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telecommunications and internet federation

Department of Communications, Marine and Natural Resources

Telecoms Strategy Group - Interim Report

Getting Ireland Online

Interim Report

Telecoms Strategy Group

Getting Ireland Online

Introduction

We are pleased to present this document to the Minister for Communications, Marine and Natural Resources, Dermot Ahern TD. This document represents the initial deliverable from the Telecommunications Strategy Group (TSG). The TSG comprises representation from the major investors in the telecommunications industry in Ireland along with representatives of key government departments. It was established following a meeting between Chief Executives of leading telecommunications companies through IBEC Telecoms and Internet Federation in October 2002 with an Taoiseach.

The TSG sees itself as particularly well placed to work towards a plan which will involve the active engagement of operators and relevant stakeholders in the context of building the optimum combination of telecommunications infrastructure and services as will be required by Ireland in the medium term. Operators, together with citizens, the wider business community, local and central government and other interest groups all have important roles to play. Therefore, this engagement will require commitments from industry, government and regulatory agencies to ensure creation of the environment that will lead to real competition – enhancing user choice – and in promotion of investment to ensure that businesses and citizens in Ireland can avail of internationally-competitive services and infrastructure going forward.

At its first meeting, the Minister for Communications asked the TSG to produce:

1. an interim report in summer 2003 that focuses primarily on measures that will increase the level of demand for broadband services in Ireland; and,
2. a final report by year end that addresses its terms of reference fully.

This is the interim report. It includes sections on:

- developing the broadband market in Ireland, including recommended actions;
- the importance of broadband services to Ireland;
- the current state of the broadband market in Ireland; and,
- issues to be addressed in the final report.

In its deliberations, the TSG considered the widest possible range of options for the development of broadband services in Ireland and focused these recommendations on the policy options that are practical and relevant to Ireland's circumstances.

Given that the focus of this report is on the use of broadband services by customers, the TSG decided to consult with representatives of various user groups. The TSG would like to express its gratitude to those people, organisations and companies (see Annex 5) that contributed their views and ideas to the preparation of the contents and recommendations of this report. The analysis and recommendations contained in this report largely arose from the very valuable and constructive suggestions and opinions of these users.

Yours sincerely

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Executive Summary

The Telecoms Strategy Group ("TSG") believes there is strong evidence indicating the willingness of Irish consumers and small & medium sized businesses to adopt new technologies, where a clear benefit can be readily understood. This augurs well for broadband services. The potential market in Ireland is estimated at up to 179,000 subscribers for broadband services in the near term.

Competition between service providers will be the main driver of Ireland's broadband market. In this context, different elements of the service, including flat rate fees and product features, will be tailored to different segments of the market.

The promotion of broadband needs to pursue a customer-focused strategy. In other words, communications should focus on the benefits for users or the valuable uses of broadband rather than the technology itself. Therefore, the TSG is recommending a lifestyle-based approach to the marketing of broadband and a user-led focus to market development.

The TSG believes that its recommendations will contribute to the development of the market for broadband services in Ireland. Responsibility for the implementation of each recommendation lies with either the Government or the service providers. Some of its recommendations are summarised below:

Broadband Usage in Schools and Libraries

- internet access in all primary and post-primary schools, including special needs schools, and libraries should be upgraded to a broadband service by end-2004;

Aggregating & Building Demand for Broadband Services

- service providers should set up 'trigger points' for the delivery of broadband services in localities, together with a customer pre-registration process, and establish local demand aggregation pilots;
- the Department of Communications, Marine & Natural Resources should set up pilots to demonstrate the use of broadband services by the community to meet the needs of the community;

Government Online Services

- the implementation of Government online services should be accelerated by prioritising the most frequently used and cost-effective government-citizen interactions;
- incentives for the use of the online version of a service should be introduced;

Improved Information & Communications to Buyers

- marketing by service providers should emphasise and promote the benefits of broadband for users in terms of lifestyle benefits, not product characteristics;
- an independent public information website, with the option of an independent telephone help-line, about broadband services should be set-up;

Easier High-Speed Internet Access in New Housing Developments

- adequate ducting for cabling along roadways/pathways for broadband services should be included in new housing estates; planners, architects, and the construction industry should be encouraged to incorporate this into new developments.

The TSG believes that broadband services are strategically important for Ireland in terms of sustaining future competitiveness, economic growth and employment.

Factors behind the current low take-up of broadband services in Ireland were identified, including the late introduction of services in Ireland, the early stage of development of the market, limited choice for customers, settlement patterns, price levels, and delays in investment.

Issues, including infrastructure, investment, regulation and Government policy, will be addressed in the final report by the TSG.

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Part
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Market Development

Developing a Market for Broadband Services in Ireland

For the purposes of this document, broadband is defined as:

advanced telecommunications services providing high bandwidth communications over a variety of platforms including DSL, cable and wireless services, both fixed and mobile, to residential and small and medium business customers.

A dynamic, competitive market for broadband services with many consumers and suppliers will foster demand. However, additional measures and a fresh approach are needed to stimulate the market in order to realise its potential for competitive, innovative services meeting the needs of customers. In this chapter, and in the main body of the interim report, we offer recommendations aimed at developing Ireland's broadband market. We also identify key messages needed to raise awareness of the benefits of broadband and attempt to estimate potential demand.

The TSG believes that a proactive and customer-focused, "bottom-up" approach will yield results in developing the market. Clearly, once proven demand exists, the necessary roll-out to meet it is likely to be undertaken by operators.

Ireland's Broadband Market Estimated at up to 179,000 Subscribers

Ireland's potential broadband market is estimated to be in the range of 66,000 to 179,000 subscribers. The upper end of the range – 179,000 – is a combination of 74,000 home subscribers and 105,000 SME subscribers for internet access. The lower end of the potential market size is based on the numbers of existing basic ISDN and leased line customers – these customers could be judged the most likely to convert quickly to broadband. Annex 1A contains more detailed information on these estimates and the basis on which they have been made.

Even allowing for the possibility of some double-counting, a reasonable assumption is that there could be 125,000 DSL subscribers in the near term. This would correspond to a broadband penetration of 9% of all households or 3.2% population penetration, given a population of 3.9 million. Mobile broadband penetration should also rise in the near term with the deployment of wireless LAN, 3G and other technologies.

Positive Indicators of Broadband Demand

Evidence on the behaviour of Irish consumers suggests that they are well-disposed to adopting technology solutions which offer them real benefits, e.g. use of the internet for online banking and travel bookings. The growth in mobile phone use and more recently, the uptake in camera phones and state-of-the-art TV products and services are further examples of the Irish consumer's willingness to adopt technology which is readily understood and which has clear demonstrable benefits. In addition:

- 61% of adults have a PC at home
- 80% of adults have mobile phones

- 34% of households have internet access
- 90% of SMEs have a PC
- 85% of SMEs have internet access

The success of the uptake of Revenue Online Services by business offers a good example of how behaviour can change, given targeted awareness campaigns and a user-led focus in both delivery of the service itself and in its promotion/explanation.

Competition is the key driver of market development

The TSG believes that the private sector telecommunications companies are best placed to drive the development of the broadband market given their direct relationship with customers. Market forces through competitive service provision, backed up by aggressive promotion and marketing campaigns will be the main drivers in developing the broadband market. This will be particularly effective in driving demand and take-up amongst early adopters (the technologically adept, active internet users, big business etc). It is envisaged that the industry will dedicate its marketing resources and specific expertise to such campaigns.

Flat Rate & Service Pricing are also important drivers of broadband uptake.

When the effects of pricing and competition are being considered, it is very important to distinguish between target market sectors and to understand the consumer buying process. For example, recent market research found that, at current pricing levels, 60% of the SME market and 15% of the residential market consider themselves "very likely" to subscribe to broadband services.[1] However, the TSG believes that absolute price levels alone will not suffice to drive demand, except, again among early adopters and the technologically aware. Of potentially much greater value to households and many SMEs is transparent flat rate pricing. A key message for consumers and SMEs is the predictability and manageability of telecoms costs provided by broadband services. While increased competition should drive overall price levels lower, hence stimulating further demand, providers will need to focus on attracting the "late-adopter" niches of the potential market.

Market Development must be Demand-Led. A Different Approach is Needed

The TSG believes that the promotion of broadband needs to pursue a customer-focused strategy and should not focus on the technology per se. Consumers want to understand what broadband can do for them, why it is different, and what difference it can make to their lives and businesses. Marketing messages to date have emphasized "always-on" and "faster access". While these are important for existing active users, they may be meaningless to those intermittent users who switch off the home PC for hours or even days at a time or those who use the internet/email so little that dial-up frustrations are not an everyday experience. Similarly, many SMEs may tend to use the internet in 'batches' rather than in a steady, constant manner.

The faster speed of broadband in respect of music or video downloads, and all the various entertainment and business applications it renders more efficient, are not readily understood by those who have not yet taken to conducting much of their business or leisure pursuits online. Further, it must be recognized that, for many people, technology is still a mystery which intimidates them, while for others it is a bore. Therefore, a focus on user benefits or an applications-led approach to marketing will be far more effective than discussions about broadband itself.

[1] See Annex 3G.

Explanation of Market Development

Market development should be a deliberately proactive, rather than reactive, approach to creating demand. To achieve this effectively, the TSG has sought to place itself in the shoes of the potential customer and to understand the buyer's thought process. This approach means:

- recognising and identifying the different market segments, particularly within the general household and SME categories;
- identifying the key influencers on each of these groups;
- identifying uses and benefits of online activity and broadband for each of these groups;
- developing targeted messages and means of communicating them to these groups.

Specifically, effective market development will mean answering the following questions:

- Why do I need broadband?
- What can it do for me that is better, different or new?
- What are my peers/competitors/neighbours doing?
- How do I get it?
- How much will it cost?
- Where do I go for further information?
- How can I judge between competing service or product offers?

It may be noted from the above that one question which becomes completely irrelevant is "What is broadband?"

Recommended Action Plan – Market Development Measures

A detailed list of demand stimulation measures recommended by the TSG can be found below. In most cases, these take a bottom-up approach and are focused on recognition of the needs and concerns of potential users (largely overlooking early adopters)

As a general point, the TSG recommends that those responsible for implementing these recommendations, including Government departments and service providers, should make provision for the effective communication of their actions to the relevant target audience using the appropriate means – this may involve providing people to visit the people/groups in a targeted locality, providing impartial technical advice where necessary, or publicity in relevant media (local and/or national).

The TSG believes that it will be essential that these recommended actions are effectively communicated to the relevant target group, if they are to be successful and provide useful lessons in developing demand for broadband communications services.

1. Broadband Usage in Schools and Libraries

The TSG recommends that:

(i) internet access in all primary and post-primary schools, including special needs schools, and libraries should be upgraded to a scalable broadband service by end-2004;

(ii) service providers should view the delivery of broadband access to rural/remote schools and libraries as an opportunity to extend access of broadband services to the surrounding locality, where there is no existing broadband service, through local demand aggregation schemes; and,

(iii) schools should be encouraged by the Department of Education and Science to offer their facilities for training on the use of ICT to the local community (e.g. parents, local businesses, etc.), in addition to each school's own student body.

Implementation

Given the strategic, national economic interest of enhancing ICT in education, and the resulting beneficial impact on demand for broadband services, the Department of Communications, Marine & Natural Resources and the telecoms services providers are agreed in principle to the urgent provision of high-speed internet access (in the range of 512Kb to 2Mb) to all schools. The Department is developing a proposal for a levy on telecommunications services as a mechanism to deliver broadband access for all schools and libraries.

As an alternative, the wider ICT industry, as represented by ICT Ireland/TIF and including the telecoms service providers, has proposed a joint Government-Industry approach to integrating ICT into education. To this end, it believes that the ICT industry and the Government should publish an agreement and implementation plan by 15 September for the integration of ICT into all primary and secondary schools and libraries. The Government-Industry agreement and implementation plan will specify funding/resourcing by the ICT industry that would provide for scaleable broadband access, networking within schools, ICT equipment (e.g. PCs, servers), ongoing support for ICT services, maintenance and upgrading of ICT, teacher training for classroom use of ICT, and digital resources/content for schools. The Government is prepared to consider proposals for the joint Government/industry initiative in parallel with the development of levy-based proposals. In September, a decision will be made by Government on the appropriate strategy to implement for the achievement of the objectives of ICT in education.

Justification

The TSG, together with the wider ICT industry and Government, recognises the strategic national economic interest of ensuring that all primary and post-primary school students have experience in the use of ICT for working, learning, researching and collaborating. It believes that the use of ICT in the classroom will ensure that Ireland develops a workforce that is flexible and comfortable with working with technology and that will have the appropriate skills-set for the needs of investing companies and ensuring Ireland's international competitiveness. The TSG also recognises the Government's commitment to integrating ICT into all schools in Ireland.

While recognising the importance of ICT in schools in its own right, the TSG believes that the use of broadband in schools will be a significant driver for residential broadband demand and up-take. It acknowledges that benefits will accrue to the ICT sector, including the telecoms service providers, arising from increased current and future usage of their services and the future availability of a skilled, flexible workforce. The TSG also believes that broadband internet access in libraries will provide an important learning opportunity for citizens to experience using high-speed, broadband internet access.

2. Aggregating & Building Demand for Broadband Services

The TSG recommends that:

(i) service providers should set 'trigger points' for the delivery of broadband services in localities, in accordance with Annex 1B. Necessary agreements to enable this should be put in place during Autumn 2003;

(ii) following implementation of the above service providers should establish a number of local demand aggregation pilots with local communities that include local

communications and subscriber pre-registration, which can be reviewed by the TSG by end-2003 to see if the model can be extended widely across Ireland;

(iii) to complement (i) and (ii), the Department of Communications, Marine & Natural Resources should establish a number of pilots where the use and exploitation of broadband by local communities (e.g. residents, local groups or businesses) is demonstrated, which can be reviewed by the TSG by end-2003 to see if the model can be extended widely across Ireland.

Implementation

Action (i): The service providers will work together where appropriate to communicate the trigger points to the Department of Communications, Marine & Natural Resources, which will make the information available to the public. Alongside the trigger point levels, a clear process should be put in place whereby customers can register for their chosen provider in an integrated process, including wholesale mechanisms if appropriate.

Action (ii): Service providers should proactively target and collaborate with a local community in order to assist them to set up this arrangement and to promote it locally. In relation to pre-registration, the participants of each pilot will need to decide how requests will be followed-up, what information will be provided by residents/SMEs, and how a service provider should respond. This will require local 'champions' and community groups/organisations to be involved in the project. The resources, in terms of impartial expert assistance/advice, should be provided by the service operators.

Action (iii): The Department of Communications, Marine & Natural Resource will be required to establish a number of pilots to facilitate local communities exploiting broadband for their own purposes, which will include effectively communicating this initiative at a local level. In turn, local communities will be required to come forward with substantive proposals. Funding will be provided by the Department of Communications, Marine & Natural Resources; however, additional resources, in terms of impartial expert assistance/advice, should be provided by the service operators and/or ICT companies.

Justification

The development of the broadband market in Ireland is not a zero-sum game. By cooperating on these recommendations, it will be possible for all service providers to benefit from a faster growing market for broadband services. This does not ignore the fact that service operators will continue to compete aggressively with each other for customers. However, if they also cooperate on certain actions, they will have more customers to compete for.

The TSG believes that greater clarity of information, through setting trigger points, will stimulate local communities to build demand for broadband services at grass roots level. From the local user's perspective, he/she will know how many neighbouring customers the broadband service provider needs before it can provide the service and recover its costs.

The TSG believes that broadband services will be technically feasible almost everywhere in Ireland through a variety of technologies ranging from DSL, cable modem, to wireless and satellite. A key uncertainty retarding service provision is whether there is a sufficient number of subscribers in a locality to make a broadband service economically viable. Demand aggregation aims to organise a sufficient number of subscribers in a locality. This demand aggregation initiative will demonstrate whether this concept will work at a local level in Ireland. In essence, this recommendation seeks to both encourage and quantify demand in specific areas.

3. Government Online Services

The TSG recommends that:

(i) the implementation of online government services should be accelerated by prioritising the most frequently used and cost-effective government-citizen interactions, e.g. payment of motor taxation charges, application and payment for driving licences, passport applications, and access to planning applications and development control;

(ii) the Government should introduce an incentive to attract people to one or a range of online services, such as a fee discount or an improvement in terms (e.g. an extended deadline; a shorter turn-around time, etc.), that is only available on the online version of the service.

(iii) the implementation of an online e-procurement service should be accelerated by the Government and the other stakeholders as a priority in order to establish an e-procurement regime that will stimulate healthy, sustainable competition among bidders and deliver cost savings for public bodies; and,

Implementation

Action (i): In the context of *New Connections*, the Assistant Secretaries Implementation Group should continue its work on the identification of key services to citizens, and timelines will be set for specific deliverables.

Action (ii): The Government should evaluate the introduction of this proposal by end-October 2003.

Action (iii): The Department of Finance should transpose the new draft EU public procurement directives as soon as possible after they are adopted at EU level. Furthermore, the Government will prioritise the implementation of systems to support online receipt of tenders as a further development of the e-tenders facility already in place.

Justification

The TSG recognises the Government's existing commitment to the objective of having all public services that are capable of electronic delivery available online, through a single point of contact, by 2005, as outlined in *New Connections*. The TSG believes that the existence of convenient public services online and appropriate incentives will act as a reason for people and businesses to go online. The success of ROS (Revenue Online Services) suggests that people make use of convenient online services.

4. Improved Information & Communications to Customers

The TSG recommends that:

(i) marketing and communications by service providers should emphasise and promote the benefits of broadband for users in terms of relevance to their lifestyle, rather than solely the characteristics of the broadband product;

(ii) an independent information website about broadband services that targets key-advisors of the general public and SMEs should be established jointly by representatives of service users and service providers by end-September 2003, including the information outlined in Annex 1C;

(iii) services providers should make the signing-up for broadband services as simple as possible in order to avoid possible confusion among potential customers. Relevant marketing and proactive support from service providers for customers of broadband

services beyond initial sign-up will ensure a positive experience for the customer and ultimately benefit the provider as well as promote overall market growth.

Implementation

The TSG recommends that comprehensive product information should be provided by the various service providers for the independent website, with updated information provided on a monthly basis. The service users' representatives and service providers should also consider the establishment of a telephone information line. The information should be targeted at 'key advisors' of the general public and SMEs, e.g. community organisation for the general public, accountants for businesses, etc. Service providers and representatives of service users should agree the scope of the information to be available on the website and establish it on that basis. Once established, the website should be operated and updated by a joint consumer-industry partnership. The TSG believes that both should be referenced in communications by service providers.

Service providers should augment the provision of proactive support for customers beyond sign up for a broadband service. This should include clear product-sales information from informed sales staff to complement help with installation and hardware support.

Justification

The TSG has found that many potential users of broadband are unsure why they should use broadband, and have found existing communications to be unclear. There is evidence that up to 87% of the general public know little or nothing about broadband. In addition, according to the TSG's consultations, a significant number of potential broadband subscribers are uncertain and deterred from using broadband because of the lack of transparent, easily understood information. The provision of easily understood information for potential customers will grow the broadband market and benefit all service providers.

5. Internet Ducting for New Housing Developments

The TSG recommends that a requirement to ensure that there is adequate ducting for broadband services installed before a development (e.g. new housing) is completed should be introduced as soon as possible by the Department of the Environment and Local Government.

Implementation

The TSG is aware that the Department of the Environment and Local Government has already commenced examination of this issue. The TSG also believes that communications will need to take place between local authority planning officials, architects, developers/builders, etc. to ensure that the potential of this guideline is effectively communicated to all stakeholders. Service providers should input into this process to ensure the operability and technical neutrality of the ducting.

Justification

The TSG believes that it is important for residential users to be supplied easily with access to a broadband service. Therefore, the TSG considers that an important, cost-effective opportunity exists to ensure that all new housing developments can be easily supplied with broadband service by introducing this requirement.

6. Follow-Up to This Action Plan

The TSG recommends that:

(i) an update report should be prepared within 9 months to indicate the progress by relevant parties in implementing the recommendations; and,

(ii) during 2004, the co-chairs of the TSG should consider proposing the preparation of another action plan.

Implementation

Given the cross-sectoral and decentralised nature of this action plan, the TSG believes that the responsible state-agencies and telecoms service providers themselves are best placed to proactively report on the status of their progress. The TSG also believes that it is desirable that an independent body be responsible for compiling the information provided by the relevant agencies and service providers. In view of its role of monitoring Ireland's performance in its evolution as an Information Society, the TSG considers that the Information Society Commission would be well placed to carry out this role. Alternatively, given its role in reporting on market developments, ComReg could be considered to carry out this role.

Justification

The TSG believes that it will be important for progress to be reported by the relevant agencies/companies in order to enhance the transparency of implementation of these recommendations.

Taking account of progress of implementation of these recommendations and the state of development of the broadband market in Ireland, it may become apparent that it is necessary to consider the preparation of another action plan during 2004.

Key Messages

Developing a market for broadband services must be inextricably linked to promotion of greater online activity in the broadest sense. It must also bring applications to life so that potential users can readily understand the specific benefits and new ways of conducting their everyday lives which broadband makes possible or better. The rollout and promotion of broadband services can be compared with the Rural Electrification Scheme in Ireland many years ago. At that time, it was not electricity itself which was promoted (or even explained); rather, the emphasis was placed on the difference that electricity provision would bring to people's everyday lives. The "marketing" was centred on lighting, household appliances, etc. A similar approach is needed with broadband.

The TSG is recommending a lifestyle-based approach to promotion of broadband and a clearly user-led focus to market development.

- Users need to know what broadband can do for them; how it will enhance their lives – for shopping, gaming, entertainment, education, business execution, and everyday transactions like paying bills, banking or dealing with Government. The benefits of broadband must be brought to life and, as stated earlier, be intertwined with a message about increasing online activity in the first instance.
- Broadband internet services allow users to use telephone/fax services while simultaneously accessing the internet. Traditional dial-up services do not provide this feature.
- The greater efficiencies and time saving available are core messages in this context, while of course the other part of the equation is building greater awareness of the online

options available. These core messages must be contextualised in order to relate them to each market segment.

- Content (in terms of digital content and online services) will be a major driver of market development because it will show the specific value that broadband can provide potential users. Each identified market segment will need to perceive broadband as relevant to them and perceive one or more benefits. It is often said that connection pushes, content pulls.

Part 2

Importance of Broadband

The Importance of Broadband Services to Ireland

There are considerable social and economic reasons why broadband has a critical role to play in Ireland's future. The potential medium and long term benefits of broadband services will facilitate the government's and industry's aim to develop a high value knowledge-based economy.

Broadband can Provide Considerable Social and Economic Benefits

Broadband is a key enabling technology that has the potential to transform exchanges of information, services and goods. Research into the potential macroeconomic benefits of widespread broadband adoption points to broadband as a significant contributor to future economic growth. For example in the US it has been estimated by the Brookings Institute, that broadband could contribute as much as a 4% increase in US GDP (i.e. US$500 Billion) in 2006.[2] Annex 2A contains a summary of this and similar research. Broadband is considered to have real potential to accelerate the five key drivers of economic growth: enterprise; innovation; competition; investment; and skills.[3]

Broadband will become Strategically Important for Ireland in the Long Term

From a macro-economic perspective, broadband will play a significant role in furthering Ireland's economic interests. Ireland's competitive position is evolving from low-value manufacturing to higher-value activities, which are critical to developing sustainable economic growth and employment in Ireland. Therefore, the ability of Irish businesses to exchange, share and exploit knowledge in an efficient and convenient manner, using broadband communications, will be essential to compete internationally. At a firm level, the potential benefits for Irish business include:

- improved communications can have a positive impact on the productivity of firms, including those outside the ICT sector, through lower costs or higher sales;
- firms can benefit from an improved ability to provide a higher quality service to both business and consumer clients through real-time communications;
- the flexibility of companies and employees can be enhanced through e-working and online or virtual collaboration between sites.

Widespread use of broadband also has the potential to provide benefits to the wider community. As well as having more choice in communication services, users may benefit from the improved delivery of other services, which are enhanced through the use of broadband. An example of these benefits is the use of broadband in schools which will enrich the learning experience and result in students (and future workers) being more familiar with technology.

[2] 'Understanding Broadband Demand', US Department of Commerce, September 2002
[3] 'Second Annual Report and Strategic Recommendations' UK Broadband Stakeholder Group

Bandwidth affects Usage of the Internet

Internet access speeds (bandwidth) begin with dial-up access, and can extend to almost limitless capacities. Currently available technologies, such as DSL, cable modems etc, together with enhanced mobile services, will allow speeds of up to 1Mbit/s in the immediate future. As the chart below outlines, these can meet current user requirements. In the medium to long term with a view to maintaining Ireland's future competitiveness, access speeds approaching 5Mbit/s will become relevant.

Service	*Dial-Up*	*512Kbit/s*	*5Mbit/s*
Internet Browsing (e.g. on-line banking, airline tickets, etc)	**X**	**X**	**X**
Simple E-mail (e.g. small files attached)	**X**	**X**	**X**
Commercial E-mail (e.g. large files attached); Teleworking		**X**	**X**
Online Gaming (e.g. XBox, Playstation 2)		**X**	**X**
Video Conferencing		**X**	**X**
DVD quality video			**X**

From the user's perspective, broadband reduces the time it takes to do things on the internet. Some indicative times, comparing the difference between broadband (512Kb) and traditional dial-up internet access (56Kb), are given below.

Downloading	*Dial-Up (56Kb)*	*DSL (512Kb)*
Normal Web Page (100KB)	**14 sec**	**1 sec**
10 Plain Text Emails (10x15KB)	**21 sec**	**2 sec**
Software Package (3.5MB)	**8½ min**	**1 min**
Britney Spears' "Oops!..I Did It Again" (4.85MB)	**12 min**	**1½ min**
"Charlie's Angels" Film Trailer (27MB)	**67 min**	**7½ min**

Irish Consumers adopt services that they Find Useful

As referred to earlier, there is significant evidence that Irish consumers adopt new technologies that they consider to be of practical use or value to them. Recent research suggests there is a significant level of internet usage by consumers and that SMEs do not appear to face major barriers to going online:[4] The principal uses of the internet in Ireland are information searches and email. Other uses are also identified in Annex 2B.

The TSG believes that there are at least three important factors needed for widespread broadband uptake.

- Adequate Skill / Familiarity to use Broadband – implied by current usage of Internet
- Available access – estimate of 1,000,000 enabled DSL by end 2003

[4] ODTR 02/79, September 2002; ComReg 03/29b, March 2003; MRBI Research for the Information Society Commission, October 2002

- A positive value proposition for the user, which encompasses both the cost and the availability of relevant online services and content

The requirement to secure Ireland's competitiveness and the outlined medium/long term economic and social benefits reinforce the Government's and industry's commitment to developing broadband services in Ireland.

Part 3

Current State of the Market

Current State of the Irish Broadband Services Market

At the time of writing, there has been a very low take-up of broadband services in Ireland. The figures for penetration of broadband services fall behind those of a number of competing economies. The low level of demand/penetration is indicated by the low absolute number of subscribers.[5] Current data indicates a penetration rate of approx. 0.3% of the population. See Annexes 3A & 3B for data for Ireland and other countries.

Broadband Services in Ireland Developed Late

The low penetration levels evident in Ireland have been mainly due to a delay in service availability. The most widespread vehicle for mass broadband services, DSL, has been available in Ireland since May 2002. Subsequently, a range of competitively priced services have become available since April 2003. Ireland's broadband market is, therefore, two to three years behind most leading countries. [6] A number of factors have led to this delay, including regulatory issues, the lack of competitive impetus from alternative infrastructure and a downturn in telecoms markets. A sample of the commercial launch dates of similar services in other countries is provided in Annex 3C.

Negative Factors in the Irish Market

The choice of broadband service for Irish users has been limited with respect to choice of access mode and service provider. There has been progress in building telecommunications infrastructure (see Annex 3D), and we acknowledge the broadband technologies currently deployed by mobile and cable operators. However, at the time of writing, copper local loop remains the foremost infrastructure capable of delivering broadband to the mass market in the short term. Unlike the UK where cable modem usage has reached a figure of 1,000,000 customers, Ireland's cable operators are at a relatively early stage of rolling out broadband services. At the time of writing, only three firms offer DSL services in Ireland. Other smaller service providers are only beginning to operate, on a more limited basis using other technologies.

Ireland has a combination of relatively low population density and low urbanisation, as compared to other countries (see Annex 3E).[7] Partly as a reflection of this, Ireland has a high ratio of local exchanges to telephone lines. In addition, a larger share of the population is located in rural areas that may be beyond the range of standard DSL services or cable-modem networks. The large number of smaller exchanges serving a relatively lower number of customers increases the investment costs of a ubiquitous DSL system in Ireland.[8] In many rural parts of the country, wireless internet access may be the most suitable solution.

[5] ComReg 03/29b
[6] 'The Development of Broadband Access in OECD Countries', OECD, 2001
[7] UN population statistics, 2000
[8] ComReg 03/01, 2003

Positive Factors in the Irish Market will Support Market Development

As in the case of most developing markets, there will be a delay between the initial take-up by "early adopters" and mass-market take-up. Initial interest in broadband offerings may result from this pent-up "early adopter" demand. However, mass market adoption will be required if these services are to become widely available. Ultimately, the most critical factor to service adoption is the competitive promotion of broadband services.

In an overall context, Ireland has a number of characteristics that will support the adoption of broadband:

- a young technology-familiar population which has quickly embraced new technologies, such as mobile phone services and gaming.
- a significant 'early adopter' segment, as evidenced by the growth in online shopping, online airline reservations, SMS, and camera-phones.
- expansion of new services, e.g. wireless LAN and Fixed Wireless Access, should help overcome difficulties in reaching the rural population where service provision could prove commercially unviable by other means.
- it is estimated that approximately one-third of Irish homes already have dial-up internet access

Broadband Service Prices are Falling, but are relatively high.

In May 2003, the price of DSL services in Ireland fell significantly. Operators are now advertising DSL monthly subscription charges of approximately €50-€55, while current cable internet modem charges are €40 for an equivalent service. These new prices represent a substantial improvement, yet are higher than countries with more developed markets. For example, a DSL service is currently available nationally in the UK for STG£27 (approx. €40). (See Annex 3F for prices in other countries.) Recent market research (see Annex 3G) found that, at current pricing levels, 60% of the SME market and 15% of the residential market consider themselves "very likely" to subscribe to broadband services.

Broadband investment decisions will depend on a number of Factors

Telecommunications operators, like all business entities, will invest in service provision based on normal business criteria, i.e. where there is perceived to be demand and where a return can be made. Potential returns are largely affected by the level of expected uptake for broadband services and the degree of competition in the market. A consequence of the collapse of the internet bubble has been the reduction in the amount of capital available for investment in the telecoms sector, both locally and globally. As a result, investment decisions and infrastructure developments have been delayed. Given the increasing prominence of global firms in the Irish telecoms sector, Ireland is very susceptible to fluctuations in global market sentiment.

Part
4

Overview of Final Report

Analysis of Other Issues

The focus of the TSG is to formulate an agreed approach for the development of the telecommunications sector, which will bring about more competition and wider choice in the delivery of high bandwidth or advanced data services to industry and society at large.

There is a Gap between Current Capabilities and National Objectives

The TSG acknowledges that a gap exists between the Government's objective and what can be achieved by industry in the short term. This interim report has focussed on development of the market from a demand perspective. However, this is only one of a number of factors that will need to be addressed if we are to close the gap in the medium to long term.

Final Report will Address Wider Factors affecting Broadband in Ireland

Here the interim report outlines a number of issues that will be further examined and dealt with in the final report. It will be published by the end of 2003 and will address the causes of deficiencies in, and negative sentiment towards Ireland's broadband market. A brief introduction of the issues to be examined follows:

Is Ireland's Telecoms Infrastructure Adequate?

In the final report it will be necessary to consider targets that are realistic for existing infrastructure, and to suggest the nature of any upgrades required. At the time of writing, the TSG considers that the technology solution best placed, in the short-term, to deliver nationwide broadband service is DSL, due to the penetration of the fixed network. Wireless and satellite technologies also have real potential to deliver broadband services widely. An initial review of existing networks is summarised as follows:

- **Mobile infrastructure**

This is generally on a par with other developed countries in Europe and world-wide. In addition, 3G roll-out looks likely to occur at a pace comparable to most peer economies.

- **Cable infrastructure**

Current cable infrastructure has been upgraded for the provision of digital television programme distribution but is, in the main, unsuited currently to the provision of broadband services. Parts of the network are being upgraded for the provision of broadband services; it is envisaged that this process will continue through 2004.

- **Copper telephone network**

This is generally seen as being on a par with most developed countries; although like many infrastructure networks, it will require ongoing investment to meet required standards of service. Overall, the network has a proven suitability for deployment of DSL-type technologies.

- **Main trunk networks**

These are generally seen as having adequate capacity, both in terms of international connectivity and in the context of coverage of most major population centres.

The Level of Investment Required

It is likely that most investment in advanced telecom service provision and the associated infrastructure requirements will be made by current operators and potential new entrants, with a catalytic role being played by government. An Ovum analysis, which was prepared for ComReg, has estimated the costs of various scenarios of broadband service speeds and market take-up (see summary in Annex 4).[9] Given the high roll-out costs indicated by the analysis, the TSG believes that scalable technologies, with relatively small capital expenditure and predictable marginal costs, represent the best commercial option for operators in the short-term.

Regulation

Investment by a firm is a function of confidence and stability, both of which are largely affected by the regulatory environment. In the final report, the TSG will consider regulatory policy including how it could be structured to effectively promote a competitive market and, in particular, how regulatory policy can ensure an appropriate margin to allow effective competition, while allowing the absolute price level to be determined by market forces.

Government Telecoms Policy

Strategic investments by Government, if properly apportioned, can generate returns to society over the long term. The Government is currently rolling out 19 metropolitan fibre rings, under the Regional Broadband Programme. The final report will consider how government and industry can optimise the benefits of this strategic investment and so support the development of a fully competitive telecoms market.

[9] ODTR 02/79, September 2002

Annexes

ANNEX 1A	Estimating the Number of Broadband Subscribers
ANNEX 1B	Broadband Service Trigger Points
ANNEX 1C	Broadband Information Website
ANNEX 2A	Summary of Research on Economic Impact of Broadband Services
ANNEX 2B	Principal Uses of the Internet
ANNEX 3A	Broadband Penetration Rates for Various Countries
ANNEX 3B	Broadband Subscriber Numbers in Ireland
ANNEX 3C	Launch Dates of DSL Services in Various Countries
ANNEX 3D	Telecommunications Infrastructure
ANNEX 3E	Ireland's Settlement Pattern
ANNEX 3F	Prices of DSL Services in Various Countries
ANNEX 3G	Broadband Pricing and Demand
ANNEX 4	Summary of Research on Broadband Investment
ANNEX 5	Acknowledgements
ANNEX 6	Membership of Telecoms Strategy Group

ANNEX 1A – Estimating the Number of Broadband Subscribers

The Short-Term Size of the Irish DSL Market Lies in the Range of 66,000 to 179,000 Subscribers – 125,000 is a likely outcome within 12 months.

A range of indicators are available to estimate the potential number of DSL subscribers within one year. These indicators can be considered as a short-term or business-as-usual scenario because they do not require any new marketing/demand measures.

- **DSL Availability**
  Eircom has indicated that a DSL service will be available to 1 million telephone lines by the end of 2003.[10] This represents the maximum potential of the DSL market.

- **Households Upgrading to DSL**
  34% of households in Ireland are estimated have internet access.[11] If it is assumed that there are 1.36 million households, this is equivalent to 462,000 residential subscribers who already have (a) a home PC and (b) a telephone connection.

  According to market research, 16% of consumers (household sector) are extremely or very likely to subscribe to broadband at a price of €50. Therefore, if these dial-up subscribers decided to up-grade to DSL, this would result in 74,000 DSL residential subscribers.

- **SME Subscriptions to DSL**
  A proportion of SMEs, which comprise 90% of Irish enterprises, could be expected to switch from their current internet service to flat-rate, high-speed DSL internet access. On the assumption that there are 172,000 SME telecoms subscribers, it is possible to estimate a range of broadband uptake by SMEs.[12]

  Projection 1: Upgrading to DSL from Dial-Up/ISDN

  - 85% of SMEs have internet access: 146,000 SMEs
  - 79% of these access the internet via dial-up (i.e. 60%) or basic ISDN (i.e. half of the 39% on basic, fractional and premium ISDN): 115,000 SMEs
  - Therefore, 115,000 SME subscribers would find a DSL service more attractive or comparable (in terms of cost/price) than their existing service.

  Projections 2: Market Research on SME Demand

  - Market research has indicated that 61% of SMEs are extremely likely to subscribe for a price of €50 per month. [13]
  - Therefore, 105,000 SMEs will purchase DSL subscriptions.

- **Leased Line Subscribers Switching to DSL**
  There were 22,000 leased lines in the country by end-March 2003; about 90% of these leased lines have the capacity of providing only dial-up/voice services.[14] Therefore, approximately 20,000 leased lines offer a similar bandwidth to DSL but at a higher price. These 20,000 subscribers would be better served by DSL for internet access.

- **ISDN Subscribers Switching to DSL**
  ISDN connections are mainly used for internet access. Basic ISDN subscribers are considered to be very likely to switch to DSL because DSL offers more speed for a lower, flat rate fee. There

[10] Eircom press release, 2 April 2003
[11] ODTR, 02/79, September 2002
[12] No. of SMEs from Small Firms Association
[13] ODTR, 02/79, September 2002
[14] ODTR, 02/79, September 2002

were 46,300 basic ISDN subscribers at the end of 2002.[15] This would suggest a likely DSL subscriber market of 46,300.

Low-end Projection
The lower end of the market size is estimated by assuming that only the basic ISDN subscribers and leased line subscribers will switch to DSL, i.e. 66,300

High-end Projection
The upper end of the range is estimated by assuming that a combination of 74,000 home subscribers and 105,000 SME subscribers will subscribe to DSL, i.e. 245,000. (This estimate could include some double-counting.)

Nonetheless, a reasonable assumption could be 125,000 DSL subscribers within 1 year without any additional demand measures. This corresponds to a broadband population penetration rate of 3.2% on the assumption of a population of 3.9 million or 9% of households by mid-2004.

[15] ComReg information

ANNEX 1B – Broadband Service Trigger Points

A trigger point is the number of subscribers in a locality that a service provider needs to cover its costs of providing the broadband service. When a trigger point is reached, the service provider can install/activate the equipment to provide the service, with the knowledge that there are a sufficient number of customers.

The TSG recommends that each service provider communicates a trigger point for localities, in which they operate or intend to operate, by end-September to DCMNR. The information provided should include:

(a) county

(b) name(s) of the locality served (e.g. townland, village, town);

(c) description of service: DSL; Cable Modem; Fixed Wireless, Mobile Wireless, Satellite, etc.

(d) the 'trigger point' – i.e. the number of subscribers in a locality that a service provider considers economically viable to provide the broadband service

The trigger points for each locality should also be included on a public information website.

ANNEX 1C – Broadband Information Website

The independent information website about broadband services should target key-advisors of the general public and SMEs/small offices. Key advisors of the general public/SMEs include: chambers of commerce, libraries, local authorities, accountants, solicitors, local business leaders, local celebrities, and local community leaders. The existence of the website must be communicated to the key advisors in the locality, through media or meetings.

The website should provide the following information to the general public in simple, user-friendly terms:

- general information about the different types of broadband services (i.e. DSL, cable, fixed wireless, mobile wireless), including advantages and disadvantages of different broadband options;
- case studies/examples of the benefits to different users arising from the use of broadband services;
- a simplified summary or calculator of the current service offerings by service providers, indicating
    - data speed of service;
    - monthly subscription fee;
    - any additional fees;
    - once-off, set-up equipment costs;
    - whether any additional services are provided.
- arranged by locality, a list of the different broadband services available to users in that locality.

The TSG recognises that many people do not have access to the internet. Therefore, the TSG recommends that a telephone helpline should be established that provides the same information as the information website and that service providers consider jointly resourcing this initiative on a temporary basis.

ANNEX 2A – Summary of Research on Economic Impact of Broadband Services

A limited amount of research into the potential macroeconomic benefits of widespread broadband adoption has been carried out. The US Department of Commerce has summarised some of these findings: [16]

- The Brookings Institution has estimated that widespread, high speed broadband access would increase US GDP by US$500 billion annually by 2006. This is equivalent to almost 4% of expected US GDP in 2006.
- A separate Brookings' report estimated that a failure to improve broadband performance could reduce US productivity growth by 1% per year or more.
- A Net Impact Study estimated that internet business process solutions, based on broadband applications, would produce US$373 billion in cost savings by 2005, and more than US$500 billion by 2010.
- In addition, the Net Impact Study also estimated that internet based solutions could account for 48% of the projected US productivity growth rate by 2010 and 30% of the projected European productivity growth rate by 2010.

In addition, local economic benefits resulting from greater broadband deployment and usage have been cited by the US Department of Commerce including:

- job creation,
- reduced traffic congestion,
- industrial growth,
- more productive research and development, and
- increased entrepreneurial activities.

[16] 'Understanding Broadband Demand', US Department of Commerce, September 2002

ANNEX 2B – Principal Uses of the Internet

Use of Internet	Share of Users
Consumers	
Information Search/Researching	**69%**
Email	**60%**
Travel/Leisure Information	**27%**
Entertainment	**17%**
Music Listening/Downloading	**17%**
SMEs	
Email/Communications	**76%**
File/Document Transfer	**45%**
E-Commerce Transactions	**42%**

MRBI Research for the Information Society Commission, October 2002

ANNEX 3A – Broadband Penetration Rates for Various Countries

Country	*Broadband Subscribers per 100 Inhabitants June 2002*
Korea	19.2
Canada	10.3
Sweden	6.8
Denmark	6.7
Belgium	6.3
USA	5.8
Japan	4.0
Australia	1.4
UK	1.3
New Zealand	1.1
EU Average	2.3
OECD Average	3.9
Ireland (March 2003)	0.3

'OECD Communications Outlook 2003', OECD, June 2003

ANNEX 3B – Broadband Subscriber Number in Ireland

Broadband Format	*As of end-March 2003*
DSL (Digital Subscriber Line)	3.850
Cable Modems	3,000
Fixed Wireless	5,000
Total Broadband Subscribers	11,850

ComReg, 03/67b, June 2003

ANNEX 3C – Launch Dates of DSL Services in Various Countries

Country	DSL Service Launch Date
Canada	**1996**
US	**1997**
Korea	**April 1999**
UK	**July 2000**
Sweden	**September 2000**
Japan	**September 2000**
Ireland	**May 2002**

'The Development of Broadband Access in OECD Countries', OECD, 2001

ANNEX 3D –Telecommunications Infrastructure

Exchanges enabled for DSL– May 2003

Dublin Area

Beggarsbush, Blanchardstown, Ballyboden, Belcamp (Coolock), Bray, Cabra, Celdbridge, Clondalkin, Clontarf, Coolock, Crown Alley , Crumlin, Custom House, City West, Dolpins Barn, Dundrum, DunLaoghaire, Finglas, Greystones, Lucan/Ballydowd, Leixlip, Merrion (Square), Malahide, North Main (north city centre), Nutley, Palmerston, Phibsboro, Priory Park (Stillorgan), Rathmines, Rochestown, Santry, Ship Street (city centre), Shankhill, Sandyford, Sandyford RSU, Swords, Summerhill, Sutton, Tallaght, Terenure, Walkinstown, Whitehall, Dublin Airport.

Outside Dublin

Arklow, Athy, Ballina , Ballinasloe, Ballincollig, Bandon, Carrick On Shannon, Castlebar, Castletroy, Churchfield (Cork), Clonmel, Cork Central, Dennehys Cross (Cork), Dooradoyle, Douglas, Drogheda, Dundalk, Ennis, Enniscorthy, Gorey, Kilkenny, Killarney, Limerick (Roches St.), Listowel, Mallow, Mervue, Naas, Navan, New Ross, Portlaoise, Quaker Rd (Cork city), Rathedmond, Roslevin (Athlone), Shannon, Shannon Airport, Shantalla (Galway city), Sligo HPO, Thurlus, Tralee, Tuam, Waterford, Wellington Rd, Westport, Wexford, Wicklow,…

Exchanges being enabled

Ashbourne, Athlone, Balbriggan, Chardavin (Limerick), Carlow, Cavan, Clane, Clonmel, Cobh, Cork central, Dunboyne, Dunshaughlin, Foxrock, Galway, Glanmire, Hettyfiel (Cork), Kilkenny, Kinsale, Letterkenny, Lomgford, Lucan, Macroom, Maynooth, Midleton, Monaghan, Mullingar, Navan, Nenagh, Newbridge, Newlands Cross, Newmarket, Portmarnock, Rathcoole, Rush, Skerries, Thurles, Trim, Tullamore, Tycor (Waterford)….

Broadband Access Network

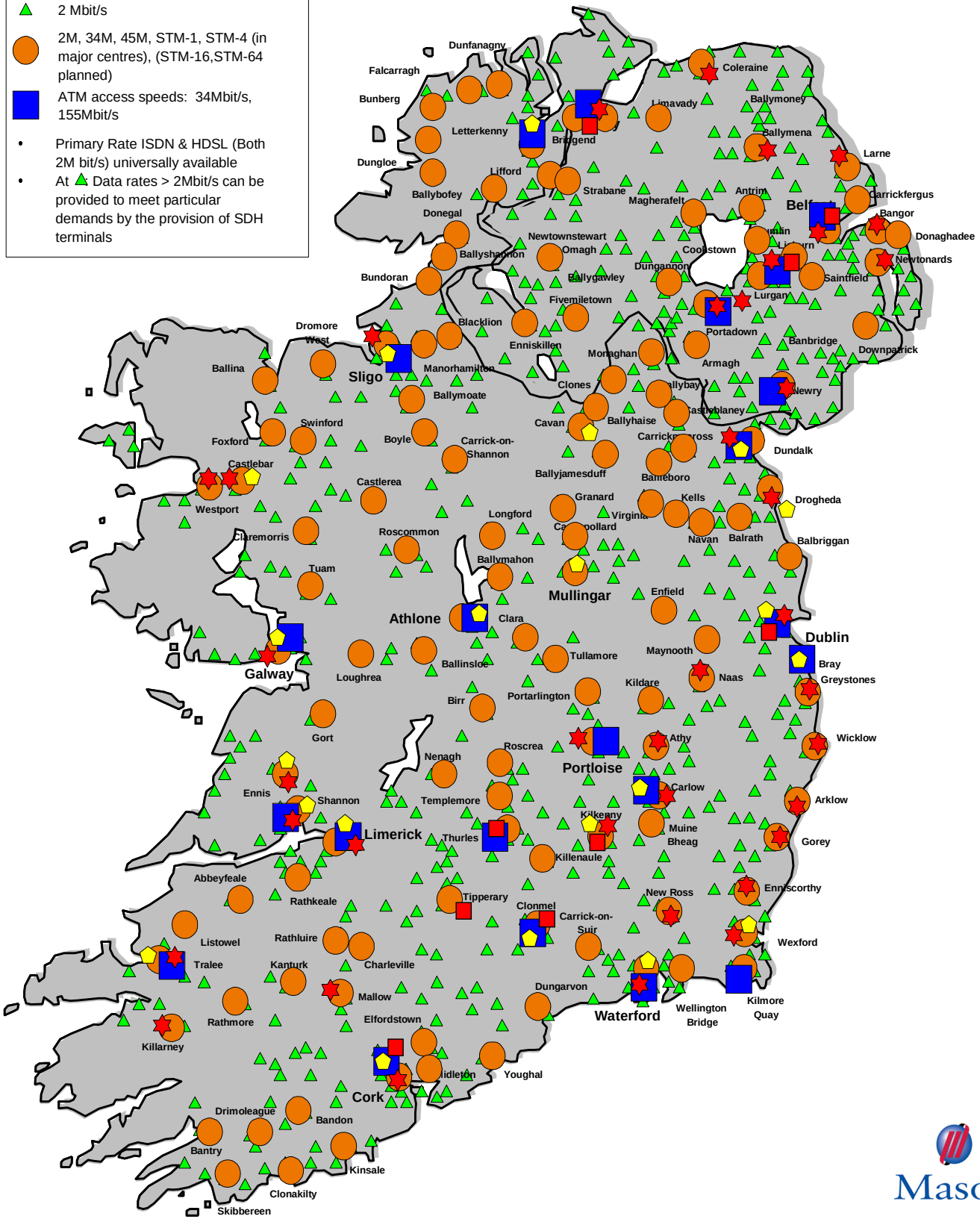
These illustrative maps have been commissioned by TIF & the Dept of Communications, Marine & Natural Resources and were developed by Mason Communications reflecting Ireland's telecoms infrastructure in April 2003.

- Optical Fibre Node
- SDH Node
- ATM Node
- ADSL Enabled Exchange
- IP Node
- CATV Broadband Availability

NB: multiple nodes in the larger centres are represented by a single icon (e.g. Dublin has >20 ATM nodes)

Access Speeds Available

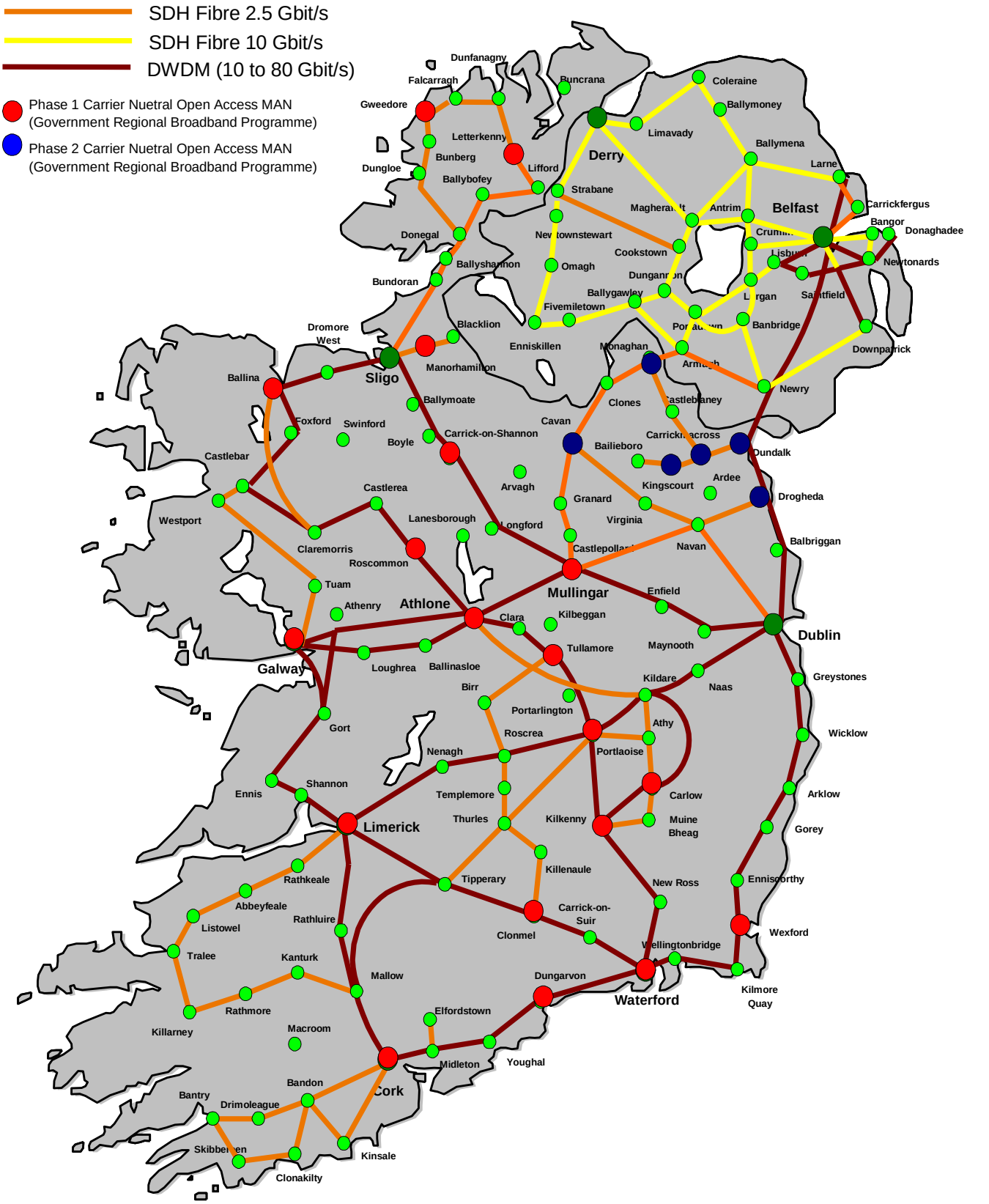
- 2 Mbit/s
- 2M, 34M, 45M, STM-1, STM-4 (in major centres), (STM-16,STM-64 planned)
- ATM access speeds: 34Mbit/s, 155Mbit/s
- Primary Rate ISDN & HDSL (Both 2M bit/s) universally available
- At Data rates > 2Mbit/s can be provided to meet particular demands by the provision of SDH terminals



Mason

Broadband Backbone Network

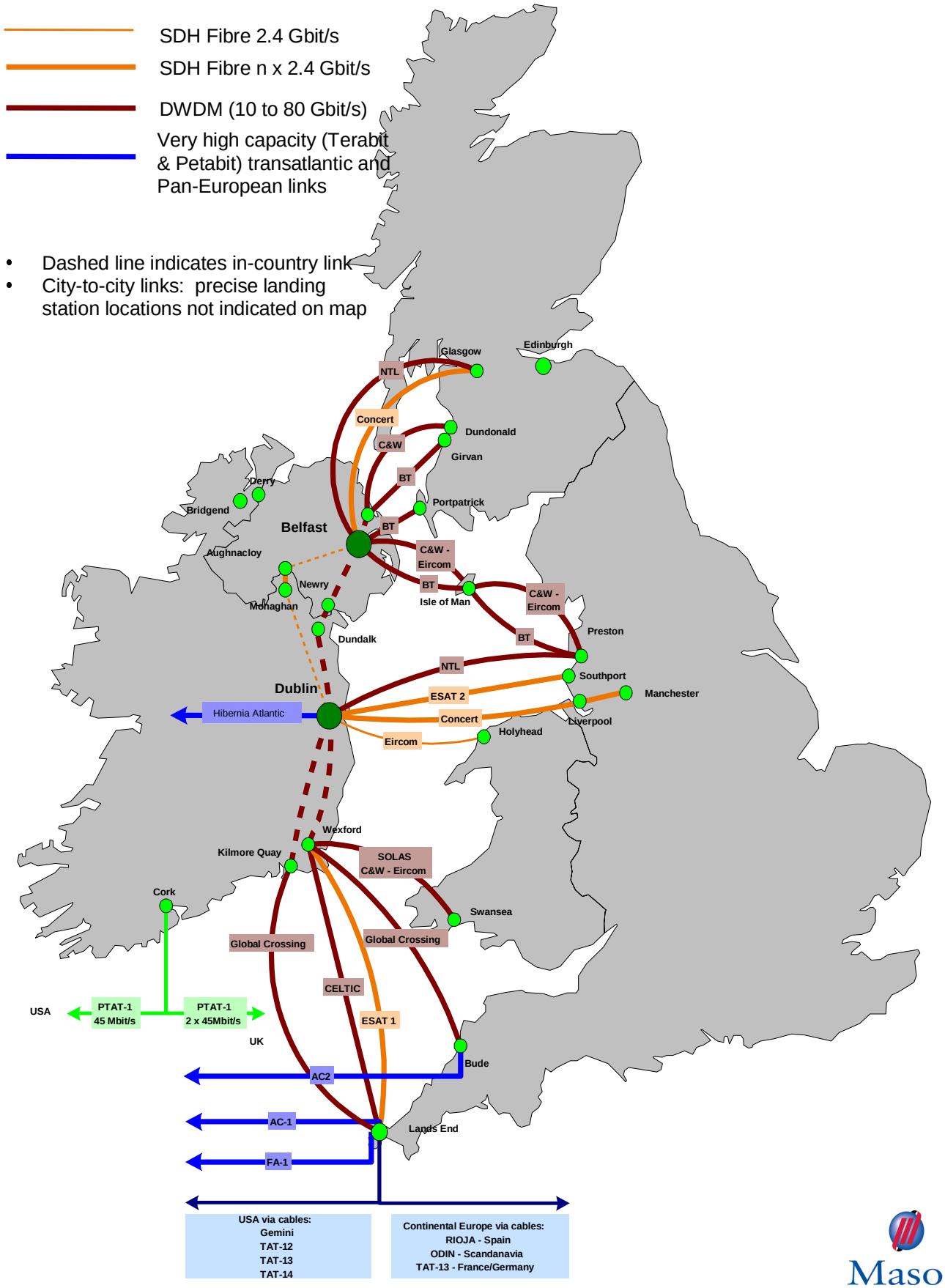
These illustrative maps have been commissioned by TIF & the Dept of Communications, Marine & Natural Resources and were developed by Mason Communications reflecting Ireland's telecoms infrastructure in April 2003.



- Highest capacity link shown for each route
- Many sections have several links of given capacity

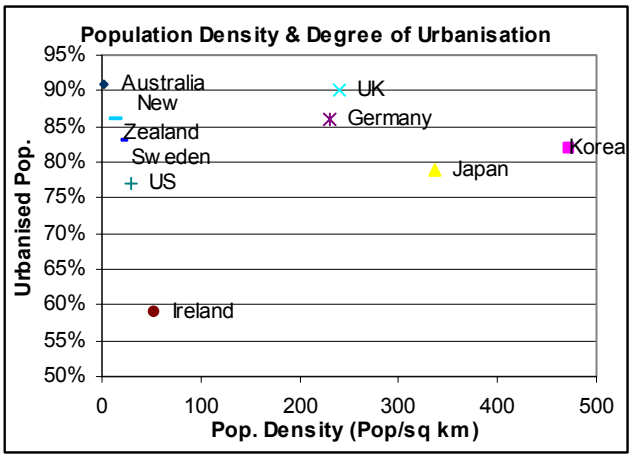
International Links

These illustrative maps have been commissioned by TIF & the Dept of Communications, Marine & Natural Resources and were developed by Mason Communications reflecting Ireland's telecoms infrastructure in April 2003.



ANNEX 3E – Ireland's Settlement Pattern

Ireland has a combination of relatively low population density and low urbanisation, as compared to other countries (see below). Partly as a reflection of this, Ireland has a high ratio of local exchanges to telephone lines. In addition, a larger share of the population is located in rural areas that may be beyond the range of standard DSL services or cable-modem networks.



ANNEX 3F – Prices of DSL Services in Various Countries

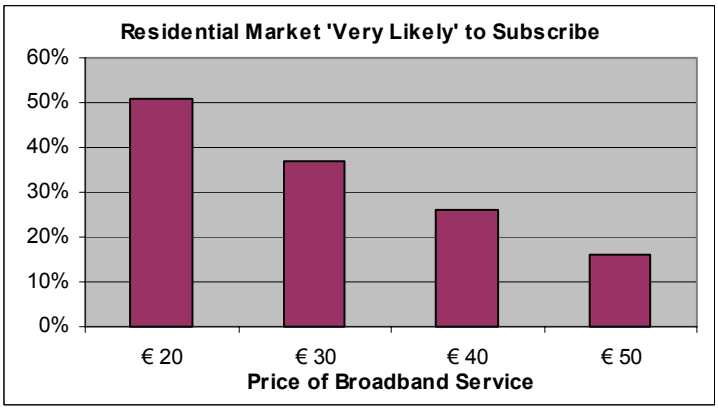
The price levels below are indicative. It should be noted that the prices refer to products with differing speeds and/or contention ratios and should not be viewed as a like for like comparison.

Country	DSL Price Range (early 2003)
Japan	**€19-€34**
Korea	**€19-€24**
Singapore	**€24-€35**
New Zealand	**€33**
USA	**€33-€51**
Australia	**€37-€57**
UK	**€39**
Germany	**€40**
Sweden	**€41**
Spain	**€45**
Ireland (May 2003)	**€50-€55**

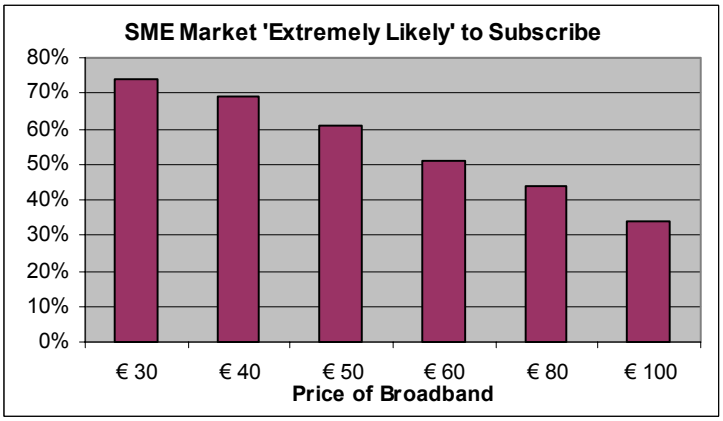
ANNEX 3G – Broadband Pricing and Demand

MRBI has conducted market research analysis on behalf of ComReg to estimate demand for broadband services in Ireland.[17]

In respect to the residential sector, it concluded that the price range of €30-€40 per month for broadband services represented a key level to stimulate significant interest in broadband. The following graph shows the shares of the residential market that are extremely likely or very likely to subscribe to broadband at different price levels.



In relation to the SME sector, a broadband monthly package in the range of €40-€60 would attract significant interest. The following graph shows the shares of the SME market that are extremely likely to subscribe to broadband at different price levels.



[17] ODTR 02/79, September 2002

ANNEX 4 – Summary of Costs of Broadband Investment

An analysis of the costs of various scenarios of broadband speeds and market take-up was prepared by Ovum, on behalf of ComReg. A summary of the cost estimates in that report is given below.

Access Speed	'More Likely' Scenario		'Higher Take-up' Scenario	
	Medium Availability & Take Up		**High Availability and Take Up**	
	Total Cost €M	€ Per User	Total Cost €M	€ Per User
512 KB/s	**185**	**697**	**450**	**536**
2 MB/s	**560**	**2,112**	**2,000**	**2,384**
5 MB/s	**2,280**	**8,600**	**4,100**	**5,000**

ODTR 02/79, September 2002

ANNEX 5 – Acknowledgements

Many groups were consulted with during the researching of this report. The TSG would, therefore, like to express its gratitude to those people and organisations that contributed their views and ideas to the preparation of the contents and recommendations of this report. These include:

- Chambers of Commerce of Ireland
- Commission for Communications Regulation
- Consumer Association of Ireland
- Department of Education and Science
- Department of the Environment and Local Government
- Department of Finance
- Enterprise Ireland
- European Commission
- Forfás
- Industrial Development Authority
- Ireland Offline
- Irish Farmers Association
- Irish Internet Association
- Marketing Institute of Ireland
- Small Firms Association
- Telecoms Users Group (IBEC)
- Western Development Commission

In addition, the TSG would like to express its gratitude for the valuable contributions by The Digital Hub, Fluid Rock, and Kratos Ltd.

ANNEX 6 – Membership of the Telecoms Strategy Group

ALTO: Mr Iarla Flynn

Chorus: Mr William Fagan

Telecommunications & Internet Federation: Mr George Young (Co-Chair)

Department of Communications, Marine & Natural Resources: Mr Eamonn Molloy (Co-Chair)

Department of Communications, Marine & Natural Resources: Mr Ciaran O'Cuinn

Department of Communications, Marine & Natural Resources: Mr Niall O'Donnchu

Department of Finance: Mr Paul Byrne

Department of the Taoiseach: Mr Martin Fraser

Eircom: Mr Pat Galvin

ESAT BT: Mr David Taylor

Meteor: Mr Andrew Kelly

NTL: Mr Edward Brophy

O_2: Mr John Gunnigan

Telecommunications & Internet Federation: Mr Tommy McCabe

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