

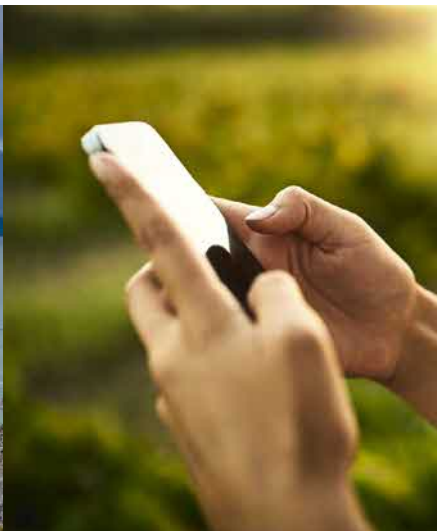


The Shared Rural Network (SRN) in Scotland



SHARED
RURAL
NETWORK

Transforming Mobile Coverage Countrywide



Ministerial Foreword

Scotland boasts some of the most breathtakingly beautiful parts of the United Kingdom. From the mountainous peninsula of Knoydart to the naturally diverse landscapes of Argyll and Bute, it is an area of exceptional beauty.



The Highlands and other areas in Scotland are not just places for leisure and tourism. People must be able to build lives, grow families and sustain businesses here, otherwise the communities that keep the area's culture and history alive will simply dwindle.

That is where great connectivity comes in.

Fast broadband and a reliable phone signal are no longer just 'nice to haves' in today's world. They are expected and demanded because of the impact they can have on access to work, services and opportunities. Young people, in particular, are unlikely to stay in a community that is cut off.

That is why, as a government, we are trying to deliver that connectivity in places such as the Highlands and Islands, and have designed a programme - the Shared Rural Network - to make sure the UK's most rural communities do not fall behind.

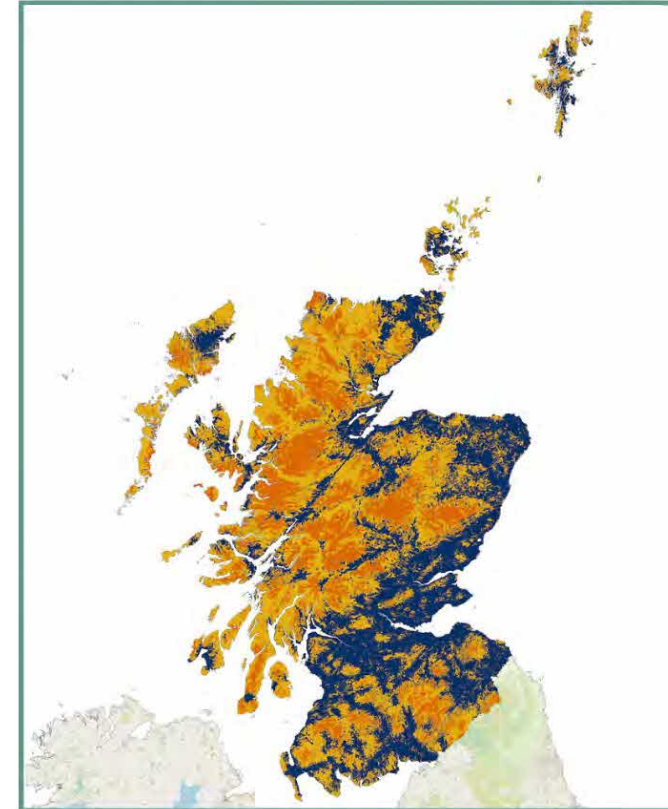
Without this investment people and businesses will miss out on the major benefits that come from improving geographic mobile coverage, like helping first responders, tackling rural crime, supporting childrens' online learning, giving businesses what they need to grow and protecting hillwalkers, cyclists and mountaineers who visit these areas.

We want to get these rural communities that vital connectivity as fast as we can. This means we will be reusing existing masts as much as possible to minimise the impact on this beautiful countryside. But we will need some new infrastructure too. We are working with the Mobile Network Operators to look at the best sites for extra masts. As we do so, we also want to work with local communities to make sure we strike the right balance between connectivity and preserving the preciousness of this unique landscape.

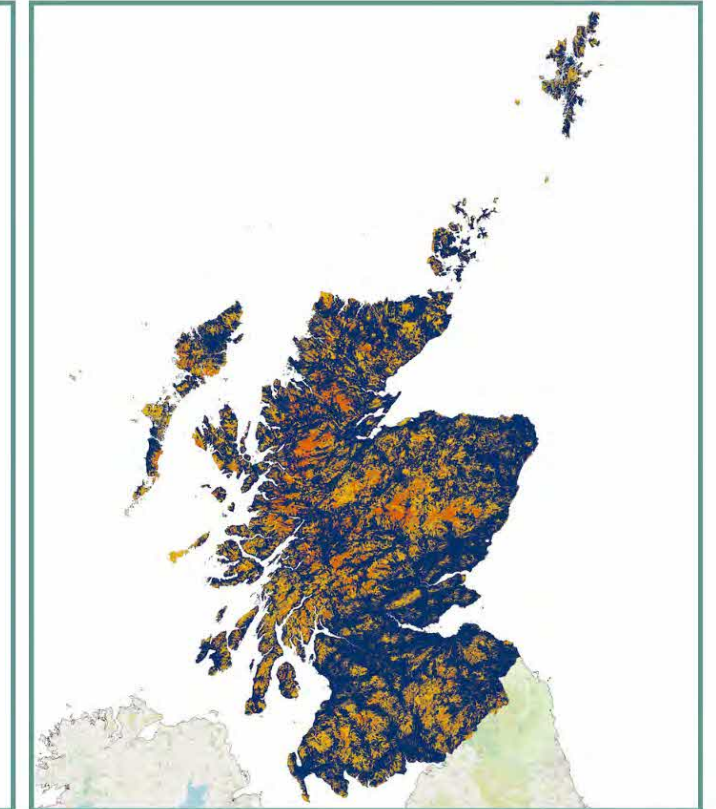


Julia Lopez,
Minister for Data and Digital
Infrastructure

Pre SRN



Post SRN



Notes: Forecast improvements subject to availability of EAS sites. Coverage improvements subject to finding suitable sites, obtaining power supply and backhaul and securing the necessary permissions through the planning system.



“Transforming Mobile Coverage Countrywide”

The Shared Rural Network was developed by the UK government and the four Mobile Network Operators EE, Three, Virgin Media O2 and Vodafone to deliver 4G coverage to 95% of the UK landmass by the end of 2025, enabling rural businesses and communities to thrive.

The ambition is to make sure everyone can benefit from fast services on the go - from those visiting areas of natural beauty to those who live and work in remote communities, boosting tourism, improving public safety and opening up access to future technology. The Shared Rural Network will spur economic growth and close the digital divide across the country through better connectivity.

By upgrading their existing networks and working together on shared infrastructure and new sites, the UK government and the Mobile Network Operators will transform mobile coverage in rural areas. Individually, each operator will reach 90% geographic coverage, which will result in 84% of the UK having 4G coverage from all four operators, increasing choice and boosting productivity in rural areas. It will improve 4G mobile coverage for an extra 280,000 premises and 16,000km of roads and will lead to increases in coverage across all four Nations with the biggest coverage improvements in rural parts of Scotland, Wales and Northern Ireland.

More information on the Shared Rural Network can be found at srn.org.uk



The Shared Rural Network (SRN) in Scotland

Expanding mobile connectivity to 95% of the UK landmass has been a longstanding priority of successive governments and there are continued calls from the public, businesses and Parliamentarians to address this issue.

It is a core part of modernising the UK's digital infrastructure but Mobile Network Operators have found the economics of deployment in rural geographies challenging given the high costs and low return on investment. The coverage targets laid down for the programme puts a renewed focus on the operators to deploy new infrastructure to cover wide geographic and often very rural areas.

Historically, Mobile Network Operators' coverage obligations were targeted at population coverage. This resulted in network rollouts that focused on the most densely populated areas. Combined with the higher costs of building infrastructure in the countryside, and fewer customers in less populated areas, this had the unintended consequence of rural parts of the UK being underserved by digital connectivity and at risk of being left behind. The Shared Rural Network is structured so that its publicly-funded elements target areas where these 'market failures' persist, and are therefore targeted at 4G TNS areas where there is no coverage and where we are unlikely to see any rollout in the near future.

The expected benefits of getting a combined geographic coverage footprint of 95% are

extensive especially in rural areas which have often been left behind. They include economic and productivity growth, as well as wider social benefits. In particular, the benefits arising directly from the programme are expected to encompass improved consumer choice, tourism benefits and rural/urban equity.

Mobile coverage already reaches 99%¹ of premises, so the programme is focused on delivering connectivity wherever you are, whether you are a farmer wishing to utilise new technology or a visitor to one of the National Parks. These new masts will improve the safety of people visiting the area and undertaking activities such as hillwalking, skiing, cycling and mountaineering. They will enable 999 calls over 4G for the first time in those areas, reducing reliance on expensive alternatives such as private radio systems and satellite phones. In the future, they will carry the new 4G critical communications system, the Emergency Services Network (ESN). The ESN will enable fast, safe and secure voice, video and data across the 4G network and give first responders immediate access to life-saving data, images and information in live situations and emergencies on the frontline.



¹ https://www.ofcom.org.uk/data/assets/pdf_file/0034/249289/connected-nations-uk-report.pdf

The Shared Rural Network in Scotland

The four Mobile Network Operators will build this new infrastructure, overseen by a jointly owned company called Digital Mobile Spectrum Limited (DMSL). In order to minimise the impact on the countryside, all four operators will share each new mast, minimising the impact on the environment. Initial plans developed in 2021 suggested that approximately 300 new sites would be needed to deliver coverage improvements in Scotland as part of the TNS programme - we now expect to be able to deliver this improvement with fewer masts.

Thanks to the government's investment, coupled with the work already being delivered via the industry element of the programme, 4G coverage from all four operators is forecasted to rise to a minimum of 74% in Scotland, up from 44% now. Coverage from at least one operator will increase from 81% to 91% once the programme completes. This will be a real step change in connectivity, especially in the Highlands and Islands which will see some of the largest uplifts as 4G coverage from at least one operator will reach 91% of the region's landmass, up from 73%, and coverage from all four operators will rise from 26% to 68%.

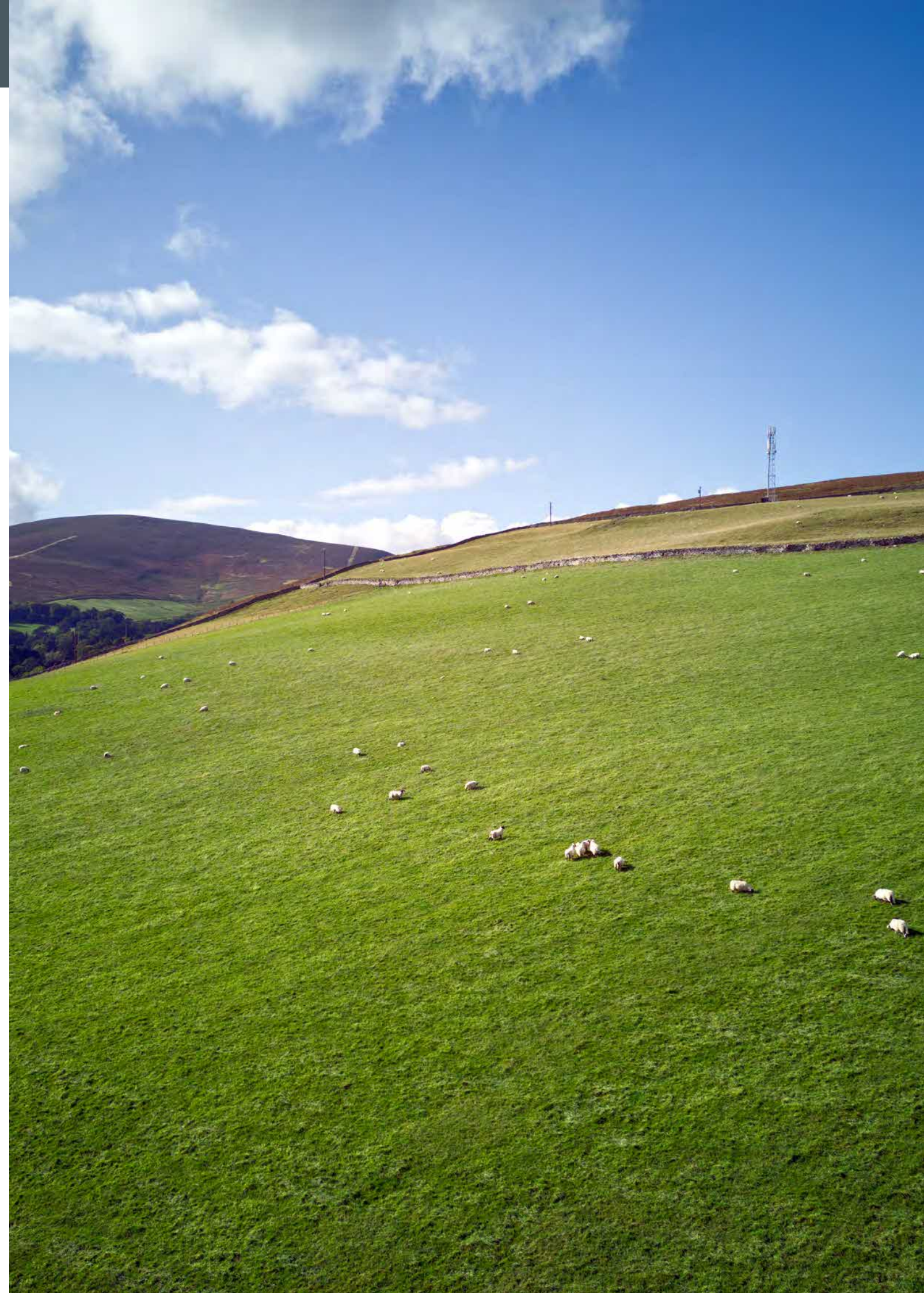
These improvements cannot be delivered without building new infrastructure. The Mobile Network Operators continue to work closely with local communities, land owners

and Local Planning Authorities (LPAs) - who are responsible for approving Shared Rural Network planning applications - to ensure new masts go through the proper planning process and are considerate to areas of natural beauty. Furthermore, community engagement will ensure concerns are heard through the planning process, and publicly funded masts will be shared by all four Mobile Network Operators to minimise the impact on the environment. Wherever possible the programme will utilise existing infrastructure.

The UK government encourages all interested parties to continue to engage with the planning process and support these applications so that we can improve 4G coverage in rural areas. The completion of this section of the Shared Rural Network can go up to January 2027 so this gives ample time for LPAs and other councils to exercise their oversight responsibilities and ensure these new masts are properly considered. The significance of this delivery must not be underestimated as there may not be another opportunity to improve 4G mobile coverage in the rural areas of Scotland that the programme is targeting.

Below you can see the coverage uplifts that will be delivered at a regional level across Scotland thanks to the programme:

Electoral Region	4G Coverage from all MNOs		4G Coverage from at least one MNO	
	Pre-SRN	Forecast post-SRN	Pre-SRN	Forecast post-SRN
Central Scotland	87%	92%	99%	99%
Highlands and Islands	26%	68%	73%	91%
Lothian	88%	94%	99%	99%
Mid Scotland and Fife	53%	78%	80%	93%
North East Scotland	59%	79%	86%	94%
South Scotland	55%	81%	88%	97%
West Scotland	59%	82%	91%	98%





The Benefits of 4G Connectivity



Benefits of 4G connectivity in rural areas

The benefits of reliable mobile connectivity are far reaching and have positive impacts on many aspects of day-to-day life, making for a safer, more connected and more prosperous rural community.

Improving Public Safety

By providing cellular service to remote areas, it will be easier for first responders to reach people in need of assistance. Masts in rural areas will improve the safety of those living, working and visiting the area, enabling 4G to facilitate 999 calls for the first time. Public investment, through various UK government-led initiatives, has been a major driver of these coverage improvements. In fact on average 900² emergency 999 calls were facilitated each month via new masts carrying a 4G signal for the first time across Great Britain.

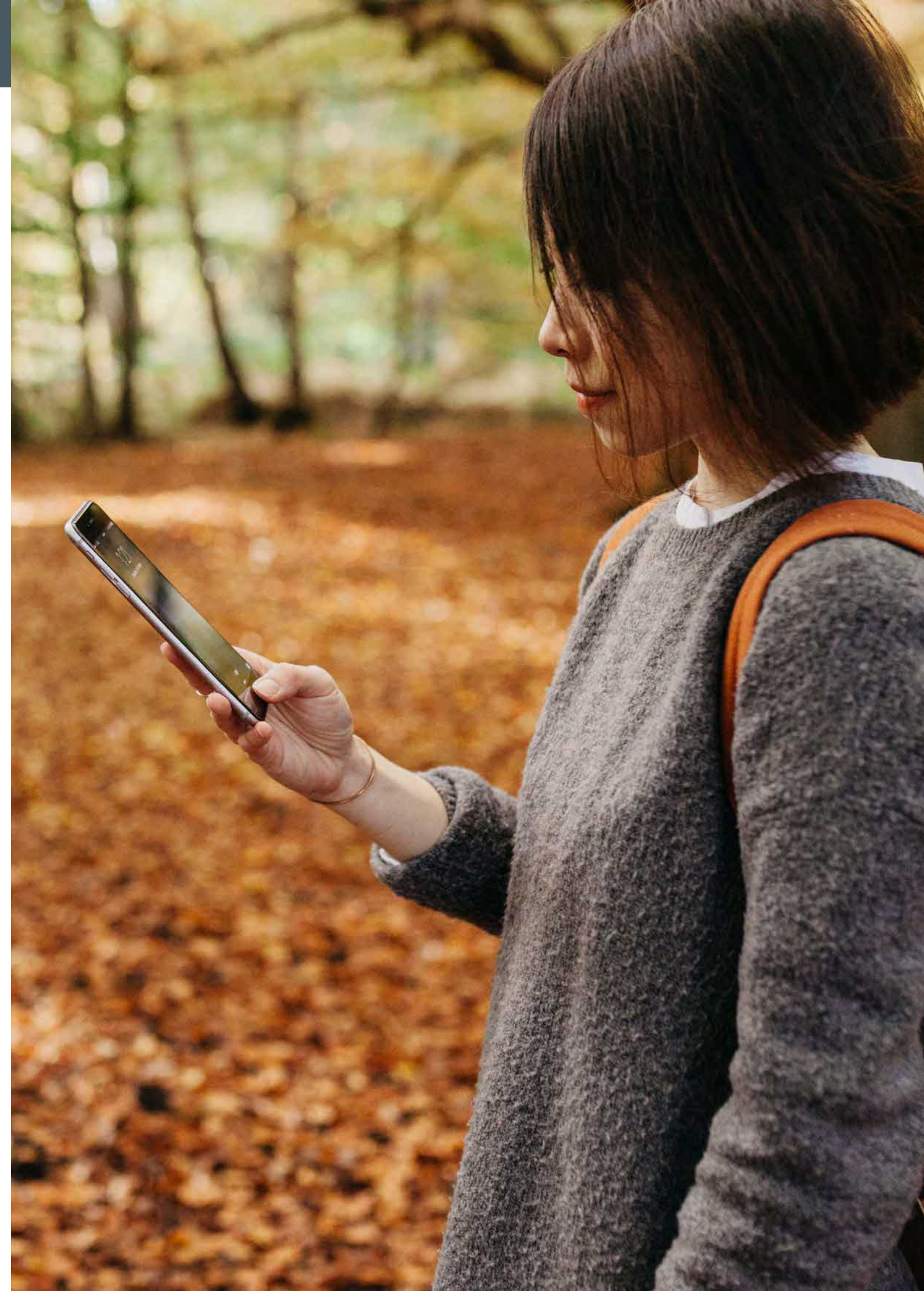
4G coverage will also enable the public to access helpful information and services whilst out and about, downloading maps and sending and receiving images and videos. In the future, these new masts will also carry the new 4G critical communications system, the Emergency Services Network (ESN). The ESN will enable fast, safe and secure voice, video and data across the 4G network and give first responders immediate access to life-saving data, images and information in live situations and emergencies on the frontline.

Cyclists, runners, ramblers and others who enjoy outdoor pursuits use mountain passes and trails across many National Parks in Scotland. To further improve the safety of those visiting these areas,

the ability to call the Emergency Services and Local Resilience partners would be of significant benefit and would further maximise effectiveness of a co-ordinated response across the Emergency Services. In a letter of support³ for a mast in the Yorkshire Dales National Park, North Yorkshire Police noted -

“There have been 4 missing people reported in the last 12 months from these areas that have required multiple key partners to become involved in the search for them. There have been an additional 35 incidents where Cave and Mountain Rescue colleagues were called to assist with concern for safety incidents.

Without the use of key radio communications and mapping services, the safety and security of key search staff cannot be maintained. Due to the large scale and rurality of North Yorkshire, often specialist Police Search Teams are called in to assist with these searches and they can travel the length of North Yorkshire to respond to an incident. Without the ability to conduct on scene briefings, make decisions, provide mapping solutions and digital communications; the ability to respond to these incidents becomes very limited and lives would be at risk.”



² Data received from the Mobile Network Operator EE - the total figure of 900 excludes accidental calls.

³ <https://planning.agileapplications.co.uk/yorkshiredales/application-details/39731>





Benefits of 4G connectivity in rural areas cont.



Supporting Tourism

Rural areas often have unique cultural and natural attractions. Connectivity helps these regions promote tourism, attracting visitors who can explore local culture, history, and landscapes. This supports the preservation of cultural heritage and generates income for local communities. However, when we think about tourism we tend to focus on the advantages of mass tourism but in the areas that the programme will target there will be significant benefit to those visitors who might be hillwalkers, climbers, wildlife enthusiasts, outdoor enthusiasts, and adventure tourists.

Better mobile coverage can encourage tourists to visit and/or return to more rural areas by, for example, reducing difficulties in navigating and locating amenities. Furthermore, social media plays a key role as a marketing tool for businesses by helping to influence tourist decision-making behaviour, improving a traveller's experience through sharing content. It has also opened up places to new audiences and encouraged people to visit more unpopular and uncommercialised destinations for unique experiences and content, this will only continue to grow.

The Cairngorms National Park noted that tourism accounts for 80% of its entire economy with over 2 million visitors every year⁴. Therefore, it is vital we provide good mobile connectivity to areas like this and ensure that people who visit Parks and scenic areas can access a 4G signal. A report by Deloitte for the Scottish Futures Trust⁵ which assesses the potential economic impact of enhanced digital capability in Scotland regarding different scenarios in increased 4G and 5G coverage stated noted that -

"It is actually rural and remote areas that see the largest proportionate impact in the most positive scenarios, as enhancements in 4G and 5G capability narrow the digital divide by allowing consumers and businesses to access superior, transformative services regardless of the location."

Additionally, enhanced connectivity can be beneficial to prevent environmental damage caused as a result of overtourism⁶. The use of sensors alongside the Internet of Things (IoT) can allow better management of visitor flows by collecting information on visitor numbers and identifying patterns.

⁴ <https://www.heraldsotland.com/news/23761692.cairngorms-60-year-battle-creation-national-park/>

⁵ <https://www.scottishfuturestrust.org.uk/storage/uploads/deloittesfteconomicimpact4g5gfinalreportforpublication.pdf>

⁶ <https://censis.org.uk/2023/12/14/iot-calanais-stones/>



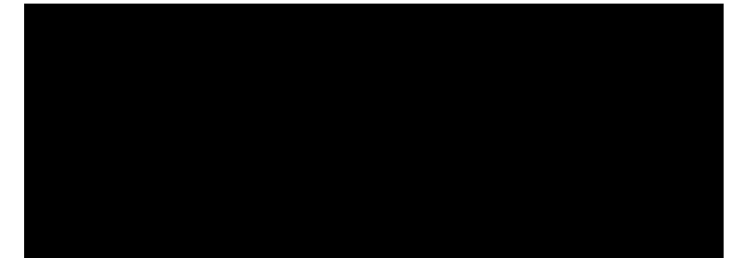


Benefits of 4G connectivity in rural areas cont.

Driving Economic Growth

One of the most significant advantages of enhanced connectivity in rural areas is the boost it provides to the local economy. In addition to the benefits to local economies which rely on tourism described above, more broadly Internet access, mobile networks, and digital infrastructure allow rural businesses to conduct business while out and about, to reach broader markets, connect with suppliers, and offer online services. This, in turn, creates new economic opportunities, promotes entrepreneurship, and stimulates job growth. Mobile phone service is essential for businesses

to operate. By building new mobile phone masts in remote areas, we can make it easier for businesses to invest in these areas and create jobs. Furthermore, businesses are more likely to invest in areas with good cellular service.



Supporting Rural Work

In rural areas, agriculture is a primary source of livelihood. Good digital connectivity means that farmers can access weather forecasts, market prices, and agricultural best practices quickly and efficiently. Additionally, e-commerce platforms enable farmers to sell their produce directly to consumers, eliminating intermediaries and increasing their income.

Improved mobile connectivity can revolutionise this sector. For example, health trackers aren't just for humans⁸ - they also work on farm animals and can be used to check their health. Mobile-connected tail-mounted sensors on cows can gather over 600 pieces of data a second to accurately predict when a cow is most likely to give birth.

Digital connectivity can also support rural areas in adopting sustainable practices. It allows for real-time monitoring of environmental conditions, precision agriculture, and the management of natural resources, contributing to the conservation of rural landscapes and biodiversity.

With farmers often working alone across big areas and remote locations with little to no signal, access to connectivity can be a game changer, and in the most extreme instances be the difference between life and death. According to data from the Health and Safety Executive⁹ agriculture has the highest workplace injury rate of 4,100 per 100,000 workers, 3.5 times higher than the all-industry average. Eradicating mobile coverage not-spots improves safety; providing reliable mobile signal across farmland gives workers the ability to get help should they need it.

Protecting The Environment

Connectivity is also crucial for disaster management in rural areas. It enables timely communication, coordination, and access to critical information during storms and floods. Rural communities can receive early warnings and guidance, enhancing their resilience in the face of emergencies.

The Shared Rural Network ensures that, by coming together and sharing resources, the Mobile Network Operators minimise the carbon footprint of building, operating and maintaining masts and their broader sites. That is to say, the need for additional masts in areas of natural beauty and associated energy consumption is removed.

⁷ <https://news.virginmediao2.co.uk/the-great-rural-revival-improved-rural-connectivity-to-unlock-8-8bn-for-british-manufacturers/>

⁸ <https://www.vodafone.com/business/news-and-insights/case-study/moocall>

⁹ <https://news.virginmediao2.co.uk/the-great-rural-revival-virgin-media-o2-trials-connected-farm-of-the-future-at-cannon-hall-farm-to-showcase-the-future-of-uk-agriculture/>



Unlocking Benefits of Drone Technology

Drone technology has the ability to speed up the delivery of critical supplies, reduce waiting times for test results, and provide equity of care between urban and rural communities. It can also reduce emissions generated by using a vehicle, and most importantly save lives. During the Covid-19 pandemic, drones were used to carry samples and test kits in some parts of Scotland and were essential to the response to the pandemic¹⁰.

In 2020, Vodafone published a report¹¹ into cellular connected drones and how 4G can be utilised to protect wildlife, respond to emergency situations, construction, and deliver medical supplies. In order to do this, they will often have to fly over areas with little or no population on their way to rural areas, and this is where having improved

geographic 4G coverage will enable the future use of this technology. As another example, connected drones can ensure the right amount of fertiliser is used on land reducing run-off into rivers and already connected intelligent self-driving vehicles can work the land without a human.

Drone technology has been trialled by Royal Mail¹² and may be considered to help them identify opportunities to support staff in delivering to very remote areas across the UK. Royal Mail has seen a number of potential benefits in using Uncrewed Aerial Vehicles (UAV), including increased reliability (e.g. in foggy conditions), additional connectivity for remote communities and better environmental credentials versus conventional air freight.

Laying the Groundwork for Future Technology

Infrastructure deployed as part of the Shared Rural Network may contribute to the rollout of 5G later down the line, in areas that might otherwise not have been targets for 5G. If the network sites have already been acquired, the masts built and the backhaul established, bringing 5G active equipment

to those regions will be significantly easier and cheaper when industry is considering deployment. We will continue to monitor market trends and technological developments to understand their impact on the Shared Rural Network and how they could deliver connectivity in remote rural areas.



¹⁰ <https://www.bbc.co.uk/news/uk-scotland-glasgow-west-56154503>

¹¹ https://newscentre.vodafone.co.uk/app/uploads/2020/01/Final_Vodafone-Drone-Report-Web-Pages.pdf

¹² <https://www.royalmail.com/sustainability/environment/drones-connecting-remote-communities-across-the-uk>





Benefits of 4G connectivity in rural areas cont.

Tackling rural crime

Rural crime and the impact of crime on rural communities cannot be underestimated. The police are responding to increases in demand across rural farming communities as they are at high risk of being targeted by travelling criminals. If police officers are deployed to these areas to target this type of crime they are put at risk in

areas of poor coverage. Furthermore, improved 4G will enable trail cameras¹³ to detect and prevent rural crime in areas where CCTV systems are too expensive and impractical due to a lack of mains power. This could cut down on fly tipping, poaching and all types of rural crime in rural communities.

Environmental Monitoring

Connectivity can also be utilised in rural areas for more efficient and accurate environmental monitoring, with the help of emerging technology. One example of this is FarrPoint's pilot study earlier this year based in Scotland's Western Isles which utilised new technologies to create a more cost-effective approach to peatland regeneration¹⁴. The trial used remote sensors alongside the Internet of Things to gather accurate live data on the health of peatland areas and was successful in reducing costs and environmental impacts as well as improving the quality and timeliness of data.

These sensors can also be utilised for a range of environmental functions such as woodland management and wildlife monitoring. Examples of this include monitoring habitat conditions of at-risk species such as Atlantic salmon¹⁵, and

identifying and assessing threats to woodland areas such as pine weevils¹⁶. Through the use of new technologies, enhanced connectivity in rural areas can enable a more cost-effective approach to managing and preventing environmental damage.

Enhanced environmental monitoring mechanisms can also provide benefits to human health. Water quality monitoring has been implemented in order to prevent water borne diseases such as legionella from contaminating water supplies. Through the use of sensors within pipes, the water temperature can be measured every 10 seconds and relayed to a dashboard to support decision making and resource allocation¹⁷. This demonstrates the capability of improved connectivity for providing benefits to both human and environmental health through IoT technology.



¹³ <https://www.wildviewcameras.co.uk/about-us/wild-view-blog/2018/01/Using-trail-cameras-for-security>

¹⁴ <https://www.scotlandis.com/blog/award-winning-peatland-iot-project-to-continue-following-successful-trial/>

¹⁵ <https://www.vodafone.co.uk/newscentre/planet/vf-and-extreme-e-iot-help-protect-atlantic-salmon-scotland-river-nith/>

¹⁶ <https://www.scotlandsuperfast.com/news/news-and-case-studies/internet-of-things/iot-innovation-to-protect-young-trees-from-pine-weevils/>

¹⁷ <https://www.devopsonline.co.uk/iot-helps-scottish-government-deliver-safe-water/>



Resources / Useful contacts

UK Government / Building Digital UK (BDUK)

For further information on the SRN or for a programme briefing please email: bduk-srn@dcms.gov.uk

Shared Rural Network Programme management

Digital Mobile Spectrum Limited (DMSL), a joint venture of all Mobile Network Operators, manages and runs the Shared Rural Network programme and provides reporting and tracking information for the four operators, the UK government and Ofcom. To contact DMSL about the Shared Rural Network, please email: info@srn.org.uk

For further information on the programme visit: srn.org.uk or sign up to the Shared Rural Network Newsletter here: srn.org.uk/subscribe-to-our-newsletter/

Mobile Network Operators

If you have a question relating to your mobile service or are experiencing issues with your mobile coverage, please contact your mobile network operator's customer service team:

EE - ee.co.uk/contact-ee

Three - three.co.uk/support/contact-us

Virgin Media O2 - virginmediao2.co.uk/help

Vodafone - vodafone.co.uk/contact-us/

Mobile UK

The Shared Rural Network is supported by the trade association for the UK's four operators, Mobile UK. For more information about how you can support the Shared Rural Network in your area, please contact the operators representative body - mobileuk.org/contact





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