



Commission for
Communications Regulation

Response to Consultation

Convergence of Mobile and Fixed Technologies

Extending Broadband Access within Licensed GSM Radio Spectrum

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Extending Broadband Access within Licensed GSM Radio Spectrum – Response to Consultation

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Extending Broadband Access within Licensed GSM Radio Spectrum – Response to Consultation

1 Foreword

On behalf of ComReg, I am pleased to present the results of the consultation on the paper issued in February on Extending Broadband Access within Licensed GSM Radio Spectrum. I wish to thank the 10 respondents who provided a wide range of views. A summary of the responses is presented in this paper, together with ComReg consideration of those responses and the Commission's position on the issues.

Convergence in technologies and services is becoming a reality driven by demand from users for access to a wider range of services, particularly IP-based services.

In line with Government objectives to achieve widespread availability of broadband infrastructure and services throughout Ireland within the next three years ComReg opened a consultation on extending broadband access within licensed GSM spectrum. One of the operators responded with an interesting proposal to use 3G type technology for this purpose which raises some broader questions. Further questions are posed in this paper to assist the Commission in coming to a conclusion as to whether this should be permitted and under what conditions.

The technology involved is claimed to offer very much superior capacity to 3G albeit in a nomadic rather than fully mobile mode. ComReg would also like to consider whether the 3G operators would wish to be permitted to use this – or another 3G technology for uses within their assigned 3G spectrum – for purposes beyond their licence obligations which must be fulfilled on UMTS as committed. Any use of this technology would be subject to tests as to its compatibility with other licensed services currently operating in Ireland and to this end, ComReg wishes to note that the test licence regime provides an appropriate vehicle for testing this technology in Irish conditions.

The Commission considers that these are important issues for the development of broadband and convergence in Ireland and would very much appreciate your views on the issues.

Etain Doyle,
Chairperson
Commission for Communications Regulation

2 Introduction

This paper is the Commission's response to the consultation document addressing the issue of extending broadband access within the licensed GSM radio spectrum (document ComReg 03/13 of February 2003). The purpose of the consultation was to obtain views on a proposal to allow mobile network operators to provide other broadband wireless services using part of their licensed radio spectrum, where this is not fully required for mobile services.

The consultation addressed four specific issues, namely:

- whether GSM 1800 MHz band spectrum could be used for the provision of broadband wireless services;
- what type of technology would be most suitable to provide such services;
- the use of fixed external antennas to provide such services;
- limiting the amount of GSM spectrum that could be used to deliver such services.

3 Background

In February 2003 the Commission issued a consultation paper on the convergence of mobile and fixed technologies entitled “Extending Broadband Access within Licensed GSM Radio Spectrum” (ComReg Document 03/13).

GSM 1800 MHz spectrum is predominantly used to provide additional capacity in areas of high population or elsewhere where there is high demand for mobile traffic. In other areas all of the available bandwidth may not be required for mobile services. Since the areas with low mobile traffic demand tend to be those that also have poor access to broadband services, it is envisaged that part of the 1800 MHz spectrum could be used by mobile operators to bring broadband wireless access to such areas. This presents the opportunity for broadband access to be extended to areas that may otherwise be beyond the reach of mainstream platforms such as DSL or FWA. However to take full advantage of this opportunity it may be necessary to consider technologies that are outside the scope of the current GSM standards.

Interested parties were invited to submit their comments on a number of questions posed at the end of the paper. This document summarises the responses received, coupled with brief outlines of the Commission’s position on the various issues raised. A wide range of comments were received from the respondents. All responses were very welcome, giving the Commission a range of views – from both fixed and mobile operators, to equipment providers and consultants. The written comments of all respondents, except those marked “confidential”, are available for inspection at the Commission’s Offices in Dublin.

4 List of Respondents

In total there were 10 responses received. The Commission would like to thank all the respondents for their time and effort and for the valuable information provided.

Respondents:

- ArrayComm
- Esat BT
- European Access Providers Limited
- Irish Broadband
- Meteor Mobile Communications
- O₂
- Simon Eades
- Tony Wade
- Vodafone
- Winchester White Consultants

5 Consultation Topics

In its concluding chapter, the consultation on “Extending Broadband Access within Licensed GSM radio spectrum” invited comments from interested parties on the issues raised in the paper. A number of specific questions were posed and in this section respondents’ views are addressed under these question headings.

5.1 Current Use of Mobile Spectrum

5.1.1 Summary of Consultation Issues

There are currently three licensed mobile operators in the GSM 1800 MHz frequency band. The Mobile Telecommunications licence schedules contain specific obligations relating to coverage and quality of service that must be met in the provision of the licensed mobile service. Although the licences are currently confined to the provision of a pan European GSM service there is no restriction per se on the future provision of other wireless services in the Mobile Telecommunications Licences as long as all obligations in relation to the provision of licensed mobile services are met.

However, such provision would require the mandatory use of GSM technology standards which are primarily intended to cater for mobile services and therefore may not be ideally suited to the efficient delivery of other broadband wireless services. Therefore it may be necessary for the GSM Regulations and Mobile Telecommunications licences to be amended to allow for the provision of services outside of those contained within the interpretation of the current regime. With this in mind, the following two questions were addressed in the consultation document.

Q. 1. Do you agree with the proposal to permit the use of GSM spectrum to deliver other broadband wireless services, where this does not conflict with the GSM operator meeting its licence obligations to provide GSM mobile telephony services?

Q. 2. Do you have a view on whether alternative, non-GSM technologies should be permitted for the delivery of other broadband wireless services in GSM spectrum?

5.1.2 Views of Respondents

There were nine responses to Question 1. Four of the respondents were in favour of this proposal. Two of the five respondents (both mobile operators) who were not in favour were of the opinion that only GSM technology standards should be used within the GSM 1800 MHz frequency band. One of these respondents claimed that there was a scarcity of GSM 1800 MHz spectrum in urban areas and that any additional spectrum allocations should be used to enhance mobile services. This respondent also argued that there is currently unused FWA spectrum, indicating a lack of demand for that service, while there is growing demand from mobile operators for GSM 1800 MHz spectrum to offer mobile services.

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The second respondent expressed reservations on the proposal but also expressed support for ComReg's innovative thinking on this issue and said that they believed that such an open-minded and flexible approach would help to provide the conditions for operators to deploy wireless infrastructure widely and so provide greater access to customers to advanced data services. This respondent was of the opinion that use of the GSM 1800 MHz spectrum to deliver broadband wireless services should require a further right of use, for which the Commission should invite applications from all qualified operators and grant a new right of use in a manner that is objective, transparent, non-discriminatory and proportionate.

Another respondent suggested that the proposal would offer mobile operators an unfair advantage over existing FWA operators through cross subsidization and would represent a material change in the nature of the mobile operators' existing licences which would result in discrimination against FWA operators. This respondent also stated that if a mobile operator wanted to deploy a broadband wireless service, it could access the available FWA spectrum on the same basis as all other FWA operators. Yet another view expressed was that any spare GSM 1800 MHz spectrum not being used by an operator should be returned to the Commission for reallocation prior to changing the types of services allowed in the band after the licence has been granted.

Eight responses to Question 2 were received, with four of those supporting the proposal to allow the use of non-GSM technologies to deliver broadband wireless services. Two of the respondents opposed to the proposal were concerned about possible interference between GSM and any other technology introduced into this band and would like extensive compatibility studies to be carried out if the proposal were to proceed. Another respondent suggested that only GSM technologies should be used in the GSM 1800 MHz spectrum allocation, in accordance with the GSM Directive and consideration should be given at a later date to the transition between GSM and IMT-2000 services.

A third respondent was of the opinion that GSM 1800 MHz spectrum was allocated to existing mobile operators to overcome capacity problems and if they had excess spectrum in this band then it should be given back to the Commission for re-allocation on a fair and non-discriminatory basis. The fourth respondent viewed the use of non-GSM technology as considerably changing the terms under which the original licence was tendered for.

5.1.3 Commissions' Position

There has been an increasing trend towards convergence in technologies and services between what were traditionally distinct fixed and mobile communications. This is currently evidenced by one public mobile operator enhancing their service offerings to their customers by providing a WLAN service using 802.11 technology in "hot spot" areas.

The Commission is also mindful of its obligations under the new regulatory framework currently being transposed by the Department of Communications, Marine and Natural Resources. Together these trends and obligations necessitate a responsive spectrum management approach which takes into account different needs, balances these needs and provides, where possible, a technologically neutral approach.

The Commission acknowledges the concerns raised by respondents about the implications of permitting non-GSM broadband wireless services in the GSM 1800

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mobile band. A number of these concerns relate to the potential impact on the availability of spectrum for mobile services in areas of high demand. However, the Commission's proposal is not intended to promote the use of GSM spectrum for broadband wireless services in preference to mobile, but to utilise spare capacity in areas where demand for mobile services is relatively low. Such areas are also likely to be less attractive for the rollout of dedicated broadband access platforms. The consultation document made clear that provision of broadband wireless services would not be accepted as justification for requiring additional spectrum beyond an operator's existing demonstrable need for mobile services.

CEPT ERC Decision ERC/DEC(95)03 which designates the 1710 – 1880 MHz spectrum for GSM services does so on a non exclusive basis and recognises that the actual amount of spectrum to be made available within the band is dependent on market needs and national licensing requirements. Unlike in the case of the 900 MHz GSM band there is no corresponding European Commission Directive relating to the GSM 1800 MHz band. The GSM 1800 MHz spectrum was assigned to mobile operators as expansion spectrum to meet excess capacity demands which could not be met from their GSM 900 MHz spectrum assignments. Therefore it is likely that operators do not use their full allocation of GSM 1800 MHz throughout the whole country.

There would be no obligation on existing GSM 1800MHz licensees to offer this service. The provision of this technology would always be secondary to their primary obligations to comply with and offer the currently licensed GSM services.

With regard to interference and compatibility concerns arising from the possible deployment of non-GSM technologies in the GSM 1800 band, the Commission emphasises that any such deployment would have to undergo sharing and compatibility studies and comply with the requirements of the R&TTE Directive. With regard to the exclusivity of the 1800MHz band, the Commission notes that there is currently no EC or national legislation in place which reserves the entire 1800 MHz band exclusively for GSM service.

The Commission notes the preference of some respondents for rights of use for broadband wireless services in GSM 1800 spectrum to be made available to non-mobile operators. The Commission does not consider that the use of 1800 MHz spectrum to deliver exclusively non-mobile services would confer any significant advantage over the use of FWA frequency bands in which licences are currently available. The use of spare capacity within existing mobile networks in areas where demand for mobile services is relatively low may however enable broadband services to be extended to areas beyond the reach of dedicated fixed broadband networks, thus supporting the Commission's objective to maximise availability of broadband throughout Ireland.

The Commission also notes the concerns raised about the competitive implications for other non-mobile FWA operators. However, the proposal relates to a very limited amount of radio spectrum (less than 2 x 3 MHz), which would be unsuitable for delivery of a full range of FWA services. Furthermore, areas with the greatest demand for broadband wireless services are also likely to be those with relatively high demand for mobile services, which will necessitate the use of all the operators' GSM 1800 spectrum. The Commission does not therefore consider that the proposal will have any significant impact on the competitive environment for FWA providers in Ireland.

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Spectrum trading is not considered an option for similar reasons for this purpose. This is quite apart from the issues in principle involved in spectrum trading.

5.2 Technology Developments facilitating Broadband Access

5.2.1 Summary of Consultation Issues

As a result of recent technological enhancements mobile cellular networks are capable of providing data rates which are comparable to those available over fixed broadband platforms such as DSL. Current GSM networks can deliver data speeds of up to 28 kbits/s with the potential to reach 115 kbits/s. Such data rates can be delivered throughout the entire network coverage area, which extends well beyond the reach of existing fixed broadband platforms. GSM networks have the potential to deliver even higher data rates but at the expense of significant degradation to mobility, coverage and the number of subscribers that can be supported. The Commission believes there may therefore be a case for permitting limited use of alternative technologies within GSM spectrum to provide other broadband services in areas where the spectrum is not fully utilised for the provision of mobile services. Views were sought on which technologies would be suitable for delivering such services and on whether the use of fixed, external subscriber antennas should be mandatory.

Q. 3. Are there any particular technologies that you consider would be suitable for delivery of other broadband wireless services using GSM spectrum?

Q. 4. Do you agree with the proposal that the provision of non-GSM broadband wireless services using GSM spectrum should be delivered only via fixed, external subscriber antennae? If you do not agree with this proposal please provide supporting arguments.

5.2.2 Views of Respondents

Six responses to Question 3 were received. Four respondents believed that there is equipment available to provide broadband wireless services in this band. Examples quoted included CDMA 1x EV-DO and Portable Wireless DSL (PWDSL) based on i-BURST as the most suitable technologies to provide portable services in this band. In contrast, two respondents, both mobile operators, felt that the use of anything other than GSM standard technologies in GSM spectrum was inappropriate.

Eight responses to Question 4 were received. Only one respondent was in favour of the restriction to deliver services via a fixed external antenna. Four of the respondents opposed to the proposal were of the opinion that such a restriction would make the services uneconomical to deliver due to the increased installation costs and would limit the appeal of the services by restricting portability. One respondent viewed such restrictions as an artificial boundary and that if such services are permitted they should be available to all types of subscriber terminal provided

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that the terminal equipment conforms to the R&TTE Directive and meets the appropriate GSM standards.

5.2.3 Commission's Position

It is evident from the responses received and the Commission's own research that there are technologies available which could provide broadband wireless services in the 1800 MHz band.

Wherever practicable, the Commission favours a non-prescriptive approach towards technology, although in this case it would be necessary to ensure that any technology that was to be deployed in this band could demonstrate compatibility with existing GSM services and compliance with the R&TTE Directive. In accordance with Article 6.4 of the R&TTE Directive it would also be necessary to notify the European Commission of any proposed deployment of a non-GSM technology within the 1800 MHz band.

The Commission has considered the arguments presented for and against the use of fixed antennas for the provision of broadband services in the GSM 1800 MHz spectrum. Of the eight respondents who expressed an opinion on this question, six of them were of the opinion that if such a restriction were required, the provision of such services would not be economically viable due to the increased installation costs. It was also suggested that services should be defined in accordance with their service characteristics, technologies and spectrum use rather than by artificial boundaries.

The Commission notes that the majority of responses were not in favour of restricting such services to external fixed antennas only. However, the Commission acknowledges the concerns that a broadband service with full mobility and wide area coverage could be construed as similar to a 3G mobile service, for which competitions have been held in accordance with Commission Information Notice 01/96 on licensing 3G.

Before making any determination on the matter, the Commission would welcome views as to whether this difficulty might be resolved by applying restrictions to ensure that any broadband non-GSM service provided in the 1800 MHz band meets the objective of enhancing broadband wireless availability whilst not replicating the separately licensed 3G mobile services. The Commission would welcome views as to whether such differentiation could be made by for example

prohibiting

- handover between base stations (i.e., in-call hand-over between base-stations will not be permitted) and
- direct provision of voice telephony services using non-GSM technology.

Furthermore, should the use of non-GSM technologies be permitted only where the over-the-air data rate exceeds that which GSM technology can reasonably deliver? A minimum downstream data rate of 384 kbps, corresponding to the maximum data rate deliverable by the GSM EDGE standard, is therefore proposed. The applicable requirements are detailed in Table 1 in the Appendix.

The Commission would also need to consider how constraints could be enforced and would welcome comments on this. It would also be a matter to be reviewed at the time of the compatibility trials.

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Additional Question 1:

What are your views on the provision of non-GSM broadband wireless services using GSM spectrum on the basis that the following regulatory requirements would be applied: handover between base stations would not be permitted; direct provision of voice services would be prohibited; the minimum downstream data rate (i.e., from the base station) must be at least 384 kbps (see Appendix Table 1)? How might these restrictions be enforced?

If you do not agree with this proposal please provide supporting arguments.

Additional Question 2:

Do you consider that an alternative range of restrictions should apply? Please outline these and indicate how they might be enforced?

5.3 Proposal to permit limited use of GSM spectrum for other broadband wireless services

5.3.1 Summary of Consultation Issues

The Commission considers that the use of licensed mobile spectrum to provide broadband services in areas where alternatives are not available would provide a further opportunity to extend the availability of broadband access to areas that might otherwise be denied such services. In order to achieve this goal the Commission favours a flexible approach to technology, reflecting the approach taken to FWA in other frequency bands. It is therefore proposed to permit the limited use of non-GSM standards such as HDR where these would be compatible with existing GSM services and would facilitate the provision of other wireless services. The provision of such broadband services would only be considered where it can be clearly demonstrated (to include an examination by ComReg of field tests conducted in its jurisdiction) that there will be no adverse affect on the provision of licensed mobile services. The Commission does not consider the deployment of high-speed data platforms in the GSM bands to be in any way a substitute for third generation mobile services, which are intended to provide wide area mobility and pan European roaming using common frequency bands. The consultation document sought views on the proposal to limit the provision of non-GSM broadband wireless access services to a maximum of 20 percent of the total 1800 MHz GSM spectrum assigned to each operator. Further views were also sought on the principle of allowing such applications in the GSM spectrum.

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Q. 5. Do you agree with the proposal to limit the amount of GSM spectrum that can be used to deliver non-GSM broadband wireless services to no more than 20% of the operator's licensed 1800 MHz GSM spectrum?

Q. 6. Do you have any further comments or views on the use of GSM spectrum for provision of non-mobile services, or on the use of non-GSM technology in GSM spectrum?

5.3.2 Views of Respondents

Seven responses to Question 5 were received. Three of the respondents were of the opinion that 20% of the GSM spectrum would be sufficient for providing such services with two suggesting that further spectrum might need to be allocated in the future should there be a demand. Three of the respondents suggested that GSM 1800 MHz spectrum should be used for GSM technologies only, with one being in favour of such a restriction should the proposal go ahead. Another of the three suggested that if the Commission considered that existing GSM licensees might be restricted in the extent to which they could offer advanced wireless services from their current GSM allocations then the Commission should consider awarding spare unused GSM spectrum to allow those GSM licensees wishing to offer advanced wireless services. The fourth respondent felt that in addition to quality of services requirements it was essential that due regard be given to market conditions and the sustainability of the business of those operators affected by the proposals

Three of the seven respondents to Question 6 welcomed the proposals which would speed up the delivery of broadband services throughout the country. Two of them repeated their concerns over the proposal to use fixed antennas which would limit the services. One respondent not in favour of the proposal was of the opinion that opening the band for broadband wireless services would be unfair to FWA operators using higher frequency spectrum allocations and would be damaging to the FWA market in the longer term. Another respondent (a mobile operator) expressed concern that the introduction of 1XEV-DO technology into GSM 1800 MHz spectrum would undermine the 3G licensing process and licence holders. Yet another respondent reiterated that unused spectrum should be re-tendered and if this was not possible then some sort of interconnect product should be developed to allow operators without SMP to provide such services in an unbundled form. The final respondent was of the opinion that very little information was given on the reasoning behind the proposals and the market effect and that the Commission should give more consideration to the Minister's recent policy direction to the Commission.

5.3.3 Commission's Position

On the basis of the responses received the Commission considers that it is worthwhile considering further if an appropriate solution can be found that would encourage the development of broadband services in particular in rural areas.

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In relation to 3G services, the Commission notes that it is claimed that some 3G type technologies provide very substantially greater capacity than UMTS when in a fixed/nomadic rather than fully mobile mode. If it were to be the case that the 3G operators would wish to use such technologies within their assigned 3G spectrum for services over and above those required by their licences, the Commission considers that this possibility might be provided for, but would wish to consider the views of interested parties before doing so.

Additional Question 3

Your views are invited on whether 3G operators should be allowed to use such technologies within their assigned 3G spectrum for services over and above those required by their licences.

It should be noted that the deployment of 3G-like mobile services based on the Enhanced Data in a GSM Environment (EDGE) standard is already permissible under the existing GSM licences.

A GSM1800 mobile operator proposing to provide broadband wireless access services in the GSM1800 MHz band will be required to demonstrate to the satisfaction of ComReg that the proposed system is compatible with the user's own GSM services and those provided by other GSM operators.

If this proposal does proceed the Commission would permit up to 20% of a mobile operator's GSM 1800 MHz spectrum assignment to be used for the provision of such broadband services. This limitation is intended to ensure that provision of broadband wireless services does not adversely impact on the quality of the operators' mobile service offerings. A strict requirement will also be placed upon any mobile operator availing of this proposal that it should not in any way impede an operator's GSM roll-out and coverage obligations.

6 Next Steps

Responses to the Additional Questions 1, 2 and 3 (see Sections 5.2.3 and 5.3.3 above)

Additional Question 1:

What are your views on the provision of non-GSM broadband wireless services using GSM spectrum on the basis that the following regulatory requirements would be applied: handover between base stations would not be permitted; direct provision of voice services would be prohibited; the minimum downstream data rate (i.e., from the base station) must be at least 384 kbps (see Appendix Table 1)? How might these restrictions be enforced?

If you do not agree with this proposal please provide supporting arguments.

Additional Question 2:

Do you consider that an alternative range of restrictions should apply? Please outline these and indicate how they might be enforced?

Additional Question 3

Your views are invited on whether 3G operators should be allowed to use such technologies within their assigned 3G spectrum for services over and above those required by their licences.

should be sent to:

Sinead Devey
Commission for Communications Regulation
Abbey Court
Irish Life Centre
Lower Abbey Street
Dublin 1
E-mail: sinead.devey@comreg.ie
Tel: 01 804 9621

The consultation period on the additional question will run from 13th June to 11th July 2003. Written comments should be marked “Additional Questions on ComReg Consultation on Broadband Access within GSM” and submitted either electronically or in hard copy before 5.00 p.m. on 11th July 2003.

Table 1: Minimum Requirements for broadband wireless radio equipment in the 1710 – 1785 MHz and 1905 – 1880 MHz frequency bands

Operational Frequency Range	Lower Frequency Limit	Upper Frequency Limit	Additional Technical Information
	1710 MHz	1785 MHz	
	1805 MHz	1880 MHz	Base Station Transmit band
Channel Spacing	Multiples of 200 kHz		
Transmitter Necessary Bandwidth	Maximum 2.8 MHz		
Transmitted User Bit Rate (burst)	Base Station: Minimum 384 kbps User Terminal: Minimum 64 kbps		
Peak EIRP (power spectral density)	Base Station: 0 dBW/kHz User Terminal: -23dBW/kHz		
Licensing Information			Mobile Communications General Authorisation and Right of Use for Radio Frequencies is required. No more than 20 per cent of an operator's total licensed spectrum may be used for provision of broadband wireless services, other than those conforming to the GSM mobile standards
Access Protocol	TDMA or CDMA		
Mobility Management	Handover between base stations is not permitted		Broadband wireless services are intended to cater for nomadic / portable use rather than full wide area mobility.