Commission for
Communications Regulation

Response to Consultation

26 GHz Fixed Service Band – Spectrum Rationalisation

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1 Foreword

On behalf of the Commission for Communications Regulation (ComReg) I am pleased to present this response to the Consultation Document 05/46 on spectrum rationalisation in the 26 GHz fixed service band. I would like to thank all of the respondents for their contributions. Summaries of the responses to the consultation questions are presented in this paper, together with ComReg's consideration of those responses and how we now intend to proceed with the rationalisation of the band.

On the basis of the responses received ComReg has decided to proceed by designating a limited amount of spectrum in the band for individual licensing in response to applications received on a first-come, first-served basis. These licences will be issued on a case-by-case basis under the existing Fixed Link Licence or FWALA Licence Regulations as appropriate. The remainder of the spectrum will be made available for block licences on a National basis. These National spectrum block licences shall be awarded following an auction process and operators shall be free to bid for multiple frequency channels.

ComReg believes this rationalisation of the spectrum in the 26 GHz band will provide greater flexibility in how the band can be used and will ensure the efficient use of the spectrum. The benefits of the improved flexibility being offered to operators should result in improved services for consumers.

Isolde Goggin,
Chairperson.

2 List of Respondents

There were 7 responses to the Consultation Document 05/46[1] and ComReg would like to thank all of the respondents for the time and effort taken in making their responses and for the valuable information provided. All responses received by ComReg except for annexes marked confidential will be made available on the ComReg website www.comreg.ie.

Respondents:

- Vodafone
- eircom
- Irish Broadband
- O_2
- Meteor
- Clearwire Ireland
- BT Ireland

[1] 26 GHz Fixed Service Band – Spectrum Rationalisation

3 Introduction

The Commission for Communications Regulation (ComReg) is responsible for the efficient management and use of the radio spectrum, one of Ireland's key natural resources. To this end ComReg adopts a strategic approach in its management, enabling the efficient use of the spectrum resource through appropriate licensing regimes while minimising interference and unnecessary regulatory intervention. A key aspect of this strategy is to continuously review the use of spectrum to ensure that its potential benefits, both economic and social, are being maximised.

Following an internal review of the 26 GHz band by ComReg a consultation document was published presenting a number of options for the rationalisation of the band. The objective of a rationalisation of spectrum in the band is to ensure flexibility in line with the requirements of our stakeholders and to ensure the availability of this resource to a range of services and applications and the efficient use of the spectrum.

Having reviewed the responses received it is clear that the demand for spectrum in the 26 GHz band and the type and scale of anticipated deployments vary considerably among those who expressed views. Therefore, while giving due consideration to the needs of occasional users of the spectrum, ComReg is proposing to use market mechanisms as far as possible in determining the future block assignment of spectrum in this band.

ComReg intends to proceed by designating a limited amount of spectrum for individual licensing in response to applications received on a first-come, first-served basis. These licences will be issued on a case-by-case basis under the existing Fixed Link Licence or FWALA Licence Regulations[2] as appropriate. The remainder of the spectrum will be made available for National spectrum block licences. These block licences shall be awarded following an auction process and operators shall be free to bid for multiple frequency channels to meet their specific network requirements up to a maximum to be specified by ComReg.

Existing National licences issued under the FWPMA Regulations[3] shall remain in force in accordance with the regulations until the final expiry of those licences which, as specified in regulation 6(4) of S.I. No 287 of 1999, is 10 years after the commencement of the first licence. Note however, that following the expiry of BT Ireland's FWPMA licence on 4 July 2006, this spectrum will become free for assignment for other purposes under the framework proposed in this document. Existing Point-to-Point link licensees in the band shall have the opportunity to bid for National spectrum block licences and ComReg shall endeavour to ensure that any disruption caused by transition from individual licences to National spectrum block licences shall be minimised, e.g. if practicable by assigning the same channel to the successful licensee on a National basis.

[2] S.I. No. 319 of 1992 & S.I. No. 79 of 2003

[3] S.I. No. 287 of 1999 – See Appendix A

4 Consultation Topics

In the concluding section of the consultation document 05/46 on Spectrum Rationalisation in the 26 GHz band comments were invited from interested parties on specific options presented in the paper for the future structure of the 26 GHz band.

ComReg has carefully considered the responses received in relation to each of the options presented and is of the view that while there is agreement among respondents for aspects of each option it is clear that the options as presented in the consultation document require further adjustment to present the optimum rationalisation of spectrum in the 26 GHz band.

The respondents views on each of the options are summarised in the following sections and ComReg's conclusions and proposals on the rationalisation of spectrum in the 26 GHz band are then presented in Section 4.5.

4.1 Option 1

Option 1 proposed dividing the 26 GHz band into two sub-bands, one for Point-to-Multipoint and other multipoint applications (PmP) and one for Point-to-Point (PP) applications (see Appendix B). Licences would be issued on an individual case-by-case basis.

Q. 1. What is your opinion on the proposed option 1?

4.1.1 Views of Respondents to Q.1

In general the view of respondents was that Option 1 offers limited additional flexibility to the current band designations, particularly for operators wishing to deploy both PP and PmP technology according to one respondent. One respondent supported the proposal to keep PP and PmP assignments in different parts of the band as the most logical way to license two differing technologies complimented with the availability of block assignments in the band. Another respondent also noted the absence of block assignments in Option 1 and the administrative burden of individual licensing to the volume user. This respondent also expressed the view that making any spectrum available for PP assignments in the 26 GHz band was unfavourable as it limited the spectrum available for PmP applications. Another respondent noted that Option 1 does not provide for PP and PmP deployments within a single 26 GHz spectrum assignment.

One respondent also noted the requirement for the maintenance of a 'Hi/Lo' database[4] for all deployments in the 26 GHz band.

Q. 2. What is your view on the amount of spectrum being made available by this option for Point-to-Point and Multipoint systems respectively?

4.1.2 Views of Respondents to Q.2

Three of the seven respondents expressed the view that the amount of spectrum being made available for PP and PmP applications under Option 1 is adequate. One respondent said that the amount of spectrum being made available is adequate for block assignments of PP and PmP applications to volume users and that the band should be reserved for volume users. The remaining three respondents suggested that more spectrum should be made available within the sub-band for PmP applications, with one suggesting moving 56MHz of paired spectrum from the PP sub-band to the PmP sub-band.

4.2 Option 2

Option 2 proposed dividing the 26 GHz band into two sub-bands, one for the purposes of individual spectrum assignments awarded on a case-by-case basis for both PP and PmP applications, and the second sub-band to be used for block assignments of spectrum on a National or regional basis for PP and PmP applications (see Appendix B). ComReg proposed that 84MHz of paired spectrum was an appropriate amount of spectrum to be made available as a spectrum block.

Q. 3. What is your opinion on the proposed option 2?

4.2.1 Views of Respondents to Q.3

Generally respondents welcomed the proposal for block assignments of spectrum within the 26 GHz band citing improved flexibility, opportunities for more efficient network planning, reduced inter-operator coordination and to maximise the efficient use of spectrum. One respondent noted that Option 2 has limited spectrum available for block assignments and another noted that the proposed 84MHz of paired spectrum per block assignment is not sufficient to meet the needs of operators deploying PP applications and PmP applications. One respondent expressed concern in relation to the efficient use of spectrum with the proposal for block assignments, particularly in relation to the potential for operators to apply for more spectrum than required.

[4] In general, systems deployed in the 26GHz band are bi-directional and operate using 'Frequency Division Duplexing' (FDD) whereby each end of the radio link transmits at different frequencies i.e. one transceiver site transmitting in the 'Hi' frequency band and the other end of the link transmitting in the 'Lo' frequency band. A 'Hi/Lo' database would contain the locations of all existing transceiver sites and indicate whether each site transmits in the 'Hi' or in the 'Lo' frequency band. Best practice in radio site engineering dictates that 'Hi' radio transmitting sites should not be co-located with or adjacent to 'Lo' sites.

One respondent, supporting the assignment of spectrum blocks, suggested that ComReg should maintain flexibility in making further spectrum available for block assignments in the band. In which case, Option 2 may provide an opportunity to migrate to Option 3 in addition to facilitating the continuation of existing licences. Another respondent suggested retaining the lower sub-band in Option 2 for individual PmP assignments under the FWALA licensing scheme and generally supported the proposal to split the band between block assignments and individual assignments.

Two respondents expressed concern with the proposed block assignment of spectrum for deployment of both PP and PmP applications indicating that for the volume user this approach will negate the benefit of either technology and will give rise to adjacent channel interference.

Q. 4. Would you be interested in spectrum, in this band, assigned on a case-by-case basis or by block assignment?

4.2.2 Views of Respondents to Q.4

Four respondents expressed a preference for block assignments to meet their network needs while one respondent expressed an interest in both individual and block assignments. One respondent who expressed a preference for block assignments also expressed an interest in individual assignments in cases where the block assigned spectrum was not sufficient to meet network demand. The remaining respondents did not express a preference.

Q. 5. Should block assignments be made available on a national basis or a regional basis? Please give reasons for your answer.

4.2.3 Views of Respondents to Q.5

Four respondents expressed preferences for block assignments on a National basis with one stating that many of the benefits of block assignments, e.g. freedom to plan and implement networks quickly, would be diminished by a regional approach to block assignments. One respondent expressed a preference for block assignments for PP applications on a National basis and block assignments for PmP applications on a regional basis, e.g. urban/rural. Another respondent suggested that deployment of applications in the 26 GHz band would be focussed on urban centres and therefore National block assignments may be superfluous but, on the other hand, national assignments may reduce the administrative burden. One respondent expressed a preference for regional block assignments thus allowing operators to apply for spectrum only in areas that best meet their needs and also noted that the cost of a national assignment may be a deterrent.

Q. 6. What is your view on the amount of spectrum being made available by this option for individual assignment and for block assignment respectively?

4.2.4 Views of Respondents to Q.6

Two respondents expressed the view that the amount of spectrum proposed in Option 2 for individual and block assignments (see Appendix B) is adequate and also suggested that ComReg should retain the flexibility to re-allocate spectrum in future between individual and block assignments. One respondent stated that the spectrum proposed for individual assignments is adequate. Another recommended that larger blocks of spectrum should be made available in the band for PP applications with demarcation between PP applications and PmP applications similar to Option 1. Another respondent expressed the view that more spectrum should be available in the band for PmP applications.

Q. 7. What is your view on the requirement for guard bands between adjacent operators licensed with either national or regional spectrum block assignments of spectrum? How should guard bands be implemented where necessary?

4.2.5 Views of Respondents to Q.7

Generally the view of respondents was that guard bands (either as a fixed bandwidth separation or a block-edge mask (BEM)) will reduce the potential for interference between licensees but that any guard band should be minimised as far as possible. One respondent expressed the view that any solution should employ the minimal use of guard bands and suggested that ComReg should maintain the role of conducting inter-operator interference analysis. Two respondents expressed a preference for the implementation of a BEM. One respondent, while not expressing a preference for either BEM or a fixed bandwidth separation, highlighted the requirement for rules (e.g. depending on channel deployment of adjacent networks and definition of acceptable interference criteria) to be associated with either approach. A view was expressed that while a BEM can be an efficient approach it introduces an administrative burden and is difficult to regulate. It was also noted that reliance on mutual frequency coordination between adjacent operators is not acceptable and a preference for the introduction of policies on this issue that all operators can adhere to was expressed. A respondent proposed that a single channel fixed guard band should be employed with the option for the licensee to deploy in the guard band where protection of adjacent channel services can otherwise be provided for.

Q. 8. Focussing on the efficient use of the spectrum, what is your view on the proposed 84MHz (i.e. three 28MHz channels) of paired spectrum which would, under this option, be made available to an operator as a block assignment?

4.2.6 Views of Respondents to Q.8

Four respondents were of the view that the proposed 84MHz of paired spectrum for block assignments is sufficient while one respondent noted that the proposed 84MHz would favour volume users of spectrum. On the other hand, another respondent was of the view that the proposed 84MHz of paired spectrum would not address the requirements of operators wishing to deploy both PP and PmP applications and noted that any use of PP applications on the same or adjacent channel to PmP systems by volume users would be severely limited and that assignment of shared spectrum for PP and PmP applications would negate the benefits of both technologies. Furthermore, the respondent proposed that two channels would be sufficient for PmP applications and four channels for PP applications. A view was expressed by another respondent that 84MHz of spectrum should facilitate a combination of PP and PmP applications. Another submission stated that two channels should be a sufficient initial assignment and proposed that the entire band should be used for PmP applications. This submission also noted that applications for expansion of block assignments should be facilitated where required.

Q. 9. What is your view on a spectrum fee structure for national/regional block assignments?

4.2.7 Views of Respondents to Q.9

The views of respondents in relation to a fee structure for block assignments of spectrum varied. Views and proposals ranged from:

- a discount system for block assignees to reflect the transfer of administrative burden from ComReg to the licensee;
- consideration to be given to national operators providing service in under-served and over-subscribed geographic areas;
- the fee structure should provide incentives to operators to migrate existing PP applications into the 26 GHz band;
- any fee structure should encourage the deployment of PmP applications;
- in the interest of adhering to the principle of non-discrimination, fees should be in-line with similar allocations;
- a fee structure based on a per-link fee for 'smaller operators' until a specified threshold is reached after which a block allocation fee would apply – ongoing fees would be based on the necessary administration cost.

4.3 Option 3

Option 3 proposed making the entire 26 GHz band available for block assignment on a National or regional basis for both PP and PmP applications (see Appendix B). In addition ComReg noted that the 26 GHz band was being considered for future secondary trading initiatives.

Q. 10. What is your opinion on the proposed option 3?

4.3.1 Views of Respondents to Q.10

Views were expressed in support of Option 3 but there were also some concerns about the proposal. Two respondents expressed interest in Option 3 in terms of the availability of block assignments. One respondent supported Option 3 in the context of it being a future progression from Option 2. Another respondent expressed support for the earliest practicable introduction of spectrum liberalisation and trading on a technology neutral basis but notes that the question raised by ComReg is very broad and cannot be addressed fully until there is clarity as to how trading will work. One respondent expressed the view that Option 2 is preferable to Option 3 and that under Option 3 there is a risk that the entire band may be assigned to 'larger operators'. Another respondent noted that no spectrum would be available for individual assignments. Two respondents expressed concern at the proposal to assign spectrum for PP and PmP applications in the same block and re-iterated the risk to volume users of interference between PP and PmP applications in the same or adjacent spectrum which in the view of one respondent will result in a situation where a spectrum block assigned to a volume user will be used for either PP or PmP but not both and more likely exclusively for PP applications.

Q. 11. Should block assignments in this case be made available on a national basis or a regional basis?

4.3.2 Views of Respondents to Q.11

Support for spectrum assignments on a National basis was expressed by four respondents, with one of them highlighting that to realise the full potential of PP and PmP applications assignments to the respective applications should be separated into different parts of the band. One respondent expressed the view that assignments should be on a regional basis thus allowing operators to apply for licences only where they are required. Another respondent preferred block assignments in this case to be made on both a National and a regional basis and another was of the view that assignments should be at least regional.

4.4 General Questions

Finally two further general questions were posed to aid ComReg in its decision making.

Q. 12. Is there any additional option not considered in the paper which will have significant advantages in terms of spectrum efficiency gains?

4.4.1 Views of Respondents to Q.12

Four additional options were proposed in response to Question 12.

One respondent proposed an enhancement of Option 1: the proposal being to split the band into two sub-bands for assignment to PmP and PP applications respectively in a similar manner to that presented in Option 1 while providing for block assignments in both sub-bands.

Another respondent proposed that where an operator is licensed for a block of spectrum on a National basis at a premium, the licensee would then be free to re-allocate that spectrum on a regional basis to other operators.

A third proposal was to make spectrum available in addition to the 26 GHz band (e.g. the 28 GHz and 32 GHz bands) and pursue National/Regional PmP block assignments in one band, National/Regional PP block assignments in another and individual PP/PmP assignments in the last band.

Finally, a respondent proposed that licensees would be free to manage their own guard bands in agreement with adjacent licensees and that block assignments (of 84MHz) should be contiguous.

Q. 13. What other frequency bands could be considered in a similar manner to the 26 GHz band?

4.4.2 Views of Respondents to Q.13

Three respondents suggested that the 28 GHz and 32 GHz bands could be considered in a similar manner to 26 GHz with one respondent proposing that such consideration should be subject to further consultation. A respondent suggested that the 28 GHz and 32 GHz bands could be considered for low volume, one-off users. Another proposed that the 40 GHz band (40.5 – 43.5 GHz) could be considered subject to further consultation. One respondent requested further clarity on the impact on existing licensees in the 26 GHz band prior to commenting on future bands for consideration. A review of the bands from 3 – 11 GHz for PP and PmP systems was also proposed.

4.5 Overall Position of the Commission

ComReg has carefully considered the views of respondents to all of the questions posed on Options 1 – 3 and to the general questions. It is clear that forecasts of demand for spectrum in the 26 GHz band and of the types and scales of deployments vary considerably among those who expressed views in this consultation process.

While there is a clear demand for block assignments of spectrum for both PP and PmP applications in this band, in most cases on a National basis, there is also the view that individual assignments should be facilitated.

In the case of block assignments of spectrum ComReg is of the view that this should be done on a National basis as inter-operator coordination at regional borders would counteract the objectives of (a) allowing operators to independently manage their licensed block of spectrum and (b) minimising ComReg's role in managing block assigned spectrum. In addition ComReg is also of the view that spectrum should be made available for individual licensing under the existing Fixed Link Licence and FWALA Licence Regulations to meet the requirements of low-volume/occasional spectrum users on a shared basis.

While some respondents agreed that 84MHz of paired spectrum for a block assignment is adequate, one requested up to 168MHz of paired spectrum whilst two others suggested that initial allocations of 56MHz of paired spectrum would be sufficient.

ComReg is of the view that the optimum rationalisation of the 26 GHz band should aim to meet the requirements of all users interested in being assigned spectrum in the band, in so far as is possible, and is minded where demand exceeds supply to let market mechanisms determine the award of National block assigned spectrum where appropriate.

The view was expressed by two respondents that operators who intend to heavily utilise the 26 GHz band for both PP and PmP applications could not do so if required to use the same or adjacent spectrum for both PP and PmP applications as proposed by ComReg in Option 2 due to problems relating to adjacent channel interference. One of these respondents recommended a demarcation between PP and PmP assignments.

ComReg's objective in the rationalisation of spectrum in this band is to increase the flexibility in using the band and ComReg is of the view that the introduction of designations for particular applications (e.g. PP and PmP) will not achieve this objective. However, ComReg believes that by utilising market forces in the award of National block assignments users of the band will have the opportunity to acquire the spectrum which they require to meet their network demands both in terms of capacity and technology.

Finally, 4 respondents submitted additional options for consideration by ComReg in deciding the future structure of the band and ComReg has taken these proposals into consideration in its decision. One respondent proposed making additional spectrum

bands (e.g. 28 GHz and 32 GHz) available to complement the rationalisation of the 26 GHz band. While ComReg has noted this comment, additional consultation will be required to further develop these bands.

In consideration of the above and all of the responses received ComReg is minded to proceed as follows:

(1) to designate a limited amount of spectrum within the 26 GHz band for assignment on an individual basis for both PP and PmP applications in response to applications on a first-come, first-served basis. These licences will be issued on a case-by-case basis in accordance with the existing Fixed Link Licence or FWALA Licence Regulations Please note that the specific amount of spectrum which will be made available for individual licensing is still under consideration and shall be announced in due course;

(2) to designate the remainder of spectrum within the 26 GHz band for block assignments on a National basis. National spectrum block assignments of 28MHz channels (each channel being 28MHz of paired spectrum) shall be awarded following an auction process where operators will be free to bid for multiple channels as required up to a maximum number of channels to be specified by ComReg. It is intended that National spectrum block licences shall be issued for a period of 10 years.

(3) ComReg will adopt a technologically neutral approach and will not designate specific channels for particular technologies or applications (e.g. PP or PmP).

(4) Please note that the specific amount of spectrum which will be made available for National spectrum block licensing is still under consideration and shall be announced in due course;

(5) to employ a block edge mask (BEM) at the outer edge of contiguous block assigned channels to mitigate against the possibility of interference between adjacent spectrum blocks;

(6) to extend ComReg's existing on-line 'Hi/Lo' database[5] to include all transceiver sites deployed in the 26 GHz band. In the interest of the efficient use of the spectrum all licensees will be required to notify ComReg of the deployment of transceiver sites in the 26 GHz band.

(7) existing National licences issued under the FWPMA Regulations[6] shall remain in force in accordance with the relevant regulations until the final expiry of those licences which, as specified in regulation 6(4) of S.I. No 287 of 1999, is 10 years after the commencement of the first licence;

[5] www.comreg.ie/licences/lic_site_designation.asp

[6] S.I. No. 287 of 1999 – see Appendix A

(8) following the expiry of BT Ireland's FWPMA licence on 4 July 2006, this spectrum (i.e. 24745 – 24773 MHz paired with 25753 – 25781 MHz) will become free for assignment for other purposes under the framework proposed in this document;

(9) existing Point-to-Point link licensees in the band shall have the opportunity to bid for National spectrum block licences and ComReg shall endeavour to ensure that any disruption caused by transition from individual licences to a National spectrum block licence shall be minimised e.g. if practicable by assigning the same channel to the successful licensee on a National basis;

(10) to undertake further study to determine the feasibility of facilitating, at some time in the future, a further development in the 26 GHz band whereby a National spectrum block licensee will be able to sub-licence that spectrum to other users in areas where the licensee is not utilising the licensed spectrum. In addition, during 2005/2006, ComReg will be conducting other projects and trials in relation to the liberalisation of spectrum management including the introduction of a new National business radio licensing scheme for the provision of services to third parties (see ComReg document 05/74)[7];

(11) ComReg will retain the flexibility to revise designations of spectrum for both individual assignments and National block assignments to meet new developments and spectrum demand as appropriate. In addition ComReg may assign spectrum in any guard band where such an assignment will not result in interference into adjacent spectrum.

The following figure broadly illustrates how the 26 GHz band will be restructured. Please note that the specific amount of spectrum to be designated for individual or National block assignment is still under consideration and therefore the location of the guard band in the channel arrangement in figure 1 is purely indicative.

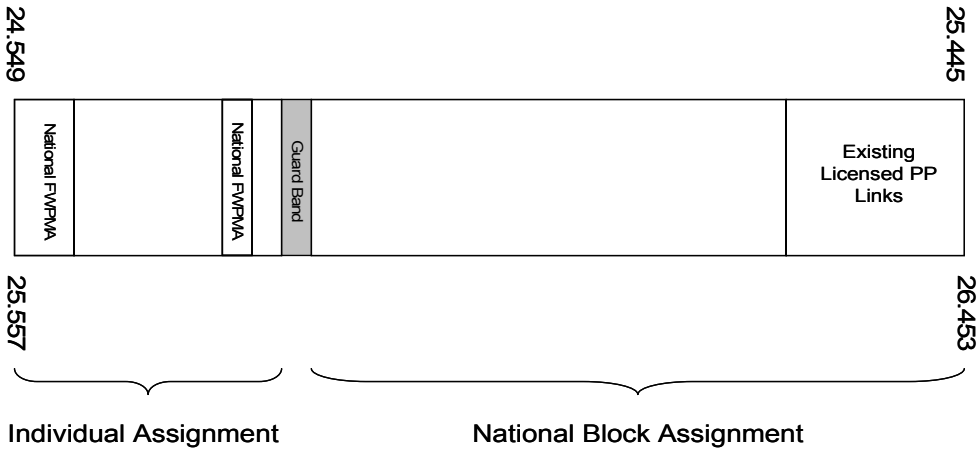


Figure 1

[7] New Licensing Scheme for the provision of business radio services to third parties

5 Next Steps

The following steps will be taken to implement the proposals made in Section 4.5 above:

- Regulations will be developed to provide the legal framework for the award of National spectrum block licences;
- An Information Notice will be published in due course detailing the specific spectrum available for individual licensing under the existing regulations and the spectrum available for the new National spectrum block licences;
- An auction process will be designed to meet the goals of the licence process;
- An Information Memorandum will be published detailing the auction rules and procedures and detailing the terms and conditions of National spectrum block licences.

It is estimated that ComReg will conduct the auction process in March/April, 2006.

Appendix A – Legislation

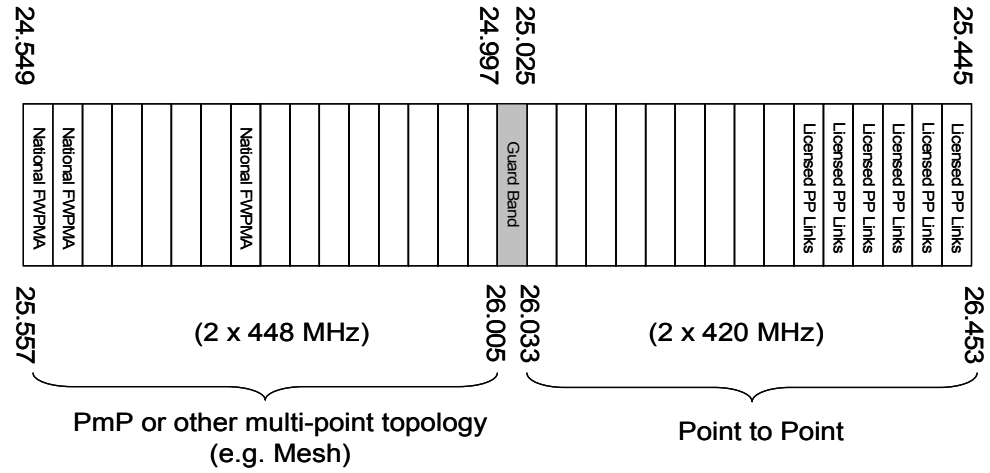
S.I. No. 319 of 1992: Wireless Telegraphy Act, 1926. Wireless Telegraphy (Radio Link Licence) Regulations, 1992;

S.I. No. 287 of 1999: Wireless Telegraphy Act, 1926. Wireless Telegraphy (Fixed Wireless Point to Multipoint Access Licence) Regulations, 1999;

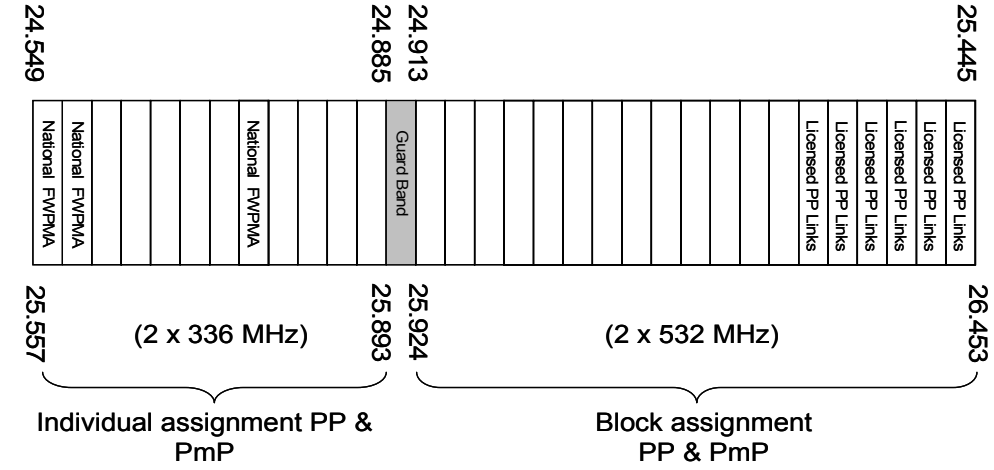
S.I. No. 79 of 2003: Wireless Telegraphy Act, 1926. Wireless Telegraphy (Fixed Wireless Access Local Area Licence) Regulations, 2003.

Appendix B – Options Presented in Consultation Document 05/46

Option 1:



Option 2:



Option 3: