RootMetrics®

Substantiation of speed, reliability, and 5G coverage claims across multiple UK metros

SUBSTANTIATION OF CLAIMS **Last Reviewed: 26/05/2022**

Claims:

Speed, reliability, and 5G coverage comparisons between EE and competitors in the following metros:

- **Belfast -** ***Based on H2 2021 results***
- **Liverpool -** ***Based on H2 2021 results***
- **Newcastle -** ***Based on H2 2021 results***
- **Leeds -** ***Based on H1 2022 results***
- **Glasgow -** ***Based on H1 2022 results***
- **Manchester -** ***Based on H1 2022 results***

Summary

EE's claim to be the most reliable and/or be fastest and/or have the most 5G coverage across the above metro areas is based on RootMetrics' extensive testing, which assesses reliability across a wide variety of call, text, and data tests using the latest devices and a geographically representative methodology. Metro-level test results are provided below for easy comparison of operator performance.

RootMetrics Awards

RootMetrics, an independent mobile analytics firm, publishes a series of reports, titled the UK RootScore® Report (the "RootScore Report"). The RootScore Report ranks the UK's four major mobile network operators ("MNOs") on a number of performance metrics, including "Network Reliability", "Network Speed", "Data Performance", "Network Accessibility," "Call Performance" and "Text Performance". The report also ranks MNOs on "Overall Performance".

In addition to testing across the nations, RootMetrics extensively tests 16 of the largest metropolitan areas (Eurostat 'Large Urban Zones' [LUZs]) within the UK. To provide objectivity, the boundaries of the areas we test for our RootScore Reports are defined by governments and official agencies—not by RootMetrics.

Why are these results robust?

RootMetrics uses scientific methodologies to design tests, measure activities, and collect data about mobile network performance that are representative of a consumer's mobile experience within a given market. RootMetrics then employs statistical techniques to verify and validate the results. This approach ensures all operators are measured on a level playing field, removes unintentional bias, and allows RootMetrics to provide actual, in-the-field data that confirms or challenges performance numbers that are otherwise only theoretical or based on ideal conditions. Weighting and stratification methods ensure that test data correctly represents the overall national population distribution.

We measure network reliability, accessibility, and speed performance across the activities that consumers use their smartphones for on a daily basis, like browsing webpages, using apps, making calls, and sending texts. Our methodology is designed to ensure that our tests measure performance across a wide range of real-world situations that consumers experience while using their smartphones on a daily basis. For example: we collect samples during periods of high and low

congestion; we measure performance across variations in speed, from standing still to driving on the highway; and we perform tests whether coverage is poor or excellent or somewhere in between. We test each network head-to-head in these situations to make comparisons easy and assure all networks are measured on a level playing field.

Methodological Facts from RootMetrics' UK tests conducted between July and December 2021:

650,000 tests performed

25,000 miles driven

4 nations visited

16 of the largest metropolitan areas (Eurostat 'Large Urban Zones' [LUZs]) included

Reliability and downlink testing

The RootMetrics Network Reliability category provides a holistic look at reliability performance across data, call, and text testing. The reliability category addresses the two questions most fundamental to a reliable mobile experience for consumers: can I access the network and can I then stay connected to complete my intended task?

To answer these critical questions, RootMetrics assesses performance across the following key areas:

	Reliability
Call	• Mobile-to-mobile blocked outgoing call • Mobile-to-mobile dropped outgoing call
Data	• Lite data (web/app) access success • Lite data (web/app) task success • Lite data (web/app) secure access success • Lite data (web/app) secure task success • Download/upload access success • Download/upload task success
Text	• Intra/inter-network text send failure rate • Intra/inter-network text receive failure rate

To evaluate downlink throughput performance, the RootMetrics testing application attempts to open and maintain 4 simultaneous HTTP connections to measure the total bytes transferred during the test period. Downlink throughput speed is measured during this testing.

Speed, reliability, and 5G coverage comparisons

The tables below provides key H2 2021 scoring and download throughput comparisons across metros in which EE has made reliability, speed, or 5G coverage claims. Links to associated RootScore Reports are as follows:

Belfast RootScore® Report October 2021
Glasgow RootScore® Report March 2022
Leeds RootScore® Report March 2022
Liverpool RootScore® Report November 2021
Manchester RootScore® Report April 2022
Newcastle RootScore® Report November 2021

Market	EE 5G% coverage	O2 5G% coverage	Three 5G% coverage	Vodafone 5G% coverage
Belfast - H2 2021	31.4%	29.3%	13.8%	26.9%
Glasgow - H1 2022	40.7%	18.5%	37.5%	28.9%
Leeds - H1 2022	40.5%	41.5%	51.6%	16.7%
Liverpool - H2 2021	38.4%	30.2%	22.5%	47.6%
Manchester - H1 2022	50.7%	30.9%	52.9%	40.0%
Newcastle - H2 2021	36.8%	40.5%	23.5%	28.6%

Market	EE Reliability RootScore	O2 Reliability RootScore	Three Reliability RootScore	Vodafone Reliability RootScore
Belfast - H2 2021	99.3	97.4	97.3	98.0
Glasgow - H1 2022	99.5	98.0	97.5	98.9
Leeds - H1 2022	99.4	98.7	98.0	97.8
Liverpool - H2 2021	99.7	99.0	98.5	99.5
Manchester - H1 2022	99.6	97.3	98.7	99.0
Newcastle - H2 2021	99.3	99.3	96.7	99.0

Market	EE median download speed (Mbps)	O2 median download speed (Mbps)	Three median download speed (Mbps)	Vodafone median download speed (Mbps)
Belfast - H2 2021	84.9	21.7	14.5	44.8
Glasgow - H1 2022	84.5	9.99	40.9	29.9
Leeds - H1 2022	77.5	22.0	48.9	19.7
Liverpool - H2 2021	96.3	23.6	33.4	70.7
Manchester - H1 2022	89.6	13.3	48.0	41.6
Newcastle - H2 2021	79.3	39.6	26.4	38.3