



Office of the Director of
**Telecommunications
Regulation**

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

Consultation Paper

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1 INTRODUCTION

The opportunities presented by radiocommunications are expanding all the time, enabling new services to be provided on a widespread basis and increasing the prospects for stronger competition in the market. This paper responds to a number of developments in relation to fixed wireless access, proposing the offering of a new national licence and the extension of the spectrum available for existing licensees.

It also reviews the potential use of low power wireless technologies in the 2.45GHz and 5GHz bands, currently available for licence-exempt self-provided applications, for provision of short-range public access services, subject to interference considerations. Finally, the document addresses the use of the 28GHz band and potential applications in the 40GHz band, which has been identified internationally for Multimedia Wireless Services including broadband fixed wireless access.

Fixed wireless access ('FWA')¹, often referred to as Wireless in the Local Loop (WLL) is a way of connecting a subscriber to a telecommunications network using radio rather than traditional wires. The idea came to the fore in the 1990s with growing interest in alternative technologies to help bring about further competition in telecommunications markets. FWA provides a radio-based alternative to “hard-wired” access networks based on copper or fibre optic cables. With FWA the work and time associated with laying cable is dramatically reduced and this wireless alternative offers the prospect of lower local call charges and high-speed connectivity for small business and Internet users.

It would appear that the greatest opportunity for FWA is in answering the current demand for broadband connectivity or high-speed access to the Internet and other interactive services. Unmet demand for these services is high, as is indicated by the June 2001 Quarterly Report issued by the Director². While FWA is often seen as a technology for deployment in rural areas in which other delivery platforms such as cable and DSL prove commercially or technologically unsuitable, and while it does have advantages in lower density areas, it is, of course, also a valuable asset in promoting competitive supply of services in highly concentrated urban areas. The availability of multiple platforms - DSL, cable, satellite and FWA - provides some assurance that the technological and commercial challenges faced by each type of technology can be overcome by the use of substitutes in different parts of the country, and increases the prospects of strong competition, with the attendant benefits for users of better services and competitive prices. As universal access to high quality communications is a prerequisite for success in the Information Age, FWA has a vital role in Ireland's response to the rapid growth of the Internet and electronic commerce.

¹ During the original tender process, the specific term Fixed Wireless Point to Multipoint Access (FWPMA) was used as the Irish name for the, at that time, not fully standardised technology. In this paper, however, the generic – and now widely used – term Fixed Wireless Access (FWA) will be used. Notwithstanding this, all reference to “existing FWA licence holders” or just “existing licence holders” in this paper shall refer to those companies that received licences under the first FWA competition.

² ODTR Document Number 01/41

Until recently, wireless technologies were perceived by some as unreliable, costly and unable to match the quality afforded by the fixed line. This has now changed. Wireless systems can operate in a variety of frequency ranges and provide a service at least comparable to that of wired systems. Recently, a number of international initiatives to promote the use of FWA have also come to the fore, particularly for broadband applications. These initiatives include the identification of harmonised European spectrum for Multimedia Wireless Systems (MWS) by CEPT and the licensing of FWA networks in twelve of the fifteen EU member states, with the remainder expected to follow within the next twelve months.

FWA technologies have often been seen as ‘interim’, to be installed for a short time until cable/copper is developed. Given the increasing capability of FWA and expected trends in development of broadband needs there is no technological or commercial reason to suppose that FWA will not prove an appropriate and viable long term solution for customers.

With a view to addressing the purposes outlined above, this paper will set out the following:

- A proposal to offer a new national broadband FWA licence comprising 2 x 56MHz of 26GHz and, where justified, 2 x 30MHz of 10.5GHz radio frequency spectrum;
- A proposal to offer 2 x 30 MHz of 10.5GHz radio frequency spectrum to existing FWA licensees;
- An exploration of the possibility of future regional FWA licences in areas not covered by the existing FWA licences;
- An exploration of the possibility of licensing the limited provision of FWA and FWA type services (based on Radio LAN technology) to third parties in the 2.45GHz, 5GHz and 40GHz radio frequency spectrum bands.

This consultation paper is does not constitute legal, commercial or technical advice. The Director is not bound by it. The consultation is without prejudice to the legal position of the Director or her rights and duties under relevant legislation and does not form part of any formal tender process.

2 STRUCTURE OF THE PAPER

This paper is structured in a number of main sections and appendices as follows:

- Section 3** introduces proposals and outlines the issues being consulted upon;
- Section 4** describes the consultation procedure and timetable for responses;
- Section 5** sets out the Director's decision with regard to the licences issued to Formus Communications Limited;
- Section 6** sets out the Director's proposal with respect to a new national FWA licence;
- Section 7** sets out the Director's proposal with respect to assignment of additional spectrum to the existing FWA licensees;
- Section 8** deals with fees attaching to the Director's proposals;
- Section 9** explores the question of the future development of FWA in Ireland
- Appendix A** presents a summary list of the questions raised;
- Appendix B** describes the minimum service requirements for proposed new national FWA licence.

3 BACKGROUND TO THIS CONSULTATION

3.1 Previous FWA Competitions

A public consultation on FWA was undertaken in the latter half of 1998³. Following this consultation, it was considered that issuing national FWA licences was the best approach in achieving the overall objective of facilitating increased competition in the telecommunications sector. It was proposed that four broadband⁴ licences and four narrowband⁵ licences would be offered.

The objective of the 1999 competition and issuing of licences was to facilitate increased competition and choice so that the Irish consumer would benefit from lower tariffs and the availability of high quality services. It was felt that the issuing of FWA licences would further contribute to increased competition in the Irish telecommunications market introduced by the full liberalisation of voice telephony on the 1st December 1998. In particular, it was felt that such licences would offer increased choice of service provider and a wider range of advanced telecommunications services to the end-user. In addition, it was indicated at that time that there would be further consideration given to the use of radio frequency spectrum for FWA to address market segments not provided for through national licences.

Pursuant to that competition, the following FWA licences were issued:

Broadband: *eircom* plc., Esat Telecom, Chorus Communication (Previously Princes Holdings) and Formus Communications.

Narrowband: *eircom* plc., Chorus Communication (Previously Princes Holdings).

A second competition was held last year, but there were no applications.

The Director intends to publish details of the existing FWA licences shortly. In addition, further background information on the current FWA licences may be found in documents ODTR 98/32 (Opening the Market for Fixed Wireless Access Point to Multipoint Services, Consultation Paper) and ODTR 98/61 (Response to the Consultation) as well as ODTR 00/47 (Expanding the Market for Fixed Wireless Access) and ODTR 00/81 (Response to the Consultation). All documents are available on the ODTR web site at www.odtr.ie.

³ ODTR Document Number 98/32, "*Opening the market for fixed wireless point to multi-point access services - Consultation Paper*"

⁴ Broadband FWA caters for the needs of medium to large users of telecommunications services, and enables services such as PABX connection, broadband Internet access, multi-media, bandwidth on demand, and fast file transfer.

⁵ Narrowband FWA is an alternative to copper in the local loop, which at present connects the majority of residential and business customers to their local exchange, and will offer mainly basic telephony, Internet and ISDN connections, and is especially suited to rural areas.

3.2 Summary of New Licensing Proposals

As outlined in section 5 below the Director has decided to revoke the licences⁶ granted to Formus Communications⁷ and proposes offering a new national FWA licence. This licence would comprise 26GHz radio frequency spectrum and, where the successful applicant for this licence can demonstrate a need, additional 10GHz radio frequency spectrum would be made available. More details of this proposed licence are contained in section 6 below. Firm expressions of interest are now invited with respect to such a licence.

In addition, the Director is minded to make available 10GHz radio frequency spectrum for assignment to suitably qualifying existing FWA licensees. Existing FWA licensees would qualify where they can demonstrate to the Director's satisfaction a genuine need for the extra assignment of 10GHz radio frequency spectrum to facilitate the roll out of networks and the commitment of sufficient financial resources to exploit any additional assignment in the delivery of such roll-out. Expressions of interest are now sought from existing FWA licensees in this regard.

⁶ General Telecommunications Licence Number 39 (including Part 5 and Schedules thereto), Wireless Telegraphy Licence and Radio Links Licences.

⁷ Formus Communications Limited was placed into voluntary liquidation on 28th March 2001

4 CONSULTATION PROCEDURES AND TIMETABLE

The consultation period will run from 19th June 2001 to 13th July 2001. **Written comments should be marked “Response to ODTR Fixed Wireless Access consultation paper” and submitted before 5.00 p.m. on Friday 13th July 2001, to:**

Sinead Devey
The Office of the Director of Telecommunications Regulation
Abbey Court
Irish Life Centre
Lower Abbey Street
Dublin 1

All comments are welcome, and should reference the relevant question numbers from this document (for convenience a summary list of the questions is at Appendix A).

The Director expects to publish a report on this consultation short after the close of the consultation period. Apart from expressions of interest, responses to the consultation will be available for inspection by the public on request, following publication of the report. Where elements of any response are deemed confidential, these should be clearly identified and placed in a separate annex to the main document.

The Director regrets that it will not be possible to enter into direct correspondence with those supplying comments.

5 REVOCATION OF FORMUS COMMUNICATIONS LICENCES

5.1 General

Formus Communications Limited ('Formus') was awarded an FWA licence last year by the Director pursuant to a winning bid in the 1999 FWA competition. Formus launched its FWA service in late 2000. Owing to financial difficulties Formus went into voluntary liquidation in March 2001.

5.2 Decision of the Director

Where an FWA licensee is wound up, the Director may suspend or revoke the licence⁸. Having considered her powers and duties, rights and obligations under the relevant legislation and the circumstances of the particular case, the Director has decided to revoke all licences issued to Formus Communications Limited. This will include General Telecommunications Licence Number 39, granted on the 13th of October 1999, together with the Part 5 and schedule thereto⁹, Wireless Telegraphy and all Radio-link licences. Following this revocation there will be unassigned radio frequency spectrum in the 26GHz band available and appropriate for the provision of FWA services.

⁸ Condition 4.8 General Telecommunications Licence

⁹ The Formus General Telecommunications Licence was supplemented by part 5 thereof, dealing specifically with the delivery of FWA services issued to Formus in July 2000.

6 A NEW NATIONAL BROADBAND FWA LICENCE

6.1 The New Licence

Following on from the revocation of the Formus licence, in the interests of national broadband roll out and competition in the marketplace for the provision of telecommunications services the Director believes that it is desirable that a new national broadband FWA licence (the 'Licence') is offered. Accordingly, the Director proposes offering a single new national broadband FWA Licence with an assignment of 2 x 56MHz of radio frequency spectrum in the 26GHz band. In addition, 2 x 30MHz of radio frequency spectrum in the 10.5GHz band will be made available where the successful applicant for this Licence can demonstrate a need for such radio frequency spectrum. The Director now seeks views on the issue of this new licence and firm expressions of interest with respect to this Licence from suitably qualified applicants on or before the end of the consultation period.

6.2 Licence Type

The Licence proposed will grant the right to use FWA technology to offer telecommunications services to the public. The successful applicant will require two types of licence:

- A General Telecommunications Licence issued in accordance with section 111 of the Postal and Telecommunications Services Act, 1983¹⁰, and
- A Wireless Telegraphy Licence issued in accordance with the Wireless Telegraphy Act, 1926 to 1988.

The combined licences, where offered, would entitle the holder to provide FWA services¹¹ to the public subject to certain minimum conditions and obligations (as set out at paragraph 6.4 below) and any commitments furnished by the applicants as part of the licence application procedure, together with all services licensed under the General Telecommunications Licence.

6.3 Licence Duration

The Director must balance the need for security of tenure for those investing in the provision of FWA services with the need to ensure that radio frequency spectrum not properly utilised can be withdrawn and made available to other FWA service providers, or reallocated to other uses. Accordingly, it is proposed that the Licence described herein would be awarded for a term of 10 years, as provided for in the existing FWA licenses. In accordance with the terms of existing FWA licences and the Director's duty to manage the radio spectrum efficiently and effectively, all licences - existing and prospective - may be reviewed periodically. It is expected that such a review will take place sometime after 2003, however, any such review will

¹⁰ It is proposed that where a successful Applicant already holds a General Telecommunications Licence this licence will be amended to provide for the provision of FWA services. Where licensees do not already hold such a licence an application for the new national FWA licence will be taken as an application for a General Telecommunications Licence, to include the licence to provide FWA services.

¹¹ The distribution of Licensed Programme Services as provided for in the Wireless Telegraphy (Programme Services Distribution) Regulations, 1999 (SI No. 73 of 1999) will be excluded from the scope in respect of which FWA services may be granted.

take into account the late start on any licence offered on foot of the proposals in this section.

It should be further noted that the Director will reserve the right, with due notice, to migrate services to new radio frequency spectrum allocations in order to comply with radio frequency spectrum allocation decisions reached through the World Radio Conferences (WRCs) of the International Telecommunication Union (ITU), or through the Decisions made by the European Radiocommunications Committee (ERC) of the Conference of European Postal and Telecommunications Administrations (CEPT). Such migration would be carried out entirely at the licensee's own expense. In any event it is proposed that the Director reserves the right to terminate these licences ten years after first issue. This would enable any necessary re-planning. The Director will additionally reserve the right to withdraw any spectrum assigned where that spectrum is not being used for the purpose licensed.

6.4 Minimum Conditions and Obligations

In addition to the terms and conditions in the General Telecommunication Licence, Parts 1-5¹², certain other minimum conditions and obligations will attach to the proposed Licence. The applicable minimum conditions and obligations in addition to those in the standard General Telecommunications Licence are set out at Appendix B. In addition, Applicants for the proposed Licence will be free, and will be invited, to offer commitments in excess of these minimum requirements.

6.5 Licensing Process

The Director will subject any applications received to a two-stage evaluation process to select the successful applicant. Firstly there will be an admittance test to determine whether each application fulfils specified formal admission requirements such as payment of relevant fees¹³, compliance with deadlines, format of application, etc. Only applications that fulfil the formal admission requirements will be deemed eligible to participate in the second stage of the process.

6.6 Key Decision Criteria

It is intended that the suitability of an applicant be assessed against a number of key criteria to be published in a process of financial, commercial and technical assessment. It will be important for all Applicants to demonstrate to the Director:

- the financial and commercial resources to achieve early service implementation and roll out. It should be noted that particular emphasis will be placed on the financial resources and solidity of all applicants in the assessment of all applications;

¹² See ODTR Document Number 98/46R - Pro Forma General Telecommunications Licence

¹³ See paragraph 8 below.

- the ability to comply with the terms and conditions of any licence offered¹⁴;
- technical competence and experience in the various radio technologies, which may be deployed, and in the provision of telecommunications services.

The Director intends that detailed guidance will be issued in the application document for the proposed Licence, but key elements sought in the responses are likely to include, but may not be limited to:

- A business plan, including details of the applicant's ownership, its relationships with suppliers and customers, its managerial resources and its financial resources. Again, particular emphasis will be placed upon the financial resources and solidity of all Applicants and their commitment to translating their financial resources into FWA network roll out and service provision;
- Detailed proposals for coverage and the time-scale for network roll out within the requirements of the licence proposed;
- The quality and range of service expected to be delivered, together with details of targeted customer base and opportunities the applicant may see for the promotion of new and advanced services (such as fast internet access or electronic commerce);
- A requirement for the applicant to advise the technical details of the system configuration proposed, including network design and likely demand for radio frequency spectrum;
- Where the applicant believes their network and roll out plan and delivery would benefit from an additional assignment of 10.5GHz radio frequency spectrum, a demonstration that such an assignment is necessary;
- An indication of how any radio frequency spectrum sharing required might be accomplished and the extent to which guardbands might be required to minimise interference to other licensed radio frequency spectrum users; and
- Details as to how the security of the system proposed would be protected, with particular emphasis on issues such as preventing fraudulent use and eavesdropping.

Where there is only one application that application will be evaluated in terms of meeting the assessment criteria as outlined above and the proposed Licence may be offered accordingly. Where an applicant does not meet the assessment criteria, no licence will be awarded.

Where there is more than one application, a comparative evaluation process will be conducted for the selection of the successful applicant. Where this is the case, applicants will be ranked against each other with respect to offerings in excess of the minimum specified in the proposed Licence¹⁵ and the highest ranked applicant may be offered the Licence accordingly. Where such a comparative evaluation process is held, each eligible application will be evaluated and ranked according to the commitments with respect to the following areas:

¹⁴ As set out at section 6.4 of this document

¹⁵ the minimum terms and conditions as detailed at section 6.4 of this document, i.e. those set out at ODTR Document Number 98/46R - Pro Forma General Telecommunications Licence and those set out at Appendix B to this document.

- Financial Resources and solidity of applicants and their commitment to translating their financial resources into FWA network roll out and service provision;
- Services offered in excess of the minimum requirements set out at Appendix B;
- Customer Tariffs Offered;
- Coverage and Speed of Roll-out in excess of the minimum requirements set out at Appendix B;
- Quality of Service in excess of the minimum requirements set out in the proposed Licence. These would be fully defined in the application documentation;
- Performance Targets backed by Financial Guarantees with respect to the above evaluation criteria.

Where the proposed Licence is offered, whether by comparative evaluation or not, the Director may incorporate conditions into any Licence issued based on the commitments contained in the application submitted.

6.7 Proposed Sequence and Indicative Timetable

Subject to a review of the responses with respect to the proposed Licence and the decision of the Director whether or not to offer such a licence, the proposed sequence and indicative timetable would be as follows;

- Publication of application details, the competition terms for potential applicants - Late-July 2001;
- Deadline for applications to be submitted - Late-August 2001
- Assessment of applications and award of License - Late-September 2001.

Question 1. Do you agree with the proposal to issue a new national broadband FWA licence as set out in this section? If you disagree, please give reasons for your response.

Question 2. Do you have a firm interest in submitting an application for a new national FWA licence as proposed in this section? If so, please submit details before the end of the consultation period separate to any response to this consultation paper;

Question 3. Do you agree with the proposal to offer the assignment of additional radio frequency spectrum in the 10.5GHz range with the new national FWA licence proposed in this section? If you disagree, please give reasons for your response.

7 EXISTING FWA LICENSEES

It is intended that existing FWA licensees be excluded from applying for the new Licence proposed in section 6 above. The Director is guided in this regard by the need to ensure effective competition between operators competing in relevant markets. In particular the Director is of the view that this approach is an objectively justified and proportionate way of achieving the objective of maximising benefits for users and facilitating the development of competition.

In both the 1999 and 2000 FWA competitions, licences were offered in the 10GHz radio frequency spectrum. No valid applications were received for those licences. Accordingly, there remains radio frequency spectrum in the 10GHz bands available for assignment for the provision of FWA services. As noted above, the Director intends conditionally offering 2 x 30MHz of radio frequency spectrum in the 10GHz band with the new national broadband FWA licence to be offered.

The Director is charged with administering the efficient and effective use of the radio frequency spectrum. Given that the 10GHz radio frequency spectrum intended to be assigned remains unassigned after two competitions, the Director is satisfied that it would be an efficient and effective use of radio frequency spectrum to offer unused spectrum to existing FWA licensees for the purposes of facilitating roll out of their FWA networks. Accordingly, having considered her powers and duties, rights and obligations under the relevant legislation and the circumstances of the particular case, the Director is minded to make available for assignment to each of the existing FWA licensees, 2 x 30MHz of radio frequency spectrum in the 10GHz band. Where this radio frequency spectrum is assigned it would be assigned strictly to the existing FWA licensees on a demonstrable need basis. Thus, existing licensees will be required to justify this additional assignment and demonstrate to the Director's satisfaction that such an assignment will be utilised in an efficient and effective manner. In this regard, an applicant would be expected to produce a proposal detailing the use to which any such assignment would be put, the financial resources to be committed and the nature of such commitment by the applicant to exploiting any additional assignment. In addition, any such applicant would be invited to offer financial guarantees relating to the use of this spectrum.

The Director invites existing FWA licensees to respond with expressions of interest on or before the end of the consultation period. Upon receipt of such expressions and subject to consideration of responses and finalisation of her position on the making available of such spectrum the Director would intend to publish details of the application process in this regard.

Question 4. Do you agree with the proposal to offer the assignment of additional radio frequency spectrum in the 10.5GHz range to existing FWA licensees as proposed in this section? If you disagree, please give reasons for your response.

Question 5. (Addressed solely to existing FWA licensees) Do you have a firm interest in submitting an application for such additional radio frequency spectrum as proposed in this section? If so, please submit details before the end of the consultation period separate to any response to this consultation paper;

8 FEES

8.1 Administrative Fees

Successful applicants, whether as an applicant for the proposed new Licence or as an existing licensee seeking the proposed additional assignment, will be liable for the administrative costs of the process attached to the licence or spectrum applied for. Although the administrative costs associated with the award of the licence and the additional spectrum allocations cannot be estimated with certainty at this stage, it is unlikely that the total costs will exceed IR£300,000.

For the avoidance of doubt, if an applicant declines a Licence offered, that applicant will be liable in any event for its proportionate share of the administrative costs of the process. In any event, the Director will reserve the right not to award licences.

8.2 Wireless Telegraphy Fees

Successful applicants will also be liable for annual wireless telegraphy licence fees. These fees are set out in the relevant statutory instrument, SI 287 of 1999.

9 FUTURE DEVELOPMENT OF FWA IN IRELAND

9.1 General

At present, certain parts of the radio frequency spectrum remain unassigned. The Director believes that it would be an efficient and effective use of particular elements of the radio frequency spectrum to offer spectrum that might be appropriate for FWA-type services for market use, where this is compatible with the interests of other spectrum users. In this time of rapid innovation and technological change, it is challenging to predict the future of communications services. To this end the Director seeks the views of respondents on the possible uses of available and appropriate radio frequency spectrum identified below.

9.2 The 2.45GHz and 5GHz Band

The 2.4GHz (2400 – 2483.5 MHz) and 5GHz (5150 – 5350 and 5470 – 5725 MHz) bands have been allocated internationally for low power technologies intended to provide short-range data connection links. Examples of such technologies include Bluetooth¹⁶, which operates in the 2.4GHz band and the HiperLAN (High Performance Radio Local Area Network) standards that operate in the 5GHz band. Whilst primarily intended for self-provided applications, these technologies also have the potential to deliver public telecommunications services, for example in the form of short range wireless extensions to fixed telecommunication networks. Unlike the currently licensed FWA spectrum, these frequency bands cannot be assigned exclusively to individual operators and, because they are shared by a variety of users and systems, cannot be guaranteed to be free from interference.

Interested parties should note that, due to potential interference from other services and equipment, which are generally licence exempt and unpredictable in nature, these shared frequency bands cannot be considered an alternative to existing, exclusive FWA bands. A licence to provide FWA in the 2.45GHz band was offered previously but was not taken up. Technology has since developed and there are now a number of emerging global standards offering the potential of short range access services in the 2.45GHz and 5 GHz band, including IEEE 802.11, Bluetooth and HiperLAN. Radio LAN and other low power wireless technologies such as Bluetooth are intended primarily to provide short range wireless connections between devices in an indoor environment and are unlikely to be suitable for reliable outdoor provision of public telecommunications services at many locations. Therefore any licensed applications should employ suitable technology capable of maintaining an acceptable level of service availability in an intensive interference environment.

Commercial and domestic microwave ovens also operate in the 2.45GHz band and may cause interference to telecommunication services using that band in some circumstances. Whilst future migration of telecommunication services to the 5GHz

¹⁶ Bluetooth is a standard developed by Ericsson, Nokia, IBM, Intel, and Toshiba that enables communication between devices via radio waves, sending data packets over short distances. In the future, when it is in place in millions of devices, Bluetooth will let these machines communicate without user intervention.

band may alleviate this, the non-exclusivity and lack of interference protection from other licence exempt services will continue to apply.

Whilst a standard basic telecommunications licence would permit the provision of services to third parties within the permitted power limits¹⁷, given renewed interest and the development of technology, the Director considers it appropriate to explore and open for public comment a possible framework for licensing of short range public access services in these bands, bearing in mind their shared nature and the potential for interference. Accordingly, the Director would welcome views on the provision of short range public access services in these bands.

Question 6. *Do you have a view on the appropriateness of offering radio frequency spectrum in the 2.45GHz and 5GHz bands for the provision of short-range public access services?*

Question 7. *(For operators) Would you be interested in providing services in the above bands and, if so, what type of services would you envisage being offered in these bands? (For potential users) Are you interested in these short-range devices and for what purposes and on what scale of operation?*

Question 8. *How would opening these bands relate to other FWA developments?*

Question 9. *Where you believe licences should be offered in these bands, how many licences do you think should be offered?*

9.3 Regional FWA Licences

All national FWA licences contain coverage and rollout obligations which are intended to promote the provision of services to population centres throughout the country. However, there are areas that are not covered by these roll-out requirements, and it may be some time before these, mainly rural areas, become fully served by existing licences. The Director is therefore exploring the possibility of licensing localised or regional FWA services in rural areas that are not covered by existing licensees' networks. Options for the provision of such services may include the use of the 2.45GHz band in sparsely populated areas where licence exempt use is likely to be limited, but subject to the constraints noted in section 9.2 above.

The Director believes that such an initiative would bring competitive digital facilities, at affordable prices, to the residential and 'small office - home office' (SoHo) markets in rural areas where service of the national FWA licensees is not available. This would make a vital contribution to extending the availability of broadband access across Ireland and to ensuring that all parts of Ireland have the opportunity to participate in the 'Information Society'.

Attention is also drawn to section 9.4 below on the potential role of satellite in delivering services in more remote regions.

¹⁷ ERC/ETSI permitted power limits

The Director would welcome views on the provision of localised FWA services in rural areas not served by existing national services and would also welcome views on appropriate technologies for serving such areas.

Question 10. *Do you have a view on the appropriateness of offering regional FWA licences?*

Question 11. *What radio frequency spectrum bands would prove most effective for delivering FWA services regionally?*

Question 12. *What do you believe would be the likely demand for such licences?*

9.4 The 28GHz Band

Radio frequency spectrum in the 28GHz band was offered in the most both recent FWA competitions but was not taken up. The capacity characteristics of this radio frequency spectrum make it highly suitable for radiolinks and the Director is minded to re-assign it for this purpose. However, before the Director does so she wishes to take account of any views respondents may have in this regard.

Question 13. *Do you have any views on the Director's proposal to re-assign radio frequency spectrum in the 28GHz band to radiolinks?*

9.5 The 40GHz Band

The Director is keen to encourage innovators to test the market for new technologies, services and applications. To this end the Director has identified radio frequency spectrum in the 40GHz range and is most interested in assessing the potential for innovative use thereof. The 40 GHz (40.5 – 42.5 GHz) band is currently not used in Ireland. This band, which has been designated throughout Europe for the implementation of Multimedia Wireless Systems, which are expected ultimately to bring broadband FWA to the mass market. This band is allocated by the ITU on a co-primary basis to the fixed, fixed satellite, broadcasting and broadcasting satellite services and to fixed, fixed satellite, mobile and radio astronomy services in the 42.5 - 43.5 GHz. Most satellite based services here will be in the space to earth direction, which means that FWA applications would be more likely to cause interference than to suffer any from other services. Satellite based services may also provide a cost-effective broadband solution in some instances, either in the form of a broadband, receive-only configuration with a conventional wire-line return path, or using very small aperture terminal (VSAT) technology to provide two-way connectivity for business users. In the longer term new "high density fixed satellite" systems may provide further opportunities for broadband connectivity in remote areas. The range of FWA services in these bands would be limited to less than a few kilometres but the available bandwidth is many times greater than in lower frequency bands. The Director invites comment regarding the efficient and pioneering use of this band.

Question 14. *Do you have a view on the suitability of offering radio frequency spectrum in the 40GHz band?*

Question 15. What type of services do you envisage being offered in this band?

APPENDIX A

List of Consultation Questions

Question 1. *Do you agree with the proposal to issue a new national broadband FWA licence as set out in section 6? If you disagree, please give reasons for your response.*

Question 2. *Do you have a firm interest in submitting an application for a new national FWA licence as proposed in section 6? If so, please submit details on or before the end of the consultation period separate to any response to this consultation paper;*

Question 3. *Do you agree with the proposal to offer the assignment of additional radio frequency spectrum in the 10.5GHz range with the new national FWA licence proposed in section 6? If you disagree, please give reasons for your response.*

Question 4. *Do you agree with the proposal to offer the assignment of additional radio frequency spectrum in the 10.5GHz range to existing FWA licensees as proposed in section 7? If you disagree, please give reasons for your response;*

Question 5. *(Addressed solely to existing FWA licensees) Do you have a firm interest in submitting an application for such additional radio frequency spectrum as proposed in section 7? If so, please submit details on or before the end of the consultation period separate to any response to this consultation paper;*

Question 6. *Do you have a view on the appropriateness of offering radio frequency spectrum in the 2.45GHz and 5GHz bands for the provision of short-range public access services?*

Question 7. *(For operators) Would you be interested in providing services in the above bands and, if so, what type of services would you envisage being offered in these bands? (For potential users) Are you interested in these short range devices and for what purposes and on what scale of operation?*

Question 8. *How would opening these bands relate to other FWA developments?*

Question 9. *Where you believe licences should be offered in these bands, how many licences do you think should be offered?*

Question 10. *Do you have a view on the appropriateness of offering regional FWA licences?*

Question 11. *What radio frequency spectrum bands would prove most effective for delivering FWA services regionally?*

Question 12. *What do you believe would be the likely demand for such licences?*

Question 13. *Do you have any views on the Director's proposal to re-assign radio frequency spectrum in the 28GHz band to radiolinks?*

Question 14. Do you have a view on the suitability of offering radio frequency spectrum in the 40GHz band?

Question 15. What type of services do you envisage being offered in this band?

APPENDIX B

Minimum Conditions and Obligations Proposed for new national broadband FWA Licence

This appendix contains the minimum terms and conditions, in addition to the standard terms and conditions of the General Telecommunications Licence, that will apply to the licence proposed in section 6 of this paper.

1. Required Services

The following would be the minimum required services:

Digital Leased Lines; High Speed Internet Access; IP LAN Interconnect; High Speed ISP Upstream Access; Web Hosting; Co-Location; Business Switched Services; Packet Telephony; ATM; Very High Speed Service.

2. Service Quality, Performance Standards and Obligations

There will be a minimum set of obligations with respect to the provision of service quality, performance standards and other criteria. These will be fully defined in the application documentation.

3. Coverage and roll out requirements

At minimum, the Licensee would be required to provide Coverage and service roll-out of their FWA Network to the listed towns in accordance with Table 1 below.

Table 1: Coverage and Roll-out

End Year ¹⁸	Location	Coverage (Area Km ²)
1	Greater Dublin Area	131
	Cork County Borough	102
	Limerick County Borough	46
	Galway County Borough	21
	Waterford County Borough	17
2	Greater Dublin Area	221
	Dundalk	47
	Bray	27
	Tralee	55
	Kilkenny	54
	Sligo	38
3	Greater Dublin Area	276
	Galway County Borough	23
	Ennis	48
	Clonmel	28
	Wexford	20
	Athlone	56
	Carlow	59

¹⁸ End of Year 1 is 12 months after the Designated Commencement date, End of Year n is n x 12 months after the Designated Commencement Date.

(The Director may consider proposals to offer service in alternative locations to those listed above provided that the geographical coverage and population profile remains the same.)

In addition, the Licensee would be required to ensure that the number of operational antenna sites shall, on or before each date specified in the following Table 2, be not less than the number specified in that Table in respect of that date.

Table 2: Antenna Sites

End year¹⁹	1	2	3	4	5	6	7	8	9	10
Antenna sites	9	18	26	30	30	30	30	30	30	30

4. Level of Tariffs

There are no minimum tariff requirements, however, applicants will be invited to make binding commitments in relation to tariffs charged for the required services. These may be evaluated in any comparative assessment procedure and the Director may incorporate these commitments into any licence that may be awarded.

5. Performance Guarantees

There are no minimum financial performance guarantees, however, Applicants will be invited to detail any performance targets backed by financial guarantees with respect to required services, service quality, performance standards and obligations, coverage and roll-out and level of tariffs, to which he intends to commit. Applicants should note that any such guarantees constitute binding commitments that may be evaluated in any comparative assessment procedure. The Director may incorporate these binding commitments into the applicant’s licence.

6. Equipment standards

The Director favours light handed regulation and thus would prefer, within the limits imposed by European law²⁰, to remain neutral on the technologies which might be deployed to provide FWA services. The Director wishes to make it clear that, regardless of the standards deployed, any ‘guard’ spectrum required to facilitate co-existence between operators using adjacent frequency channels must be included within the operators’ assignments and will not be provided as additional radio frequency spectrum.

¹⁹ End Year n = n x 12 months after the Designated Commencement Date.

²⁰ In particular, equipment must be compliant with the requirements of the Radio and Telecommunications Terminal Equipment Directive (RTTE Directive 1999/5/EC)