9-1-1 EMERGENCY COMMUNICATIONS CELEBRATES GOLDEN 50 YEAR ANNIVERSARY IN THE UNITED STATES ON FEBRUARY 16, 2018

InfoBrief

International Public Safety Association

February 2018

Prompted by the public safety community

The beginnings of one emergency number in the United States can be traced back to the driving force of the coordinated efforts of members of public safety moved to service. Professional firefighter and law enforcement associations went to Congress on behalf of the citizens they serve requesting one nationwide emergency number, spanning the course of decades; the most prominent public records indicate International Association of Fire Chiefs in 1957 and in a white paper published in February 1967 produced by President Lyndon Johnson's Commission on Law Enforcement and Administration of Justice. Then, on November 8, 1967, House Congressional Resolution 361 was adopted: "The United States should have one uniform nationwide fire reporting telephone number…and police reporting telephone number."

A little over three months later, on a clear, 45° F day in Haleyville, Alabama, on February 16, 1968, at 2 p.m., U.S. Rep. Tom Donald Fike Bevill (1921-2005) became the first individual in the United States to answer a 9-1-1 emergency phone call. Rep. Bevill answered the call from inside the Haleyville Police Station – where this jurisdiction had unwittingly set up the first Public Safety Answering Point (PSAP).

Alabama Speaker of the House Ernest Rankin Fite (1916-1980) placed the official first call from Haleyville City Hall mayor's office just 35 days after the president of AT&T and the FCC publicized use of 9-1-1 as their choice for the nationwide emergency service number in the Wall Street Journal (January 12, 1968).

Inspired to action because independent telcos views were not considered in discussions with AT&T and FCC regarding the nationwide emergency number, B.W. Gallagher, President of Alabama Telephone Company and his team, in a valid display of the nimble proficiency of Alabama Telephone Company, planned, engineered and installed the first working emergency telecommunications system in a little over one month - a great example of a carrier going to any length to serve public safety in the spirit of competition. Nome, Alaska, was not far behind Haleyville, Alabama, successfully implementing 9-1-1 service on February 22, 1968.

911 early technology

These early Basic 911 (B911) systems were often rotary phones with analog, wireline, circuit-switched infrastructure. Although DTMF (dual-tone multi-frequency) or "touch tone" phones were commercially available as early as 1963, it would not be until the 80's and 90's that the majority of consumers owned push-button phones in their homes.

From a technology perspective, B911 service formed a direct physical link between the telephone company central office and equivalent circuit-switched, PSAP. These early reconfigurations to accommodate B911 were built on local "intrastate" exchanges on the same public switched telephone network (PSTN) which was predominantly designed to switch seven-digit telephone calls, and it was challenging to network engineers to locally switch 3-digits to individually designated emergency agencies at the onset. Initially there were no caller identification features, adoption was slower than anticipated, and funding was sparse.

Who was operating the PSAP?

Since establishment of the emergency communication agency was a local matter, the public safety answering point, or PSAP, could be established at any local emergency agency such as the police station, sheriff's office, fire station or agreed upon locale. It was common to have public safety officers manage the emergency telephones in the early B911 days.

In 1977, Dr. Jeff Clawson, in Salt Lake City, started developing emergency medical query protocols for use by 911 and ambulance radio dispatchers. These protocols were introduced throughout the Salt Lake City Fire Department in 1978, and eventually became widely known as Medical Priority Dispatching. There were three

critical components to Clawson's Medical Priority Dispatching: interrogation questions, pre-arrival instructions and conditional priority response factors which determined the proper use of emergency vehicle lights and siren. Clawson's early efforts eventually developed into the Medical Priority Dispatch System™ (MPDS®) which is still in use today in many emergency communications centers and embedded in manufacturer CAD EMS software systems. The National Academies of Emergency Dispatch (NAED) would later build on Dr. Clawson's original protocols to develop the Fire Priority Dispatch System™ (FPDS®) in 2000, and the Police Priority Dispatch System™ (PPDS®) in 2001.

In 1966, research and development commenced on a public safety communications standard operating procedure manual due to Association of Public-Safety Communications Officials (APCO) being awarded a grant by the U.S. Attorney General. From that research, a new product arose from APCO Project 2 for the standardization of public safety communications operating procedures around radio use. More than 23,000 copies of the manual were sold by April 1971, firmly establishing APCO as a leader in public safety communications standards and solidifying their membership. According to APCO project page, discussions emerged from the development of the Project 2 standard operating procedures manual for public safety communications in that the use of civilian operators in public safety communications centers was now a possibility, and could potentially release sworn officers from the duty of servicing shifts in the communications centers. This conversation about who would operate the PSAP would continue to parallel the adoption of and evolution to Enhanced-911 (E-911).

As 911 systems expanded across the country and technology slowly advanced, telecommunicators' numbers increased, and their role became more noticeable in the public eye. One catalyst of the 911 public awareness campaign was the docudrama hosted by William Shatner entitled "Rescue 911" which included reenactments of emergency calls to 911, at times combined with real footage, and ran as a weekly series on CBS from 1989 to 1996.

During this time, H.J.Res.284 — 102nd Congress (1991-1992), *To designate the second week in April as "National Public Safety Telecommunicators Week"*, introduced by Senator Edward J. Markey (D-MA), became public law on March 26, 1992, further bolstering public knowledge and appreciation for the duties of public safety telecommunicators.

The National Fire Protection Association introduced NFPA 1061, Professional Qualifications for Public Safety Telecommunications Personnel, in 1996, with several comprehensive revisions following to accommodate the changing landscape of the PSAP and various roles of emergency communications professionals relating to the fire service. Recommended minimum national guidelines for training telecommunicators were eventually adopted and are available at 911.gov although additional standards above the minimum exist, variable by state.

A repository and support network of uniform training, standardized protocols, quality assurance and technological advances to 911 with an emphasis on wireless location is maintained by the Denise Amber Lee Foundation, established by Denise's husband Nathan Lee in June 2008, six months following horrific events which led to her tragic death. In partnership with public safety leaders, Foundation President Nathan Lee has dedicated his life to supporting public safety emergency communications through in-person education, standardization and quality measures.

The International Academies of Emergency Dispatch (IAED) continues to manage multiple levels of emergency medical, fire and police dispatch certifications which are regularly updated – as certifications are often required to meet minimum standards in most states, and advanced certifications up to instructor and call center manager are available.

The National Association of State 911 Administrators (NASNA) is another organization which represents the interests of 911 emergency communications in various standards groups. NASNA had its start when informal meetings began between state 911 program administrators to collectively seek ideas and solutions by discussing and comparing mutual 911 center issues. Since its incorporation in 1994, NASNA has provided leadership in topics ranging from establishing public policy to tackling complex technical issues within the ongoing national 911 communications center dialogue.

Telecommunicators have proven continually over the past 50 years that they are much more than telephone operators. They must be versed in medical, fire, and law enforcement protocols, must have high technical acumen and proficiencies while being person-sensitive, have a rigid backbone, grace under fire, and strong leadership skills. This is not an easy skill set for PSAP call center managers to repeatedly find to fill the ergonomic seat, let alone maintain under immense daily pressure, which is why the Bureau of Labor Statistics reports, "Job prospects should be good because the stressful nature of the job results in many workers leaving this occupation." So please don't forget to show appreciation for your Public Safety Telecommunicators this coming April 2018.

911 expands with grass roots efforts

In March 1973, a national policy statement was delivered by the White House's Office of Telecommunications publicly recognizing the benefits of 911, encouraging its adoption and setting up assistance in the form of an information center, however, funding and legislation to implement and/or mandate 911 were not on the federal docket that year – no federal mandate would come until 1999.

Meanwhile in California, the first 911 mandate was in process, known as the Warren 911 Emergency Assistance Act, which created a small surcharge on phone bills to pay for 911 emergency communications systems, signed in 1973. Similar bills followed in scant intervals around the country, for example, Public Act 79-1092 from Illinois, House Bill 911, being passed on September 25, 1975. These early states' determination to improve public safety would influence the financial blueprints for funding 911 services for future jurisdictions in the years that followed.

These grassroots efforts paid off. By the end of 1976, it was estimated that 911 services were available to about 17 percent of the U.S. population. By 1979, there were nine states which had successfully passed 911 legislation and 911 services were reaching approximately 26 percent of the U.S. population and expanding by 70 new systems per year.

Less than ten years later by 1987, it was estimated that 50 percent of the U.S. population had access to 911 emergency services. Yet as B911 service began to expand across America, telecommunications technology began to change at an exponentially rapid pace, thrusting funding efforts once focused on deployment and maintenance of analog telephone system services into the realm of enhancements, upgrades and investments in entirely new IP-based technological platforms, data analytics, and the training associated with them.

911 PSAP and the demands of commercial technology

The first big update from B911 was Enhanced 911 service, or E911. Understanding that the caller to an emergency dispatch center was not always in the best condition or situation to identify themselves or their location, E911 brought with it features such as ANI (Automatic Number Identification), ALI (Automatic Location Identification) and, as more PSAPs were added, selective call routing to ensure callers would be sent to the appropriate emergency call center corresponding with their call origination location. These enhancements to wireline E911 were available starting in the mid 1970's and expanded with additional features for the PSAP throughout the 1980's. Additional details regarding 911 technology and features history is available on this webpage.

With the arrival of mobile telephones to the commercial market in the 1990's, PSAPs encountered a new hurdle – previously, location information was based on a static origination point, typically an installed service address, so how could the PSAP receive location identification information on a moving target? Of course, it could be accomplished by technology, but the how, when and where were eventually determined by the FCC in 1996, when they issued the Wireless Enhanced 911 Rules, which described the methodology and timing in a two-phase process.

Not only did the wireless carriers have to deliver the required information, such as nearest cell tower, longitude/latitude to the PSAPs, but the PSAPs had to be capable of quickly processing it into actionable intelligence. In other words, the PSAP couldn't have telecommunicators dispatching an ambulance to a longitude – latitude for one call and then a street address for another call. They also couldn't risk the time to the citizen or officer for telecommunicators to have to manually discover addresses via longitude – latitude or cell tower coordinates on a per call basis. Therefore, CAD (Computer Aided Dispatch) systems needed to be updated to receive the new coordinates and make the location address translations in real time to effectively serve the emergent requirements of public safety, which required time, funding and training.

Next on the technology landscape emerged VoIP (Voice over IP) which included an assortment of options for subscribers varying from fixed premise to full mobility services. VoIP 911 remains complicated to regulate and manage from an emergency communications perspective, offering scant features and requirements such as customer location self-provisioning or pop-up warnings regarding 911 service limitations. In 2008, Congress sought to close the technology gap of VoIP 911 by enacting the *New and Emerging Technologies 911 Improvement Act of 2008* which permits interconnected VoIP service providers access to E911 features "from an entity with ownership or control over such capabilities."

Next Generation 911 (NG911) has been not only a technological feat to accomplish, but a funding miracle of sorts. Many E911 systems still ride legacy circuit-switched technology and require full "forklift" upgrades to move to modern IP-enabled networks to support even rudimentary NG911 functionality. However, public safety officials, citizens and legislatures are working together across the country to rise up to the challenge of NG911, and PSAPs are indeed transitioning to NG911 (see state status map here).

The current technological backdrop of NG911 and emergency communications continues to explode with new and exciting possibilities, with advances in machine learning, augmented reality, autonomous vehicles, and proliferation of Internet of Things (IoT), that the original vision of NG911 conceptualized by U.S. DOT in 2007 and expounded upon by NENA i3 in 2011 was thankfully pliable enough to encompass these astounding opportunities. Where, fifty years later, we've gone from one call to one red analog phone in 1968, to PSAPs receiving location information, text, voice, and video from mobile smartphone and tablet devices and interacting with multiple social media platforms in 2018, we can only imagine where the generation beyond ours will take emergency communications fifty years from today.

Happy 50th Anniversary, 911!

About the International Public Safety Association
Established in July 2014 in the State of Arizona, the International Public Safety Association, a 501(c)3 non-profit public safety association, represents all public safety verticals: law enforcement, fire service, EMS, telecommunications, public works (water, sanitation, transportation), public health, hospitals, security, private sector, and emergency management.

Our Mission is to break down the cultural barriers and foster the relationships between EMS, fire, law enforcement, telecommunicators, allied emergency responders, and the communities they serve. Our vision is for a stronger, more integrated public safety community capable of an effective joint response to all public safety incidents.

This InfoBrief was authored by Ms. Helen Troyanovich. Ms. Troyanovich has been in telecommunications for over 30 years and is a current member of the International Public Safety Association's Public Safety Technology Committee. She has served public safety in various roles throughout the years, as a volunteer firefighter in Ohio and Iowa, as Iowa Deputy SWIC, and on various public safety communications technology committees both in Iowa and at the national level. She currently serves on NPSTC LMR-LTE Interoperability Working Group.