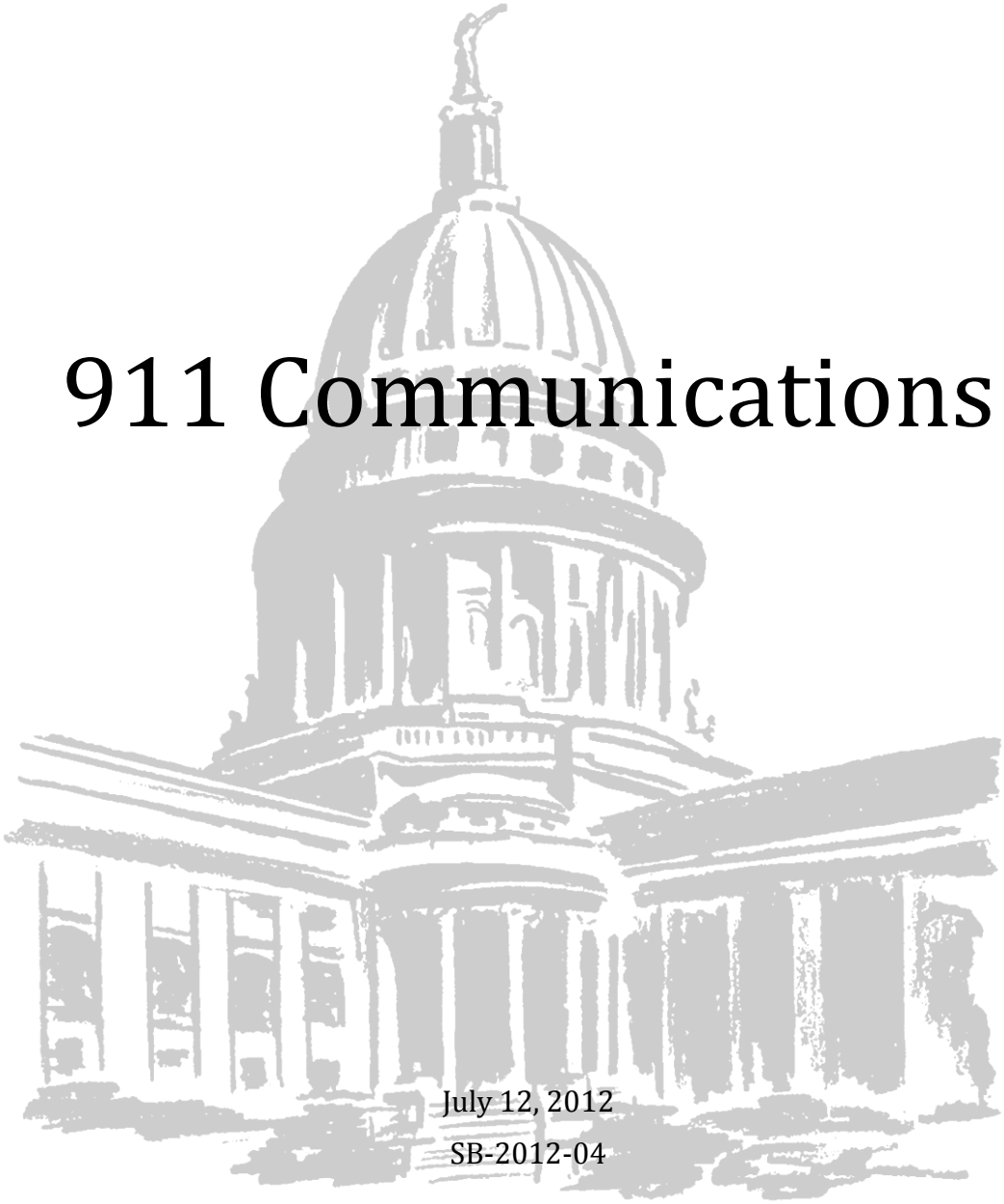
Staff Brief



911 Communications

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Wisconsin Legislative Council
One East Main Street, Suite 401
Madison, WI 53703-3382
Phone: (608) 266-1304
Fax: (608) 266-3830

www.legis.state.wi.us/lc

INTRODUCTION

The Wisconsin Legislative Council established the Special Committee on 911 Communications (911 Committee) and tasked it with reviewing the 911 public safety communications in Wisconsin and developing legislation as needed to strengthen and improve the system. The 911 Committee was charged with studying: (a) creation of a statewide entity to provide coordination and long-term planning for the system; (b) existing funding sources and projected costs of the system; (c) the training curriculum and requirements for 911 dispatch personnel; (d) establishment of a minimum 911 service standard; (e) methods to upgrade multi-line telephone system technology to enable responders to locate calls originating from large or multi-location facilities; and (f) best practices around the country for potential implementation in Wisconsin.

This Staff Brief provides a brief description of the structure of the 911 system, describes federal requirements related to 911, outlines state law, explains funding for 911 programs, and provides some information about the operation of the 911 system in Wisconsin.

The Staff Brief is divided into the following parts:

- ***Part I*** provides information about the structure of 911 service.
- ***Part II*** describes some federal requirements and initiatives related to 911 service.
- ***Part III*** describes 911 service in Wisconsin.

This Staff Brief was prepared by Larry Konopacki, Senior Staff Attorney, and Chad Brown, Staff Attorney.

PART I – STRUCTURE OF 911 SERVICE

Significant advances have been made in the way 911 systems are designed and operated since the first 911 call was placed in the United States over 40 years ago. 911 has become the universal emergency telephone number nationwide and is a vital part of the nation's emergency response and disaster preparedness systems.

When a call is placed to 911, it is routed to a public safety answering point (PSAP). PSAPs are generally operated by local units of government. When a PSAP receives an incoming 911 call, the operator either transfers the call to a more appropriate PSAP, relays the request to a provider of emergency services, or dispatches emergency services directly.

LEVELS OF 911 SERVICE

Basic 911 Service

A basic 911 system is a telecommunications system that automatically connects a person dialing the digits "911" to a PSAP. Basic 911 service generally does not involve separate, dedicated telecommunications lines and circuits. Instead, the call traffic uses the public switched telecommunications network (PSTN). Basic 911 service does not provide a PSAP operator with a 911 caller's phone number or information about the physical location of the caller.

E911 Service

Enhanced 911 or "E911" systems provide a PSAP with the telephone number (referred to as automatic number identification, or "ANI") and information about the location of a 911 caller (referred to as automatic location identification, or "ALI"). In most cases with E911 services, it is possible to dispatch emergency services to the correct location even if the caller cannot accurately identify his or her location to the PSAP.

TELECOMMUNICATIONS MODES

Current 911 services can be described as two separate systems: one for landline 911 calls and another for wireless 911 calls.

Landline 911 Calls

With Basic 911, when a 911 call is made from a landline phone, the phone number of the caller is used to determine which PSAP should receive the call. If the call is made on an E911 system, the address associated with the phone number will direct the call to the appropriate PSAP along with the caller's phone number and the specific location data associated with that phone number. Based on this information, the necessary services can be deployed to the location of the call.

Wireless 911 Calls

The 911 system cannot process 911 calls from wireless callers in the same way as it manages calls from landlines because a wireless phone does not have a fixed location. Instead, the call strength of a wireless 911 call is evaluated at each wireless telecommunications tower that is receiving a particular 911 call. The tower receiving the strongest signal from the 911 call is considered the "hot tower." The 911 call is forwarded to the PSAP that is responsible for handling wireless 911 calls from the sector of the hot tower associated with that call. The telecommunications provider sends the PSAP the 10-digit phone number of the mobile phone *plus* a 10-digit number assigned to the face of the hot tower receiving the call (called "10/20 digits").

The hot tower may not be the tower that is closest to the caller due to capacity limits for towers, signal interference, or other reasons, and the hot tower for a particular wireless 911 call can change during the course of the call. In most cases, the precise location of the incident a wireless caller is reporting can only be determined after talking to the caller.

A wireless 911 call can be delivered to the wrong PSAP if the hot tower is not located in the same PSAP jurisdiction as the caller. In such cases, the PSAP receiving the call will transfer the call to the correct PSAP. In most cases, these call transfers are transmitted over the regular switched network and can be charged as long distance toll calls, and would typically be charged to the jurisdiction not responsible for handling the call.[1]

When a 911 call is placed over an E911 system, the caller's phone number and additional information about the caller's location are transmitted with the call. This locational information is captured by wireless providers using either the "handset method," which uses a global positioning system (GPS) device in the phone, or the "network method," which uses triangulation of the caller from the wireless telephone towers picking up the call signal.[2] In part due to new E911 locational accuracy requirements, most wireless providers use or are moving towards the more accurate handset/GPS method.

There is a delay of approximately 12-15 seconds between when a wireless 911 call is placed and the additional information about the location of the caller is available to the PSAP. This delay has been judged to be too long for a caller to wait to have his or her call answered, so the system does not wait for this information to decide which PSAP will receive the call. This is why the PSAP that will initially receive the call is chosen using the "hot tower/call sector" method described above, even for E911-capable systems.

Accordingly, the typical wireless 911 call begins with the PSAP answering the call, and then more specific locational information is captured through the E911 locational system or directly from the caller. Either the call is transferred to another appropriate PSAP, or services are dispatched by the original PSAP that answered the call. A similar process happens in areas

[1] Some telecommunications carriers have apparently chosen not to bill for 911 call transfers over the public switched telecommunications network, as least temporarily.

[2] Wireless E911 locational information provides only an approximate location of a caller. In areas with sparse population, such as rural areas, it may be easier to find a caller using this information than in more populated areas.

without wireless E911 capability, except that whatever additional information is needed about the caller's phone number or location would have to be captured by the PSAP operators.

VoIP

Telephone systems that use "voice over internet protocol" or "VoIP" transmit telecommunications over the Internet. Static VoIP systems have a defined customer location because they use a fixed medium such as traditional cable lines or phone lines to transmit telecommunications. These calls use the wireless 911 data format but are routed over the landline 911 network. Therefore, 10/20 digit capability is required for PSAPs to capture all of the data that accompanies such a call.

Unlike static VoIP systems, nomadic VoIP systems can be accessed from anywhere that sufficient Internet access is available. Each customer has to "register" his or her location with his or her VoIP provider for emergency calls to be initially routed to the appropriate PSAP and so that services can be dispatched to the correct location in the event that a 911 caller cannot provide locational information. If a nomadic VoIP system customer does not register or dials 911 on that system from somewhere other than his or her registered location, it can be difficult to quickly connect that person with the appropriate PSAP, even if he or she is able to accurately provide locational information. In part, this is because there are thousands of PSAPs in this country alone and connecting a caller with the appropriate one can be a relatively slow, multi-step process.

Mobile Satellite Services

Mobile Satellite Service (MSS) is a communications service that involves direct satellite-based communication. MSS plays an important role in areas where the landline and wireless networks do not provide coverage. A call placed to 911 over an MSS service is routed to a call center. The call center operator ascertains the caller's phone number and location, and routes the calls to appropriate PSAPs with that information.

PART II – FEDERAL REQUIREMENTS AND INITIATIVES

UNIVERSAL EMERGENCY NUMBER – 911

The purpose of the federal Wireless Communications and Public Safety Act of 1999 (911 Act) is to improve public safety by encouraging and facilitating the prompt deployment of a nationwide, seamless communications infrastructure for police, fire, and emergency medical services. The Act directs the Federal Communications Commission (FCC) to make 911 the universal emergency number for all telephone services nationwide.[3]

E911 REQUIREMENTS

The FCC has adopted a series of orders establishing a phase-in schedule requiring wireless providers to be able to make available basic and enhanced wireless 911 services to PSAPs. The FCC requires wireless providers to provide E911 information to a PSAP only if a PSAP that is capable of receiving and using this service requested it.[4]

Pursuant to these orders, wireless providers were first required to provide basic 911 service, which included processing and transmitting wireless 911 calls to an appropriate PSAP, by fall of 1997. Next, the FCC required wireless providers to implement two "phases" of E911. By early 1998, wireless providers were required to implement Phase I of the E911 requirements. Phase I requires providers to be able to relay, to the PSAP, a wireless caller's phone number and the cell site receiving the 911 call.

Under Phase II of the E911 requirements, the FCC required wireless providers to have the capability to identify the latitude and longitude of wireless 911 callers within a specified degree of accuracy for the handset and network-based methods. Phase II was to be implemented by October, 2001. The FCC has promulgated rules requiring increased accuracy for E911 location, which may result in further shifts by wireless providers away from the network-based locational approach to the more accurate GPS-based handset method.

OTHER TECHNOLOGY

The FCC also requires all "interconnected VoIP" service providers to make E911 services available to their customers and PSAPs. Interconnected VoIP services are those that use the public switched network, including wireless networks, to originate or terminate calls.[5] VoIP service

[3] Federal laws related to 911 regulate telecommunications carriers and equipment manufacturers, but do not regulate states or local units of government.

[4] Federal law does not require PSAPs to develop enhanced 911 capabilities for wireless calls.

[5] Interconnected VoIP services include static and some nomadic VoIP services.

providers are also required to inform their customers of the capabilities and limitations of their VoIP 911 service.

MSS carriers providing voice service that is interconnected to the regular switched network are required under federal law to establish call centers to ascertain a 911 caller's phone number and location and forward the call to an appropriate PSAP.

Telecommunications carriers are required to be capable of transmitting 911 calls made by persons with disabilities, for example through the use of text telephone devices (TTY equipment). This is also a requirement imposed by the Americans With Disabilities Act on both carriers and PSAPs.

Multi-Line Telephone Systems

Multi-line telephone systems (MLTS) serve multiple telephone stations at a customer's location (for example, multiple offices in an office building or dorm rooms, offices, and other locations within a university campus) and allow these stations to be administered, managed, and billed as a single entity for the customer. When a 911 call is placed from a station served by an MLTS, the PSAP receiving the call will not always be able to identify the detailed location of the caller with more specificity than the customer's overall building or campus location. The FCC is currently evaluating this identified gap in the emergency call system.

Next Generation 911

According to the FCC, the Next Generation 911 Initiative (NG 911) is a research and development project intended to identify the system architecture for and develop a transition plan to establish a digital, Internet Protocol (IP)-based foundation for the delivery of multimedia 911 contacts. This is currently a topic of significant interest at the federal level, with multiple agencies involved.

PART III – 911 SERVICE IN WISCONSIN

WISCONSIN LAW

Wisconsin began adopting 911 as the state emergency number starting in the 1970s. It was decades before 911 became the universal emergency number throughout the state. Section 256.35, Stats., entitled "Statewide Emergency Services Number," provides much of the direction for the state 911 program. This section authorizes municipalities and other public agencies to establish and maintain a "basic" or "sophisticated"[6] emergency services communication system for law enforcement, fire fighting, and emergency medical and ambulance services, and declares that the primary emergency telephone number for these systems must be "911."

This statutory section is also the source of the landline 911 service fee, and housed the wireless surcharge and wireless E911 grant system that was created under 2003 Act 48, both described below. This statute also provides that telecommunications utilities, wireless providers, and counties, municipalities, and other local governments are not liable to users of the 911 system.

The Public Service Commission (PSC) has promulgated ch. PSC 173, Wis. Adm. Code., entitled "911 Emergency Telecommunications Service," which outlines the process for PSC review of telecommunications emergency services contracts and other aspects of the 911 program.

FUNDING

PSAP costs include staffing, overhead, system hardware and software, costs of dedicated telecommunications systems, and usage and toll fees for individual calls, among other costs. Local exchange carrier (local telephone company) costs are funded in part via a landline service charge, with the remaining funding coming from general unrestricted revenue sources like the property tax levy.

Landline Service Charge

In place since the 1980s, the landline 911 service fee has been an option for at least partially funding 911 service. This charge can be imposed by county ordinance and is only levied against landline service users. The service charge is restricted to a maximum charge of 40 cents per landline per month for counties recovering only recurring expenses like monthly fees for 911 circuits, and $1.00 per landline per month for counties recovering non-recurring expenses, such as hardware costs. Because the number of landlines has been decreasing in recent years due to increases in usage of wireless and VoIP services, the revenue from this service charge has generally decreased. The landline fee surcharge is billed and collected by the phone company and only used to pay local exchange carrier costs. PSAPs do not receive funding from the landline fee. This fee does not generate enough revenue to cover local exchange carrier costs in most parts of

[6] A "sophisticated" 911 system is comparable to an "enhanced" or E911 system: a system with automatic number and location identification.

the state. This leaves a larger proportion of the total cost of 911 services to be supported by other revenue sources. [s. 256.35 (3), Stats.]

Wireless Grant Program (2003 Wisconsin Act 48)

With the passage of 2003 Wisconsin Act 48, the Legislature created a three-year grant program to reimburse local governments and wireless telephone service providers for certain costs related to providing enhanced wireless 911 service. Administered by the PSC, the Act imposed a surcharge on the bills of wireless service customers in Wisconsin. The amount of the surcharge was based upon the PSC's estimate of costs of providing grants to local governments and wireless telecommunications providers for the service upgrades.

The PSC set the initial surcharge rate at 83 cents per month, and over the life of the program that rate was raised to 92 cents per month and then lowered to 43 cents per month, as it was realized that the number of cellular phone subscribers exceeded estimates. By July 1, 2008, the PSC determined that sufficient revenues had been assessed and the rate was cut to zero.

Pursuant to the 2009-11 state budget, the program sunsetted after disbursing more than $60 million in grants from the surcharge collected from wireless subscribers. After all grants were paid, the fund had a balance of approximately $20 million. The PSC had promulgated a rule to redistribute any fund excess to wireless providers to be returned to consumers, but the state budget transferred the balance to a new appropriation to be used for county and municipal aid.

Police and Fire Protection Fee

A "Police and Fire Protection" fee was also created by the 2009-11 state budget. This fee imposed a 75 cent per month charge on most voice and non-voice communication service connections in Wisconsin. The revenue from this fee is used to offset reductions that otherwise would have been made to the county and municipal aid program.

IMPLEMENTATION

According to the FCC's Master PSAP Registry, there are more than 150 PSAPs in Wisconsin although this number may overestimate the number of PSAPs due to recent consolidations. These are operated by counties, municipalities, the University of Wisconsin, and by the federal government at Ft. McCoy. Currently, most wireless calls to 911 are initially routed to county-designated PSAPs or call centers.

In Wisconsin, "enhanced 911" or "E911," which provides the telephone number and information about the location of a 911 caller, has been deployed nearly statewide. 71 of 72 counties have E911 for landline 911 calls (all except Iron County), and 70 counties have E911 systems in place for wireless 911 calls (all except Iron and Taylor Counties).

The counties with landline E911 systems have special telecommunications lines and circuits dedicated to 911 call traffic. This allows 911 calls to be transmitted without competing

with other call traffic on the public switched network.[7] Some counties have special telecommunications lines and circuits dedicated to 911 call traffic from wireless calls. Others combine their wireless 911 traffic with their landline 911 traffic on the separate landline system, described above.

[7] Calls from landlines to 911 in Iron County are routed to the PSAP over the public switched network (called "switched translation" of the 911 call).