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emergency communications systems

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Emergency Communications Systems

This paper discusses funding and operations for emergency communications systems administered by the Department of Military Affairs (DMA). Specifically, this paper provides information about programs administered by DMA's Office of Emergency Communications (OEC) and Division of Emergency Management (WEM).

The Office of Emergency Communications supports the ability of emergency responders and residents to communicate in the event of accidents, natural disasters, terrorism, or other human-made disasters. The Office provides staff support to the Interoperability Council (IC) and administers the following programs: Next Generation 911 (NG911), the Wisconsin Interoperability System for Communications (WISCOM), Land Mobile Radio (LMR), and the Nationwide Public Safety Broadband Network (NPSBN). The Office's responsibilities have been administered by a number of agencies since its creation in 2008. Most recently, under 2017 Act 59, the OEC was transferred from the Department of Justice to DMA. For the 2019-21 biennium, the OEC is allocated $25.5 million and 7.0 positions ($2.8 million GPR; $2.5 million PR and 4.0 PR positions; and $20.2 million SEG and 3.0 SEG positions).

The Division of Emergency Management is responsible for coordinating the state's planning, preparedness, mitigation, response, and recovery efforts for natural and human-made disasters. The Division oversees the state emergency operations center, which facilitates coordination among state and local agencies in the event of an emergency.

The Department's organizational structure is identified in Appendix I. A glossary of frequently used emergency communications terminology is provided in Appendix II.

Interoperability Council

In response to events such as car accidents, natural disasters, terrorism events, or high-speed pursuits, public safety officials from different disciplines and jurisdictions need to rapidly communicate. Interoperability refers to the ability of multiple parties to exchange information, even when disparate systems are involved.

The Interoperability Council was created in 2008 to develop strategies, standards, and guidelines to achieve statewide communications interoperability for the public safety community.

The 15-member IC consists of: (a) 10 members appointed by the Governor to four-year terms, including a chief of police, a sheriff, a chief of a fire department, a director of emergency medical services, a local government elected official, a local emergency management director, a representative of a federally-recognized tribe or band, a hospital representative, a local health department representative, and another person with expertise in interoperable communications; (b) the Attorney General; (c) the Adjutant General (head of DMA); (d) the Secretary of the Department of Natural Resources; (e) the Secretary of the Department of Transportation; and (f) a representative from the Department of Administration with knowledge of information technology.

In addition, the IC has chartered subcommittees to provide advice on specific programs as follows: (a) the statutorily-established 911 subcommittee, which consists of 18 voting members; (b) the WISCOM subcommittee, which consists of 20 voting members; (c) the LMR subcommittee, which consists of 15 voting members; and (d) the NPSBN subcommittee, which consists of 15

voting members. All subcommittee members are appointed by the IC.

Next Generation 911

Current System

Overview. Under current law, 911 is established as the statewide emergency services telephone number. Basic 911 service was first established in the 1960s as a voice-only service, meaning that the caller had to provide location and callback information verbally in order to receive assistance. In the 1980s, the system was upgraded to "Enhanced 911," which automatically recorded the caller's landline telephone number and address. The system was last updated in the 1990s to "Wireless Enhanced 911," which provides a mobile caller's number and approximate location. The current Wireless Enhanced 911 service consists of separate networks maintained by telephone service providers across Wisconsin through contractual relationships with local governments.

The state has over 100 public safety answering points (PSAPs), locally-administered call centers that answer and process 911 calls. Wisconsin PSAPs employ 2,115 public safety personnel, serve 2,288 first responder agencies, and handle approximately three million 911 calls each year.

Funding. In general, 911 services are funded and administered on the local level. Local units of government are responsible for PSAP operations, including costs associated with personnel compensation, workspace requirements, dispatch radio systems, computer aided dispatch systems, and 911 call handling equipment (CHE), also referred to as customer premise equipment (CPE).

The current 911 system is primarily supported through three fees: (a) a landline fee assessed per county based on population, collected by carriers and applied to the cost of providing 911; (b) a monthly fee of $0.75 on each assigned telephone number, deposited to the police and fire protection (PFP) fund; and (c) a $0.38 fee per transaction on all prepaid wireless services, deposited to the PFP fund.

The police and fire protection fund supports state programs and provides direct financial assistance to local governments through the shared revenue program. The shared revenue program is also funded by a capped, sum-sufficient general purpose revenue (GPR) appropriation, such that any PFP funds allocated for state programs are offset by an equal increase in GPR. In 2019-20, $753.0 million was distributed to local governments through the shared revenue program ($39.2 million from the PFP fund). Local entities have discretion in allocating shared revenues, and a portion may be used to offset the cost of providing 911 services. [For more information, see the informational paper entitled, "Shared Revenue Program."]

Next Generation 911

Overview. To create an interoperable 911 system that is compatible with current and emerging digital technologies, emergency response agencies nationwide are upgrading to the "Next Generation 911" system. Under current law, DMA is responsible for supporting the development of NG911 in Wisconsin. Appendix III compares the wireless enhanced 911 system and the NG911 system.

According to DMA, a statewide NG911 system will: (a) provide equal access for all callers, including the deaf and hard-of-hearing; (b) resolve current infrastructure limitations among PSAPs by creating a shared statewide network; (c) improve resiliency and reduce system downtime; (d) provide an increase in situational awareness through data sharing with first responders; (e) deliver increased location accuracy for all calls; (f) facilitate mutual aid collaborations between PSAPs; (g) provide the ability to re-route 911 calls during

crises, periods of high call volume, and service outages; (h) support a variety of consumer devices as technology evolves; (i) enhance financial efficiencies; and (j) support the ability to change or add connections during emergencies. In addition to 911 voice capabilities, NG911 will enable the public to transmit text, images, video, and data to 911.

The NG911 system consists of three key components, described further below: (a) the Emergency Services Internet Protocol Network (ESInet), a statewide internet-based network shared by all public safety agencies; (b) PSAP equipment (CHE/CPE), which facilitate the transmission of information between callers and emergency responders; and (c) Geographical Information System (GIS) data, which route calls and messages to the correct PSAP.

Once NG911 is implemented, the system's network will be operated on the state-level, while local units of government will retain fiscal and administrative responsibility for PSAP operations. Local entities will also need to upgrade answering equipment (CHE/CPE) to ensure that 911 calls can be processed under the new system.

Funding. The state has supported the development of NG911 with allocations from the PFP fund. As of November 1, 2020, DMA has spent $585,200 from the PFP fund on NG911 ($280,200 in 2018-19, $273,300 in 2019-20, and $31,700 in 2020-21). In addition, DMA received one-time federal support of $2.9 million in August, 2019, to help PSAPs purchase equipment compatible with NG911.

Under 2017 Act 59, a NG911 appropriation was created under DMA and provided $6.7 million from the PFP fund in 2018-19. However, due to the timing of system development, DMA only spent $280,200 in 2018-19. Unspent amounts were returned (lapsed) to the PFP fund at the end of 2018-19.

Under 2019 Act 9, one-time funding of $19.7 million was provided for NG911 and the appropriation was modified from an annual to biennial appropriation. (A biennial appropriation allows funds to be expended over the two-year period of a biennium, rather than on a one-year basis.) Of the amount provided for the 2019-21 biennium, DMA spent $273,300 in 2019-20 and $31,700 in 2020-21 (as of November 1, 2020) for contractual services to develop the Request for Proposal (RFP) for the ESInet and to conduct a GIS gap analysis. Any NG911 funds allocated under Act 9 that are not spent or encumbered by June 30, 2021, will lapse to the PFP fund. It should be noted that the appropriation is not provided base funding for the 2021-23 biennium.

The Department is also allocated 1.0 PR position to manage NG911, funded from justice information systems fee receipts. Receipts are generated from a $21.50 fee assessed for certain court proceedings, such as civil, small claims, forfeiture, and wage earner or garnishment actions.

Emergency Services Internet Protocol Network. The first step to implement NG911 is to create the ESInet, an internet-based network that will connect PSAPs across the state. The ESInet will provide for broadband speed transmissions and facilitate the delivery of messages and data that public safety agencies use for field operations.

The Department solicited bids for the ESInet through a RFP in March, 2020, and is currently reviewing submitted proposals. It is anticipated that a contract to design the ESInet will be negotiated in early 2021, after which the implementation process will take twelve months. According to DMA, local agencies plan to transition to the network in 2022.

Building the ESInet will cost approximately $18.5 million for: (a) call access services, including equipment and circuits required by carriers to send data and calls to PSAPs; (b) core connec-

tions, including the design of data centers to facilitate call routing and data transmission; and (c) PSAP connections, including the software needed to allow PSAPs to receive 911 calls. In addition, the ESInet is expected to incur ongoing costs of $14 million annually for system operations, maintenance, and security audits. The above costs are preliminary; the RFP process will identify the actual costs of building and operating the ESInet.

Public Safety Answering Point Equipment. In general, local governments are responsible for purchasing 911 call answering equipment (CHE/CPE). To receive and process calls through the NG911 system, PSAPs must have call answering equipment compatible with NG911 technology. According to the 2019 Statewide 911 System Assessment, 49 out of 98 (50 percent) of responding PSAPs already owned compatible equipment. An additional 29 PSAPs (30 percent) had not yet purchased such equipment, but had plans to do so within two years. The remaining 20 PSAPs (20 percent) did not have compatible equipment nor plans to purchase such equipment.

State and federal support has been made available to help PSAPs facilitate the transition to NG911. Under 2019 Act 26, a competitive state grant program was created to help PSAPs purchase equipment compatible with NG911 and to train employees. To date, funds have not been allocated for the state grant program.

The Department has received $2.9 million in federal grant funds to assist PSAPs with equipment upgrades. In June, 2020, DMA awarded 24 federally-funded grants totaling $2.2 million, as listed in Table 1. Priority was given to agencies that did not have NG911-capable equipment, and recipients were required to provide a 40 percent match. In September, 2020, DMA announced a second round of grants to award remaining federal funds. Applications for round two were due in November, 2020, with award notices scheduled for January, 2021. Projects must be completed by December, 2021.

Table 1: PSAP Federal Grant Recipients, Round One

Award Agency	Grant Amount
Barron County Sheriff's Department	$76,200
Bayfield County Sheriff's Office	77,000
Bayside Communications Center	100,600
Cedarburg Police Department	59,200
Clark County Sheriff's Office	57,700
Crawford County Communications Center	75,600
Dodge County Sheriff's Office	109,800
Eau Claire Communication Center	276,500
Florence County Sheriff's Office	11,100
Franklin Police Department	16,100
Iron County Sheriff's Department	93,000
Juneau County Sheriff's Office	102,600
Kewaunee County Sheriff's Department	125,300
Lafayette County Sheriff's Office	99,400
Menominee County Sheriff's Office	79,900
Minocqua Police Department	62,200
Muskego Police Department	12,600
Oconto County Sheriff's Office	79,700
Portage County Sheriff's Office	198,400
Richland County Sheriff's Department	14,900
Sauk County	134,000
Waukesha County Communications	122,300
Winnebago County Sheriff's Office	125,500
Wisconsin Dells Police Department	72,900
Total	$2,182,500

Geographical Information System Data. The NG911 system uses GIS data to accurately route calls to the correct PSAP. In the current 911 system, the caller's location is determined after the call is answered by a PSAP, at which point the call may be transferred to a more appropriate PSAP. In the case of a wireless caller, the address is often approximate. To decrease call transfers and response times, NG911 uses GIS data to determine the caller's location before the call is answered to immediately route the call to the correct PSAP. Associated data elements include street centerlines, address points, road networks, PSAP boundaries, and emergency service zone boundaries.

Wisconsin does not currently have a statewide GIS dataset capable of supporting NG911. Therefore, DMA is developing a plan to create a statewide GIS dataset for NG911 based on a

model designed by the National Emergency Number Association. In May, 2020, DMA announced that Geo-Comm, Inc. will conduct a GIS gap analysis for Wisconsin to identify potential sources of data, develop database standards, and estimate costs. The expected completion date for the GIS gap analysis is June, 2021.

According to DMA, stakeholders have already identified a lack of data, differences in data administration, and the need for financial support as issues to be addressed. Initial estimates indicate that the creation and maintenance of a statewide GIS database would incur a one-time cost of $330,000 and an ongoing annual cost of $1.4 million.

Implementation Considerations. As a "home rule state," much of the decision-making related to public safety has been delegated to the local level in Wisconsin. According to DMA, the NG911 program will be administered on a state-guided, local control basis. For example, while the statewide ESInet will create the capacity to connect PSAPs, participation in the network will be voluntary. Further, while consolidating PSAPs could increase efficiencies by requiring fewer call centers to purchase new equipment, current law does not allow the state to require consolidation. Equipment capabilities and training requirements also vary throughout the state, which creates challenges when transitioning to a statewide network.

Individual PSAPs will have the choice of implementing certain features, such as text-to-911, which allows residents to communicate via text message rather than voice call. Differences in service could create confusion as residents navigate which features are available in their area.

Under 2017 Act 59, DMA was required to conduct a Statewide 911 System Assessment, completed in August, 2019. The assessment concluded that transitioning to NG911 will likely result in improved responses and lower long-run costs by reducing the need for backup PSAPs, call transfers, and busy call routing scenarios that delay responses. The assessment also made recommendations to facilitate the transition to NG911, such as updating legislation relative to 911, providing ongoing financial support, and allocating state positions to manage the system.

Wisconsin Interoperability System for Communications

Current System

Overview. The Wisconsin Interoperability System for Communications is a radio system that permits emergency responders from varying public safety disciplines to communicate across jurisdictions during major disasters and large-scale incidents. In addition, state and local agencies may elect to use WISCOM as their primary radio system. The system was developed in 2012 and installed by the State Patrol with equipment procured from EF Johnson. Since the system is reaching its end-of-life, DMA is in the process of procuring the system's replacement.

As of October, 2020, WISCOM consists of communications equipment installed at 130 tower sites statewide. The system was built to support 95% mobile radio coverage statewide, while also allowing agencies the ability to join and enhance the coverage with additional sites. The State Patrol also has a mobile site on wheels that can provide or enhance WISCOM communications coverage in an emergency. Appendix IV shows the location of WISCOM tower sites.

In total, WISCOM is used by 1,132 local, state, federal, tribal, and non-governmental agencies (17 federal agencies, 12 state agencies, 908 local and tribal agencies, and 195 non-governmental agencies). These agencies have over 42,000 subscriber radios registered to participate on WISCOM.

The core system consists of five Very High Frequency (VHF) channels that permit emergency

responders to carry on four simultaneous conversations in a given area utilizing a particular radio tower. Utilizing the VHF band for WISCOM has enabled the state to develop statewide coverage with fewer radio towers and lower infrastructure expense. However, the VHF band on which WISCOM primarily relies does not penetrate buildings as well as other radio bands and can be difficult to utilize in urban settings with increased radio traffic. In addition, portable radios have weaker antenna ranges and may not be able to gain access to the system from all locations.

Under 2017 Act 59, DMA was required to submit an interoperability report describing the initiative's status, challenges, and next steps. The report, published in December, 2018, identified WISCOM system challenges, including insufficient financial resources for maintenance, inadequate staffing levels, coordination issues across agencies, and infrastructure problems stemming from improper installation. The report indicated that staff had made improvements to technical challenges by adopting a single set of installation and lightning protection standards, bringing sites into conformance with adopted standards.

Funding. To develop and construct the current WISCOM system, the state spent approximately $45.2 million derived from federal funds ($29.6 million), general purpose revenue ($4.8 million), program revenue ($5.5 million), and segregated funding ($5.3 million). In addition, approximately $8.6 million was spent for subscriber units utilized to access the system, such as dispatch consoles and radios.

The interoperable communications system appropriation is allocated $1,262,400 PR annually during the 2019-21 biennium, funded from justice information systems fee receipts. The Department has assigned 2.0 PR positions to manage WISCOM. In addition, WISCOM is allocated $1,450,500 GPR in 2019-20 and $1,345,600 GPR in 2020-21 for maintenance.

Further, DMA is authorized to charge a fee to local, state, federal, and non-governmental entities (such as hospitals) for use of the WISCOM system. While several agencies utilize the system, including the Department of Natural Resources and the Department of Transportation (State Patrol), most agencies are not assessed fees in recognition of their contributions to system development and maintenance. The Department has also decided not to charge local public safety agencies.

In 2019-20, DMA collected $30,300 in fee revenue for WISCOM use. Revenue was generated from charging the federal Drug Enforcement Administration for registered radios and the Wisconsin Department of Health Services for hospitals with a WISCOM base station.

System Replacement

Under 2017 Act 59, DMA was required to upgrade or replace WISCOM. According to DMA, WISCOM must be upgraded or replaced to ensure the system can deliver public-safety grade communications to current users, expand to support other users at the state and local levels, and provide interoperability with other communications systems. The current system's key components have reached their end-of-life, and the system's technical specifications have a limited ability to provide expanded coverage and capacity concurrent with program demand.

As directed under Act 59, DMA issued a RFP to replace the WISCOM system in October, 2018. To support related costs, Act 59 provided $464,000 GPR annually to purchase software, equipment, and services starting in 2018-19. However, the RFP was placed on hold because of a statewide moratorium on RFPs during the gubernatorial transition in November, 2018.

Under 2019 Act 9, the requirement that DMA issue a RFP for WISCOM was repealed. Instead, in May, 2020, DMA solicited a request for information (RFI) to develop requirements and

specifications for the next iteration of WISCOM. According to DMA, the RFI is the first phase of a competitive procurement approach that seeks to engage the vendor community and experts in public safety communications to collaborate on solutions for the design, construction, implementation, support, and maintenance of the interoperable communications system. Information gathered through the RFI will inform the scope and objective of the subsequent RFP. The Department indicates that gathering information from vendors prior to re-soliciting a RFP will reduce system costs and improve the quality and reliability of proposals.

According to the RFI, the next iteration of WISCOM must meet the following requirements: (a) deliver at least 95% service area reliability across the state, with higher levels in selected areas; (b) provide best performance for diverse daily users, given that VHF has been the frequency band of choice in rural areas while 700/800MHz is prevalent in urban areas; (c) have the ability to improve coverage through future expansions; and (d) support statewide interoperability through interconnections to mutual-aid channels, external radio systems, and authorized broadband users. Additionally, the system must comply with industry standards that support multi-vendor interoperation (support for user radios from various companies without proprietary technologies) and best practices for the design and construction of the system.

The Department intends to use the RFP process to select and award a vendor and a specific system design in 2021, begin a phased deployment with first live use by 2022, and sustain the system through 2037. The new system is expected to cost $34 million during the 2021-23 biennium for the initial build ($27.0 million for design and implementation of the new radio network, $5 million for civil work to upgrade tower facilities, and $2 million for project management).

The cost estimate for the new radio network is based on building costs for the following: (a) communication sites, physical sites that contain, transmit, receive, and control equipment; (b) backhaul sites, used to bring the radio signal back to main communication sites; (c) consoles, equipment that enable the dispatch center to communicate with field personnel; and (d) peripheral equipment, such as remote base stations, remote control consoles, handheld chargers, and amplifiers to ensure coverage inside of buildings.

Upgrading the state's interoperable radio network will require an overlap of the existing WISCOM system and the replacement system. In September, 2019, DMA signed a five-year contract with EF Johnson to continue providing maintenance on the WISCOM system. The Department indicates that the extended maintenance agreement is needed to ensure the current system remains viable as the state moves forward with a future system.

Other Emergency Communications Systems

The Department of Military Affairs also administers the State Emergency Operations Center, the Land Mobile Radio program, and the Nationwide Public Safety Broadband Network.

State Emergency Operations Center

The Department operates the state emergency operations center (SEOC), located in Madison, to facilitate the coordination of state and local agencies during an emergency. Depending on the gravity of the situation, the SEOC may be activated, at which time staff from pertinent agencies coordinate a response in the SEOC or using the virtual SEOC system. A duty officer is on call 24 hours a day to receive calls from counties and local jurisdictions relating to emergency situations. A senior duty officer is also on call 24 hours a day to provide management direction to the duty officer. The duty officers continuously monitor events through

frequent contacts with the National Weather Service, Department of Transportation, and county emergency management offices.

The status of the SEOC is updated in response to severe weather and other emergency situations. The Department categorizes event levels from one through five, with five being the lowest level of emergency and one being the highest.

Financial support is generally provided by DMA's emergency management services general program operations appropriation, allocated $1,608,700 GPR and 10.08 GPR positions in 2020-21. However, in the event of a Presidential declaration of major disaster, costs may be supported by the federal government. For example, during the COVID-19 pandemic, the activation was funded by the Coronavirus Aid, Relief, and Economic Security Act with expenditures of $769,900 FED in 2019-20.

Land Mobile Radio

As a home rule state, public safety agencies are not required to join WISCOM and can instead build their own radio systems. The LMR program helps manage these other public safety radio frequencies and coordinate interoperability with WISCOM. The LMR program also helps manage the state's mutual aid frequencies to ensure the resource is equitably available to all public safety agencies. The communications unit (COMU) workgroup, attached to the LMR subcommittee, assists with applications for the national COMU recognition program and the development of emergency communications plans.

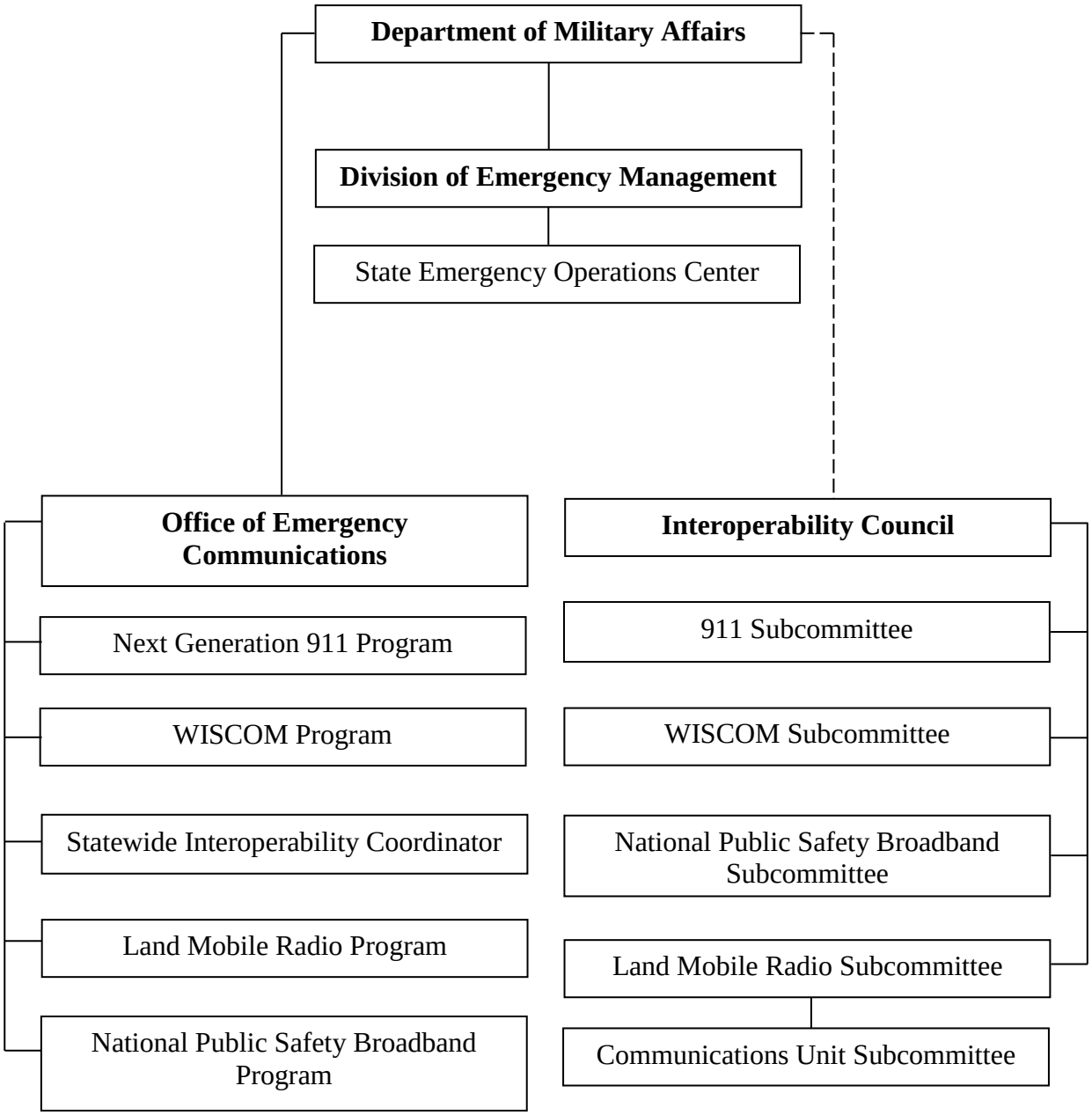
Nationwide Public Safety Broadband Network

The national public safety broadband network (NPSBN) aims to create a nationwide interoperable high-speed wireless network for police, fire, emergency medical, and other public safety officials. The program will provide users with dedicated spectrum and broadband capabilities to ensure that first responders have voice and data access at all times. FirstNet, an authority within the U.S. Department of Commerce, is authorized to develop, build, and operate the network nationwide through a contract with AT&T. In addition, DMA has allocated 1.0 SEG position, funded by the PFP fund, to assist with NPSBN.

In 2017, FirstNet and AT&T delivered a NPSBN plan for Wisconsin. Based on the plan, the Governor was required to opt-in and allow AT&T to build out the network, or opt-out and instead build a statewide network that would interconnect with the nationwide network. In 2017, the Governor notified FirstNet that Wisconsin would opt-in to the nationwide network. AT&T is currently implementing the network across the state in coordination with DMA and federal authorities.

APPENDIX I

Emergency Communications Organizational Chart



APPENDIX II

Glossary of Emergency Communications Terminology

911 - A telephone number to report emergencies that require a public safety agency response.

911 System - The network, database, and customer premise equipment required to provide 911 service.

Automatic Location Identification (ALI) - The automatic display at the PSAP of the caller's telephone number, the address/location of the telephone, and supplementary emergency services information.

Automatic Number Identification (ANI) - The telephone number associated with the access line from which a call originates.

Backup Public Safety Answering Point (Backup PSAP) - Typically, a disaster recovery answering point which serves as a backup to the primary PSAP and is not co-located with the primary PSAP.

Base Station – A wireless communications device that acts as both a transmitter and receiver installed at a fixed location (such as a tower site).

Computer Aided Dispatch (CAD) - A computer-based system which aids PSAP personnel by automating selected dispatching and record keeping activities.

Consolidated PSAP - A facility where multiple public safety agencies operate as one 911 entity.

Customer Premise Equipment (CPE) - Equipment used by PSAPs to answer and process 911 calls. Also called call handling equipment (CHE).

Dedicated Trunk - A telephone circuit used for a single purpose, such as transmission of 911 calls.

Emergency Services Internet Protocol Network (ESInet) – A managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core functional processes can be deployed, including, but not restricted to, those necessary for providing NG911 services.

Enhanced 911 Service – A service that directs 911 calls to appropriate PSAPs based on selective routing and provides the capability for automatic number identification and automatic location identification.

Federal Communications Commission (FCC) – For emergency communications, the FCC is responsible for overseeing the regulation of telecommunications services providers that provide 911 services.

First Responder – A person (such as a police officer or an emergency medical technician) who is among those responsible for going immediately to the scene of an accident or emergency to provide assistance.

First Responder Network Authority (FirstNet) – An independent authority within the Department of Commerce that provides emergency responders with the first nationwide, high-speed, broadband network dedicated to public safety.

Geographic Information System (GIS) - A computer software system that visualizes geographic aspects of data. It contains the ability to translate implicit geographic data (such as a street address) into an explicit map location. It has the ability to query and analyze data to receive results in the form of a map. It is used to graphically display coordinates (i.e. Latitude/Longitude from a wireless 911 call).

Interoperability – The ability of disparate public safety agencies to work together.

Interoperability Council (IC) – A Wisconsin governance body created under s. 15.315(1)(a) and tasked with making recommendations and assisting the Department of Military Affairs with public safety interoperability tasks identified under s. 323.29(2).

Land Mobile Radio (LMR) – A classification of FCC radio communications used by private business, state and local governments, and others to coordinate resources during emergency scenarios.

Legacy Network – A 911 network that is operating as a basic or enhanced 911 system.

Maintenance – The effort to repair unscheduled and scheduled deficiencies of a communications system to keep the system running at peak performance including, but not limited to, upkeep of physical infrastructure and equipment and software upgrades.

Mobile Radio – A two-way radio device physically installed in a vehicle; usually equipped with a rooftop antenna and a handheld microphone. This radio can typically transmit at a power of 15 to 100 watts.

Mutual Aid Frequencies – A common set of frequencies that are used during incidents in which multiple agencies may respond.

National Emergency Number Association (NENA) – The association strives to provide standards, certification programs, legislative representation, and technical assistance for managing 911 systems.

Next Generation 911 (NG911) – An enhanced 911 system that incorporates the handling of all 911 calls and messages. NG911 is designed to provide access to emergency services from all communications sources and provide multimedia data capabilities for PSAPs and emergency service organizations.

Portable Radio – A two-way radio device typically worn in a radio case (holster) on the hip of the user. Portable radios typically transmit at a lower power (3 watts) than their mobile counterparts.

Primary PSAP – A PSAP equipped with automatic number identification and automatic location identification displays and is the first point of reception of a 911 call.

Public Safety Agency – A functional division of a public agency which provides firefighting, law enforcement, medical, or other emergency services.

Public Safety Answering Point (PSAP) – A facility equipped and staffed to receive and process 911 calls. A primary PSAP receives the calls directly. If the call is relayed or transferred, the next receiving PSAP is designated a secondary PSAP.

Redundancy – Duplication of components, running in parallel, to increase reliability.

Response Agency – The agency with the legal or consensual obligation to respond to a call for service.

Secondary PSAP – A PSAP to which 911 calls are transferred from a Primary PSAP.

Selective Routing – The routing of a 911 call to the proper PSAP based upon the caller's location.

Selective Transfer – The capability to transfer a 911 call to a response agency by operation of one of several buttons typically designated as police, fire, and emergency medical.

Short Message Service (SMS) – Under NG911, residents in need of emergency services can use SMS, or text messages, to reach the PSAP.

Statewide Interoperability Coordinator (SWIC) – Each state and territory has a designated SWIC, responsible for coordinating with emergency response leaders to facilitate interoperability.

Very High Frequency (VHF) – The frequency band from 30 Megahertz (MHz) to 300 MHz and is the main frequency band utilized by the WISCOM system.

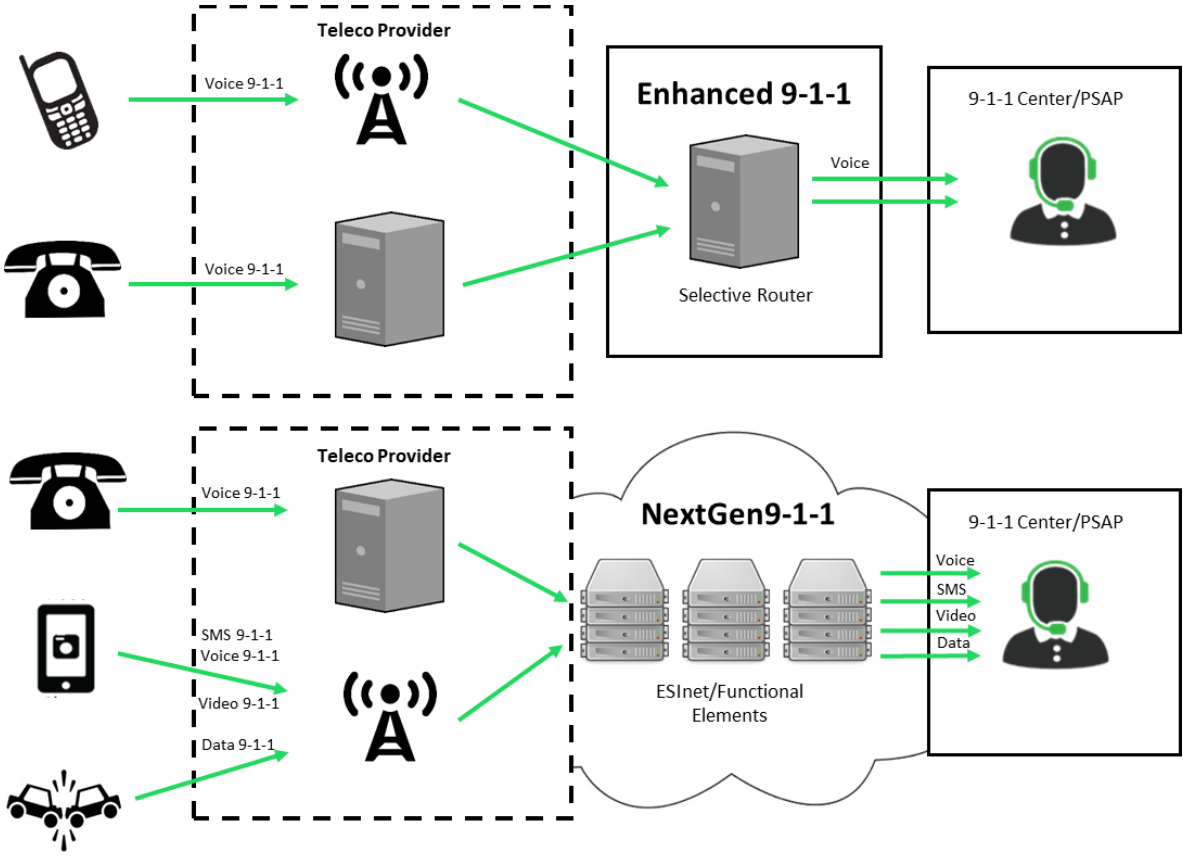
Wireless Telecommunications – Telecommunications services under Commercial Mobile Radio Service, including Cellular, Personal Communications Services, Mobile Satellite Services, and Enhanced Specialized Mobile Radio.

Wireline Enhanced 911 Service – Service provided by a wireline carrier that connects a subscriber dialing or entering the digits 911 to a PSAP.

Wisconsin Interoperable System for Communications (WISCOM) – A shared statewide, Very High Frequency, digital radio network that first responders in communities across the state may use to communicate with each other for daily operations, major disasters, and large-scale incidents.

APPENDIX III

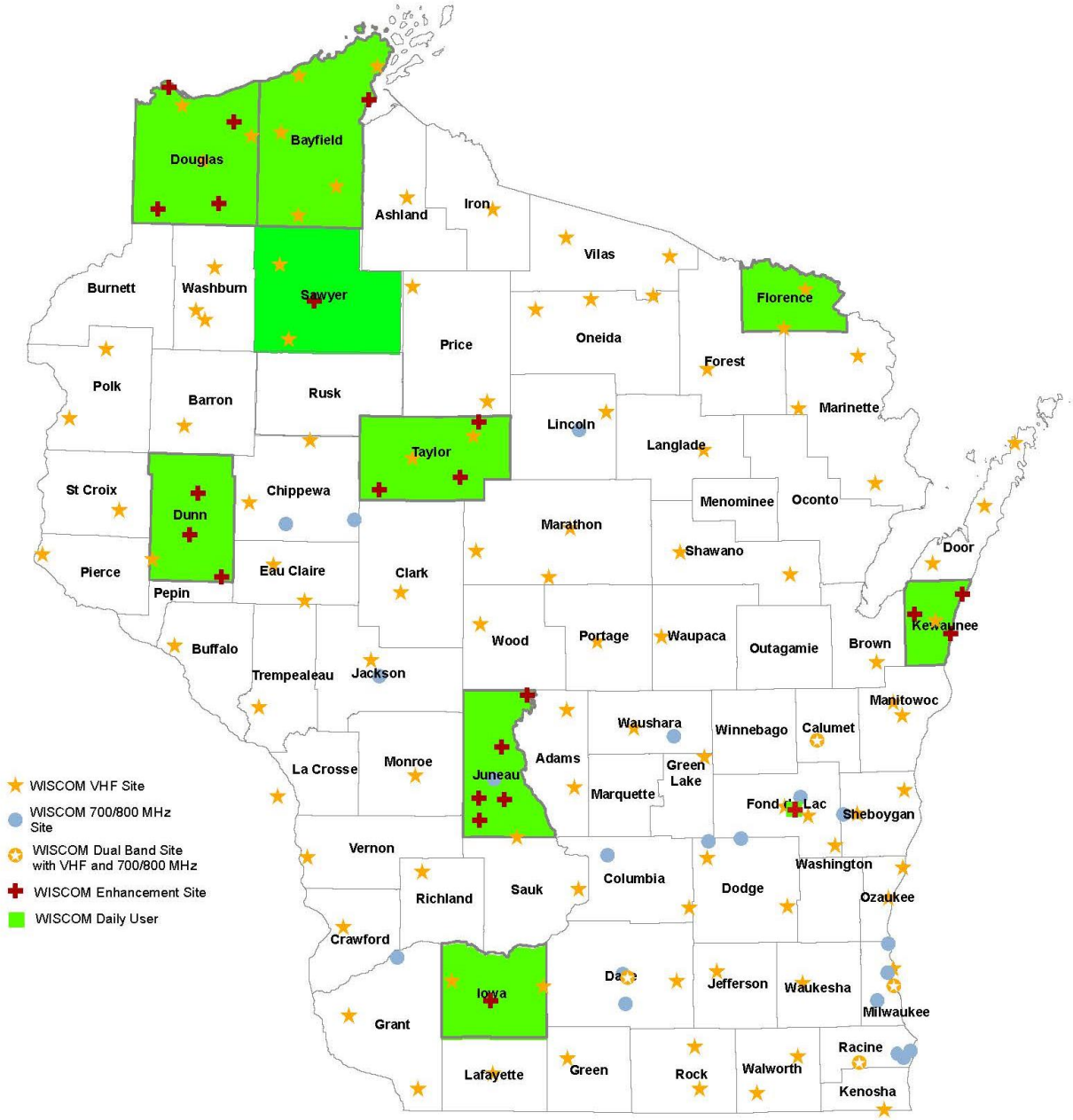
Comparison of 911 System Operations



Source: Department of Military Affairs.

APPENDIX IV

WISCOM Tower Sites



Source: Department of Military Affairs.