Wireless Broadband in the UK

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This paper provides an overview of the broadband wireless market in the UK covering the competitive position, the regulatory background, and the technology developments that are driving the interest in this area. Building on this overview, a focused case study is described which shows how wireless is providing broadband access to some very remote communities. The author of this paper is the Regional Manager of a major UK independent telecoms consultancy, who also lives and works from a home office in one of the remote communities discussed.

1 The UK Broadband Market

Increasing demand for bandwidth, coupled with growing availability of DSL services and British Telecom (BT) price cuts, have continued to drive the demand for broadband services in the UK. Despite a slow start, BT has accelerated its DSL exchange upgrade programme, which once complete, will allow an estimated 99.6% of UK homes and businesses to be connected to a DSL-enabled exchange. Coupled with announcements in summer 2004 on extended reach of the ADSL product, this has meant that BT's DSL product has consolidated its position as the main wholesale delivery mechanism.

Whilst the delivery of broadband services over Fixed Wireless Access (FWA) networks has not been widespread in the UK to date, demand for wired broadband delivery networks, notably cable and xDSL, has continued to grow. The latest figures published by the telecom regulator Ofcom (June 2004) [1] suggest that the total broadband subscriber base in the UK was 3.99m at the end of April 2004. This includes an estimated 1.54m end-users of broadband cable services and 2.45m users of DSL services.

The European industry for wireless services is one of the fastest-growing niche markets, with both established cell phone groups and newer entrants offering services such as WiFi medium-range, high-speed data connections for laptops. However, the success of FWA networks, as a means of providing the 'last mile' connection to the home has been limited, due mainly to high equipment costs and technical limitations, such as line of sight limitations. This has limited the success of fixed wireless deployments to date in the UK, with only two networks currently in operation (Your Communications at 28 GHz and Firstnet, now Pipex Communications, at 3.6 GHz) which are both now focusing on gaining business customers in provincial towns. More recently, the huge growth in use of licence-exempt systems, for both WLAN and community broadband schemes, has been a significant factor in raising market awareness of wireless solutions in the broadband market. There are a growing number of community wireless networks emerging in the 2.4 GHz and 5 GHz bands, providing broadband access to homes and small businesses in areas where ADSL and cable modem services are not available.

2 UK Spectrum

The 3.4 GHz, 3.6 GHz and 10 GHz frequency bands have been earmarked for FWA services by the UK and other European regulators for a number of years, although the market has been slower to develop than anticipated. To encourage harmonisation in the supply of equipment for operation in these bands, further European Telecommunications Standards Institute (ETSI) Recommendations have been developed that define harmonised channel arrangements for FWA systems in these bands. ETSI has developed various FWA standards for operation across these frequency bands, with standards aimed both at achieving interoperability (defining a standardised air interface for operation over a range of FWA frequency bands) and co-existence (so that different systems can co-exist in a shared band).

Although the intention has been to foster a harmonised supply market, the range of different access technologies and configurations (TDMA, CDMA, FDD/TDD etc.) has meant that this goal has not been achieved. Coupled with the limited number of commercial FWA systems in operation in licensed bands in Europe, this has meant that the cost of equipment has not fallen to levels where economies of scale are being achieved. This is likely to remain a key challenge in successful deployment of commercial FWA services and will be further challenged by the emergence of FWA equipment for the 5.8 GHz band, where vendors are co-operating on open standards and interoperability, which is likely to drive down equipment costs for those products compared to the higher cost of other proprietary FWA equipment. While the lower bands at 3.4 GHz, 3.6 GHz and 10 GHz were originally envisaged to accommodate narrowband FWA targeting the consumer market, there has been a shift away from this towards business data services. The main disadvantage of the lower FWA bands compared with higher FWA/BFWA bands, such as the 28 GHz band, is the bandwidth, which limits the services that can be offered. As an example, for 3.4 GHz, connection rates are typically a maximum of 512 kbit/s. Conversely, at higher FWA frequencies, availability of spectrum is not an issue, although the signal range is more limited and susceptible to external interference, which can limit the maximum data rate as well as reliability.

It is likely that the role of the 3.4 GHz, 3.6 GHz and 10 GHz bands in the broadband market will be to support a combination of end-user broadband services plus wireless backhaul, possibly in combination with 28 GHz or other microwave bands. This is likely to be relevant to urban and suburban environments in particular, whilst in remote areas, the cost of deployment is likely to be higher than the revenues gained, which will make the business case unviable.

The short-term market development most likely to affect the demand for spectrum in licensed FWA bands above 3.4 GHz is development of FWA systems for the 5.8 GHz band (based on the WiMAX standard), which is likely to offer a more cost effective means of providing FWA.

Spectrum in the UK is likely to see some further changes as Ofcom moves to crack open the highly regulated market for radio frequencies to allow organisations to trade scarce spectrum[2]. Regulatory curbs will be eased by the end of 2004, in a move to encourage the industry to either develop better services or sell their licences to rivals who are better placed to do so. It is hoped that prices could fall and innovation grow if it handed over more responsibility to the market for deciding how scarce spectrum should be used.

Calls have mounted for European regulators to allow spectrum trading since the telecoms industry spent more than $122 billion on third-generation (3G) mobile phone licences four years ago, only to see some companies balk at the subsequent cost of building new networks and starting services.

3 Technology Developments

It is widely recognised that WLAN has become the fastest growing technology in the telecommunications market in the last two years. Several factors have contributed to its success, including low cost equipment (driven down by the global availability of the 2.4 GHz and 5 GHz bands on a licence-exempt basis and strong manufacturing support), its widespread availability and ease of installation. In addition to being used as an adjunct to fixed and wireless data networks, WLANs are also used to provide services that substitute entirely for other delivery platforms. WLAN is now being used in various deployments of commercial broadband community networks, typically to serve remote areas not covered by ADSL or cable. By the use of directional antennas, it is possible to link fixed points over large distances using standard WiFi equipment. For example, a UK company, WRBB, is currently rolling out a fixed wireless broadband network using WiFi technology to service rural areas of England under the brand name 'Sunshine'.

While WLAN technology was originally limited to use in the private domain (i.e. for self provided systems), the UK regulator decision in 2002 to enable commercial systems to operate in the band has created a range of new 'public' WLAN systems as a means of delivering localised wireless broadband access services. A number of 'hotspot' Internet access services are now being provided in public areas within airports, railway stations, retail locations and hotels. More recently, WLAN technology has also been used to build community broadband networks, offering a cost effective means of providing broadband connectivity for homes and businesses in more remote areas. An example of this will be discussed later.

Recent industry developments suggest that the wireless industry is increasingly looking to the 5 GHz band for future WLAN and wireless metropolitan area (MAN) deployment. Particular interest is focused on 5 GHz Band C, which has been opened for commercial use, for products based on the IEEE 802.16 and other standards. A key driver in use of this band is that it has the support of product vendors within the WiMax forum.

Use of 2.4 GHz and 5 GHz systems for 'last drop' broadband connectivity could generate further demand for spectrum in licensed FWA bands, to provide the backhauling of traffic from community broadband schemes. There are several alternative means of backhaul provision, however, typical wireless scenarios envisaged are the use of WLAN in the local area, with either point-to-point or point-to-multipoint links providing the backhaul to the nearest point of interconnect.

Mobile communications offer an alternative medium to fixed wireline and wireless infrastructure for accessing the Internet and sending and receiving data transmissions. The European 3G/UMTS standard provides for maximum theoretical rates of up to 2 Mbit/s for stationary phones, 344 kbit/s for a person walking and 144 kbit/s in a moving vehicle, which are comparable with many existing DSL and cable broadband offerings. However, realistic rates at launch for UK 3G networks are less than this. Five operators have been awarded licences in the UK, although only one has launched to date. In the early years of deployment, availability is not expected be universal; outside of urban areas it is likely that the networks will, for instance, fall back to GSM/GPRS coverage.

802.16 systems are anticipated to provide wireless access system architectures in the 5 GHz Band C, including point-to-multipoint, multipoint-to-multipoint (mesh) and point-to-point. There is already growing industry interest in this (e.g. BT trials in Cornwall, Wales and Scotland). Co-operation between vendors on development of the IEEE 802.16/802/16a standards is taking place within the WiMax forum, following a similar co-operative approach to that used by the wireless LAN industry through the WiFi Alliance. The 802.16 standard will provide wireless metropolitan area network connectivity, with products aimed at bands in the 2 GHz to 11 GHz frequency range (a separate part of the standard addresses operation in the 10 GHz to 66 GHz bands). The WiMax forum aims to establish interoperability between products (similar to the objectives of the WiFi Alliance), which has the potential to reduce product costs and expand the addressable market. Potential applications include connection of 802.11 wireless LAN hotspots to a wide area network, or provision of wireless extension to cable or DSL networks (e.g. to extend the reach of DSL coverage).

Currently, vendors appear to be focusing on products for the 5.7/5.8 GHz band (5 GHz Band C). Since this will provide a cost effective means of providing FWA, due to economies of scale and low licence fees, this is a likely to be a key development affecting future demand for spectrum in the licensed FWA bands at 3.4, 3.6 and 10 GHz, where equipment costs are higher. For example, BT is currently conducting a trial of 'wireless DSL' services using point-to-multipoint technology operating in the 5.8 GHz band using equipment supplied by Alvarion.

At the same time as WiMax vendors are focusing on the 5.8 GHz band for lower cost implementation of FWA systems for access and/or backhaul services, the WLAN community also appears to be shifting focus from the 2.4 GHz band to the 5 GHz bands for provision of WiFi systems for broadband access. Benefits of the 5 GHz band include the significantly larger bandwidth availability and superior service quality. The growing interest in the use of 802.11 technologies to provide both wireless Internet access in hotspots and community broadband schemes has been widely recognised in recent Government Reports[3]. WLAN access systems can also be combined with 802.16 FWA type systems to provide wireless backhaul between hotspots and community schemes to the nearest point of exchange. There is evidence of a shift from the traditional point-to-multipoint architecture of FWA networks to ad hoc and mesh networking solutions, which potentially offer a number of benefits to operators in deployment in terms of cost, scalability and improved quality of service. Products are typically designed for operation in lower frequency bands (less than 10 GHz), including licence-exempt operation in 2.4 and 5 GHz bands.

It can be expected that the increasing interest in the use of WiFi-based broadband access and community networks will, in turn, drive an increased demand for wireless access backhauling to deliver traffic to a Point-of-Presence (PoP). This could increase demand on spectrum for FWA in licensed bands to provide high capacity backhauling of traffic in place of fibre or point-to-point links. Whether an FWA solution is the most appropriate will depend on existing infrastructure and consideration of the most feasible and cost effective way to achieve the backhaul. Typical wireless scenarios could include either point-to-point or point-to-multipoint links providing the backhaul to the nearest point of interconnect. This could be provided either by FWA at 5.8 GHz, or in licensed bands at 3.4, 3.6, 10 or 28 GHz, depending on availability.

The potential for rollout of 28 GHz systems is likely to be limited beyond urban environments and limited 'hotspot' areas where there is a concentration of business demand. It is unlikely that 28 GHz FWA networks will support broadband delivery into more remote areas of the UK due to the high cost of rolling out networks. The 28 GHz band may play a role in broadband delivery into remote areas by providing a means of wireless access backhaul from community broadband schemes deployed using equipment in the 2.4 or 5 GHz bands.

In the UK it is likely that services in this band will be targeted at the high end of the broadband market, competing predominantly with the leased line market for high-quality, high bandwidth, symmetric data services to larger businesses plus the SME market. This is predominantly due to:

- High cost of CPE equipment making deployment economically unviable unless to high-bandwidth users
- Difficulty in competing on price in the consumer market against established platforms
- Niche nature of the technology, making network deployment complex.

Whilst there have been developments in equipment in this band (e.g. the emergence of mesh solutions), the price of customer premises equipment remains relatively high, which is a key limiting factor in the business case, affecting demand for spectrum.

The critical factors in viability of FWA rollout are the cost of subscriber equipment, and the cost of backhauling traffic to interface at a PoP. The backhaul cost varies on a regional basis (and depends on the particular backhaul strategy that an operator follows). However, in general, the rollout of FWA networks in licensed spectrum will only be viable in certain areas of the UK, and there will be differences in markets between regions and nations of the UK. In rural and remote areas, the very low density of subscribers spread over a relatively wide area suggests that FWA services in licensed spectrum will not be viable. Rural demand will, therefore, probably be met by FWA systems operated in licence-exempt spectrum that can be more readily configured to connect geographical dispersed customers more cost effectively. The increasing numbers of community networks being deployed in the 2.4 GHz band to provide the 'last drop' connection to more remote areas is already demonstrating this and an example of such is now described.

4 Community Networks – A Case Study

Community networks are reasonably well established in a number of countries, including Canada and the US, and this interest has now spread to other countries, including the UK. These networks cover a range of levels, from do-it-yourself efforts sharing a broadband connection between immediate neighbours, to those more commercial services offered by new, alternative, service providers.

In the Scottish Highlands and Islands, access to broadband services is limited in terms of competitive supply, affordability and availability. This is an area that truly is a challenge when it comes to affordable broadband services. With a population density of just 11/km^2 - equal to the sparsest in Europe - innovative solutions have to be found.

A recent community broadband project has been developed to address this requirement for affordable broadband services. A not-for-profit managing company has been set up to manage the rollout of community broadband networks throughout the area. The company is funded by the Government's regional development agency (RDA) and the European Regional Development Fund. Through these funding sources, funding was obtained for capital infrastructure to bring low-cost solutions to a number of remote communities. The ongoing costs to sustain the community networks is not covered by these funding sources and, therefore, each community must be able to cover these costs through its own subscription levels. Tariffs must be set to be equivalent to mainstream broadband services, such as ADSL. It is clear, therefore, that the fundamental requirement is for the complete service to be affordable and sustainable in revenue terms through the community subscribers.

The community broadband wireless solution launched in the area is a challenge on a number of fronts. Communities in this region are small; often subscriber numbers within a community will not reach more than 20. The terrain is extremely challenging for traditional types of technology with mountains, lochs, coastline and scattered households. The availability of affordable backhaul is limited. This all adds up to a significant challenge in making any network service sustainable. Keeping capital investment in infrastructure to reasonable levels by avoiding long distance underground cable routes, and maintaining low ongoing costs dictates, to a large extent, the use of wireless networks. From a technology perspective, the local infrastructure within the communities can be provided in the most cost-effective manner using wireless networking, operating in the unlicensed frequency bands.

To keep ongoing costs low, site fees, licences and other ongoing costs must be kept to an absolute minimum. Households and other suitable community property must be used to host the equipment, and this means working very closely with the community to ensure buy-in from the start. Community meetings have to be held and local champions used to generate and retain the enthusiasm. Bearing in mind that previously dial-up modem access at less than 28kbps may have been the norm in these areas, this enthusiasm is not hard to find and it is noticeable how readily broadband is being embraced within these localities.

The backhaul connection to the Internet may be achieved using technologies such as satellite to offer a relatively low cost solution with easy deployment, or fixed line options. There is performance considerations with satellite that make it unsuitable for certain uses, and this may prove problematic to subscribers in the longer term. Fixed line services, although more expensive, offer improved performance that will be an important consideration when offering a commercial service. To be successful, after all, the service offered to the subscribers must be comparable with other broadband services available from providers elsewhere in the UK. The subscriber must be prepared to pay his monthly rental and poor service will not suffice.

Due to the nature of the end solution, it is important that the communities are involved in the programme from an early stage. The community would first have to demonstrate an initial interest in improving their access to telecom services and, after generating local interest, would approach the managing company for assistance. The company, through a previous procurement process, would contract with suppliers to provide the infrastructure required, the Internet services overlaying the infrastructure and the continued maintenance, support and billing function to run the service. End users would pay an installation cost and a monthly rental for the service - comparable to that offered by ADSL services available elsewhere. This means that defined service packages are required, with offerings at 512kbps and 1Mbps download, plus the usual ISP services of email and web hosting. Costs of these services to the end user would be set at $250 installation and $45/month.

The initial phase of the project provided broadband connection to 20 subscribers in five remote communities utilising a wireless solution. At an early stage, the decision was taken to trial 2.4 GHz FHSS (Frequency Hopping Spread Spectrum) technology, due to its perceived suitability for low-cost, outdoor provision. The communities' chosen were typical of the area and included very remote mountainous and coastal locations plus island communities. Within each of the communities identified, a wireless exchange area was defined to cover the user registrations within that community, and to represent the extent of the broadband coverage required.

The process of bringing a community online was developed through a number of steps, including community consultations and public meetings. The principal aims of the community consultation phase were to:

- Maximise the numbers of potential subscribers to broadband in a particular area
- To ensure that as many people (including non subscribers) know that a wireless broadband rollout is happening
- Be aware of the general community benefits.

In some instances, the network may be entirely dependent on nodal infrastructure located on third party (i.e. non subscriber) land or property and so a general review of all properties in a community must be made.

One of the pilot communities is Achiltibuie on the north west coast of Scotland. This is a small community situated along a stretch of coastline with households spread out along a coastal road for several kilometres. There is no simple notional design for 'linear coastal' communities such as Achiltibuie. Buildings are not evenly spread in a radial layout from the village centre, and so it is not feasible to connect all the subscribers by deploying just a few high hub sites across the area. Instead, the most practical method for efficient connectivity is to deploy a string of hub sites along the coast, with spurs to connect in subscribers who are located away from the main spread of buildings. This is shown in the following diagram:

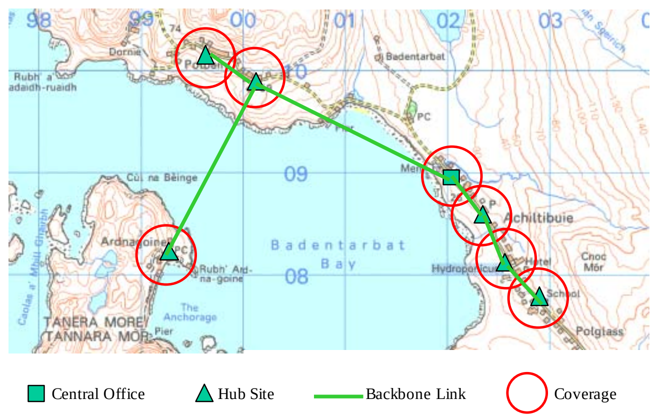

Figure 1 Community Network Design

This installation shows six coverage sites, serving subscriber locations using point-to-multipoint 2.4GHz technology and interconnected using the same point-to-multipoint technology. There are an average of three and a maximum of five radio hops per subscriber back to the central hub location where a 2Mbps broadband satellite provides the backhaul Internet connectivity.

Based on the technical specifications for the FHSS equipment, and observation of the typical installation environments (antenna types, feeder types and lengths, usage of in-line accessories such as surge protectors), a theoretical link budget for the system was created. Weather affects the quality of the radio signal and can lower the end performance so the link budget calculated the maximum permissible link range against a set of target data rates, in both dry and wet conditions. These maximum link ranges are illustrated as follows.

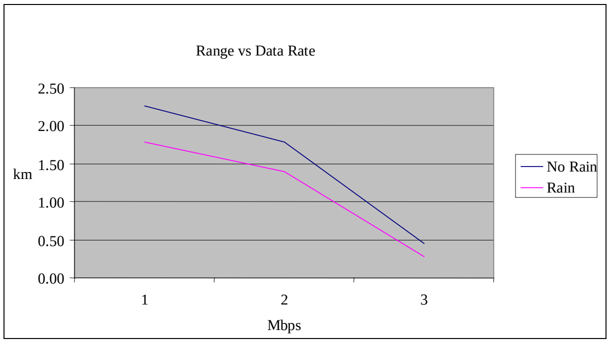

Figure 2 Link Range

Based on this analysis, it was concluded that the maximum practical link length of typical equipment was around 1.5km (with 15dBi antenna at one end, 18dBi antenna at other end).

In the backhaul, broadband satellite provides a low cost solution that is targeted at rural broadband projects such as these. As a result, broadband satellite is becoming a feasible option for many organisations, either as direct access to subscribers, or as the backhaul element of a terrestrial wired or wireless scheme. One of the main advantages of satellite is its almost universal reach, with service offerings being available virtually anywhere within the UK. Against this there are some performance issues that can affect some applications.

As with any broadband service over a shared medium, there will be a degree of contention for the total available bandwidth. The lower the degree of contention, the better the service is likely to be. Under the commonly used Digital Video Broadcasting, Return Channel via Satellite (DVB-RCS) service, contention becomes even more important. With this architecture the central satellite hub can schedule downlink data locally. Thus, there will be latency variability, but this is largely determined by the contention ratio for the downlink channel. Suitable packet prioritisation, quality of service and admission-control schemes can all improve this, where necessary. The return channel access for uplink is still centrally scheduled (uplink channel utilisation is broadcast to the terminals) but, invariably, needs to be requested by the terminal. This means there is an inherent delay in requesting uplink capacity. Within a DVB-RCS environment, therefore, high contention on the reverse channel can adversely affect performance. This is largely down to the dimensioning of the service by the provider.

Latency is perhaps the most obvious issue for a satellite system. A signal travelling to a Geostationary Earth Orbit (GEO) satellite at 37,800km will require approximately 260ms to reach the satellite and return to Earth. This gives a round-trip time of at least 520ms. This is a fundamental limitation to receive satisfactory quality of service for some applications.
The latency will have an impact on transport protocols, but for some aspects, mitigations are possible. For others (e.g. the response time from a remote application server) there is little or nothing that can be done.

The key aspect of the Transmission Control Protocol (TCP) used on these links is the overhead delay in the connection set-up and tear-down, particularly for short-lived connections. This overhead is closely related to congestion control on the link. TCP is a reliable protocol, which means that if a data packet is lost en route from the sender to the receiver, the sender will detect this and the packet will be retransmitted.
There are a number of developments underway to mitigate the latency performance issues with satellite and these are centred on Performance Enhancing Proxies (PEPs) and other strategies such as caching. PEPs work by hiding the long-latency satellite hop from the end-systems by 'spoofing' TCP so that all recovery to loss and congestion is performed locally, improving the performance. Other types of PEPs work around compression and packet prioritisation.

Use of PEPs restricts the implementation of certain security mechanisms, ultimately meaning that IPSec VPN solutions cannot be used effectively. This is due to the PEP being unable to access the TCP header, which is protected, and so, the traffic cannot benefit from the acceleration features of the PEP. The resultant performance is unlikely to be tolerated. Alternative security measures can be implemented, but end-end VPN tunnelling, which is a popular VPN deployment, remains an issue over satellite. Caching data locally, which then can be delivered without having to transmit data over the satellite link, saves not only bandwidth but also, more importantly, time. The benefit that web-caches will have depends quite heavily upon the types of web pages being accessed. Where web-caches are used by ISPs, there are very large user communities at the network 'edge', and the aggregate behaviour is easier to predict. A small user community may have very specific behaviour that is either suitable, or not, for a web-cache. Other protocols can usefully be cached, however, DNS allows for caching name-servers and their use may well improve performance (eliminating a round-trip time from the initial connection set-up).

Due to the availability and relatively low cost of broadband satellite, this technology is being increasingly adopted as the backhaul mechanism for small community networks. As a result of this increasing take-up, satellite companies continue to look to address the key issues faced by the operators of these networks, namely the performance limitations on applications, and also to reduce the ongoing costs.

Some interesting lessons have been learnt from this community project. From an installation perspective, it is clear that, once a community knows that broadband delivery is potentially imminent (rather than simply a theoretical aspiration), then there is a clear surge in interest. There is also a high degree of goodwill amongst communities in general towards the provision of broadband, with even residents who are not actually interested in broadband being willing to help out by letting their properties be used to host equipment. It is clear that the installations within the community require a high degree of micro-project management. The installations are, by necessity, fluid: some take longer than anticipated, others are faster and occasionally a subscriber may simply be unavailable for a variety of reasons. While these problems should be minimised through a thorough survey process, the installation teams will often have to undertake a considerable amount of negotiation, and schedule changes will have to be communicated with the affected subscribers. By necessity, this requires an ability to cope with pressure, be able to adapt to changing circumstances and, very importantly, provide a pro-active professional rapport with the subscribers.

It is evident in the UK that community broadband networks only appear where traditional market services do not provide. There are no known examples in the UK of community networks being set up in competition to services offered by telecom operators. As such, community networks face the difficult dilemma of how to provide a quality service to a low numbers of subscribers. The service currently expected is an 'ADSL-equivalent' in terms of bandwidth, contention and price. Due to their very nature, potential subscriber numbers in community networks are limited, and there tends to be a real community spirit of developing something themselves, with the associated relaxation that comes with a 'best effort' approach. However, once the subscriber starts to pay a monthly rental charge, service quality must be on a par with other broadband services, and this is an area that still needs to be proved in many cases.

It does not seem to be an obviously attractive area in which the traditional telecom players could participate directly, bearing in mind the low subscriber numbers, reliance on community goodwill and the use of unlicensed spectrum as the basis for a network. Perhaps a crucial indicator is the likelihood that, even if a community network operating on the current basis were in place, if a more 'commercial' provider introduced service, such as DSL, it is very likely that the majority of users would migrate, and this would pretty much kill-off any other business plan.

Strengths of community networks are that they provide a service for which an element of demand exists, but for which market forces do not provide. As such they are welcome by the communities who provide support and encouragement, backed up by high levels of take-up. Community properties are often willingly made available, even by non-subscribers, who offer sites for the benefit of other users. This level of support is quite unique to the community network and would not be available to larger, commercial telecom companies.

The potential weaknesses are largely around sustainability of the network once the initial funding packages and enthusiasm have ceased. It is clear that the service must be reliable and affordable and a premium on the monthly rental is not likely. Whilst some leeway is given in terms of getting the system up and running, once the rental is being paid, the service must perform or users will not continue with payment. Aside from the technology, a structure must be put in place to provide continued support that does not just rely on the continuing goodwill of community activists. This overhead cost must obviously be factored into the business model.

Wireless technology, if properly engineered and installed, should not have difficulties in meeting the community network requirement; however, satellite in the backhaul could cause problems with users. The availability of 5.8 GHz unlicensed wireless should provide greater opportunities for community broadband, and this is perhaps the greatest area of interest in the development of these projects. Additionally, this technology can now also be considered, for example, for the provision of backhaul links to neighbouring communities or to nearby PoP.

It is worth bearing in mind again that community networks have their position in the market where there are no likely opportunities for alternative supply. The launch of ADSL products for smaller exchanges has been targeted in the past at the small town level. With recent tariff reductions, these products now start to have potential in even the smallest of communities. Provided sufficient subscriber numbers can be generated, and ADSL distance limitations can be met, communities with around 30 subscribers now have alternative options through these products. The role of the community network is pushed further out to the very rural and remote areas, where wireless provision is still the most realistic alternative. As these communities become smaller, long-term sustainability becomes even more of a challenge. Pressure will increase around the affordability of backhaul, with affordable terrestrial 2Mbps backhaul remaining a challenge.

Community networks have often operated as a catalyst to raise interest and attract commercial suppliers. Their role must change as the market develops and as wireless solutions improve and remote areas get left behind again as existing DSL services no longer meet requirements, it is likely that community networks will remain a useful solution.

References

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