b>	<b>HOSPITAL</b>	<b>TONE (hz)</b>	<b>TELEPHONE</b>
Grantsburg	Burnett Medical Center, Inc.	110.9	715 463 5353
Green Bay	Aurora Baycare Medical Center	131.8	920 288 4301
Green Bay	Bellin Health	173.8	920 433 7534
Green Bay	St. Mary's Hospital Medical Center	151.4	920 498 4560
Green Bay	St. Vincent's Hospital	173.8	920 433 8383
Hartford	Aurora Medical Center – Washington County	167.9	262 673 2300
Hayward	Hayward Area Memorial	100.0	715 934 4321
Hillsboro	St. Joseph's Community Health Services	123.0	608 489 2211
Hudson	Hudson Memorial Hospital	167.9	715 531 6000
Janesville	Mercy Health System	100.0	608 756 6000
Kenosha	Aurora Medical Center	107.2	262 942 5640
Kenosha	United Hospital System - Kenosha Med Center	107.2	262 656 2011
Keshena	Menominee Tribal Clinic	146.2	715 799 3361
Kewaunee	St. Mary's Kewaunee Memorial Hospital	82.5	920 388 2210
LaCrosse	Gunderson Lutheran Hospital	97.4	608 785 0530
LaCrosse	Franciscan Skemp Health Care - LaCrosse	97.4	608 785 0940
Ladysmith	Rusk County Memorial Hospital	118.8	715 532 5561
Lancaster	Grant Regional Health Care	123.0	608 723 2143
Madison	Meriter Park Hospital	167.9	608 267 6000
Madison	St. Mary's Hospital Medical Center	167.9	608 251 6100
Madison	University of Wisconsin Hosp and Clinics	167.9	608 262 2398
Madison	Wm S. Middleton Memorial Veterans Admin	167.9	608 255 2345
Manitowoc	Holy Family Memorial Medical Center	179.9	920 320 2011
Marinette	Bay Area Medical Center	156.7	715 735 6621
Marshfield	St. Joseph's Hospital	82.5	715 387 7676
Mauston	Mile Bluff Memorial Hospital	82.5	608 847 6161
Medford	Memorial Health Care	88.5	715 748 8107
Menomonee Falls	Community Memorial Hospital	173.8	262 251 1000
Menomonie	Red Cedar Medical Center – Mayo Health System	100.0	715 235 5531
Mequon	Columbia St. Mary's Hospital – Ozaukee Campus	206.5	262 243 7373
Merrill	Good Samaritan Health Center	85.4	715 536 5511
Milwaukee	Children's Hospital of Wisconsin	156.7	414 266 2000
Milwaukee	Columbia St. Mary's Hospital – Columbia Campus	156.7	414 961 3300
Milwaukee	Aurora Sinai Medical Center	156.7	414 219 6666

<b>CITY</b>	<b>HOSPITAL</b>	<b>TONE (hz)</b>	<b>TELEPHONE</b>
Milwaukee	St. Francis Hospital	156.7	414 647 5165
Milwaukee	St. Joseph's Regional Medical Center	156.7	414 447 2171
Milwaukee	Aurora St. Luke's Medical Center	156.7	414 649 6333
Milwaukee	Columbia St. Mary's Hospital – Milwaukee Campus	156.7	414 291 1200
Monroe	The Monroe Clinic	114.8	608 324 1160
Neenah	Theda Clark Medical Center	141.3	920 729 3100
Neillsville	Memorial Medical Center	85.4	715 743 3101
New London	New London Family Medical Center	100.0	920 531 2000
New Richmond	Westfield Hospital	127.3	715 246 2101
Oconomowoc	Memorial Hospital of Oconomowoc	131.8	262 569 9119
Oconto	Oconto Memorial Hospital	167.9	920 834 8800
Oconto Falls	Community Memorial Hospital	103.5	920 846 3444
Osceola	Osceola Medical Center	91.5	715 294 2111
Oshkosh	Aurora Medical Center	131.8	920 456 7400
Oshkosh	Mercy Medical Center of Oshkosh, Inc.	186.2	920 236 2000
Osseo	Osseo Medical Center – Mayo Health System	173.8	715 597 3121
Park Falls	Flambeau Hospital	146.2	715 762 2484
Platteville	Southwest Health Center	123.0	608 348 2331
Pleasant Prairie	United Hospital System – St Catherine Med Center	107.2	262 577 8117
Portage	Divine Savior Hospital	162.2	608 742 4131
Prairie du Chein	Prairie du Chein Memorial Hospital	151.4	608 326 2431
Prairie du Sac	Sauk Prairie Memorial Hospital	141.3	608 643 3311
Racine	All Saints Medical Center - St. Luke's Campus	229.1	262 687 4011
Racine	All Saints Medical Center - St. Mary's Campus	229.1	262 636 4201
Reedsburg	Reedsburg Area Medical Center	103.5	608 524 6487
Rhineland	St. Mary's Hospital	114.8	715 369 6700
Rice Lake	Lakeview Medical Center	192.8	715 234 1515
Richland Center	Richland Hospital, Inc.	118.8	608 647 6321
Ripon	Ripon Medical Center	85.4	920 748 3101
River Falls	River Falls Area Hospital	85.4	715 425 6155
Shawano	Shawano Medical Center	127.3	715 526 2111
Sheboygan	Aurora Sheboygan Memorial Medical Center	186.2	920 451 5553

<b>CITY</b>	<b>HOSPITAL</b>	<b>TONE (hz)</b>	<b>TELEPHONE</b>
Sheboygan	St. Nicholas Hospital	146.2	920 459 8300
Shell Lake	Indianhead Medical Center	123.0	715 468 7833
Sparta	Franciscan Skemp Health Care - Sparta Campus	156.7	608 269 1770
Spooner	Spooner Health Systems	123.0	715 635 2111
St. Croix Falls	St. Croix Regional Medical Center	203.5	715 483 3261
Stanley	Our Lady of Victory Medical Center	91.5	715 644 5571
Stevens Point	St. Michael's Hospital	206.5	715 346 5100
Stoughton	Stoughton Hospital	91.5	608 873 6611
Sturgeon Bay	Door County Memorial Hospital	123.0	920 743 5566
Superior	St. Mary's Hospital of Superior	151.4	715 395 5400
Tomah	Tomah Memorial Hospital	156.7	608 372 2181
Tomahawk	Sacred Heart Hospital	85.4	715 453 7762
Two Rivers	Aurora Medical Center of Manitowoc County	94.8	920 794 5135
Viroqua	Vernon Memorial Hospital	167.9	608 637 4261
Watertown	Watertown Memorial Hospital	88.5	920 262 4222
Waukesha	Waukesha Memorial Hospital	141.3	262 928 1000
Waupaca	Riverside Medical Center	203.5	715 258 1040
Waupun	Waupun Memorial Hospital	71.9T, 136.5R	920 324 5581
Wauwatosa	Froedtert Memorial Hospital	156.7	414 259 3000
Wauwatosa	Wisconsin Heart Hospital	156.7	414 778 7800
Wausau	Aspirius Wausau Hospital	167.9	715 847 2121
Weston	St. Clare's Hospital of Weston	179.9	715 393 3000
West Allis	West Allis Memorial Hospital	156.7	414 328 6111
West Bend	St. Joseph's Community Hospital	94.8	262 334 5533
Whitehall	Tri-County Memorial Hospital	107.2	715 538 4361
Wild Rose	Wild Rose Community Memorial Hospital	110.9	920 622 3257
Wisconsin Rapids	Riverview Hospital	82.5	715 423 6060
Woodruff	Howard Young Medical Center	114.8	715 356 8000

***APPENDIX E - EMS AND OTHER MUTUAL AID CHANNEL USE***  
**AUTHORIZATION PROCEDURES**  
**MISCELLEANOUS OTHER NOTES**

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

Refer to appendix B on page 22.

Authorization for the use of those channels covered by the FCC state license call sign KO2099 shown in appendix B is obtained by making written request to:

Frequency Coordinator  
WSP, Bureau of Communications  
POB 7912, Madison, WI 53707-7912.

The Frequency Coordinator's phone number is 608-266-2497.

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

EMS Communications Coordinator  
Bureau of Local Health Support and EMS  
POB 2659, Madison, WI 53701-2659.

The Communications Coordinator's phone number is 608-261 9306.

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 page 15 for further details.

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

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

