

OUR DIGITAL FUTURES: POLICIES FOR BROADBAND CONNECTIVITY IN REMOTE AND RURAL COMMUNITIES OF IRELAND AND SCOTLAND

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INTRODUCTION

Digital living

A funny thing happened on the way to 2005: the digital revolution actually became real. Walk around any city or town and what do you see? You see young people text messaging; commuters jamming to their iPods; friends snapping photos on their camera phones. Look a bit further, and you see doctors' decisions aided by patient information called up on hand-held devices; teachers using wireless technology as tools; parents printing photos on cordless printers before leaving their children's football games. ... It's a revolution in any sense of the word. But I have another name for it: a warm-up act. We are entering an era where everything is going digital. It's going to be the main event of our lives for decades to come'. (Carly Fiorina, CEO Hewlett-Packard: 'Totally Digital', in **The Economist – The World in 2005**, p. 128).

We know the law formulated by Gordon Moore in 1964, namely that the number of transistors that can be placed on a silicon chip doubles every 18 months. Computational power ... also doubles every 18 months. So

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much so that we have reached the point where the capacity of a simple greetings card that plays 'Happy Birthday' when you open it up is more than the total computational power on Earth in the 1950s. (RTD Info Special Issue on Science and Memory, Odds and Ends Section 2005, p. 44).

The terms 'Information Society', 'Digital Age' and 'Knowledge Economy' are increasingly viewed as appropriate to describe the backdrop to 21st Century living. The largely metropolitan trend towards '24/7 connectivity' at high speed, facilitated through a range of Information and Communication Technologies (ICTs) and their associated infrastructures, is increasingly seen as the norm. There is, according to some commentators, an apparent ubiquity of access to always-on, high-speed, computer-mediated communication (CMC) through broadband-enabled email, websites and portals. This, in turn, skews channels of information and service provision towards online media. As stated by the OECD (2001), 'The Information Society and the New Economy, based on virtual networking and knowledge oriented activities, are rapidly becoming a reality...' (p. 15).

Broadband advantage with territorial disadvantage

The implications of this connected, international 'society' are highlighted in many European documents relating to e-Europe and e-Europe+ , for example:

As the knowledge-based economy advances, the exclusion from ICT becomes more and more a barrier to economic, employment and social opportunities and to using public services. Disadvantaged areas and groups are at higher risk of lagging for various reasons including low income and poverty, lack of ICT infrastructures, awareness and training opportunities, or difficulties of access because of disabilities. On the other hand, ICT can overcome barriers of distance, distribute more equally knowledge resources, and generate new services. ... Thus, the risks of the digital divide need to be transformed to digital opportunities by actions focused at disadvantaged groups and areas. (European Commission 2001, p.17).

Thus, remote and rural areas are said to benefit disproportionately from ICT usage, primarily because of the distance-shrinking and social inclusion potential of such media (Cairncross 1997). However, investments-costs per head for rural infrastructural provision (such as broadband) for remote and

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rural populations are also disproportionately high, making such investments relatively unattractive to the private sector, due to the small, dispersed customer base. According to many sources, there is evidence that rural areas severely lag behind their urban counterparts. The OECD has termed this a 'Territorial digital divide' (OECD 2001, p. 89). Further, the European Commission identifies rural and remote regions as experiencing geographical isolation and low (and, in some areas, declining) population density; such characteristics mean that their full participation in the Information Society is hampered by the high cost of upgrading infrastructure and providing access to ICTs (European Commission 2003). Other authors have highlighted the actual and potential inequity of high-speed digital connectivity, and its implications for individuals and for a cohesive society (Skerratt AND Warren 2003; Skerratt 2003; Agnew 2002; Mathieson 2003; Dilenge 2000; Grimes 2000; Hindman 2000; NTIA 1998, 1999, 2000; Parker 2000).

This situation has implications for development and regeneration, as well as for stemming out-migration. In addition, there is evidence that broadband connectivity shapes in-migration trends and patterns towards hot-spots of digital connectivity ('people follow the bandwidth', Skerratt 2003). Further, with the advent of 'super broadband' (or new generation broadband), rural areas are seen as being further disadvantaged in the medium term (**RuralCity Media** 2004). In addition to having implications for social justice, such a situation means that European targets for e-government and e-services face particular challenges in a rural setting, because of limited access per head to online facilities. The slow speed of connectivity can be further exacerbated by increasingly high bandwidth requirements of applications (including distance learning – some sites now requiring broadband support), which would otherwise attract business and leisure users to the internet. Finally, the costs of access for many businesses and individuals still remain prohibitive, particularly at household and micro-business levels.

Rural digital futures in Ireland and Scotland

I examine responses to such digital divides within the Republic of Ireland and Scotland. Firstly, I outline the drivers towards ensuring broadband connectivity for remote and rural areas. I then examine the process of policy response, the investment behaviour of the telecommunications companies, and the implications of the current state of provision.

THE REPUBLIC OF IRELAND

Regional development for a competitive Ireland

The **National Development Plan** (NDP) for 2000-2006 sets specific objectives of 'fostering balanced regional development' and 'promoting social inclusion'. In recognition of a regional imbalance within Ireland, the Plan identifies a number of regional 'Gateways' (urban growth centres) to drive development, and espouses 'positive discrimination in favour of regions lagging behind' (p. 10).

Sitting alongside the National Development Plan is the **National Spatial Strategy** (2001), which comprises an explicit push towards 'regionalisation', and subsidiarity of the regions within an otherwise potentially core-periphery, or top-down, approach to development. To this end, Gateways and Hubs are designated within newly-ascribed regions, to act as catalysts for economic regeneration at a sub-regional level. The underpinning rationale is that: 'Given that resources are not unlimited, attempts to create the requisite competitiveness on a widely dispersed basis would undermine Ireland's capacity to exploit the potential of centres where critical mass exists or can be promoted.' (p. 35)

Regional broadband connectivity

This policy focus on a regional basis for development was reflected initially in the Plan's Regional Broadband Programme, through the Regional Metropolitan Area Network¹. The rationale underlying the Network rollout was that, although the Irish Government 'is not in the telecommunications business', their role is 'to provide seed money' (**New Connections** 2002, p. 8), since this, in turn, will lead to an increase in demand:

¹ *The project, 90% grant-aided by the government under the National Development Plan 2000-06, is co-funded by the European Union under the European Regional Development Fund. Whilst ownership of the completed networks will remain with the State, the marketing, management and maintenance of the infrastructure will be undertaken by a Management Services Entity on a concession basis. The Management Services Entity will administer access to the networks on an open access basis. The government is tendering for a Management Services Entity to manage, maintain and operate access to these networks OECD 2004, p. 27).*

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By demonstrating in the initial intervention that resolving the specific infrastructural deficit identified *will unlock latent commercial and domestic demand* for broadband services, it is envisaged that the strategy will attract significant private investment in subsequent roll-out phases. (p.8, emphasis added).

The initial intervention (from 2002) was through the pathfinder projects in 19 regional towns. A further seven are to be completed before the end of 2005; another 45 towns, with populations exceeding 1,500, are to be enabled by the middle of 2006, with 45 towns enabled under the final part of the programme, to be completed by the end of 2006 (www.electricnews.net 28 February 2005). The Government describes the Network programme as facilitating 'increased competitiveness, global access and application of cutting edge technology. These networks are placing Ireland at the forefront of the technology revolution, providing the infrastructure to sustain our economic growth and jobs and lead to a better future for everyone' (DCMNR 2003).

It was expected that networks emanating from the Metropolitan Area Network fibre optic rings would enable the high-speed link up of a greater proportion of the regional population, stretching to what some may term 'rural', although still within 3.5km of an enabled exchange. However, in December 2003, Dermot Ahern TD (Minister for Communications, Marine and Natural Resources) stated that: 'The project does not go far enough in delivering on a new high speed agenda which any go-ahead economy demands' (12 December 12 2003), and announced the Broadband Action Plan, comprising two key elements: (i) connecting 88 towns of 1,500+ population to broadband with Community Broadband Exchanges and strategic fibre; and (ii) a new Group Broadband Scheme similar to group water schemes where smaller rural communities can pool their demands and secure high speed connectivity from a range of providers in the Irish market through grants from the Government.

This dual approach, then, would balance the focus of the Metropolitan Area Networks (delivering services and infrastructure where there is already critical mass) with an approach which sought to address the needs of smaller communities with lesser critical mass and more dispersed population. This resonates with the National Development Plan Telecommunications Priorities for 2002-2006 (2.1.4) which recognise market failure in broadband provision to more remote rural areas:

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The deregulation of the telecoms services ... means that delivery ... will be primarily by the market. However, the market alone may not deliver advanced telecommunications services to rural areas. ... The lack of these services hinders businesses in these areas. (p. 36)

The Group Broadband Scheme was formally launched in March 2004, under the strapline 'Radical Scheme to Connect Rural Communities'. The budget is 25 million euros over 3 years, and represents 55% capital funding from Government (the maximum allowable under EU rules) with half of the funding payable at the commercial launch of broadband services to local businesses and residents. The balance of funding will be allocated when the scheme reaches the minimum subscriber targets for the projects (see Department of Communications, Marine and Natural Resources, 7 March 2004). The objective is to promote the rollout of broadband access through the establishment of sustainable broadband services in villages and their rural hinterlands. The scheme is open to all smaller and rural communities of fewer than 1,500 people, and 'enables local communities to work with a broadband service provider of their own choice, or to draw up and implement their own broadband plan'. Under the First Call, 1.4 million euros was being invested and thirty-four projects were approved, providing a broadband service to thirty-eight communities. The Second Call (January 2005) further expanded investment to 4 million euros (<http://www.dcmnr.gov.ie/Communications/Group+Broadband+Scheme/>).

International context

The above agenda of balanced regional telecommunications development, coupled with broadband opportunities for remoter rural communities, is within the context of increasing national competitiveness. This is reflected in the commentary on Ireland's position internationally, relative to other members of the European Union. For example, the following quote is cited in **New Connections** as a key driving force towards improvement in provision:

Given its significance as the underlying information infrastructure, progress with provision of broadband services in Ireland is a cause for concern. ... An OECD study [October 2001] ranked Ireland 27th of 30 countries in terms of penetration of broadband technologies. ... The November 2002 update shows no appreciable improvement, with Ireland being the worst performing country of the benchmarking group for broadband take-up ... we must recognise that we are 2-3 years behind

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leading competitor countries. (Information Society Commission 2002, p. 28)

Further:

It is simply untenable in a modern society and economy that so many have no access to broadband and no immediate prospect of it. That is all going to change. We are in the middle of a global information revolution and we are running to catch up with economies such as Korea and Japan where high speed connectivity is accepted as simply as throwing an electric light switch is here. (Dermot Ahern, TD, March 2004)

Such sentiments are also reflected in the Preface to the Government's Broadband Strategy Document (2003), where connectivity and usage targets are outlined, including attaining a position for Ireland in the top decile of OECD countries for broadband connectivity by 2005.

Given this regional and local strategic approach, is there a digital divide?

To be on the wrong side of the digital divide means less opportunity to take part in the Information Society, in which more and more jobs will be related in some way to the use of ICTs. It also means a loss of opportunity in education, learning, training, shopping, entertainment, and communications. ... As more and more people regularly use ICTs in their daily activities, people who lack access to these tools are at a growing disadvantage. (**New Connections**, p. 39)

The momentum implied by the Irish Government's actions and programmes is set against a backdrop of continuing debates over: the extent and nature of Ireland's 'digital divides'; the roles of Eircom (Ireland's biggest provider of high-speed internet services) – particularly in connection with the speed of unbundling the local loops and the possibility for other telcos to provide broadband² to a wider customer base; and the impact of ComReg (the communications regulator) on these processes.

² For example, according to www.electricnews.net (22 February 2005), fewer than 0.2 percent of Eircom's phone lines have been unbundled. 'This situation, though, could be improved upon in the coming months; ComReg has recently issued Eircom with an order to offer a local loop unbundling ordering process to rivals in order to allow other companies to gain access to Eircom's 1.6 million phone lines in much

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For example, writing in 2001, in 'The State of the West', the Western Development Commission makes the following contextual statement:

As the deregulation process is evolving, rollout is proceeding in areas with high-density business and residential usage. It is the free market that is largely determining supply and provision. If free market principles continue to determine rollout, then much of the Western Region will have extremely limited provision and capacity. This will hamper efforts at enticing new investment into the region, as well as limiting the development of existing business ... (and) further widening the digital divide. (p. xiv)

Further, access, cost and quality of services in Ireland are very much related to location 'suggesting an emerging "digital divide" or "broadband gap"' (p. 5). In their 'Update on Telecommunications in the Western Region' (WDC December 2002), it is argued that: 'the availability of quality telecommunications infrastructure and services at a competitive price is as crucial to regional development today as rural electrification was in the 1940s and 1950s' (p. 5).

In commenting on the future delivery of broadband within Ireland, the ODTR (2002) report describes a 'broadband gap' which emerges because broadband rollout is largely restricted to price insensitive large companies mainly concentrated in the major urban centres, for whom broadband is likely to be a crucial input for their business (p. 31). An outcome of this, the ODTR states, is that:

The promise of broadband communications can leave those who are unable to access facilities they require, through high costs or lack of availability, frustrated and unable to develop their businesses in directions that they want. For example, ordering and maintaining leased lines has not been as easy, quick and cheap as many users would like. This has caused some users to turn to or explore alternative solutions including those presented by new technologies. (p. 12)

Further, IBEC (Irish Business and Employers Confederation) states that:

greater numbers and at a faster pace' (Deirdre McArdle). See also www.irelandoffline.com

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The reality is that a 'Digital Divide' now exists between companies based in Dublin and those based in the regions in locations such as Letterkenny, Sligo and Carrick-on-Shannon. Higher costs, poorer quality inferior service and lack of infrastructure are emerging as major issues for business. Companies in the NW region now need to maximize the use of available technology, R&D and highly trained staff to sustain competitive advantage. World class telecommunications infrastructure is essential if we are ever to achieve balanced regional development (IBEC 2003, p.7)

Implications

Although the Group Broadband Scheme is welcomed, in that the specific target is small rural communities and their hinterlands, it remains to be seen whether the shift in emphasis towards communities themselves taking the leading role in their own broadband procurement process will allow for a *coherent* provision of high-speed connectivity across rural Ireland. The four key requisites for rural communities to participate in the Group Broadband Scheme are:

1. Communities must work in partnership with a broadband internet service provider;
2. The scheme must meet the current and projected broadband needs of the community;
3. Schemes must be sustainable – technically and commercially viable on an ongoing basis after start-up support;
4. Schemes must be cost effective and exploiting existing resources where available.

Will such an assembly of information, business plans, sustainability projections, plus assessment of existing resource base, be possible coherently and consistently across rural Ireland, or will such processes of bidding and management be dependent on 'champions' or 'champion communities'? If the latter, will this then lead to a persistence of intra-rural digital divides (Skerratt and Warren 2003), where infrastructural provision is dependent on capacity? This is not to imply an absence of such skills and resources at rural community level; rather, to be aware that such a presumption appears to exist, which could lead to inequitable access provision. Previous research by the author in Ireland (2003) highlighted the complex community processes

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involved in bidding for rural broadband funds, and that capacity issues and expectation levels remain critical (Skerratt 2003).

Secondly, research shows that demand for broadband is either latent or not well articulated (Skerratt 2003; Gilligan, personal communication May 2005), and, indeed, a survey by O2 (2004), and a recent Forfas Benchmarking Study (2004), both show low levels of broadband and internet usage and demand. In the Forfas report, Ireland ranked 18 out of 21, surpassing only Hungary, the Czech Republic and Greece in terms of broadband usage. At the time, Forfas said that Ireland would need to sign up over 700,000 new broadband customers in the next three years if the country is to match the progress of other developed states. Gilligan's research at household level (personal communication May 2005) states that further investigation is required to gain a more accurate picture of existing demand, particularly where this may not be expressed through the required channels.

Thirdly, with the concentration being upon settlements of less than 1500 population, does this address the 'last mile' (see Skerratt 2003), or is the Group Broadband Scheme focusing on centres (albeit smaller) where critical mass can be said to exist? Do rural communities under the Scheme have 'responsibility' to make provisions within their plans for remote homes, farms, small and medium-sized enterprises, and hamlets, or will these be the focus of a further phase? In addition, as broadband speeds in metropolitan areas reach 8-30 Mbits/second, will a further layering of a digital divide emerge, when such rural centres have broadband speeds of 0.5Mbits/second-2Mbits/second³? These 'future-proofed' technical requirements will also have to be assessed and proposed within the Group Broadband Scheme Plans prepared by rural communities.

Finally, research by Comreg, which points to high mobile phone usage (94%) compared with broadband uptake, is believed to relate to the fact that there are many rural households without phone lines – an infrastructural

³ *Standard definitions of broadband speed remain unclear, however. For example: '... broadband defined as capacities of 512kbit/s and above. ... However, we regard this as a somewhat arbitrary working definition, and we recognise that technological and market developments may require us to revisit this definition in the future. It should be noted that the definition excludes Basic ISDN connections (max. speed of 128kbit/s) of which there has been strong growth over the past 18 months' (ODTR 2002, p. 15)*

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prerequisite for being part of the online age. To this end, Comreg has proposed a number of measures to Eircom, to guarantee access to a fixed telephone service to all members of society, along with making sure that everyone who wants to connect to the internet can do so at a minimum data rate (3 April 2005). In early March, ComReg issued a consultation paper outlining Universal Service Provider obligations on Eircom to provide basic connections to the public telephone network. On functional internet access, ComReg is proposing guidelines for meeting a required minimum data rate of 28.8Kbps for basic narrowband internet access:

Universal Service is really about social inclusion, and access to basic telephone services is a right of all members of society. This consultation will contribute to providing greater clarity as to the nature of that right and also in the nature of the duty which Eircom has in delivering access (Mike Byrne, ComReg commissioner www.electricnews.net and www.Irelandoffline.com).

I would argue that these contextual factors of capacity, demand assessment and articulation, the last mile, super broadband, and landline phone connectivity, comprise critical inter-related elements in rural Ireland's digital future, and in the feasibility of broadband rollout programmes.

SCOTLAND

The vision, and the need for foundations

A Scotland without fast, reliable, state of the art connections to global communications is a Scotland that will not prosper. It is a Scotland that will not be able to offer its business full access to all of the opportunities that the Internet can offer. It is a Scotland that will not be able to provide its citizens with the services that they expect and deserve. It is a Scotland that will not be able to offer its people the access to the educational opportunities that they need. ... Information and communications technology can reduce the constraint of peripherality and enable the development of a less geographically centralised economy. ... From a business point of view, we want the world to be able to come to you regardless of your location. Communities will be strengthened. And from an individual point of view, whoever you are and whatever you do, you

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will have fast access to a world of opportunities. (Scottish Executive (2001), **Connecting Scotland: Our Broadband Future**, pp. 3-4).

The above quote is illustrative of the perspective from the Scottish Executive which has explicitly underpinned their ongoing broadband policy reviews, reports, statements and infrastructural decisions, since 2000. These are now reviewed chronologically.

Prior to the publication of the above Report, the Digital Scotland Task Force published **Digital Scotland: The Way Forward** (May 2000), where broadband is viewed as one of the foundations for achieving a digital Scotland (p. 34). When reviewing the communications infrastructure (Section 6.1), the Task Force states that they support a vision of ‘citizens, businesses, and other organisations throughout Scotland having easy pervasive access, at internationally competitive rates, to the bandwidth and networked services that they need’ (p. 34). The Task Force highlight the contribution of ‘broadband mobile services’ and the Third Generation Mobile (3G) to the digital communications infrastructure, which will ‘offer particular opportunities in remote areas of Scotland’ (p. 33). This was viewed as critical in 2000, since:

In some rural and sparsely populated areas, access to even quite basic digital services – such as ISDN – can be more expensive to obtain as well as more difficult, particularly when the customer is located several kilometres from the local exchange. This can impact in particular on small businesses ... and act as a disincentive to inward location (pp. 33-34).

However, a point which is echoed in many other reports, some of which are cited below, is that (in 2000) there is doubt over the level of demand for broadband in rural areas, and therefore the case for private sector investment in telecommunications is weakened – in addition to being challenged already by a dispersed population base. For example, the Task Force states that: ‘the low levels of demand for high-speed digital services in sparsely populated areas, and technical limitations, mean the investment by telecommunications companies in rural areas may not achieve commercial rates of return’ (p. 34).

In responding to this Report (September 2000), the Scottish Executive emphasise their principle of *aggregating* demand for broadband as a key solution to the dispersed and low levels of demand identified as existing in

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rural areas. Specifically, the Executive outline their Recommendations and Agreed Responses relating to broadband as follows⁴:

No.	Recommendation	Response
6	Opportunities for linking up the planned broadband network for schools with other key infrastructural developments, including the public library network and the Metropolitan Area Networks which link higher education institutions and (very soon) all further education colleges, should be identified in the report of the study of broadband communications for schools and taken forward as quickly as possible.	Agreed. The Executive will act quickly on the recommendations of a study that it has commissioned on these issues from Price Waterhouse Coopers. The final report is due in September, and the Executive will publish its initial response and timetable for making decisions in October.
41	The Scottish Executive should ask representatives of the higher and further education sectors and of local authorities (in relation to National Grid for Learning investment in schools and plans for networking public libraries) to examine urgently the scope for joint planning and procurement of network services for universities, colleges, libraries and schools, in time to take appropriate action to replace existing contracts or set up new contracts when they are required. The UKERNA model – which has expertise in procuring network services for the HE and FE sectors throughout the UK – could be a model here.	Agreed. By November, and following the completion of the Executive's response to the schools broadband study (see recommendation 6), we will be approaching the HE and FE sectors and local authorities to consider how we take forward issues on joint planning and procurement of network services in the context of implementation of the planned broadband network for schools.

continued

⁴ from *Digital Scotland - The Way Forward* (September 2000), pp. 6, 16 & 20

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61	<p>The Scottish Executive should work with Scottish Enterprise, Highlands and Islands Enterprise and telecomms companies and others, to review supply of and demand for digital links in remote and rural areas. If shortcomings are identified, the enterprise bodies should explore with the telcos ways of encouraging investment in services, including for example co-operative action to plan and develop infrastructure, community involvement, and public sector partnerships.</p>	<p>Agreed. The Executive's papers 'Framework for Economic Development in Scotland' and 'Rural Scotland: A New Approach' concluded that telecommunications infrastructure coverage is vital to attaining the Executive's vision of a 'digital Scotland' and preventing a 'digital divide'. A study by Ovum Ltd commissioned by Scottish Enterprise to report on the telecommunications infrastructure in Scotland also provided a useful background. We recognise that telecommunications infrastructure coverage and capacity is generally good in Scotland but that lack of competition and choice may restrict access to broadband technology in rural areas. The Executive are taking this matter very seriously and are considering all the technological options for extending broadband access to rural areas. The Partners under the EC Special Transitional Programme in the Highlands and Islands will be commissioning a study of needs and options with a view to developing a programme for action eligible for EC funding. We are working with enterprise agencies in southern Scotland to develop a remit for a study in that area, and to investigate co-operative action to develop infrastructure.</p>
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By August 2001, the aggregation principle for facilitating infrastructural improvement in remote and rural areas had gathered further momentum, through a 'zonal procurement strategy' and the establishing of two Pathfinders, outlined by the Scottish Executive in their report **Connecting**

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Scotland: our Broadband Future (August 2001), with three elements identified as key:

1. ensure that every school has access to a rich online world in which it will be possible to communicate with others by text, voice or video;
2. ensure that all parts of the health service can transfer data and use telemedicine as necessary; and
3. ensure that all local authorities can provide modern, customer focused services.

This 'vision' would be realised through the aggregated broadband procurement for the public sector, which would then support 'modern public services and stimulate improvements in broadband services to the wider benefit of businesses and individuals' (p.9)⁵. Interestingly, the Executive explains 'why broadband', and gives this answer:

The use of Information and Communication Technologies (ICTs) is key to Scotland's economic and social well being. In the world of e-commerce, many businesses, particularly smaller businesses, will not initially need more than a telephone line to ensure that they make the most of these new technologies. However, if we wish to ensure that we have world-class services and the capacity to grow and maintain world-class businesses, we need to extend access to faster more flexible telecoms services for those who need it and be ready for the applications of the future. Broadband can provide this. It can offer a fast reliable 'always on' link to the Internet that will streamline delivery of public services and benefit business. In short, we need a world-class broadband telecommunications infrastructure (p. 9).

⁵ *In 2002 the Executive launched an official buying process in OJEC (Official Journal of the European Community), for a framework contract for government departments and local authorities. According to the Deputy Finance and Public Services Minister (then Peter Peacock): 'Broadband provides such a boost for rural areas as it effectively removes geographical disadvantage. ... It offers the opportunity for different parts of the public sector to work together more effectively and for local government services to be delivered more easily to customers' (Arnott, 28 November 2002 **Computing**).*

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In order to achieve this, the Executive assesses the appropriate role of government in terms of whether ‘the current operation of the market will provide the infrastructure to which we aspire’ (p. 9), with a resultant focus on intervening only where ‘activity would not otherwise happen, or to accelerate existing action’ (p. 9). With this in mind, intervention was proposed in the geographical areas of the Highlands and Islands, and South of Scotland, through two Pathfinder Projects⁶, since it expected that ‘the market is unlikely to meet anticipated demand under current procurement practices’ (p. 3). According to **Computing**, the Pathfinder projects were to test the policy of ‘using the combined weight of public sector demand ... to make it worthwhile for commercial telecoms providers to invest in infrastructure for otherwise unviable areas by providing a guaranteed level of demand...’ (28 November 2002). According to subsequently published material, the Pathfinders are also aiming to deliver higher bandwidth over a longer-term period, and to lever community-wide benefits (Scottish Executive 2004).

The infrastructural investment required for remote and rural areas must address, for example: lack of trunk capacity for future expansion beyond the medium term; age of local telephone exchange (older UXD5 exchanges); the legacy copper local loop (some of which is not robust) which is the basis for ADSL broadband (Asymmetrical Digital Subscriber Line); and the non-competitive pricing of broadband options for the end user. Given this, zonal aggregation in the public sector is therefore believed to be a key driver to encouraging investment by telcos, since higher usage costs are borne more widely by an aggregation of users. The Executive felt this approach to be crucial, and, at the time of their Report (August 2001), stated that: ‘We must anticipate what has been called the “Next Internet”, which will deliver applications in e-learning, e-government, e-health and e-business. If there are indications that the current operation of the market will not provide connectivity when it is needed, we need to identify solutions now’ (p. 12). The Executive concludes that ‘the digital revolution is already changing how we work, communicate and live, and we must ensure we keep pace with demand for changing technologies. We are sure that the actions set out here

⁶ **South of Scotland:** covering the geographical areas of Dumfries and Galloway and Scottish Borders Councils. **Highlands and Islands:** comprising the geographical areas of The Highland Council, the Islands Councils, Moray Council and Argyll and Bute Council.

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will contribute to the promotion of Scotland as a great place to live and work'(p. 28).

So, how would this vision become a workable reality? In 2002, the Scottish Executive states that: 'we are not satisfied that enough of Scotland's people are gaining access to broadband quickly enough. The population coverage of the technology in Scotland is less than the percentage figure for the UK as a whole and we mean to address this' (Scottish Executive 2002, p. 3). They set out their plans and outline the recent achievement for a digital Scotland in their Report **Connecting Scotland – Our Broadband Future: Making it Happen** (2002). Readers of the Report are encouraged to 'spread the word and be part of the virtuous circle' that encourages more businesses, public sector institutions and individuals to see the benefits of broadband connectivity and thus drive up demand. The two Pathfinder projects are seen as integral to this, as is awareness raising. In summary, the Executive sets out their actions to stimulate demand and supply⁷:

In the **short term**, on the **demand** side, we are:

- Rolling out demonstrator centres across the country;
- Providing seminars and roadshows to drive up interest in broadband;
- Developing high quality materials to ensure that the best information is available on broadband; and
- Developing a website to provide advice and information on broadband.

In the **medium term**, on the **supply side**, we are:

- Piloting aggregated procurement by the public sector;
- Intervening in the market to increase competition;
- Trialling alternative delivery mechanisms in rural areas; and
- Providing a focus to encourage the development of content and applications.

In the **longer term**, we will continue to take a strategic approach to the development of broadband across Scotland.

⁷ from SOURCE: *Connecting Scotland – Our Broadband Future: Making it Happen* (2002), p. 5.

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The 2002 Report addresses such issues as: access, cost and demand; Broadband: 'making business better and more competitive'; UK liaison: 'making it count for Scotland' (including the Scottish Programme under the UK Broadband fund); and gives examples of Demand and Supply Stimulation Projects. The Report concludes with observations concerning the future – 'Making it Sustainable' in the short, medium and longer term.

In addition to the Pathfinder Projects, 2003 then saw the launch of a number of Scottish Enterprise pilot projects (see www.ruralgateway.org) which included: a trial of broadband service for the farming community in the Maybole area of Ayrshire; the Power Line Trial in Crieff; the development of a Wireless Excellence Network; and a Community Broadband Project in Ayrshire, aggregated through a number of voluntary organisations.

The BBC News reported on rural broadband developments in Scotland, for example, in October 2003, 'Broadband heads for the islands': Orkney, Shetland and the Western Isles are to have access to fixed-line broadband technology in 2004 (through BT Scotland and Thus). We read that 'this is a landmark telecommunication project for Scotland' and links with the Government's pledge that 'rural communities will not be geographically disadvantaged by poor access to broadband' (10 June 2003). In January 2004, we read that 'Broadband helps sell your house', and in February 2004, how 'Broadband comes up from the sewer' (2 February 2004), reviewing a pilot scheme by Scottish Water, in Rosyth, where leasing sewage pipes to broadband providers could drive down internet costs. The 'Information sewerage highway' was to begin its pilot phase in Dunfermline, and there was an expectation that, 'with 24,000 miles of sewers' there was potential for the pilot scheme to be a widespread success.

The next key statements from the Executive come in 2004, as Press Releases and reports focus around the Scottish Borders Rural Broadband scheme. On 3rd February 2004, the £1M pilot scheme went live, having secured £700,000 from the Scottish Programme of the UK Broadband Fund, £270,000 from Scottish Enterprise National, and additional funds from the Department of Trade and Industry and Scottish Enterprise Borders (as part of the Scottish Enterprise Broadband for Business Programme). It aims to deliver broadband services to 1000 businesses and households, giving a potential coverage of 70% (according to a statement from Jim Wallace: <http://www.ruralgateway.org/cgi-bin/item.cgi?id=451>), through fixed wireless technology. The Scottish Borders area was chosen as it had the lowest

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broadband coverage in Scotland (www.scotlandonline.co.uk/news/bordersbroadband_story.htm). One of the key suppliers is Scotland On Line, with the aim of trialling a range of approaches to the delivery of broadband technology over a two-year period, and the opportunity to expand to a further three. In addition to the infrastructural investment, an impartial informative website was set up (www.broadbandforscotland.co.uk) where Borders residents and businesses could check whether the new service was available to them, with links to Internet Service Providers (ISPs). The key objective for the project is that it will continue to provide broadband services to customers on a self-sustaining basis, beyond the pilot phase.

Against the backdrop of these (and other) pilot broadband projects, March 2004 also saw a key statement from the Scottish Chambers of Commerce, who, in their evidence to the Enterprise and Culture Committee of the Scottish Parliament, called for an end to the urban/rural divide on broadband access (www.ruralgateway.org.uk) 'which affects so many rural businesses looking to access affordable broadband'. The Chambers' position is that all businesses, regardless of their location, should be able to access affordable broadband services. Bob Leitch, Director of SCC, stated that:

We appreciate that much has and is being done by the Scottish Executive and the Enterprise Networks in terms of stimulating demand, but this approach alone will not get broadband to businesses in many remote areas. ... These businesses are at a disadvantage. Efforts must be focused on increasing broadband in the more remote areas whether that is by selective intervention, by triggering more telephone exchanges or by looking at how to make alternative technologies more competitive .

In June 2004, the Scottish Executive issued a News Release entitled 'Broadband for all Scotland' (www.scottishexecutive.gov.uk/News/Releases/2004/06/5585). The Executive announced that they would step in 'to ensure every community in Scotland has access to affordable broadband by the end of 2005'. This would mean that 'the more remote and rural parts of Scotland will be able to access the vital technology', through a public procurement process (<https://news.scotsman.com/archive.cfm?id=1422352004>). In a 'Frequently Asked Questions (FAQ)' Release in November 2004, the Executive outlined the Broadband for Scotland Initiative in more detail. The majority of funding has come from the Scottish Executive

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and its Enterprise Agencies, Highlands and Islands Enterprise, and Scottish Enterprise. In defining their commitment, the FAQ information states that:

Our Initiative will seek to provide affordable broadband in every Scottish Census Output Area. These are the smallest geographical units used in the official census – each typically contains c. 50 households. This is an ambitious target as these are the basic building blocks for the census's higher order definitions of Scotland's communities. ... It is our aim, consistent with our obligation to secure best value for money, to ensure as 'near 100%' coverage as possible within the limits of available technology and budget (pp. 1-2).

Soon after the News Release, Netimperative (August 2004) reported that the Scottish Executive was offering a 60-month contract to extend broadband services to rural and remote parts of rural Scotland (www.netimperative.com/2004/08/09/Scotland_offers): 'BT and Energis are expected to bid for the contract, along with several other main suppliers'.

Later, in December 2004, **The Scotsman** Newspaper reported on how the 'public agencies and commercial providers are getting together to put broadband on the Scottish Map' (<https://news.scotsman.com/archive.cfm?id=1422352004>). Journalist Andrew Collier began his piece with the words:

The remote, rugged countryside of the Highlands and Islands may seem like an unlikely place for a new industrial revolution. Yet it is here, in Europe's biggest wilderness, that a new engine for powerful economic growth is rapidly being created (p. 1).

Collier outlines how BT removed its 'trigger list'⁸ earlier in 2004, 'in favour of a system which promises near-universal access by the summer of 2005'. He goes on to say that it is the use of the word 'near' which is concerning, since 'there are 400 mainly tiny and remote exchanges serving communities ... where the population is so small and the distances so great that

⁸ *Prior to April 2004, individuals within rural communities were required to indicate an interest in broadband; once a specified trigger level had been reached, indicating an acceptable level of demand, BT would enable the telephone exchange, giving broadband access to those living within 3.5-6km of the enabled exchange. However, 'while BT judged the scheme to have been very successful in assisting to identify demand, its value diminishes with near universal availability' (OECD 2004, p. 46).*

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commercial provision of the service is not realistic for the foreseeable future'. However, the combination of the Scottish Executive's Broadband for Scotland Initiative, with further BT investment, 'should put in the last pieces in the jigsaw'. The General Manager of BT Scotland stated that the uptake of broadband in rural Scotland had been greater in rural areas than in some parts of the Central Belt: 'we have already seen evidence that some companies are prepared to relocate to rural areas on the basis of availability of broadband. It's becoming an imperative, and that is particularly true of smaller firms'. BT Scotland's Director stated that broadband is 'in its own way, as important a network as roads or rail tracks'.

The most recent developments have been announced by the Scottish Executive in April 2005 (www.scotland.gov.uk/News/Releases/2005/04/25085656), in their News Release concerning the contract signed between the Executive and BT. Through the Executive's 'Broadband for Scotland's Rural and Remote Areas initiative'⁹, BT will enable 378 of the 399 exchanges to deliver basic broadband to 51,000 households and 5,400 businesses across Scotland that would not have otherwise received the service. All of these exchanges are in remote and rural areas where it would not have been commercially feasible to provide broadband without Executive support (Executive News Release, April 2005). The remaining 21 exchanges in the Western Isles are due to be enabled as part of the separate Connected Communities project (Scottish Executive, HIE, and European Regional Development Fund). The Director of BT Scotland states that: 'we are looking forward to placing Scotland at the technological, if not physical, epicentre of Europe. Ubiquitous broadband availability brings opportunities for Scotland in education, public services and business life, and will place Scotland among the leaders of the G8 Countries in terms of availability'.

A partitioning of the digital debate?

In the documentation published since 2000 (reviewed above), a key driver to broadband take-up, and the further realisation of the benefits of broadband, is described as being e-delivery of services. I therefore briefly reviewed some of the key publications concerning service delivery covering the same period

⁹ *The Initiative has been funded as part of the Executive's £24M broadband strategy for Scotland, and has also received financial support of up to £5M from the European Regional Development Fund (ERDF) programme in Scotland.*

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(2000-2005), in order to see the extent to which broadband is viewed as an essential component. The following examples are illustrative of what appears to be a disjuncture between broadband considerations and the services that could be enabled and delivered through broadband networks.

There are three key documents concerning service delivery within the time period 2000-2004, two of which refer specifically to rural areas. Overall, the references to broadband are extremely sparse. For example, in the SNRP Report, **Implementing 'Services in Rural Scotland' – A Progress Report** (November 2002), the only occasion on which broadband is mentioned is under the heading of 'Innovative approaches to sharing best practice'. The authors state that:

A number of developments being promoted by the Executive to facilitate better and more innovative service provision, making particular use of ICT, for example the broadband pilot ... electronic kiosks and information points. ... (However) we were concerned that we did not find many new examples of innovative approaches to service delivery in remote and rural areas (p. 20)

In the Scottish Executive's **Good Practice in Rural Development No. 8: Innovative Methods in Service Delivery in Rural Scotland – a Rural Practice Guide** (2003), broadband is again only mentioned on one occasion, with respect to one case study (Ayrshire Electronic Community where broadband access had been provided to 20 Centres).

In the **E-Services Delivery Progress Report** from the 21st Century Government Unit (Scottish Executive, April 2004), there is no mention of broadband as an integral element of e-service delivery and its feasibility within Scotland.

If we look more broadly at the social economy, for example to the Report **FutureBuilders Scotland: Investing in the Social Economy** (Scottish Executive 2003), there is no mention of broadband, the digital divide, the digital society or economy, or ICTs. This is particularly interesting, given the other Report headings of 'developing the social economy as a service provider' and 'Closing the Opportunity Gap'. One would have expected some reference to the wider vision espoused in other documents to do with Scotland's Future and Connected Communities to have resonated within these issues.

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When we examine, finally, reports concerning ICT projects, we again find limited mention of broadband. However, where it is discussed, the issues relate to cost of access, the difficulties of offering free broadband internet usage in public internet access points (PIAPs), and a need to examine what broadband-enabled content can really provide. The following examples are illustrative:

Digital Champions - case studies on good practice in ICT projects (Hall Aitken for Scottish Enterprise, Sept 2002): no mention of broadband; Caithness.org is highlighted as one example of an excellent initiative.

Evaluation of the PIAP Initiative (Hall Aitken for the Scottish Executive, May 2004):

We would suggest that any future programme addresses the problems of connection speed which causes significant problems in many access points. With improving technology and the increasing availability of broadband, peoples' expectations will continue to rise. ... The Scottish Executive should consider taking advantage of new technologies such as wireless networks to provide improved level of service in areas where connection is currently poor and there household access to broadband is limited (p. 50; Section 6.2.2. Connection Speed).

Digital Inclusion Audit 2004 (Digital Inclusion champions, May 2004): it is noted that 80% of facilities have a broadband connection; however, the ongoing costs of offering free broadband access are a 'challenge' for many centres.

'Digital Communities' Final Report (DT2 & Piedad Consulting, for Scottish Executive, July 2004): there is a reference to the time and money costs of installing and maintaining broadband, and we also read that: 'programmes need to be tailored to the needs of participants, and in this it is essential to decide what specific benefits the technology can provide (p. 3); there is a need 'to focus on intangibles' (p. 3).

So, is the digital divide now over in Scotland?

We need, then, to ask whether the digital divide is indeed over, due to the closing of the broadband gap by the end of 2005 (if designated broadband investment rolls out as outlined above). If we examine the vision of a broadband-enabled Scotland, inclusive of all remote and rural areas, we know

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that the 'constraint of peripherality' can indeed be addressed to some degree through high-speed connectivity (the 'death of distance' Cairncross 1997). Businesses can become more competitive, once the constraints of slow-speed connectivity are removed. Access to e-learning and e-health can enhance quality of life. And technological exclusion leading to social exclusion can become a thing of the past.

However, we read in **Digital Inclusion: Connecting Scotland's People** (Scottish Executive, September 2001) that broadband availability is only one part of the jigsaw, since:

In the UK, the digital divide is not related to the availability of broadband. ... Anyone with an ordinary telephone line and a PC can get online. ... The digital divide is not generally related to a lack of communications infrastructure, but to poverty, lack of awareness, and low skill levels. Those on low incomes; the unemployed; people with disabilities; people with poor literacy and numeracy skills – all have low rates of take-up and access to ICTs and the Web (p. 11).

Further, in the FAQ concerning the Executive's Broadband for Scotland Initiative, the Executive's response to the question 'How does the BFS purchase of broadband services fit with the Prime Minister's pledge to ensure there is access to all who want broadband by 2008?' is as follows:

Our understanding of the PM's pledge is to ensure that there is no social exclusion on *uptake* of broadband technology, in other words, that people have the skills and IT equipment to take advantage of broadband. The Executive's *immediate priority* is to ensure that there is no social exclusion on broadband *availability*, which is why this procurement aims to deliver access to every Scottish community by end 2005 (p. 3; emphasis in original).

The subtle distinction is one which is, of course, being pursued in many ways through strategic and ad hoc initiatives across Scotland (such as the PIAP schemes, and integration of ICT skills alongside adult literacy and numeracy provision). It has not been the focus of this paper to review such initiatives. However, it is worth adding a note of caution as broadband achieves 100% coverage, that we continue to consider what the term 'coverage' indeed means, and equally, does not mean, yet can come to imply.

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In addition, the commitment of BT and the Executive, according to News Releases (reviewed above), is to what is termed 'basic broadband'. Under the zonal aggregation initiative, we know that broadband speed is in the region of 2Mbits/second for primary schools, for example, and up to 8Mbits/second for secondary schools. We know, from reports such as Rural Focus (RuralCity 2004), that super-broadband is due to be the norm in the medium term, that is, operating at speeds of at least 8Mbits/second. Applications and online content will likewise develop to be carried through such higher-speed channels, and thus we need to question the extent of 'future proofing' that is possible through a 'basic broadband' provision.

Thirdly, we have seen through a brief overview of some rural services documents, that there appears to be a disjuncture in policy thinking, between the rhetoric and vision of zonal and aggregated use and delivery, and the (often necessary) partitioning of delivery of services to the client. Innovative thinking and service delivery is indeed enabled by broadband; however, the institutional and individual cultural boundaries and opportunities that exist may require equal levels of 'investment'. If we go further, and examine models of integrated service delivery (rather than multiple service delivery) for rural areas, then broadband, although vital, is purely one component of both hard and soft infrastructural requirements (Berry 2004).

CONCLUSIONS

The policy reviews in Ireland and Scotland have illustrated the differing paths being developed by two administrations. The past five years have seen key moves towards increasing the broadband coverage for remote and rural areas in both countries, and have secured greater access for many individuals, communities, small and medium-sized enterprises and micro-enterprises within rural areas.

The challenges remaining within Ireland include: community capacity to engender, manage and support their own broadband infrastructure; articulation of demand for broadband; provision of broadband to the 'last mile' (beyond the community hubs); the emergence of super-broadband; and landline connectivity within rural households. In Scotland, the challenges include: 'coverage' does not necessarily equate with 'usage', an obvious statement but perhaps clouded by the near-100% coverage being developed for the end of 2005; future proofing against the emergence of super-broadband; and a potential disjuncture between components of service

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delivery which may work against aggregation of activity, culture and delivery, and integrated service provision.

These dimensions provide further evidence that the 'digital divide', and the associated promises and 'info-punditry' (Brown and Duguid 2002), comprise a complex phenomenon. There are many sub-sets of processes and opportunities, as policy-makers, private industry, public sector bodies, individuals and communities 'mediate' and interact with technological developments. For example, technology-related research demonstrates that some of the keys to people's engagement are: relevance and therefore motivation; adding value; local; quality; credibility; ease of use; and usefulness (McCown 2002). Further, writers such as Servon (2002) and Hellowell (2001) write of *multi-dimensional* digital divides, with Servon stating the need to examine, equally, 'access, capacity (ability) and content'; and Hellowell examining the content and ability issues '*beyond access*'. Ireland and Scotland are experiencing differing levels of rural and remote broadband access, with the end of 2005 promising universal access in Scotland. Thus, both countries will be facing the 'beyond access' issues at different times and at different levels. What is certain is that – in addition to the strategic, national programmes instigated by both governments in partnership with telecommunications companies – the role of local level champions, and models of asset-based community development, will continue to remain pertinent, as individuals and communities in both countries seek to determine the extent to which they will be an active part of their digital futures. The key remains to maintain the opportunity to choose that future.

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