

5G Shared Spectrum for Private Networks

The Case of Malawi

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Status of Mobile Coverage

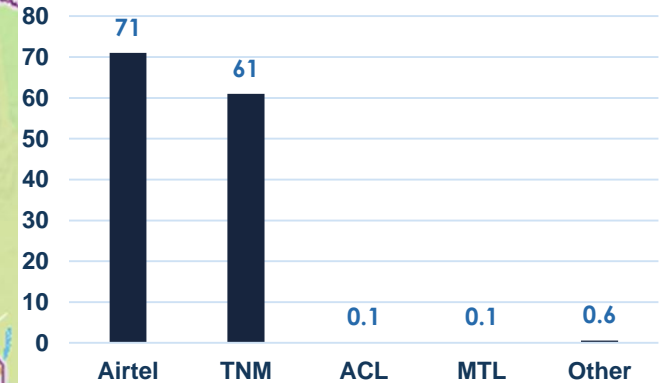
Mobile Network Operators

- **Airtel**
 - Established 1998
 - Covers over 80% of the population (2019)
 - 2G/3G/4G LTE
- **TNM**
 - Established 1995
 - Covers over 74% of the population (2019)
 - 2G/3G/4G LTE
- **MTL**
 - Oldest sole provider of fixed PSTN
 - CDMA
- **ACL**
 - Awarded licence in 2007, launched in 2010
 - GSM/4G/CDMA



TNM Coverage (Source: GSMA)

Proportion of individuals subscribed to MNOs (2019 NSO survey)



Positive: Coverage has extended.

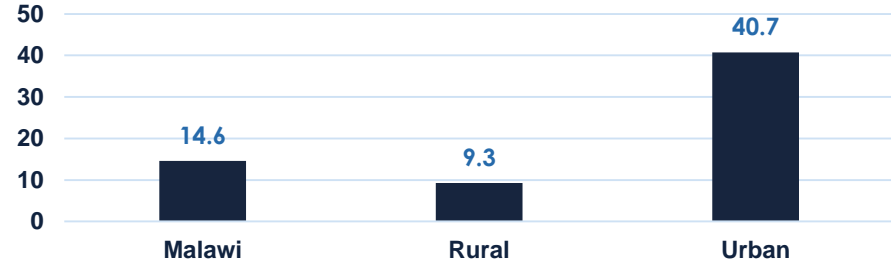
Negative: Monopoly of 2 companies

Status of Mobile Coverage

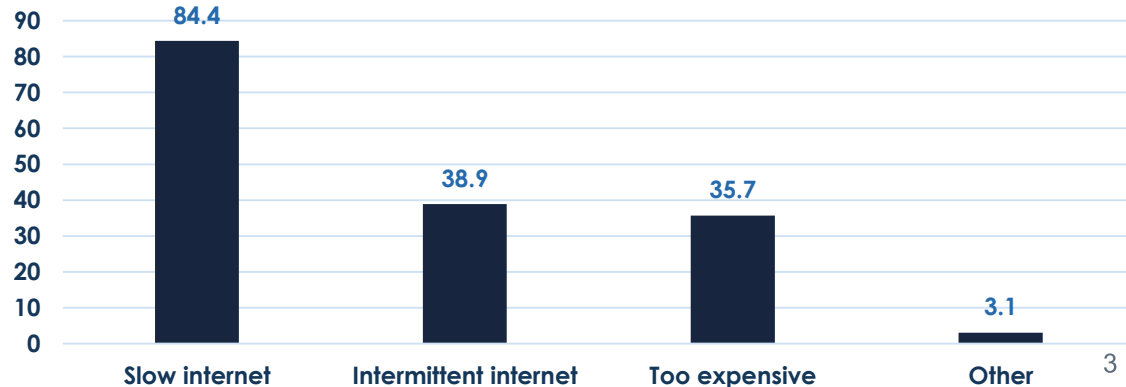
Consequences

- **Not affordable for most of the population**
 - e.g data bundle £1 - £5/GB
- **Slow rate of return on investment**
 - difficult for new entrants to roll out, risking breach of licence.
 - constrained investment in network performance improvement, QoS guarantee, network upgrade e.g to 5G

Proportion of individuals using the internet
(2019 NSO survey)



Proportion of individuals facing challenges when using internet services (2019 NSO survey)




5G Shared Spectrum for Private Networks?


New Business Models? New Use Cases? New Industries?


- **Leverage investments and Policies**
 - Shared infrastructure (neutral InP)
 - Shared spectrum
 - Regulatory incentives, e.g. Licence exemption
- **Industrial Networks**
 - Mining e.g. mostly in remote areas not covered by MNOs.
 - Agriculture e.g. low-power networks for security requirements of Cannabis farms.
- **Rural connectivity**
 - Community networks
 - Connecting schools – Covid pandemic is proof!
- **Upscale Existing IoT Applications**
 - Smart health care
 - Disaster early warning systems



Thank You

 <https://sdr.eee.strath.ac.uk/>

 <https://github.com/strath-sdr>

 [@StrathSDR](https://twitter.com/StrathSDR)

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