Guidelines

Revised Guidelines to Applicants for Fixed Wireless Access Local Area (FWALA) Licences

Guidelines

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1 Introduction

1. The Fixed Wireless Access Local Area (FWALA) licensing scheme was launched by the Commission for Communications Regulation ("ComReg") in 2003. This document provides revised guidance on the FWALA licensing scheme and replaces ComReg document 06/17R6.

2. A FWALA licence affords licensees the opportunity to provide wireless broadband access services to the public in a specific geographic area which is defined by the licensee.

3. Licences issued under the FWALA licensing scheme are primarily intended for use in the provision of broadband services to end users. However ComReg may issue a FWALA licence for the provision of radio access services in a network, where this facilitates the rapid connection of broadband services to end users. This reflects the general policy of ComReg to encourage the roll out of broadband services on multiple platforms.

4. This licensing regime has been developed to encourage competitive deployment of broadband services in the market. Taking into consideration the novel approach adopted in the FWALA licensing regime, the limited spectrum available and the emphasis on technology neutrality, licensees are requested to cooperate with ComReg and other licensed operators in coordinating with neighbouring systems to facilitate the deployment of quality broadband services to the public.

5. In considering applications for FWALA licences ComReg policy is to optimise the use of the radio spectrum by ensuring that, as far as practicable, the assigned bandwidth is the minimum consistent with the service requirement

6. ComReg is aware that the European Commission has adopted a decision[1] harmonising the conditions of use of the 3.4 – 3.8 GHz band for fixed, nomadic and mobile applications. ComReg plans to implement the remaining articles of this Decision which will allow the use of mobile technologies in this spectrum band.

1 Commission Decision of 21 May 2008 on the harmonisation of the 3400 – 3800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community – 2008/411/EC.

2 The Statutory Regulations

7. A Wireless Telegraphy Licence is required under Section 3 of the Wireless Telegraphy Act 1926 to keep and operate apparatus for wireless telegraphy. The specific regulations governing the issue of FWALA licences are contained in the Wireless Telegraphy (Fixed Wireless Access Local Area Licence) Regulations, 2003 (S.I. 79 of 2003) and the Wireless Telegraphy (Fixed Wireless Access Local Area Licence) (Amendment) Regulations, 2003 (S.I. 530 of 2003). Please note that these Regulations should be read in the light of the regulatory framework for electronic communications networks and services and in conjunction with Appendix E of ComReg document 03/84.

8. The applicant should be aware that any FWALA licence granted by ComReg is for the keeping and operating of the apparatus for wireless telegraphy which is specified in the licence. Any licence issued by ComReg does not absolve the licensee from complying with any other statutory obligations (e.g. planning permission).

9. FWALA operators must also comply with ComReg's General Authorisation scheme governed by the European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations 2003 (SI 306 of 2003). See ComReg documents 03/81R1, 03/82R2, 03/83 and 03/102R for more information on the General Authorisation scheme.

3 The FWALA licensing scheme

10. The FWALA licensing scheme was launched in 2003 and by April 2012 there were 211 FWALA licences issued to 13 licensees. These licences are in the 3.5 GHz, 10.5 GHz and 26 GHz bands. Maps showing the location of these licences are published on ComReg's website[2].

11. This section outlines the frequency spectrum available for the scheme, the definitions and technical parameters in relation to the service area and general equipment requirements.

3.1 Frequency Spectrum

12. Three spectrum bands have been identified for FWALA:

- 3.5 GHz band (3.4 GHz – 3.8 GHz)
- 10.5 GHz band (10.154 GHz – 10.672 GHz)
- 26 GHz band (24.549 GHz – 25.781 GHz)

13. While the spectrum bands have been identified for FWALA licensing, this does not imply that ComReg is always in a position to offer a FWALA licence to an applicant as issues such as availability of spectrum in a particular area and band need to be considered for each application.

14. Changes in the spectrum identified for FWALA licensing may arise for a number of reasons, these include:

- changes in spectrum allocations in accordance with the requirements of international treaties or regionally negotiated agreements;
- changes necessitated by EU legislation;
- changes in order to meet national requirements; and
- in the interests of the efficient use of the radio spectrum it is the policy of ComReg to review the use of the spectrum on an ongoing basis in order to reflect the changes outlined above and changes in the market place.

[2] See FWALA maps at http://www.comreg.ie/radio_spectrum/fwala_search.541.960.fwalasearch.html

3.2 3.5 GHz band

15. The channels identified for FWALA licensing in the 3.4 GHz – 3.8 GHz band are shown in Figure 1 below.

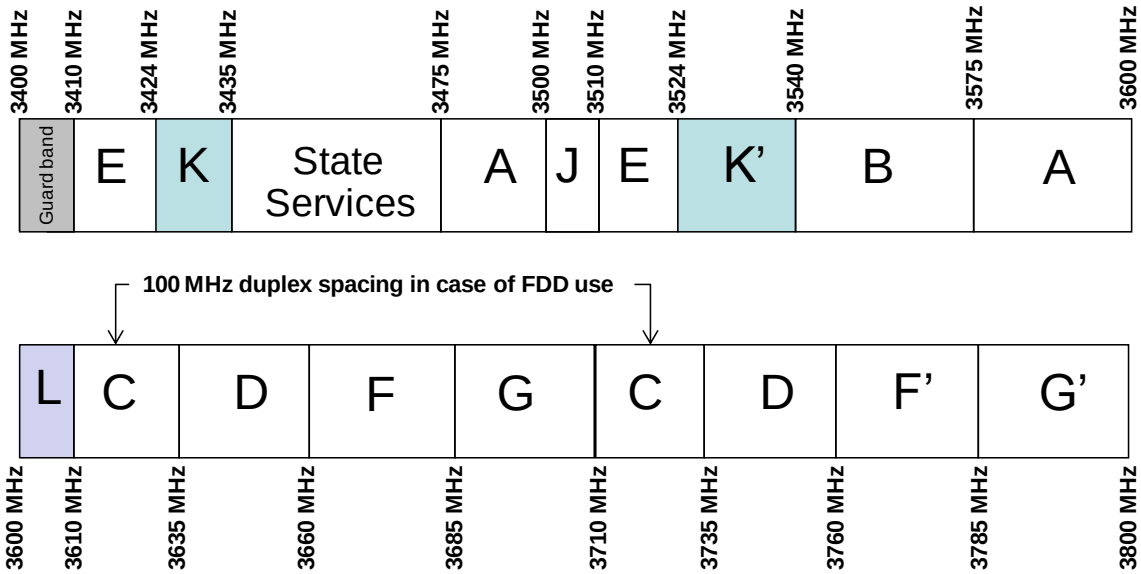

Figure 1: FWALA channel arrangements in the 3.4 GHz – 3.8 GHz band

16. The licensing process for Channels A through to L is set out in this document and details of these channels are set out in the table below:

3.4 GHz – 3.8 GHz band Channels	**Channel Bandwidth**	**Mode of Operation**	***Transmit centre frequency (MHz)***	
			Base Station	*CPE*
A	2 x 25 MHz	FDD or TDD	3587.5	*3487.5*
B	1 x 35 MHz	TDD	*3557.5*	
C	2 x 25 MHz	FDD or TDD	3722.5	*3622.5*
D	2 x 25 MHz	FDD or TDD	3747.5	*3647.5*
E	2 x 14 MHz	FDD or TDD	3517	*3417*
F	2 x 25 MHz	FDD or TDD	3672.5	*3772.5*
G	1 x 25 MHz and 1 x 15 MHz	FDD or TDD	3697.5	*3792.5*
J	1 x 10 MHz	TDD	*3505*	
K	1 x 11 MHz and 1 x 16 MHz	FDD and TDD		
L	*1 x 10 MHz*	*TDD*	*3605*	

Table 1: 3.4 – 3.8 GHz channel plan details

17. As of April 2012 ComReg has issued 273 licences in this band to 13 different operators. Applicants are strongly advised to examine the FWALA maps published on the ComReg website to see what geographic areas and channels are available in this band before applying for a licence.

18. In April 2010 ComReg published an Information Notice[3] announcing that the current FWALA licensing scheme in the 3.6 GHz band would be terminated by 31 July 2017, allowing all existing 3.6 GHz licences to run for their full 7-year duration. The introduction of mobility to the band under the current scheme is recognised as having limited scope for facilitating deployment of mobile services, particularly on a national basis which is anticipated to be a major driver of demand for wireless broadband services in the future. It is also expected that demand for fixed and nomadic services is likely to continue.

3.3 10.5 GHz band

19. There are five 28 MHz FDD FWALA channels in the 10.5 GHz band nationwide (excluding Dublin and Cork), as shown in Figure 2 below.

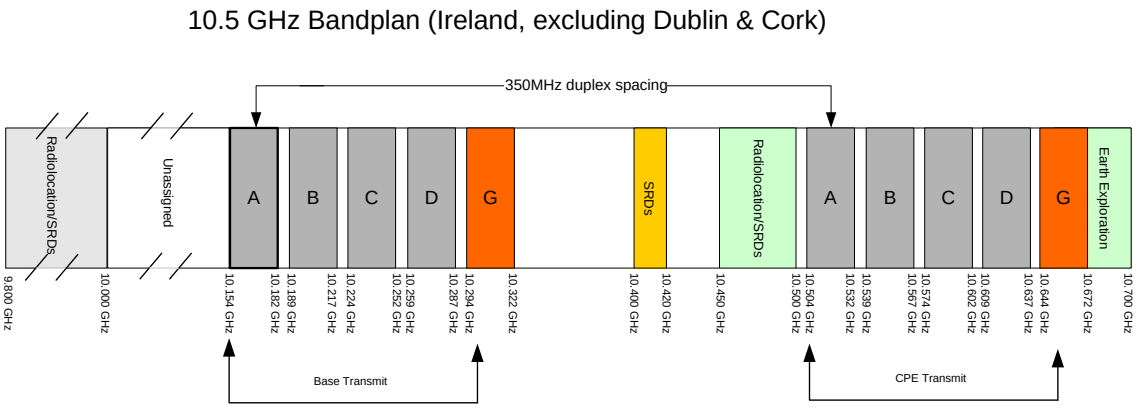

Figure 2: FWALA channel arrangements in the 10.5 GHz band (nationwide, excluding Dublin and Cork)

[3] ComReg 10/29 – Fixed Wireless Access Local Area Licensing: End date of the FWALA licensing scheme in the 3.6 GHz band – 8 April 2010. http://www.comreg.ie/_fileupload/publications/ComReg1029.pdf

20. In Dublin and Cork, there is a slightly different channel arrangement for the 10.5 GHz FWALA band, and this is shown in Figure 3. In Dublin and Cork, there are four 28 MHz FDD channels (Channels A-D), and two 14 MHz FDD channels (Channels E and F).

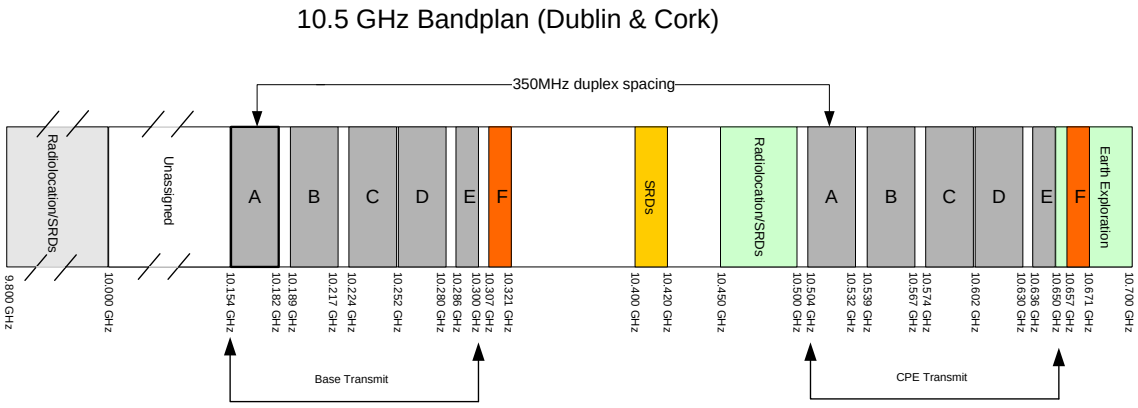

Figure 3: FWALA channel arrangements in the 10.5 GHz band (in Dublin and Cork)

21. The licensing process for Channels A-G in the 10.5 GHz band is set out in this document and details of these channels are set out in the table below:

10.5GHz Channels	Channel Bandwidth	Mode of Operation	*Transmit centre frequency (MHz)*	
			Base Station	*CPE*
A	2 x 28 MHz	FDD	10168	*10518*
B	2 x 28 MHz	FDD	10203	*10553*
C	2 x 28 MHz	FDD	10238	*10588*
D	2 x 28 MHz	FDD	10273	*10623*
E (Dublin and Cork only)	2 x 14 MHz	FDD	10293	*10643*
F (Dublin and Cork only)	2 x 14 MHz	FDD	10314	*10664*
G (nationwide excluding Dublin and Cork)	*2 x 28 MHz*	*FDD*	*10308*	*10658*

Table 3: 10.5 GHz channel plan details

As of April 2012 ComReg has issued 44 licences in this band to 5 different operators. Applicants are advised to look at the 10.5 GHz maps on the ComReg website to see what geographic areas and channels are available in this band before applying for a licence.

Mandatory Sharing Conditions

22. The band 10.6 – 10.68 GHz is currently allocated to the Earth Exploration-Satellite Service (passive) on a co-primary basis with, among others, fixed, mobile and radio astronomy services, at both an International and European level. The main function of these services within this spectrum is for the measurement of rain, snow, sea state, ocean wind and soil moisture, through the deployment of passive sensors.

23. The World Radiocommunication Conference of 2007 (WRC 07) passed a Resolution[4] urging administrations to comply with the sharing criteria defined in the Resolution, in order to protect the Earth Exploration-Satellite Service (EESS)[5] (passive) from interference in the 10.6 – 10.68 GHz band, noting that EESS (passive) sensors provide worldwide measurements that benefit all countries, even if these sensors are not operated by their country.

24. These sharing criteria, detailed in Table 4, allow for the fixed service, of which FWALA forms a part, to operate without undue constraints, while also providing EESS with protection against harmful interference. These sharing criteria are mandatory on all FWALA operators in the 10.6 to 10.68 GHz band.

4 ITU-R Resolution 751 (WRC–07)

5 Earth exploration-satellite Services (EESS) (passive) and space research service (passive) are assigned frequencies 10.600 – 10.700 GHz on a primary basis. The main function of these services within this spectrum is for the measurement of rain, snow, sea state, ocean wind and soil moisture; through the deployment of passive sensors

Stations of point-to-multipoint systems in the fixed service

Parameter	Value
Hub stations (See Note 4)	
Maximum transmitter power at the antenna port	−7 dBW
Maximum off-axis e.i.r.p. above 20° from the horizontal plane	−6 dBW
Maximum off-axis e.i.r.p. above 45° from the horizontal plane	−11 dBW
Maximum off-axis e.i.r.p. at 90° from the horizontal plane	−13 dBW
Customer stations (See Note 4)	
Maximum elevation angle	20°
Maximum transmitter power at the antenna port	−8 dBW
Maximum off-axis e.i.r.p. above 45° from the horizontal plane	−18 dBW (See Note 5)

NOTE 4 – Administrations planning point-to-multipoint deployment in the band 10.6-10.68 GHz, paired with another frequency band, are encouraged to only deploy return links (i.e. emissions from customer stations) in the 10.6-10.68 GHz band.

NOTE 5 – In the case of point-to-multipoint systems using ATPC, the maximum transmitter power at the antenna port may be increased by a value corresponding to the ATPC range, up to a maximum of −3 dBW.

Table 4: Sharing Criteria applicable to the 10.6 – 10.68 GHz band, extracted from ITU-R Resolution 751 (WRC–07)

Ireland/UK Coordination

25. In May 2010, OfCom and ComReg agreed a Memorandum of Understanding (MoU) which describes the procedures for co-ordination of wireless access radio services between Republic of Ireland and the United Kingdom in the frequency band 10000 - 10689 MHz. Licences are required to abide by the criteria and procedures detailed in this MoU as contained in Annex 4.

3.4 26 GHz band

26. There are five frequency channels identified for FWALA licensing in the 26 GHz band as shown in Figure 3 below.

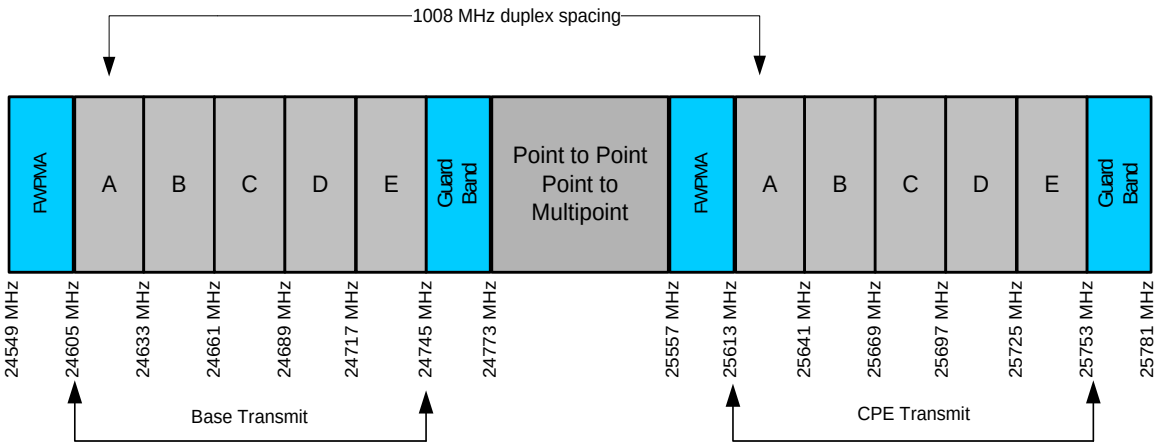

Figure 4: 26 GHz Channel Plan[6]

27. The Licensing process for Channel A, B, C, D and E is as set out in this document and details of these channels are set out in the table below:

26GHz Channels	Channel Bandwidth	Mode of Operation	*Transmit centre frequency (MHz)*	
			Base Station	*CPE*
A	2 x 28 MHz	FDD	24619	*25627*
B	2 x 28 MHz	FDD	24647	*25655*
C	2 x 28 MHz	FDD	24675	*25683*
D	2 x 28 MHz	FDD	24703	*25711*
E	*2 x 28 MHz*	*FDD*	*24731*	*25739*

Table 5: 26 GHz channel plan details

28. As of April 2012 ComReg has issued 14 licences in this band to 4 different operators. Applicants are advised to look at the 26 GHz maps on the ComReg website to see what geographic areas and channels are available in this band before applying for a licence. Hi-Lo Database.

[6] In accordance with ECC Recommendation (00)05 use of the band 24.5 – 26.5 GHz for Fixed Wireless Access

29. ComReg maintains a high/low database for all licensed point to point links. This is in place so as to preserve a particular geographical site as being designated as transmit high or transmit low site for a particular frequency band. For example, if a site was designated transmit low in the 18 GHz band, this means that only transmissions from the low duplex of the 18 GHz band can be transmitted from this site. This reduces the likelihood of interference.

30. With respect to 26 GHz frequency band, point to point (P2P) and point to multi-point (PMP) and FWALA licences as assigned in spectrum adjacent to each other. Therefore it is necessary for ComReg to have a high/low database which incorporates the entire 26 GHz frequency band (whether P2P, P2MP or FWALA).

31. All 26 GHz base station deployments must be registered on the ComReg online Hi/Lo database prior to deployment. This can be done via ComReg's elicensing website[7]. Unregistered base stations will be considered to be unlicensed.

3.5 FWALA Spectrum Assignment Issues

32. There is limited spectrum available for FWALA licences and in order to maximise use of this spectrum, it is ComReg's policy to manage the spectrum in an efficient and orderly manner.

33. While ComReg will endeavour to minimise the potential for interference between users and services, no liability shall accrue to ComReg arising from interference. Licensed operators should initially liaise with other licensed operators regarding interference issues, if a resolution is not reached, ComReg will act as an intermediary.

34. Licensees should note that guard bands may be required between adjacent channel frequency assignments and in these cases FWALA licensees will be required to accommodate these guard bands within their licensed frequency channel. Where 2 different technologies are operating in adjacent channels, substantial guard bands may be required to avoid mutual interference.

3.6 FWALA Definitions and Technical Parameters

35. The following definitions and technical parameters are applicable to the FWALA licensing scheme:

[7] https://www.elicensing.comreg.ie/login.aspx

- FWALA Service Area
- Interference Contour
- Field Strength Limits
- Geographical Service Area (GSA)

FWALA Service Area

36. The FWALA service area is defined as the geographic area within which an operator may offer telecommunications services by means of a local area fixed wireless access network. The service area for a licence is defined by a centre point and a maximum permitted radius from that point. The centre point is normally the geographic location of the base station. The service area of a FWALA licence is defined by a circle, with 20km radius from nominated centre point.

37. It is intended that Customer Premises Equipment (CPE) and outlying base stations[8] may only be deployed within the service area of a FWALA licence and may only operate on the frequency range covered by the FWALA licence and do not cause the field strength limit specified in Table 6 below to be exceeded.

Interference Contour

38. The interference contour is defined by means of a circle around the centre point of the service area. The interference contour is set at 30km. See Table 6 below for details of the technical parameters and limits applicable to the interference contour. An application will be rejected if its interference contour overlaps with the interference contour of another applicant/licensee.

Field Strength Limits

39. The field strength applied at the interference contour is intended to ensure that any interference to a FWALA receiver in a service area beyond this contour is at least 6dB below the thermal noise floor. The field strength is dependent on the frequency band employed, as set out in Table 6 below.

[8] "Outlying base stations" are those base stations which are **not** located at the centre of the FWALA service area,

40. The FWALA licence states that the field strength must not be exceeded by the FWALA licensee at the interference contour. It is expected that the applicant will employ a propagation tool when planning their network to ensure that the field strength limits at the interference contour is not exceeded.

Geographical Service Area

41. When two or more FWALA Licences overlap, a Geographic Service Area (GSA) may be formed provided that the criteria as set out below are met. FWALA licences may be considered as overlapping if their interference contours overlap.

42. Once a GSA is designated, the Licensee will be allowed to deploy FWA apparatus[9] and provide FWALA services throughout the GSA.

43. The maximum area that can be applied for in respect of a GSA is dependent upon:

- maintenance of the existing 10km Interference Buffer Zone to the edge of their FWALA licences, as specified under the FWALA licensing scheme; and
- not exceeding the interference field strength limits at the edge of the buffer zone as specified under the FWALA licensing scheme.

Frequency Band (GHz)	Maximum Service Area Radius (km)	Interference Contour Radius (km)	*Field Strength (dBµV/m)*
3.5	20	30	*33*
10.5	20	30	*43.3*
26	*20*	*30*	*50.8*

Table 6: FWALA Parameter Limits

9 Outlying Stations or Customer Premises Equipment.

3.7 FWALA Code of Practice for the 3.4 – 3.8 GHz band

44. While every effort has been made by ComReg to minimise the possibility of interference between licensed operators in licensing FWALA systems, it is possible that situations will arise from time to time where it is necessary to coordinate the usage of frequencies between different FWALA networks in order to facilitate the operation of these networks. It is ComReg's view that the most appropriate way to deal with such instances is by means of a Code of Practice on Domestic Frequency Coordination.

45. The following Code of Practice applies to all FWALA licences in the 3.4 – 3.8 GHz band only and is based on the following principles:

- it is not possible to provide an environment which is completely free of interference;
- operators have a number of mitigation options available to deal with interference problems;
- operators require a level of certainty in frequency planning for their network;
- it is not possible to anticipate every possible interference scenario – therefore a pragmatic approach is required;
- operators with neighbouring networks may arrive at sharing solutions independent of ComReg;
- that a Code of Practice be considered best practice in the absence of any other agreements;
- ComReg is responsible for the international coordination of radio systems between the Republic of Ireland and other countries;
- management of the deployment of network infrastructure, including customer premises equipment, in the service area and within the licensed frequency channel is generally a matter for the operator;
- the local area approach and the requirement to comply with the maximum permissible field strength contour will result in differing EIRP values for base-stations and customer premises equipment deployed within the licensed service area;

- the approach in Ireland should as far as possible take into consideration the approach recommended by CEPT[10];
- that the Code of Practice 07/74 is a working document and may be subject to review from time to time; and
- that the Block Edge masks detailed in the Code of Practice 07/74 may be changed to take into consideration technological changes that may arise.

3.8 Cross-border frequency considerations

46. ComReg's jurisdiction ends at the national border. There is currently a Memorandum of Understanding (MoU) in place between ComReg and its UK counterpart Ofcom, to facilitate operation of FWALA stations as close to the border as possible. The criteria for co-ordination are as follows:

47. A station may be established without co-ordination, provided that the predicted power spectral density (PSD) produced by the station, at a height of 10m above ground at 15km from the border of the border or coast line of the neighbouring country does not exceed 24 dBuV/m in a bandwidth of 1MHz (equivalent to an aperture power of -122 dBW/MHz/m2).

48. In the case of time division duplex technology the interference power shall be the power, during the active part of the signal, in the stated bandwidth.

49. This MoU is bilateral in nature and all licensees are required to meet the terms of the agreement. The full text of the MoU can be found in Annex 3 of this document.

[10] European Conference of Postal and Telecommunications Administrations (www.cept.dk or www.ero.dk). Reference ERC/REC 14-03, ECC Report 033 and ECC/REC(04)05.

3.9 Equipment Compliance

50. In common with other licensed radio services, all radio equipment used to deliver FWALA services must comply with the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (the R&TTE Directive)[11] which was enacted into Irish law on 5 June 2001 by Statutory Instrument 240 of 2001. Harmonised standards under the R&TTE Directive, published by the European Telecommunications Standards Institute (ETSI) and CENELEC, can be used to demonstrate compliance to the essential requirements of the R&TTE Directive[12]. Information on the R&TTE Directive may be found in ComReg documents 00/61 and 00/62R – please note that these documents are subject to revision and updates[13].

[11] OJEC reference L 91, 7.4.1999, p.10 (available from http://europa.eu.int/eur-lex/en/search/search_oj.html)
[12] A list of the harmonised standards under the R&TTE Directive is maintained at http://europa.eu.int/comm/enterprise/newapproach/standardization/harmstds/reflist/radiotte.html
[13] Further information on the R&TTE Directive can be found at http://europa.eu.int/comm/enterprise/rtte/

4 The Application Process

4.1 Terms for submission of an Application

51. All applications for a FWALA licence must be made on the appropriate application form - ComReg document 06/17aR1 .

52. The minimum requirements for a FWALA Application are that:

- the application form must be completed correctly in accordance with these guidelines and the information requested in the application form (ComReg document06/17aR1);
- the full licence fee is to be submitted with the application;
- the applicant must commit to using the licence to make electronic communications services available in the FWALA service area no later than 11 months after the issue of the licence;
- a separate application is required in respect of each FWALA system (i.e. centre point of FWALA service area);
- a person who applies for adjacent areas should, where feasible, request the same frequency channel in all service areas;
- where a Licensee has an existing channel and is making an application for a channel in another service area, the licensee should request the existing channel, where available, in its application; and
- in the interest of spectrum efficiency applications will only be accepted where the applicant applies for the full channel bandwidth of the FWALA channel. See Tables 1, 3 and 5 of this document for the channel plans for the 3.5 GHz, 10.5 GHz and 26GHz band.

4.2 The Evaluation Process

53. Only applicants that have met the minimum requirements will be considered for evaluation

54. Unless ComReg indicates otherwise, all valid applications for FWALA licences will be evaluated on a First Come First Served basis with applications received by ComReg on the same day being treated equally, i.e. evaluated as though they arrived at the same time. Applications will only be accepted during office hours i.e. 9.00 a.m to 5.00 p.m Monday to Friday.

55. Where applications arrive on the same day for the same geographical area[14] and there are more applications than available licences, a comparative evaluation process will be used.

4.3 Comparative Evaluation Process

56. When a comparative evaluation process is applicable ComReg will notify the affected applicants that their application will be evaluated comparatively rather than using a First Come First Served method.

57. Guidance on the comparative evaluation process is set out in Annex 1 of this document.

58. Each applicant will be requested to submit voluntary offerings to ComReg using the form set out in Annex 1 of this document. The voluntary offerings are to be received by ComReg within 14 calendar days of ComReg's request. Failure to meet this deadline will result in the application being rejected. All voluntary offerings submitted to ComReg will be included in the applicant's FWALA licence.

4.4 Geographical Service Area

59. A licensee will be eligible to apply to ComReg to form a GSA based around its individual FWALA licences when certain criteria are met. These are that:

- two or more FWALA licences overlap[15];
- the FWALA licences are on the same channel;
- the FWALA licences are licensed to the same licensee; and
- the FWALA licences are current and valid.

[14] In this context, "geographical area" refers to the area covered by the interference contour.
15 FWALA licences overlap if their interference limit contours overlap.

60. Please see Annex 2 of this document for details of the GSA application/approval process.

4.5 Provision of Further Information

61. ComReg reserves the right to request an applicant to submit further material and documents in addition to the information already provided within such time and within such format as ComReg may stipulate. Only the applications and written material requested by ComReg will be taken into account during the evaluation process.

4.6 Application Conditions

62. By participating in the application process, the applicant undertakes to accept the terms of the application, will abide by the rules of the process and that it's application is an irrevocable and unconditional offer that will remain valid and binding on the applicant for the period of the competition or until such time as the applicant has been awarded or declined a licence, or ComReg has otherwise terminated the competition. All expenses incurred by applicants or potential applicants shall be borne by themselves exclusively.

63. ComReg reserves the right to alter any of the deadlines or conditions during the licensing process. Although every care has been taken in preparing this document and conducting this process, no representation, warranty or undertaking, expressed or implied, in respect of any error or misstatement is or will be made or given, and no responsibility or liability will be accepted by ComReg or by any of its officers, employees, servants, agents or advisers as to the accuracy or completeness of this document or any other written or oral information made available to any interested party or its advisers concerning this document and any liability howsoever arising (including in respect of this licensing process) is expressly disclaimed. No information contained in this document shall form the basis for any warranty or representation nor will the application for a licence, nor the grant of any licence (whether conditional or otherwise) constitute a contract with ComReg.

64. ComReg makes no representations and warranties in respect of the viability of the market or accuracy of the contents of this application form so that applicants and potential applicants are responsible for their own verification and due diligence. The applicant agrees by accepting any licence which it may be offered that the Licensee is responsible for all costs, liabilities and losses derived from the operation or non-operation of the licence or licensed service for whatever cause.

65. Applicants should note that ComReg is subject to Irish and EU rules on treatment and handling of confidential information, is a ‘Public Body’ for the purpose of the Freedom of Information Act, 1997 and is bound by this Act in relation to the release of information.

66. Any personal information which you provide to ComReg will be treated strictly in accordance with the Data Protection Acts, 1988 & 2003

5 Licence Information

67. A licence granted under the FWALA Regulations allows the licensee to keep and operate radio apparatus in accordance with these regulations.

68. Please refer to the Wireless Telegraphy (Fixed Wireless Access Local Area Licence) Regulations, 2003 (S.I. 79 of 2003) and documents 03/83 and 03/84 for a complete list of conditions attaching to the FWALA licence.

69. A licence does not confer any right of ownership of the frequency spectrum. It allows the assigned frequency channel to be used during the term of the licence in accordance with the conditions of the licence.

70. ComReg reserves the right not to award licences.

5.1 Licence Fee

71. As specified in section 4.1, all applications for a new FWALA channel must be made for the full channel bandwidth of the FWALA channel. (See Tables 1, 3 and 5 above)

72. The licence fees to be paid on, grant of and on each renewal of a FWALA licence are as set out in Table 7 below.

Bandwidth (Paired channel)	***Licence Fee (€)***
Up to 7MHz	*1500*
Over 7 MHz and up to 14 MHz	*2000*
Over 14 MHz and up to 28 MHz	*2800*

Table 7: Schedule of Fees

73. Channel B of the 3.6 GHz band is a single channel. The annual licence fee for a single channel is calculated by first determining the “equivalent” paired channel bandwidth and then using Table 7 to determine the fee.

Example:

A 1 x 35 MHz single channel allocated.

The “equivalent” paired channel bandwidth is 2 x 17.5 MHz

Using Table 7, the annual licence fee is €2800

74. Where a licence is granted for a portion of a year the licence fee to be paid by the licensee shall be calculated as follows:

A x (B/12) = C

Where

A is the relevant annual licence fee (e.g. €2800);

B is the number of whole months for which the licence is granted (if a licence is granted for a period of less than one month then, for the purpose of these calculations only, the licence shall be considered as a licence granted for a period of one month); and

C is the appropriate licence fee to be paid.

5.2 Duration and Renewal of Licences

Licence Duration

10.5 GHz and 26 GHz FWALA licences

75. These FWALA Licences are issued for a period of 1 year from the commencement date stated in the licence and may be renewed up to a maximum of 7 years. At the end of 7 years, a licence shall expire utterly and cannot be renewed or extended.

3.6 GHz FWALA licences:

76. 3.6 GHz FWALA licences awarded prior to 31 July 2010 were issued for a period of 1 year from the commencement date stated in the licence and may be renewed up to a maximum of 7 years. At the end of 7 years, a 3.6 GHZ FWALA licence shall expire utterly and cannot be renewed or extended.

77. No 3.6 GHz FWALA licences shall be issued, renewed or extended beyond the 31 July 2017 and any FWALA licence in the 3.6 GHZ band which is still active on 31 July 2017 shall terminate at midnight on that date[16].

[16] See ComReg document 10/29 - Information Notice - FWALA Licensing - End date of the FWALA licensing scheme in the 3.6 GHz band - published 8 April 2010.

78. For example, a 3.6 GHz FWALA licence which was first granted on 1 January 2007 shall expire on 1 January 2014, 7 years after it was first granted, and shall not be renewed or extended beyond that expiry date. Spectrum released upon the expiry of the licence would be made available by ComReg under a new licence under the existing FWALA scheme, however such a licence would run for a maximum of 3 years, 7 months (i.e. form 1 January 2014 to expire fully on 31 July 2017)

Licence Renewal

79. Licences for FWALA systems will not be considered for renewal if the system has not been brought into service and the declaration form has not been submitted to ComReg prior to the renewal date of the licence.

80. The licence, if not renewed prior to the termination date, will be deemed to have lapsed.

81. It may not, in all cases, be possible to effect renewal. In considering renewal ComReg will have regard to, inter alia:

- Whether the licence fee is paid in full;
- Whether the FWALA system is being operated in accordance with the terms and conditions of the licence:
- whether changes in radio frequency management requirements are being considered at a national or international level for the band in question. Where this is the case ComReg will endeavour to provide affected licensees with as much notice as is reasonably practicable;

82. A written request for renewal should be sent to ComReg at least 28 days prior to the termination date of the licence.

5.3 Amendments to Licences

83. It is recognised that licensees, from time to time, may wish to request a modification to an existing licence. For example, an existing licensee with a licence for part of a FWALA channel may apply to ComReg to amend its licence by requesting additional bandwidth in that channel.

84. Where the Licensee wishes to modify elements of their licence a request must be submitted on the application form (ComReg 06/17aR1). Table 7 will be used to determine if a fee is required with the amendment request.

85. In exceptional circumstances and where appropriate, ComReg may need to make modifications to existing licences. In such cases ComReg will follow the procedures set out in the Authorisation Regulations.

86. ComReg will not permit amendments to licences where the request is being made to move the central base station of the FWALA service area more than 5km in any direction from its current centre point location.

5.4 Revocation of a Licence

87. ComReg may suspend or revoke a licence where there is serious or repeated non-compliance by the licensee with the conditions of the licence. Applicants are referred to Regulation 13 of the FWALA Regulations 2003.

5.5 Cancellation of a Licence

88. A Licence may be cancelled at the written request of the licensee. There shall be no entitlement to any refund of licence fees in the event of such cancellation.

89. A licence which has not been renewed as per Section 5.2 of this document will be deemed to have lapsed.

5.6 Non-Ionising Radiation

90. The licensee shall ensure that non-ionising radiation emissions from the fixed wireless access apparatus operated by the licensee are within the limits specified in the guidelines published by the International Commission for Non-Ionising Radiation Protection ("ICNIRP") and that these comply with any radiation emission standards adopted and published by ICNIRP or its successors from time to time, any radiation emission standards of the European Committee for Electro technical Standards and any other radiation emission standards specified by law.

5.7 Interference

91. Licensees are required to adhere to the guidelines in ETSI Technical Report ETR 053, "Radio Site Engineering for Radio Equipment and Systems in the Mobile Service", to minimise the risk of interference between co-sited radio systems.

5.8 International Coordination Obligations

92. In some cases it may be necessary for ComReg to undertake international coordination and registration procedures, particularly where there is a possibility of interference to/from the terrestrial and/or satellite services of another administration. As this may take some time, FWALA networks are licensed subject to a condition that the licence may have to be amended, or withdrawn, if successful coordination is not achieved. Where changes arising from international coordination are required to be made to a licence, the licensee will be advised of the necessary changes. In this event, all expenses must be borne by the licensee.

5.9 Commissioning/Site Inspections

93. ComReg reserves the right to inspect a FWALA station at any time to ensure that the system is configured and operating in accordance with the licence conditions. In addition, ComReg may attend the commissioning of the system and may carry out measurements on the system at that time.

5.10 Harmful Interference to other users

94. Licensees are obliged to comply with the general FWALA technical obligations (see chapter 3) which are designed to reduce:

- Co-channel interference
- Adjacent channel interference
- Cross-border interference

Annex: 1 FWALA Comparative Evaluation Process

A 1.1 Any reference in this Annex to a “licence” should be construed as a reference to both a “temporary licence” and a “12 month”, unless indicated otherwise.

A1.1 Comparative Evaluation Criteria

A 1.1 Four criteria are included in the Comparative Evaluation Process, namely:

- Speed to Market Offering;
- Maximum Monthly Charge for Residential Service Offering;
- Maximum Monthly Charge for Business Service Offering; and
- Performance Bond Offering.

A 1.2 All of the above are based upon voluntary offerings from the applicant. The applicant’s voluntary offerings will form part of the licensee’s licence text. An example of the licence text is provided in Section A1.5.

A 1.3 The following provides guidance on each of the Comparative Evaluation Criteria.

1. Speed to Market Offering

A 1.2 The applicant is invited to make a speed to market offering by stating the maximum number of full months from the date of licence issue that the applicant requires to make meaningful FWALA services available to all end users within coverage in the licensed area.

A 1.3 “Meaningful FWALA services” in this context means the provision of actual broadband services to all end users, within coverage in the licensed area, who request such services. Anything that falls short of providing actual services is unacceptable and may result in revocation or non-renewal of a licence. For example, setting up a base station or transmitter in a licensed area would not of itself constitute providing meaningful services or using a licence, nor would providing services to a token number of customers while turning away numerous others.

2. Maximum Monthly Charge for Residential Service Offering

A 1.4 An unbundled and stand-alone FWALA service having the attributes as set out in Table 1 is to be made available on request to all of residential ("non-commercial") end users within coverage in the licensed service area.

Table 1: Residential Offering Characteristics

Nominal data transmission rate, network to subscriber:	*2 Mbit/s*
Nominal data transmission rate, subscriber to network:	*256 kbit/s*
Maximum contention ratio:	*24:1*
Inclusive data allowance in monthly tariff:	*10 GByte per month*

A 1.5 The applicant is invited to make a voluntary offering in respect of the maximum monthly charge, including VAT, for such a residential service. The maximum monthly charge must be clear, unambiguous and all inclusive, with no hidden extras. The charge shall include the monthly tariff and any additional charges, such as installation charge and equipment rental, averaged over a 12 monthly period.

A 1.6 For an uninterrupted period of 12 months from date of service launch, the applicant shall make its residential service offering available to all end users in the licensed area at a monthly charge not exceeding the maximum monthly charge committed to by the applicant.

A 1.7 For the avoidance of doubt, licensees will be free to offer additional services beyond those to which their committed charge relate.

3. Maximum Monthly Charge for Business Service Offering

A 1.8 An unbundled and stand-alone fixed wireless access service having the attributes as set out in Table 2 is to be made available on request to all commercial end users within coverage in the licensed service area.

Table 2: Business Offering Characteristics

Nominal data transmission rate, network to subscriber:	*2 Mbit/s*
Nominal data transmission rate, subscriber to network:	*2 Mbit/s*
Maximum contention ratio:	*10:1*
Inclusive data allowance in monthly tariff:	*Unlimited*

A 1.9 The applicant is invited to make a voluntary offering in respect of the maximum monthly charge, including VAT, for such a business service.

A 1.10 The maximum monthly charge must be clear, unambiguous and all inclusive, with no hidden extras. The charge shall include the monthly tariff and any additional charges, such as installation charge and equipment rental, averaged over a 12 monthly period.

A 1.11 For an uninterrupted period of 12 months from date of service launch, the applicant shall make this business service offering available to all end users in the licensed area at a monthly charge not exceeding the maximum monthly charge committed by the applicant.

A 1.12 For the avoidance of doubt, licensees will be free to offer additional services beyond those to which their committed charge relate.

4. Performance Bond Offering

A 1.13 The applicant is invited to submit a voluntary offering in respect of the value of the performance bond that is to be attached to the licence. The maximum value applicable to the performance bond is €15,000.

A 1.14 The performance bond shall have effect for a period of 24 months from the date of licence issue and will be forfeit in the event of a failure by the licensee to comply with any of the conditions of its FWALA Licence. A performance bond that is not forfeited will be returned to the licensee after the 24-month period has elapsed.

A 1.15 A performance bond must be secured by means of a cash deposit or by means of a guarantee provided by a reputable bank or bonding agency.

A 1.16 The performance bond shall apply to any “temporary” and subsequent “12 month” FWALA licence issued to the applicant. For example, if a temporary licence is issued for 9 months and a 12 month licence is subsequently issued, then the 24 month performance bond would apply to the 9 months of the initial temporary licence, the 12 months of the subsequent “12 month” licence, and the first 3 months of the second 12-month licence.

Guidance on Comparative Evaluation Scoring Mechanism

A 1.17 Where the number of valid applications received exceeds the number of available licences, the comparative evaluation criteria will apply. All applications will be evaluated in accordance with the procedure set out in Regulation 11 of the European Communities (Electronic Communications Networks and Services) (Authorisation) Regulations, 2003 (S.I. 306 of 2003).

A 1.18 Unless advised otherwise, the maximum points available to each of the criteria are set out in Table 3.

Table 3: Summary of evaluation criteria and associated marks

Evaluation Criteria	*Maximum Marks*
Speed to Market Offering	*25*
Residential Service Offering	*25*
Business Service Offering	*25*
Performance Bond	*25*

Guidance on the scoring mechanism for each of the criteria is set out below:

1. Speed to Market Offering

A 1.19 Marks will be awarded to applicants who commit to providing meaningful services in a time period shorter than 12 months. Maximum marks will be awarded to offerings within 2 months.

2. Maximum Monthly Charge for Residential Service Offering

A 1.20 Marks will be awarded to applicants based upon the maximum monthly charge for the residential service offering.

3. Maximum Monthly Charge for Business Service Offering

A 1.21 Marks will be awarded to applicants based upon the maximum monthly charge for the business service offering.

4. Performance Bond Offering

A 1.22 Marks will be awarded to applicants who commit to providing a performance bond. Maximum marks will be awarded to the applicant who commits the highest performance bond. The maximum value of the performance bond that an applicant can commit to is €15,000.

A 1.23 Upon completion of the process each applicant will be informed of the outcome and presented with a summary of the evaluation result regarding its application.

Outcome of Competition & Temporary Licence Offers

A 1.24 A temporary licence will be offered to the applicant who meets the minimum admittance criteria and is ranked highest following a comparative evaluation.

A 1.25 The duration of the temporary licence will be matched to the "speed to market" voluntary offering of the applicant. e.g. if an applicant states that it will provide meaningful FWALA services within 6 months of being granted a licence, then the temporary licence will run for 6 months.

A 1.26 Any remaining temporary licence(s) in that geographical area will then be offered to the next highest ranked, eligible applicant, and so on. In the event that the first successful applicant does not accept the temporary licence or fails to meet its' commitments within the term of the temporary licence, the temporary licence will then be offered to the next highest ranked applicant, and so on.

A 1.27 If two or more applications cannot be differentiated by comparative evaluation, then the available temporary licence(s) shall be awarded by drawing of lots.

A 1.28 Where a temporary licence is offered, whether by comparative evaluation or not, ComReg will incorporate conditions into the licence based on the voluntary commitments contained in the application submitted.

A 1.29 Successful applicants will be notified in writing by ComReg. From the date of notification the applicant will have 14 days to accept the licence and 30 days to lodge its committed performance bond with ComReg. A performance bond must be secured by means of a cash deposit or by means of a guarantee provided by a reputable bank or bonding agency. The temporary licence offer will be deemed to have lapsed if it is not accepted within 14 days or if the performance bond is not lodged with ComReg within 30 days.

Application for a 12 month Licence

A 1.30 Prior to the expiration of the temporary licence, the licensee may apply to ComReg for a 12 month licence. In applying for a 12 month licence, the onus is on the licensee to prove that it has complied with its licence commitments.

A 1.31 Where the licensee has satisfied ComReg that it has met its licence conditions, ComReg may grant a 12 month licence to the licensee.

A 1.32 Where the licensee has not satisfied ComReg that it has met its licence conditions ComReg will either refuse to issue a 12 month licence, thereby rendering the spectrum available for re-allocation, or where it is appropriate ComReg may extend the temporary licence.

Example of Part VIII FWALA Licence Text

A 1.33 The following is an example of Part VIII of a FWALA Licence which may be issued following this comparative evaluation.

Part VIII - Commitments which the licensee made in the course of a competitive or comparative evaluation process"

(1) Commitment regarding Speed to Market

A 1.34 Within _____ full months from the date of licence issue, the licensee shall make meaningful FWALA services available to all end users within coverage in the licensed service area.

A 1.35 Meaningful FWALA services are defined as the provision of actual broadband services to end customers.

(2): Commitment regarding Maximum Monthly Charge for Residential Service Offering

A 1.36 For an uninterrupted period of 12 months from date of service launch, the licensee shall make available on request to all of its residential ("non-commercial") end users within coverage an unbundled and stand-alone fixed wireless access service having the following attributes:

Nominal data transmission rate, network to subscriber:	*2 Mbit/s*
Nominal data transmission rate, subscriber to network:	*256 kbit/s*
Maximum contention ratio:	*24:1*
Inclusive data allowance in monthly tariff:	*10 GByte per month*

A 1.37 For an uninterrupted period of 12 months from date of service launch, the licensee shall make such a service available at a maximum charge of € _____ per month, including VAT.

A 1.38 The maximum monthly charge must be clear, unambiguous and all inclusive, with no hidden extras. The charge shall include the monthly tariff and any additional charges, such as installation charge and equipment rental, averaged over a 12 monthly period.

(3) Commitment regarding Maximum Monthly Charge for Business Service Offering

A 1.39 For an uninterrupted period of 12 months from date of service launch, the licensee shall make available on request to all of its commercial end users within coverage an unbundled and stand-alone fixed wireless access service having the following attributes:

Nominal data transmission rate, network to subscriber:	*2 Mbit/s*
Nominal data transmission rate, subscriber to network:	*2 Mbit/s*
Maximum contention ratio:	*10:1*
Inclusive data allowance in monthly tariff:	*Unlimited*

A 1.40 For an uninterrupted period of 12 months from date of service launch, the licensee shall make such a service available at a maximum charge of € _____ per month, including VAT.

A 1.41 The maximum monthly charge must be clear, unambiguous and all inclusive, with no hidden extras. The charge shall include the monthly tariff and any additional charges, such as installation charge and equipment rental, averaged over a 12 monthly period.

(4): Performance Bond

A 1.42 Where the licensee fails to comply with any of the conditions of its licence, within the time period of 24 months from the date of issue of its licence, then the licensee shall pay to ComReg by way of a performance bond, the amount of € _____.

A 1.43 In order to discharge its performance bond, the licensee must satisfy ComReg that it has complied with its licence conditions. The licensee shall provide ComReg with such information as may be requested. The performance bond shall remain valid for 24 months from the date of issue of the licence as stated in Part VII.

A 1.44 Collection or payment of the performance bond set out above shall not affect ComReg's powers to take such other measures as it deems necessary to ensure compliance with the licence conditions.

Annex: 2 Geographical Service Areas (GSAs)

Application process

A 2.1 In order to provide FWALA services in an area that was previously unauthorised, as part of a GSA, a licensee will have to apply to ComReg for approval of the GSA using the application form 07/73.

A 2.2 A licensee must identify which specific overlapping FWALA licences they wish to use to form a GSA. These FWALA licences will be amended to authorise provision of FWALA services in an area previously unauthorised and forming part of the GSA. A FWALA licence can only form part of one GSA at any given time.

A 2.3 In applying to form a GSA, it is proposed that a licensee will have to provide ComReg with the following:

1. the ComReg reference numbers of the licences that it wishes to use to form a GSA. This determines the maximum sized GSA that can be formed;
2. a map[17] showing the area that the licensee wishes to be covered by the GSA. This map should be in PDF format and dated so that it can be displayed on the ComReg website. And
3. the coordinates (in latitude and longitude) which form the perimeter of the GSA. It is necessary to supply as many points which form the perimeter of the GSA as possible to accurately visually display the GSA[18].
4. a commitment to publicly offer services in all of the area previously unauthorised and forming part of the GSA within 12 months of amendment by ComReg of the appropriate licences (this will be known as the "GSA Commitment");
5. the licensee should provide ComReg with the square kilometres of the proposed GSA Commitment area;

17 ComReg will supply details of map requirements, such as scale, topography etc in the Response to Consultation document.

18 For GSA mapping guidelines, please see Annex 3a

6. a performance bond[19] in respect of the GSA Commitment. In respect of a previously unauthorised area of 1257 square kilometres[20] (equivalent to the size of an existing FWALA licence), ComReg proposes a performance bond of €15,000. In respect of any other size of previously unauthorised area, ComReg proposes to require a performance bond scaled pro rata from the baseline figure of €15,000 with a minimum performance bond of €5,000. The formula to be used to calculate the performance bond will be:

A 2.4 Performance bond (in euro) = ((area/1257) * 15,000) rounded up to the nearest euro.

A 2.5 If ComReg approves the formation of a GSA, the Licences will be amended and the licensee informed accordingly. Once a GSA has been authorised ComReg will not, except in extraordinary circumstances, consider further applications to alter the relevant GSA for a period of twelve months from the date of amendment of the licence by ComReg.

A 2.6 Where any of the licences comprising an approved GSA either lapses or is revoked, the associated GSA approval is automatically revoked.

A 2.7 The coordinates which represent the GSA must be supplied electronically in xml format (as detailed in Annex 3a).

A 2.8 To ensure that services are offered within the GSA Comreg will require, by the first anniversary of the GSA being formed that the licensee shows to ComReg's satisfaction that broadband is being provided on a best effort basis with the GSA. This should be done through the provision of:

- field strength coverage plots;
- subscriber numbers within the GSA traceable to physical addresses; and
- traffic statistics to GSA subscribers.

A 2.9 Failure to supply this information by the required date will result in the forfeit of the performance bond and withdrawal of the GSA.

19 Other conditions concerning the performance bond such as period of validity will be similar to those described in ComReg Document 06/17 "Revised Guidelines to Applicants for Fixed Wireless Access Local Area (FWALA) Licences".

20 The value of 1257 km2 is the area of a 20km radius circle (rounded up to the nearest whole number).

Amendment of the Licences

A 2.10 ComReg will amend the Licences:

- to authorise the provision of FWALA services in an area that was previously unauthorised and which is now forming part of a GSA;
- to extend the licensee's existing FWALA licence obligations to this previously unauthorised area;
- to reflect the eligibility criteria set out above;
- to include, as a condition of the licence, the GSA Commitment; and
- to bring forward the renewal dates of all the licences forming the GSA so that it is the same as the commencement date of the GSA.

A 2.11 ComReg will assess compliance with the GSA Commitment. Failure to comply with this GSA Commitment may result in forfeiture in whole or in part of the performance bond and revocation of the licence.

A 2.12 It is only after ComReg has authorised a GSA that a licensee will be allowed to deploy FWA apparatus[21] and can begin offering services within a GSA.

Existing FWALA Licences

A 2.13 Licensees will still be obliged to comply with the licence conditions of their existing FWALA licences.

21 Outlying Stations or Customer Premises Equipment.

Geographical Service Area (GSA) Mapping guidelines

A 2.14 GSA maps must be submitted both electronically and in hardcopy format for all GSA FWALA applications. A high quality hardcopy pdf map must be submitted with the hardcopy application. This map must clearly outline the perimeter of the GSA being applied for.

A 2.15 The electronic copy of the map must be submitted in xml format. The coordinate standard that will be employed is the google standard WGS84, which uses latitude and longitude coordinates. The xml file (sample seen below) must be populated with as many coordinate points as possible in order to accurately define the perimeter of the GSA, with at least one coordinate point supplied for every 500 meters of the perimeter. The coordinates must be entered in an anti-clockwise fashion, i.e. the second coordinate must be anti-clockwise from the first, the third given coordinate must be anti-clockwise from the second coordinate and so on.

Sample xml file, with 6 points given;

```
<?xml version="1.0"?>

<markers>

    <line>

        <point lat="53.00" lng="-8.60" />

        <point lat="53.00" lng="-8.50" />

        <point lat="53.10" lng="-8.45" />

        <point lat="53.22" lng="-8.50" />

        <point lat="53.20" lng="-8.60" />

        <point lat="53.00" lng="-8.60" />

    </line>

</markers>
```

A 2.16 The above xml file outlines an area with 5 points, and the last point is a copy of the first point in order to complete the GSA area. If there are more than 5 points which define the perimeter of the GSA, then it is necessary to enter more latitude and longitude coordinates by inserting another row in the xml file. For example, if 10 points define the perimeter of the GSA, it would be necessary to include 11 lines of coordinates in the xml file,

A 2.17 Maps of each band and channel can be viewed on the ComReg website.

Annex: 3 Memorandum of Understanding on 3.6 GHz.

Commission for Communications Regulation

Ofcom OFFICE OF COMMUNICATIONS

MEMORANDUM OF UNDERSTANDING ON

FREQUENCY COORDINATION BETWEEN

THE REPUBLIC OF IRELAND

AND

THE UNITED KINGDOM

FOR WIRELESS ACCESS SERVICES

IN THE FREQUENCY BAND

3400 TO 3800 MHz

1. INTRODUCTION

1.1. This memorandum describes the procedures for the coordination of Wireless Access [22] (WA) radio services between the Republic of Ireland (ROI) and the United Kingdom (UK) in the frequency bands 3400 to 3800 MHz.

1.2. Services other than Wireless Access are not covered by this agreement.

1.3. Ofcom is the Administration of the United Kingdom responsible for all relations with Ireland concerning this MoU.

1.4. The Commission for Communications Regulation is the Administration of the ROI responsible for all relations with the UK concerning this MoU.

1.5. Accordingly, the Administrations of the UK and the ROI have agreed the following co-ordination procedures.

1.6. The co-ordination procedure, is based on the principle of equitable access to the spectrum resource

2. CRITERIA FOR COORDINATION

2.1. A station may be established without co-ordination, provided that the predicted power spectral density (PSD) produced by the station, at a height of 10m above ground at 15km from the border of the border or coast line of the neighbouring country does not exceed 24 dBμV/m in a bandwidth of 1MHz (equivalent to an aperture power of -122 dBW/MHz/m^2).

2.2. In the case of time division duplex technology the interference power shall be the power, during the active part of the signal, in the stated bandwidth.

3. PREDICTION OF PROPAGATION

The field prediction method shall be according to the current version of Recommendation ITU-R P.452[23] which shall be applied as follows:

- 10% of the time

Taking account of:

- Height of the receiver antenna set at 10 m above ground.
- Terrain profile for the base station in all main directions
- Type of terrain (e.g. land, sea, mixed path)
- Effective radiated field strength

[22] Recommendation ITU R F 1399 Vocabulary of terms for Wireless Access
[23] Recommendation ITU-R P.452, Prediction procedures for the evaluation of microwave interference, between stations on the surface of the earth at frequencies above about 0.7 GHz.

- Antenna tilt and azimuth

4. CO-ORDINATION PROCEDURE

4.1. The Administration of the ROI and the UK are committed to ensuring that the licensees covered by this Memorandum of Understanding, respect the limits for establishment of base stations without co-ordination, given in 2 above. However, there might be an occasional need to establish stations such that the PSD will exceed the limits given in 2 above. In such cases, each administration may seek co-ordination according to paragraph 4.

4.2. Receive stations in a neighbour country shall not claim protection from interference from transmit stations that operate such that the signal level in a neighbour country is less than the trigger level described in this MoU or are coordinated according to this MoU.

5. EXCHANGE OF INFORMATION

5.1. An MoU between the administrations of the ROI and the UK, which enables co-ordination between operators, subject to agreement of the Administrations, was signed on the 22 November 2000.[24] This principle shall be extended to operators of systems for the frequency bands identified in this MOU.

5.2. In the event of interference the affected parties shall exchange information with a view to resolving the dispute by mutual agreement. A report of the interference and the details of the information exchanged shall be sent to both administrations. The Administrations of Ireland and the United Kingdom agree to facilitate the exchange of information between operators.

5.3. An Administration wishing to bring a station into service or wishing to modify the characteristics of a station, such that the signal exceeds a coordination threshold given in paragraph 2, must submit a request for co-ordination with the other Administration by way of notice.

5.4. Exchanges of information for coordination/notification purposes shall be in the format set out in the HCM agreement Appendix 2A (revised at Vilnius 2005).

5.5. The affected Administration shall evaluate the request for co-ordination and shall within 30 days notify the result of the evaluation to the Administration requesting co-ordination.

5.6. If in the course of the co-ordination procedure the affected Administration requires additional information, the Administration seeking co-ordination shall provide such information upon request.

[24] Agreement between the administrations of United Kingdom/Ireland concerning the approval of planning arrangements between operators of mobile radio communication networks 22 November 2000

5.7. An Administration not having responded within 30 days following communication of the reminder shall be deemed to have given its consent and the station may be brought into use with the characteristics given in the request for co-ordination.

6. REVIEW ARRANGEMENTS

The limits and prediction methods defined in this Memorandum of Understanding may be reviewed in the light of experience of operation of networks in both countries and future prediction developments.

7. TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

Either Administration may withdraw from this Memorandum of Understanding subject to 6 months notice.

8. DATE OF ENTRY INTO FORCE

This Memorandum of Understanding shall enter into force on 1 April 2008.

Signed on 31 March 2008.

For the UNITED KINGDOM administration

[Signature redacted]

P BURY

For the administration of the REPUBLIC OF IRELAND

[Signature redacted]

J. CONNOLY

Annex: 4 Memorandum of Understanding in 10 GHz frequency band.

MEMORANDUM OF UNDERSTANDING ON

FREQUENCY COORDINATION BETWEEN

THE REPUBLIC OF IRELAND

AND

THE UNITED KINGDOM

FOR WIRELESS ACCESS SERVICES

IN THE FREQUENCY BAND

10000 TO 10680 MHz

9. INTRODUCTION

9.1. This memorandum describes the procedures for the coordination of Wireless Access [25] (WA) radio services between the Republic of Ireland (RoI) and the United Kingdom (UK) in the frequency bands 10000 to 10680 MHz.

9.2. Services other than civil Wireless Access are not covered by this agreement.

9.3. In the RoI, the frequency bands 10154 – 10321 MHz and 10504 – 10672 MHz are designated for Fixed Wireless Access (FWA) Services, SRD's and Radiolocation services. It is anticipated that 10000 – 10154 MHz will also be designated for FWA Services in the RoI.

9.4. In the UK , the frequency bands 10125 – 10225 MHz and 10475 – 10575 MHz are designated for Wireless Access Services only. The bands 10125 – 10225 MHz 10504 – 10671 MHz are also used in the UK by the Ministry of Defence and Low Power Radar Level Gauges.

9.5. Ofcom is the Administration of the United Kingdom responsible for all relations with Ireland concerning this MoU.

9.6. The Commission for Communications Regulation is the Administration of the RoI responsible for all relations with the UK concerning this MoU.

9.7. This MoU applies in the regions of The Republic of Ireland, The United Kingdom and The Isle Of Man.

9.8. The co-ordination procedure is based on the principle of equitable access to the spectrum resource

10. COMMITMENT OF THE ADMINISTRATIONS

10.1. The Administrations of the ROI and the UK are committed to ensuring that the radio communication stations operating in the band 10000 - 10680 MHz, respect the limits for establishment of base stations without co-ordination given at paragraph 3.1, unless the stations are specifically exempt from the coordination procedure in accordance with paragraph 12.

11. CRITERIA FOR COORDINATION

11.1. Within the frequency band 10000- 10680 MHz, a station may be established without co-ordination, provided that the predicted power spectral density (PSD) produced by the station, at a height of 10m above ground at 15km inside the border or coastline of the

[25] Recommendation ITU R F 1399 Vocabulary of terms for Wireless Access

neighbouring country does not exceed 30.8 dBμV/m in a bandwidth of 1MHz (equivalent to an aperture power of -115 dBW/MHz/m^2).

11.2. Radiocommunication stations for which the predicted field strength exceeds the values given in 3.1 must be co-ordinated in accordance with paragraph 7, except where stations are listed in paragraph 6 or an arrangement exists between operators as described in paragraph 4.

11.3. To establish the predicted field strength produced by a station, the methodology set out in paragraph 5 shall be employed.

11.4. In the case of time division duplex technology the interference power shall be the power, during the active part of the signal, in the stated bandwidth.

12. ARRANGEMENTS BETWEEN OPERATORS

12.1. To facilitate reasonable and timely development of their systems, licensees are encouraged to develop Bilateral Arrangements.

12.2. Licensees holding rights, in each of the neighbouring countries, to use the frequencies of operation of a Radiocommunication station may mutually agree conditions in which that station can exceed the predicted field strengths set out at paragraph 3.1.

12.3. Where licensees have reached such a mutual agreement, coordination of the corresponding station in accordance with paragraph 7 is not required, subject to the terms of the agreement between the licensees and subject to the agreement being lawful. It is the responsibility of the licensees to ensure that the agreement is lawful. It is also the responsibility of the licensees to ensure that an appropriate agreement is reached with all licensees in the neighbour country authorised to use frequencies at which the predicted field strength may exceed the thresholds set out at paragraph 3.1.

12.4. In order to facilitate operator co-ordination, each Administration will provide names and point of contact information for the relevant licensees, subject to the agreement of the licensees

In order to facilitate operator co-ordination, each Administration will provide names and point of contact information for the relevant licensees, subject to the agreement of the licensees.

13. PREDICTION OF PROPAGATION

The field prediction method shall be according to the current version of Recommendation ITU-R P.452[26] which shall be applied as follows:

[26] Recommendation ITU-R P.452: Prediction procedures for the evaluation of microwave interference, between stations on the surface of the earth at frequencies above about 0.7 GHz.

- 10% of the time

Taking account of:

- Height of the receiver antenna set at 10 m above ground.
- Terrain profile for the base station in all main directions
- Type of terrain (e.g. land, sea, mixed path)
- Effective radiated field strength
- Antenna tilt and azimuth

14. CO-ORDINATED STATIONS

The stations listed below have been agreed by both administrations to be coordinated. Any subsequent change in the parameters given in the table shall void any acceptance of co-ordination for the corresponding station or stations.

	Station Name	Centre Frequency (MHz)	Modulation	Individual Channel Bandwidth	Lat	Long	Ground H AMSL (m)	H AGL (m)	EIRP (dBm)	Ant. Style eg Omni/sector	Pol	3dB BW (Degs)	Az (Degs E of N)	Ant. Pattern or manufacturers code
1														
2														

15. CO-ORDINATION PROCEDURE

15.1. Exchanges of information for co-ordination/notification purposes shall be in the format set out in the HCM agreement Annex 2A (revised at Vilnius 2005)[27]

15.2. In the event of interference between authorised users of the band 10000 – 10680 MHz in the RoI and the UK, the affected users shall exchange information between themselves with a view to resolving the interference by mutual agreement. A report of the interference and the details of the information exchanged shall be sent to both Administrations. The Administrations of the RoI and the UK agree to facilitate the exchange of information between authorised users of the band.

Co-ordination requests should be sent by a licensee through the administration responsible for its authorisation.

16. REVIEW OF MOU

16.1. The co-ordination threshold and prediction methods defined in this MoU may be reviewed in the light of experience of operation of networks in both countries and future prediction developments.

17. TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

Either Administration may withdraw from this Memorandum of Understanding subject to 6 months notice.

[27] Agreement between the Administrations of … on the Coordination of frequencies between 29.7 MHz and 39.5 GHz for fixed service and land mobile service (HCM Agreement) Vilnius, 2005 http://hcm.bundesnetzagentur.de/http/englisch/verwaltung/index_europakarte.htm

18. DATE OF ENTRY INTO FORCE

This Memorandum of Understanding shall enter into force on *1st June 2010*.

Signed on the 14th May 2010.

For the UNITED KINGDOM administration

[signature redacted]

RAY MCCONNELL

Date14th May 2010

For the administration of the REPUBLIC OF IRELAND

[signature redacted]

JIM CONNOLLY

Date14th May 2010