



An Coimisiún um
Rialáil Cumarsáide
Commission for
Communications Regulation

Spectrum Lease Determination

Lease of spectrum rights in the 3.6 GHz band from Meteor Mobile Communications Limited and Vodafone Ireland Limited to Imagine Communications Ireland Limited

Reference: ComReg 21/131

Date: 16/12/2021

Additional Information

Document No:	21/131
Date:	16/12/2021

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1 Introduction and background

- 1.1 The procedures and guidelines for transfers and leases of spectrum rights of use for electronic communications services (“ECS”) in the 700 MHz¹, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2.6 GHz and 3.6 GHz bands in Ireland are set out in Commission for Communications Regulation (“ComReg”) Document 14/11R.²
- 1.2 On 18³, 25⁴ and 26⁵ March 2021, Imagine Communications Ireland Limited (“Imagine”)⁶ submitted to ComReg notifications regarding its proposal to lease spectrum rights in the 3.6 GHz band from each of Dense Air Ireland Limited (“Dense Air”), Meteor Mobile Communications Limited (“Meteor”), and Vodafone Ireland Limited (“Vodafone”)⁷ at 18 locations (“Existing Lease Areas”). At a high level, Imagine leased:
- 20 MHz from Dense Air (in the frequency range 3410 to 3430 MHz) at eight locations;
 - 20 MHz from Meteor (in the frequency range 3620 to 3640 MHz) at six locations; and
 - 20 MHz from Vodafone at two locations, 40 MHz at one further location, and 60 MHz at another further location (in the frequency range 3480 to 3540MHz).
- 1.3 These leases expired on 18 (Dense Air), 25 (Meteor) and 26 (Vodafone) November (collectively the “Expired Leases”).
- 1.4 On 5 and 11 November 2021, Imagine submitted to ComReg two separate further notifications to lease spectrum rights in the 3.6 GHz band from Meteor (“Proposed Meteor Lease”) and Vodafone (“Proposed Vodafone Lease”) (collectively the “Proposed Leases”). ComReg published an information notice regarding the

¹ Decision (EU) 2017/899 of 17 May 2017 on the use of the 470-790 MHz frequency band in the Union requires EU Member States to allow the transfer or leasing of spectrum rights of use in the 700 MHz (694-790 MHz) band.

² ComReg Document 14/11R, ‘*Spectrum Transfer and Lease Framework in Ireland - Procedures and Guidelines, and Notification Form(s)*’, revised 12 October 2017.

³ ComReg Document 21/25 – Spectrum Lease Notification Proposed lease of spectrum rights in the 3.6 GHz band from Dense Air Limited to Imagine Communications Ireland Limited – 25th March 2021.

⁴ ComReg Document 21/27 – Spectrum Lease Notification Proposed lease of spectrum rights in the 3.6 GHz band from Meteor Mobile Communications Limited to Imagine Communications Ireland Limited

⁵ ComReg Document 21/36 – Spectrum Lease Notification Proposed lease of spectrum rights in the 3.6GHz and from Vodafone Ireland Limited to Imagine Communications Ireland Limited– 9th April 2021.

⁶ Imagine Communications Ireland Limited provides fixed wireless ECS – 26th March 2021.

⁷ Details of these leases are set out in Annexes 1 of Documents 21/25, 21/27 and 21/36 and readers are referred to same

Proposed Leases on 16 November (Document 21/115⁸) which set out:

- by way of background and context, material regarding ComReg’s recent spectrum leases to date;
- relevant technical details of the lease notifications and other relevant material; and
- the process by which interested parties could make submissions on the Proposed Leases and next steps.

1.5 ComReg does not repeat this background information and refers interested parties to Documents 21/115.

1.6 ComReg did not receive any submissions in response to Document 21/115.

1.7 This document sets out ComReg’s written determination, having regard to the procedures and guidelines set out in Document 14/11R in particular.

1.1 Background – key aspects of framework for spectrum leases in Ireland

1.8 In October 2017, ComReg published its response (“Document 17/82”)¹ to the public consultation (“Document 17/47”)² on its proposed framework for spectrum leases in Ireland (“Spectrum Lease Framework”). ComReg also updated its spectrum transfer procedures to reflect its decisions on the Spectrum Lease Framework (“Document 14/11R”).

1.9 While the draft Wireless Telegraphy (Transfer of Spectrum Rights of Use) (Amendment) Regulations have yet to be made, there is no impediment to the Proposed Leases in the 3.6 GHz Band.⁹

1.10 In addition to Document 14/11R and S.I. No. 532 of 2016, ComReg would highlight Regulation 19 of the Framework Regulations¹⁰ and Regulation 9(11) of the

⁸ ComReg Document 21/115 – “ Spectrum Lease Notification: 3.6 GHz band. Proposed lease of spectrum rights in the 3.6 GHz band from Meteor Mobile Communications Limited and Vodafone Ireland Limited to Imagine Communications Ireland Limited” - published 16 November 2021.

⁹ See, in particular, the Wireless Telegraphy (3.6 GHz Band Licences) Regulations 2016 (S.I. No. 532 of 2016) at <http://www.irishstatutebook.ie/eli/2016/si/532/made/en/print>

¹⁰ European Communities (Electronic Communications Networks and Services) (Framework) Regulations 2011 (S.I. No. 333 of 2011).

Authorisation Regulations¹¹.

- 1.11 Readers are also referred to Annex 2 of Document 20/122 for a general overview of the legislative framework relevant to ComReg's spectrum management function.

1.2 Background - 3.6 GHz Band, 3.6 GHz Band Award and Transition

3.6 GHz Band

- 1.12 The 3.6 GHz Band comprises the frequency range 3 400 – 3 800 MHz and in Ireland a total of 350 MHz is assigned to licensees for the purposes of providing ECS.¹²
- 1.13 The 3.6 GHz Band is one of the three “Pioneer 5G candidate bands” in Europe¹³ and its use is harmonised in Europe by way of European Commission decisions (EU) 2019/235 and 2008/411/EC.¹⁴
- 1.14 3.6 GHz Band rights of use in Ireland are service- and technology-neutral, and use cases include mobile broadband, fixed wireless broadband and small cells.

3.6 GHz Band Award¹⁵

- 1.15 On 22 May 2017, ComReg announced the results of its 3.6 GHz Band Award (“Award”) which resulted in five Winning Bidders, across over nine regions (four rural and five urban), together “Regions”) and assigned on a contiguous basis.¹⁶
- 1.16 The 9 licence regions are shown in Figure 2 in **Annex 1**.

3.6 GHz Band Transition

- 1.17 Prior to the Award, the 3.6 GHz Band was used to provide fixed wireless broadband services (and phone services in some cases) to 21,665 existing customers, predominantly in rural areas. In those areas, the then existing operators may have

¹¹ European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2011 (S.I. No. 335 of 2011)

¹² The remainder comprises a 10 MHz guard band (between 3 400-3 410 MHz) and spectrum used by State Services.

¹³ https://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf

¹⁴ Commission Implementing Decision (EU) 2019/235 of 24 January 2019 on amending Decision 2008/411/EC as regards an update of relevant technical conditions applicable to the 3400-3800 MHz frequency band (notified under document C(2019) 262) (Text with EEA relevance.)

¹⁵ For more information, please see:

<https://www.comreg.ie/industry/radio-spectrum/spectrum-awards/3-6ghz-band-spectrum-award/>

¹⁶ Full details of the results are set out in Document 17/38 and corresponding Media Release.

been the only available provider of broadband services, such as to homes and schools.

- 1.18 In order to ensure continued services for those existing customers who were at risk of losing their service while Winning Bidders prepared for the deployment of their services (e.g. trials), ComReg developed a Transition licensing framework - which it consulted upon extensively with interested parties and implemented by way of the rules of the Award - which all participants to the Award agreed to be bound by.¹⁷ Essentially, this Transition licensing framework allows existing operators to continue to provide services to their customers until such time that Winning Bidders were ready to roll-out commercial services.
- 1.19 Relevantly, as Imagine was both a Fixed Wireless Access Local Area licensee and a Winning Bidder in the Award, Imagine was eligible to apply for, and currently holds, a 3.6 GHz Band Transition Protected Licence (“TPL”)¹⁸, to facilitate the completion of its Transition Activities as provided for under Section 3.8 of the IM.
- 1.20 Further details on 3.6 GHz Band Transition activities is available on ComReg’s website.¹⁹

1.3 Structure of document

- 1.21 The remainder of this document is structured as follows:
- **Chapter 2** sets out ComReg’s assessment of the Proposed Leases and determination.
 - **Annex 1** contains an analysis of Imagines’ spectrum holdings.

¹⁷ These rules are contained in the 3.6 GHz Band Spectrum Award Information Memorandum (Document 16/71) (“IM”).

¹⁸ See Section 2.6 of <https://www.comreg.ie/publication/3-6-ghz-band-spectrum-award-information-memorandum/>

¹⁹ See: <https://www.comreg.ie/industry/radio-spectrum/spectrum-awards/3-6-ghz-band-transition/>

2 Determination

2.1 This chapter outlines ComReg's determination and is structured as follows:

1. A brief description of the notifying parties and their spectrum holdings;
2. Imagine's existing 3.6 GHz Band spectrum holdings;
3. Proposed Leases;
4. Imagine's post-lease 3.6 GHz Band spectrum holdings; and
5. Assessment.

2.1 The Notifying Parties

2.1.1 Business activities of the notifying parties

2.2 **Imagine** is the largest Wireless Internet Service Provider ("WISP") with circa 42,000 fixed broadband subscribers (2.8% market share by subscriptions) as at Q3 2021.²⁰ Imagine does not provide mobile telecommunications services.

2.3 **Vodafone** is a mobile network operator ("MNO") with circa 2.8 million mobile subscribers (36.5% market share by subscriptions). Vodafone also provides fixed line and mobile broadband services and has circa 313,000 fixed broadband subscribers (20.0% market share by subscriptions)²¹.

2.4 **Meteor** is a MNO and a wholly-owned subsidiary of Eircom Group which has circa 1.2 million mobile subscribers (15.8% market share by subscriptions). Eircom Group also provides fixed line and mobile broadband services and has circa 441,000 fixed fixed broadband subscribers (28.2% market share by subscriptions)²².

2.1.2 Existing overall spectrum holdings of the notifying parties

2.5 The existing spectrum holdings of the notifying parties²³ capable for the provision of public wireless ECS is shown in **Table 1**: Existing spectrum holdings of notifying parties capable for the provision of public wireless ECS

²⁰ Quarterly Key Data Report, Q3 2021.

²¹ Quarterly Key Data Report, Q3 2021.

²² Quarterly Key Data Report, Q3 2021.

²³ The figures exclude leases or other temporary rights of use.

Band	Meteor	Vodafone	Imagine
800 MHz	20 MHz	20 MHz	-
900 MHz	20 MHz	20 MHz	-
Total sub-1 GHz	40 MHz	40 MHz	-
1800 MHz	30 MHz	50 MHz	-
3.6 GHz	80 MHz in rural regions and 85 MHz in the cities	80 MHz in rural regions and 85 MHz in the cities	60 MHz in each of the rural regions
2.1 GHz FDD	30 MHz	30 MHz	
Total supra-1 GHz	145 MHz	185 MHz	60 MHz
Total	185 MHz	225 MHz	60 MHz

2.6 below.²⁴

²⁴ This excludes temporary spectrum rights issued under ComReg's Covid-19 Temporary Spectrum Management Measures, TPL and Previous Leases.

Table 1: Existing spectrum holdings of notifying parties capable for the provision of public wireless ECS

Band	Meteor	Vodafone	Imagine
800 MHz	20 MHz	20 MHz	-
900 MHz	20 MHz	20 MHz	-
Total sub-1 GHz	40 MHz	40 MHz	-
1800 MHz	30 MHz	50 MHz	-
3.6 GHz	80 MHz in rural regions and 85 MHz in the cities	80 MHz in rural regions and 85 MHz in the cities	60 MHz in each of the rural regions
2.1 GHz FDD	30 MHz	30 MHz	
Total supra-1 GHz	145 MHz	185 MHz	60 MHz
Total²⁵	185 MHz	225 MHz	60 MHz

2.2 Imagine's existing 3.6 GHz Band spectrum holdings

- 2.7 Imagine's existing 3.6 GHz Band spectrum holdings consists of 60 MHz (in the frequency range 3560 to 3620 MHz) in each of four rural licence regions (i.e. Borders, Midlands and West; South West; East and South East) held under its 3.6 GHz Band Liberalised Use Licence ("LU Licence").
- 2.8 Imagine also holds 3.6 GHz Band spectrum rights in various parts of the band in 111 Transition Service Areas ("TSAs") under its TPL.
- 2.9 These TSAs correspond to local service areas in which Imagine previously operated under the 3.6 GHz Band FWALA licensing scheme prior to the Award. At the start of Transition immediately after the Award, all TSAs had a 20 km radius boundary around a defined centre point. As Transition has progressed, the area of some TSAs has been reduced to reflect completion of Transition Activities which affect only part of a TSA and to facilitate ongoing Transition Activities in the remainder of the TSA
- 2.10 In addition to having a defined geographic area, TSAs are assigned frequency

²⁵ Note that these numbers are the maximum assigned to the licensee in any given region.

ranges which derive from the previous channel plan for 3.6 GHz Band FWALA licensing prior to the Award, which included a number of paired and unpaired channels. In many cases, the frequency ranges of Imagine's TSAs have reduced as Transition has progressed.

2.11 Further details of Imagine's TPL holdings, including the locations of same, are set out in **Annex 1**.

2.3 The Proposed Leases

2.12 Details of the Proposed Leases are set out in Annex 1 of Documents 21/115 and readers are referred to same.

2.13 At a high level, the Proposed Leases entail Imagine leasing:

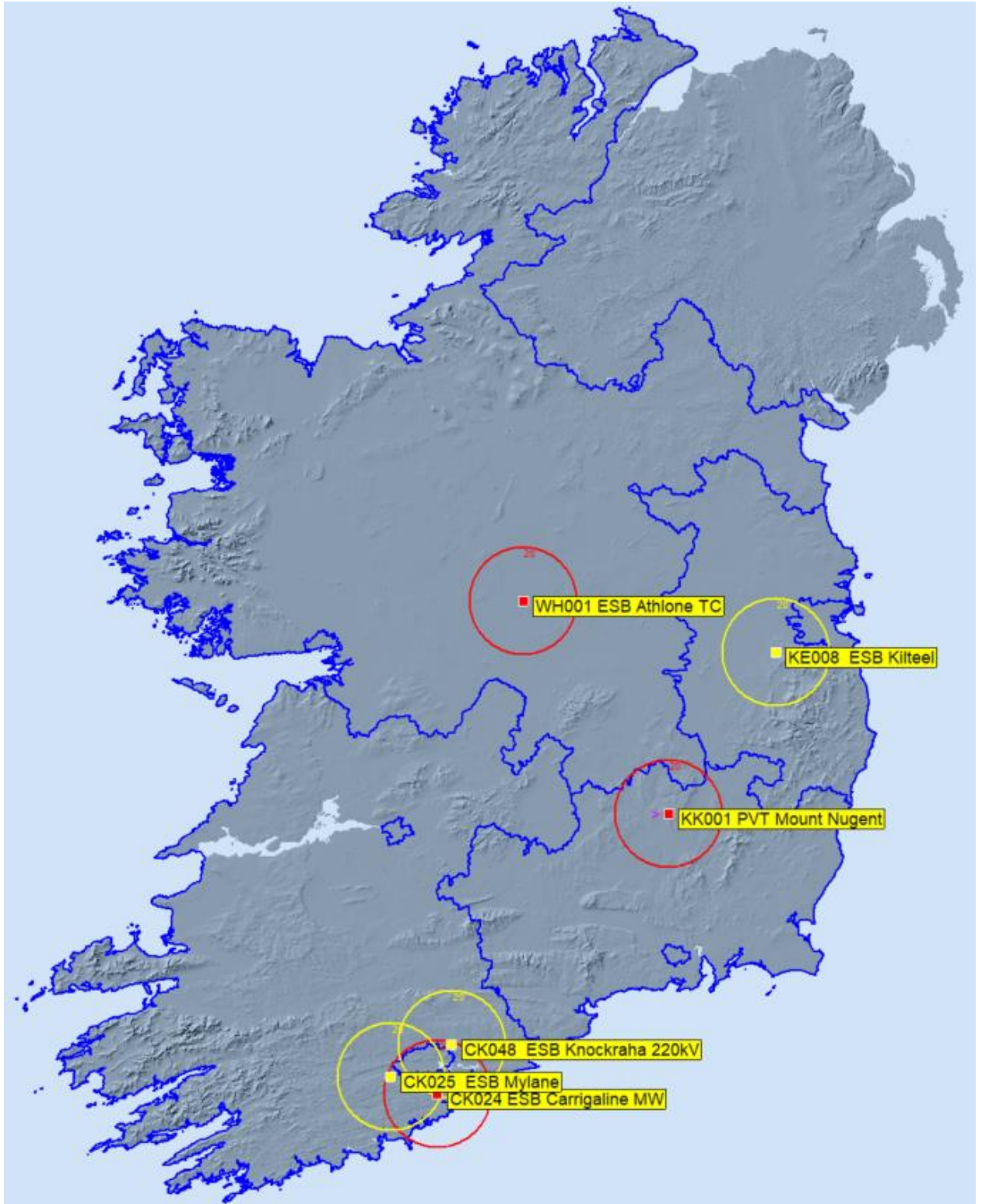
- 20 MHz of Meteor's spectrum (in the frequency range 3620 to 3640 MHz) at three locations;
- 20 MHz of Vodafone's spectrum at one location, 40 MHz at one further location; and 60 MHz at another further location (in the frequency range 3480 to 3540MHz).

2.14 Each location consists of an area of 20 km radius around an existing Imagine base station ("Proposed Lease Area" or "PLA"). The Proposed Lease Areas are shown at **Figure 1** below.

2.15 The Proposed Leases are for three months initially, with a further three-month period subject to the prior agreement by the relevant parties, and approval by ComReg. Accordingly, the following assessment has been conducted on the basis of the Proposed Leases having a 6-month (potential) overall duration.

2.16 The Proposed Leases do not entail any amendments to the conditions of the 3.6 GHz Band Liberalised Use Licences of Vodafone or Meteor.

Figure 1: Map of Proposed Lease Areas



2.4 Imagine's 3.6 GHz Band spectrum holdings following the Proposed Leases

- 2.17 First, the Expired Leases do not form part of the assessment of the potential impacts of the Proposed Leases.
- 2.18 As noted above, the Proposed Leases would increase Imagine's 3.6 GHz Band spectrum holdings by 20MHz-60MHz in the 6 unique PLAs, relative to Imagine's holdings absent the Proposed Leases.
- 2.19 It is not, however, a straightforward task to assess Imagine's current spectrum holdings in the PLAs because:
- PLAs do not correspond directly to Imagine's TSAs (i.e. they are not concentric in most cases);
 - in many cases, PLAs are overlapped by multiple TSAs in a particular frequency range, but not necessarily across the entire area of the PLA;
 - TSAs in different frequency ranges often overlap different parts of PLAs; and
 - in the frequency range 3560 – 3620 MHz, where Imagine holds spectrum rights in the four rural Regions under its LU Licence, 4 PLAs²⁶ are partly overlapped by urban Regions where Imagine does not hold 3.6 GHz Band spectrum rights²⁷.
- 2.20 Therefore, if a PLA is not entirely overlapped by one or more TSAs in a particular frequency range, the question arises as to whether the TSA frequency range should constitute part of Imagine's current spectrum holdings for that PLA and, in particular, where the geographic overlap may be relatively small (e.g. 20%).
- 2.21 Therefore, ComReg has assessed Imagine's current spectrum holdings in each quadrant²⁸ of each of the PLAs - rather than in the entirety of each PLA – which should provide sufficient granularity to capture the contributions of significant TSA overlaps within the PLAs. The average increase in Imagine's spectrum across all site quadrants is 33%²⁹.

²⁶ KE008, CK024, CK025, and CK048

²⁷ A detailed discussion of the issues and ComReg's approach, including examples of same, are detailed in the Annex.

²⁸ i.e. North East, South East, South West and North West Quadrants

²⁹ This figure excludes the SW quadrant of CK048 ESB Knockraha 220kV, in which absent the Proposed Leases Imagine does not hold spectrum, see footnote 39.

2.22 As a result of Imagine's spectrum holdings under its TPL (which vary across different parts of the State), Imagine's post-lease spectrum holdings in the relevant areas would increase by 20 – 60 MHz (as shown in **Table 2:** , resulting in Post-Lease holdings of a maximum³⁰ of:

- Between 140 MHz and 165 MHz in 3 PLAs; and
- 210 MHz in 3 PLAs.

2.5 Assessment

2.23 By way of background, ComReg recalls that its guidelines for the determination of whether a spectrum transfer or lease would likely distort competition - as set out in Chapter 3 Document 14/11R - are to be interpreted and applied flexibly having regard to the specific circumstances of each case.³¹ For example and other things being equal, a transfer or lease with prima facie greater potential to raise competition concerns (such as in terms of quantum of spectrum rights involved, the relative existing spectrum holdings of the notifying and other relevant parties before and following the proposed transfer or lease, and/or the duration of lease etc.), would likely involve a more exhaustive assessment of the matters identified in the guidelines, including a likely corresponding higher burden on the notifying parties in terms of the information required to inform such an assessment.

2.24 In the present matter, ComReg would particularly note the quite limited duration of the Proposed Leases (i.e. 3 months initially, and up to 6 months overall), the relative spectrum holdings of the relevant parties (both pre- and post-lease) and the broader context in which the Proposed Leases are occurring (i.e. COVID-19 and the impact of the measures to address same (e.g. tele-working) on electronic communications networks).

2.25 In addition, ComReg has, in this particular instance, chosen to assess the likely impact of the Proposed Leases collectively, which is a conservative approach as the potential impacts would necessarily be greater than that of any individual proposed lease.

2.26 In light of the above context, ComReg outlines out its assessment below.

2.27 **First**, and in the context of market definition, ComReg recalls paragraph 39 of

³⁰ Represented by the quadrant in each PLA with the greatest quantum of spectrum holdings.

³¹ Paragraph 33 of Document 14/11R.

Document 14/11R which states:

“It is not always necessary to reach a firm conclusion on market definition - for example, where it is clear that the proposed spectrum transfer or lease is not likely to raise competition concerns on any reasonable definition of the market.”

2.28 In the present case, it appears sufficient to consider the Proposed Leases in the narrow context of the relative distributions of holdings in the relevant spectrum band, noting, of course, the potential for other competitive constraints when viewed more broadly, such as in terms of alternative spectrum bands (e.g. fixed wireless access services provided using licence-exempt spectrum) and alternative technologies (e.g. mobile broadband and fixed broadband etc).

2.29 **Second**, and in that context, ComReg does not consider that the post-lease 3.6 GHz Band spectrum holdings of Imagine would be likely to distort competition noting, among other things:

- that Imagine presently holds 60 MHz under its LU Licence out of a total of 350 MHz assigned in rural regions in the 3.6 GHz Band (or circa 17%), further noting the service-and technology-neutral licensing of rights in this band;
- Imagine’s existing holdings under its TPL (as detailed in the Annex), whilst being counted according to the methodology described herein and accounting for a considerable proportion of Imagine’s post-lease spectrum holdings, are nevertheless ultimately temporary as Imagine holds them subject to the Transition Rules and, in particular, the commercial deployment plans of the relevant Winning Bidder/s;
- the very short-term nature of the Proposed Leases (see further below); and
- the overall quantum of spectrum Imagine would hold under the Proposed Leases is less than that held by Imagine under the Previous Leases.

2.30 By way of context, ComReg observes the following differences between the Proposed Leases and the Expired Leases:

- A reduction of 20 MHz of Dense Air’s spectrum at eight locations;
- A reduction of 20 MHz of Vodafone’s spectrum at one location; and
- An reduction of 20 MHz of Meteor’s spectrum at three locations.

- 2.31 Furthermore, the very short-term nature of the Proposed Leases limits the potential for material competitive distortions to arise because, among other things:
- the Proposed Leases are stated to be for use in providing FWA services to Imagine's pre-existing customers only;³² and
 - the benefits to Imagine from the Proposed Leases (i.e. additional capacity and better quality of service) are short-lived, thereby reducing the ability and incentive to seek to increase its prices (or reduce its output) on foot of same without concern as to the reactions of its competitors and/or customers.
- 2.32 **Third**, ComReg recalls the broader context in which the Proposed Leases are occurring (i.e. COVID-19 and the impact on measures to address same on electronic communications networks).
- 2.33 For the reasons outlined above, ComReg considers that the Proposed Leases would not be likely to distort competition and has determined that the Proposed Leases may be put into effect for a period of six months from 16/12/2021.

³² See page 4 & 5 of the lease agreement between Imagine with Vodafone and Meteor respectively, in ComReg Document 20/115.

Annex 1: Imagine’s spectrum holdings

The increase in Imagine’s spectrum holdings as a result of the Proposed Leases

A 1.1 The impact of the Proposed Leases on Imagine’s spectrum holdings in each PLA relative to its spectrum holdings absent any leases on a per quadrant basis is shown in **Table 2** below.³³

Table 2: Summary of the accumulation of spectrum by Imagine on a PLA basis

Proposed Lease Area	Proposed Lease Arrangement	Freq Range	Imagine's Spectrum Holdings before Lease (MHz)				Additional Quantum of Spectrum	Imagine's Spectrum Holdings during Lease (MHz)				%Increase of Imagine's Spectrum Holdings - Lease Period/Current (within each quadrant)			
			NE	SE	SW	NW		NE	SE	SW	NW	NE	SE	SW	NW
CK025 ESB Mylane	Meteor/Imagine	3620 - 3640 MHz	175	175	60	123	20 MHz	210	210	80	143	+20%	+20%	+33%	+16%
CK048 ESB Knockraha 220kV	Meteor/Imagine	3620 - 3640 MHz	140	175	0	175	20 MHz	155	210	40	190	+11%	+20%	(³⁴)	+9%
KE008 ESB Killeel	Meteor/Imagine	3620 - 3640 MHz	135	94	145	145	20 MHz	155	114	165	165	+15%	+21%	+14%	+14%
CK024 ESB Carrigaline MW	Vodafone/Imagine	3540 - 3560 MHz	175	60	60	175	20 MHz	210	80	100	210	+20%	+33%	+67%	+20%
KK001 PVT Mount Nugent	Vodafone/Imagine	3500 - 3540 MHz	115	90	90	90	40 MHz	145	120	120	120	+26%	+33%	+33%	+33%
WH001 ESB Athlone TC	Vodafone/Imagine	3480 - 3540 MHz	80	80	80	80	60 MHz	140	140	140	140	+75%	+75%	+75%	+75%

³³ ComReg’s rationale for this approach is explained below.

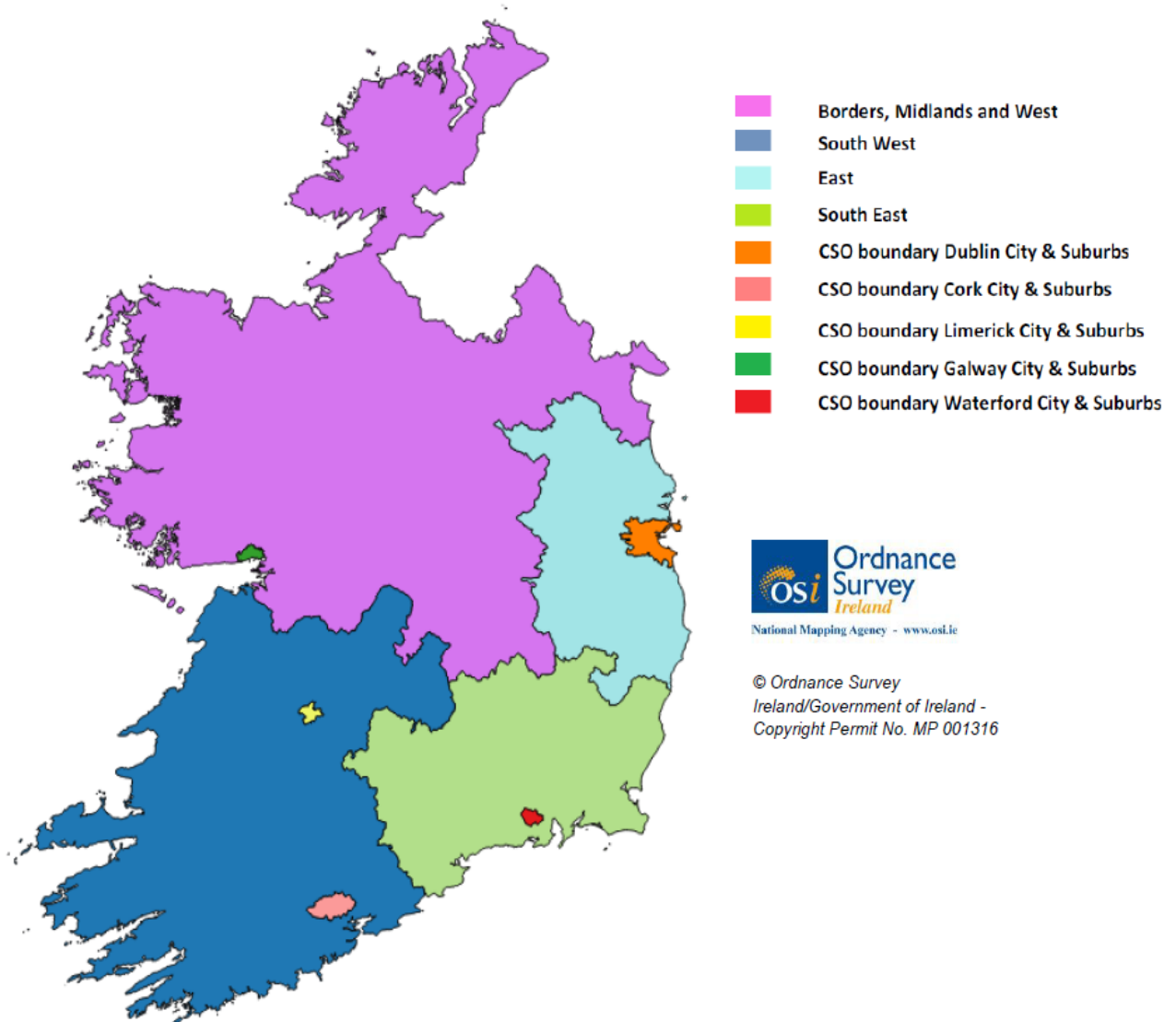
³⁴ Not possible to calculate percentage for this Quadrant as the initial holding is 0 MHz.

Imagine's current 3.6 GHz Band spectrum holdings

Imagine's LU Licence Spectrum Holdings

A 1.2 Under the 2017 3.6 GHz Band Spectrum Award³⁵, ComReg made 3.6 GHz Band spectrum available in nine Regions of the State as identified in **Figure 2**.

Figure 2: Regions in the 3.6 GHz Band Award



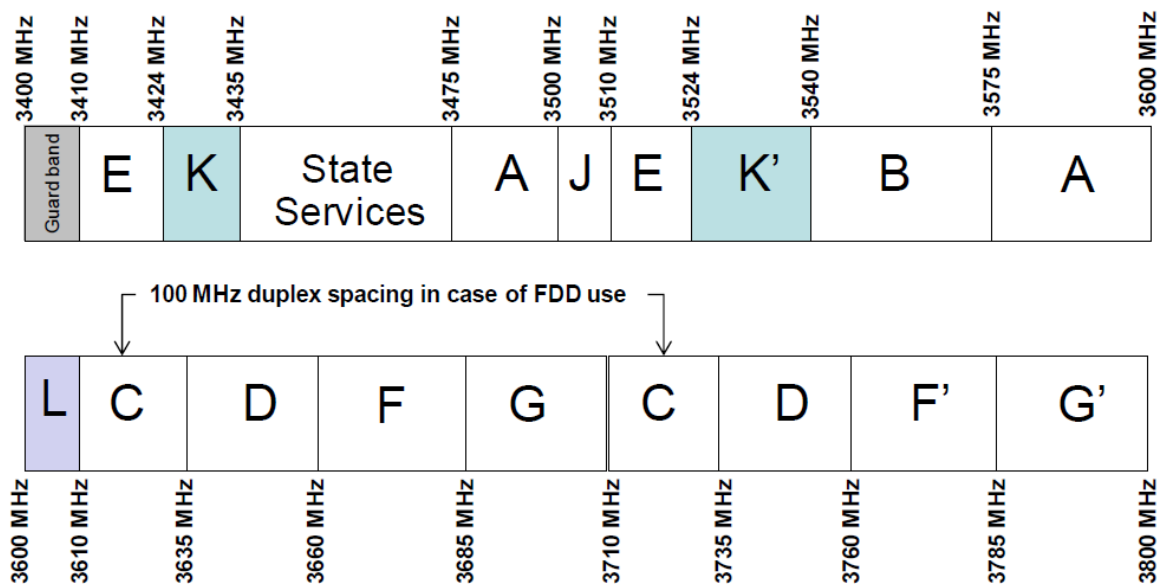
³⁵ For more information, please see:

<https://www.comreg.ie/industry/radio-spectrum/spectrum-awards/3-6ghz-band-spectrum-award/>

Imagine's TPL Spectrum Holdings

- A 1.3 Imagine currently holds rights of use to spectrum in various parts of the 3.6 GHz Band in 134 Transition Service Areas ("TSAs") under its TPL.
- A 1.4 These TSAs correspond to local service areas where Imagine previously operated under the 3.6 GHz Band FWALA licensing scheme prior to the 3.6 GHz Band Award. At the start of Transition immediately after the Award, all TSAs had a 20 km radius boundary around a defined centre point. As Transition has progressed, the area of some TSAs has been reduced to reflect completion of Transition Activities which affect only part of a TSA and to facilitate ongoing Transition Activities in the remainder of the TSA.
- A 1.5 In addition to having a defined geographic area, TSAs are assigned frequency ranges which derive from the previous channel plan for 3.6 GHz Band FWALA licensing from before the Award, which included a number of paired and unpaired channels as shown in **Figure 3**.

Figure 3: Previous FWALA channel arrangements in the 3.6 GHz Band



- A 1.6 In many cases, the frequency ranges of Imagine's TSAs have reduced as Transition has progressed and Imagine has vacated parts of the spectrum in those TSAs to make that spectrum available for other Winning Bidders to roll out new services.

A 1.7 Having originally held spectrum rights in 241 TSAs under its TPL, Imagine now has 111 TSAs which are licensed in respect of the frequency ranges identified in **Table 4**.

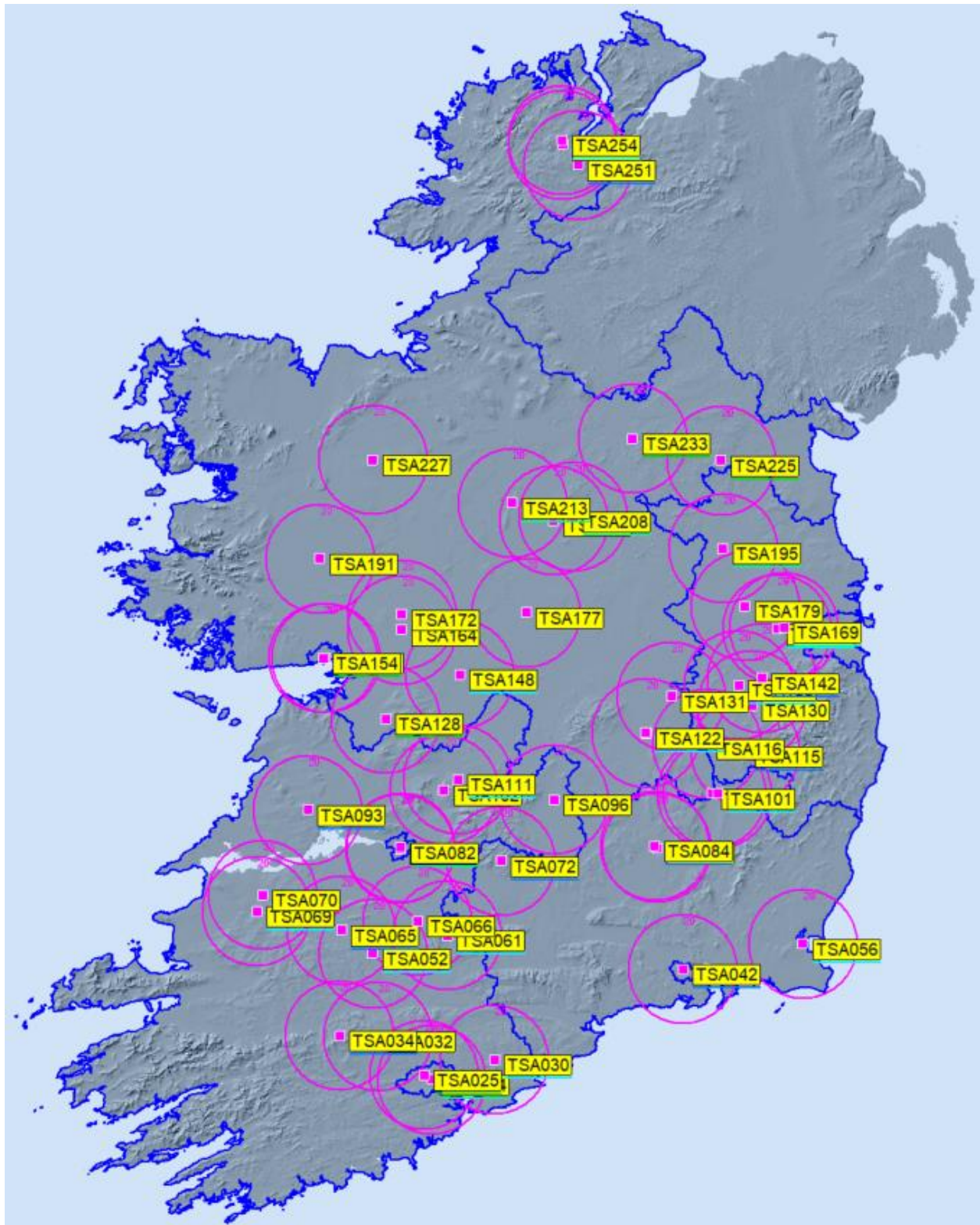
Table 3: Number of Imagine TSAs by Frequency Range³⁶

Frequency Range/s Licensed in TSA	No. TSAs
3410-3424 MHz and 3510-3524 MHz	3
3424-3435 MHz and 3524-3540 MHz	2
3475-3500 MHz	15
3475-3500 MHz and 3575-3600 MHz	2
3475-3500 MHz and 3580-3600 MHz	1
3500-3510 MHz	19
3510-3524 MHz	21
3524-3540 MHz	18
3540-3560 MHz	26
3540-3575 MHz	2
3635-3660 MHz	2
Total TSAs	111

A 1.8 Together, Imagine's current TSAs cover most of the geographic area of the State as can be seen in **Figure 4**.

³⁶ As of 3 December 2021.

Figure 4: Locations of Imagine's TSAs



Approach to assessing Imagine's 3.6 GHz Band spectrum holdings

A 1.9 ComReg has assessed the current spectrum holdings in each of the PLAs using the approach outlined in A 1.9 of Document 20/77.

A 1.10 ComReg does not repeat the explanation of this approach and refers interested parties to Documents 20/77.

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