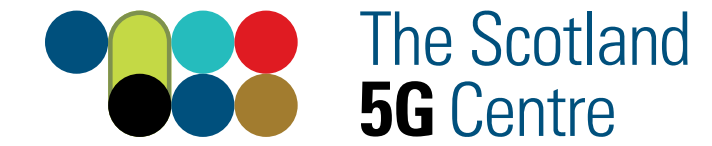


# Connecting Rural Communities – The Orkney Trial

University of Strathclyde (StrathSDR), Cisco, CloudNet IT Solutions, SHEFA, Orkney Islands Council








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Rural Scotland accounts for 98% of the land mass of Scotland and 17% of the population are resident there. In Scotland, the population per square mile is lower than any other part of the UK. This causes significant issues for broadband delivery as telephone exchanges often serve large geographical areas. It is imperative that businesses, schools, public services and residents have good, reliable network coverage within their area in order to meet their needs and requirements. Emerging 5G technologies allow rural communities to implement their own wireless networks. Here is an example on how this emerging technology was applied to rural communities.

## 1 Situation

The Orkney Islands are located off the north coast of Scotland and have a population of approximately 22,000. They have the slowest fixed broadband speed of any local area authority in the UK. Over a quarter of households were unable to obtain the minimum speed to meet an average household's digital needs – USO speeds of 10mb/s. More than 83% of Orkney's roads also do not have 4G services from all mobile network operators and nearly a quarter of Orkney's premises have either no 4G service or no choice of operator.



-  Rural Location
-  Approx. 22k Population
-  Slow Fixed Broadband
-  Approx. 1/4 no 4G Services

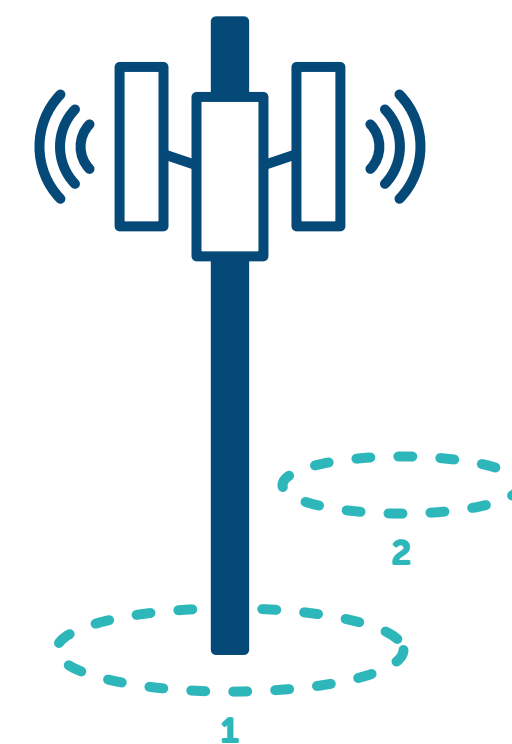
## 2 Task

Establish and deploy new 5G technologies to demonstrate that improved mobile coverage, and broadband wireless networks can be implemented by communities and installed, operated, and managed by local providers, CloudNet.



## 3 Action

The team created two networks in remote areas of Westray and Flotta using a combination of 7 base stations with 20MHz cells working in various available shared and test radio frequency bands. Where available, backhaul was setup either as microwave or fibre backhaul links, and for future set-ups, recent tests indicate the viability of Low Earth Orbit (LEO) satellites, such as Starlink, for backhaul, bringing true 'middle of nowhere' 5G networks to reality.



## 4 Results

The trial demonstrated the viability and engineering required to implement a single mobile network that could provide neutral host support to Mobile Network Operators (MNOs) and provide Fixed Wireless Access (FWA) broadband services to the community. As a result, businesses and communities can have a better choice of operator and faster connectivity.



Faster Connectivity



Choice of Operators

## 5 Why 5G?

5G can provide a secure private standalone network that is reliable and does not experience congestion from users of other networks. The pop-up software-defined 5G network can be rapidly deployed and readily reconfigured for different user requirements. It's ideally suited for remote locations and has the capacity to delivery small rural communities digital needs.

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