Office of the Director of
Telecommunications
Regulation

RESPONSE TO CONSULTATION

Expanding Opportunities in the Radiocommunications Market: Fixed Wireless Access (FWA)

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Oifig an Stiúrthóra Rialála Teileachumarsáide
Office of the Director of Telecommunications Regulation
Abbey Court, Irish Life Centre
Lower Abbey Street, Dublin 1, Ireland
Tel. +353 1 804 9600 Fax. +353 1 804 9680 E-mail info@odtr.ie

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Foreword

Thank you to all who responded to the consultation on expanding opportunities in the radiocommunications market for fixed wireless access (FWA). My Office received twenty three responses to the consultation, providing a valuable contribution to the policy making process in the important area of broadband wireless access. This paper summarises the responses to each of the issues and proposals raised in the Consultation and outlines the actions we now propose to take. These include the introduction of a licensing process for local area FWA systems using spectrum in the 10.5 GHz frequency band and provision for licence exempt metropolitan area access networks in the 5.8 GHz frequency band. Discussions will also be undertaken with interested parties with a view to rationalising existing FWA spectrum in the 26 GHz band and a review of the licence fee structure applicable to FWA will be undertaken in the light of the changed market circumstances since licences were first issued.

These initiatives will complement the existing provisions for FWA in Ireland, both licensed and licence exempt under the Wireless Telegraphy Acts 1926-1988, and in particular will provide new opportunities for local or community based provision of broadband access services.

Etain Doyle,

Director of Telecommunications Regulation.

1 Introduction

This paper is the ODTR's response to the consultation document addressing new opportunities in the radio communications market for fixed wireless access (ODTR document 02/19 of February 2002). The purpose of the consultation was to identify the best basis for future licensing of fixed wireless access (FWA) in Ireland to encourage the roll-out of FWA services, in the light of changing market conditions. FWA is one of several delivery mechanisms that can provide broadband connectivity or high-speed access to the Internet and other interactive services.

The consultation addressed four specific issues relating to FWA, namely:

- services deliverable over FWA networks and implications for spectrum requirements, with specific regard to the 26 GHz frequency band,
- licensing of spectrum in the 10.5 GHz band for local area FWA systems,
- use of licence exempt spectrum in the 5.725 – 5.875 GHz band to provide public access to data networks, and
- existing fixed wireless point-to-multipoint (FWPMA) licences, with specific regard to the level of fees.

2 Structure of the Response Document

This response document contains the following further sections:

- A list of respondents to the consultation
- Summaries of the consultation topics, the views of respondents and the Director's position for each of the main themes addressed in the consultation paper
- Summary of the proposed next steps following the consultation.

This paper does not constitute legal, commercial or technical advice. The Director is not bound by it. This response to the consultation is without prejudice to the legal position of the Director and to her rights and duties under legislation.

3 List of Respondents

The following 23 organisations submitted responses to the consultation.

Aperto Networks

Broadband

Budget Telecom

Chorus

Colt

eircom plc

Ensemble Communications UK

Esat Telecom

European Access Providers Limited, Leap Broadband

Francis Walker & Co. (Consultants)

Irish Radio Transmitters' Society (IRTS)

Lucent Technologies

Magnum Opus Ltd

Maguire McClafferty

Mr R McGrane (Chairman Irish Amateur Television Club)

Mr B Minish

Mr C O Murchu

Nevada tele.com

Off Air Electronics Ltd.

Ogier Electronics

Mr D Pearson (Consultant)

Technico Ltd

Vodafone Ireland plc

The Director wishes to express her thanks to everyone who responded to the consultation. With the exception of the material marked as confidential, the written comments of respondents are available for inspection at the ODTR's office in Dublin.

4 Consultation Topics

4.1 Services deliverable over FWA networks and implications for spectrum requirements

4.1.1 Summary of the Consultation Topic

The consultation document sought views on the possibility of modifying the current spectrum assignments in the 26 GHz band to a new arrangement, in order to facilitate more effective utilisation of the available spectrum and provide greater opportunities for operators to expand their service portfolios (see Figure 1). Views were also sought on how the spectrum in the 26 GHz band that is currently identified for review should be licensed in the future. It was proposed that it could be made available to existing licensees for service expansion, for further national or regional broadband FWA licences, for point to multipoint backhaul purposes or for use by other fixed services.

Figure1: Proposed Rationalisation of Spectrum

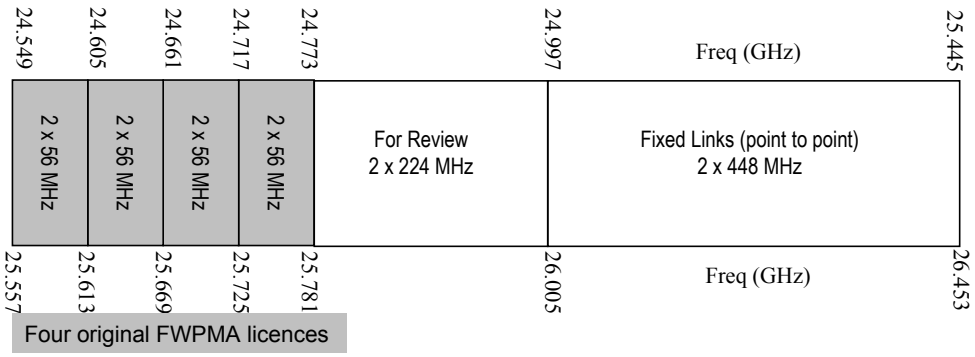

Figure 1a: Original 26 GHz spectrum assignments

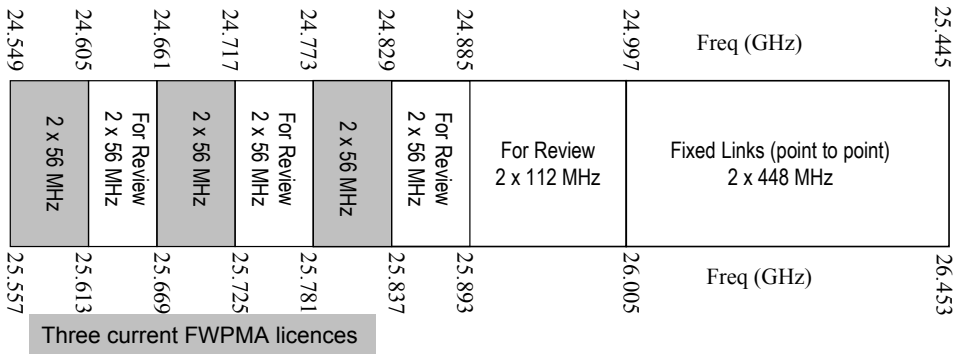

Figure 1b: Revision proposed in Consultation Document ODTR 02/19 for 26 GHz spectrum assignments

Q. 1.	**Do you agree with the proposed rationalisation of the 26 GHz band spectrum?**
Q. 2.	**Do you have a view on how the 26 GHz spectrum currently identified for review in the future should be licensed?**

4.1.2 Views of Respondents

Of the eight responses which expressed a view, six supported the proposed rationalisation of the 26 GHz band spectrum. Two respondents considered that the proposal would facilitate more efficient use of the existing spectrum by the three FWA operators and would increase the opportunities for expansion of service portfolios. One also suggested that the existing assignments in Ireland constrained the technology choice of the operators, because of the need to co-exist with competing operators in the same area in adjacent bands, while the new proposals would allow full unconstrained use of their current 2 x 56 MHz assignments. It was also suggested that similar benefits could be realised by placing one 28 MHz channel between each of the operators and this could bring benefits to the future planning of the band if the expansion of services is not as great as anticipated. A third respondent agreed with the proposed rationalisation with the proviso that the use of guard bands was enforced with licence holders.

Of the two respondents who did not support the proposal, one expressed concern that rationalisation should not give preferential treatment to incumbent licence

holders and the other felt that investment constraints resulting from the changed economic climate would eliminate any benefits that might arise from rationalisation.

Eleven responses to question 2 were received, which ranged from a view that no spectrum should be issued until there is a demonstrable need to a specific expression of interest in obtaining access to spectrum in the 26 GHz band for the deployment of FWA technology. One respondent suggested that specific channels could be allocated to "virtual" FWA (VFWA) operators. The VFWA operator would use the infrastructure of the existing licensed FWA operators, who would provide this as a wholesale service, to deliver services to their own end-use base stations.

Another respondent proposed that the contiguous 2x112 MHz of spectrum under review should be allocated as two licences of 2 x 56 MHz or four licences of 2 x 28 MHz, for the purpose of implementing radio transmission infrastructure to assist in the roll-out of data services over mobile devices. Such use could be either point to point, point to multipoint or multipoint to multipoint (mesh) solutions. Allocation of the spectrum in this way would ensure that the business of any existing or future FWA operator is not undermined and that existing FWA operators should be permitted to use their existing spectrum allocations for similar purposes.

One respondent suggested that when allocating spectrum the potential availability of higher bandwidth systems than currently available should be recognised. The respondent cited trials being undertaken in the 28 GHz band of equipment that provides broadband internet, multichannel TV, CCTV and video on demand. In another reply it was proposed that high quality of service commercial applications should be allocated spectrum where there is low or no contention.

Another respondent suggested that, when allocating spectrum, care should be taken to allow for future expansion and the reduction or elimination of interference. Another proposed that the spectrum under review should be held in reserve for future applications, as there are no current demands that cannot be met by other FWA frequencies. There was a similar view expressed that the channels,

other than those adjacent to the assignments for existing operators, should be reserved for the expansion of either FWA services or point to point links, which are either side of the review spectrum. This reply also made the point that on the basis of developments in the telecommunications arena it was important to keep an open mind regarding ultimate applications. Finally, one respondent proposed that any future 26 GHz licences should be awarded on a "beauty contest" basis.

4.1.3 Position of the Director

On the basis of the responses and in order to facilitate the development of innovative new broadband services, the Director is minded to proceed with a partial rationalisation of the spectrum currently licensed to FWA operators in the 26 GHz band. This will provide possible expansion spectrum in the channel vacated by Formus on the return of their licence, for other licensees on a demonstrable needs basis. Additional expansion spectrum may also be made available in the 26 GHz band, subject to availability, on a demonstrable need basis.

With regard to the spectrum currently under review, the Director considers that there is merit in a number of the suggestions that have been made regarding this spectrum and is minded to designate part of the review spectrum for point to multipoint or multipoint to multipoint (mesh) applications, which may include FWA or other services. The licensing regime for such systems will be developed shortly.

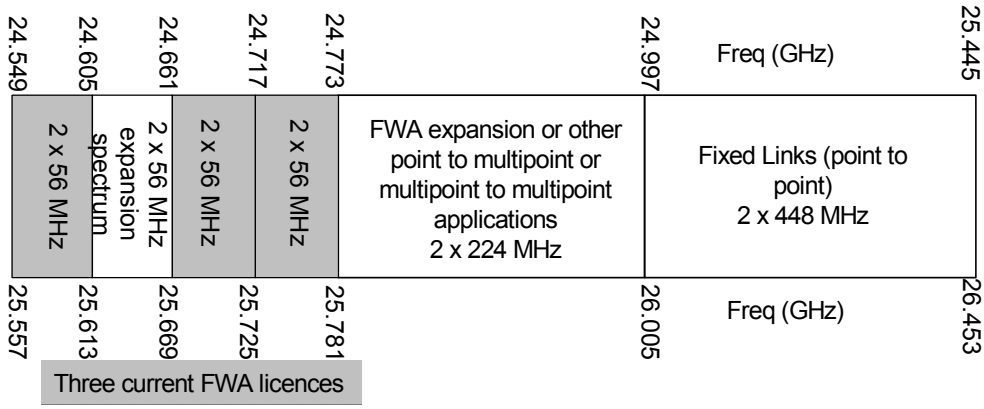

Figure 2: Revised 26 GHz Band Plan

4.2 Licensing of spectrum in the 10.5 GHz band on a local area, first-come first-served basis

4.2.1 Summary of the Consultation Topic

Views were sought on whether local area licensing was appropriate for the 10.5 GHz band. In response to previous consultations the majority of respondents had expressed a view in favour of a regional licensing option for FWA, but there was no consensus on the most appropriate frequency band. There had been no expressions of interest previously for national licences in the 10.5 GHz band, despite licences being offered on two separate occasions.

Views were requested on the initial proposal to license FWA systems in the 10.5 GHz band on a first-come first served basis, with the details of the licensing regime taking account of the responses received to the consultation. It was proposed that each licence issued would cover a single FWA base station and views were sought on whether any geographic restrictions should be placed on where 10.5 GHz spectrum was licensed.

In order to achieve a balance between the coverage areas served by individual licensed base stations and the number of stations that can be licensed in the available spectrum, views were sought on whether any constraints should be placed on the deployment of individual FWA base stations in the band. Views

were also requested as to the size of the initial spectrum that should be made available and on whether additional spectrum to the current 2 x 30 MHz allocation was required for FWA and how it might be made available, taking into account the requirements of other users.

Q. 3.	**Do you agree with the proposal to introduce a local area licensing regime for FWA systems in the 10.5 GHz band? If you do not, please provide supporting arguments and any alternative proposals.**
Q. 4.	**Do you agree with the proposal to use a first-come, first served approach to licensing local area FWA systems?**
Q. 5.	**Do you agree with the proposal to licence local area FWA systems on the basis of individual base stations?**
Q. 6.	**Do you have a view on whether licensing of local area FWA systems should be restricted geographically, and if so in which areas licences should or should not be awarded?**
Q. 7.	**Do you have a view whether constraints should be placed on the coverage of individual local area FWA base stations, and if so what these constraints should be?**
Q. 8.	**Do you have a view on the size of the initial spectrum assignment that should apply to local area FWA licences in the 10 GHz band?**
Q. 9.	**Do you have a view on whether additional spectrum beyond the current 2 x 30 MHz should be made available in the 10 GHz band for FWA services, and if you support this option what measures are required to accommodate other users of this spectrum?**

4.2.2 Views of Respondents

Seven of the seventeen respondents who expressed views on this topic supported the concept of local licensing, including one of the existing FWA operators. One respondent expressed the view that local licensing would allow smaller operators to enter the market and provide services in niche areas, while another considered that it would allow greater granularity of service offering and thus allow a planned and profitable network rollout. A third suggested that it would allow

smaller operators to produce a viable business plan which finance houses may be more willing to support because of lower initial costs and so lower financial risk.

Seven respondents were against the proposal. Of these, four (including one existing operator) favoured only national licences, one favoured pre-defined licensing regions, one favoured either national or regional licences and one felt that the 10.5 GHz spectrum should be made available for local authorities to complement their planned fibre networks. One equipment vendor had no objections to the proposal but queried the business case for establishing isolated broadband wireless applications. Three representatives of amateur users in the band expressed concern that licensing FWA would impact on the other services that operate in the 10.5 GHz band. One argument put forward against local licensing was that in Germany, where Regional Licences have been issued, this has not solved the problem of limited use of FWA and a number of licence holders have been declared bankrupt. It was also argued that national licensing allows self management of each FWA allocation, which would lead to a more effective deployment of service.

Eight respondents were in favour of a first come, first served approach to licensing and one other (an existing FWA operator) thought this approach should be used in preference to a beauty contest where there was marginal or low market interest. Four, including one existing operator, were against a first come, first served approach and one other thought that this approach should not be taken unless spectrum is explicitly reserved for local authorities. One respondent thought that a segment of the spectrum should be reserved for the development of information technology in education. Three of the respondents against first come, first served licensing were concerned about the potential for anti-competitive behaviour. One raised concerns that operators would “cherry pick” and only apply for licences in those areas where there are sufficient potential users while another was concerned about the possibility of applications being made to block other operators from deploying services. A third respondent was concerned that applicants might apply for licences with a view to reselling rights in valuable areas. Two of the respondents who supported first come first served licensing also proposed measures to ensure effective allocation. These were a “use it or lose it”

provision in the licences and an assessment of business plans to ensure they are viable.

Five respondents were supportive of the proposal to license local FWA services on the basis of individual base stations, although one felt that a beauty contest would be more appropriate and another suggested that preference should be given to applicants that propose and/or commit to offering coverage of a greater geographic area (e.g. a complete region, town or city). Two further respondents, including one existing FWA operator, proposed that local licences should be for one or more stations within a defined area, arguing that some areas may need more than one base station to provide the necessary coverage. It was also suggested that a number of geographically identified areas should be identified for which potential licensees could apply. One existing operator, while not expressing a view for or against the licensing of individual base stations, suggested that the approach may be attractive to new entrants but could disadvantage existing operators.

Three respondents did not support the licensing of individual base stations. One argued that licensing should be on the basis of the operator that commits to the greatest coverage. Another suggested that as some areas may require more than one base station due to local topology, licensing should be based on the number of potential subscribers, while the third proposed that allocations be confined to within local authority boundaries.

Six respondents were opposed to geographic constraints on the deployment of local FWA base stations. Two respondents, including an existing FWA operator, suggested that local area FWA licences should be based on pre-defined geographic areas.

With regard to possible constraints on coverage of 10.5 GHz FWA base stations, three respondents suggested that licensing should be on a non-interference basis with one respondent proposing that the ODTR should facilitate a negotiation process between operators if there are co-ordination issues. It was also suggested that an operator who is first to deploy should have priority as long as they operate within the regulations. Three respondents proposed that there should be coverage

restrictions, with two suggestions being coverage radius and power output. Two respondents proposed that ETSI standards should be adhered to, although one of these referred only to safety considerations. In contrast another reply proposed a flexible approach with operators not being put in the position of having to wait for appropriate standards to be developed, and one respondent suggested the band should be self-regulating.

With regard to size of the initial spectrum assignment for 10.5 GHz FWA licences, two respondents proposed 2 x 30 MHz and two proposed 2 x 14 MHz. One of the former said that this would allow each base station to provide 6,500 subscribers with 500 kbps at a 15:1 contention ratio. One respondent proposed that there should be sufficient spectrum for operators to deliver symmetrical 2 Mbps up to a range of 10 km and another that no more spectrum should be made available than is assigned to existing operators in other bands.

Eight respondents, including three representatives of the amateur community which currently uses parts of the 10.5 GHz band, expressed a view on the possibility of additional FWA spectrum beyond the 2 x 30 MHz currently available. Concerns were raised about the potential impact of reduced spectrum allocations on amateur use if the FWA band was extended, in particular the importance of maintaining alignment of amateur frequencies with neighbouring countries was highlighted. Three respondents thought there may be a future need for additional spectrum, though none had any specific views on how much or proposals on how to accommodate other users of the spectrum. One expressed the view that the necessary additional spectrum might become available through future trading of companies and bandwidth. One other respondent felt that some spectrum should be held in reserve.

4.2.3 Position of the Director

Having considered the various responses to this consultation and being mindful of previous consultations relating to FWA licensing which indicated a potential demand for non-national licences, the Director is minded to proceed with introducing a licensing regime for local area licences in the 10.5 GHz band. In particular, she considers that the potential to attract specialised local operators in

areas not currently served by FWA or other broadband platforms outweighs the arguments put forward against the proposal. Licences will be issued in accordance with regulations to be made under the Wireless Telegraphy Acts 1926 to 1988 (as amended), and will be subject to renewal on an annual basis. It is intended that the whole licensing scheme will be reviewed three years in advance of the expiry of the existing FWPMA national licences with a view to determining whether the scheme will be closed, continued or amended. The national licences are due to expire in 2010.

The Director has considered carefully the arguments put forward in the responses for and against a first-come first served approach to local area FWA licensing in the 10.5 GHz band. The main argument against this approach was the potential for anti-competitive behaviour, although two respondents have proposed potential measures that could limit such behaviour. The Director is keen to implement a simple, flexible and transparent licensing process for the 10.5 GHz band and to facilitate the rollout of FWA services in the most timely and effective manner, complementing the existing national licensing regime. She is satisfied that measures can be implemented to limit the potential for anti-competitive behaviour through the licensing process and that a simple first come, first served approach to licensing would help to expedite the provision of new FWA services in areas not currently served.

The Director also considers that the objective of a simple, flexible and transparent licensing approach can best be achieved on the basis of licensing individual base stations. However, she recognises the concern raised by some respondents that FWA operators may wish to extend coverage beyond that which can be achieved with a single base station. She therefore proposes that applicants would be permitted to apply for multiple licences at different locations, which would be licensed to operate in the same radio spectrum, subject to local availability. Operators may sub-divide the licensed spectrum or use polarisation discrimination to facilitate operation of stations in adjacent areas. The Director does not wish to constrain initiatives for new service development by pre-defining regions for licensing purposes.

To ensure effective utilisation of licensed radio spectrum and to discourage anti-competitive behaviour, a "use it or lose it" condition will apply, requiring each licensed system to be in use for the delivery of FWA services prior to annual renewal of the WT licence relating to that station. In addition, applicants for 10.5 GHz FWA licences will be required to demonstrate a reasonable need for the spectrum requested at the time of application, and priority will be given to those who do not have access to alternative means of delivering the proposed service in the area. The Director is minded to make the 10.5 GHz band available throughout the country, to enable services to be developed in line with local demand, reflecting the view of the majority of those who commented on this aspect. Interested parties should note that the 10 GHz band is also used by other services, including short range devices. It should also be noted that co-ordination with neighbouring countries may be required near border areas or along the East coast and this may restrict the use of these bands.

The provision of 10.5 GHz FWA may be a useful addition to available broadband platforms. However, in the event that real demand for these licences exceeds the availability of spectrum available for 10.5 GHz FWA then the ODTR may introduce a competitive process to select licensees.

The Director recognises that FWA operators are likely to focus increasingly on the provision of broadband services, and this is in line with the Director's own objective to extend as far as possible the availability of broadband access. She therefore feels that up to 2 x 28 MHz should be available per operator to enable a viable range of broadband services to be offered. She further considers that there should be scope to accommodate multiple operators in areas where the demand warrants this. She therefore proposes to make sufficient spectrum available to accommodate up to three duplex 28 MHz channels in any local area. Provision will also be made within the proposed channel plan for continued access to parts of the 10.5 GHz band by the amateur community, in accordance with the current secondary allocation to this service in the Radio Regulations.

The Director acknowledges the concerns expressed by some respondents about potential interference and the requirement under the new EU Framework Directive to encourage efficient use and ensure effective management of radio

frequencies. It is therefore anticipated that individual FWA base stations will be subject to a pre-defined limit on exported interference, in the form of a maximum field strength at specified radial distance from the base station. Alternative network topologies, such as mesh networks, may also be licensed and will be subject to the same limits on exported interference at a pre-defined radius from a central point as would apply to a point to multipoint base station located at that point.

The Director proposes to assign frequencies to 10.5 GHz FWA systems in accordance with CEPT Recommendation ERC/REC 12-05. Frequencies will be assigned in the form of multiple, adjacent channels of 2 x 3.5 MHz, up to a maximum of 2 x 28 MHz total contiguous spectrum per operator. A 2 x 7 MHz block will be retained between each 2 x 28 MHz block to facilitate co-existence between users of adjacent spectrum. A total of three 2 x 28 MHz blocks will be available, enabling amateurs to continue using part of the 10 GHz band on a secondary basis.

Interested parties should be aware of the other services operating in the band, including short range devices and radiolocation systems operating on a secondary basis in the band above 10.5 GHz. In addition, frequency co-ordination with other countries will be required and this may restrict the use of the band in border/coastal areas.

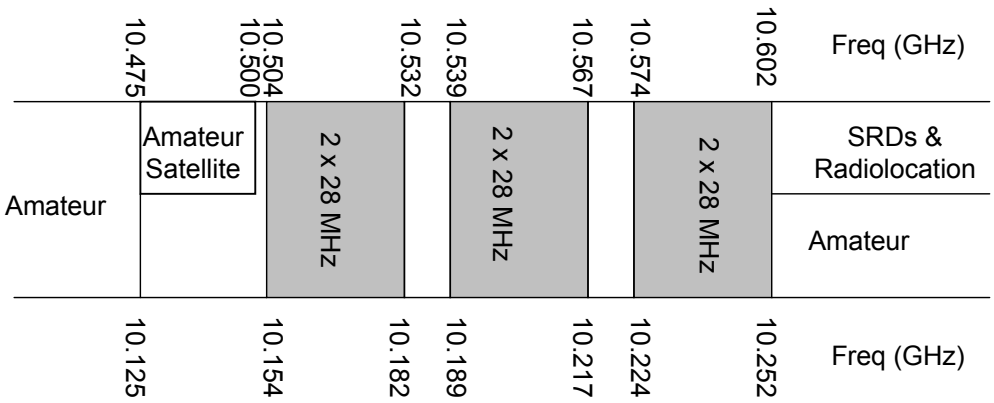

Figure 4.2: Proposed channel plan for local area FWA services in the 10.5 GHz band

Depending upon the extent of future demand for local and national FWA services, the Director may consider extending this approach to other frequency bands in the longer term.

4.3 Delivery of public access fixed wireless services in the 5.725 – 5.875 GHz band on a licence-exempt basis

4.3.1 Summary of the Consultation Topic

Views were sought on a proposal to permit the deployment of fixed access systems on a licence exempt basis in the 5.725 – 5.875 GHz frequency band, at power levels above the 25 milliwatt EIRP limit that currently applies to this band. Views were also sought on what EIRP limit would be appropriate and what type of services might be delivered over such licence exempt access networks. It was noted that licence exempt spectrum is not entitled to any protection from interference and should not therefore be considered as an alternative to licensed FWA spectrum, nor is it likely to be suitable for applications where a specified quality of service is required.

Q. 10.	**Do you agree with the proposal to increase the EIRP limit in the 5.725 – 5.875 GHz band to facilitate the provision of licence exempt MAN services, and if so do you have a view on what an appropriate EIRP limit would be?**
Q. 11.	**What types of service do you think would be suitable for delivery over licence exempt MANs in the 5.725 – 5.875 GHz band?**

4.3.2 Views of Respondents

Of the twelve respondents who expressed a view, eight were in favour of increasing the EIRP in the 5725 -–5875 MHz band from the current 25 milliwatts. Two respondents proposed an EIRP of 1 watt, one at least 2 watts and another 4 watts. 1 watt was considered by one respondent to be sufficient to allow cost effective, non-line of sight technology to customers within a 5 to 10 km radius. Another respondent suggested that at least 2 watts was required to enable

metropolitan area network (MAN) services such as fast wireless Internet beyond the reach of alternative platforms such as ADSL or cable modems. The 4 watt proposal was based on enabling service providers to address rural and metropolitan services at reasonable cell / network costs. Four of the respondents in favour of higher powers also proposed that the spectrum should be licensed and split into two 75 MHz bands for assignment. One further respondent supported higher power levels but suggested that access be restricted to specific user groups.

Four respondents did not support an increase in power. The arguments cited against an increase were potential interference problems, that the band should be used to facilitate multiple smaller cells and a concern that licence exempt services should not become a substitute for licensed services. One respondent raised broader concerns that there should be a clear understanding in the difference between licensed and licence exempt spectrum, and that licence exempt wireless systems complement rather than compete with licensed BFWA.

Suggested services included high speed internet access and IP based services including voice, data and video. Only one respondent specifically stated that they did not see the potential for citywide networks using exempt spectrum.

4.3.3 Position of the Director

The Director notes that the majority of the responses were in favour of increasing the maximum EIRP to enable licence exempt rural and metropolitan access services. Reflecting this, and noting the work currently under way within the ETSI BRAN[1] project to develop standards and inter-service sharing criteria for such services in Europe, the Director is minded to proceed with increasing the maximum EIRP (power spectral density) to 100 milliwatts within any contiguous 1 MHz bandwidth, up to a maximum total EIRP of 2 watts on a national basis and to continue to pursue within CEPT a review of the current EIRP limit on a European basis. The revised limit will be subject to ongoing review, depending upon European regulatory developments arising from the current ETSI BRAN work or from any future CEPT Recommendations or Decisions. The ODTR will

[1] European Telecommunications Standards Institute, Broadband Radio Access Networks

continue to pursue dialogue within ETSI and CEPT with a view to such use being reflected in the European Common Allocation Table. In the event that the decision to increase the maximum EIRP (power spectral density) is reversed or modified in the future, the Director will not bear any expenses incurred by those who availed of the decision.

No changes are proposed to the current licence exempt status of short range devices (SRD) in the band, as the use of the band by industrial, scientific and medical (ISM) equipment, and an increasing range of types of SRD mean that it would not be practical to provide protection from interference. The band is also used by radars and satellite earth stations on a primary allocation basis. However, in order to facilitate management of the band in the event of changes being necessitated by European standards or regulatory developments the Director may introduce a registration scheme for those wishing to use higher powers.

Operators should note in this regard that the regulations pertaining to licence exempt FWA systems in this band, including the permissible EIRP and technology standards, are under review and that the status of the band may change, depending upon international developments and any requirements to protect other users of the band. Operators should also note that, in common with all other licence exempt services, such systems will not be entitled to any protection from interference from any other licensed or licence exempt service. In particular, operators should note the presence of road transport and traffic telematic (RTTT) systems in the 5795 - 5805 MHz band and the presence of other short range devices such as motion sensors throughout the band. It is the responsibility of the operator to minimise the potential for interference to and from neighbouring systems and adequate measures should be taken to avoid interference in all cases.

The range of services proposed by respondents are those which the Director wants to encourage as they will help to extend the benefits of high speed data access to users to a broad cross section of the community.

4.4 Existing FWPMA Licences

4.4.1 Summary of the Consultation Topic

The take-up of FWA services in the market place has been limited, both in Ireland and throughout Europe, and informal representations have been made to the ODTR by existing licensees regarding the level of the annual fee for the spectrum licences. In view of these representations the consultation sought wider views on the level of licence fees for FWA services.

Q. 12.	**Do you agree with the representations being put forward that suggest that the level of fees applying to FWPMA spectrum is too high? Please support your arguments.**

4.4.2 Views of Respondents

There were sixteen replies, all of which indicated that they considered the current level of fees were too high. Arguments were based on the low take up of FWA services to date, the lack of new market entrants and the limited operational and capital expenditure budgets available to operators. It was also suggested by one respondent that to encourage the entry of new innovative and competitive companies fees should be kept to a minimum and be based on the ODTR cost of running licence competitions.

Proposals for revision of licence fees ranged from no fees, no fees until the system is profitable, nominal administration fees, costs tied to usage, costs spread by customer or time to make it easier to obtain finance and cutting of current costs.

4.4.3 Position of the Director

The Director acknowledged in the consultation document that the take-up to date of FWA services had been limited, both in Ireland and throughout Europe. This point was made by a number of respondents in support of their arguments for a reduction in the licence fees payable. The Director believes these concerns to be legitimate and intends to investigate possible approaches to revising fee levels to reflect the current state of the market. This may entail a reduction in the base

level of spectrum fees applicable to FWA services, a modification or extension of the discount applicable in the early years of network rollout, or a combination of the two. An alternative approach to determining fees, for example based on the number of operational base stations, may also be considered.

4.5 Other issues raised by respondents

Three respondents suggested that licensing of FWA systems should be considered in bands other than those addressed by the consultation, notably the 2.3 GHz, 28 GHz and 40 GHz bands. Following a previous consultation, the Director decided that the 28 GHz band would be re-allocated to point to point links, and that it would be premature to initiate licensing in the 40 GHz band. In view of the current uncertain nature of the FWA market the Director considers that priority should be given to the provision of FWA as outlined in this response document and the potential for other frequency bands could be reviewed again in the light of developments.

5 Next Steps

5.1 The 26 GHz Frequency Band

The Director intends to discuss options for rationalisation of the existing licensed FWA spectrum with the licensed operators, with a view to accommodating projected levels of FWA traffic on those operators' networks in the most effective manner. She will also develop a licensing regime for point-to-multipoint and multipoint-to-multipoint applications in the 26 GHz band.

5.2 The 10.5 GHz Frequency Band

The Director intends to develop regulations under the Wireless Telegraphy Acts 1926 – 1988 to introduce a licensing regime for local area FWA systems operating in the 10.5 GHz band. This regime will include the following main technical elements:

- Services will generally be licensed on the basis of individual base stations;
- It is anticipated that individual FWA base stations will be subject to a pre-defined limit on exported interference, in the form of a maximum field strength at specified radial distance from the base station. Alternative network topologies, such as mesh networks, may also be licensed and will be subject to the same limits on exported interference at a pre-defined radius from a central point as would apply to a point to multipoint base station located at that point.
- Spectrum will be assigned in multiples of 2 x 3.5 MHz up to a maximum of 2 x 28 MHz, in accordance with Figure 4.1 above;
- Sufficient spectrum will be made available to accommodate up to three 2 x 28 MHz spectrum blocks in any geographic area;

- Applicants will be permitted to apply for licences at different locations, which will be licensed in the same block of radio spectrum where this is available locally.

- Licensees will be required to demonstrate annually that each licensed system is in use for the delivery of FWA services prior to licence renewal in order for the licence to be renewed.

For the avoidance of doubt, licensees intending to offer FWA services, will be required to possess the appropriate Telecommunications service licence (either Basic or General) details of which can be obtained from the ODTR website, www.odtr.ie.

5.3 The 5.8 GHz Frequency Band

The Director will develop regulations under the Wireless Telegraphy (WT) Acts 1926 – 1988 to exempt from WT licensing certain FWA systems operating in the 5.8 GHz band. Exemption will be subject to a maximum EIRP (power spectral density) of 100 milliwatts within any contiguous 1 MHz bandwidth, up to a maximum total EIRP of 2 watts and compliance with any emerging requirements that may be mandated as a result of CEPT Decisions relating to the band. Operators will also be required to adhere to any emerging ETSI standards (or equivalents) relating to the operation of FWA or Metropolitan Area Networks in this band.. In order to facilitate the implementation of any future changes to the regulation of the band, a registration process will be introduced which will require operators to notify the ODTR of the number, location and technical characteristics of all FWA stations operating in the 5.8 GHz band prior to such stations becoming operational. A registration fee may be chargeable to cover the administrative costs arising from this process.

For the avoidance of doubt, licensees intending to offer FWA services, will be required to possess the appropriate Telecommunications service licence (either Basic or General) details of which can be obtained from the ODTR website, www.odtr.ie.

5.4 FWA Licence Fees

The Director intends to review current fee levels in consultation with existing operators and other interested parties.

5.5 FWA licensing in other frequency bands

In the future, and where demand exists, the Director may open other frequency bands for use for FWA., however currently she does not consider there to be a case for such additional spectrum.