

# THE TEGOLA WIRELESS COMMUNITY BROADBAND PROJECT



Installing the Tegola system

As befits an institution that operates at the leading edge of technology, the University's School of Informatics recognises the importance of a fast and reliable broadband connection in this online age. In late 2007, a team of researchers from the school saw that they had the knowledge and resources necessary to make this a reality for people in remote communities, and set about creating the highly successful Tegola Wireless Community Broadband Project.

## Recognising a need for rural areas

With more and more services operating in the online environment, the need for reliable and fast internet access increases. Due to lower population densities, however, conventional wired broadband is not cost-effective for rural areas. As a result, many areas do not have broadband internet, and where wired internet is available, it is often unreliable and slow. This lack of service in rural areas leads to an widening rural-urban broadband divide.

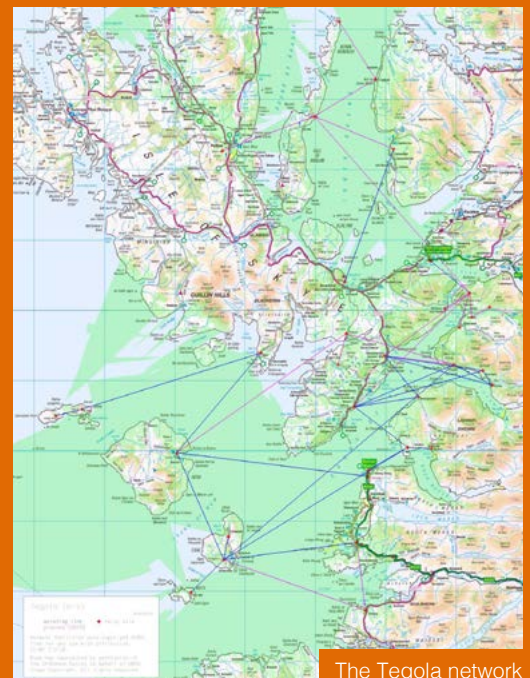
The School of Informatics team took up the challenge to deploy wireless networking in remote Scottish communities where high-speed broadband has not been available because the nearest telephone exchange is too far away.



## ROBUST CONNECTIONS

The head of BT Scotland had expressed the opinion that mesh networks like Tegola were not "robust". Experience has shown otherwise. In 2011, Tegola was successfully used for emergency medical services when a lightning strike knocked out the telephones to a wider area. To date, the Tegola downtime on Knoydart has been about three days, whereas the BT telephones have been down for more than a month.

As a direct result of the Edinburgh team's research, some of Scotland's most remote communities are now enjoying superfast broadband for the first time – for some, it's their first ever connection to the online world.



The Tegola network





Creating new technology to ensure reliability



Between late 2007 and the summer of 2008, researchers deployed the experimental Tegola network based on long distance WiFi. It connected the residents of the villages of Arnisdale and Corran to the Internet, most of them for the first time in their lives. Local communities were involved in the installation and upkeep of the network and their active participation has contributed greatly to the success and sustainability of the project.

The Tegola network demonstrated the suitability of long-distance WiFi technology, even for areas like rural Scotland where the environment can be difficult due to the challenging terrain and weather conditions, particularly in coastal areas. To increase the stability and sustainability of the network, the up-to-the-minute resources of the School were used to develop certain engineering measures, such as planned redundancy, and the use of solar and wind power for self-powered masts, that would strengthen and protect the network.

Tegola has become a replicable model for community-driven local access network deployments in Scotland. It has also inspired research into tools, systems and techniques to aid communities in deploying and maintaining rural networks like that of Tegola; simplifying network management, and adaptive spectrum use for robust and high performance operation are just some of the areas of research that have been inspired by this innovative project.



The Tegola project has substantially influenced government policy on digital access in Scotland and changed the focus of the debate across the UK and beyond.

The team's research and implementation of the Tegola project has been recognised with the NextGen Challenge award for community broadband. Another community wireless network started by Tegola in 2010, Hebnet ([hebnet.co.uk](http://hebnet.co.uk)), was shortlisted for the NextGen 2012 Award for Rural Leadership and Community Development.



Many now have internet access for the first time

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