An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Mobile and Wireless Broadband licences: annual compliance report for the period July 2024 to June 2025

Information Notice

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1 Introduction

1.1 This document sets out the Commission for Communications Regulation's ('ComReg') annual compliance report assessing compliance by licensees with their respective mobile and wireless broadband ('MWBB') licence obligations that applied during the period July 2024 to June 2025 (the 'Reporting Period') where, in summary, **ComReg assesses that licensees complied with their respective current coverage[1] and base station rollout MWBB licence obligations for the Reporting Period**.

1.2 There are four different types of MWBB licences, being the:

- 3G Licence & 2.1 GHz Band Liberalised Use Licence (the '2.1 GHz Band Licence');
- MBSA1 Liberalised Use Licences (the 'MBSA1 Licences');
- 3.6 GHz Band Liberalised Use Licences (the '3.6 GHz Band Licences'); and
- MBSA2 Liberalised Use Licences (the 'MBSA2 Licences').

1.3 There are four licensees holding one or more MWBB licences, being:

- Eircom Limited ('Eir');
- Imagine Communications Ireland Limited ('Imagine');
- Three Ireland (Hutchison) Limited ('Three'); and
- Vodafone Ireland Limited ('Vodafone').

1.4 In Ireland, MWBB licences are important radio spectrum licences and are used to provide:

[1] The current coverage obligations are a 70% population obligation in the MBSA1 licences and an 83% population obligation in the 3G and 2.1 GHz Band Licence. The coverage obligations of the MBSA2 licences do not fall due until Q1 2026 (i.e. next year's reporting period) and are therefore not assessed for this Reporting Period. Instead ComReg provides observations as set out in Chapter 3 of this document.

- mobile broadband, mobile voice and text services and machine-to-machine (M2M) services to the 10,732,236 mobile subscriptions[2] in Ireland; and

- some Fixed Wireless Access ('FWA') broadband services.

1.5 Each MWBB licence provides rights of use to different radio spectrum assignments, and has distinct coverage, base station rollout and/or Quality of Service ('QoS') obligations - that were set in advance of licence issue - and which reflect, among other things, the technology capabilities, regulatory framework and national objectives at that time[3]. That said, and generally speaking, such licence obligations are typically designed to ensure optimal, effective and efficient use of radio spectrum, including by providing quality services to end users.

1.6 One of ComReg's duties in carrying out its function of managing the radio spectrum for electronic communications services is to monitor and supervise compliance with rights of use for radio spectrum, and the obligation to use radio spectrum effectively and efficiently (in accordance with Regulations 27(1) and 29 of the European Union (Electronic Communications Code) Regulations 2022 (S.I. No 444 of 2022) ('ECC Regulations')).[4]

1.7 In summary, ComReg assesses that licensees complied with their respective current coverage and base station rollout MWBB licence obligations for the for the Reporting Period (July 2024 to June 2025). This is summarised in greater detail at Chapter 6.

1.8 In carrying out this duty it is important to note that ComReg's approach to assessing licence compliance is constantly evolving, as technology developments frequently emerge in relation to both the services provided by licensees[5] and the relevant measurement standards or assessment tools

[2] ComReg Document 25/86, "*Irish Communications Market, Summary: Quarterly Key Data Report - Data as of Q3 2025"* published 11/12/2025. This figure consists of 394,084 mobile broadband ('MBB') subscriptions, 4,276,911 Machine to Machine ('M2M') subscriptions and 6,061,241 mobile voice subscriptions.

[3] For example, the MBSA2 Licence obligations set in 2020 (see ComReg Document 20/122) include obligations for a 30 Mbit/s download service (single user throughput at cell edge), which is 100 times faster than the 384 kbit/s download obligation in the 3G Licences which were set in early 2000/2001 (see ComReg Documents 00/92 and 01/96) and reflected the capabilities of the 3G technology at that time.

[4] Regulation 105 of ECC Regulations.

[5] For example, mobile voice calls are now provided with "*4G Calling*" or Voice over LTE ('VoLTE') – see Section 5.2 of this document for further information.

available[6]. At times, this necessitates the collection of further information and/or consultation with licensees before a full assessment can be made, and it may also require ComReg to provide further specifications on how to measure an obligation.

1.1 Structure of document

1.9 This document is structured as follows:

- Chapter 2 provides an overview of the licence obligations in the MWBB licences;
- Chapter 3 sets out ComReg's assessment and observations in relation to the coverage obligations;
- Chapter 4 sets out ComReg's assessment and observations in relation to the base station rollout obligations;
- Chapter 5 sets out ComReg's assessment and observations in relation to the QoS obligations; and
- Chapter 6 summarises ComReg's assessment of licensees' compliance with their MWBB licence obligations for the Reporting Period.

[6] For example, radio planning tools are now considered the key component to assessing coverage as opposed to drive test measurements used previously. A key factor in this evolution is work carried out in relation to ComReg's Outdoor Mobile Coverage Map (https://coveragemap.comreg.ie/map/), where mobile network information is regularly provided to ComReg and radio planning tools are used to predict outdoor mobile coverage.

2 Overview of licence obligations in the MWBB licence types

2.1 This chapter sets out background information on each of the MWBB licence types, including an overview of the coverage, base station rollout and/or QoS licence conditions in each.

2.1 3G Licence & 2.1 GHz Band Licence

2.2 Eir holds a 3G Licence (L3G1004) and a 2.1 GHz Band Licence (21L1004), both of which expire on 11 March 2027[7].

2.3 These licences provide rights of use for spectrum in the 2.1 GHz band where the:

- 3G Licence[8] is for 3G technology use only; and
- 2.1 GHz Band Licence[9] is a technology- and service-neutral licence meaning that it can be used to provide services with any compatible technology (e.g. 3G, 4G, 5G, etc).

2.4 Both licences contain an 83% population **coverage obligation** and related reporting obligation (see further details in Appendix 1).

2.5 In its most recent assessment of mobile network operators' compliance with their licence obligations (ComReg Document 23/45)[10], ComReg stated, in relation to assessing Eir's coverage obligation, that:

> *"…the combined coverage of all technologies deployed in the 2100 MHz band would be the more appropriate basis";* and
>
> "*the appropriate metrics for assessing compliance in the 2100 MHz band should be informed by a consideration of all relevant information available to ComReg*". (emphasis added)

[7] Previously Three and Vodafone also held a 3G Licence & a 2.1 GHz Band Licence. These licences expired in 2022.
[8] In 2002 and 2007, following 3G licence competitions, four 3G Licences were issued for spectrum rights in the 2.1 GHz band each for a 20-year period. These licences were issued under the 3G Licensing Framework of S.I 345 of 2002, as amended by S.I. 340 of 2003.
[9] Between 2021 and 2023, a 2.1 GHz Band Licence was issued to each of the 3G licensees. These licences were issued under the licensing framework of S.I. 265 of 2021.
[10] ComReg Document 23/45, *"Assessment of Mobile Network Operators' Compliance with Licence Obligations (Coverage), Winter 2023",* 10 March 2023

2.2 MBSA1 Licences

2.6 Eir (MLU1004), Three (MLU1001 and MLU1003) and Vodafone (MLU1002) each hold a MBSA1 Licence[11], with all licences expiring on 12 July 2030.

2.7 These licences provide rights of use for spectrum in the 800 MHz, 900 MHz and 1800 MHz bands, and are technology- and service-neutral - meaning that they can be used to provide services with any compatible technology (e.g. 2G, 3G, 4G, 5G, etc.).

2.8 Each MBSA1 Licence contains:

- a 70% population **coverage obligation** and related reporting obligations (see detail in Appendix 1); and
- **QoS obligations** in relation to network availability and minimum voice call standards and a reporting on QoS obligation (see detail in Appendix 3).

2.3 3.6 GHz Band Licences

2.9 Eir (3L1001), Imagine (3L1004), Three (3L1003) and Vodafone (3L1002) each hold a 3.6 GHz Band Licence[12], with all licences expiring on 31 July 2032.

2.10 These licences provide rights of use for spectrum in the 3.6 GHz band and are technology- and service-neutral – meaning that they can be used to provide mobile and fixed wireless broadband services with technologies compatible with the relevant European harmonisation decisions (i.e. 4G and 5G technologies).

2.11 Spectrum rights for the 3.6 GHz band were issued for nine regions - five urban and four rural[13].

2.12 The 3.6 GHz Licences contain:

[11] In 2013, following the Multi-Band Spectrum Award of 2012 ('MBSA1'), four MBSA1 Licences were issued under the MBSA1 Liberalised Use Licensing Framework of S.I 251 of 2012 as amended by S.I 380 of 2024. Following the acquisition of Telefonica O2 in 2014, Three now holds two MBSA1 licences.

[12] In 2017, following the 3.6 GHz Band Award, five 3.6 GHz Band Licences were issued under the 3.6 GHz Band Licensing Framework of S.I 532 of 2016. In 2024, Dense Air surrendered its licence with effect from 31 July 2024.

[13] The five urban regions are the cities and suburbs of Dublin, Cork, Limerick, Galway and Waterford. The four rural regions are the Borders Midlands and West, the South-West, the East and the South-East.

- **Base station rollout obligations** per licensee and per region, and related reporting obligations (see detail in Appendix 2); and
- **QoS obligations** in relation to network availability and minimum voice call standards and a reporting on QoS obligation (see detail in Appendix 3).

2.4 MBSA2 Licences

2.13 Eir (LU1006), Imagine (LU1005), Three (LU1007) and Vodafone (LU1008) each hold a MBSA2 Licence[14], with all licences expiring on 13 February 2042.

2.14 These licences provide rights of use for spectrum in the 700 MHz, 2.1 GHz, 2.3 GHz, 2.6 GHz FDD[15] and 2.6 GHz TDD[16] bands, and are technology- and service-neutral meaning that they can be used to provide mobile and fixed wireless broadband services with technologies compatible with relevant European harmonisation decisions (e.g. 2G, 3G, 4G, 5G, etc.).

2.15 The MBSA2 Licences contain **coverage obligations** and related reporting obligations as detailed in Appendix 1, which, in summary, oblige licensees with 700 MHz rights (i.e. Eir, Three and Vodafone) to:

(i) achieve and maintain the general outdoor mobile coverage obligation, where the first milestone to be achieved is in 2026, i.e. the next reporting period (see detail in Appendix 1);

(ii) achieve and maintain the outdoor coverage obligation for specific locations for a 30 Mbit/s mobile service (Single User Throughput Cell Edge – "SUTP")[17] where the first milestone to be achieved is in 2026, i.e. the next reporting period (see detail in Appendix 1); and

(iii) deploy Native Wi-Fi[18] technology and make available Native Wi-Fi voice and/or text services to all end users within 2 years (i.e. in 2025).

2.16 All MBSA2 licensees have a **base station rollout obligation** and related

[14] In 2023, following the MBSA2 Award, four MBSA2 Licences were issued under the MBSA2 Liberalised Use Licensing framework of S.I. 264 of 2021 as amended by S.I. 483 of 2022 and S.I. 594 of 2023.

[15] Frequency Division Duplexing (FDD).

[16] Time Division Duplexing (TDD).

[17] Single user throughput cell edge ('SUTP') means the downlink bit rate that can be successfully delivered to a single active user per cell at a particular depth and consistency of coverage. This is the downlink bit rate or download speed that a user could experience when not contending with other users for service in that cell, so that the cell delivers the maximum possible data rate to a single user consistent with the signal quality experienced by that use.

[18] Native Wi-Fi means a technology which allows mobile phone calls and texts to be made on a device utilising a Wi-Fi connection rather than through the mobile network directly

reporting obligations where this obligation is to be achieved in 2027 (see detail in Appendix 2).

2.17 All MBSA2 Licences have **QoS obligations** and related reporting obligations (see detail in Appendix 3), which obliges the licensee to:

- meet network availability and minimum voice call standards; and
- deploy and maintain Voice over LTE ('VoLTE')[19] technology across 100% of its LTE (Long Term Evolution or 4G) Base Stations within 2 years (i.e. 2025), where the licensee has deployed LTE and provides a mobile voice service.

[19] VoLTE means voice over LTE which is a managed voice service that benefits from prioritisation over other traffic.

3 Coverage Obligations

3.1 The MWBB licences of Eir, Three and Vodafone (i.e. the Mobile Network Operators ('MNOs')) each have coverage obligations and reporting on coverage obligations as detailed in Appendix 1 of this document.

3.2 This chapter sets out:

(a) ComReg's assessment of licensees' compliance with the coverage obligations that were to be achieved or maintained in the Reporting Period, i.e.:

(i) the MBSA1 coverage obligation;

(ii) the 3G Licence & 2.1 GHz Band Licence coverage obligation; and

(iii) the MBSA2 Native Wi-Fi obligation; and

(b) ComReg's observations on licensees' progress towards meeting the coverage obligations that are to be achieved in the future, i.e.:

(i) the MBSA2 outdoor mobile coverage obligations (both general and specific locations).

3.1 Background information

3.1.1 ComReg's outdoor mobile coverage map

3.3 Periodically, ComReg collects information from the MNOs on their network deployments and uses this information to independently predict their outdoor mobile coverage on a map for that point in time. This coverage map is displayed on "ComReg's Outdoor Mobile Coverage Map" tool[20].

3.4 The MNOs' outdoor mobile coverage is predicted for all the technologies deployed (i.e. 2G, 3G, 4G and 5G)[21], and the predicted outdoor mobile coverage level is presented in terms of four levels: "Very Good", "Good", "Fair" and "Fringe", with areas of no coverage being blank.

Outdoor mobile coverage maps (as of Q2 2025)

3.5 Set out below are screenshots from ComReg's outdoor mobile coverage map

[20] https://coveragemap.comreg.ie/map

[21] The outdoor mobile coverage maps for each mobile technology (i.e. 4G, 5G etc.) are aggregate coverage maps based on the sum of the coverage for each frequency band used by the MNO for that technology. For example, the 4G coverage map for an MNO is likely to comprise of the sum of its 4G coverage on many frequency bands (e.g. 800 MHz, 1800 MHz, 2.1 GHz etc.).

tool for each the three MNOs using information collected by May 2025.

3.6 These screenshots indicate that:

- the MNOs are providing nationwide coverage for the 2G, 3G (except for Vodafone which has switched off its 3G network), 4G and 5G technologies; and
- the extent of this coverage varies between MNOs and between technologies, with, for example, the extent of 5G coverage tending to be at a lower level than 4G coverage.

Technology	Eir	Three	Vodafone
2G			
3G			Vodafone switched off 3G in October 2024

Technology	Eir	Three	Vodafone
4G			
5G			

3.1.2 Coverage information on MNOs' websites

3.7 On the MNOs' websites, each MNO provides information on the extent of its mobile coverage as outlined below.

Eir

3.8 On Eir's website[22], it states that it provides 2G, 3G, 4G and 5G services and that it has "***99% 5G and 99.9% 4G population coverage***".

Three

3.9 On Three's website[23], it states that it provides 2G, 3G, 4G and 5G services and that "*Three has **99% 4G coverage** throughout Ireland, and we now have over*

[22] https://www.eir.ie/ourmobilenetwork/ (accessed 12 January 2026)
[23] https://www.three.ie/support/coverage-checker.html (accessed 12 January 2026)

90% 5G population coverage."

3.10 Additionally, in a media release of January 2025, Three stated that its network has over **92% 5G population coverage**.[24]

Vodafone

3.11 On Vodafone's website[25], it states that it provides 2G, 4G and 5G services and that its network provides "Up to **99% population coverage for Voice, Data and Text**" and "More than **90% 4G coverage in every county**".

3.2 MBSA2 Outdoor Mobile Coverage Obligations

3.2.1 Summary of obligations

3.12 There are two separate outdoor mobile coverage obligations in the MBSA2 Licences, being:

(i) a **general outdoor mobile coverage obligation** as set out in Table 1 below, with the first milestone, the 3-year obligation, due in 2026; and

(ii) an **outdoor coverage obligation for specific locations** as set out in Table 2 below, with the first milestone, the 3-year obligation, also due in 2026.

3.13 The milestone dates in the above obligations are set with reference to the earliest commencement date of 700 MHz spectrum rights for the licensee, meaning that Three has different milestone dates compared to Eir and Vodafone:

- Three's earliest commencement date of its 700 MHz spectrum rights was 26 January 2023 meaning that **Three is obliged to meet its 3-year outdoor mobile coverage obligations by 26 January 2026**; and
- Eir's and Vodafone's earliest commencement date of 700 MHz spectrum rights was 1 April 2023, **meaning that they are obliged to meet their 3-year outdoor mobile coverage obligations by 1 April 2026**.

[24] https://www.three.ie/corporate/media-centre/three-achieves-fastest-mobile-network-in-ireland-for-the-fifth-year-in-a-row.html (published, 9 January 2025)
[25] https://www.vodafone.ie/about-us/vodafone-network (accessed 12 January 2026)

Table 1: MBSA2 general outdoor coverage obligation

Outdoor coverage service (SUTP)	**Coverage dimension**	**Coverage % levels to be met in[26]:**		
		3 Years (i.e. 2026)	**5 Years** (i.e. 2028)	**7 Years** (i.e. 2030)
30 Mbit/s	Population	85%	92%	95%
30 Mbit/s	Motorways	75%	85%	90%
30 Mbit/s	Primary Roads	60%	75%	80%
3 Mbit/s	Population	99%	99%	99%
3 Mbit/s	Geographic area	90%	91%	92%

Table 2: MBSA2 outdoor coverage obligation for specific locations for a 30 Mbit/s mobile service (SUTP)

Specific Locations (as particularised in the MBSA2 Information Memorandum[27])	**Coverage % levels and milestones[28]**		
	3 Years (i.e. 2026)	**5 Years** (i.e. 2028)	**7 Years** (i.e. 2030)
Business and technology parks 31 Business and Technology Parks and 9 Strategic Sites.	70%	90%	100%
Hospitals 48 public and 17 private hospitals;	70%	90%	100%
Higher education campuses 8 Universities, 11 Institutes of Technology and 5 other colleges;	70%	90%	100%
Air and sea ports 7 main airports and 7 passenger sea-ports;	70%	90%	100%
Train and bus stations The busiest 144 train stations and 16 main bus stations;	70%	90%	100%
Top visitor attraction information points The top 21 fee charging and 21 free entry visitor attractions	70%	90%	100%

[26] This is from the earliest commencement date of the 700 MHz Duplex Block(s) for the licensee. Three's 700 MHz rights commenced on 26 January 2023, while Eir and Vodafone's 700 MHz spectrum rights commenced on 2 April 2023.

[27] ComReg Document 21/40, *"Multi Band Spectrum Award – Information Memorandum and Draft Regulations The 700 MHz Duplex, 2.1 GHz, 2.3 GHz and 2.6 GHz Bands"*, published 16 April 2020

[28] This is from the earliest commencement date of the 700 MHz Duplex Block(s) for the licensee. Three's 700 MHz rights commenced on 26 January 2023, while Eir and Vodafone's 700 MHz spectrum rights commenced on 2 April 2023.

3.2.2 MNOs' submissions

Background

3.14 Every twelve months, each of the relevant MBSA2 licensees (i.e. the MNOs) are obliged to measure and assess their outdoor mobile coverage and submit an MBSA2 Coverage Compliance Report to ComReg within 30 days of the licence commencement anniversary of their licence.

3.15 Noting that 20 January 2025 was the second anniversary of the commencement of the MBSA2 Licences, and that the 3-year outdoor mobile obligations are due to be achieved by 2026, ComReg wrote to the MNOs in January 2025 seeking the submission of their 2025 MBSA2 Annual Licence Compliance Report.

3.16 An important objective for ComReg in respect of assessing MBSA2 coverage obligations in this Reporting Period was to establish the process for assessing coverage and provide sufficient time to consider and address the MNOs' queries in advance of next year's reporting when the 3-year milestone is to be achieved.

3.17 Between February and June 2025, ComReg had considerable engagement with each of the MNOs in relation to the 2025 MBSA2 Coverage assessments, during which varying aspects of the reporting process and common measurement parameters and files were clarified, and information was obtained on the main operator-specific measurement parameters and files. This enhanced the accuracy and consistency of each MNO's assessment and helped inform ComReg's consideration of each MNO's coverage assessment and whether further details would need to be specified by ComReg in future reporting.

Common measurement parameters and files

3.18 Prior to the MNOs assessing their outdoor mobile coverage, and to enhance the accuracy and consistency of assessment, ComReg provided information on several key parameters to use in the MNOs' coverage assessments and common files on population and geographic areas.

3.19 In relation to the key parameters, and in line with the measuring and monitoring information as set out in the MBSA2 Licences, ComReg noted that:

- the coverage predictions of network planning tools, supported by field measurements - which may include drive tests where appropriate - would be the key component in assessing outdoor mobile coverage;
- all spectrum rights of use held by the licensee (e.g. 700 MHz, 800 MHz, etc.) could be used to meet its coverage obligation;

- the MNOs needed to report LTE (i.e. 4G) coverage for this Reporting Period[29]; and
- for LTE coverage, a Reference Signal Received Power ('RSRP') metric is to be used as a proxy for determining coverage levels, where:
  - 30 Mbit/s (SUTP) LTE coverage requires an RSRP level of -103 dBm for one 2 x 10 MHz carrier and -108 dBm for two-band carrier aggregation; and
  - 3 Mbit/s (SUTP) LTE coverage requires an RSRP level of -112 dBm for one 2 x 10 MHz carrier and -114 dBm for two-band carrier aggregation.

3.20 The common files provided to the MNOs by ComReg were:

- Population file;
- Geographic area of the State file;
- Motorways file;
- Primary Roads file; and
- the Specific Locations Boundary files[30].

Operator-specific measurement parameters and files

3.21 In addition, in carrying out their assessments, the MNOs used various operator-specific parameters and files[31] as detailed in Table 3 below, where:

(a) **Technology** refers to the technology used to assess outdoor mobile coverage:

[29] While the coverage obligation can be met with any technology, 4G coverage information was collected for this Reporting Period. This approach was deemed appropriate as the methodology for determining 4G coverage is established in the licence conditions and based on public information on coverage (see Section 3.1) the MNOs' 4G coverage is currently greater than their 5G coverage. For future reporting, ComReg may also request 5G coverage information.

[30] Note while an earlier version of this dataset was provided on ComReg MBSA2 webpage in 2019, this updated version had minor adjustments made to the Specific Locations Boundary Files to make it more suitable for efficient reporting and processing.

[31] The MBSA2 licences do not specify all the details of the files, parameters and models to be used in the coverage assessments. However, these details are important as they influence the outcome on any coverage assessment. To gain insights on the accuracy of each MNOs' coverage assessment and to understand their consistency with each other and with ComReg (see Appendix 4 for the parameters used in ComReg's coverage assessment) ComReg collected information on these details in this Reporting Period.
This can be particularly important to (i) inform ComReg's assessment on an MNO's compliance where the MNO's coverage assessment is close to the obligation level; and (ii) inform any further ComReg specifications needed to assess specific coverage obligations (e.g. in this Reporting Period it appears that specifying a minimum resolution may be necessary for future reporting in order to assess the coverage of specific locations)

- For this assessment all MNOs used LTE technology. This may change in future assessments should, for example, 5G coverage become more widespread than 4G coverage.

(b) **Band(s) used in assessment** refers to the frequency bands used in the coverage assessment. As LTE coverage is provided by multiple frequency bands, licensees could choose to base their assessment on one or more frequency bands:

- For this assessment, one MNO chose to base its coverage assessment on a single frequency band, while the other two MNOs chose to base their coverage assessment on the carrier-aggregated coverage of two frequency bands.

(c) **Carrier aggregation methodology** refers to the methodology used for calculating coverage based on the carrier aggregation of coverage for two or more frequency bands. While the MBSA2 Licences set out the specific RSRP levels to be used for carrier aggregation, there are different methodologies to calculate this:

- For this assessment, two different methodologies were used. The first was to calculate the coverage of each frequency layer separately and then sum them together. The second was to calculate the coverage for one frequency layer and make appropriate power adjustments for sites which have two 2 x 10 MHz LTE carriers using sub-1 GHz frequency bands (e.g. in the 700 MHz and 800 MHz bands).

(d) **Date of network** refers to the date used for taking a snapshot of the MNO's network for assessing coverage.

(e) **Number of sites per frequency band** refers to the number of sites per technology and frequency band used for assessing coverage.

(f) **Propagation model** refers to the mathematical model used by the licensee to predict how radio signals, or electromagnetic waves, travel through a specific environment, including factors such as path loss, signal attenuation, and multipath effects. These models help determine the signal strength (i.e. coverage) at specific locations.

(g) **Clutter** refers to data used in a modelling tool for quantifying how physical objects, such as buildings and vegetation, affect radio signal propagation and cause signal loss, which in turn impacts coverage:

- For this assessment, each MNO used somewhat different clutter data (e.g. 2D or 3D clutter of varying resolutions depending on location, urban, town etc.)

(h) **Resolution** refers to the level of detail or granularity (e.g. 10m, 50m etc.) at which a network's coverage is assessed:

- For this assessment, somewhat different resolution levels (5-50m) were used by the MNOs.

Table 3: Operator-specific parameters used in MBSA2 coverage assessment [✂PARTIALLY REDACTED✂]

	Eir	Three	Vodafone
Technology	LTE	LTE	LTE
Band(s) used in assessment	700	700/800	700/800
Methodology for Carrier aggregation	30 Mbit/s: neg103 dBm 3 Mbit/s: neg112 dBm	30/3 Mbit/s: neg103/112dBm for L800 only sites 30/3 Mbit/s: neg108/114 dBm for sites with L700 and L800 carrier aggregation	30/3 Mbit/s: neg 103/112 dBm with EPRE increases of 5/2dB dB for 1674 sites with L700 and L800 carrier aggregation
Date of network	26-Feb 2025	15-Apr-2025	06-Mar-2025
Sites / Transmitters	[redacted]	[redacted]	[redacted]
Propagation Model	[redacted]	[redacted]	[redacted]
Clutter	[redacted]	[redacted]	[redacted]
Resolution	[redacted]	[redacted]	[redacted]

(i) MBSA2 general outdoor mobile coverage

3.22 Table 4 below sets out information on the MNOs' outdoor mobile coverage assessments for each of the five elements of the MBSA2 general outdoor mobile coverage obligation.

3.23 From the MNOs' submissions, all MNOs reported coverage levels that already meet or exceed their 3-year obligations for the following four elements of the MBSA2 general outdoor mobile coverage obligation:

- 30 Mbit/s SUTP to 85% of the Population;
- 30 Mbit/s SUTP to 75% of the Motorways;
- 30 Mbit/s SUTP to 60% of the Primary Roads; and
- 3 Mbit/s SUTP to 90% of the Geographic area of the State.

3.24 For the 3-year 3 Mbit/s SUTP obligation to 99% of the Population, one MNO submitted that its coverage levels exceeded this obligation, while two MNOs submitted that their coverage levels were close to but slightly below the 3-year obligation.

Table 4: MBSA2 general outdoor mobile coverage obligation - MNOs' assessment [✂PARTIALLY REDACTED✂]

Outdoor coverage service (SUTP)	**Coverage dimension**	**3 Years** (i.e. 2026)	**Eir**	**Three**	**Vodafone**
30 Mbit/s	Population	85%	>85% [redacted]	>85% [redacted]	>85% [redacted]
30 Mbit/s	Motorways	75%	>75% [redacted]	>75% [redacted]	>75% [redacted]
30 Mbit/s	Primary Roads	60%	>60% [redacted]	>60% [redacted]	>60% [redacted]
3 Mbit/s	Population	99%	>99% [redacted]	<99% [redacted]	<99% [redacted]
3 Mbit/s	Geographic area	90%	>90% [redacted]	>90% [redacted]	>90% [redacted]

(ii) MBSA2 specific location outdoor mobile coverage

3.25 Table 5 below sets outs information on the MNOs' outdoor mobile coverage assessments for each of the six categories of the MBSA2 specific location outdoor mobile coverage obligation.

3.26 From the MNOs' submissions, all MNOs reported outdoor coverage levels that already meet or exceed their 3-year obligations for each of the specific locations categories:

- Business and Technology Parks: ≥ 70% coverage.
- Hospitals: ≥ 70% coverage.
- Higher Education Campuses: ≥ 70% coverage.
- Air and Sea ports: ≥ 70% coverage.
- Train and Bus stations: ≥ 70% coverage.
- Top Visitor Attraction Information Points: ≥ 70% coverage.

Table 5: MBSA2 specific location outdoor mobile coverage (30 Mbit/s SUTP) - MNOs' assessment
[✂PARTIALLY REDACTED✂]

Specific Locations Categories (as particularised in the MBSA2 Information Memorandum[32])	**3 Years (i.e. 2026)**	**Eir**	**Three[33]**	**Vodafone**
Business and technology parks 31 Business and Technology Parks and 9 Strategic Sites.	70%	>70% [redacted]	>70%	>70% [redacted]
Hospitals 48 public and 17 private hospitals;	70%	>70% [redacted]	>70%	>70% [redacted]
Higher education campuses 8 Universities, 11 Institutes of Technology and 5 other colleges;	70%	>70% [redacted]	>70%	>70% [redacted]
Air and sea ports 7 main airports and 7 passenger sea ports;	70%	>70% [redacted]	>70%	>70% [redacted]
Train and bus stations The busiest 144 train stations and 16 main bus stations;	70%	>70% [redacted]	>70%	>70% [redacted]
Top visitor attraction information points The top 21 fee charging and 21 free entry visitor attractions	70%	>70% [redacted]	>70%	>70% [redacted]

3.2.3 ComReg's observations

3.27 As the 3-year milestone for the MBSA2 outdoor mobile coverage obligations does not fall due until 2026 (i.e. next year's reporting period), **ComReg does not assess compliance with these obligations for this Reporting Period** but instead provides the following observations.

(i) Process, assessment files and parameters

3.28 In relation to the reporting process and the parameters and files used in the MNOs assessments, while considerable progress has been made this year in bedding down the process and resolving queries, ComReg observes that some further improvements can be made for next year's process with a view to

[32] ComReg Document 21/40, *"Multi Band Spectrum Award – Information Memorandum and Draft Regulations The 700 MHz Duplex, 2.1 GHz, 2.3 GHz and 2.6 GHz Bands"*, published 16 April 2020

[33] In Three's submission, the calculation of its coverage for each specific location category did not work as expected given factors including the resolution used in the assessment. However, based on Three's calculation of coverage for each of the 345 specific location areas, ComReg assesses that it has greater than 70% outdoor mobile coverage in each category.

obtaining greater consistency between the MNOs' assessments (e.g. as far as possible using the same resolution) and with ComReg's own analysis[34] (e.g. using the same network information).

(ii) MNOs' progress towards their 3-year milestones

3.29 According to their own assessments, each MNO is currently meeting all elements of the 3-year MBSA2 outdoor mobile coverage obligations (both general and specific locations), except for the 99% Population 3 Mbit/s SUTP obligation where two of the MNOs stated that while they are close to the obligation they have not yet achieved the 99% Population level.[35]

3.3 MBSA1 Coverage Obligation

3.3.1 Summary of obligation

3.30 MBSA1 licensees (i.e. Eir, Three and Vodafone) are obliged to achieve 70% population coverage using spectrum in the 800 MHz, 900 MHz, 1800 MHz and/or 2100 MHz bands (as further detailed in Appendix 1).

3.3.2 Relevant information

3.31 For this Reporting Period, ComReg did not consider it necessary to request the MNOs to provide an annual compliance report on MBSA1 coverage[36] because:

(i) the public information on coverage as set out in Section 3.1 above, indicates that each MNO has nationwide networks with population coverage much greater than 70% population level;

(ii) the MNOs' submissions for their MBSA2 outdoor mobile coverage obligations indicates that each MNO has greater than 85% population coverage for a 30 Mbit/s SUTP; and

(iii) ComReg's own analysis[37] of each MNO's LTE coverage for the 800 MHz band (as depicted in Figure 1 below) indicates that each licensee's coverage is well in excess of the 70% population obligation.

[34] ComReg's analysis is based on the MNOs' network information submitted for the outdoor mobile coverage map and other files and parameters as outlined in Appendix 4.
[35] Based on available information, ComReg would expect these MNOs to achieve the 3 Mbit/s 99% Population level in the next reporting year.
[36] As detailed in Appendix 1, the MBSA1 licences oblige the licensees to assess their coverage and provide an annual compliance report to ComReg every twelve months.
[37] ComReg's analysis is based on the MNOs network information submitted for the outdoor mobile coverage map and other files and parameters as outlined in Appendix 4.

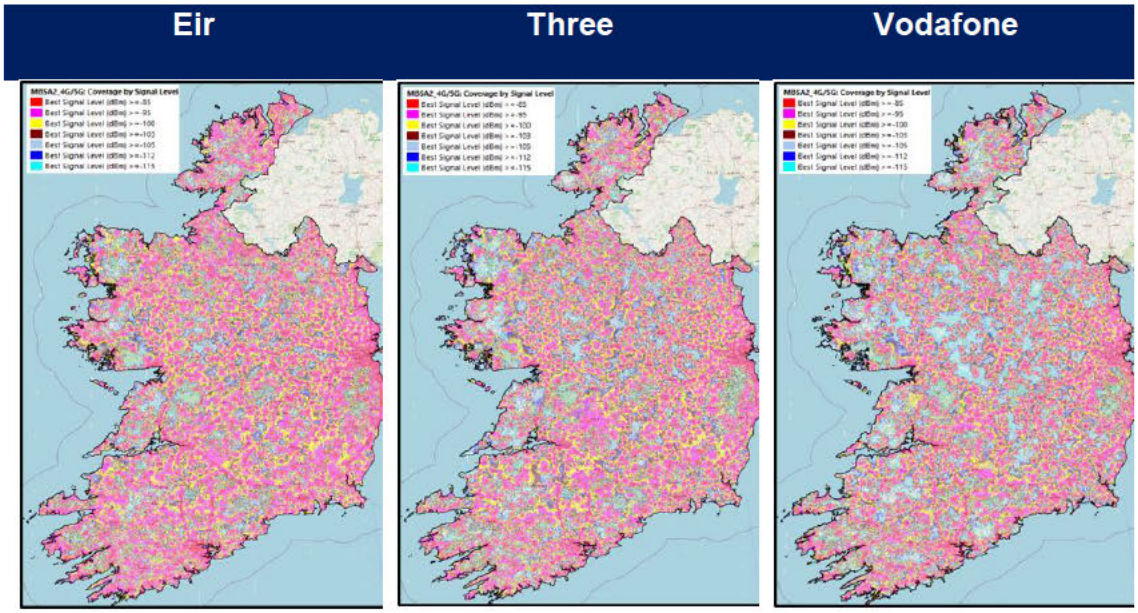

Figure 1: ComReg's analysis - LTE 800 MHz heat maps (network data from Jan 2025)

3.3.3 ComReg's assessment

3.32 Based on the information outlined above, ComReg assesses that, for the Reporting Period, all MNOs complied with their MBSA1 coverage obligation.

3.4 3G Licence & 2.1 GHz Band Licence Coverage Obligation (Eir)

3.33 Eir's 3G Licence and 2.1 GHz Band Licence obliges it to deploy and maintain 83% population coverage using spectrum in the 2.1 GHz Band as detailed in Appendix 1.

3.34 For this Reporting Period, ComReg observes that:

- Eir provides both 3G and 4G services using its spectrum rights in the 2.1 GHz Band;
- the combined coverage of these technologies is the appropriate basis for assessing Eir's coverage obligation for the 2.1 GHz band[38];
- in Q1 2025, Eir's number of licensed sites in the 2.1 GHz Band was 1672, an increase of 65 sites to compared to Q1 2024 (see Section 4.1 of this document for further information); and

[38] ComReg Document 23/45, *"Assessment of Mobile Network Operators' Compliance with Licence Obligations (Coverage), Winter 2023"*, 10 March 2023

- ComReg's analysis[39] of Eir's coverage in the 2.1 GHz Band - as depicted in Figure 2 below - indicates that Eir's combined coverage in the 2.1 GHz band exceeds the 83% population obligation.

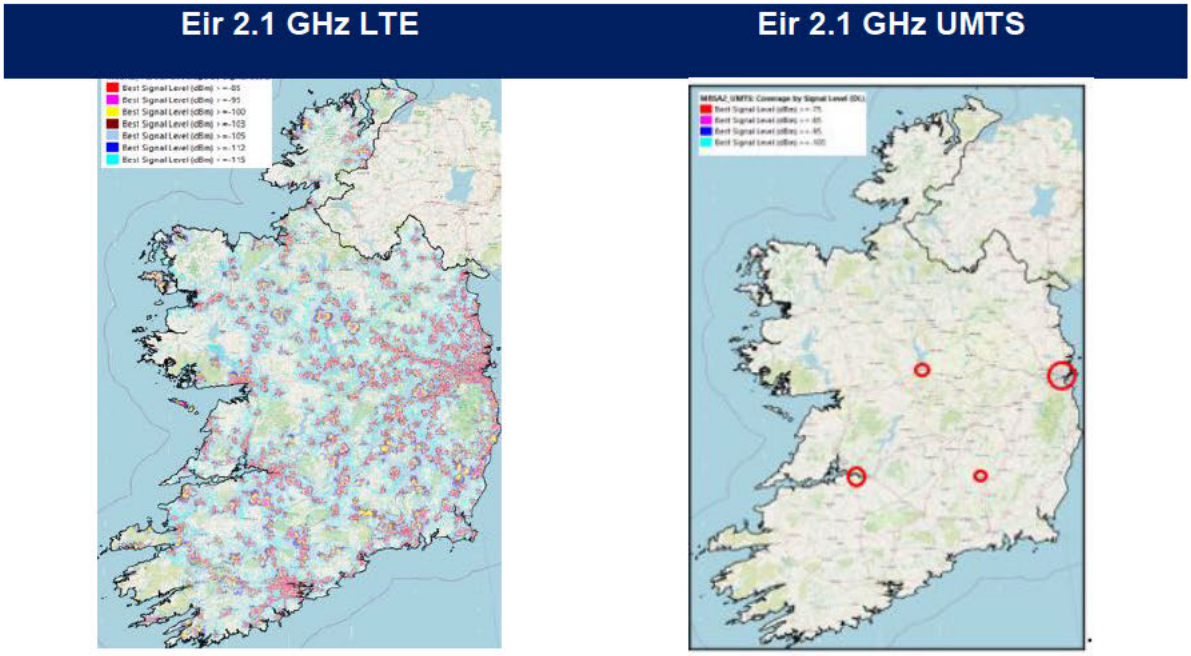

Figure 2: ComReg analysis - Eir's 2.1 GHz band coverage heatmaps (network data from Jan 2025)

3.4.1 ComReg's assessment

3.35 Based on the information outlined above, ComReg assesses that, for the Reporting Period, Eir complied with its 3G Licence and 2.1 GHz Band Licence coverage obligation.

3.5 MBSA2 Licences: Native Wi-Fi Obligation

3.5.1 Summary of obligation

3.36 The MBSA2 licences of Eir, Three and Vodafone obliges the licensees to deploy Native Wi-Fi technology and make available Native Wi-Fi voice and/or text services to all end users within 2 years (i.e. in 2025).

3.37 The date for achieving this obligation is set by reference to the earliest commencement date of 700 MHz rights for the licensee, meaning that Three is obliged to meet its 2-year Native Wi-Fi obligation by 26 January 2025, and Eir and Vodafone are obliged to meet their 2-year Native Wi-Fi obligations by 1 April

[39] ComReg's analysis is based on the MNOs network information submitted for the outdoor mobile coverage map and other files and parameters as outlined in Appendix 4.

2025.

3.5.2 Relevant information

3.38 ComReg observes that the MNOs' websites provide information on the availability of Native Wi-Fi (also called 'Wi-Fi calling') to end users, including:

- Eir indicates that *"New and existing eir customers on an eligible eir Mobile plan with an enabled phone can avail of eir WiFi Calling."*[40];
- Three indicates that Wi-Fi calling is available on its network for compatible phones;[41] and
- Vodafone indicates that Wi-Fi calling is available in any location that has a Wi-Fi network for compatible phones.[42]

3.5.3 MNOs' submissions

3.39 In Q1 2025, all three MNOs submitted that they had achieved the Native Wi-Fi Obligation, stating that they:

(a) use (i.e. deploy and maintain) Native Wi-Fi technology on their networks; and

(b) make available Native Wi-Fi voice or text services or both (as appropriate to the type of mobile service/s provided by the licensee) to all end users on their networks (including the end users of third-party customers, e.g. to mobile virtual network operators ('MVNOs')), where those end users:

(i) have established for themselves a suitable Wi-Fi connection; and

(ii) have a Native Wi-Fi / Wi-Fi calling-enabled mobile device.

3.40 Vodafone additionally noted that in relation to an MVNO on its network [✂ [redacted] ✂].

3.5.4 ComReg's assessment

3.41 Based on the MNOs' submissions and the publicly available information on their

[40] https://www.eir.ie/helpandsupport/mobile/eir-mobile-services/eir-wifi-calling/ (accessed 12 January 2026)
[41] https://www.three.ie/support/4g-and-wi-fi-calling.html (accessed 12 January 2026)
[42] https://n.vodafone.ie/network/wi-fi-calling.html (accessed 12 January 2026)

websites, ComReg assesses that, for the Reporting Period, all MNOs complied with their MBSA2 Native Wi-Fi obligations.

4 Base Station Rollout Obligations

4.1 The MWBB licences of Eir, Imagine, Three and Vodafone each have base station rollout obligations and related reporting obligations as detailed in Appendix 2 of this document.

4.2 This chapter sets out ComReg's assessment of licensees' compliance with the base station rollout obligations that were to be achieved or maintained in the Reporting Period (i.e. for 3.6 GHz Licences). Additionally, it also sets out ComReg's observations on licensees' progress towards base station rollout obligations that are to be achieved in the near future (i.e. for MBSA2 Licences).

4.1 Background information

4.1.1 Number of licensed sites per frequency band

4.3 Each year the MWBB licensees are required to submit information to ComReg on the apparatus and sites to be licensed under each licence type. The non-confidential subset of this information is published by ComReg on its *SiteViewer* tool[43] and on its *"Mobile & WBB-Licensed apparatus & sites"* webpage[44].

4.4 Based on this information, ComReg determines the number of licensed sites per radio frequency band per licensee and publishes this on its website.

4.5 Table 6 below sets out the latest information on the number of licensed sites per frequency band based on MWBB licensees' submissions received in Q1 2025.

[43] See https://siteviewer.comreg.ie/#/mobile-masts

[44] See https://www.comreg.ie/industry/radio-spectrum/licensing/search-licence-type/mobile-licences-2/

Table 6: Number of licensed sites per frequency band per MWBB licensee (based on licensees' submissions in Q1 2025)

Unique Site Count (Q1 2025 information)	700 MHz	800 MHz	900 MHz	1800 MHz	2.1 GHz	2.3 GHz	2.6 GHz	3.6 GHz*	Sum of licensed sites[45]
Eir	2,484	2,576	2,627	1,674	1,672	145	–	361	11,539
Imagine	–	–	–	–	–	1	–	270	271
Three	1,606	2,495	2,863	2,299	1,847	–	149	627	11,886
Vodafone	1,603	2,196	2,293	1,665	1,255	–	143	433	9,588

4.6 Information on the number of licensed sites per frequency band for Q1 2024 is also published on ComReg's website and is set out in Table 7 below.

Table 7: Number of licensed sites per frequency band per MWBB licensee (based on licensees' submissions in Q1 2024)

Unique Site Count (Q1 2024 information)	700 MHz	800 MHz	900 MHz	1800 MHz	2.1 GHz	2.3 GHz	2.6 GHz	3.6 GHz*	Sum of licensed sites[46]
Eir	2,371	2,461	2,519	1,609	1,607	15	–	358	10,940
Imagine	–	–	–	–	–	3	–	284	287
Three	1,409	2,393	2,776	2,195	1,660	–	77	547	11,057
Vodafone	1,349	2,086	2,221	1,553	1,067	–	99	284	8,659

4.7 Comparing the Q1 2025 information to the Q1 2024 information (see Table 8 below), ComReg observes that:

(a) each MNO increased the number of licensed sites for each of its licensed spectrum bands, indicating network expansion;

(b) Imagine's number of licensed sites decreased for each of its licensed spectrum bands, indicating network contraction; and

(c) the percentage change in the sum of licensed sites (Q1 2024 to Q1 2025) per MWBB licensee is: +5% for Eir, +7% for Three, +11% for Vodafone and -6% for Imagine.

[45] Note as MNOs use multiple frequency bands at the same site, the sum of licensed sites is much greater than the total number of sites in an MNO's network, which presently ComReg understands to be in the 2,400 to 2,700 range.
[46] Ibid

Table 8: % change in sum of licensed sites per MWBB licensee (Q1 2024 – Q1 2025)

	Q1 2024 – sum of licensed sites	Q1 2025 – sum of licensed sites	% Change (Q1 2024 to Q2 2025)
Eir	10,940	11,539	5%
Imagine	287	271	-6%
Three	11,057	11,886	7%
Vodafone	8,659	9,588	11%

4.1.2 Other information

4.8 In general, the MWBB licensees do not publish information on the number of base station sites in their network or details as to whether their networks are expanding or contracting. However:

- Imagine states on its website that it is decommissioning its *"legacy LTE service"*[47]; and
- Eir states on its website that its *"transformation programme has grown our mobile network to some 2,670 network sites with 800 new sites developed in recent years"*. [48]

4.2 3.6 GHz Band Licences

4.2.1 Summary of Base Station Rollout Obligation

4.9 As detailed in Table 9 below, the 3.6 GHz Band licensees are obliged to:

(a) achieve and maintain a Base Station Rollout obligation within 3 years for each licensed Region, and

(b) work and use Rollout Base Stations in at least 4 counties for Regions 1, 2, 3 and 4.[49]

4.10 The commencement date for the Base Station Rollout Obligation is the date when the last spectrum block in the licensed Region is made available to the licensee. This varies per licensee and per Region as detailed in Table 9 below.

[47] https://www.imagine.ie/ (accessed 12 January 2026)
[48] https://www.eir.ie/ourmobilenetwork/ (accessed 12 January 2026)
[49] Each of the areas of South Tipperary and North Tipperary are deemed to be a county for the purposes of determining compliance with the base station rollout obligation.

Table 9: Base Station Rollout Obligations in 3.6 GHz Band Licences

Ref No.	Region[50]	Minimum number of Rollout Base Stations to be worked and used								Number of counties where a Rollout Base Station is to be worked and used
		Eir		Imagine		Three		Vodafone		
		No. of base stations	Compliance date	No. of base stations	Compliance date	No. of base stations	Compliance date	No. of base stations	Compliance date	
1	BMW	15	07-Jan-22	15	01-Aug-22	15	05-Feb-23	15	01-Oct-26	4
2	SW	15	01-Sept-23	15	01-Aug-22	15	01-Oct-21	15	TBD	4
3	E	15	01-Oct-22	15	01-Aug-22	15	01-Oct-21	15	TBD	4
4	SE	15	01-Sept-23	15	01-Aug-22	15	01-Sept-23	15	21-Nov-21	4
5	Dublin	10	18-Oct-22	N/A	N/A	10	16-Apr-22	15	01-Jul-21	N/A
6	Cork	2	01-Apr-25	N/A	N/A	2	07-Jan-22	4	13-Aug-22	N/A
7	Limerick	2	18-Oct-22	N/A	N/A	2	12-May-23	4	19-Nov-22	N/A
8	Galway	2	18-Oct-22	N/A	N/A	2	07-Jan-22	4	01-Apr-26	N/A
9	Waterford	2	01-Sept-23	N/A	N/A	2	01-Sept-23	4	TBD	N/A

TBD – as not all rights for spectrum blocks in the Region have commenced.

[50] BMW (Borders, Midlands and West), SW (South West), E (East), SE (South East), Dublin (CSO boundary for Dublin and Suburbs), Cork (CSO boundary for Cork City and Suburbs), Limerick (CSO boundary for Limerick City and Suburbs), Galway (CSO boundary for Galway City and Suburbs), Waterford (CSO boundary for Waterford City and Suburbs).

4.2.2 Licensees' submissions

4.11 In Q3 2024, the 3.6 GHz Band licensees submitted information to ComReg on the number of Rollout Base Stations being worked and used in their networks as at 1 August 2024, as detailed in Table 10 below.

4.12 For the Regions where the licensee's compliance date had already been reached, all 3.6 GHz Band licensees submitted that, as at 1 August 2024, their base station rollout levels were equal to or greater than the licence requirement.

4.13 For the Regions where the licensee's compliance date had yet to be reached (i.e. Cork for Eir, and BMW, SW, E, Galway and Waterford for Vodafone):

(a) Eir submitted that as at 1 August 2024 it was already meeting its obligation; and

(b) Vodafone submitted that while it was not yet meeting the levels required for 3 Regions (i.e. BWM, SW and E) as at 1 August 2024, it is "*mindful of its obligations and will complete as required*".

Table 10: 3.6 GHz Band licensees' rollout base station submissions as at 1 August 2024

	Region	Eir		Imagine		Three		Vodafone	
		No of BS	No. Counties	No of BS	No. Counties	No of BS	No. Counties	No of BS	No. Counties
1	BMW	32	12	120	13	54	11	10	7
2	SW	18	5	84	5	29	4	12	5
3	E	21	4	36	4	86	4	35	3
4	SE	16	5	42	4	35	5	17	4
5	Dublin	195	N/A	N/A	N/A	264	N/A	210	N/A
6	Cork	37	N/A	N/A	N/A	60	N/A	54	N/A
7	Limerick	19	N/A	N/A	N/A	22	N/A	29	N/A
8	Galway	13	N/A	N/A	N/A	21	N/A	26	N/A
9	Waterford	8	N/A	N/A	N/A	14	N/A	5	N/A

4.2.3 ComReg's assessment

4.14 Based on licensees' submissions, and the publicly available information on the number of licensed sites as set out in Section 4.1 above, ComReg assesses that, as at 1 August 2024, all 3.6 GHz Band licensees complied with their respective Base Station Rollout obligations.

4.3 MBSA2 Licences

4.3.1 Summary of Base Station Rollout Obligation

4.15 As detailed in Table 11 below, MBSA2 licensees are obliged to achieve and maintain a Base Station Rollout obligation within 4 years of the earliest commencement date of a spectrum block in that band. As spectrum blocks commenced on 20 January 2023 for each frequency band, the 4-year milestone is 20 January 2027.

Table 11: MBSA2 base station rollout obligation

Band	Number of base stations to be worked and used in each band within 4 years (i.e. by 20 January 2027)			
	Eir	Imagine	Three	Vodafone
2.1 GHz	1,200	N/A	1,200	1,200
2.3 GHz	525	290	N/A	N/A
2.6 GHz FDD	N/A	N/A	525	525
2.6 GHz TDD	N/A	290	N/A	525

4.3.2 Licensees' submissions

4.16 In Q1 2025, the MBSA2 licensees submitted information to ComReg on their base station rollout per band (as detailed in Table 12 below).

Table 12: MBSA2 Licensees' base station rollout submission

Band	Eir		Imagine		Three		Vodafone	
	Obligation (20/01/27)	No. of BS as of 25/02/25	Obligation (20/01/27)	No. of BS as of 10/3/25	Obligation (20/01/27)	No. of BS as of 07/03/25	Obligation (20/01/27)	No. of BS as of 06/03/25
2.1 GHz	1200	1678	N/A	N/A	1200	1816	1200	1288
2.3 GHz	525	150	290	1	N/A	N/A	N/A	N/A
2.6 GHz FDD	N/A	N/A	N/A	N/A	525	144	525	331
2.6 GHz TDD	N/A	N/A	N/A[51]	0	N/A	N/A	525	1

4.3.3 ComReg's observations

4.17 As the **4-year Base Station Rollout obligations do not fall due until January 2027**, ComReg does not assess compliance for this Reporting Period but instead provides some observations on current progress.

Progress towards their 4-year obligations

4.18 In relation to the **2.1 GHz band**, ComReg notes that Eir, Three and Vodafone all submit that they are already achieving this base station rollout obligation. ComReg also observes that between Q1 2024 and Q2 2025 all three MNOs increased the number of licensed sites in the 2.1 GHz band (as outlined in Section 4.1 above).

4.19 In relation to the **2.3 GHz band, 2.6 GHz FDD and 2.6 GHz TDD bands**, ComReg notes that all MBSA2 licensees submitted that their respective base station rollout is not yet at the obligation level.

4.20 Looking towards the rollout obligation date of January 2027, ComReg observes

[51] On 12 December 2025, BCP IV Telecommunications OPCO Limited (formerly Imagine Communications Ireland Limited) surrendered the 15 MHz of 2.6 GHz Band TDD spectrum rights of use contained in its MBSA2 licence, meaning that BCP IV was released from the licence conditions related to these spectrum rights.

that:

- While Imagine's base station rollout level is very low at 1 base station for the 2.3 GHz band, it has proposed the transfer of its 2.3 GHz spectrum rights to Eir (see ComReg Document 25/94[52]);
- Eir is making progress towards reaching its base station obligation in the 2.3 GHz band, although as at 25 February 2025, it still had a further 375 base stations (or 71% of the obligation) to rollout;
- Three is making progress towards reaching its base station obligation in the 2.6 GHz FDD band although, as at 7 March 2025, it still had a further 381 base stations (or 73% of the obligation) to rollout;
- Vodafone, in relation to the 2.6 GHz FDD band, is making progress towards reaching its base station obligation, although as of 6 March 2025, it still had a further 194 base stations (or 37% of the obligation) to rollout; and
- Vodafone, in relation to the 2.6 GHz TDD band, submitted that it had only rolled out 1 base station as at 6 March 2025, meaning that it still has practically all of this base station obligation to rollout.

[52] ComReg Document 25/94, "Notice of proposed Spectrum Transfer - Proposed transfer of spectrum rights in the 2.3 GHz Band from BCP IV Telecommunications OPCO Limited to Eircom Limited", published 19 December 2025.

5 Quality of Service obligations

5.1 The MWBB licences of Eir, Imagine, Three and Vodafone each contain QoS and related reporting obligations as detailed in Appendix 3 of this document. These QoS obligations apply for the full duration of the licence from its commencement date.

5.2 This chapter sets out ComReg's assessment of licensees' compliance with the following QoS obligations:

(a) minimum voice call standard obligations in the 3.6 GHz Band and MBSA2 licences; and

(b) MBSA2 VoLTE obligations.

5.3 It also sets out ComReg's observations in relation to the network availability obligations in the 3.6 GHz Band, MBSA1 and MBSA2 licences, noting that further work is required before an assessment can be made in relation to these obligations.

5.1 Minimum Voice Call Standard Obligations

5.4 The aim of these obligations are to protect end users from experiencing poor quality voice calls noting, in particular, that should an end user experience poor quality voice call services, the source of same (e.g. the MWBB network or another network) may not be readily identifiable to the end user, thus making it difficult for the end user to take remedial actions.

5.1.1 Summary of obligations

5.5 For each of the 3.6 GHz Band, MBSA1 and MBSA2 licences, and where the licensee provides a voice call service on a terrestrial system using radio spectrum licensed in the respective licence, the licensee is obliged to comply with the minimum voice call standard obligations (as summarised in Table 13 below and further detailed in Appendix 3).

5.6 This minimum voice call standard obligation is to be measured and assessed biannually (i.e. in 6-month periods as determined for each MWBB licence type).

Table 13: Minimum voice call standard obligations for each 6-month period as determined for each MWBB licence type

	Average	Worst Case
1. **Maximum Permissible Blocking Rates** This refers to the maximum percentage of total call attempts which are unsuccessful during the time consistent busy hour.	2%	4%
2. **Maximum Permissible Dropped Call Rates** This refers to the maximum percentage of total originating calls which are prematurely released by the network within 3 minutes of the call being made.	2%	4%
3. **Transmission quality** The Licensee shall ensure that the speech transmission quality is as good as or better than the speech quality associated with the GSM Standard and GSM Technical Specifications of the European Telecommunications Standards Institute ('ETSI'). The Licensee shall ensure that appropriate echo treatment equipment is used and that it is properly configured.		

5.7 In each of the 3.6 GHz Band, MBSA2 and MBSA1 licences, the same definitions are used for the minimum voice call standard obligation, except for the "voice call" definition[53].

5.1.2 3.6 GHz Band Licences

Licensees' submissions

5.8 In Q4 2024, the 3.6 GHz Band licensees submitted information on the minimum voice call standard for the previous 12-month period of their 3.6 GHz Band licence (i.e. from 1 August 2023 to 31 July 2024). In that regard:

- Eir, Three and Vodafone stated that they were not providing voice call services on a terrestrial system using spectrum rights in the 3.6 GHz Band and, consequently, the minimum voice call standard did not apply to them in this period; and
- Imagine stated that it was providing voice calls on a terrestrial system using 3.6 GHz spectrum and submitted information indicating that it was meeting the minimum voice call standard obligations as detailed in Table 14 below.

[53] In the more recent MWBB licence types (i.e. the 3.6 GHz Band and MBSA2 licences) the "voice call" definition includes managed Voice over Internet Protocol ('VoIP') services reflecting the way that voice call services are now provided. In the older MBSA1 licence, the "voice call" definition excludes VoIP services.

Table 14: 3.6 GHz Band Licence - Imagine's submission - minimum voice call standard (1 August 2023 to 31 July 2024) [✂PARTIALLY REDACTED✂]

			Imagine			
		6-month Period	1 August 2023 to 31 January 2024		1 February 2024 to 31 July 2024	
	Average	Worst Case	Average	Worst Case	Average	Worst Case
Maximum Permissible Blocking Rates	2%	4%	[redacted]	[redacted]	[redacted]	[redacted]
Maximum Permissible Dropped Call Rates	2%	4%	[redacted]	[redacted]	[redacted]	[redacted]
Transmission quality:			[redacted]		[redacted]	

5.9 In relation to transmission quality, Imagine stated that its "*VoIP monitor tool calculates an industry standard MOS score to automatically measure the quality of every voice call using Packet Delay Variation (jitter) and packet loss into a MOS score according to ITU-T E model as per ITU-T G.107*. and that *"Imagine reports the minimum MOS values recorded to the 95th percentile for all calls during the measurement period."*

ComReg's assessment

5.10 Based on licensees' submissions, ComReg assesses that, for the period 1 August 2023 to 31 July 2024, all 3.6 GHz Band licensees complied with their 3.6 GHz Band minimum voice call standard obligation.

5.1.3 MBSA2 Licences

Licensees' submissions

5.11 In Q1/Q2 2025, MBSA2 licensees submitted information on the minimum voice call standard for the previous 12-month period of their licence (i.e. from 20 January 2024 to 19 January 2025). In that regard, ComReg notes that:

- all licensees (Eir, Imagine, Three and Vodafone) submitted that they were meeting the blocking and dropped call elements of the minimum voice call standard obligation (as detailed in below);
- information on the transmission quality element of the minimum voice call

standard obligation varied, with Vodafone stating that *"The method would need to be agreed with such a proportion of traffic now on VoLTE".*

Table 15: MBSA2 Licensee's submission – MBSA2 Minimum voice call standard (20 January 2024 to 19 January 2025) [✂PARTIALLY REDACTED✂]

		Eir		Imagine		Three		Vodafone[54]	
		Average	Worst Case	Average	Worst Case	Average	Worst Case	Average	Worst Case
Maximum Permissible Blocking Rates	Obligation	2%	4%	2%	4%	2%	4%	2%	4%
	20/01/24 – 19/07/24	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Not calculated	Not calculated
	20/07/24 – 19/07/24	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Not calculated	Not calculated
Maximum Permissible Dropped Call Rates	Obligation	2%	4%	2%	4%	2%	4%	2%	4%
	20/01/24 – 19/07/24	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	20/07/24 – 19/07/24	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Transmission quality:	20/01/24 – 19/07/24	Not Supplied		[redacted]		[redacted]		The method would need to be agreed with such a proportion of traffic now on VoLTE	
	20/07/24 – 19/07/24	Not Supplied		[redacted]		[redacted]			

[54] Vodafone did not calculate its maximum permissible blocking rate but instead supplied two files which set out information on the successful call set-up rate during the period.

ComReg's assessment

5.12 Based on MBSA2 licensees' submissions, ComReg assesses that, for the period 20 January 2024 to 19 January 2025, all MBSA2 licensees complied with the dropped and blocked call elements of their MBSA2 minimum voice call standard obligation.

5.13 In relation to the transmission quality element of the MBSA2 minimum voice call standard obligation, ComReg's assessment continues as:

(i) the information provided by licensees indicated no consistent methodology, quality standard or level being used by the licensees for their assessments, meaning that ComReg may need to specify these details to ensure accurate and consistent reporting[55]; and

(ii) new technologies (i.e. VoLTE) are now also being used to deliver voice calls.

5.1.4 MBSA1 Licences

5.14 Considering the information provided in relation to the MBSA2 minimum voice call standard obligation where the MNOs indicated that they were all meeting the blocked calls and dropped calls obligations by a factor of 5 or better[56], and that during February and June 2025 ComReg's focus has been on bedding down the reporting process and parameters and files to be used in the MNOs MBSA2 coverage assessments, ComReg did not, for this Reporting Period, request submissions in relation to the minimum voice call standard in the MBSA1 licences, and hence did not assess licensee's compliance with their MBSA1 minimum voice call standard obligation.

5.2 MBSA2 Licences: VoLTE Obligation

5.2.1 Summary of obligation

5.15 Where a MBSA2 licensee has deployed LTE technology in any of the bands in which it holds rights of use under its MBSA2 Licence and also offers a mobile

[55] The text of the obligation (see below) does not specify the precise assessment details,
- *"the speech transmission quality of Voice Calls is as good as or better than the speech quality associated with the relevant ETSI Standard and Technical Specifications"; and*
- *"appropriate echo treatment equipment is used and that such equipment is properly configured".*

[56] In addition, in reviewing the MBSA2 submissions, ComReg noted that in relation to the voice call transmission quality element of this obligation it may need to specify the relevant ETSI Standard and Technical Specifications and provide detail on a methodology and/or the quality level to be met.

voice service to consumers using those bands, the licensee shall:

(i) enable VoLTE[57] technology on its network and on its Base Stations which use those bands within 1 year;

(ii) make a VoLTE service available to its end users (including MVNO end users) that have a VoLTE-enabled handset within 1 year; and

(iii) deploy and maintain VoLTE across 50% of its LTE Base Stations which use those bands within 1 year and across 100% of such Base Stations within 2 years.

5.16 As the MNOs were providing voice call services using LTE on the commencement date of their licences, the 1-year obligation was due to be achieved by January 2024 and the 2-year obligation by January 2025.

5.2.2 Relevant information

5.17 Mobile voice services are provided by the MNOs but not Imagine. In relation to the deployment and availability of VoLTE, also called "4G calling", to end users, the MNOs' websites provide the following information:

- Eir indicates that "*4G calling available to eir mobile customers providing they have a 4G calling compatible handset.*"[58];
- Three indicates that 4G calling is available on its network for compatible phones and that "*All voice plans include 4G calling*".[59]; and
- Vodafone indicates that 4G calling is available on its network for compatible phones.[60]

5.2.3 Licensees' submissions

5.18 Imagine submitted that it was not providing a mobile service and therefore the VoLTE obligation did not apply to it.

5.19 The MNOs all submitted that they have met their VoLTE obligations, including that they have:

[57] "VoLTE" means voice over LTE which is a managed voice service that benefits from prioritisation over other traffic.
[58] https://www.eir.ie/helpandsupport/mobile/eir-mobile-services/4G-calling/ (accessed 12 January 2026)
[59] https://www.three.ie/support/4g-and-wi-fi-calling.html (accessed 12 January 2026)
[60] https://n.vodafone.ie/network/wi-fi-calling.html (accessed 12 January 2026)

(i) enabled VoLTE technology on their network and on their base stations which use the relevant MBSA2 spectrum bands;

(ii) made a VoLTE service available to their end users (including MVNOs noting comments below) that have a VoLTE-enabled handset; and

(iii) as of 20 January 2025, they had deployed and maintained VoLTE across 100% of their base stations on its network.

5.20 In relation to making a VoLTE service available to their respective MVNO end users:

- Eir notes that VoLTE for its MVNO end users is not applicable to it;
- Three notes that as of Q1/Q2 2025 none of the three MVNO's utilising its RAN (Virgin Media, Tesco Mobile, Lyca Mobile) had deployed VoLTE at that time. Three additionally submits that:
  - *"VoLTE enablement is dependent on functionality within the networks of Three's hosted MVNOs. It cannot be unilaterally made available to their end-users by Three. [✂[redacted]"✂];* and
  - *"the implementation of VoLTE for MVNO customers is dependent on the MVNO's own technology deployment which needs to include": [✂[redacted]✂]*
- Vodafone reports that [✂[redacted].✂]

5.2.4 ComReg's assessment

5.21 Based on the licensees' submissions and publicly available information on VoLTE on the MNOs' websites, ComReg assesses that, as of Q1 2025, all licensees complied with their MBSA2 VoLTE obligation.

5.3 Network Availability Obligations

5.3.1 Summary of obligation

5.22 As detailed in Appendix 3, the 3.6 GHz Band, MBSA2 and MBSA1 licensees are obliged to ensure that their respective network unavailability is less than 35 minutes based on the weighting factors set out in Table 16 below, for each six-month period used for annual reporting for that MWBB licence type.

Table 16: Weighting Factors for Network Unavailability tracking all periods of network unavailability.

Network Unavailability, Weighting Factors (divide duration of each network event by weighting factor)			
	Monday to Friday	Saturday	Sunday
For periods between 07:00 and 24:00 hours	1	2	4
For periods between 00:00 and 07:00 hours	4	8	16

5.23 In each of the 3.6 GHz Band, MBSA2 and MBSA1 licences, the same network availability definitions are used, including in particular that:

"the network" means any Terrestrial System which uses the Licensed Spectrum Blocks"; and

"Network Unavailability" means the average number of minutes per six-month period for which services on the network are not available due to a disturbance, failure or scheduled unavailability to a Network.".

5.3.2 3.6 GHz Band Licences

Licensees' submissions

5.24 In Q3/Q4 2024, the 3.6 GHz Band licensees submitted information on their network availability obligation for the previous 12-month period of their 3.6 GHz Band licence (i.e. from 1 August 2023 to 31 July 2024). In those submissions, all licensees submitted that they were meeting or close to meeting their Network Availability obligations as detailed in Table 17 below.

Table 17: Licensees' submissions 3.6 GHz Band Licence: Network Availability [✂PARTIALLY REDACTED✂]

			Eir		Imagine		Three		Vodafone	
6 Month Period	Obligation - Max minutes "network unavailability" (weighting applied)	Obligation - % availability (weighting applied)	Average number of minutes services on not available (weighting applied)	% availability in the period cell level -	Average number of minutes services on not available (weighting applied)	% availability in the period cell level -	Average number of minutes services on not available (weighting applied)	% availability in the period cell level -	Average number of minutes services on not available (weighting applied)	% availability in the period cell level -
1 August 2023 to 31 January 2024	35	99.987%	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1 February 2024 to 31 July 2024	35	99.987%	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

5.25 The 3.6 GHz Band licensees also detailed the source information and methodology used to calculate their respective network availability values and, in that regard, ComReg observes that:

(i) the licensees used varying approaches and methodologies to calculate network availability;

(ii) not all licensees applied the required weightings;

(iii) there were queries on how to treat temporary sites (e.g. Croke Park, Aviva stadium, temporary sites for festivals – e.g. Electric Picnic) within the calculation;

(iv) one licensee, Eir, submitted that the inclusion of scheduled maintenance (i.e. times when a cell is down due to planned maintenance) within the network availability calculation did not promote the correct behavioural incentives for licensees because, in its view, scheduled maintenance is necessary to facilitate network upgrades and ongoing maintenance, both of which have positive impacts for end users. It therefore submitted that ComReg should make allowances for scheduled maintenance within the network availability calculation; and

(v) some licensees submitted that they are utilising or considering utilising power saving techniques at multi-frequency sites (i.e. for 3.6 GHz and other spectrum bands) whereby certain carriers are dynamically powered down or go dormant when traffic is very low and then are dynamically brought back online when traffic increases. One of these licensees, Eir, contends that "…*the use of power saving technology has no service impact on end users. The availability of 3.6GHz cells has no impact on service availability for end users as power saving is operated on a dynamic demand basis in conjunction with transmissions on other bands licensed to eir*." As such, Eir submits that "*the impact of power saving on 3.6GHz network availability cannot be considered a non-compliance issue*.".

ComReg observations

5.26 Considering the different approaches and methodologies used by licensees to calculate network availability, ComReg's assessment of 3.6 GHz Band licensees' compliance with the Network Availability obligation for the Reporting Period continues.

5.27 In relation to the issues outlined in the first three bullets above (i.e. use of different approaches and methodologies, non-application of weightings and treatment of

temporary sites), ComReg has written to the licensees setting out it views on the information to be used and the recommended methodology steps to be used (see Appendix 5 below). In relation to the issues outlined in the final two bullets above (i.e. inclusion of scheduled maintenance in the calculation and the use of power saving techniques), ComReg is collecting more information on same to inform its considerations.

5.3.3 MBSA1 and MBSA2 licences

5.28 In light of the issues regarding network availability for 3.6 GHz Band licences, including the need for ComReg to specify further aspects (i.e. the basis for the information used and the associated methodology) as well as collecting information on matters such as power saving techniques, and that during February and June 2025 ComReg's focus was on bedding down the reporting process and parameters and files to be used in the MNOs MBSA2 coverage assessments, ComReg did not request submissions in relation to network availability for the MBSA1 or MBSA2 licences and hence did not assess licensees' compliance with their MBSA1 or MBSA2 network availability obligations for this Reporting Period.

6 Summary of ComReg's Assessment

6.1 Overall, ComReg assesses that licensees complied with their current coverage and base station rollout MWBB licence obligations for the Reporting Period, noting also that:

(a) the due date for achieving some coverage and rollout obligations did not fall due within the Reporting Period, specifically:

(i) the MBSA2 coverage obligations – where the 3-year milestone obligation is required to be achieved in 2026; and

(ii) the MBSA2 base station roll out obligations - which are due to be achieved by 2027;

(b) ComReg's assessment of certain QoS obligations, in relation to network availability and the transmission quality of voice calls, continues.

6.1 Coverage Obligations

6.2 In relation to the coverage obligations in the MBSA1 Licences, the 3G Licence and the 2.1 GHz Band Licence, and the Native Wi-Fi obligation in the MBSA2 Licence, ComReg's assessment is that for the Reporting Period:

(a) all MBSA1 licensees (i.e. Eir, Three and Vodafone) complied with their **MBSA1 coverage obligation** of 70% population coverage;

(b) Eir complied with its **3G Licence and 2.1 GHz Band Licence coverage obligation** of 83% population coverage; and

(c) all relevant MBSA2 licensees (i.e. Eir, Three and Vodafone) complied with their **MBSA2 Native Wi-Fi obligations**

6.3 For the 3-year **MBSA2 Licence outdoor mobile coverage obligations**, both general and at specific locations, and noting that these obligations are due to be achieved in 2026 (i.e. the next year's reporting), ComReg observes that:

(a) while considerable progress has been made this year in bedding down the reporting process (e.g. in relation to the parameters and files to be used in the coverage assessments and resolving queries) some further improvements can be made for next year's process with a view to obtaining greater consistency in the use of certain parameters in the MNOs' assessments (e.g. resolution) and with ComReg's own analysis (e.g. using the same network information); and

(b) the MNOs' submissions state that they are already meeting all elements of the 3-year MBSA2 outdoor mobile coverage obligations (both general and specific locations) except for the 99% Population 3 Mbit/s SUTP obligation, where two of the MNOs indicated that they are close to but have not yet achieved the 99% Population level.

6.2 Base Station Rollout Obligations

6.4 In relation to the **base station rollout obligations in the 3.6 GHz Band Licences**, ComReg's assesses that as at 1 August 2024, all 3.6 GHz Band licensees were in compliance with their respective base station rollout obligations.

6.5 For the **base station rollout obligations in the MBSA2 Licences**, ComReg notes that these **obligations are due to be achieved by January 2027** and ComReg will, during the next reporting cycle, engage with each of the licensees to monitor their progress. Notwithstanding, ComReg observes that in relation to this Reporting Period:

(a) in relation to the 2.1 GHz band, Eir, Three and Vodafone each submit that their respective base station rollout exceeds the obligation;

(b) in relation to the 2.3 GHz band, 2.6 GHz FDD and 2.6 GHz TDD bands, all MBSA2 licensees submitted that their respective base station rollout is not yet at the obligation level.

6.3 QoS Obligations

6.6 In relation to the **minimum voice call standard obligations**, ComReg's assessment is that:

(a) for the **3.6 GHz Band Licences** and for the period 1 August 2023 to 31 July 2024, all 3.6 GHz Band licensees were in compliance with their 3.6 GHz Band minimum voice call standard obligation; and

(b) for the **MBSA2 Licences** and for the period 20 January 2024 to 19 January 2025, all MBSA2 licensees were in compliance with the dropped and blocked call elements of their MBSA2 minimum voice call standard obligation, while for the transmission quality element of this obligation, ComReg's assessment continues.

6.7 In relation to the **VoLTE obligation in MBSA2 Licences**, ComReg assesses that, as of Q1 2025, all MBSA2 licensees were compliant.

6.8 In relation to the **network availability obligations** in the 3.6 GHz Band Licence

and considering the different approaches and methodologies used by licensees to calculate network availability, ComReg's assessment continues[61].

6.4 Next reporting period

6.9 ComReg has now progressed to collecting information from MWBB licensees for the next reporting period (i.e. August 2025 to July 2026) and notes, among other things, that the 3-year outdoor mobile coverage obligations of the MBSA2 licences are to be achieved during this reporting period.

[61] With a view to addressing the different approaches and methodology matters raised, ComReg has written to licensees outlining its views on the information basis and recommended methodology for calculating network availability and is collecting further information.

Appendix 1: Coverage Obligations in MWBB licences

A 1.1 This Appendix sets out information on the coverage obligations in:

- Eir's 3G Licence and 2.1 GHz Band Licence;
- the MBSA1 Licences; and
- the MBSA2 Licences.

A1.1 Eir's 3G Licence and 2.1 GHz Band Licence

A 1.2 The following coverage obligation applies in both Eir 's 3G Licence (see Part 5 of Schedule 5 of 3G Licence L3G1004) and its 2.1 GHz Band Licence (see Part 4 of 21L1004):

> *"the Licensee shall ensure that its **3G network services** achieve **demographic coverage of 83%** on and after 31 October 2012." (emphasis added)*

Definition of coverage

A 1.3 Eir's 3G Licence and its 2.1 GHz Band Licence define coverage as:

> *"Maps showing Coverage for 3G service, where Coverage is defined as: An area, A, shall be covered where the field strength - measured on the pilot signal (from the Common Pilot Channel/downlink) from the base station, outdoor at a height of 1.7 metres – is maintained equal to or above 58 dBμV/m over 95% of the area A during 95% of the time;"*

A 1.4 In ComReg's most recent assessment of mobile network operators' compliance with licence obligations (see ComReg Document 23/45)[62], it noted that:

- each of the MNOs had deployed two technologies in the 2.1 GHz band, namely the legacy 3G (UMTS) technology and the more spectrally efficient 4G (LTE) technology, with the 4G (LTE) technology being the most deployed technology; and

[62] ComReg Document 23/45, *"Assessment of Mobile Network Operators' Compliance with Licence Obligations (Coverage), Winter 2023",* 10 March 2023

- while the coverage obligations in Eir 's 3G Licence relates to the deployment of the 3G (UMTS) technology, Eir 's deployment of 4G (LTE) technology in the 2.1 GHz band improves the spectral efficiency of its network and, in turn, benefits consumers by providing lower latency and higher mobile data speeds on the same spectrum assignment.

A 1.5 ComReg therefore stated that:

> *"…the **combined coverage of all technologies deployed in the 2100 MHz band** would be the more appropriate basis for assessing EIR 's coverage in the 2100 MHz band with respect to its coverage obligations in the Third Generation and GSM Licence."* (emphasis added)
>
> *"…the appropriate metrics for assessing compliance in the 2100 MHz band should be **informed by a consideration of all relevant information available to ComReg**[footnote 22]."*
>
> Footnote 22 stated – *"For example, considering information from other relevant licensing frameworks, and from ComReg's coverage map."* (emphasis added)

Reporting on coverage obligations

A 1.6 Eir's 3G Licence and its 2.1 GHz Band Licence provides that "*For the purposes of carrying out service quality surveys, the Licensee shall provide, on request, to ComReg*" …"*Maps showing coverage for 3G services*".

A1.2 MBSA1 Licences

Coverage obligation

A 1.7 The coverage obligation in each of the MBSA1 Licences is that:

> *"The Licensee shall ensure the attainment of, and maintain, a coverage level of at least **70% of the population** within 3 years of the Licence commencement."*

Definition of Coverage

A 1.8 In the MBSA1 Licences, coverage is defined as the combined coverage of the Terrestrial Systems in the 800 MHz, the 900 MHz or the 1800 MHz bands, and where coverage in the 2100 MHz band can also count *"up to 35% of the population coverage (that is to say, one-half) of the 70% of the population coverage obligation."*

A 1.9 In determining coverage for Terrestrial Systems in the 800 MHz, the 900 MHz or the 1800 MHz bands, each MBSA1 Licence states that:

> *"For measurement purposes, an average pilot signal will be measured outdoors at a height of 1.5m."*
>
> *"For propagation prediction systems a pilot signal over 95% of the area during 95% of the time is required"*
>
> *"The coverage level specification per frequency band, per bandwidth and per Terrestrial System is set out in Table 5 below.*
>
> - *Where both a FS and an Ec/Io or BLER metric are specified in Table 5 for a particular Terrestrial System (i.e., UMTS and LTE), an area will be deemed to have coverage where the Ec/Io or BLER exceeds the levels as set out in Table 5, even if the FS is less than the value shown in the Table 5.*
> - *Where a FS metric is the only metric specified in Table 5 for a particular Terrestrial System (i.e., GSM), an area will be deemed to have coverage where the FS is met."*

Table 5 of the MBSA1 Licence – *"The coverage level specification per frequency band, per bandwidth and per terrestrial system"*

Terrestrial System and Bandwidth	*800MHz FS (dB(uV/m))*	*800MHz Ec/Io or BLER*	*900MHz FS (dB(uV/m))*	*900MHz Ec/Io or BLER*	*1800MHz FS (dB(uV/m))*	*1800MHz Ec/Io or BLER*
GSM (0.2MHz)	*45*	*N/A*	*46*	*N/A*	*54*	*N/A*
UMTS (5MHz)	*49*	*-8*	*50*	*-8*	*57*	*-8*
LTE (5MHz)	*47*	10^{-2}	*48*	10^{-2}	*55*	10^{-2}
LTE (10MHz)	*44*	10^{-2}	*45*	10^{-2}	*52*	10^{-2}
LTE (15MHz)	*42.5*	10^{-2}	*43.5*	10^{-2}	*50.5*	10^{-2}
LTE (20MHz)	*41*	10^{-2}	*42.5*	10^{-2}	*49.5*	10^{-2}

Where:
FS= Field Strength
BLER= Block Error Rate; and
Ec/Io= The ratio of received energy per chip and the interference level.

Reporting on coverage obligations

A 1.10 The MBSA1 Licences oblige licensees to provide an annual compliance report on coverage to ComReg every twelve months (and that the measurements required for this report shall be agreed with ComReg in advance), and with sufficient detail and granularity to allow ComReg to verify its contents.

A 1.11 In addition, the MBSA1 Licences provide that, upon request from ComReg, the Licensee shall carry out drive test measurements and submit these results to ComReg.

A1.3 MBSA2 Licences

A 1.12 MBSA2 Licences have three coverage obligations being the:

(i) general outdoor coverage obligation;

(ii) outdoor coverage obligation for specific locations; and

(iii) Native Wi-Fi obligation.

General outdoor coverage obligation

A 1.13 MBSA2 Licensees with 700 MHz spectrum rights of use (i.e. Eir, Three and Vodafone) are obliged to achieve and maintain the following general coverage obligations:

Table 18: MBSA2 general outdoor coverage obligations

Outdoor coverage service **(Single User Throughput Cell Edge)**	**Coverage dimension**	**Coverage % levels to be met in[63]:**		
		3 Years (i.e. 2026)	**5 Years** (i.e. 2028)	**7 Years** (i.e. 2030)
30 Mbit/s	Population	85%	92%	95%
30 Mbit/s	Motorways	75%	85%	90%
30 Mbit/s	Primary Roads	60%	75%	80%
3 Mbit/s	Population	99%	99%	99%

Outdoor coverage obligation at specific locations

A 1.14 MBSA2 Licensees with 700 MHz spectrum rights of use (i.e. Eir, Three and Vodafone) are also obliged to achieve and maintain outdoor coverage at specific locations for a 30 Mbit/s mobile service (Single User Throughput Cell Edge), as outlined in Table 19 below.

[63] This is from the earliest commencement date of the 700 MHz Duplex Block(s) for the licensee. Three's 700 MHz rights commenced on 26 January 2023, while Eir and Vodafone's 700 MHz spectrum rights commenced on 2 April 2023.

Table 19: MBSA2 outdoor coverage obligation for specific locations for a 30 Mbit/s mobile service (Single User Throughput Cell Edge)

Specific Locations (as particularised in the MBSA2 Information Memorandum[64])	**Coverage % levels and milestones[65]**		
	3 Years (i.e. 2026)	**5 Years** (i.e. 2028)	**7 Years** (i.e. 2030)
Business and technology Parks: 31 Business and Technology Parks and 9 Strategic Sites.	70%	90%	100%
Hospitals: 48 public and 17 private hospitals;	70%	90%	100%
Higher Education Campuses: 8 Universities, 11 Institutes of Technology and 5 other colleges;	70%	90%	100%
Air and Sea Ports: 7 main airports and 7 passenger sea ports;	70%	90%	100%
Train and Bus Stations: The busiest 144 train stations and 16 main bus stations;	70%	90%	100%
Top Visitor attraction information Points: The top 21 fee charging and 21 free entry visitor attractions	70%	90%	100%

Native Wi-Fi obligation

A 1.15 Where a MBSA2 Licensee's 700 MHz spectrum rights of use (i.e. Eir, Three and Vodafone) provides a mobile voice or text service, or both, using rights of use in its MBSA2 licence, it is obliged to meet the following Native Wi-Fi obligation within 2 years of the earliest commencement date of the 700 MHz Duplex Block(s)[66]:

(a) use (i.e. deploy and maintain) Native Wi-Fi technology on its network in respect of spectrum rights of use in its MBSA2 licence; and

[64] ComReg Document 21/40, *"Multi Band Spectrum Award – Information Memorandum and Draft Regulations The 700 MHz Duplex, 2.1 GHz, 2.3 GHz and 2.6 GHz Bands"*, published 16 April 2020

[65] This is from the earliest commencement date of the 700 MHz Duplex Block(s) for the licensee. Three's 700 MHz rights commenced on 26 January 2023, while Eir and Vodafone's 700 MHz spectrum rights commenced on 2 April 2023.

[66] Three's 700 MHz rights commenced on 26 January 2023, while Eir and Vodafone's 700 MHz spectrum rights commenced on 2 April 2023.)

(b) make available Native Wi-Fi voice or text services or both (as appropriate to the type of mobile service/s provided by the Licensee) to all end users on its network (including the end users of third party customers, e.g. mobile virtual network operators ('MVNOs')), where those end users:

i. have established for themselves a suitable Wi-Fi connection; and

ii. have a Native Wi-Fi / Wi-Fi calling-enabled mobile device.

Definition of coverage

A 1.16 The MBSA2 Licences set out the following principles for determining compliance with the outdoor coverage obligation:

"(a) the Commission's [ComReg's] radio network planning tools, supported by field measurements which may include drive tests where appropriate, will be the key component in assessing compliance with the coverage obligations;"

"(b) all rights of use available to the Licensee can be used to contribute to meeting the coverage obligations; "

"(c) the Commission will use an RSRP metric for LTE as a proxy for determining the Licensee's compliance with the coverage levels;"

"(i) an RSRP base level of -103 dBm will be used as a proxy for 30 Mbit/s SUTP using a 10 MHz downlink carrier. Where capacity increasing techniques are used such as carrier aggregation or deployment of additional bandwidth, or both, a lower RSRP value can be used as follows:

i. where additional 10 MHz downlink carriers are added using two or three band carrier aggregation across bands with similar propagation characteristics (e.g. carriers in the 700 MHz Duplex, 800 MHz Band and 900 MHz Band) RSRP levels of -108 dBm and -113 dBm will apply respectively

"(j) an RSRP base level of -112 dBm be used as a proxy for 3 Mbit/s SUTP using a 10 MHz downlink carrier. Where capacity increasing techniques are used such as carrier aggregation or deployment of additional bandwidth, or both, a lower RSRP value will be used as follows:

i. where additional 10 MHz downlink carriers are added using two or three band carrier aggregation across bands with similar

propagation characteristics (e.g. carriers in the 700 MHz Duplex, 800 MHz Band and 900 MHz Band) RSRP levels of -114 dBm and -116 dBm will apply respectively;"

"(l) as new technologies or coverage enhancing techniques are rolled out, the Commission will consider proposals from Licensees as to how this could influence meeting the coverage obligations, following which the Commission may determine additional metrics and base levels as a proxy for determining the Licensee's compliance with the coverage levels."

Population file

A 1.17 The MBSA2 Licences states that:

"The Commission will identify a population file for the purposes of measuring and monitoring the population coverage obligation by using the most up to date and appropriate datasets available at the time of conducting the measurement."

"In the absence of manifest error, the population file used by the Commission will be definitive in assessing compliance with the obligation.

Reporting on coverage obligations

A 1.18 MBSA2 Licences oblige licensees with 700 MHz spectrum rights (i.e. Eir, Three and Vodafone) to measure and assess its compliance with the above outdoor coverage and native Wi-Fi availability obligations every twelve months and submit an annual Coverage Compliance Report to ComReg (where the information required shall be agreed with ComReg in advance) with sufficient detail and granularity to allow ComReg to verify its contents.

Appendix 2: Base Station Rollout Obligations in MWBB Licences

A 2.1 This Appendix sets out information on the rollout obligations in the 3.6 GHz Band Licences and MBSA2 Licences.

A2.1 3.6 GHz Band Licences

Rollout Obligation

A 2.2 The 3.6 GHz Band Licences oblige licensees to achieve and maintain a Base Station Rollout obligation within 3 years of licence commencement relevant to its licensed Region as outlined below.[67]

A 2.3 In addition, for Regions 1, 2, 3 and 4, a licensee is required to work and use Rollout Base Stations in at least 4 counties.[68]

Table 20: Base Station Rollout Obligation in the 3.6 GHz Band Licences

Reference number of Region	Region	Minimum number of Rollout Base Stations to be worked and used				Number of counties where a Rollout Base Station is to be worked and used
		Imagine	Three	EIR	Vodafone	
1	Borders, Midlands and West	15	15	15	15	4
2	South West	15	15	15	15	4
3	East	15	15	15	15	4
4	South East	15	15	15	15	4
5	CSO boundary for Dublin and Suburbs	N/A	10	10	15	N/A
6	CSO boundary for Cork City and Suburbs	N/A	2	2	4	N/A
7	CSO boundary for Limerick City and Suburbs	N/A	2	2	4	N/A
8	CSO boundary for Galway City and Suburbs	N/A	2	2	4	N/A
9	CSO boundary for Waterford City and Suburbs	N/A	2	2	4	N/A

[67] In the 3.6 GHz Band Licences, this is the date when the last spectrum block in that licensed region is made available to the Licensee.

[68] Each of the areas of South Tipperary and North Tipperary are deemed to be a county for the purposes of determining compliance with the rollout obligation.

Definitions

The following definitions apply to the Rollout obligation:

> *"Rollout Base Station" means a Network Controlled Wireless Telegraphy Apparatus in the 3.6 GHz Band with a minimum spectrum efficiency capability of 4 bits/Hz."; and*
>
> *"Network-Controlled Wireless Telegraphy Apparatus" means apparatus which has backhaul capability [Footnote 4] over a network connection under the control of the Licensee. For the avoidance of doubt, "plug-and-play" type apparatus, such as femto cells, Terminal Stations and repeaters, are not Network-Controlled Wireless Telegraphy Apparatus".*
>
> *[Footnote 4]: "If the 3.6 GHz Band is used for the provision of backhaul connectivity, even if such Apparatus comprises of multiple hops to the network, this counts as a single Rollout Base Station, provided such backhaul connectivity carries data originating from or destined for multiple customer premises. The connection to individual customer premises equipment is excluded."*

Reporting on Compliance obligation

A 2.4 3.6 GHz Band licensees are obliged to submit an annual compliance report on rollout to ComReg within 31 days of each anniversary of the commencement of the licence (where the information required shall be agreed with ComReg in advance) with sufficient detail and granularity to allow ComReg to verify its contents.

A2.2 MBSA2 Licences

Rollout Obligation

A 2.5 MBSA2 licensees are obliged to achieve (within 4 years of the earliest commencement date of a Spectrum Block in the relevant spectrum band), and maintain thereafter, rollout base station obligations as outlined in Table 21 below.

Table 21: MBSA2 base station rollout obligation

Band	Number of base stations to be worked and used in each band within 4 years of the earliest commencement date of a Spectrum Block in that band (i.e. in 2027)			
	Eir	Imagine	Three	Vodafone
2.1 GHz	1,200	N/A	1,200	1,200
2.3 GHz	525	290	N/A	N/A
2.6 GHz FDD	N/A	N/A	525	525
2.6 GHz TDD	N/A	N/A[69]	N/A	525

Definitions

The following definitions apply to the Rollout obligation:

> *"Performance Band" means any of the following: 2.1 GHz Band, 2.3 GHz Band, 2.6 GHz FDD Band or 2.6 GHz TDD Band;*
>
> *"Rollout Base Station" means a Network Controlled Wireless Telegraphy Apparatus in the Performance Bands with a minimum spectrum efficiency capability of 4 bits/Hz."; and*
>
> *"Network-Controlled Wireless Telegraphy Apparatus" means apparatus which has backhaul capability [Footnote 33] over a network connection under the control of the Licensee. For the avoidance of doubt, "plug-and-play" type apparatus, such as femto cells, Terminal Stations and repeaters, are not Network-Controlled Wireless Telegraphy Apparatus".*
>
> *[Footnote 33]: "If any of the Performance Bands is used for the provision of backhaul connectivity, even if such Apparatus comprises of multiple hops to the network, this counts as a single Rollout Base Station, provided such backhaul connectivity carries data originating from or destined for multiple customer premises. The connection to individual customer premises equipment is excluded."*

[69] On 12 December 2025, BCP IV Telecommunications OPCO Limited (formerly Imagine Communications Ireland Limited) surrendered the 15 MHz of 2.6 GHz Band TDD spectrum rights of use contained in its MBSA2 licence, meaning that BCP IV was released from the licence conditions related to these spectrum rights.

Reporting on Compliance obligation

A 2.6 MBSA2 licensees are obliged to submit to ComReg an annual compliance report on rollout every 12 months (where information required shall be agreed with ComReg in advance) with sufficient detail and granularity to allow ComReg to verify its contents.

Appendix 3: Quality of Service Obligations in MWBB licences

A 3.1 This Appendix sets out information on the QoS obligations in MBSA1, 3.6 GHz Band and MBSA2 licences.

A3.1 MBSA1 Licences

A 3.2 MBSA1 Licences contain a network availability and a minimum voice call standards obligation as outlined below.

The minimum "Availability of the Network" obligation

A 3.3 The minimum "Availability of the Network" obligation requires MBSA1 licensees to ensure that network unavailability is less than 35 minutes per six-month period based on the weighting factors set out in the table below.

Table 22: Weighting Factors for Network Unavailability tracking all periods of network unavailability.

Network Unavailability, Weighting Factors (divide duration of each network event by weighting factor)			
	Monday to Friday	Saturday	Sunday
For periods between 07:00 and 24:00 hours	1	2	4
For periods between 00:00 and 07:00 hours	4	8	16

Definitions

"the network" means any Terrestrial System which uses the Licensed Spectrum Blocks"; and

"Network Unavailability" means the average number of minutes per six month period for which services on the network are not available due to a disturbance, failure or scheduled unavailability to a Network."

Maintenance of a network log

A 3.4 MBSA1 licensees are obliged to maintain a network log in a manner that can demonstrate to the satisfaction of ComReg that said log is an adequate means

of assessing whether the licensee is complying with its "Availability of the Network" licence obligations.

A 3.5 This network log shall be made available to ComReg upon request.

Reporting on compliance

A 3.6 MBSA1 licensees shall calculate the Network Unavailability for any period specified by ComReg from the information recorded in the network log, and shall, upon request and within such time as may be specified by ComReg, provide ComReg with the results of the calculation.

A 3.7 Every twelve months, MBSA1 licensees shall measure and submit an annual compliance report to ComReg on the availability of the network obligation.

A 3.8 The measurements required for this compliance report shall be agreed with ComReg in advance and the compliance report shall have sufficient detail and granularity to allow the Commission to verify the Licensee's measurements.

The minimum "Voice Call" standard

A 3.9 Where a MBSA1 licensee and/or any third party via contractual or other arrangements with the licensee, provides a "voice call" service on a Terrestrial System which uses the Licensed Spectrum Blocks, the licensee is obliged to comply with the minimum "Voice Call" standard as set out in the table below.

Table 23: The minimum "voice call" standard for each 6-month period for annual reporting

	Average	Worst Case
Maximum Permissible Blocking Rates This refers to the maximum percentage of total call attempts which are unsuccessful during the time consistent busy hour.	**2%**	**4%**
Maximum Permissible Dropped Call Rates This refers to the maximum percentage of total originating calls which are prematurely released by the network within 3 minutes of the call being made.	**2%**	**4%**
Transmission quality The Licensee shall ensure that the speech transmission quality is as good as or better than the speech quality associated with the GSM Standard and GSM Technical Specifications of the European Telecommunications Standards Institute ('ETSI').		

The Licensee shall ensure that appropriate echo treatment equipment is used and that it is properly configured.

Definitions

"voice calls" does not include Voice over Internet Protocol (VoIP)

Where a "voice call" service is provided by the Licensee and any third party via contractual or other arrangements with the Licensee, the minimum voice call standard shall be calculated by combining the "voice call" measurements of the Licensee with that of the third party.

"Time consistent busy hour" means the period of one-hour starting at the same time each day for which the average traffic of the network concerned is greatest over the days under consideration. The time consistent busy hour shall be determined from an analysis of traffic data obtained from the service and be subject to the Commission's [ComReg's] approval.

The 'Time consistent busy hour' is determined from the operator's voice traffic. It is the one-hour period during which there is the highest level of traffic. The blocked call rates are measured for the same one-hour period during each review period (i.e. 6 months). The one-hour period is determined by the operator and is subject to the Commission's [ComReg's] approval.

Reporting on compliance

A 3.10 Every twelve months, the MBSA1 licensee shall measure and submit an annual compliance report to ComReg on the voice call standard.

A 3.11 The information required for this compliance report shall be agreed with ComReg in advance and the compliance report shall have sufficient detail and granularity to allow ComReg to verify the contents of the Licensee's measurements.

3.6 GHz Band Licences

A 3.12 3.6 GHz Band Licences contain network availability and minimum voice call standards obligations as outlined below.

The minimum "Availability of the Network" obligation

A 3.13 The minimum "Availability of the Network" obligation obliges the 3.6 GHz Band licensee to ensure that network unavailability is less than 35 minutes per six-month period based on the weighting factors set out in the table below.

Table 24: Weighting Factors for Network Unavailability tracking all periods of network unavailability.

Network Unavailability, Weighting Factors (divide duration of each network event by weighting factor)			
	Monday to Friday	Saturday	Sunday
For periods between 07:00 and 24:00 hours	1	2	4
For periods between 00:00 and 07:00 hours	4	8	16

A 3.14 The "Availability of the Network" shall be calculated by combining the Network Unavailability measurements of the relevant services provided to the licensee's customers and provided to third party customers by the licensee via contractual or other arrangements with the licensee.

A 3.15 The licensee shall calculate the Network Unavailability for any period specified by ComReg from the information recorded in the network log, and shall, upon request and within such time as may be specified by ComReg, provide ComReg with the results of the calculation.

Definitions

"the network" means any Terrestrial System which uses the Licensed Spectrum Blocks"; and

"Network Unavailability" means the average number of minutes per six-month period for which services on the network are not available due to a disturbance, failure or scheduled unavailability to a Network."

Maintenance of a network log

A 3.16 3.6 GHz Band licensees are obliged to maintain a network log on a per Base Station basis in a manner that can demonstrate to the satisfaction of ComReg that such a network log is an adequate means of assessing whether a licensee is complying with its "Availability of the Network" licence obligations.

A 3.17 This network log shall be made available to ComReg upon request.

Reporting on compliance

A 3.18 Licensees shall calculate the Network Unavailability for any period specified by ComReg from the information recorded in the network log, and shall, upon request and within such time as may be specified by ComReg, provide ComReg with the results of the calculation.

The minimum "Voice Call" standard

A 3.19 Where a 3.6 GHz Band licensee and/or any third party via contractual or other arrangements with the licensee, provides a "voice call" service on a Terrestrial System which uses the Licensed Spectrum Blocks, the licensee is obliged to comply with the minimum "Voice Call" standard as set out in the table below.

Table 25: The minimum "voice call" standard for each 6 month period for annual reporting

	Average	Worst Case
Maximum Permissible Blocking Rates This refers to the maximum percentage of total call attempts which are unsuccessful during the time consistent busy hour.	2%	4%
Maximum Permissible Dropped Call Rates This refers to the maximum percentage of total originating calls which are prematurely released by the network within 3 minutes of the call being made.	2%	4%
Transmission quality The Licensee shall ensure that: • the speech transmission quality is as good as or better than the speech quality associated with the relevant European Telecommunications Standards Institute ('ETSI') Standard and Technical Specifications; and • appropriate echo treatment equipment is used and that such equipment is properly configured.		

Definitions

"Voice Call" means all relevant non-VOIP (Voice over Internet Protocol) and managed VOIP call services[Footnote 6] which are considered by the Commission to be substitutable with traditional voice call services as may be updated and notified to Licensees from time to time.

Footnote 6: "See for example, paragraph 2.6 of ComReg Document 14/89, Market Review: Retail Access to the Public Telephone Network at a Fixed Location for Residential and Non-Residential Customers in relation to the fixed voice calls."

Where a "voice call" service is provided by the Licensee and any third party via contractual or other arrangements with the Licensee, the minimum voice call standard shall be calculated by combining the "voice call" measurements of the Licensee with that of the third party.

"Time consistent busy hour" means the period of one-hour starting at the same time each day for which the average traffic of the network concerned is greatest over the days under consideration. The time consistent busy hour shall be determined from an analysis of traffic data obtained from the service and be subject to the Commission's [ComReg's] approval.

The 'Time consistent busy hour' is determined from the operator's voice traffic. It is the one-hour period during which there is the highest level of traffic. The blocked call rates are measured for the same one-hour period during each review period (i.e. 6 months). The one-hour period is determined by the operator and is subject to the Commission's [ComReg's] approval.

Maintenance of a network log

A 3.20 3.6 GHz Band licensees are is obliged to maintain a network log in respect of the performance of their network against the Minimum Voice Call Standards, according to measuring standards as agreed with ComReg and in such a manner that can demonstrate to ComReg's satisfaction that its network log is an adequate means of assessing whether the licensee is complying with these standards.

Reporting on compliance

A 3.21 Every twelve months, a 3.6 GHz Band licensee shall measure and submit an annual compliance report to ComReg on the voice call standard.

A 3.22 The information required for this compliance report shall be agreed with ComReg in advance and the compliance report shall have sufficient detail and granularity to allow ComReg to verify the contents of the Licensee's measurements.

MBSA2 Licences

A 3.23 MBSA2 Licences contain network availability, minimum voice call standards, and VoLTE obligations as detailed below.

The minimum "Availability of the Network" obligation

A 3.24 The minimum "Availability of the Network" obligation requires MBSA2 licensees to ensure that network unavailability is less than 35 minutes (based on the weighting factors set out in the table below) per six-month period, and to be measured and reported to ComReg on an annual basis.

Table 26: Weighting Factors for Network Unavailability tracking all periods of network unavailability.

Network Unavailability, Weighting Factors (divide duration of each network event by weighting factor)			
	Monday to Friday	Saturday	Sunday
For periods between 07:00 and 24:00 hours	1	2	4
For periods between 00:00 and 07:00 hours	4	8	16

A 3.25 The "Availability of the Network" is to be calculated by combining the Network Unavailability measurements of the relevant services provided to the MBSA2 licensee's end users and provided to the end users of third parties.

Definitions

"the network" means any Terrestrial System which uses the Licensed Spectrum Blocks"; and

"Network Unavailability" means the average number of minutes per six-month period for which services on the network are not available due to a disturbance, failure or scheduled unavailability to a Network."

Maintenance of a network log

A 3.26 MBSA2 licensees are obliged to maintain a network log on a per Base Station basis in a manner that can demonstrate to the satisfaction of ComReg that such a network log is an adequate means of assessing whether the licensee is complying with its "Availability of the Network" licence obligations.

A 3.27 This network log, or as may be appropriate part thereof, shall be made available to ComReg upon request.

A 3.28 MBSA2 licensees are required to calculate the Network Unavailability for any period specified by ComReg from the information recorded in the network log, and shall, upon request and within such time as may be specified by ComReg, provide ComReg with the results of the calculation.

Reporting on compliance

A 3.29 Every twelve months MBSA2 licensees are required to measure and submit an annual compliance report to ComReg on the availability of the network obligation.

A 3.30 The measurements required for this compliance report shall be agreed with ComReg in advance and the compliance report shall have sufficient detail and granularity to allow ComReg to verify a licensee's measurements.

The minimum "Voice Call" standard

A 3.31 MBSA2 licensees are obliged to comply with the minimum "Voice Call" standard (as set out in the table below) where the licensee, and/or any third party via contractual or other arrangements with the licensee, provides a "voice call" service on a Terrestrial System which uses the Licensed Spectrum Blocks.

Table 27: The minimum "voice call" standard for each 6-month period for annual reporting

	Average	Worst Case
Maximum Permissible Blocking Rates The blocked call rates are measured for the Time Consistent Busy hour. during each review period (i.e. 6 months).	2%	4%
Maximum Permissible Dropped Call Rates	2%	4%
Transmission quality The Licensee shall ensure that: • the speech transmission quality is as good as or better than the speech quality associated with the relevant European Telecommunications Standards Institute ('ETSI') Standard and Technical Specifications; and • appropriate echo treatment equipment is used and that such equipment is properly configured.		

Definitions

"Voice Call" means all relevant non-VOIP (Voice over Internet Protocol) and managed VOIP call services[Footnote 34] which are considered by the Commission to be substitutable with traditional voice call services as may be updated and notified to Licensees from time to time.

Footnote 34: "This includes traditional voice call services carried over circuit-switched connections and 'managed' packet-switched voice call services (e.g. using VOIP or similar protocols) which can be provided over different technologies (e.g. VoLTE, Native Wi-Fi, etc.)."

Where a "voice call" service is provided by the Licensee and any third party via contractual or other arrangements with the Licensee, the minimum voice call standard shall be calculated by combining the "voice call" measurements of the Licensee with that of the third party.

"Time Consistent Busy Hour" means the period of one-hour starting at the same time each day for which the average voice traffic of the network concerned is greatest over the days under consideration. The time consistent busy hour shall be determined by the Licensee from an analysis of traffic data obtained from the service and be subject to the Commission's approval;

Maintenance of a network log

A 3.32 MBSA2 licensees are obliged to maintain a network log in respect of the performance of its network against the Minimum Voice Call Standards, according to measuring standards as agreed with ComReg, and in such a manner that can demonstrate to ComReg's satisfaction that its network log is an adequate means of assessing whether the licensee is complying with these standards.

Reporting on compliance

A 3.33 Every twelve months, a MBSA2 licensee shall measure and submit an annual compliance report to ComReg on the voice call standard.

A 3.34 The information required for this compliance report shall be agreed with ComReg in advance and the compliance report shall have sufficient detail and granularity to allow ComReg to verify the contents of the Licensee's measurements.

A3.3 The VoLTE "Availability" obligation

A 3.35 Where a MBSA2 licensee has deployed LTE technology in any of the bands in which it holds rights of use under its MBSA2 Licence, and also offers a mobile voice service to consumers using those bands, the licensee shall:

(a) enable VoLTE technology on its network and on its Base Stations which use those bands within 1 year;

(b) make a VoLTE service available to its end users (including MVNO end users) that have a VoLTE-enabled handset within 1 year; and

(c) deploy and maintain VoLTE across 50% of its LTE Base Stations which use those bands within 1 year and across 100% of such Base Stations within 2 years.

A 3.36 "VoLTE" means voice over LTE which is a managed voice service that benefits from prioritisation over other traffic.

Reporting on compliance

A 3.37 Every twelve months, a MBSA2 licensee shall measure and submit an annual compliance report to ComReg on the VoLTE standard.

A 3.38 The information required for this compliance report shall be agreed with ComReg in advance and the compliance report shall have sufficient detail and granularity to allow ComReg to verify the contents of the licensee's measurements.

Appendix 4: Parameters and files used in ComReg's analysis of coverage

A 4.1 To inform ComReg's assessment of licensees' compliance with their outdoor mobile coverage obligations, ComReg carries out its own analysis of MNOs' coverage. This is based on the network information provided by the MNOs to ComReg's Outdoor Mobile Coverage Mapping tool, the common files shared with MNOs and other parameters as outlined below.

(a) Planning tool and propagation model:

(i) The coverage predictions are generated using the Forsk 'Atoll' radio planning tool, together with the 'Crosswave' radio propagation model from Orange Labs.

(b) Technology and Frequency Bands:

(i) MBSA2 Licence: LTE technology and all frequency bands used by MNO for LTE

(ii) 3G Licence and 2.1 GHz Band Licence: 3G technology and LTE technology using spectrum in the 2.1 GHz band

(iii) MBSA1 Licence: LTE technology and the 800 MHz band

(c) Date of network

(i) January 2025 – exact date is the same as that used by MNO to collect network information to provide to ComReg for the outdoor mobile coverage map.

(d) Measures used for determining coverage: Single frequency band

(i) MBSA2 Licence: 30 Mbits/s LTE coverage (RSRP ≥ -103 dBm); 3 Mbits/s LTE coverage (RSRP ≥ -112 dBm)

(ii) MBSA1 Licence: LTE coverage (RSRP ≥ -115 dBm)

(iii) 3G Licence and 2.1 GHz Band Licence: LTE coverage (RSRP ≥ -115 dBm), 3G coverage (Best Signal Level (dBm) ≥ -105 dBm)

(e) Carrier Aggregation

(i) No carried aggregation applied

(f) Clutter

(i) National Clutter class is 15m and for the 5 main cities the resolution is 2m. Clutter height data is also used for the 5 main cities of 1m resolution.

(g) Resolution

(i) 10 m across all country

Appendix 5: 3.6 GHz Band Licence Network Availability - Basis Information and Recommended Methodology

A 5.1 In advance of the next reporting year, ComReg wrote to the 3.6 GHz Band licensees setting out its view on the basis information to be used and the recommended methodology steps for calculating network availability for the 3.6 GHz Band Licence obligation.

Basis Information

For the Network Availability calculation, the following **basis information** is to be used.

1. Network availability is to be calculated on the basis of the **availability of <u>each cell (i.e. base station)</u>**.

   This is line with paragraph (4) of Section 5(2) of Part 4 of the Licence which states that *"The Licensee shall <u>maintain a network log on a per Base Station basis</u> in a manner that can demonstrate to the satisfaction of the Commission that such a network log is an adequate means of assessing whether the Licensee is complying with its "Availability of the Network"* (emphasis added).

2. Network Availability is to be calculated on the basis of a **<u>daily calculation</u>** using the **<u>weightings</u>** as set out in the Licence for all the **<u>commissioned cells on that day</u>**.

   By calculating on a daily basis, this means that as new cells become commissioned, they will be included in the calculation on the day that they are commissioned. Similarly, as old cells get decommissioned, they will be excluded from the calculation.

For the avoidance of doubt:

- Sites commissioned for some or all of the day are included in the daily calculation.
- Sites commissioned but taken down for scheduled maintenance for some or all of that day are to be included in the daily calculation.
- Sites yet to be commissioned are not to be included in the daily calculation.

Recommended Methodology

Using the above basis information, there are various ways of calculating the network availability (i.e. % availability) or level of network unavailability (i.e. % unavailable) or downtime (i.e. minutes/seconds unavailable) for the 6-month period as per the licence obligation.

Set out below is ComReg's recommended methodology.

STEP 1 - For each day over the relevant 6-month period, calculate the daily total downtime in seconds (weightings applied) for an average cell, based on all commissioned cells on that day.

$$\text{Daily Total Downtime}_{\text{avg cell (secs)}} = \frac{\text{Sum of Daily Downtimes}_{\text{for each commissioned cell (secs)}}}{\text{No. Commissioned Cells}_{\text{daily count}}}$$

Where:

- **Daily Total Downtime$_{\text{avg cell (secs)}}$** = the daily total downtime in seconds (weightings applied) for an average cell on the relevant day.
- **Sum of Daily Downtimes$_{\text{for each commissioned cell (secs)}}$** = the sum of each commissioned cell's daily downtime in seconds (weightings applied) on the relevant day. (See also note 1 below); and
- **No. Commissioned Cells$_{\text{daily count}}$** = the total number of commissioned cells on the relevant day.

STEP 2 - For each day over the relevant 6-month period, calculate the daily network availability (weightings applied) for an average cell.

$$\text{Daily Network Availability}_{\text{avg cell (\%)}} = 100\% - \left(\frac{\text{Daily Total Downtime}_{\text{avg cell (secs)}}}{\text{Daily Total Network Time}_{\text{(secs)}}}\%\right)$$

Where:

- **Daily Network Availability$_{\text{avg cell (\%)}}$** = the percentage daily network availability (weightings applied) for an average cell for the relevant day.
- **Daily Total Downtime$_{\text{avg cell (secs)}}$** = the daily total downtime in seconds (weightings applied) for an average cell for the relevant day, as calculated in Step 1 above; and
- **Daily Total Network Time$_{\text{(secs)}}$** = the daily total network time in seconds for the relevant day (see also Note 1).

Note 1: Daily Total Network Time (Seconds) under normal circumstances is 86400 seconds (24hr x 60min x 60sec). However, care should be taken on the days when Daylight Savings Time (DST) is applied and removed to ensure that the correct number of seconds is used for Daily Total Network Time (Seconds) that day.

Similarly, the Daily Downtime Seconds for each commissioned Cell would need to be calculated correctly and consistently.

STEP 3 - Calculate the six-month network availability (%)

$$\text{Network Availability}_{6\text{ months (\%)}} = \frac{\text{Sum Daily Network Availability}_{\text{avg cell/each day/6 months (\%)}}}{\text{No. Days}_{6\text{ month period}}}$$

Where:

- **Network Availability$_{\text{6 months (\%)}}$** = the percentage network availability over the relevant six-month period.
- **Sum Daily Network Availability$_{\text{avg cell/each day/6 months (\%)}}$** = the sum of all the **Daily Network Availability$_{\text{avg cell (\%)}}$** percentages calculated for each day over the relevant six-month period in Step 2 above; and
- **No. Days$_{\text{6 month period}}$** = the number of days in the relevant six-month period.

STEP 4 - Calculate the six-month network unavailability (in minutes)

$$\text{Network Unavailability}_{6\text{ months (mins)}} = \left(100\% - \text{Network Availability}_{6\text{ months (\%)}}\right) \times \text{No. Minutes}_{6\text{ month period}}$$

Where:

- **Network Unavailability$_{\text{6 months (mins)}}$** = the downtime of the network in minutes over the relevant six-month period.
- **Network Availability$_{\text{6 months (\%)}}$** = the percentage network availability over the relevant six-month period, as calculated in Step 3 above; and
- **No. Minutes$_{\text{6 month period}}$** = the number of minutes in the relevant six-month period.