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Review of consultation responses to technical aspects of WBB LMP licensing

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About Plum

Plum offers strategy, policy and regulatory advice on telecoms, spectrum, online and audio-visual media issues. We draw on economics and engineering, our knowledge of the sector and our clients' understanding and perspective to shape and respond to convergence.

About this study

In July 2025, ComReg undertook a public consultation on a proposed licensing regime for private mobile radio services (PMR) and low and medium power wireless broadband systems (WBB LMP). This report provides a response to the technical issues raised by respondents in relation to WBB LMP.

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1 Introduction

In July and August 2025, ComReg undertook a public consultation[1] on a proposed licensing regime for private mobile radio services (PMR) and low and medium power wireless broadband systems (WBB LMP). The consultation document was accompanied by supporting reports from DotEcon[2] on general licensing issues for both WBB LMP and PMR services and from Plum Consulting[3] on technical issues relating to WBB LMP.

Responses were received from seven organisations:

- Analog Devics,
- DECT forum,
- Druid Software,
- EUWENA,
- Shure UK Limited
- Sigma Wireless, and
- Transport Infrastructure, Ireland

This report provides Plum's consideration of the technical issues raised by the respondents relating to WBB LMP. The Shure UK Limited response is not addressed here as it relates to ComReg's PMR proposals. Additionally, updated information on the WBB LMP technical harmonisation work within CEPT is also provided before setting out Plum's conclusions and recommendations.

[1] See ComReg Document 25/46, 11 July 2025 (link)
[2] See ComReg Document 25/46a (link)
[3] See ComReg Document 25/46b (link)

2 Consultation responses: WBB LMP technical issues

A summary listing of the individual issues raised by each respondent is provided in Appendix A. There was considerable commonality between the various responses which are summarised by topic below, before setting out Plum's response on each topic.

2.1 Neutrality

The DECT Forum submission asserts that there had not been equitable consideration by Plum of candidate technologies. In particular, it mentioned the lack of reference to sections 6.4.1 and 6.4.2 of ECC Report 358 which address the DECT-2020 NR in-band coexistence studies and it suggests that a 'Base Station' is defined in a technology neutral way.

2.1.1 Plum response

The proposed WBB LMP licensing framework is intended to be service and technology neutral taking into account relevant ECC Reports and work ongoing in FM60. We do not believe that any specific technical proposals run counter to the intention of technical neutrality.

It is acknowledged that DECT-2020 NR systems have an architecture different to the cellular model of base stations and terminal stations. No network topology is assumed or mandated in this document. The use of the term 'base station' should not be taken to imply that peer-to-peer networks cannot be deployed, but simply to identify the node with greatest interference potential due to power or antenna height.

The DECT Forum response notes that this difference is accommodated in the text of 'Decides 3' of ECC Decision 24(01)[4] . We suggest that the eventual licensing framework should make it clear that the term 'Base Station' is to be interpreted in line with 'Decides 3' of the ECC Decision.

2.2 Power levels in the cities

There were five responses to the proposal not to licence medium power (MP) base stations in the cities[5] unless there are 'exceptional' circumstances. Four respondents, Transport Infrastructure Ireland, Druid Software, Analog Devices and Sigma suggested that MP use should be more generally permitted in urban areas on the basis of justification, use of synchronisation or MoU's with neighbouring users. Transport Infrastructure Ireland noted that not licensing MP base stations could require a greater density of base stations and possible implications associated with planning permission and operational risks.

One respondent (DECT Forum) was clear that MP use should not be permitted in urban areas, as it agreed with the view in the consultation that MP use in urban areas could constrain the supply of spectrum for other users.

[4] "for the purpose of [ECC 24(01)], a base station is a fixed radio device providing the gateway between the back-end network, for example the gateway to the internet or the user's fixed infrastructure, and the WBB LMP radio network devices"
[5] Dublin, Cork, Limerick, Galway and Waterford

2.2.1 Plum response

Plum does not consider it appropriate to totally exclude the possibility of exceptions, as suggested by the DECT forum, as in some instances the deployment of a MP base station may be more spectrally efficient and cost effective than several low-power base stations, and some MP base station deployments might not be significantly higher than the low power limit.

The feasibility of the deployment of MP wireless broadband in urban areas needs to consider the indicative re-use distances that would likely be necessary between different WBB LMP base stations (see tables below) and also any co-existence issues with adjacent channel MFCN networks, noting that in urban areas there will likely be a high density of MFCN base stations per kilometre (for example inter-site distances of 300 – 400 metres).

From ECC Report 358, and Plum's analysis in ComReg 25/46b, it is noted that indicative re-use distance of spectrum between unsynchronised MP base stations is around 22 km and with synchronised base stations is around 4 kms (BS-UE).

Unsynchronised		MP	LP	Indoor
Interferer (BS)	MP	22 km	9 km	1.5 km
	LP	6 km	3 km	0.5 km
	Indoor	1.5 km	0.5 km	<0.3 km

Table 2.1: Indicative re-use distances (BS-BS, unsynchronised operation)

Synchronised		MP	LP	Indoor
Interferer (BS)	MP	4 km	4 km	<0.2 km
	LP	0.4 km	0.4 km	<0.2 km
	Indoor	<0.2 km	<0.2 km	<0.1 km

Table 2.2: Indicative re-use distances (BS-UE, synchronised operation)

In relation to co-existence with MFCN base stations, in the calculations undertaken in FM60 between MFCN as the interferer and LMP-MP as the victim[6], worst case separation distances of between 6.1 and 85 kms have been calculated depending on the assumed LMP receiver parameters[7]. This makes it difficult, with the typical density of MFCN base stations, for the two services to be deployed without synchronisation. This is addressed in the proposed licensing framework by the assignment of channels in the lower part of the 3.8-4.2 GHz band to WBB LMP services operating on a synchronised basis with the same frame structure as the adjacent MFCN.

These considerations highlight the difficulties of allowing, with no restrictions, the deployment of WBB MP base stations in urban areas.

[6] Where the interference is blocking of the WBB LMP receiver due to MFCN in-band emissions
[7] Informal input from the Chair of FM60

The benchmarking in the Plum report (see section 1.5) noted that for medium power licences, there are restrictions on the deployment's geographic area in the UK, Norway and Poland and that in the UK and Norway exemptions will be considered as follows:

- In the UK, an "Exceptions" process is used to assess applications for medium power deployment (for antenna height of up to 10m) in Greater London, and for antenna heights above 10m everywhere in the UK (including Greater London).

- In Norway, medium-power base stations are not permitted in geographic areas that fall within a zone of 10 km outside urban settlements with more than 10,000 inhabitants. Nkom may, however, grant exemptions for large industrial sites such as ports, if the benefits of deployment outweigh the disadvantages.

In ComReg's consultation, ComReg proposed that medium power would be allowed in urban areas in '*exceptional*' cases. However, noting that in some instances the deployment of a MP base station in an urban area may be more spectrally efficient and cost effective than several low-power base stations, and that some MP base station deployments might not be significantly higher than the low power limit, Plum considers that this wording could be amended to '*justification by a demonstrable requirement*', or similar.

In any such justification, Plum is of the view that applicants should submit information on the actual power level required and that detailed account should be taken of antenna radiation patterns to avoid the over-prediction of coverage that is not suited to the planned coverage area of the service, therefore limiting the potential for 'sterilised' areas.

2.3 Bandwidth

ComReg proposed in the consultation that 400 MHz between 3.8 – 4.2 GHz would be allocated for WBB LMP.

Four respondents, Druid Software, Analog Devices, EUWENA and Sigma Wireless all supported this approach.

ComReg also consulted on the bandwidths that should be assigned per applicant noting that bandwidths of between 5 MHz and 100 MHz are mentioned in the Plum report. ComReg also proposed, based on Plum and DotEcon inputs, that for licensed bandwidth there should be two controls:

1. The applicant should provide detailed rationale and plans for the requested bandwidth to provide the services it needs, and

2. The licensees would have to periodically report actual usage to ComReg. Should licensees not be utilising, in whole or in part, the licensed bandwidth, ComReg would retain the right to amend or withdraw the licence as appropriate.

There were five responses that addressed assigned bandwidth considerations. Druid Software and Analog Devices proposed that the full 3.8-4.2 GHz band should be authorised with an initial bandwidth of 100 MHz per applicant to be reviewed based on usage. These respondents submitted that this approach would encourage "*innovation and experimentation with new devices types*" and would be consistent with the approach adopted by the UK and Germany.

EUWENA commented that Ireland should allocate larger, contiguous blocks of spectrum so enterprises can take advantage of international standards and equipment availability.

Sigma Wireless suggested the requirements proposed to justify the required bandwidth "*may be unnecessarily complex and restrictive*". It noted that the bandwidth demand will vary according to the traffic on a cell and is 'elastic' and that "*assigning larger channel bandwidths is not necessarily inefficient spectrum use and it is certainly less complex. It is not always practical or possible to know the traffic demands or usage profiles before deployment, and in the early stages of WBB LMP deployments, use cases and user demands may be changing rapidly*". Sigma Wireless proposed that "*a range of different channel bandwidths (100 MHz, 50 MHz, 20 MHz or 10 MHz), with more flexibility of design and for the lower bandwidth license requests (such as MP usage) should be offered*".

The DECT Forum agreed that large bandwidths risk possible future use by assigning all the spectrum to a small number of users.

2.3.1 Plum response

It is noted that the respondents supported the allocation of the full 400 MHz in the 3.8 -4.2 GHz band, which aligns with ComReg proposals.

In Plum's view, the default suggestion of 100 MHz bandwidth assignments within the 400 MHz allocated for WBB LMP would seem a recipe for interference, especially in urban areas, taking into account necessary separation distances, unless take-up is very modest.

In this context we note the comment in the recent Ofcom Statement[8] on shared access licensing in which Ofcom identified the 'spectrum bandwidth users choose to deploy' as one of the primary drivers of spectrum scarcity and *"took these factors into account [...] with an increased focus on bandwidths we considered more likely to result in scarcity*"

In the Plum report, it was noted from the benchmarking exercise that the "*minimum channel size is generally between 10MHz (UK, Poland, Germany and Sweden) and 20MHz (Norway and Belgium), and the maximum channel bandwidth varies between 40MHz (Belgium) and 100MHz (UK, Poland and Germany). Bandwidths offered increase in increments of 10MHz for countries with a minimum channel size of 10MHz and in increments of 20MHz for countries with a minimum channel size of 20MHz*."

The adoption of a wide range of different licensed bandwidths can lead to issues of spectrum fragmentation, where sharing conditions across a requested channel bandwidth are very heterogenous. There is also a less significant issue of the administrative burden associated with processing and verifying applications for a wide range of bandwidths.

On this basis it is proposed to minimise these issues by licensing on the basis of a few preset bandwidths (for example 10, 20, 40, 60, 80 or 100 MHz).

2.4 Synchronisation

ComReg proposed that it would aim to reflect the recommendations for synchronisation provided in the current FM60 draft recommendations[9]. ComReg also proposed that it may, for spectrum management reasons, seek to

[8] Statement and further consultation on enhancing the Shared Access Licence Framework, para 4.56-4.57

[9] The latest available recommendations on restricted blocks for LP and MP WBB LMP BS prior to the October FM60 meeting provide the following recommendations:

- Implement a restricted block of 20 MHz (3800-3820 MHz) in which unsynchronised operation with MFN should not be permitted,
- Implement further an additional restricted block of 40 MHz (3820-3860 MHz) limited to low power WBB LMP

amend applications or existing licences and that it would be necessary for all equipment to be tuneable across the entire 3.8-4.2 GHz Band.

There were two responses regarding synchronisation. Sigma Wireless suggested that all of the lower 100 MHz of the WBB LMP band (i.e. 3800 to 3900 MHz) be reserved for licences synchronised with MFCN use in the 3.4-3.8 GHz band (i.e. the WBB ECS band) and not just the lower 20 MHz for low power and the lower 60 MHz for medium power use. This would allow for a 100 MHz synchronised channel and maximise spectrum efficiency.

The DECT Forum raised concerns that the proposal for synchronisation was not technology neutral and "*notes that the 3.8-4.2 GHz band has been in use in the UK for some time operating with a 5 MHz guard band to MFCN (for both low and medium power WBB) with no reported cases of interference*".

2.4.1 Plum response

Without supporting information it is too restrictive to mandate synchronisation in the lower 100 MHz and there is insufficient information to propose a 5 MHz guard band.

In relation to mandating some level of synchronisation, while noting that Norway, Poland and Belgium apply special technical usage conditions, such as synchronisation requirements, in the 40 MHz (Norway and Poland) or 60 MHz (Belgium) bandwidth above 3800 MHz to prevent interference with public mobile networks, we also note the importance of technology neutrality and adopting a light-touch approach, where possible, to provide some flexibility.

In Plum's view, ComReg's proposed approach of not mandating synchronisation but instead applying a 'soft' band segmentation that reflects demand (i.e. assigning WBB LMP systems that intend to adopt the standard frame structure at the lower end of the band, with other systems assigned from the top down) seems to strike the appropriate balance.

We also note that the current CEPT approach is only to recommend synchronisation, rather than to mandate it, so the ComReg proposal is in line with this.

2.5 Timescales for roll-out and usage

In its consultation, ComReg notes that rollout and usage obligations are important regulatory tools for ensuring that spectrum licensed is efficiently used and ComReg proposed a 6 month roll-out requirement with licensee reporting.

There were four responses to this proposal and they all considered that the proposed 6-month roll-out requirement was too short. Sigma Wireless, Analog Devices and Druid Software all noted the long lead times for equipment delivery with Sigma Wireless quoting 12 to 16 weeks not being unusual. These respondents also noted that until a WBB LMP licence is granted there may be uncertainty as to the final system design depending on the channel bandwidth (e.g. whether medium power or low power base stations are actually allowed) so advance ordering of equipment would be necessary to meet the 6 months roll out obligation.

Sigma Wireless suggested "*a rollout and spectrum usage period of 18 months as standard with an obligation on the licensee to report and demonstrate progress is being made, at regular intervals of 6 months*". Analog Devices and Druid Software proposed 24 months for activation with interim milestones at 12 months (50 % of carriers live). EUWENA proposed that rollout obligations should be phased, with enterprises allowed 18 to 24 months for deployment and only light-touch milestone reporting during that period.

Transport Infrastructure Ireland considered that 6 months may be insufficient for the deployment of major public transport infrastructure, such as metro and tram systems and it proposed either extending the timeframe or introducing exemptions for large-scale projects and potential future project extensions.

2.5.1 Plum response

It is noted that, in the UK and Sweden, use must be within 6 months from licence award and in Norway and Germany 12 months.

Considering the responses and current equipment lead times[10], it is Plum's view that a 9-12 month rollout obligation is probably more appropriate for the majority of systems.

In the case of larger, more complex systems, Plum considers that the standard rollout period of 9-12 months may be impractical to achieve (e.g. noting that final system design may depend on the licence issue, etc..) and that the possibility of a longer roll-out obligation (e.g. up to 3 years) with interim milestones is probably appropriate in justified cases.

2.6 Other items

In addition to the comments noted above, the DECT Forum provided inputs on the following:

2.6.1 Applicant coordination with existing licensees

The DECT Forum raised concerns that any requirement for coordination with existing licensees would need some form of regulatory agreement and they may not have the necessary skills to do so. The existing licensee may incur costs and need to reconfigure their networks.

Plum response

Plum notes that ComReg has not proposed that an agreement must be reached with other operators, rather that coordination is a possible method to facilitate two systems to work together and facilitate licensing.

2.6.2 Mobile network codes

The DECT Forum noted that for DECT-2020 NR mobile network codes are not required and there should be no requirement included in the licence.

Plum response

Noted.

[10] For low-power devices, lead-times may be only a few days, while those for complex MP networks will be measured in months. Just as important, however, will be issues of site rental and access and availability of installation staff.

3 Updated information: WBB LMP technical harmonisation work within CEPT

The original Plum report (ComReg Document 25/46b) noted that the ECC group responsible for the regulatory implementation of the shared use of the 3.8-4.2 GHz frequency band is FM60, and that they expect to finalise their Recommendations on (i) "*Guidance on the coordination between low and medium power terrestrial wireless broadband networks (WBB LMP) in the band 3800-4200 MHz, and on the protection of MFCN below 3800 MHz*" and (ii) '*Protection of Radio altimeters above 4 200 MHz*' in Q1 of 2026.

The most recent meeting of FM60 was held on 13-14 November, and the structure, though not the content, of the first Recommendation was finalised. The Recommendation will include three annexes that apply to the different WBB LMP deployment options.

- Annex 1 defines, "*in the context of this recommendation, synchronised and semi-synchronised operation between WBB LMP and MFCN, as well as between 3GPP-based WBB LMP networks*"

- Annex 2 provides "*Measures for the WBB LMP coexistence with and protection of MFCN below 3800 MHz*". It considers synchronised operation (no requirement for co-ordination or risk of interference) and semi synchronised operation (WBB LMP can operate in the entire 3800-4200 MHz band without coordination or risk of interference into MFCN. The WBB LMP base station receivers may however experience some interference from MFCN downlink. A frequency separation of at least 40 MHz (MFCN spurious emissions domain) will reduce but not eliminate the risk of performance degradation in the WBB LMP network uplink, includes recommendations for reduced unwanted emission levels.)

  Annex 2 also considers non synchronised operation and proposes, for example, unsynchronised WBB LP base stations deployment above 3820 MHz and WBB MP above 3860 MHz.

  Complementary mitigation measures are provided "*in order to ease coordination and further improve the coexistence. These measures are useful but some may not be sufficient for the protection of MFCN below 3800 MHz.*"

- Annex 3 provides measures for the coexistence between WBB LMP networks. It notes "*there are different approaches that can be taken by the administrations when issuing licences for WBB LMP networks. Some of them reduce the need for administrative coordination when issuing licences, by e.g. including in the licence requirements on maximum field strength levels to be met at the border of the licensed area. Other is based on a case-by-case authorisation, where the national regulator ensures coexistence based on the technical parameters given in the licence conditions (output power, antenna configuration etc). The national regulator then also performs and manages national planning of the local area licences, including spectrum available for applicants*."

The second ECC Recommendation, regarding radio altimeters, still requires updating of the example of a zone in close vicinity of runways (Annex 1) to take account of lateral deviation of an aircraft during final approach that was not part of the ECC Report 362 coordination zone description.

The aim is to finalise these two Recommendation in the next FM60 meeting (27 – 29 January 2026) so it can be submitted to the FM meeting in February (8 – 13 February 2026).

4 Conclusion and recommendations

Plum appreciates the detailed and constructive consultation responses that have been received from respondents.

Plum's recommendations are as follows:

- ComReg proposed wording of allowing medium-power in urban areas only in 'exceptional' cases could be softened to 'justification by a demonstrable requirement', or similar, with the expectation that in some instances use could be permitted where justified and with appropriate technical constraints (e.g. lowest power necessary for the target service area, antenna pattern, height and downtilt).

- To minimise constraints on allocation and spectrum scarcity, assigned bandwidths should neither exceed user-requirements, nor be so small as to create problems of fragmented spectrum. A standard set of bandwidth increments (e.g. 10, 20, 40, 60, 80 and 100 MHz) with a defined raster to facilitate administrative and planning efficiency could be adopted.

- Currently there is insufficient information to mandate synchronisation . ComReg's proposed approach of applying a 'soft' band segmentation appears appropriate, i.e. assigned spectrum at the lower end of the band to applicants intending to align their frame structure with MFCN below 3.8 GHz , with other systems assigned from the top down.

- Roll-out timescales could be relaxed from the originally-proposed 6 months. For the majority of systems a standard rollout period of 9-12 months is probably more appropriate. However, in the case of larger, more complex systems this may be impractical to achieve and a longer rollout obligation (e.g. up to 3 years) with interim milestones is probably appropriate in justified cases.

Appendix A Summary of responses by respondent

Organisation	Section	Summary of comments
Transport Infrastructure Ireland	6.4 (TX power)	LP may not be enough in urban areas for transport applications
	6.9 (roll-out/usage)	6 months may not be adequate for large projects
	6.10 (Fees)	Document "*Proposed Licensing Regimes for Private Mobile Radio (PMR) and Low- and Medium-Power Wireless Broadband Systems (WBB LMP)*" lacks clarity. Low fees would offer significant benefits.
	6.11 (application process)	Timeline may not fit large public projects.
DECT forum		Fundamental mistake in considering band as being for MFCN rather than PMR. Don't assume 3GPP standards.
	Plum 2.2	Plum omit to mention 6.4.1&2 of ECC Report 358. Risk of undermining technical neutrality.
		Define 'Base Station' in tech neutral way (See Dec (24)01
	6.4 (power)	Power levels. DECT only allows LP. MP should not be allowed in urban areas. No power greater than that in Table 1 should be permitted.
	6.5	50m radius may not suit many ports/industrial sites/etc. Allow larger single-owner sites?
		Supports proposed flexibility regarding synchronisation, but concerned at potential for future changes.
		Sync: Believe risk of interference to MFCN is overstated.
		Sync: The requirement for synchronisation is contrary to the principle of technology neutrality

		Synchronisation is non-trivial and may be impracticable in the real-world (between LMP and MFCN)
	Plum 2.4	5 MHz UK guard band "*Plum asserts, with no evidence, that this is probably because LMP networks are, by default, synchronized with the same frame structure as users below 3.8 GHz*".
		"*no other instances where a 20 MHz guard band is required to protect MFCN from adjacent low power use*"
	6.7 (Synchronisation)	Don't assume that BS-BS is the dominant scenario. Another example on non-neutrality.
	Plum 3.5.1	Coordination: Coordination with existing licensees is unlikely to work (no incentive, may lack tech skills)
	6.12	Mobile Network Codes: Should not be required (Tech neutrality)
Druid Software & Analog Devices	6.4 (Power)	Should allow MP in urban areas (with sync or neighbour MoU)
	6.6 (Bandwidth)	Provide initial minimum of 100 MHz per applicant 'to encourage innovation'. Justified by UK /DE
	6.8 (Licence duration)	Should be at least 10 years to give certainty for investment. Annual reapplication is 'disproportionate to interference risk'
	6.9 (rollout)	6 months is too short. Should allow 24 months.
	6.10 (Fees)	Need immediate visibility of fees
	6.11 (application process)	Give timeline for approvals. Simple renewal process
EUWENA	6.6 (Bandwidth)	Should allocate entire 3.8-4.2 GHz band for maximum flexibility
	6.10 (Fees)	Flat tariff, rural discount
	6.8 (Licence duration)	Multi-year, seamless renewal
	6.9 (rollout)	18-24 months

Sigma	6.5 (power)	Not allowing general use of MP in cities is unnecessarily restrictive. Suggest requiring a justification for MP.
	6.6 (Bandwidth)	Proposal for justification may be too complex & restrictive. Notes that only required RB are used at any time. Maybe offer a range of standard BWs.
	6.7 (Synchronisation)	Lower 100 MHz should be reserved for synchronised operation
	6.8 (Licence duration)	1 year is too short. Should be 10 years minimum. May still need annual compliance statement.
	6.9 (rollout)	6-month rollout & usage is too short. Suggest 18 months (with 6 monthly progress updates