



# EMERGENCY COMMUNICATIONS

Communications are crucial during and after a disaster, including being able request help, to coordinate response and to check on others. Landline, IP and cellular phone services may or may not be available in an emergency, while satellite phones and 2-way radios are often more reliable means of communicating. Having multiple ways to communicate is a good plan.

**“LANDLINE” PHONE SERVICE** is the old-fashioned Plain Old Telephone Service (POTS) that works over twisted copper wire. This is steadily being replaced by IP and cellular phone service. While some providers like AT&T still support landline service, they typically no longer install it new. And in most cases if landline service is canceled, it cannot be reinstated.



Landline phone service is likely to work after a disaster or a prolonged power outage if the telephone lines are intact and the service provider infrastructure (e.g. a local switching center) has power and functions.

A simple corded phone with landline service may still be desirable to have for an emergency as it does not require its own separate power. However, there is no guarantee that it will continue to work after a major disaster.

**“IP” (INTERNET PROTOCOL) PHONE SERVICE** runs over the Internet. This is also referred to as VoIP (Voice over IP). This service is offered by Internet providers such as Comcast, AT&T and Sonic. Regular phones plug into the Internet modem or gateway in the residence. When new phone service is installed, it most likely will be IP-based.

Internet service requires power for the residential modem or gateway. IP phones may work after a major disaster or power outage if:

- there is local backup power from a storage battery/UPS, solar panels, generator, etc, and,

- the cable, phone or fiber optic lines are still intact and the service provider infrastructure still has power and functions.



**CELLULAR PHONE SERVICE** relies on cellular towers that connect with cell phones via radio signals. Cell towers range from tall antennas with generator back-up to small antennas mounted on telephone poles, called a Distributed Antenna System, each with battery backups (which may run down and disrupt service during a power outage.) Cell phones also need to stay charged.



Cell towers are designed to handle a certain number of connections and amount of data at one time. During or after a major disaster, cell towers may be overloaded and service disrupted. Towers can also be damaged. Mobile cell towers (CoWs - Cell on Wheels) can be deployed, but may take some time to become available. One should not depend solely on cellular service for emergency communications.



**SATELLITE (SAT) PHONE SERVICE** relies on satellites in orbit above Earth that connect with satellite phones via radio signals. Satellite service is very reliable during a local disaster or prolonged power outage as long as the satellite phone stays charged. Sat phones can be used almost anywhere outdoors as they don't rely on towers or similar infrastructure. Some satellite location trackers (e.g. Garmin inReach and SPOT) can send text messages as well.

The main disadvantage of satellite phones has been their higher cost for both the phone and especially for the service, compared with cell phones. Satellite phones and location trackers also do not typically work well indoors as they need direct line-of-sight to the satellite.

The growing Starlink ([www.starlink.com](http://www.starlink.com)) system provides Internet and phone service via low-orbit satellites, and may be a useful means of communicating as it becomes more generally available.

Some new cellular phones (e.g. iPhone 14) can send and receive text/SMS messages via satellite.

**INTERNET-BASED COMMUNICATIONS** make use of applications such as email, texting/SMS, Twitter, Skype, Facebook, etc. These apps run on Internet-connected devices including cell phones, tablets and computers. In an emergency or during a prolonged power outage, as long as the device and the local Internet modem/gateway or cell tower have power and the service provider infrastructure is functioning, these means of communicating should still work. There are no guarantees though that apps will be accessible during and after a major disaster.



Note that Internet infrastructure, like a cellular network, can handle a certain amount of data before slowing down or even coming to a halt. So it's best to limit large data transmissions in an emergency.

And with cell phones it is best to text/SMS when possible, as this uses much less bandwidth than calls or sending media files, and is more likely to get through a busy network. Plus there's a record of the messages to refer back to. Signal, Telegram and WhatsApp are popular text/SMS applications.



## 2-WAY RADIO COMMUNICATIONS



**2-WAY RADIOS** such as handheld transmitters ("walkie-talkies" or "HTs") provide a very reliable means of communicating during and after a disaster. This is why emergency responders still rely on them. As long as a radio has power (battery/rechargeable), it can communicate with similar radios.

There are many different 2-way radio services managed by the FCC. The most popular for civilians are FRS (Family Radio Service), GMRS (General Mobile Radio Service), CB (Citizens Band) and Amateur:

**FRS** utilizes low-power handheld radios to communicate short distances, typically a mile or less. FRS is ideal for use within a neighborhood/CERT group or community. An FCC license is not required.

**GMRS** utilizes lower-power handheld up to higher-power mobile radios that can communicate over medium distances, often several miles. Many GMRS radios can use a "repeater" that repeats the signal over much longer distances, for example throughout a city or across a county. These are ideal for communicating between neighborhood/CERT groups and communities. Every group should have at least one person with a GMRS radio (which also works with FRS) and they should practice using it regularly. The FCC requires that GMRS operators have a license, for information go to [www.fcc.gov](http://www.fcc.gov)

**CB** typically utilizes handheld or vehicle-mounted radios to communicate over longer distances, up to about 20 miles. These are most often used by professionals (e.g. "truckers") and while not as popular for emergency communications, they can be used. An FCC license is not required for CB.

**AMATEUR (HAM)** utilizes handheld radios up to high-power base stations for communicating over longer distances, most often also using a repeater. Certain Ham frequencies can enable conversations across the country or around the world. There are official emergency Ham services such as the Radio Amateur Civil Emergency Service (RACES) for disaster communications. Ham operators also require a license from the FCC, separate from GMRS, which is strictly enforced. Go to [www.fcc.gov](http://www.fcc.gov)

Note that talking over a 2-way radio is different than over a phone. Phone calls usually involve known individuals speaking to each other, whereas with a radio you are broadcasting out to potentially many operators who may then want to transmit back. Protocols are used to manage this more effectively.

**OCP&R has created a GMRS Emergency Network for Oakland (GENOAK)** that uses a repeater to enable neighborhood/CERT groups and communities to communicate. We recommend you getting your GMRS license (and Amateur/Ham too) and joining this network. Check out [www.genoak.org](http://www.genoak.org)