



Media release

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nbn sets 5G long-range transmission world record

Technology trial paves way for additional tool to optimise performance and customer experience on the nbn™ Fixed Wireless network

nbn has achieved a world record for long-range 5G transmission using mmWave as it develops new options to further optimise the performance and customer experience of the **nbn**™ Fixed Wireless network.

In live testing at an **nbn** proof of concept site near Mortlake, Victoria, **nbn** and its technology partners, Ericsson, Qualcomm Technologies Inc. and Casa Systems, achieved a stable 5G mmWave transmission of close to 1Gbps¹ at a distance of 7.3km, double the distance recorded at the site just three months ago, and a new record globally. **nbn** anticipates ongoing testing to demonstrate even longer range capability in the future².

nbn is exploring 5G technology operating in mmWave spectrum as part of its commitment to continually enhance customer experience and evolve the Fixed Wireless network for future needs. The network currently covers more than 620,000 premises across regional and rural Australia with more than 90% of customers currently within 7.3km of a Fixed Wireless cell.

Recognising the unique long-range requirements of the **nbn**™ Fixed Wireless network, the field measurements will provide development guidance for wireless technology suppliers, while helping **nbn** understand the most cost-effective, and spectrum-efficient ways to integrate 5G into its evolving network architecture.

nbn currently invests around \$200 million annually in measures to optimise the performance of the Fixed Wireless network within finite spectrum and resource limitations. Under initiatives already implemented, the Fixed Wireless network exhibits spectral efficiency levels above 4bps/Hz in the downlink and 1.6bps/Hz in the uplink, challenging global benchmarks of even the highest performing 4G networks. **nbn**'s own performance benchmarking shows that 99.9% of Fixed Wireless network cells and 100.0% of Fixed Wireless backhaul links are currently performing at or above their design thresholds.

nbn anticipates continued innovation and technology developments on the existing 4G platform to further enhance average and peak user speeds to complement a targeted 5G implementation in the future. Working with its technology partners, **nbn**'s current and ongoing optimisation initiatives include:

- Wider deployment of carrier aggregation to improve load balancing across available spectrum and enhance single user data rates.
- Introduction of advanced antenna technologies such as multi-beam wideband antennas, Massive MIMO, multi-user MIMO and coordinated multipoint transmission to improve spectrum

efficiency and reduce interference while driving down the cost per bit to accommodate greater traffic growth.

- Optimisation of end user radio conditions, actively balancing user profiles and reducing the average number of users per cell to achieve increased data rates for users. Following a 20% increase in the number of active cells in the last twelve months, there are currently 19 users per cell on average, a reduction from historical levels of around 60.
- Introduction of new high-capacity backhaul solutions, including increasing penetration of fibre and additional traffic engineering capability to improve uptime and reduce congestion.
- Increased deployment of advanced end user equipment for wider support of advanced radio features, enhancing individual user experience as well as increasing network spectral efficiency³.

NBN Co Chief Development Officer, Regional and Remote, Gavin Williams said: “The **nbn**[™] Fixed Wireless network plays a vital role connecting Australians right across regional and rural parts of the country. We face some unique challenges, not least vast distances and harsh environments, that have always required a strong focus on innovation. This long-range achievement is a very promising sign as we continue to develop our options to further improve performance and customer experience and plan to meet emerging demand on the network.”

NBN Co Chief Technology Officer, Ray Owen said: “This is a significant achievement for **nbn** and our technology partners, Ericsson, Qualcomm Technologies and Casa Systems, and we anticipate strong interest from the global technology community as we further develop these capabilities. With industry development for mmWave largely focussed on high-density urban environments, this trial helps prove the case for additional work to suit the unique requirements of the **nbn**[™] Fixed Wireless network and other regional and rural use-cases around the world.”

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Notes for editor:

1. Regardless of the retail service you purchase, the actual wholesale speeds will be less than 1000 Mbps due to equipment and network limitations. Your experience, including the speeds actually achieved over the **nbn**[™] network, depends on some factors outside our control (like your equipment quality, software, and how your service provider designs its network). [Speeds may also be impacted by the number of concurrent users on the **nbn**[™] Fixed Wireless network, including during busy periods.
2. These speeds were achieved in the context of a trial and are not necessarily reflective of the speeds that will be experienced by end customers.

3. Your experience, including the speeds actually achieved over the **nbn**[™] network, depends on the **nbn**[™] access network technology and configuration over which services are delivered to your premises, whether you are using the internet during the busy period, and some factors outside **nbn**'s control (like your equipment quality, software, broadband plan, signal reception and how your service provider designs its network). Speeds may also be impacted by the number of concurrent users on the **nbn**[™] Fixed Wireless network, including during busy periods.