

# All Island Competitiveness

Knowledge  
capital  
channels  
carriers

## INFORMATION & COMMUNICATIONS TECHNOLOGY



**InterTradeIreland**

TRADE & BUSINESS DEVELOPMENT BODY



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# FOREWORD

The economies of Northern Ireland and the Republic of Ireland share the challenge of maintaining and developing their competitiveness positions in an increasingly global market place. Until recently the two jurisdictions faced this challenge separately.

The new political framework established under the Belfast Agreement, 1998, including the North/South Ministerial Council (NSMC), and the greater political and economic stability flowing from the Agreement and its enabling legislation, provides the opportunity to place economic co-operation on a new, more strategic and cohesive plane. The establishment of *InterTradelreland*-the Trade and Business Development Body-as one of six Implementation Bodies offers a new opportunity for supporting the development of enterprise and trade on a North-South basis.

*InterTradelreland* recognises that better, more focused co-operation can provide the opportunity to enhance the efficiency with which scarce economic resources are used and enable the two economies to build up competitive strengths.

To advance this mutual goal of enhanced competitiveness, *InterTradelreland* is publishing this working paper as one in a series of three such papers which look at all-island competitiveness issues in the areas of Information and Communications Technology (ICT), eBusiness and Skills. The general aim of the papers is to explore areas in which a shared vision and a commonality of purpose could lead to collaborative programmes offering genuine competitive advantage for both jurisdictions.

The specific objectives of the series of three reports, as outlined are summarised below:

- **Scoping the supply-side and the demand-side;** analysing existing provision and capability levels;
- **Identification of 'best in class';** examples/case studies of best practice;
- **Review of markets and policies;** assess and describe current market forces and governmental policies/initiatives;
- **Identification of 'border effect';** cross-border barriers to effectiveness and natural market development, unexploited synergies and North and South gaps;
- **Identify areas of enhanced co-operation;** areas where co-operation may improve the competitive performance of the specified sectors;
- **Linkages with wider competitiveness agenda;** consider the integration of competitiveness in each of the relevant areas; and
- **Recommendations;** recommendations and action required by both governments in the various time periods.

In relation to these objectives, the main aim of the present paper is to focus on those areas of ICT, which firstly, have a clearly all-island dimension; and secondly, are mutually recognised as areas requiring development in the future and, as such, represent a priority for policy makers in the coming years.

Finally, we wish to emphasise that this is a working paper designed to initiate debate around crucial competitiveness issues. The views expressed are those of the authors themselves and should not necessarily be construed as those of *InterTradelreland*.

# EXECUTIVE SUMMARY

Information is rapidly becoming the driving force of competitiveness, economic growth, employment and social development. Pervasive, high speed, low cost access to information services is a prerequisite for participation in the information age and the island of Ireland requires widespread low cost bandwidth availability to ensure future competitiveness.

ICT plays a critical role in national competitiveness at all levels from national infrastructure to in-company exploitation. This report assesses the current competitiveness of Northern Ireland and the Republic of Ireland in these areas, identifies the respective strengths of each jurisdiction and proposes recommendations, in co-operation, to enhance the overall competitiveness of the island of Ireland.

The role of ICT is well recognised in both jurisdictions with significant investment programmes in hand. While either Northern Ireland or Republic of Ireland may be stronger in particular areas, both are well behind international best practice in many and this is the real issue in seeking to improve competitiveness. Strategic co-operation between Northern Ireland and Republic of Ireland could improve all-island competitiveness and benefit the whole island.

In terms of provision:

- International broadband connectivity in the Republic of Ireland is excellent, and the Irish government's partnership with Global Crossing is an excellent example of strategic telecoms planning in setting a vision and delivering it through public/private partnerships. International connectivity in NI is currently routed through GB. However, the same access principles have not been applied to the internal backbone and broadband coverage is uneven, with local access restricted by delays in unbundling the local loop, particularly in Republic of Ireland;
- Mobile penetration rates are similar in Northern Ireland and Republic of Ireland, with Republic of Ireland usage costs greater and the issue of Third Generation (3G) licences is significantly behind schedule there. Rollout of interactive television and 'always-on' Internet connections through digital television is not progressing in the ROI as envisaged;
- There is a wider range of suppliers and services available in Northern Ireland than in Republic of Ireland and Northern Ireland is in a stronger competitive position in terms of suppliers and services availability as a result; and
- Republic of Ireland is up to best European practice in use of PCs and business Internet access and Northern Ireland is progressing rapidly to close the gap. There is a much better provision of data centres in the Republic of Ireland (19), with just one BT data centre which offers a complete package (Internet Service Provider (ISP), Applications Service Provider (ASP), security and hosting services) open for business in Northern Ireland and seven others which offer a variety of data hosting services.

The biggest barriers to the adoption of eCommerce are a lack of appropriate skills and inadequate bandwidth in the regions. Evidence suggests that companies may not be fully aware of the immediate business benefits.

In terms of tariffs, while Republic of Ireland is more competitive in national, international and leased lines, Northern Ireland is cheaper for mobile calls and offers flat rate unmetered Internet access.

Both Northern Ireland and Republic of Ireland have defined strategies for competitiveness in eCommerce and supporting ICT. Greater harmonisation of national regulatory authorities' implementation of European legislation could help drive down costs and increase access. Various models exist of best practice in co-operation, education, learning, etc., and these can be built upon in developing strategies to improve competitiveness.

A lack of telecoms infrastructure in regions, a shortage of service providers in the local loop, delays in the rollout of new technologies and opaque cross-border pricing policies will hinder all-island competitiveness. Action is required to ensure that the island of Ireland does not fall behind best practice and Northern Ireland and Republic of Ireland can increase competitiveness by working together.

This report proposes initiatives to enhance the island's overall competitiveness.

### **Telecoms Actions**

- A co-ordinated approach should be taken to infrastructure planning in both jurisdictions to ensure that:
  - An overview is taken of the key gaps in provision, priorities for investment and cross-border synergy opportunities; possibly facilitated by plans in each area having common sections dealing with cross-border issues;
  - Rollout is extended beyond the current commercially viable areas in order to improve access to broadband and prevent the growth of regional 'digital divides', particularly in cross-border areas. The delivery of affordable broadband access is of high relevance to the social as well as the business agenda. Public/private partnerships are one mechanism by which this could occur;
  - Consistent planning of telecoms infrastructure occurs between local authorities in each jurisdiction and in cross-border areas, to encourage telecoms operators to share infrastructure costs and minimise environmental impacts; and
  - National guidelines are agreed for telecoms infrastructure planning in Republic of Ireland, as well as a common approach to infrastructure sharing by local authorities and telecoms operators.
- Government departments in Northern Ireland and the Republic of Ireland should ensure harmonisation of regulations within the island of Ireland, within the constraints posed by differing OFTEL / ODTR regulatory regimes and telecoms being a reserved matter for Department of Enterprise, Trade and Investment in Northern Ireland. This parallels the EU move to co-ordinate regulation within Europe.

### **Information Technology**

- The slowness of industry, particularly SMEs, to exploit IT is a key all-island competitiveness gap requiring further co-operative investigation taking account of the views of industry, north and south. To address this:
  - Research should be conducted by sector, location and scale to obtain feedback from industry on priorities, barriers and opportunities, etc.;
  - Root cause analysis should be carried out on the reasons for slowness in uptake; and
  - Ongoing benchmarking within the island and versus external best practice should be carried out, focusing on performance and the lessons to be learned;
- Governments should act to increase IT education generally and provide universal access to IT to address the risk of a growing 'digital divide'. Thus:
  - An all-island-training programme should be developed for SMEs, which promotes IT and increases their desire to move up the connectivity chain and develop eBusiness opportunities, thus helping to stimulate demand in the end users; and
  - A co-operative education programme should be developed to communicate to consumers an understanding of, and the benefits from, IT including a basic IT familiarity course for workers and the unemployed.

**Cross-cutting Themes.**

- The government initiatives which led to this unique study of all-island competitiveness should be developed to provide an ongoing focus for action to address gaps versus best practice and business needs, and to avail of synergy opportunities.
- Actions should be taken to promote transparency of cross-border mobile tariffs and educate the consumers on the real cost of mobile telephony packages, e.g. development of websites such as b4Ucall.com.
- A joint All-Island Business Directory Information Service would improve availability of information and provide further publicity for existing businesses throughout the island, as would easy access to the online directories of each jurisdiction.

InterTradelreland's role should be to co-ordinate and monitor the implementation of the above recommendations, acting as a facilitator for the respective governmental departments and agencies that will be involved.

# 1 INTRODUCTION

## 1.1 CHALLENGES FACED BY BUSINESS TODAY

The last three years have witnessed an explosion in eBusiness, flexible communication and remote computing. As organisations increasingly trade and exchange information electronically, services such as remote dial-up, audio- and video-conferencing, e-mail, mobile voice and data, intranets and extranets have led to a requirement for ever-increasing amounts of bandwidth. Subsequently, greater demands have been placed on the physical delivery infrastructure.

Having timely access to the right technology and supporting infrastructure is a critical factor in competitiveness and, in some cases, the ability to trade at all.

The next three years will see the demand for bandwidth multiplying with the availability of powerful applications through Windows 2000, the advent of 3G mobile communication, Bluetooth (a low cost wireless connection between PCs, mobile phones and other devices), unified messaging, digital subscriber lines and ever-increasing Internet usage. Business will become ever more reliant upon technology and the requirement for highly secure and highly resilient delivery systems will be paramount.

A key issue will be to ensure that Ireland, North and South, is seen to be at the forefront of technology in order to sustain competitiveness. Businesses will need to be convinced that new technologies can be quickly and easily deployed and that skills are readily available.

## 1.2 INTEGRATION INTO THE WIDER COMPETITIVENESS AGENDA

Telecoms and information technology play a critical role in national competitiveness at all levels from national infrastructure to in-company exploitation.

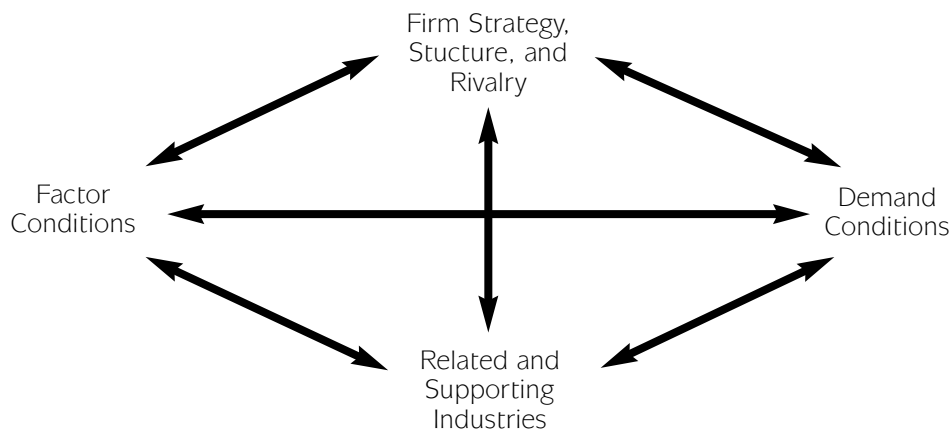
This section of the report assesses how telecoms and IT fit into the wider competitiveness agenda in terms of what is competitiveness, how it is assessed and the issues which impact upon it.

### 1.2.1 What is competitiveness?

The national infrastructure plays a key role in competitive performance at company level.

Competitiveness at company level is greatly influenced by the national infrastructure in which companies operate and the interplay between the various determinants of competition is illustrated below.

**Figure 1.1 The Determinants of National Advantage<sup>1</sup>**



<sup>1</sup> Source, M.Porter, *The Competitive Advantage of Nations*, London: Macmillan Press, 1990.



Competition applies in any country at up to four levels from country to industry to firm to product level with competitive performance at each level being an agglomeration of that at the level below.

At each level, three different aspects of competitiveness can be identified<sup>2</sup>, and telecoms and IT contribute at each of these:

- Potential - the capability and capacity to compete;
- Performance - the end results of competition; and
- Process - the organisational and administrative framework that permits the competitiveness potential to be achieved in terms of performance.

### **1.2.2 How is competitiveness measured?**

Telecoms and eBusiness are a key competitiveness priority.

The National Competitiveness Council's (NCC's) *Annual Competitiveness Report 2000* identifies 7 competitiveness priorities with 33 indicators to 'provide the backdrop for the main issues that are facing the Irish economy at present and into the future'. Telecoms and eBusiness are key priorities in themselves and as inputs to other factors such as productivity and export performance.

<sup>2</sup> Peter Buckley et al. 'Measures of International Competitiveness: A Critical Survey' *Journal of Marketing*, 1988

## Key Competitiveness Indicators

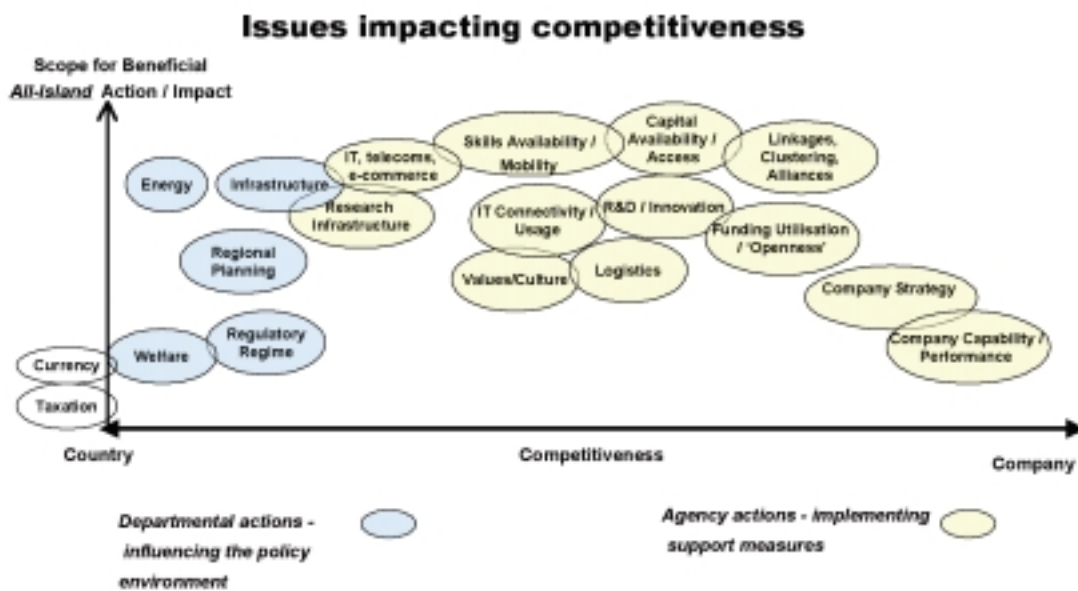
Priority	Indicator
Social Partnership	GDP per capita/EU GDP per capita Income inequality ration: share of richest 20% to poorest 20% Standard Unemployment Rate
People	School expectancy for a 5-year-old child Net enrolment in tertiary education (% age 18-21) Science and engineering degrees awarded as per cent of total degrees Total tax wedge (single person) Female activity rate (% pop., 15-64)
Costs	Unit labour costs in the total economy (% increase) Interest rate spread (absolute) Industrial electricity prices (large users) Building costs (offices) Producer prices Consumer prices (annual change)
Infrastructure	Average time commuting to and from work Rail infrastructure indicator Road infrastructure indicator
Telecommunications and eBusiness	Internet hosts per capita Mobile subscriptions per capita 2 Mbit/s leased lines national circuits (annual rental, 100 km) Internet use (30 mins) Cost of calls: business basket OECD national (GSM) mobile basket
Competition and Regulation	Overall regulatory environment
Science and Technology	Business R&D expenditure as per cent of GDP Inventiveness coefficient (resident patent applications per capita) ICT expenditure as per cent of GDP
Economic Environment	Productivity (annual average change) Non-residential fixed investment as per cent of GDP Export performance for total goods (% change from last period) FDI inflow as per cent of GDP FDI outflow stock as per cent of GDP Cumulative venture capital raised as per cent of GDP

### 1.2.3 Issues impacting competitiveness

#### Telecoms and IT have a role to play at country and company level.

The illustration below highlights how telecoms and IT fit within the range of issues that impact on competitiveness along a spectrum of 'country' to 'company' impact. They offer significant scope for beneficial all-island impact in terms of both the national infrastructure and the ability of individual firms to exploit this infrastructure.

Figure 1.2 Issues Impacting Competitiveness



### 1.3 FOCUS OF THIS REPORT

InterTradeIreland recognises that better, focused co-operation can provide the opportunity to enhance the efficiency with which scarce economic resources are used and enable the economies of Northern Ireland and the Republic of Ireland to build competitive strengths.

This report examines the areas of ICT. The report is based on a comprehensive review of a wide variety of publications available prior to August 2001, public statements and the expertise of the consultants, together with interviews with InterTradeIreland management and the Republic of Ireland Director of Telecommunications Regulation, Etain Doyle. Information was also sought from agencies such as Industrial Research Technology Unit (IRTU) and Leapfrog, the Information Age Initiative in Northern Ireland.

The report addresses the topic under headings as below:

- Provisions in telecoms and IT;
- Capabilities in telecoms and IT;
- Market forces and governmental policies;
- The border effect and areas for enhanced co-operation;
- Integration into the wider competitiveness agenda; and
- Recommendations for improvements in all-island competitiveness.

## 2. EXISTING PROVISIONS

The role of ICT is well recognised in both jurisdictions with significant investment programmes in hand. While international connectivity is excellent, broadband coverage throughout the island is uneven with local access restricted by delays in unbundling the local loop. While either Northern Ireland or Republic of Ireland may be stronger competitively than the other in particular areas, they are both well behind international best practice in many and this is the real issue. Strategic co-operation between Northern Ireland and Republic of Ireland could improve all-island competitiveness and benefit the whole island.

This section of the report examines the provisions (i.e. supply-side - the current technology and availability) and section three covers the capabilities (i.e. demand - the ability of businesses and users to exploit these provisions) in the areas of information and communications technology on the island of Ireland.

### Overview

A universally accessible broadband network is essential to business success. The Internet can only provide access to the global marketplace if businesses can connect to a network that is of sufficiently high speed, high quality, reliable and reasonably priced.

If a nation wants to participate and prosper in today's global economy, it will need to ensure that ICT is available and accessible to all segments of the population. This is the key message from a new IDC/World Times Information Society Index. This index measures variable in 55 countries under 4 different headings: computer, information, Internet and social. The Republic of Ireland is ranked 9th of 14 EU countries measured and the UK is ranked 5th (no separate data on Northern Ireland).

**Figure 2.1 IDC/World Times Information Society Index<sup>3</sup>**

EU ranking	Country	World ranking
1	Sweden	1
2	Finland	3
3	Denmark	5
4	Netherlands	7
5	UK	12
6	Germany	13
7	Belgium	15
8	Austria	16
9	Ireland	19
10	France	21
11	Italy	23
12	Spain	24
13	Portugal	26
14	Greece	29

<sup>3</sup> ISC, *Third Report of Ireland's Information Society Commission*, December 2000

There appear to be no fundamental differences in the development policies of governments North and South. Both jurisdictions have invested in the same processes of infrastructure, education, training and connectivity. While there has been more public investment in the South, this money has primarily gone to build the infrastructure that Northern Ireland had already developed under the European STAR programme<sup>4</sup>.

Both jurisdictions recognise the role of ICT in opening up enormous possibilities for rural and regional areas and have a stated strategic aim of ensuring that all parts of the island have access to cheap high speed communications networks. More recently, fuelled by strategic take-overs of private companies, an all-Ireland network has begun to develop.

However, late delivery of leased lines, a lack of telecoms infrastructure in regions, (particularly in the west and close to the border) and high costs for broadband have all been cited in numerous reports as major reasons why the regions of the Republic of Ireland are still not competitive. A recent study published by the Cork Chamber of Commerce found that there was a 7% differential in broadband costs between Cork and those of Dublin and UK regional cities<sup>5</sup>.

The overall penetration of mobile telephones on the island is high, and has grown considerably over the last two years. However, the costs of mobile calls in the Republic of Ireland are among the highest in Europe, and the use of mobile phones across the border on a day to day basis proves extremely costly with different mobile phone licences in the North and South.

For the purposes of research, the areas examined have been split into 'wired' and 'wireless' telecoms, service providers and information technology.

## **2.1 WIRED TELECOMS**

Broadband connectivity is essentially a high-speed telecoms link and can be described in terms of the island's international connectivity, the island backbone and finally local access. Each of these is discussed separately below.

### **2.1.1 International connectivity**

The capacity capable of being delivered to the end user is excellent and already being increased. However, it is constrained by the weakest link in the chain and such huge connectivity is only of use if supported throughout the network.

There is now virtually unlimited capacity from the island to Europe and the US as shown in Figure 2.2.

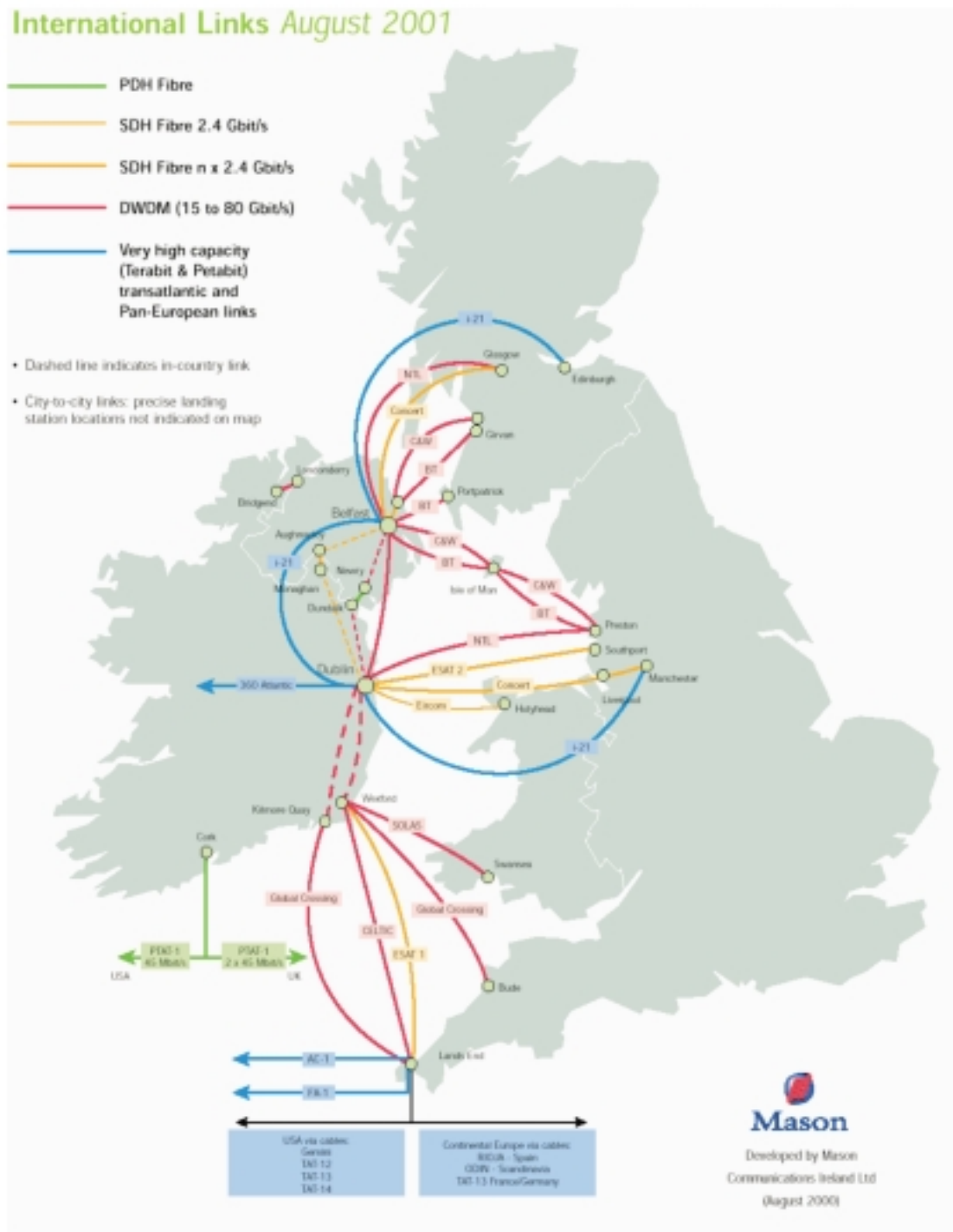
The Global Crossing project was part-funded by the Irish government, and involved 160 STM-1 links and dark fibre to the US and 36 European cities. Almost all of these lines have been sold to telecoms operators and ISPs. This network was ready for commercial service in August 2000. In June 2001, it was announced that a further agreement between Global Crossing and the Republic of Ireland will cut high speed Internet costs with Europe and link Ireland to additional key European, US and Asian cities. In bandwidth terms this announcement represents a 1,000-fold increase in the reach of the Republic of Ireland's 1999 deal with Global Crossing.

The provision by 360 Networks of high-speed direct connectivity to European destinations and the US involved the laying of 12,200 km of transatlantic fibre. The ring connects Dublin to Canada, and Liverpool, where it then ties in their European network. However the very recent demise of 360 Networks may impact on the island's international connectivity as ownership of the fibre has yet to be decided. International connectivity from Northern Ireland is routed through GB, and the UK regulator Oftel does not allow for differential pricing.

<sup>4</sup>Centre for Cross Border Studies, *North-South Co-operation on Information and Communications Technologies*, July 2000.

<sup>5</sup>Cork Chamber of Commerce, *IT and Communications Committee*, March 2000.

Figure 2.2 International Links 2001



This city-to-city connectivity to all the leading industrial centres provides a universally accessible, highly resilient and competitively priced service across the globe. But that wealth of internal connectivity has not yet realised its full benefits due to the lack of an effective internal backbone network.

### 2.1.2 Backbone

Broadband coverage is uneven throughout the island but plans are in place to address this North and South, including a number of cross-border links. There is a concern, particularly in Republic of Ireland, that a lack of interest by the telecoms operators may delay the development of an all-island backbone.

**Recommendation:** Implement plans with a clear commitment to extend rollout beyond current commercially viable areas, to prevent the growth of regional 'digital divides', particularly in cross-border areas.

Broadband is available unevenly throughout the island (see Figure 2.3). Coverage is better in Northern Ireland than Republic of Ireland and 34% of Republic of Ireland companies indicate difficulty in accessing broadband services<sup>6</sup>. ODTR, . Future developments in Northern Ireland will address the majority of coverage issues there, while the Republic of Ireland government has recently publicised investment plans to address access in the rural areas (see Figure 2.4). Progress has also been made in the development of an all-island network, with three new cross-border links.

Measure	Northern Ireland	Republic of Ireland	European Best Practice
Backbone	100% digital, 100% fibre.	98% fibre	
Broadband Coverage into local exchanges	95% by the end of 2003	77% coverage (Mayo and Donegal lack coverage <sup>7</sup> )	
Households with broadband connections	37% in UK in 2004	23% in 2004.	47% in Norway 2004.

The 'backbone' network transports information between major population centres. Its infrastructure comprises fibre optic and digital radio links necessary to support transmission systems such as Synchronous Digital Hierarchy (SDH) and Plesiochronous Digital Hierarchy (PDH). These transmission systems then provide the necessary reliable infrastructure to deliver services such as Asynchronous Transfer Mode (ATM), voice, Internet and Frame Relay to the end user.

The capacity of broadband networks is described by the rate of transmission or bandwidth, measured in bit/s. The minimum capacity of broadband, and that most commonly described, is 2 Mbit/s (residential users avail of a 500 Kbit/s capacity). Although this capacity is adequate for most of today's applications, many customers are already demanding increased bandwidth of 34 Mbit/s, 155 Mbit/s and higher. While current distant constraints could potentially lead to the clustering of businesses around exchanges, technology developments are ensuring that this will not be a constraint in the near future.

<sup>6</sup>The Irish Communications Market Quarterly Review, June 2001

<sup>7</sup>UKOnline: The Broadband Future, 2001.

The island backbone network provides bandwidth of 2.5 Gbit/s or more, with scope for further capacity increase through the deployment of Dense Wavelength Division Multiplexing (DWDM). Thus for fibre routes, link capacity can be increased almost without limit.

Significant future developments are planned, including:

- Upgrading of all backbone links to 2.5 Gbit/s;
- Addition of new links;
- Phasing out of backbone PDH links;
- Upgrading of legacy links from the backbone to smaller towns to a minimum of 155 Mbps SDH capacity over fibre;
- Addition of ATM nodes, to expand reach of ATM networks as demand requires;
- Addition of new North-South interconnection points particularly in the west of the border region;
- Expansion of existing capacity on main trunk lines;
- Expansion of existing backbone 2.5 Gbit/s links by the addition of multiple 2.5 Gbit/s links through investment by new operators; and
- Evolution of the backbone into a high capacity SDH mesh structure with protection and restoration features.

The Irish government has also announced a €250 million investment aimed at overcoming communication deficits to promote greater commercial and social use of the Internet. The major element of this initiative will involve the construction of the first dedicated broadband network to be rolled out on Electricity Supply Board's (ESB) existing electricity infrastructure. This high capacity network would enable ESB to offer capacity for high speed Internet and data services as far north as Donegal and throughout the west of Ireland.

Regarding the border region, telecommunication services in Donegal could gain most from a IR£18.2 million EU allocation. The highest allocation of IR£6.4 million for two separate projects has been received by eircom. It was to provide optical fibre and broadband access nodes to 75 small urban centres between Sligo and Cork, ensuring that high-speed telecoms are available to 70% of the residents in the west of Ireland. However, some of these projects have already been cancelled because they were not attractive enough to the telecoms companies. Despite many good individual programmes and an innovative national development plan, the Republic of Ireland lacks any national planning authority to oversee and streamline the infrastructure rollout process. Key players such as *eircom* have not signed on completely to the National Development Plan, leaving crucial gaps in the backbone.



Figure 2.3 All-Island Backbone Network August 2000



Figure 2.4 All-Island Backbone Network August 2002



### 2.1.3 Local access

Bringing the local access network, as the final link to the user, to international standards is critically important. Unbundling of the local loop would facilitate user choice, foster price and service level competition and encourage growth of the market.

**Recommendation:** Implement a co-ordinated programme to improve the local access network, including:

- Improvement in the delivery of leased lines in Republic of Ireland;
- Options to equalise costs, particularly in the regions;
- Implementation of ex Digital Subscriber Line (xDSL) technologies;
- Mechanisms to unbundle the local loop; and
- Effective co-ordination between Office of the Director of Telecommunications Regulation (ODTR) and Oftel.

The local access network is the final link, ‘the last mile’ between the service user (business or home) and the service provider. This point of contact is generally between Customer Premises Equipment (CPE) and the service provider network equipment.

There are a variety of methods to make this final link between the service provider and the user, including:

- Fixed lines for dial-up access (Public Switched Telephone Tariffs: PSTN);
- Fibre cable;
- Leased lines;
- Integrated Services Digital Network (ISDN) primary lines; and
- xDSL technologies (upgrade of existing copper lines).

The fixed line infrastructure in Northern Ireland compares well to European best practice, particularly as all fixed lines are connected to digital exchanges<sup>10</sup>. This places Northern Ireland in a favourable position for future developments in technologies. The Republic of Ireland has seen significant growth in the new entrants share of the fixed line market, thus offering consumers and businesses a choice of service providers. The new entrants share of the fixed line market has doubled in the Republic of Ireland from 10% to 20%<sup>11</sup>.

Measure	Northern Ireland	Republic of Ireland	European Best Practice
Fixed Lines per 100 inhabitants <sup>12</sup>	555	42.7	71 (Luxembourg)
Connected to digital exchanges	100%	68%	100

Fibre installed directly to a house or business premises provides higher bandwidth access and delivery rates. It is currently being used where there is a high density of demand, for example large volume users in the business market. Installation of fibre to replace the copper loop is expensive and there is unlikely to be widespread employment of fibre direct to low volume customers’ premises.

<sup>10</sup>BT, *Liberalisation Milestones*, February 2000.

<sup>11</sup>ODTR, *The Irish Communications Market Quarterly Review*, June 2001.

<sup>12</sup>Forfas, *Annual Competitiveness Report*, 2000.

Leased lines comprise permanent telecoms links supplied by network operators to users, which provide capacity dedicated to the user's exclusive use. 2 Mbit/s bandwidth on leased lines is available generally throughout the networks in Northern Ireland and Republic of Ireland with 34 Mbit/s access is available on request at nodes served by 2.5 Gbit/s links.

The delivery levels of leased lines in the Republic of Ireland is not satisfactory and this is impacting on the development of broadband services and the ability of SMEs to develop along the connectivity chain.

<b>Measure</b>	<b>Northern Ireland</b>	<b>Republic of Ireland</b>
Leased lines availability	BT has an obligation to provide leased lines up to 2 Mbit/s. Leased lines are treated as interconnect product <sup>13</sup> .	39,000 leased lines in operation, an increase of 5% since June 2000. 88% of SMEs in the Republic of Ireland do not utilise a leased line <sup>14</sup> .
Leased line costs		
Leased line installation	The UK is competitive with the EU, but expensive in comparison to the US.	More expensive outside Dublin and placing regional locations at a disadvantage for eBusiness.
	9 days from request to delivery of a leased line by BT.	10th of OECD countries in annual rental charge, but it is over three times the tariff in Finland.
		It takes 113 days from request to access to a leased line for businesses <sup>15</sup> .

ISDN uses existing copper wiring and adds digital switching. Primary rate ISDN is available providing bandwidth of 2 Mbit/s. It was thought that future deployment of ISDN technology was likely to be limited as the unbundling of the local loop and wireless loop technology provided businesses and residences with the access bandwidth they require. However, this is being re-evaluated by the business market due to the lack of progress in unbundling the local loop.

There has been a 30% growth in the number of ISDN channels over the past year. 59% of large companies believe that they will increase their broadband requirements relying on ISDN.

<b>Measure</b>	<b>Northern Ireland</b>	<b>Republic of Ireland</b>
SMEs with ISDN line	Information not available	33% <sup>16</sup>
Households with ISDN line	Information not available	4%

<sup>13</sup>BT, *Liberalisation Milestones*, February 2000.

<sup>14</sup>ODTR, *The Irish Communications Market Quarterly Review*, June 2001.

<sup>15</sup>*Irish Times*, July 2001.

<sup>16</sup>ODTR, *The Irish Communications Market Quarterly Review*, June 2001.

Digital Subscriber Line (DSL) technologies have been developed to deliver broadband access over copper twisted pair cable (telephone line). It creates a tremendous opportunity for SMEs to take advantage of broadband connections. xDSL is a suite of technologies based on ATM technology.

High Bit Rate Digital Subscriber Line (HDSL) at 2 Mbit/s is available in some parts of the network as required by demand.

Asymmetric Bit Rate Digital Subscriber Line (ADSL) will be launched during September 2001 in ROI on a limited basis. It allows access rates from the network to the user up to 8 Mbit/s and is ideal for services such as Local Area Network access, fast Internet access and video-on-demand. Local loop unbundling is essential to facilitate open competition and maximise the potential of ADSL.

The unbundling of the local loop is one of most important telecoms developments. It is progressing particularly slowly in the Republic of Ireland and not one local loop has yet been unbundled. Esat have applied to access *eircom's* local telecoms network and are planning to introduce Symmetric Digital Subscriber Line (SDSL) technology. The ODTR has set interim prices for access and directed changes to be made to *eircom's* RIO. The original price proposal from *eircom* was among the highest in the world, with the price of installing a line nearly three times the cost charged by BT<sup>17</sup>.

This story of total control of all DSL lines by the national incumbent is repeated in Austria, Belgium, France, Germany, Italy, Portugal, Spain and Sweden. It is also the case in the UK, where most of the 20 or so operators originally signing up to co-locate equipment in BT exchanges have subsequently pulled out, leaving a mere handful of viable competitors<sup>17</sup>. Northern Ireland has certainly progressed further than the Republic of Ireland, with DSL technology now available to businesses at £40 to £50 per month and the first UK exchange opened in Belfast in early 2001.

## 2.2 WIRELESS TELECOMS

This section examines mobile telephony, digital satellite television and wireless local loop technology.

### 2.2.1 Mobiles

While mobile penetration rates are similar in Northern Ireland and Republic of Ireland, costs are much greater in Republic of Ireland. Issue of 3G licences is significantly behind schedule in Republic of Ireland.

**Recommendation:** Implement mechanisms to ensure effective on-going co-ordination between ODTR and Oftel, paralleling the EU move to co-ordinate regulations across Europe. Take action to promote transparency of cross-border mobile tariffs, e.g., development of websites such as b4Ucall.com.

One advantage of mobile phones is that they bypass the local loop and its associated costs and controversies. The Republic of Ireland's mobile penetration rate is on an upward trend, rising from 49% in June 2000 to 73% in April 2000. The total number of mobile subscribers in the Republic of Ireland now stands at over 2 million and this exceeds the number of fixed lines (1.58 million) in the country.

<sup>17</sup>*Irish Times*, 2001

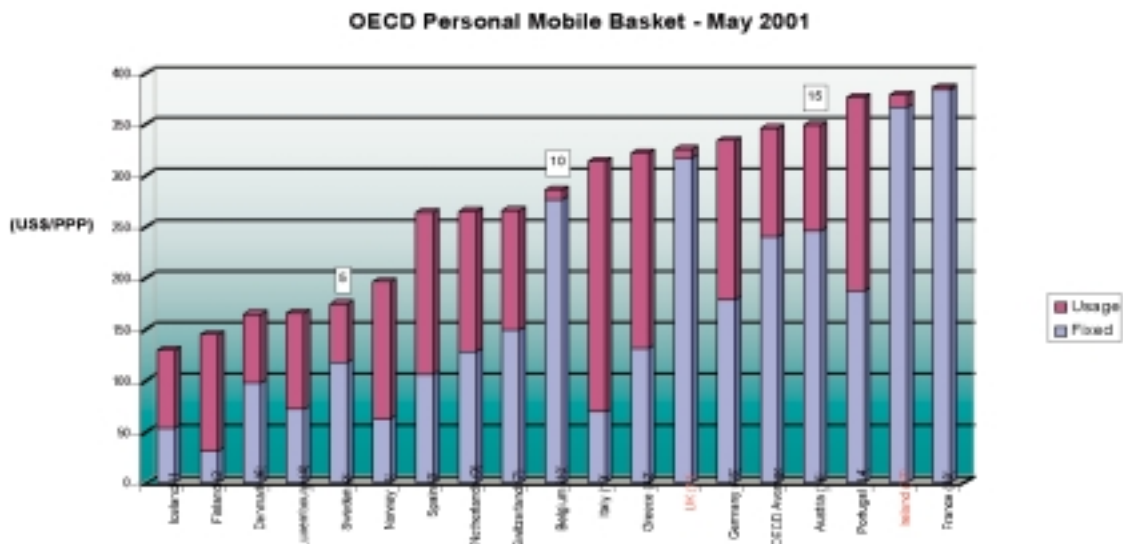
<sup>18</sup>*Financial Times*, 18 July 2001.

Measure	Northern Ireland	Republic of Ireland	European Best Practice
Population with mobile phone <sup>19</sup> Global System for Mobile Communications (GSM) (2G)	74% UK19 Available	73% Available	78% in Luxembourg
High Speed Circuit Switched Data (HSCCD)	Available	Available	
General Packet Service Radio (GPRS) (2.5G)	Available	Not available	
Universal Mobile Telecommunications System (UMTS) (3G)	Under trial	Licences yet to be awarded	

Mobile tariffs in the Republic of Ireland are some of the most expensive in the OECD, with Ireland ranking 17th of 27 countries on the OECD Personal Mobile Basket. On this measure, Irish charges are more than three times the rate in the best performing country. In comparison, the UK ranks 11th out of the 27 countries<sup>20</sup>.

<sup>20</sup>OECD, *Measuring the ICT Sector*, 2000

**Figure 2.5 OECD Mobile Tariffs**



The evolution of mobile technology is based on the increasing speed of the data connection between the phone and the network provider. 3G mobiles will offer an opportunity for a significant proportion of the population to access broadband services.

Northern Ireland has developed further than the Republic of Ireland having already issued licences for 3G telephony. BT Wireless and T-Mobile International have announced that they intend to co-operate on the rollout of 3G networks. This co-operation will potentially save as much as 30% on capital expenditure, and reduce the number of masts and base stations needed, as well as potentially speeding up roll out.

<sup>19</sup>ODTR, *The Irish Communications Market Quarterly Review*, June 2001.

The Republic of Ireland remains one of only three European countries yet to issue 3G phone licences as fee disagreements between the Department of Finance and the ODTR has heightened. The tender document for the licences has yet to be issued due to this dispute. Under EU law, all member states must have awarded 3G licences by January 2002. However, the ODTR now has only a few months to complete the process.

### 2.2.2 Digital Television

Northern Ireland offers better infrastructure for the user to connect to the Internet through digital television. The rollout of interactive television and 'always-on' Internet connections through digital television is not progressing in the Republic of Ireland as originally hoped.

<p>Recommendation: A co-ordinated approach should be developed in both jurisdictions to the rollout of telecoms infrastructure to include:</p> <ul style="list-style-type: none"> <li>• An overall analysis and strategy-setting exercise of the key gaps in provision priorities for investment and cross-border synergy opportunities, North and South; facilitated by plans in each area having common sections dealing with cross-border issues; and</li> <li>• Incentives targeted at providing Internet access for lower income groups (e.g. digital interactive TV).</li> </ul>
--

Digital TV allows the operator to provide a single connection for high speed Internet access, is interactive and will effectively be a gateway to the Internet in every home.

Republic of Ireland, with only 20% accessing the Internet at home, is among the lowest in OECD. This is accentuating an emerging digital divide. As almost every household in the country has a television, the introduction of digital television has a key role to play in providing all citizens with access to the Internet and the public services that will be provided on it.

Service	Northern Ireland	Republic of Ireland
Digital cable	Available in all major towns and cities in NI	ntl has scaled back its digital service offerings, saying it will launch in the Republic of Ireland over its existing network by September 2001. This limits supply to the major cities.  Chorus missed its deadline in the Republic of Ireland for implementing digital TV services by March 2001.
Digital Terrestrial Television	Available in Northern Ireland. ITVDigital was the first company in the world to launch a DTT service. No Irish based companies have offered digital interactive services or the high speed 'always on' Internet service.	Implementation in the ROI may be delayed beyond 2002.
Satellite Digital TV	Satellite systems providing general solutions are being developed to offer data rates up to 155 Mbit/s and comparable to DSL.	

### 2.2.3 Wireless Local Loop

Wireless local loop (WLL) provides scope for an alternative access to the network, and may become more popular if the unbundling of the local loop does not progress in a cost-effective manner.

WLL can provide broadband access over a wireless link up to 5 km from a base station. Thus it helps to fill gaps in the access network and users can have high speed Internet access and data transmission without the need for cabling.

Northern Ireland	Republic of Ireland
Six operators licensed in the UK, covering 57% of the country – Northern Ireland information not known.	Four wireless local loop licences have been awarded in Republic of Ireland and network rollout has commenced. Formus Broadband, one of the licence holders, has since collapsed.

### 2.3 SERVICE PROVIDERS

There is a wider range of suppliers and services available in Northern Ireland than the Republic of Ireland and Northern Ireland is in a stronger competitive position as a result.

Northern Ireland's stronger competitive position results from:

- The liberalisation of the telecoms industry which began in 1984 in the UK, as compared to December 1998 in the Republic of Ireland;
- The delay in the unbundling of the local loop in the Republic of Ireland;
- The lack of progress in the Republic of Ireland's rollout of digital television services by the licensees; and
- The fact that the Republic of Ireland is still in the process of issuing licences for 3G telephony.

The UK telecoms market has been liberalised since 1984, and the Republic of Ireland's market since December 1998. Both markets are fully deregulated, with some 60 different telecoms operators offering services in Northern Ireland and 20 in Republic of Ireland. Although offering fewer service providers, the Republic of Ireland's market has seen strong competition since deregulation with *eircom*, Esat, GTS Ireland, Worldcom, Nevada and Spirit competing for market share in the fixed line segment. Eircell and Esat Digifone have driven the significant mobile telephony growth as the third operator, Meteor, only launched its service in February 2001. However, Meteor is the only mobile operator to offer all-island rates. The two principal cable operators, ntl and Chorus, have plans to enter the combined digital telephony, television and high speed Internet access offerings. *eircom* and Esat dominate the ISP sector, having acquired the major independent ISP operators. Standard 'dial-up', as opposed to 'always-on', Internet access is the common feature of the ISP market at present.

The recent international downturn has resulted in investment plans being postponed. In early 2001 both *eircom* and Esat postponed their DSL rollout plans while ntl revised its investment plans for the cable sector. One of the four wireless local loop operators – US company Formus Broadband- ceased operations within nine months. In addition, the plans of the ODTR to award four UMTS (3G) mobile telephony mobile licences by mid-2001 following a 'beauty contest' licensing competition, are unfulfilled, as the formal contest has not yet been launched.



It is interesting to note that there is a convergence of suppliers occurring in the island of Ireland (see Section 4.1.1). This could eventually ensure that services are offered on an all-island basis.

Within both jurisdictions, the dominant operators (eircom in the South and BT in the North) still control access to the local loop, with governments pushing hard for deregulation. However, it is expected that eircom, along with other telecoms operators, will begin trials on long-awaited broadband DSL technology.

Within the North, BT had originally scheduled July 2001, with the possibility of December 2001, as the start date for unbundling the local loop. This was achieved in Northern Ireland ahead of schedule, with an exchange in Belfast being the first unbundled and access made available to other service providers. This is expected to lead to the introduction of high-speed broadband services, including video and music on demand, along existing phone wires before the end of 2001. Meanwhile, the introduction of unmetered access, such as BT Surftime (offered by other service providers as well as BT), which allows continuous connection to the Internet for £14.99stg per month, should see the number of connected Northern Ireland businesses soar to a new high.

Understandably, as connectivity costs have fallen over the past couple of years, cost is no longer seen as a major factor in hindering business use of the Internet. However, much work is needed in raising awareness of companies to the existence of these reduced cost platforms and of encouraging companies to maintain their use (it is estimated that 10% of free Internet connections become redundant after one month).

<b>Service Provider</b>	<b>Northern Ireland</b>		<b>Republic of Ireland</b>	
Telecoms (voice services and infrastructure network)	BT (incumbent)	Plans to cover 95% area with ADSL by 2003 <sup>21</sup> .	<i>eircom</i> (incumbent)	Controls local loop and in discussion with ODTR re. unbundling
			Esat (owned by BT)	Application to enter local loop
			Cable & Wireless	
Mobile	OnetoOne Vodafone Orange BT Cellnet		Eircell Esat Digifone Meteor	
3G Mobile	BT Vodafone		No licence issued yet	
Cable & Multipoint Microwave Distribution System (MMDS)	ntl Telewest		ntl Chorus	
Digital Television	ITVDigital (formerly ONDigital) Sky Television (BskyB)		No licences issued yet Four licences issued	
Broadband Fixed Wireless Access	Six operators licensed in the UK, covering 57% of the UK population, including Northern Ireland		One company, Formus Broadband, went into liquidation	
Internet access via power supply lines	No progress		ESB investment proposed along existing electricity infrastructure	

BT provides an advanced network (all-digital) of over 1,000 miles of optical fibre. The all-digital network can transmit and process every kind of communication – voice, data, text, still and moving video images - at speeds from 128 Kbits to 2.4 Gbits. For inward investors this provides total flexibility with immediate high speed access to the world's information systems. Indeed, past practice, which the Information Age Initiative intends to encourage, is the rollout of new technology in Northern Ireland in advance of comparable UK regions.

This section has examined the infrastructure provisions of the telecommunications industry, primarily as a supply issue to the island of Ireland. Section 2.4 will assess information technology in terms of business uptake and use of the telecoms infrastructure (business connectivity and capabilities).

<sup>21</sup>BT, British Telecom Liberalisation Milestones, February 2000.

## 2.4 INFORMATION TECHNOLOGY

Information technology is addressed in the areas of business connectivity (i.e. how far along the eCommerce chain has the business progressed) and critical external business enablers for growth.

### 2.4.1 Business Connectivity

Republic of Ireland is up to best European practice in use of PCs and business Internet access, while Northern Ireland is behind this. Comparisons are difficult in other areas reviewed due to lack of data. This is a key issue in improving competitiveness in the island of Ireland.

**Recommendation:** Provide an ongoing focus for action to address gaps versus best practice and business needs, and to avail of synergy opportunities. To achieve this:

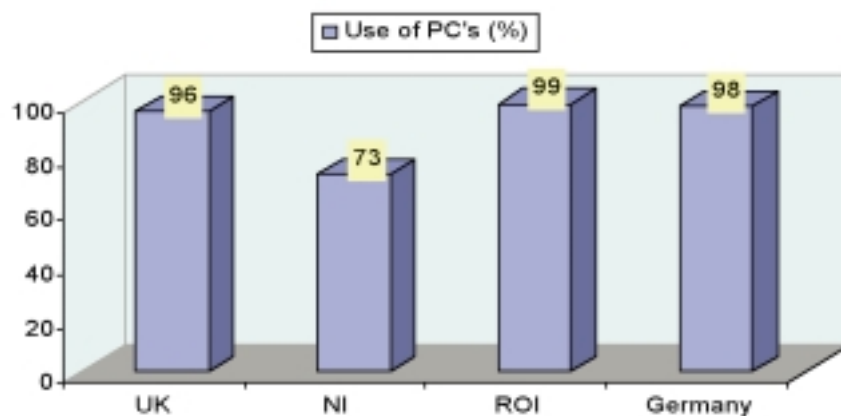
- Critical areas for benchmarking should be defined;
- Compatibility of telecoms and IT data should be improved;
- Internal benchmarking should continue in the defined areas; and
- Formats should be developed to compare the competitiveness of the island of Ireland with European best practice.

This section examines the information technologies that form the enablers for eBusiness and reports on their levels of adoption within the island. Information was not readily available directly comparing Northern Ireland and the Republic of Ireland and the comparisons below were compiled from a variety of sources.

#### A USE OF PCs

The primary access device to e-mail, Internet and other network-based services is currently the PC, though in the future alternative access devices such as mobile handsets and interactive television may have an important role. Almost 100% of the Republic of Ireland's<sup>22</sup>. September 2000. companies now use PCs compared to 73% of businesses in Northern Ireland<sup>23</sup>.

**Figure 2.6 PC Usage**



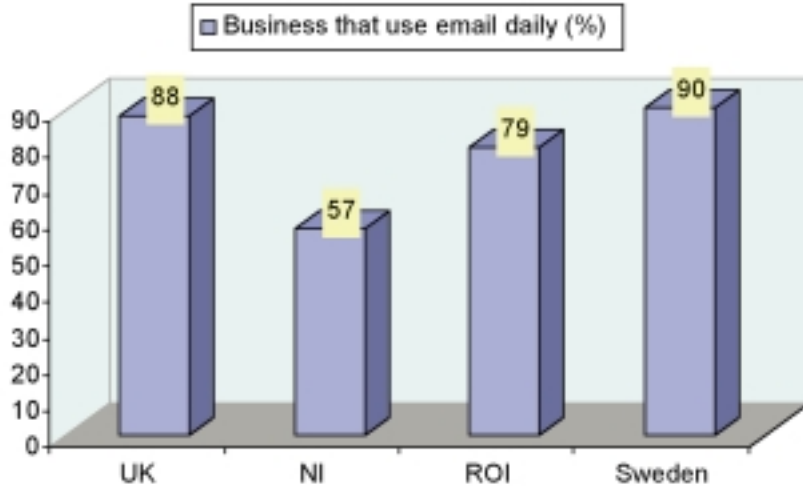
<sup>22</sup>ISC, *How The Business Community is Adapting to the Information Society in Ireland*.

<sup>23</sup>UKOnline, *UK International Benchmarking Study*, 2000.

## B USE OF E-MAIL

Although e-mail usage is on the rise, in many companies, particularly large and medium companies, e-mail use is still restricted to a small percentage of employees.

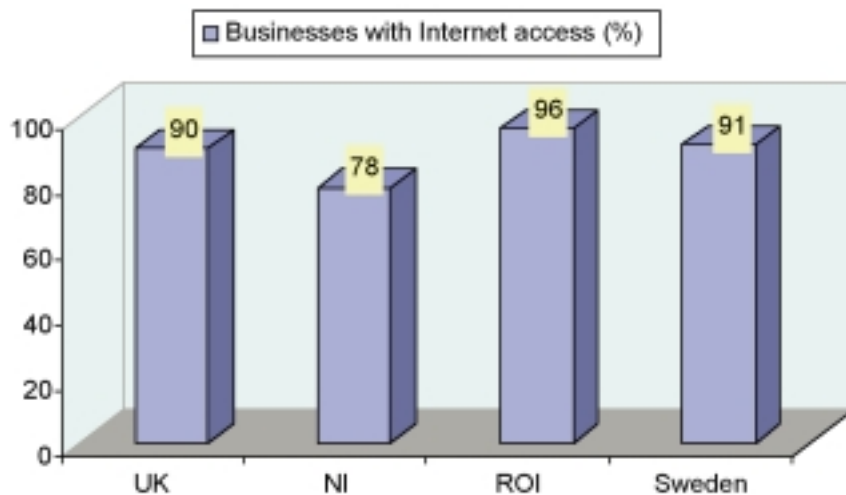
**Figure 2.7 E-Mail Usage**



## C. INTERNET ACCESS

This figure (2.8) gives a measure of the level of use of the Internet. It is worth highlighting that the percentage figure for Northern Ireland has increased from 43% in 1999 to 78% in 2000. The percentage of Republic of Ireland firms with Internet access has risen to an all-time high at 96% of business, with access to computers, up from 74% in 1998, and 85% in 1999. ISDN now outstrips standard telephone lines for Internet connections. Awareness of technologies and services such as the Internet and e-mail is now almost universal.

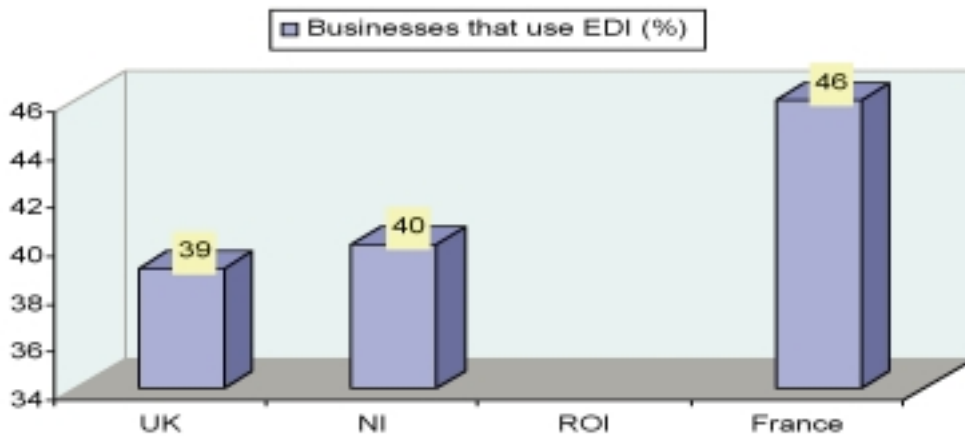
**Figure 2.9 Business Internet Access**



#### D. BUSINESSES THAT USE EDI

Electronic Data Exchange (EDI) is the computer-to-computer exchange of structured data, sent in a form that allows for automatic processing with no manual intervention. It is usually carried out over specialist EDI networks. Data was not found for Republic of Ireland EDI usage.

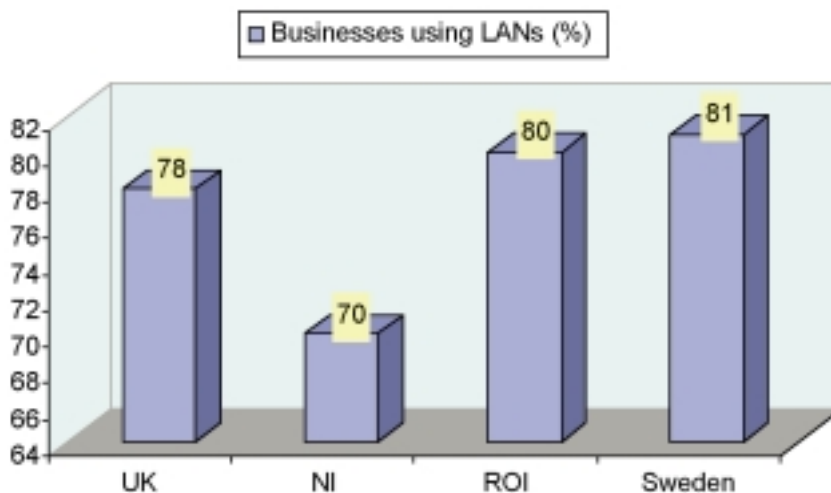
Figure 2.9 Business Use of EDI



#### E. LOCAL AREA NETWORKS

LAN is a dedicated network that does not rely on switching, and is used to link PCs together. Using a LAN allows people to share data easier and faster. It can be linked through the LAN server to a telecoms network<sup>24</sup>. Comparative figures were difficult to find, and the Republic of Ireland figure is weighted by employee numbers, therefore, it is not possible to assess comparative performance from figure 2.10.

FIGURE 2.10 Businesses Using LANs

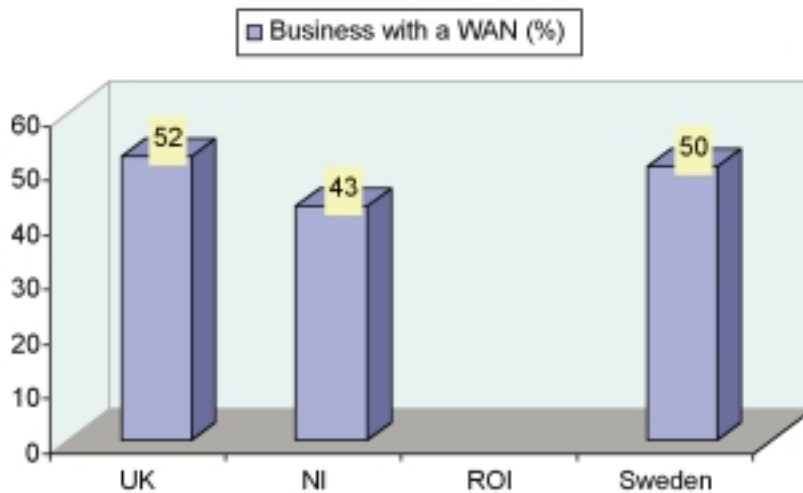


<sup>24</sup>ISC, *How the Business Community is Adapting to the Information Society in Ireland*, 2000.

## F. WIDE AREA NETWORK

A Wide Area Network (WAN) is used to link together LANs in other locations, either in the same country or in a number of different countries. No data was found for the Republic of Ireland.

**FIGURE 2.11 Businesses with a WAN**

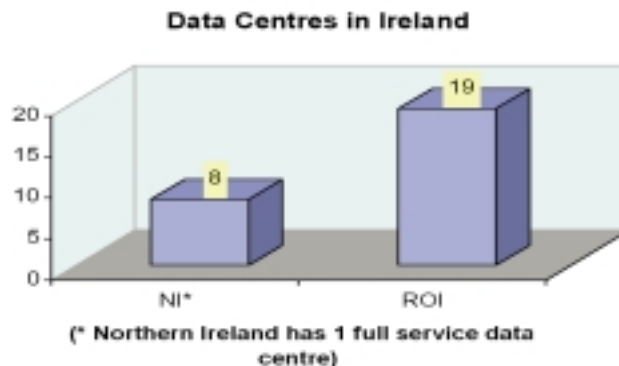


### 2.4.2 Data Centres

There is a much better provision of data centres in the Republic of Ireland (19), with just one open for business in Northern Ireland.

Data centres provide facilities for Web-hosting, network and support services for companies of all sizes. Many of these centres are located directly on the telecoms operator's backbone networks, allowing them to offer very high speeds of connectivity and the highest level of network resilience and reliability. A major phase of large scale data centre deployment is under way in the Republic of Ireland. In Northern Ireland the data centre market is starting to materialise, with service providers developing plans to implement similar scale projects to those emerging in Dublin. There is currently one large full-service data centre (BT-owned) and a variety of smaller centres offering some form of data hosting and service offerings in Northern Ireland.

**Figure 2.12 Data Centres in Ireland**



The Industrial Development Authority has stated that the Republic of Ireland will have in excess of one million square feet of hosting space by the end of 2001, despite the cessation of construction of two new data centres (GTS and 360 Networks). WorldCom has selected Republic of Ireland as the location for one of its purpose-built International Data Centres. As part of its worldwide agreement with Digex, WorldCom Ireland will rollout a new suite of managed hosting services in 2002.

Many of the 1,000 multi-national companies in the Republic of Ireland have developed eCommerce strategies to operate in the international business environment. For example, IBM is investing US\$120 million to establish an e-portal for its suppliers at its Dublin technology campus. The company also plans to establish a trade centre in Ireland to support the company's eBusiness activity.

Microsoft has established an Internet Data Centre to handle its business transactions across the Europe Middle-East and Africa (EMEA) region. The Republic of Ireland's growing teleservices sector (60 firms employing 60,000 people) also represents an emerging segment of eCommerce activity, as firms providing customer fulfilment services and Internet sales develop a stronger local presence.

Northern Ireland possesses one new virtual business park for the region entitled 'NI for Business'. BT is offering every firm a free website, effectively giving them free space to advertise their business on the Internet. The site is designed and hosted by BT and housed in a new virtual business park. There is a range of smaller centres which are offering a variety of hosting and application services (e.g. Data Electronics, UTVInternet, United Solutions, Titanic Information Services, Nevadatele.com)

BT is planning investment of up to £100 million per year on new information highway technology, which will allow company's customers to have simultaneous phone, fax, video and Internet access – all down one phone line.

### **2.4.3 Learning and Technology Centres**

Initiatives are in hand in both jurisdictions to introduce an element of learning to development.

Two examples of such initiatives are presented below.

A learning and technology centre, focused on education, and a virtual academy in digital media arts form part of the Republic of Ireland, plans to develop a major technology site in Dublin. The development, known as the Digital Hub, may also include an enterprise centre to attract high-tech companies specialising in digital media, such as interactive television and Web services. A development plan will be published this autumn by Digital Media Development Limited.

The University of Ulster plans to create 100 high-tech jobs at its Jordanstown campus in a new £2.5 million centre for fledgling engineering companies<sup>25</sup>. The Technology and Engineering Innovation Centre, to be based at a 20,000 sq ft site at the university, will allow start-up companies to benefit from the university's technological expertise and research facilities. The University of Ulster has already established similar centres at its Coleraine and Magee campuses and at Springvale in Belfast.

<sup>25</sup>*Irish Times*, 17 July 2001.

#### 2.4.4 Internet Service Providers

Northern Ireland is better served with ISPs than Republic of Ireland with flat rate access widely available there.

**Recommendation:** Implement mechanisms to ensure effective on-going co-ordination between ODTR and Oftel, paralleling the EU move to co-ordinate regulations across Europe.

The cost of using the Internet has prohibited connectivity in the past. While the cost of telephone charges has dropped dramatically in recent years, it is only since the introduction of unmetered and free Internet access that the use of the Internet has begun to rise significantly. Within the Republic of Ireland the number of ISPs is gradually increasing, and includes CableNet, Connect Ireland, Cork Internet Services, Esat Fusion, Ireland On-line, Unison, *eircom* Net and OceanFree. Some of these ISPs offer services only to parts of the country (e.g. Cork Internet services). Northern Ireland is much better served, with over 70 ISPs covering the UK, a large percentage of which offer their services within Northern Ireland, most notably BT SurfTime offering unmetered access for a fixed monthly payment, through any service provider.

From a cross-border perspective, the use of a single ISP within both jurisdictions of Ireland can prove very costly, with international call charges and surcharges added when logging on in the alternative jurisdiction. One example of this would be the use of CompuServe. Within the North, customers can access the service through a single local rate number, but access from the South outside Dublin and Cork is charged on a national rate complete with surcharges. ISPs are beginning to provide equivalent services on a North-South basis (see below) but this trend has not been without problems.

OceanFree, owned by BT, is based in Dublin and employs in excess of 180 people. The introduction of the Republic of Ireland's first free Internet service in June 1999 (OceanFree.net) was expected to see a surge of Irish customers. Instead it highlighted concerns over joint, cross-border working. While OceanFree's technical, modem connection, marketing, sales, distribution and web-design teams are based in Dublin; the free Internet service uses BT as its Internet connector. While the ISP calls begin in Ireland, they terminate in BT networks, possibly in London. Concern was expressed that the creation of jobs to support and handle the calls would be based in London and that Irish users would be connected to an already congested system in the UK, leading to a poor quality service with no incentive to improve the Irish infrastructure necessary for Internet access.



### 3. EXISTING CAPABILITIES

There is a growing divide between multi-national and technology-literate Irish firms and traditional SMEs in the take-up of the Internet and related ICT<sup>26</sup>. The biggest barriers to the adoption of eCommerce by SMEs are a lack of appropriate skills and a lack of bandwidth in the regions.

The take-up of the Internet and related ICT is an important indication of whether businesses are exploiting these technologies. This report is based upon desk research rather than direct feedback from users of their varying requirements by sector, location and company size.

The vast majority of businesses are now familiar with terms and services relating to information technology. While Irish businesses are very positive about eCommerce, the number actually engaging in on-line sales and business-to-business eCommerce remains relatively low. Skill shortages remain a major concern and it is clear that businesses must make greater efforts to train their employees in new technology.

**Recommendation:** Governments should act to increase IT education generally and provide universal access to information technology resources. To achieve this:

- Develop an integrated all-island support programme for SMEs (with a special focus on managers) to promote information technology and increase the desire to move up the connectivity chain and develop eBusiness opportunities. This should address issues such as:
  - Success stories from SMEs that are benefiting from eBusiness;
  - Benefits of the services and outsourcing arrangements that data centres offer, and their availability; and
  - The importance of internet security.

Support is likely to require a mix of measures, designed to suit the need, including training, consultancy, mentoring, support from fast track IST users, academia, etc.

As Internet devices become completely wireless and truly mobile, it is forecast that high-powered mobile devices delivering new business applications will sideline the traditional PC within six years. Companies will have to re-engineer their processes if they are to maximise the opportunities this new technology has to offer. It is forecast that logging on to the Internet via a mobile phone will be more common than logging on through a PC. A mobile Internet will provide an important channel for businesses to interact not only with customers but also with employees and business partners. This will transform working practices as well as communications and data management. Businesses must anticipate and react to these changes in order to remain competitive.

The island of Ireland's capability in ICT is assessed in three areas below:

- Awareness in ICT;
- Skills availability; and
- Drive to exploit these new technologies.

<sup>26</sup>Houses of the Oireachtas, *The Impact of eCommerce on Small & Medium-Sized Enterprises*, 1999.

### 3.1 AWARENESS

The Republic of Ireland's business community is positive about the concept of the Information Society, and is making excellent progress in relation to the adoption of information and communications technologies. In Northern Ireland, awareness of the benefits of ICT appears to be reaching saturation level<sup>27</sup>.

- Access to technologies such as the Internet, e-mail and computer networks is now very high and places businesses in a good position to compete in the eCommerce marketplace;
- There is a high level of acceptance and understanding of the importance of ICT to business and overall competitiveness; and
- Companies recognise that the lack of IT skills poses a serious challenge for the future.

The attitude of SMEs and Small Office Home Office Businesses (SOHOs) towards ICTs and the benefits of broadband is different from the larger business community. There is a low level of awareness of the benefits of broadband and this may be holding back market development. The vast majority of broadband users came to see the benefits of it only after having first used narrowband services<sup>28</sup>.

A massive 80% of UK SMEs do not see the business benefits of high speed Internet and data communications services, according to a survey by MORI, with 47% saying that they did not expect broadband to be crucial to their business strategy<sup>29</sup>. The figure illustrates the uphill battle faced by telecoms firms in selling next-generation services. Until broadband access can be provided to small businesses, they will not understand the benefits. The education of the end user about the importance of broadband is essential to the growth of eBusiness.

The ODTR commissioned Irish Marketing Surveys to examine the attitudes of large corporates to the provision of broadband services in Ireland. The corporate users believe their telecommunication needs are being well served, are more satisfied with their telecoms supplier than 12 months ago and believe the market is more competitive than 12 months ago<sup>30</sup>. The companies surveyed also believed that their broadband requirements would increase in the coming months.

However, smaller businesses are shown to be more at risk, as they are still lagging behind large companies in the adoption and usage of new technology<sup>31</sup>.

In the UK, consultation with stakeholders by UKOnline has highlighted four areas where barriers to growth may be holding back market development:

- Low level of awareness about the benefits of broadband;
- Demand for broadband services is often fragmented;
- The number of Internet sites offering services and applications which exploit the rich content capability of broadband is currently limited; and
- Skill gaps may be holding back both broadband rollout and broadband content development.

<sup>27</sup>ISC, *How The Business Community is Adapting to the Information Society in Ireland*, 2000.

<sup>28</sup>UKOnline, *The Broadband Future*, 2001.

<sup>29</sup>UKOnline, *MORI Survey*, 2000.

<sup>30</sup>ODTR, *The Irish Communications Market Quarterly Review*, June 2001.

<sup>31</sup>ISC, *Benchmarking Ireland in the Information Age* May 2000.

### 3.2 SKILLS AVAILABILITY

Common to both jurisdictions is the shortage of skilled personnel to service the telecoms industry and past difficulties in retraining graduates.

A key factor in the future development of the telecoms sector in both regions is the availability of a suitably trained workforce. The timely rollout of new broadband networks will depend to a large extent on there being sufficient numbers of people with technician level skills to install and maintain communications equipment and manage network infrastructure<sup>32</sup>.

In the Republic of Ireland the Expert Group on Future Skills Need has cited a likely shortage of 3,300 skilled ICT workers and recommended that €165 million be invested in IT education in the years to 2006<sup>33</sup>.

This area of skills availability is covered more comprehensively in a separate working paper, *All-Island Competitiveness: Skills*.

### 3.3 DRIVE TO EXPLOIT ICT

High levels of technology uptake do not necessarily translate into equally high levels of eCommerce activity and evidence suggests that businesses may not have a clear understanding of the immediate business benefits.

Internet usage has consistently grown over the past few years among Irish businesses on both sides of the border, as has the number of tasks and services it is being used for, as well as the level of dependence on it as a business tool. Nonetheless, small businesses throughout the island have yet to be convinced that the Internet is of relevance to them<sup>34</sup>.

The use of telecoms by businesses in Northern Ireland is underdeveloped compared with other parts of the UK and the Republic of Ireland. Within both jurisdictions, the use of the Internet by small businesses is very slow to develop, with connectivity of micro enterprises (0-9 employees) perceived to be even lower than that of SMEs. This has particular connotations for eCommerce in Northern Ireland, where over 85% of business are classified as micro-enterprises.

Reasons commonly cited for lack of business use include supply chain inertia, fear of security and legal issues, concern about local liability, lack of knowledge about technology and various businesses models and a lack of appreciation of the business benefits.

The evidence suggests that where firms have implemented the new technologies, they may not be fully aware that these represent a whole new way of working. Thus 25% of the Republic of Ireland's businesses with access to the Internet have no security policy and almost 50% have no employee IT training plan.

**Recommendation:** Address the above information gap and incorporate findings into plans by:

- Conducting research by sector, location and scale to obtain feedback from industry on priorities, barriers and opportunities, etc., to exploitation of ICT;
- Carry out root cause analysis on the reasons for slowness in uptake;
- Maintain ongoing benchmarking within the island and versus external best practice focusing on performance and the lessons to be learned; and
- Developing co-operative education programme to communicate to consumers an understanding of and the benefits from IT including a basic IT familiarity course for workers and the unemployed.

<sup>32</sup>Leapfrog, *NI Business in the Information Age, ICT Benchmarking Report*, 2000; ISC, *Third Report of Ireland's Information Society Commission*, December 2000.

<sup>33</sup>Irish Times, 'Group Says invest 165m in IT Education', 1 August 2001.

<sup>34</sup>ISC, *Ireland as an Information Society...is the Business Community Ready?*, 1999.

The Chambers of Commerce of Ireland (CCI), Irish Business and Employers Confederation (IBEC), Small Firms Associations (SFA), the Irish Internet Association (IIA), Local Enterprise Development Unit (LEDU) and Leapfrog to the Information Age are all strongly supporting the adoption of eCommerce principles in the island of Ireland through the provision of eCommerce educational programmes.

Businesses in NI generally believe that eCommerce will have an impact on their businesses in the next three years. However, compared to other UK regions and the ROI, relatively few recognise that eCommerce is having an impact at this present time<sup>35</sup>.

SMEs throughout the island of Ireland have recognised the importance of information technology and eCommerce, but have been slow to move up the connectivity chain. Few recognise the impact eCommerce is having right now.

<sup>35</sup>Leapfrog, *Information Age Initiative for Northern Ireland Progress Report*, April 2001.

## 4. REVIEW OF MARKETS AND GOVERNMENTAL POLICIES

### 4.1 MARKETS

This section paints a picture of the forces within the marketplace driving change (technology convergence, supplier convergence and the development of new services) and also reviews current tariffs. It is not possible to treat this subject without reference to the controlling regulations – this is the topic of Section 4.2.2

#### 4.1.1 Evolution

Convergence of technology and of suppliers is a key ICT issue, while the rate of development of new services has proved difficult to predict.

It should be stressed that the island of Ireland is, largely, able only to react to changes on the global scale within these markets – on a macro-economic level the ability to lead is sharply curtailed by the local market size.

##### *a. Technology Convergence*

The Internet is currently deployed on Internet Protocol (IP) version 5. Although providing a robust scalable infrastructure, the explosive, all-pervasive penetration of the Internet across the world has revealed some deficiencies in design. In particular the Internet is potentially close to running out of usable addresses to allow future devices to connect. This is one of the drivers behind the development of version 6, known as IPv6.

As IPv6 emerges into a wider commercial market, it will necessitate the refreshment of the country's infrastructure. Part of this work will accommodate better provision for Quality of Service (QoS). In this context, QoS is a specific design component of the IP that will allow for, amongst other things, priority routing of traffic around the Internet infrastructure.

This is a technical aspect of IPv6 with considerable impact to the business user – QoS will allow for end-to-end WANs near real-time services such as voice and video to become a reality. Coupled with broadband access near the end user the drive will be on for single supply of voice and data.

Another key aspect of technology convergence is around access devices. It will soon be common for domestic users to access the Internet through devices other than a PC. The deployment of 'always on' Internet access and the moves towards digital TV will also allow TV to be consumed through devices other than the traditional television itself. Recent emergence of the TiVo device and Sky Plus are evidence of this trend.

##### *b. Supplier Convergence*

Coupled with the technological changes, suppliers are undergoing a continuous period of convergence, for example the Vodaphone / Orange / France Telecom changes of ownership. This is to some extent offset by other restructuring, for example the BT split into three companies, and also by the range of new entrants in the market place.

Within the island of Ireland region, one effect has been for convergence of ownership to take place, led by market forces. Examples include Eircell being bought by Vodaphone, Esat Digifone owned by BT, and the new entrant Meteor providing undifferentiated service across the whole island of Ireland.

All markets are suffering from recent investment in 3G licenses, this is driving supplier collaboration as has been seen in recent initiatives within Germany towards shared infrastructure costs.

#### *c. New Services*

Despite the over-hyping of Wireless Access Protocol (WAP), it is clear that the consumer wants new services. The success of SMS text messaging took the market-place by surprise. Future consumers will assume the ability to connect all the time to information services and corporate applications.

The mobile device will quickly revolutionise the working practices of a wide range of businesses in the first decade of the 21st century. A restriction here is the current costs of mobile-fixed connections.

#### **4.1.2 All-Island Tariffs**

While the Republic of Ireland is more competitive in the areas of the national, international and leased lines, Northern Ireland is cheaper for mobile calls and offers flat rate unmetered Internet access.

With the rapid change in the mobile telephony market, it should be noted that many pricing models are of necessity immature. One particular case in point is the model for SMS which has seen an unprecedented growth in use – for example, Vodafone handled 600,000 messages in January 1998, 30,000,000 in August 1999, a fifty-fold increase in 20 months.

It can be seen that the Republic of Ireland is more competitive than the UK (and by extrapolation Northern Ireland) in the areas of the national business basket, international business basket, national leased lines and international leased lines. However, Northern Ireland performs much more strongly on mobile tariffs, being cheaper for personal and business mobile calls.

The cost of local calls in the Republic of Ireland is among the highest in the OECD and the cost of 'always-on' access to the Internet for SMEs is prohibitive. The availability of flat rate Internet access via ISPs in Northern Ireland is an important competitive differential, as it will directly influence the growth of Internet penetration and subsequently eCommerce.

Appendix B contains detailed information on tariffs in Ireland and the UK.

### **4.2 GOVERNMENTAL POLICIES**

This section examines the national strategies of Northern Ireland and Republic of Ireland, the national regulatory issues and the impact of European legislation.

#### **4.2.1 National Strategies**

Both Northern Ireland and Republic of Ireland have a defined strategy for competitiveness in eCommerce and supporting ICT.

The Republic of Ireland's government has developed a comprehensive eCommerce strategy comprising:

- World-class international telecoms connectivity;
- Pro-active eCommerce legislation (Electronic Commerce Bill 2000);
- An eCommerce campus in a 100-acre National Digital Park;
- Support for SMEs to develop eCommerce strategies; and
- An 'Information Age' programme for the educational sector.

Past practice in Northern Ireland, which the Information Age Initiative intends to encourage, is the rollout of new technology in Northern Ireland in advance of comparable UK regions. The UK vision is for a country that:

- Is a world class centre for eCommerce;
- Is the leading hub for eCommerce activity within a successful European market;
- Fosters demanding consumers, in a highly competitive domestic market;
- Possesses excellent suppliers; and
- Develops extensive Government/industry partnerships<sup>36</sup>.

#### 4.2.2 Regulatory Issues

Despite the apparent openness of markets, there are still many areas of concern, particularly within the mobile telephony market.

It is widely accepted that the most successful markets are those which are open for competition. It is interesting that OECD studies show that markets with four suppliers outperform those with three.

The broad drive for regulation is to homogenise pricing and tariff structures for the end user and to create a level European playing field in which competition can take place.

Two areas affecting pricing are worth discussing in greater depth – telecoms and broadband. A brief discussion of planning regulation regarding mobile telephone masts is also given.

##### *a. Telecoms*

The drive here is to give the user simplified pricing.

This will be delivered by eroding the penalties favouring fixed versus mobile, clarifying the position of so-called Virtual Network Operators (VNOs) and reducing the impact of high termination costs and the interconnection between fixed and mobile.

Other artificial practices that will likely be regulated away include 'tromboning', whereby a connection can be made between two points in a country by routing internationally through a neighbouring region with very low termination costs. This can undercut the ability of the national provider to deliver good quality end-to-end service within a territory.

Evidence shows that Flat-Rate Internet Access Services (FRIACO) drive up both Internet access and usage; and taken together these increase the range and volume of eCommerce activity<sup>37</sup>. This is particularly relevant for the Republic of Ireland, as Northern Ireland already enjoys unmetered access. BT's Irish subsidiary Esat Fusion sparked off protests after it imposed a monthly usage limit of 75 hours on its IOL NoLimit service, which originally provided unmetered access between 6 pm and 8 am seven days a week. Esat Fusion has stated that its interconnect costs in the Republic of Ireland are metered and that, with a flat-rate Internet service, it cannot afford to subsidise heavy users whose interconnect costs exceed the monthly subscription fee of €25.40<sup>38</sup>.

A series of legal challenges to licences awarded and a readiness to take court action over the ODTR's decisions on industry issues are jeopardising the Republic of Ireland's hope of becoming an eBusiness leader, according to technology industry experts. They contend that the legal challenges are arising because the government has an unclear policy on telecoms and the role of the regulator and has not passed the necessary laws to support telecoms infrastructure development. Delays in the rollout of new Internet access technologies like wireless broadband could deter eQBusiness from locating here.

<sup>36</sup>Performance and Innovation Unit, *eCommerce at its Best*. UK, September 1999.

<sup>37</sup>ecta, *ecta Calls For Action on Flat-rate Internet Access*, 2 July 2001.

<sup>38</sup>Campaign for Unmetered Telecoms, 31 May 2001.

#### *b. Broadband*

Encouragement of broadband connectivity through regulatory input could help break down the digital divide.

The pressure on the regulator is to maintain an environment which will encourage market entry whilst not playing unduly into the first mover advantage of the local incumbent.

The development of high volume 'always on services', particularly in the Republic of Ireland is critical to the growth of eCommerce.

Broadband will also impact the delivery of digital television in that there will be further convergence from the point of view of the consumer, who will be able to receive programming through a channel of choice (satellite/cable/IP connection). This presents many regulatory challenges not limited to tariff but also including the ability to regulate in a wider sense - digital content can be originated outside the country of receipt.

#### *c. Mobile Telephone Masts*

Public backlash to siting of masts is rising. Despite studies demonstrating the low impact of radiation, it is likely that planners will need to consider the needs of the wider community when allowing for the planning and construction of antennae in the future.

### **4.2.3 European Strategy**

Greater harmonisation of national regulatory authorities' implementation of European legislation could help drive down costs and increase access.

The variation in the 3G licensing process and its devastating impact on the financial markets, the slow implementation of local loop unbundling and the ineffective regulation of leased lines show the importance of real harmonisation in Europe<sup>39</sup>.

The European Commission has recently criticised national regulators for stifling competition by introducing different regulations in member states. The Republic of Ireland's telecoms regulator, together with other European telecoms regulators, has proposed setting up a new European regulation telecoms authority comprising European Commission officials and national telecoms regulators. The body would have powers to implement regulations in EU member states and would supersede plans by the Commission to boost its powers in this area. The technical details would include redefining Internet and telephony technologies and co-ordinating rates of interconnect and the delivery of leased lines across different markets.

The European Competitive Telecoms Association (ecta) has also called for Europe's regulators to move to implement effective wholesale tariffs for flat rate Internet access.

<sup>39</sup>ecta, *ecta Calls for Greater European harmonisation*, 26 June 2001.



## 5. CONSTRAINTS AND OPPORTUNITIES PRESENTED BY THE BORDER

### 5.1 THE BORDER EFFECT

This section examines the issues raised for competitiveness by the impact of the border on the new global telecoms and eCommerce marketplace. It considers the current situation before developing suggestions of areas for enhanced co-operation.

#### 5.1.1 Current Situation

The fact that Northern Ireland and the Republic of Ireland follow different market drives and ambitions may result in new services being introduced at different times, and pricing and service strategies evolving on different time scales, leading to 'time-zones' of technological development.

Northern Ireland is often used to test-bed services for the rest of the UK. For example, Orange has announced the near-future introduction of a videophone. If this happens, Northern Ireland consumers will be served first. This will parallel the introduction of digital and interactive television, which occurred first in Northern Ireland.

As discussed in Section 2, the Republic of Ireland has not yet issued licences for 3G telephony. Unless addressed very soon, it is likely that there will be 'time-zones' of technological development and evolution introduced between Northern Ireland and the Republic of Ireland.

Pricing presents an even more immediate issue. The pricing strategies of mobile service providers are obviously different between the Republic of Ireland and Northern Ireland. The use of mobile phones across the border can prove extremely costly, with different mobile phone licences in the North. During their campaign to obtain the third mobile phone licence in the Republic of Ireland (finally granted to Meteor in July 2000 following a two-year legal battle) Orange had claimed that if successful they would reduce the cost of cross-border calls<sup>40</sup>.

From a cross-border perspective, the use of a single ISP within both jurisdictions can prove very costly, with international call charges and surcharges added when logging on in the alternative jurisdiction. One example of this would be the use of CompuServe. Within the North, customers can access the service through a single local rate number, but access from the South outside Dublin and Cork is charged on a national rate complete with surcharges. ISPs are beginning to provide equivalent services on a North South basis but this has not been without problems.

It is also the case that calling Northern Ireland from the Republic of Ireland necessitates the use of local area code 048, whereas calling the Republic of Ireland from Northern Ireland requires the use of international calling code 00 353. It was not possible to assign the Northern Ireland 028 code for calls from Republic of Ireland, as that had previously been allocated to the Cork region. This is an area where co-operation between the telecoms regulators could have avoided current dialling confusion.

There is little favour shown to immediate cross-border areas and no special pricing policy exists, unlike immediate cross-border regions on the European mainland<sup>41</sup>. This raises a whole range of issues, with different and very expensive international tariffs applying to calls even over very short distances. Comparisons between operators are very difficult and quite outside what can be reasonably expected of a small business or domestic customer<sup>42</sup>. These can all be seen as areas that could benefit from a broader regulatory vision.

<sup>40</sup>Centre for Cross-Border Studies, *North-South Cooperation on Information and Communications Technologies*, July 2000.

<sup>42</sup>Centre for Cross-Border Studies, *The Evolution of Telecom Technologies: Current Trends and Near Future Implications*, February 2001.

<sup>43</sup>NIACT, *Response to Consultation*, 2001.

In terms of mobile coverage in Northern Ireland, there is considerable variation in levels of coverage and numbers of black spots. There are many instances of roaming onto Republic of Ireland networks while using mobiles close to the border in Northern Ireland. This means that the user ends up paying international rates for what should be a local call<sup>43</sup>.

### **5.1.2 Cross-Border Harmonisation**

All-island technology development can play a key role in development.

The IBEC-CBI Joint Business Council, officially recognises the crucial role that all-island technology development can play in attracting future investment and calls for greater co-operation between ODTR and Oftel office to achieve a seamless telecoms infrastructure. In addition, it highlighted several difficulties that hamper cross-border trade, such as a diverse range of business directories, non-uniform telephone dialling codes and limited coverage of toll-free dialling.

### **5.1.3 Success Stories**

Despite some examples of cross-border co-operation in ICT, few ventures exist to improve the access or awareness of individuals on a cross-border basis.

There has recently been an explosion of start-up Internet companies in island of Ireland, offering either Web services or business products to customers on both sides of the border. In addition, there has been a recent trend of company start-ups with two business sites, one in each jurisdiction, to avail of tax benefits in the Republic of Ireland and the labour market in the North. Some of these businesses have been born out of the eCommerce revolution, while others are long-established businesses who have adopted a new model to sell their products.

All of these sites have similar characteristics, such as ease of use, customised use, currency exchange facilities, on-line tracking if appropriate, and reduced or discounted prices on certain items.

## **5.2 AREAS FOR ENHANCED CO-OPERATION**

### **5.2.1 Improving Transparency of Costs**

The mobile user requires greater transparency of mobile tariffs, particularly in the border area where international roaming is a common occurrence. An interactive information server, b4Ucall.com has been developed that provides on-line mobile phone tariffs for Northern Ireland and the Republic of Ireland. Using the system, it is now possible to compare packages offered by different service providers, and to determine cross-border and roaming call costs<sup>44</sup>. If this site were to be maintained and developed it would further improve the transparency of mobile telephone costs, as well as eventually helping to drive down the cross-border roaming costs.

### **5.2.2 Unified Planning**

The Republic of Ireland has a fragmented approach to planning regulations. IBEC has highlighted the fact that there is no agreed national framework within which telecoms operators can roll out their backbone and access infrastructure. When a telecoms operator crosses territorial boundaries from one local authority to another, the operator is regularly faced with different and conflicting sets of guidelines for infrastructure rollout<sup>45</sup>.

<sup>43</sup>NIACT, *Quarterly Meeting Minutes*, May 2001.

<sup>44</sup>Centre for Cross-Border Studies, *The Evolution of Telecom Technologies: Current Trends and Near Future Implications*.

<sup>45</sup>IBEC, *Telecoms in 2001, A New Urgency*, February 2001.

In the longer term it is likely that co-operative cross-border planning will enhance the ability of suppliers to deliver services.

### **5.2.3 Public Infrastructure Information Campaign**

The critical importance of infrastructure components, such as masts and fibre optic cables, to the provision of advanced telecoms services needs to be more widely understood.

Local opposition to masts and cable-laying could economically disadvantage parts of the country that object to such infrastructure. A better understanding, through a jointly organised public information campaign, should lead to a greater appreciation of, fewer objections to, and faster establishment of network infrastructures.

This needs to accommodate the natural anxiety of individuals when faced with the prospect of telecoms masts in public locations.

### **5.2.4 Education Campaign for SMEs**

It has been recognised that SMEs on both sides of the border have been slow to recognise the relevance of broadband connectivity in the immediate future. There is scope to jointly address this through all-island information and training campaigns.

It is important that any such activity be supported by early research with SMEs across the whole island of Ireland.

### **5.2.5 Improve Public Awareness of New Technologies**

This is another education initiative that can be driven across the island of Ireland and be a tangible example of co-operation. It would also benefit from the economies of scale to drive down costs. The messages on new technology are consistent and would emerge from studies of public awareness.

### **5.2.6 Benchmarking Within the Island**

This report has been effective in benchmarking Northern Ireland versus the Republic of Ireland by indirect means. In other words, the position of Northern Ireland within the UK has been ascertained from UK studies, and then compared against the Republic of Ireland. The UK and Republic of Ireland are normally benchmarked against European standards.

Direct benchmarking between the two areas will remove the natural uncertainties of the above process, ensuring that consistent measurements are used. It will also allow analysis of the performance gaps to trigger further studying into the root causes of major differences.

It will then be possible in the longer term to benchmark island of Ireland as a whole with Europe.

It will also be useful to co-operate with Europe-wide partners to study how other member states approach closing the gap from their perspective. This will allow lessons to be learnt and best practice to be shared.

A final benchmarking benefit will be to focus on the states within Europe that are most specifically successful (compared to the island of Ireland) in key areas and study their success to see what other lessons may be learnt.

### **5.2.7 Improve Co-operation between ODTR and Oftel**

The brokering of a formal relationship between the ODTR and Oftel could enhance all-island competitiveness.

Development of flat rate Internet access could be a tangible example of co-operation. It is also possible that this level of interaction will be mandated in the future by Europe-wide legislation.

### **5.2.8 Licences for Rollout of New Technology**

While recognising that an island of Ireland licensing scheme is an ideal and possibly unattainable objective, it should be recognised that European legislation may insist on improved co-operation on legislative issues.

### **5.2.9 Capacity Sharing in Data Centres**

The Republic of Ireland could aid the drive in Northern Ireland for the increased use of technology by providing some real case studies of businesses that have benefited from data centres, promoting the use of the technologies and providing the skills to optimise their take-up by SMEs.

### **5.2.10 Development of the Digital Corridors**

This is a co-operative venture, which should be encouraged, with a study completed of the needs of businesses, the incentives that would encourage businesses to relocate to a digital corridor and the development of skills in this area.

## 6. EXAMPLES OF BEST PRACTICE

This section examines ICT-related examples of best practice of cross-border co-operation under the headings of:

- Education and awareness;
- Infrastructural developments; and
- Cross-border models for co-operation.

It also briefly considers initiatives in European countries.

### 6.1 EDUCATION AND AWARENESS

#### 6.1.1 The Connectivity Chain

LEDU in Northern Ireland has initiated a Connectivity Programme targeting 1,000 small companies in Northern Ireland to provide them with website access and e-mail facilities.

#### 6.1.2 UKOnline

UKOnline centres are based in communities and designed to meet the needs of local people who have low or no ICT skills or access to ICT. They will provide access to the Internet and e-mail, and help people explore opportunities for further learning through ICT. For the business community, UKOnline for business advisors offers advice and support from local Business Links Centres on how best to use eCommerce technologies to achieve business benefits.

### 6.2 INFRASTRUCTURAL DEVELOPMENTS

#### 6.2.1 Network of 'Webworks'

'Webworks' is a network of technology hubs planned by Enterprise Ireland. These will house new companies in towns and cities around the country on a regional basis to help develop ITS companies, especially start-ups. These hubs will generate zones of specialisation based on clusters of companies located in the area.

Four sectors have been identified by Enterprise Ireland as priorities in terms of potential for wealth creation and growth<sup>46</sup>.

These are:

- Informatics (including software and ICT);
- Digital Media;
- eBusiness; and
- Healthsciences.

The *ITS 2007* report recommends the establishment of technology hubs, 'webworks'. Other recommendations include the development of a Digital Media centre in Dublin, and an eBusiness learning centre and other centres around the country to help ITS companies succeed.

<sup>46</sup>Enterprise Ireland, *Opportunities for Ireland's High-Technology Internationally Traded Services Sector to 2007*, 1999.

### **6.2.2 Private/public Partnerships**

IDA Ireland's strategy is to make Ireland a European eBusiness hub, and is working to achieve this through partnerships with private industry, for example, the Irish government/IDA contract with Global Crossing, which gives Ireland practically unlimited bandwidth connectivity to Europe and the rest of the world.

### **6.2.3 Designation of National Digital Parks**

IDA Ireland is working with the private sector on the development of this and other digital parks, developing an international telehouse for telecoms and ISP companies to exchange traffic at City West.

## **6.3 CROSS-BORDER MODELS FOR CO-OPERATION**

### **6.3.1 The Common Chapter in the National Development Plan**

The respective development plans for Northern Ireland and Republic of Ireland have recognised the importance of developing an agreed strategy for co-operation, developing a common chapter which seeks to set out a strategic framework that develops benefits through closer economic co-operation. Communications and eCommerce was recognised as a key element for future economic development and the following actions were taken:

- Establishment of a North-South Digital Corridor Working Group;
- Commissioning of a study by the North-West Region Cross-Border Group with a view to developing an integrated, multi-sectoral cross-border information society; and
- The study of a proposed Digital Technology Corridor in the Armagh/Monaghan area<sup>47</sup>.

### **6.3.2 North-West Region Cross-Border Group**

This is a partnership of Derry County Council, Donegal County Council, Limavady Borough Council and Strabane District Council. The purpose of the partnership is to help foster development of the economy of the region which traverses the border between Northern Ireland and Republic of Ireland. This group was founded on the principles of co-operation between local authorities and economic co-operation across a national boundary<sup>48</sup>.

### **6.3.3 IDA/IDB Initiatives**

A common approach to promote the economic development of the north-west is to be explored by IDA Ireland and the Industrial Development Board (IDB) for Northern Ireland. Both organisations are to look closely at the steps that can be taken to strengthen the economy and increase employment opportunities<sup>49</sup>.

<sup>47</sup>National Development Plan, 2000 - 2007, 2000.

<sup>48</sup>North-West Region, Cross-Border Group, *Mission Statement*, 2000.

<sup>49</sup>IDA Ireland, *North-West to be a Focus of IDA/IDB Initiatives*, May 2000.

## 6.4 EUROPEAN LEADERS IN ICT

Development of ICT among European leaders has tended to be stimulated by public funding.

Sweden, Norway and Finland are consistently ranked highest in Europe in relation to ICT. They are in a strong competitive position because of their advanced information, computer, Internet and social infrastructure.

The Swedish government pre-empted many EU telecommunications liberalisation measures, and the market has been technically open to full competition for many years. Sweden has also pulled ahead of the US in the 2000 ISI rankings because of the efforts undertaken to bolster home PC usage through a 'Home PC Employee Purchase Scheme'<sup>50</sup>. The Dutch and Swedish governments have elected to subsidise fibre network services to the home, in a move which could provide models for island of Ireland in considering how to promote broadband local access.

The Swedish government earlier this month voted a budget of 5 billion Swedish kroner for developing broadband networks in rural areas in an attempt to ensure high-speed broadband access to all of Sweden.

The Dutch government has announced it will provide 100 million guilders to fund a project to test which business models are the most viable for offering fibre-to-the-home. The government and service providers are hoping to begin initial work on the networks in Autumn 2001. The Dutch government wants network operators and service providers to offer connection speeds to each home of at least 10 Mbits per second.

The French government has put together a package worth \$182 million to support rural 3G mobile infrastructure. The scheme will include \$65 million in cheap credits from central government, further credits of \$65 million from local government offices and a \$52 million contribution from the telecom operators themselves. Aware that, as with UMTS, more rural locations cannot be supported within the existing business models for broadband, the government is committing \$190 million to laying fibre trunks to rural areas. Likely to piggy-back the state-owned Electricité de France's national grid, the choice of which operators will get to manage it is yet to be decided. Although the government has avoided the more expensive, and contentious, last mile issue, it is clearly a help to competitive broadband service providers which cannot commit to the expensive costs of creating a network themselves.

<sup>50</sup>*World Times Information Society Index, 2000.*

## 7. RECOMMENDATIONS

This report identifies the impact of ICT on the island of Ireland's competitiveness and proposes actions where enhanced co-operation between Northern Ireland and Republic of Ireland would generate competitive advantage for businesses.

As illustrated in previous sections, supply (provision) and capability (demand) gaps exist between the Republic of Ireland and Northern Ireland which are both telecoms-related (e.g. uptake, delivery and cost of leased lines) and IT-related (e.g. uptake of IT by SMEs). The island in general is behind world best practice standards in many areas and the thrust of these recommendations must be to ensure optimum use of resources in bridging the gaps.

In each case the basic issue is identified, recommendations to address it are made and the desired outcome assessed. Telecoms actions relate mainly to infrastructure while IT recommendations mainly relate to awareness and education.

### 7.1 TELECOMS ACTIONS

#### 7.1.1 Infrastructure Planning

**Issue:** Broadband coverage is uneven throughout the island and there is a concern, particularly in Republic of Ireland, that a lack of interest by the telecoms operators may delay the development of an all-island backbone.

**Recommendation:** A co-ordinated approach should be developed in both jurisdictions to the rollout of telecoms infrastructure to include:

- An overall analysis and strategy-setting exercise of the key gaps in provision, priorities for investment and cross-border synergy opportunities, North and South; facilitated by plans in each area having common sections dealing with cross-border issues;
- Plans with a clear commitment to extend rollout beyond current commercially viable areas, to prevent the growth of regional digital divides, particularly in cross-border areas;
- Incentives targeted at providing Internet access for lower income groups (e.g. digital interactive TV);
- Public support to development in regions, e.g. a new public/private partnership to provide broadband capacity to the west and north-west of the island;
- Consistent planning of telecoms infrastructure between local authorities in each jurisdiction and in cross-border areas to encourage operators to share infrastructure costs and minimise environmental impacts; and
- National guidelines for telecoms infrastructure planning in Republic of Ireland, as well as a common approach to infrastructure sharing by local authorities and telecoms operators.

The existing planning processes should be reviewed and mechanisms put in place to ensure effective co-ordination in these areas.

**Outcome:** Widespread and cost-effective broadband coverage throughout the island.



**Issue:** Bringing the local access network, as the final link to the user, to international standards is critically important. Unbundling of the local loop would facilitate user choice, foster price and service level competition and encourage growth of the market.

**Recommendation:** Implement a co-ordinated programme to improve the local access network, including:

- Improvement in the delivery of leased lines in Republic of Ireland;
- Options to equalise costs, particularly in the regions;
- Implementation of xDSL technologies;
- Mechanisms to unbundle the local loop; and
- Effective co-ordination between ODTR and Oftel.

**Outcome:** Local access up to best international standards, supported by unbundling of the local loop to ensure active competition.

### 7.1.2 Regulation

**Issue:** The fact that Northern Ireland and the Republic of Ireland follow different market drives and ambitions may result in new services being introduced at different times (e.g. 3G licences), and pricing and service strategies evolving on different time scales.

**Recommendation:** Implement mechanisms to ensure effective on-going co-ordination between ODTR and Oftel, paralleling the EU move to co-ordinate regulations across Europe.

**Outcome:** Effective co-ordination in priority areas such as redefining Internet and telephony technologies, co-ordinating rates of interconnect and delivery of leased lines. 3G licences in place by January 2002.

## 7.2 INFORMATION TECHNOLOGY ACTIONS

### 7.2.1 Business Connectivity

**Issue:** The slowness of industry, particularly SMEs, to take advantage of existing infrastructural provisions and computing power is a key all-island competitiveness gap requiring further co-operative investigation. There is a distinct lack of information on the views of industry, North and South on issues such as those relating to connectivity, levels of investment and usage.

**Recommendation:** Address the above information gap and incorporate findings into plans by:

- Conducting research by sector, location and scale to obtain feedback from industry on priorities, barriers and opportunities, etc., to exploitation of ICT;
- Carrying out root cause analysis on the reasons for slowness in uptake; and
- Maintaining ongoing benchmarking within the island and with external best practice focusing on performance and the lessons to be learned.

**Outcome:** Governments will have a better understanding of the needs of the business community.

### 7.2.2 Awareness And Education

**Issue:** The risk exists of a growing digital divide between the fast track ICT users and general users/SMEs.

**Recommendation:** Governments should act to increase IT education generally and provide universal access to IT resources. To achieve this:

- Develop an integrated all-island support programme for SMEs (with a special focus on managers) to promote IT and increase the desire to move up the connectivity chain and develop eBusiness opportunities. This should address issues such as:
  - Success stories from SMEs that are benefiting from eBusiness;
  - Benefits of the services and outsourcing arrangements that data centres offer, and their availability; and
  - The importance of internet security.
- Support is likely to require a mix of measures, designed to suit the need, including training, consultancy, mentoring, support from fast track IST users, academia, etc.;
- Develop a co-operative education programme to communicate to consumers an understanding of and the benefits from information technology including a basic IT familiarity course for workers and the unemployed; and
- Disseminate information on critical issues such as the importance of telecoms masts to IT infrastructure while recognising the natural caution of the public.

**Outcome:** The general public and SMEs have an increased understanding of the benefits of ICT, a better vision of how they can exploit eCommerce and the will to progress along the connectivity chain.

## 7.3 GENERAL ACTIONS

### 7.3.1 All-Island Benchmarking and Competitiveness Analysis

**Issue:** This report provides a unique overview of current performance in the critical areas impacting on ICT and this information should be made available on an ongoing basis.

**Recommendation:** Provide an ongoing focus for action to address gaps versus best practice and business needs, and to avail of synergy opportunities. To achieve this:

- Critical areas for benchmarking should be defined;
- Compatibility of telecoms and IT data should be improved to emphasise the compatibility of statistics and ongoing benchmarking;
- Internal benchmarking should continue in the defined areas; and
- Formats should be developed to compare the competitiveness of the island of Ireland with European best practice.

**Outcome:** An agreed framework for all competitiveness initiatives on the island.

### **7.3.2 Information Services**

**Issue:** There is a lack of transparency in mobile phone charges across the border

**Recommendation:**

- Take action to promote transparency of cross-border mobile tariffs, e.g. development of websites such as b4Ucall.com
- Consider a joint All-Island Business Directory Service to improve availability of information and provide further publicity for existing businesses on the island.

**Outcome:** Consumers educated on the real costs of mobile telephony packages with a resultant driving down of costs.

## APPENDIX A: LIST OF INFORMATION SOURCES

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## **A.2 NORTHERN IRELAND AND THE UK**

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## APPENDIX B: TARIFFS INFORMATION

### A GENERAL COMPARISONS

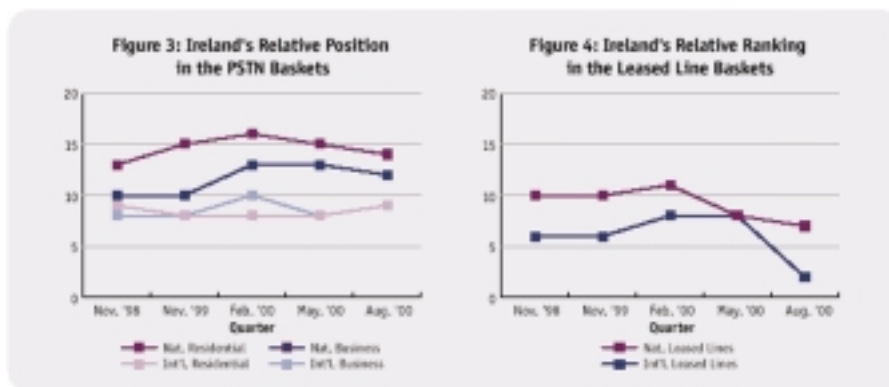
Prices for telecoms services in Northern Ireland are very low by European standards and are lower than in the Republic of Ireland. However, while the cost of national and international calls has fallen dramatically in both the North and the South in recent years, this pattern has not been repeated in the local loop. This is the last mile of wire that connects homes and businesses to the national telecoms infrastructure and so to the Internet. The cost of making a local call to connect to an ISP remains high, even though the Internet service (e.g. Freeserve) may actually be provided free of charge. The cost of local calls in the Republic of Ireland is very high compared to other OECD countries, with the price of leased lines over 100% higher than in the US.

Deregulation and considerable investment in the Republic of Ireland has worked to increase penetration of information and communications technologies, as well as reducing the cost of access. However, the fact remains that communication costs are too high<sup>51</sup>.

### B. PSTN TARIFFS

Figure B.1 illustrates the Republic of Ireland's relative position in December 2000 with regard to PSTN when ranked against 19 key countries. The Republic of Ireland's position in the leased line baskets is better and shows considerable improvement over the same period, particularly in international leased lines<sup>52</sup>.

**Figure B.1 The Republic of Ireland's Relative Position in PSTN**



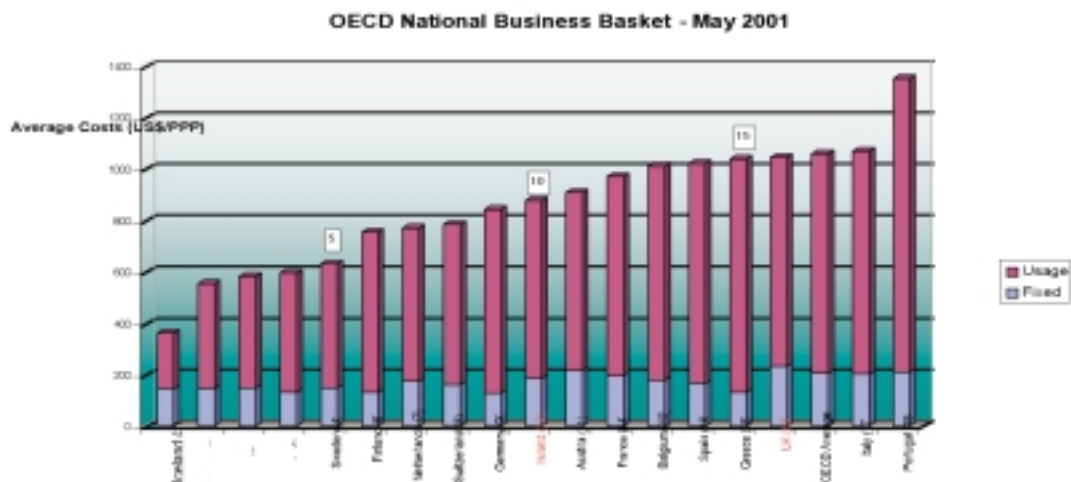
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### C. NATIONAL BUSINESS BASKET

The 'National Business Basket' examines the average cost of national and local calls for the business sector. This basket is comprised of a much larger number of calls compared to the residential basket, with a greater proportion at peak times, although they are generally of shorter duration. The Republic of Ireland's position improved two places in this basket during the first quarter of 2001. The Republic of Ireland now lies 6 places ahead of the UK and 7 places ahead of the OECD average in this basket (See Figure B.2).

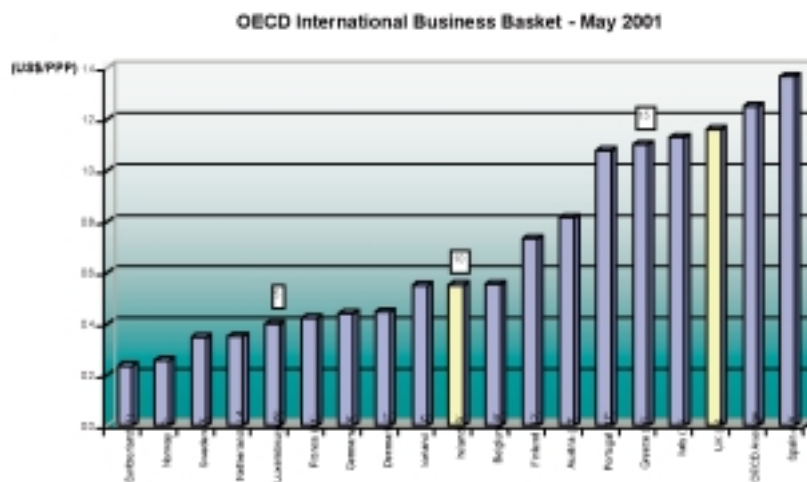
**Figure B.2 OECD National Business Basket - May 2001**



Note: The numbers in brackets represent the countries' respective rankings as at March 2001.

Figure B.3 sets out the average cost of international calls for business users. Like the national baskets, the international baskets have different weights for the business and the residential sectors. The business basket apportions 75% of the calls to peak rates, while the residential basket apportions 25% to peak rates.

**Figure B.3 OECD International Business Basket May 2001**

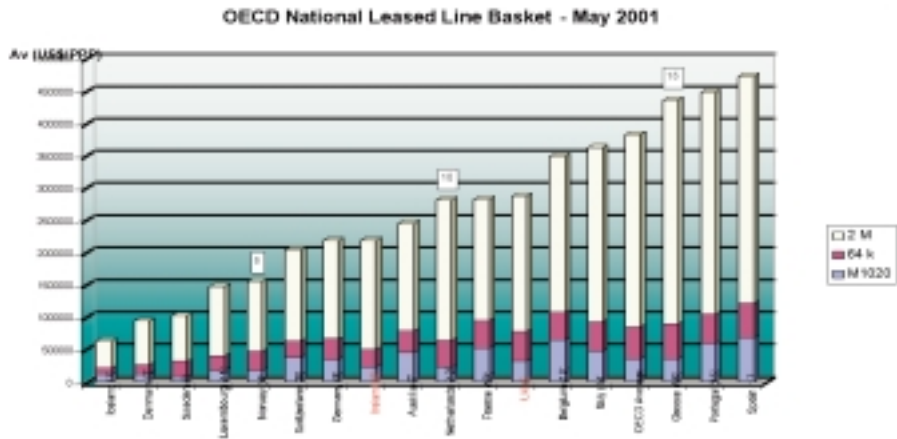


Note: The numbers in brackets represent the countries' respective rankings as at March 2001.

#### D. NATIONAL LEASED LINES

The Republic of Ireland now lies in 8th position, 7 places ahead of the OECD average<sup>53</sup>. The UK lies in 12th position (see Figure B.4).

**Figure B.2 OECD National Leased Line Basket May 2001**

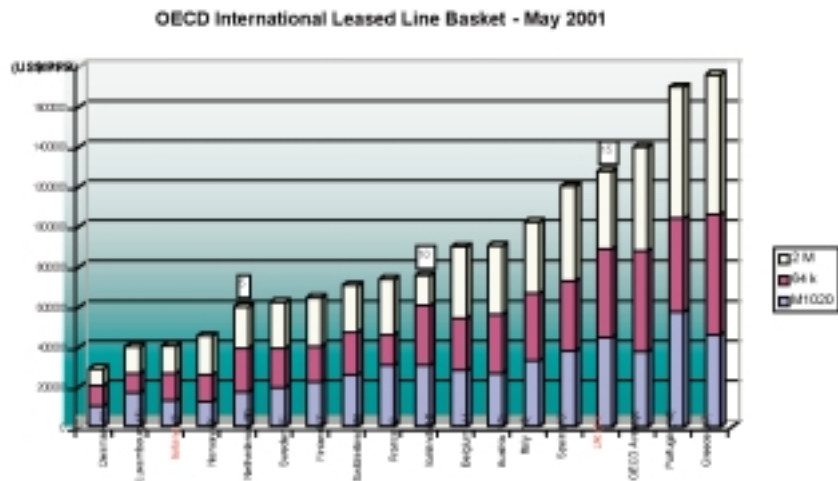


Note: The numbers in brackets represent the countries' respective rankings as at March 2001.

#### E. INTERNATIONAL LEASED LINES

The Republic of Ireland lies in a competitive 3rd position, ahead of the UK in 15th position in the rankings (See Figure B.5).

**Figure B.5 OECD International Leased Line Basket May 2001**



Note: The numbers in brackets represent the countries' respective rankings as at March 2001.

<sup>53</sup>The 'National Leased Line Basket' is based on 100 circuits distributed over 6 distances from 2 to 500 km. Results exclude VAT.



## F. PERSONAL MOBILE BASKET – POST-PAID

This basket covers GSM or DCS tariffs<sup>54</sup>. Both reflect post-paid tariffs available from the incumbent fixed network operators' mobile subsidiary. The 'Personal Mobile Basket' sets out the average costs of personal mobile tariffs (see Figure 2.5). In 17th place the Republic of Ireland now lies 4 places behind the OECD average, and four places behind the UK in 13th place.

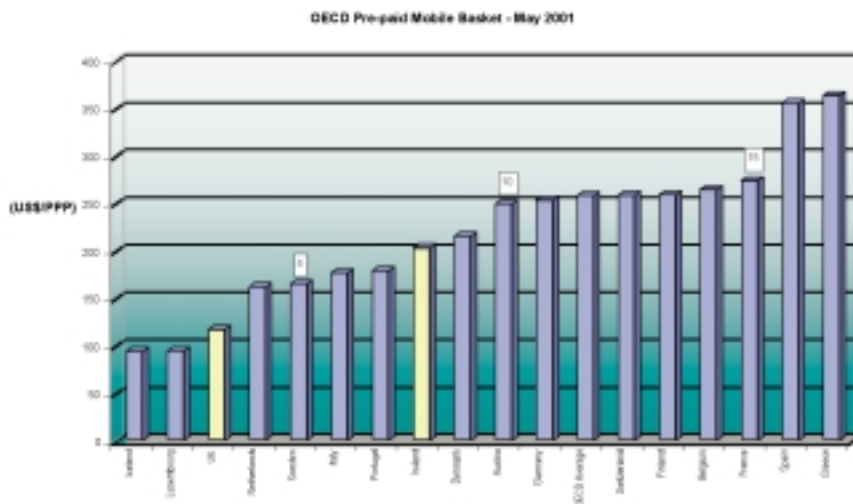
<sup>54</sup>The OECD Personal Mobile Basket has national calls fixed at 200 distributed between local and national (not distance-related) and including 10% of calls to other mobiles in the same network. Call duration will be 3 minutes for all types of calls. The charge for each call reflects the actual charge for the duration in question, as defined by the tariff. Call set-up and minimum charges are included.

## G. PERSONAL PRE-PAID BASKET

This basket covers GSM or DCS tariffs<sup>55</sup>. Both reflect pre-paid tariffs available from the incumbent fixed network operator's mobile subsidiary. It can be seen from Figure 3.7 that the Republic of Ireland lies in 8th position, 4 positions ahead of the OECD average. However, the UK performs much better, holding 3rd position in the overall rankings.

<sup>55</sup>The OECD Personal Pre-paid Baskets has a peak/off-peak relationship of 25%/ 75%, the same as the standard Personal Mobile Basket, and as the OECD stipulates. There are no handset charges or other initial fees included, and the cheapest option available is always used. As is the case with all the baskets, US\$/PPP is used.

**Figure B.6 OECD Personal Pre-paid Basket May 2001**



## H. BUSINESS MOBILE BASKET

This basket covers GSM or DCS tariffs. Both reflect post-paid tariffs available from the incumbent fixed network operator's mobile subsidiary<sup>56</sup>. The 'Business Mobile Basket' sets out the average cost of business mobile tariffs. In 14th position the ROI lies one position ahead of the OECD average and 5 positions behind the UK (see Figure B.7).

<sup>56</sup>The number of national calls in the OECD Business Mobile basket is fixed at 1200. The national calls are just distributed between local and national (not distance related), and include 10% of calls to other mobiles in the same network. The international proportion of the basket follows the basic structure of the International PSTN basket, for business and residential usage. The only difference is that all calls have a duration of 3 minutes.

