

From mountain to sea

# Telecoms Resilience Information

## Information for Community Resilience Groups

Document created by the Digital Engagement Team

### Overview

As Aberdeenshire Council continues to support Community Resilience Groups to develop community resilience plans, it is important to be aware of how the communications infrastructure in the region is affected, primarily with regards to power outages. This document aims to provide communities with some high-level information to support community planning. For more localised, specific information, Aberdeenshire Council's Digital Engagement Team is ready and willing to provide data and analysis at request and is keen to answer questions and queries from residents, businesses and community in any matters relating to digital connectivity.

The Digital Engagement Team can be contacted:

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### Mobile Phone Networks

Mobile phone networks are provided by four Mobile Network Operators (MNO's) in the UK, namely EE, O2, Three and Vodafone. Mobile phone communications work over 2G, 3G, 4G and 5G systems:

- **2G** provides long-range, low bandwidth data capacity, used by devices such as smart electricity metres, and also used by the Emergency Services.
- **3G** provides mid-range voice and data services. This system is currently being **switched off** by the MNO's, due to the system being largely redundant in the industry.
- **4G** provides mid-range, higher capacity voice and data services, and is the most widely utilised network system in the UK, with most mobile devices using this system.
- **5G** is a short-range, high capacity network that provides very high bandwidth for calls and data services but is currently not widespread in Aberdeenshire.

MNO's create their networks across the landscape through transmission from masts, which can be located in fields, or in the landscape, or from apparatus on top of tall buildings.

To create the network for transmission, masts use a variety of backhaul sources, including satellite, fibre broadband, or other masts. This means the source of the 4G signal is not coming just from the nearby masts, but by a source further afield.



### Mobile Phone Networks (cont.)

In the event of a power cut, many residents will be hoping to use the mobile phone network for communications, and/or to access the internet. When the power goes out in an area, it is highly likely that the mobile phone masts in the local area will also lose their power supply. Without a mains power supply, all masts do have a short-term power resilience system. The majority of masts will have battery systems that can keep the mast 'online' for at least an hour, but battery systems will not last long during extended power outages. Some masts may have a diesel generator backup that will provide power for a slightly longer period, but these generators need to be topped up for extended outages. If an outage is widespread, there may not be engineers available to attend these sites to maintain the generators.

In a localised power outage, if a mast can maintain power, then network signal can be maintained for a time. If the power outage is widespread, and affects a larger geographic area, then the backhaul for the network may be impacted. If the mast's data source (i.e. through fibreoptic feed, or from neighbouring masts) is lost, the masts may be unable to provide adequate network signal, even with a local power source.

It is also important to highlight that mobile networks by their nature, are impacted by congestion. If more devices than average are using the available network, the network will begin to lose stability. Residents may notice the signal on mobile devices becomes patchy or inconsistent, and that the ability to load data or access internet service on the mobile device is impacted. If the congestion in the network continues, then the network will reduce capacity to all non-emergency related communications, meaning the network will be unavailable, except in the case of 999/112 calls.

With the different factors mentioned above, it is not always possible to determine how resilient the mobile phone networks will be, in different areas, or in different situations. Mobile Telecommunications is a reserved policy area with UK Government and is regulated as an industry by Ofcom. Additionally, the Digital Engagement Team can access a range of data sources, and has routes of contact with necessary stakeholders, should further information, support or guidance be required.



### Landlines

Landlines in Aberdeenshire will typically operate through one of two different technology infrastructures:

- **Public Switched Telephone Network (PSTN)**, often referred to as the analogue system, is the historic system used by telecoms operators to allow customers to make calls through switched exchanges.
- **Voice over Internet Protocol (VoIP)**, often referred to as digital voice services, is a newer technology that allows customers to make phone calls over an internet connection, instead of the PSTN.

At present, PSTN system connections can often continue to work in the event of a power outage, because the copper phone line from the telephone exchange carries a small electrical current, to power handset devices in the home.

However, it is important to be aware that the PSTN system is being retired across the UK in 2025, as all telecoms operators move their customers over to VoIP services. From September 2023, telecoms operators will no longer be able to offer new or renewed services on the PSTN and will move all customers over to VoIP services ahead of the retirement in 2025.

The move to this newer technology is being led by the telecoms industry, with backing from UK Government and Ofcom. The retirement of the PSTN is happening across the whole of the UK, and it is not possible to maintain an analogue connection beyond 2025. But what does this move to VoIP mean for residents?



## Landlines – Moving from PSTN to VoIP

When moving from PSTN to VoIP, residents need to be aware of the following:

- The landline phone number can be retained, and is 'ported' over to the digital service. Similarly to mobile phone numbers, once ported, the number can be moved between operators with ease. Once the number is ported, the analogue copper phonenumber will be reassigned, and only provide internet communication services.
- Telecoms providers may provide residents with a new wi-fi router for the property, for the purpose of offering broadband and VoIP. This doesn't mean that a broadband service must be purchased, as telecoms operators have confirmed they will continue to offer voice only services for residents who do not want an internet service.
- Landline phone handsets will no longer be plugged in to the wall phone socket in the property, but will instead be plugged in to the back of the wi-fi router. Many phone handsets will work straight away with this new set-up, however a small adapter can be provided by the telecoms provides if a handset doesn't work in the new set-up.
- Accessibility devices, such as textphones, text relay services, amplified phones etc, are all available to work over VoIP connections.
- There will be some changes to how specialist equipment may work with the new technology. If there are devices that are connected to the landline such as telecare alarms, emergency pendants, dialysis machines and telemetry devices, residents should contact the provider of those devices to ensure compatibility with the new system.

## VoIP in Power Cuts

Unlike the PSTN, VoIP services will not work by default in the event of a power cut. Once a landline connection is moved to VoIP, the electrical current will no longer be provided through the phonenumber, with the whole system being switched off in 2025.

Ofcom has published guidance that states telecoms operators must provide a solution to residents that allow them to make calls in the event of a power cut. It is up to residents to ask for these resilience solutions when taking out a VoIP service. If a resident is dependent on their landline, these solutions must be offered to customers free-of-charge. These solutions will either be:

- a) The provision of a mobile phone handset with SIM card, which can allow residents to make calls when the power goes out.
- b) The provision of a wi-fi router with an integral battery, or a battery pack for an existing router. This battery solution will provide power to the router, allowing for phone calls to be made, and ability to use the internet.

As noted previously, there may be resilience issues in the available mobile phone network in the event of a power cut. Where 4G coverage is not great, residents should opt for a battery back-up solution. For more detail on the Ofcom guidance around ensuring calls can be made in a power cut, the guidance document can be found at [ofcom.org.uk](https://ofcom.org.uk).

## Further Information

The Digital Engagement Team exists to support residents, businesses and communities in all matters relating to digital connectivity. If there are any queries, questions or requirements for more tailored support in these matters, enquiries are welcome.

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