



## Introduction

There are an increasing number of Smartphone Applications (Apps) entering the market that impact public safety and emergency communications. Many of these new “Apps” display a high degree of creativity and innovation. The Association of Public-Safety Communications Officials (APCO) has worked in collaboration with the National Emergency Number Association (NENA) to provide developers with information on the Enhanced 9-1-1 (E9-1-1) technical architecture as well as operational limitations that may influence the development of Smartphone Apps.

The information below is an overview of the E9-1-1 system and key considerations on issues of impact.

## Smartphone Apps and Their Relationship to Enhanced 9-1-1 Service

Enhanced 9-1-1 (E9-1-1) is the system used by the public in the vast majority of the USA & Canada to access 9-1-1 Centers during an emergency. A 9-1-1 Center is an entity that receives 9-1-1 calls from a defined geographic area and processes those calls according to operational policies. This emergency communications and data system was designed in the 1970's and has unique limitations as compared to the current application and internet environment. Key limitations that App developers should be aware of are:

1. Only voice and a single 8 or 10 digit reference code can be carried with an E9-1-1 call. This 8 or 10 digit code is designed to carry the caller's telephone number, or a reference number that assists in determining how to route a 9-1-1 call to the appropriate 9-1-1 Center. It is important for developers to note that the 9-1-1 Center that a call is routed to ***may not*** be the 9-1-1 Center physically closest to the caller. There are jurisdictional responsibilities, local laws and geographic relationships that impact the decision as to where a 9-1-1 call is routed.
2. The public expects that their location will be automatically delivered to the 9-1-1 Center any time they call or contact 9-1-1. Data that is resident within smart-phone type applications, such as the caller's name, location or callback number, cannot currently be delivered with a 9-1-1 call. There are limitations in the E9-1-1 call delivery networks that prevent this. A limited amount of critical data, such as location information and telephone callback number, can be automatically acquired after the voice call is answered at a 9-1-1 Center. This data is obtained from external, standardized databases that contain pre-processed and pre-validated information. One of the databases involved that may be familiar to developers is an **ALI** (Automatic Location Identification) database. There are still 9-1-1 Centers in the U.S. that do not receive any of this data, due to technology limitations. Not all public safety agencies are capable of receiving 9-1-1 calls.
3. Most 9-1-1 Centers currently **CANNOT** accept text, pictures or videos nor can they receive additional data such as personal information, medical history or building floor plans. E9-1-1 uses different interface techniques for calls from wireline, wireless, and Voice over Internet Protocol (VoIP), due to forced adaptation of the original E9-1-1 architecture to support the newer caller service types. There are significant variations in how calls and data are handled among different service types, and a resulting need for application developers to understand how these services interact with the E9-1-1 system.

4. An App that notifies the caller's family or friends of an emergency situation should not be viewed as a solution for contacting 9-1-1. Callers that need emergency services need to contact 9-1-1 directly or there is risk that emergency services will not be sent or may be significantly delayed.

5. The App must not interfere with the handset's ability to place a voice 9-1-1 call to the local authority. If the user makes a 9-1-1 call, some phones will not allow the user to access any other applications within the phone, such as texting or video.

An improved 9-1-1 communications system has been designed, based on Internet Protocol (IP), and it is beginning to be implemented in some areas across the United States. It is expected that Canada will follow this transitional pattern soon. This new system, known as Next Generation 9-1-1 (NG9-1-1), has the capabilities to support voice, text, video, and additional data. There are many factors (funding, regulatory etc.) that impact how and when the new 9-1-1 system will be available on a large scale. As a result, NG9-1-1 will likely take 8-10 years to evolve across most of the USA & Canada. During this transitional period, when the original, legacy E9-1-1 system is still in use, it is imperative that new communications services or technologies that allow users to speak, text, or otherwise communicate with others, be able to interoperate with the legacy E9-1-1 and the new NG9-1-1 systems in a reliable, seamless manner.

## Additional Considerations for Developers

Telecommunicators are tasked with handling each call competently and expeditiously to ensure life safety. It is important that applications do not adversely affect 9-1-1 Center operations. Developers should become familiar with common 9-1-1 Center workflows and refrain from having their App rely on telecommunicators perform additional atypical tasks such as publishing information to Facebook or accessing third party websites.

## Direct Communications with 9-1-1

- ✚ App developers should *be aware of limitations and follow established methods'* when routing calls to 9-1-1.
- ✚ Not all 9-1-1 Centers are equipped to receive location information from wireless phones and there are some areas in the United States that do not have any 9-1-1 service. These centers rely solely on the caller to provide their location to send emergency responders.
- ✚ Calls should route directly to 9-1-1 in an emergency situation, allowing a trained telecommunicator to gather necessary details and dispatch emergency services.
- ✚ Users should be encouraged to call 9-1-1 directly whenever possible in an emergency situation.
- ✚ Encourage users to call 9-1-1 only if it is an emergency, not for information.
- ✚ 9-1-1 centers must take the time to evaluate each and every call that is presented to a telecommunicator. In many cases, depending on local agency policy, the telecommunicator is required to stay on the phone in an open line situation, to determine if the caller has an emergency or not. If the call is disconnected, the telecommunicator must also take the time to call the user back to determine if there is an emergency. This creates additional workload and pulls the telecommunicator away from callers with true emergencies.
- ✚ Most 9-1-1 Centers do not have the ability to receive any type of multi-media or text messaging. Users should clearly understand that although the App provides a method to send multimedia or submit a GPS location by email or text, the majority of 9-1-1 centers will not be able to receive it.
- ✚ 9-1-1 Centers are not always able to immediately answer each and every 9-1-1 call that is delivered to the center. There is a possibility that a 9-1-1 caller will be put "on hold" or receive a recording. Circumstances occur during unusually busy times that cause incoming calls to outnumber the 9-1-1 staff. In these cases calls may go into a queue that typically provides a recording that advises the caller they have reached 9-1-1 and to remain on the line. These calls are answered in the order they are received.

## Notifying Friends and Family

App developers should be aware of several important considerations for applications designed to notify friends and family of a possible emergency:

- ✚ Direct contact with 9-1-1 is the most expedient way to assure that help will be sent. App developers should not encourage users to rely on a friend or family notification to obtain help during an emergency.
- ✚ Friends and family may not be in the same geographic area as the user needing assistance. If the friend or family member calls 9-1-1 for assistance there is a possibility the call will go to a 9-1-1 center in another state or jurisdiction. If the user needing assistance is relying on a friend or family member to call 9-1-1, help will be delayed.
- ✚ When friends and/or family receive a notification, they will likely call 9-1-1 to obtain information about their loved one. This will unnecessarily tie up telecommunicators from handling additional emergencies.
- ✚ In the event friends and/or family call 9-1-1 in an attempt to find out information about their loved one, it is likely the telecommunicator will not be able to provide the information to them. Local privacy laws and internal agency policies may prevent information being shared in that manner.
- ✚ App developers offering to conference friends and family into the user's 9-1-1 call may impede the telecommunicator's ability to hear and/or delay the telecommunicator's ability to gather critical information. The more people engaged in a single conversation, the more difficult it is to get pertinent details. **This practice is discouraged.**

## GPS & 9-1-1 Location

- ✚ Many people conserve battery power on their phone by turning off location services. Developers should clearly indicate that if a user does not have location services turned on in their phone, the App will not provide GPS coordinates. Non-tech savvy users will not understand that their phone's location services must be enabled for the 9-1-1 location to work.

## Third Party Services

- ✚ App developers should clearly advertise whether the App will dial 9-1-1 directly or whether it will use another method. Calls that dial directly to the digits 9-1-1 typically take priority over any other phone line. Calls directed to a ten-digit line may not be answered as promptly.
- ✚ App developers should clearly state in their marketing description of the product, whether a call is going to be routed to a third party call center to process the emergency call prior to connecting to a public safety entity. The App developer should also clearly identify how and/or if the caller will be conferenced to 9-1-1, if needed. The third party call center's abilities should also be identified (ie: EMS trained, services provided).

## General Consideration

- ✚ Many 9-1-1 centers do not provide their telecommunicators access to the internet for multiple reasons that are primarily related to system security. App developers must be aware that it is not always possible to expect 9-1-1 center personnel to access information through the internet.
- ✚ App developers should become aware of state and federal laws that cover 9-1-1 Centers. Laws may prohibit functions such as automated calls that do not present with a live person or monetary contributions.
- ✚ Creating an App that allows a user to shake the phone to dial 9-1-1 may increase the propensity for inadvertent dialing into 9-1-1. **This type of functionality is discouraged.**

The Association of Public-Safety Communications Officials (APCO) and the National Emergency Number Association (NENA) are ready to assist App developers and distributors to develop applications that meet the needs of citizens and will work with the current and future 9-1-1 system. For the most up-to-date information regarding 9-1-1 and to answer questions go to [www.apcointl.org](http://www.apcointl.org). or [www.nena.org](http://www.nena.org)