



CONSULTATION PAPER

*Convergence of Mobile and
Fixed Technologies*

Extending Broadband Access within
Licensed GSM Radio Spectrum

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An Coimisiún um Rialáil Cumarsáide
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Foreword

ComReg is committed to extending the reach of broadband communications to the widest possible extent. This commitment is in line with Government objectives to achieve widespread availability of broadband infrastructure and services throughout Ireland within three years. Broadband services can be delivered by various means, including enhancement of existing telephone or cable TV networks and the rollout of dedicated broadband wireless networks. Whilst availability of these delivery platforms is progressing, the extent of development required makes it unlikely that these options alone will fully meet ComReg's and the Government's broadband objectives.

This document seeks 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. This option is not intended to replicate the capabilities of dedicated wireless networks, which will have far greater capacity, but to provide an opportunity to extend the availability of broadband access to areas that might be beyond the reach of alternative platforms. ComReg believes this would be a valuable complement to existing broadband initiatives, enabling the extensive geographic coverage of the mobile networks to be utilised to the benefit of fixed as well as mobile subscribers. We look forward to receiving your views on the proposal.

Commission for Communications Regulation

1 Introduction

In recent years there has been an increasing convergence between traditionally distinct fixed and mobile telecommunications services. For example, mobile phones are increasingly being adopted as users' main or only means of voice communication and are also now able to deliver a range of data and multimedia services, including access to the Internet. The availability of mobile networks in Ireland is virtually ubiquitous, with coverage extending beyond 99% of the population. The three recently licensed third generation mobile networks will provide further growth in the capability and capacity of mobile networks, including the ability to deliver high speed mobile data services beyond the capability of today's GSM networks.

At the same time, fixed network technology has evolved to allow the provision of broadband data services over existing telephone and cable TV networks, and over dedicated fixed wireless access (FWA) networks. Rollout of these broadband platforms is progressing, but the scale of infrastructure development required means that they may not be able to provide universal availability to broadband services in the short to medium term.

Part of ComReg's brief, as enshrined in the recent Draft Policy Direction by the Minister for Communications Marine and Natural Resources, is to work towards the widespread availability of broadband infrastructure and services throughout the State within three years, on the basis of utilisation of a range of existing and emerging technologies. ComReg is therefore keen to explore additional platforms for the delivery of fixed broadband access that would facilitate provision beyond the areas covered by existing technologies. One such option is the use of spare capacity within mobile phone networks, which already have substantially ubiquitous coverage, to deliver wireless broadband services. Recent technological developments provide the potential for mobile networks to deliver data speeds comparable to fixed network technologies such as Digital Subscriber Line (DSL).

The purpose of this consultation is to consider whether GSM operators should be permitted to use some of their licensed radio spectrum to deliver other broadband wireless services where GSM spectrum is not fully required for mobile services. It is emphasised that such services would be intended to meet the immediate

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requirement for access to broadband services and not to replicate the mobile broadband capabilities of the third generation networks, nor to provide an alternative to other broadband fixed wireless platforms where these exist.

2 Responding to the Consultation

The consultation period will run from 4th February 2003 to 10th March 2003.

Written comments should be marked “Response to ComReg Consultation on Broadband Access within GSM” and submitted either electronically or in hard copy before 5.00 p.m. on 10th March 2003, to:

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It would be helpful when responding if you would make specific reference to the questions raised in Section 6 of this document.

3 Current Use of Mobile Spectrum

Under the current licensing regime GSM operators are issued with two licences. A Wireless Telegraphy Licence which is issued under the Wireless Telegraphy (GSM and TACS Mobile Telephony Licence) Regulations, 1999 which licences the apparatus to be used in the provision of the GSM service and a Mobile Telecommunications Licence issued under Section 111 of the Postal and Telecommunications Services Act 1983 which licences the operator to provide mobile telecoms services to the general public and also outlines in detail the individual rights and obligations of the operator in conjunction with this right.

Currently there are three such licensed mobile operators within this jurisdiction.

The Pro Forma Mobile Telecommunications Licences define the Licensed Mobile Services as:

“the establishment and/or operation of a Mobile and Personal Communications System and/or Mobile and Personal Communications Services including but not limited to) those services set out in part 2 of the Schedule, but excepting:

- (i) services to which section 4(A) of the Telegraph Act 1869 (as inserted by the European Communities (Telecommunications Infrastructure) Regulations, 1997 (SI 338 of 1997) and as amended by the European Communities (Telecommunications Infrastructure)(Amendment) Regulations, 1999 (SI 70 of 1999) relates;*
- (ii) the reception and/or origination of licensed programme services and their conveyance over a telecommunications network.*

The Part 2 of the Mobile Telecommunications Licence Schedules further defines the Licensed Mobile Service as:

“a GSM Mobile and Personal Communications Service having the characteristics of a pan-European, cellular, digital, land-based mobile telephony service, provided in the 900 MHz and 1800 MHz bands in accordance with the WT Acts and conforming with the GSM technical specifications of the European Telecommunications Standards Institute”.

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The licences contain specific provisions relating to coverage and service quality levels that must be maintained in the provision of the licensed mobile service. Other than as specified in (i) and (ii) above, there is no specific restriction on the provision of other wireless services under the Mobile Telecommunications Licences, so long as the obligations relating to the provision of the licensed mobile services are met. However, such provision would require the mandatory use of technology based on the GSM standards. These standards are primarily intended to cater for mobile services and are therefore not ideally suited to the efficient delivery of other broadband wireless services.

S.I. 442 of 1999 defines the *mobile telephony service as meaning a GSM mobile telephony service or a TACS mobile telephony service*; GSM Mobile Telephony Service is further defined as *a service consisting of the provision of a mobile telephony service of the kind referred to in the Annex to Council Recommendation 87/371/EEC of 25 June 1987 that is to say a pan-European, cellular, digital, land-based mobile telephony service provided in the 900MHz frequency band and/or a GSM1800 cellular land based public mobile telephony service of the kind referred to in the European Commission Communications of 23rd November 1994 and conforming with the standard known as GSM and with the GSM Technical Specifications of the European Telecommunications Standards Institute, published by the National Standards Authority of Ireland and providing international roaming capability.*

Depending on the outcome of this consultation it may be necessary for the GSM Regulations and Mobile Telecommunications licences to be amended in order to allow for the provision of services outside those contained within the interpretation of the current regime.

Demand for mobile services tends to be concentrated in major population centres and along the main transport corridors, it is these “hotspots” which essentially determine the radio spectrum required by the networks. Currently each of the three GSM operators is assigned a total of 2 x 7.2 MHz in the 900 MHz GSM band and 2 x 14.4 MHz in the 1800 MHz GSM band. As the 900 MHz spectrum provides wider area coverage from a single base station, this band is heavily utilised for mobile services throughout the country. The 1800 MHz frequency assignments are used predominantly to provide additional capacity in areas of high population or mobile

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traffic demand and may not be fully required for mobile services in all areas. Since areas with lower demand for mobile services are also likely to be those least likely to have access to broadband services, it is envisaged that part of the 1800 MHz assignments could be utilised by mobile operators to extend the reach of broadband access to such areas.

This would present an opportunity for broadband access to be extended to areas that may otherwise lie beyond the reach of mainstream broadband platforms. However, to take full advantage of this opportunity it may be necessary to consider alternative technologies more suited to a fixed broadband environment and which are compatible with the current GSM standards. Such an approach would be consistent with that taken to the provision of fixed wireless access (FWA) services in other frequency bands, where specific standards or technologies are not mandated.

4 Technology Developments facilitating Broadband Access

Recent technology enhancements provide the potential for mobile cellular networks to deliver data rates comparable to those available over current fixed broadband platforms such as DSL. For example, the recently licensed third generation mobile networks are expected to have the capability to deliver data rates of up to 384 kbit/s to mobile terminals, with even higher data rates (up to 2 Mbit/s) available to stationary users. Current second generation GSM networks deliver data speeds of up to 28 kbit/s, with the potential to reach 115 kbit/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, although this may impact on the degree of mobility, coverage and the number of subscribers that can be supported alongside conventional mobile services. ComReg believes there may be a case for permitting the limited use of alternative technologies within GSM spectrum to provide other broadband wireless services in areas where the spectrum is not fully required for the provision of licensed mobile services. Any such move would require compatibility with existing mobile services to be clearly demonstrated, and would need to be accommodated within a limited amount of the operators' existing licensed spectrum.

A number of technology options exist which could meet these requirements. For example, EDGE (Enhanced Data in a GSM environment) is an evolution of the European GSM standard which enables data rates of up to 384 kbit/s to be delivered in a mobile environment. As a GSM standard provision of EDGE services is already covered by the operators' existing licences. Another example, which may be more appropriate for broadband fixed access, is the proprietary 1XEV-DO standard, sometimes referred to as HDR (High Data Rate). This standard is optimised for high speed packet data transmission in either fixed or mobile environments and can deliver a peak data rate of up to 2.4 Mbit/s in a single 1.2 MHz carrier. ComReg would welcome suggestions of other suitable technologies for delivery of high speed fixed wireless access in the 1800 MHz band.

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

ComReg seeks to maintain a regulatory regime that ensures competition, choice and diversity in the provision of telecommunication services. Amongst the objectives of ComReg set out in its Act of establishment are objectives to promote competition and to ensure the efficient management and use of the radio frequency spectrum and it is with these objectives in mind that ComReg seeks submissions on the proposals contained within this document.

To this end, a number of fixed wireless access (FWA) networks have been licensed and broadband wireless access using licence-exempt spectrum in the 2.4 and 5 GHz bands has also recently been made available. ComReg considers that the use of licensed mobile spectrum to deliver broadband wireless access 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 a service.

In order to gain maximum benefit from the opportunity presented by broadband access delivery in GSM spectrum, ComReg 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 facilitate the provision of other broadband wireless services.

However, ComReg also recognises the importance attached to the provision of high quality mobile communications throughout the operators' network coverage areas. It therefore takes the view that provision of other broadband wireless services should only be considered where it can be clearly demonstrated that there will be no adverse affect on the provision of licensed mobile services. Furthermore, ComReg 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 a common frequency allocation.

ComReg therefore proposes that the provision of high speed services using non-GSM technology should be limited to provision of broadband wireless access via externally mounted subscriber antennae. To ensure that the provision of high quality

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mobile services by GSM operators is not compromised, it is further proposed to limit the provision of non-GSM broadband wireless access services to a maximum of 20 per cent of the total 1800 MHz GSM spectrum assigned to each operator.

The limited bandwidth available in the GSM bands and the high demand for conventional mobile cellular services means GSM spectrum cannot be considered an alternative to existing FWA frequency allocations such as those in the 3.5 GHz or 26 GHz bands, for example. ComReg favours the use of such bands for FWA services where this is practical, but considers that the availability of this further option will help to stimulate the availability of further broadband access into areas not currently served.

ComReg's proposal would require modification of the current mobile telecommunications licences, and possibly modification of the associated regulations, to permit the provision of broadband wireless access services using either GSM or non-GSM technologies in up to 20% of the licensees' assigned 1800 MHz spectrum. Such a move would provide the opportunity for broadband access to be provided in areas beyond the reach of alternative platforms, in line with the Government's objective of achieving widespread broadband availability throughout the State within three years. By ensuring that only a small proportion of the licensed mobile spectrum is used for other broadband wireless services, ComReg considers that the proposal would not adversely impact upon other broadband service providers, or upon the continued provision of high quality mobile telephony services in Ireland.

It should be noted that the primary purpose of GSM licences is, and will continue to be, the delivery of high quality mobile services using the pan-European GSM standard, as stipulated in the operators' licences. The use of non-GSM technologies for the delivery of mobile services will not be permitted and the delivery of broadband fixed services will not be considered as justification for further GSM spectrum.

It should also be noted that the Commission intends to introduce in 2003 a licensing scheme for Fixed Wireless Access in the 26 GHz and 10.5 GHz bands as well as a limited scheme at 3.5 GHz to enhance the rate of delivery of broadband services in

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Ireland. This scheme will operate on a first come first served, per base station basis. The Commission proposes to publish details of this scheme in early 2003.

6 Issues for Consultation

Views are sought on the following specific aspects of ComReg's proposal, as outlined in the previous section:

Question 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?

Question 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?

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

Question 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.

Question 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 operators' licensed 1800 MHz GSM spectrum?

Question 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?