

High-speed **Broadband** for the most **remote communities** of Britain.

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The goal of the Tegola project is to provide low-cost, high-quality broadband wireless access to people in remote communities.

Achievements:

The testbed now provides the most remote part of the mainland with faster speeds than in most cities:

- **High speeds:** 20+ Mbps, ten times more than the "Digital Britain" target.
- **Low equipment cost:** ~£80 per subscriber using commodity wireless hardware.
- **High reliability**
- **Lower latency** than DSL and satellite solutions



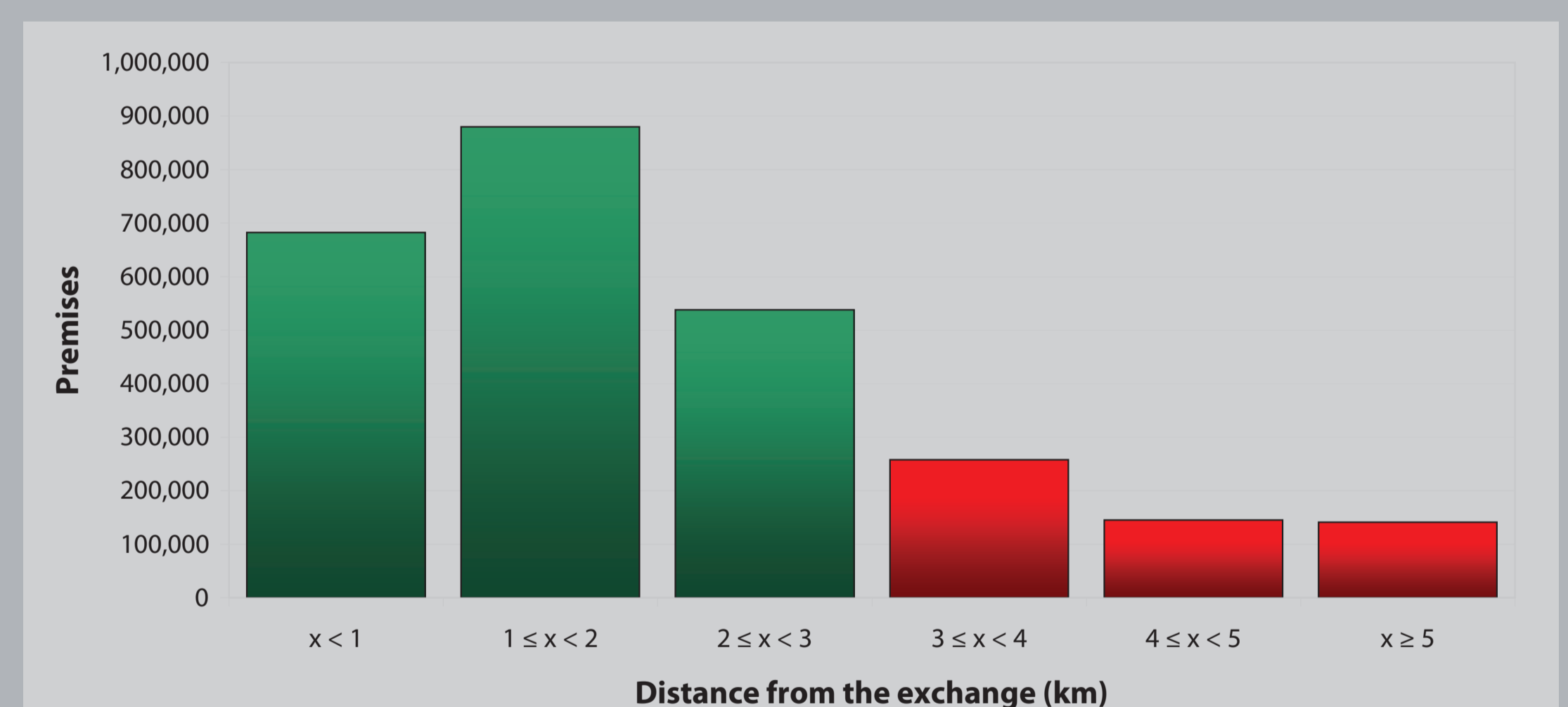
High-quality broadband is especially important for rural areas:

- **Voice over IP** is needed when there is no mobile coverage and poor landline quality.
- **Internet radio and video** are needed when conventional radio and TV coverage is poor
- **Teleconferencing** is needed for remote work. Surprising uptake by the older generation to keep in touch with their families.
- **Video** needed for remote **education** and **tele-medicine**.

All these require **both speed and quality of service**.

Providing broadband in rural areas is inherently different:

- Low population density and scattered users.
- Large distance from phone exchanges and the Internet backbone.
- Difficult terrain for any wire-based broadband technology.
- On the positive side, **community-based deployments** are possible.
- Access to **backhaul** is a key issue.



26% of Scottish premises are more than 3km from an exchange: they are unlikely to get 2Mbps (the "Digital Britain" target).



Our research:

- In less than a year, engineered a **platform based on commodity hardware** to:
 - enable very **long-distance wireless links** (~20km).
 - achieve **high reliability** via judicious use of redundancy to cope with intermittent power sources, etc.
- Developing **software to ease the deployment and operation** of community-owned broadband wireless access networks.
- Low-cost self-powered wireless relays** for places with no electricity supply.
- Low-cost solutions to achieve **robust communication** over time-varying wireless links (e.g., due to tides).
- Maximise the efficiency in using the **scarce wireless spectrum**.