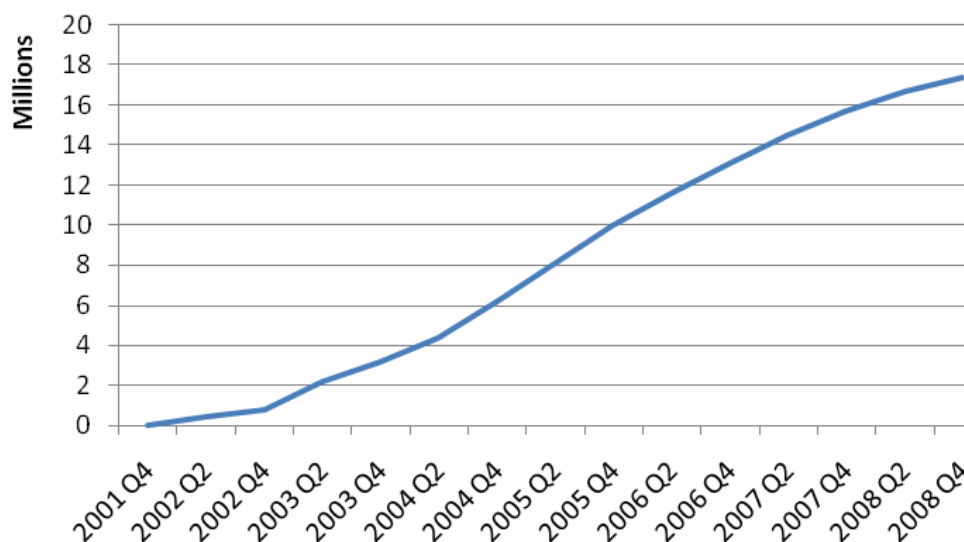


Annex 5

Planning ICT Infrastructure

Introduction and Summary: This annex focuses on the rising importance and the changing ways in which information and communications technology (ICT) is being used to support all aspects of our lives, and the opportunities and challenges involved in the effective integration of digital services and systems into new communities.

UK Broadband Subscribers



Source: Point Topic for Broadband Stakeholder Group

ICT is commonly recognised as the most significant driver of economic, social and cultural change in the past twenty years. And whilst broadband penetration has increased steadily over the last 5 years¹, there is also an increasing recognition of the “digital divide” that exists in the UK, where some 17 million people are currently cut off from new social, educational and economic opportunities through their lack of access to broadband services.²

The effective use of digital systems and services is also key in helping to meet our society’s sustainability challenges. The Government’s target of rolling out 26 million smart meters to all residences³ by 2020 will need to be supported and maintained via digital connectivity, and new systems to support sustainable resource monitoring and management will always remain reliant on effective digital technology solutions.

¹ *Broadband growth slowing as UK hits 17.4 million subscribers:*
<http://www.broadbandwatchdog.co.uk/news/170409-321>

² <http://news.bbc.co.uk/1/hi/technology/7736389.stm>

³ <http://news.bbc.co.uk/1/hi/business/8042716.stm>

This annex outlines the areas that require consideration and planning to maximise the benefits available from a digital systems strategy for an Eco-town as well as detailing several case studies of different implementation approaches and related references.

Key questions to be addressed

Why invest in digital infrastructure? The development and implementation of new digital services is critical to the economic development of the Eco-town and its future wellbeing. A forward-thinking, strategic approach to the development of digital systems for the Eco-town can deliver significant improvements to:

- Environmental sustainability
- Economic performance
- Social cohesion, health and wellbeing
- Education, training and development opportunities

The initial outlay for the development and installation of integrated information networks for an Eco-town helps not only to meet changing public service demands, but can be readily justified against cost savings and performance benefits across a wide range of social and commercial applications, telecommunications services, and building systems.

Who will invest? The business case for the deployment of high speed “next generation” broadband networks and services has been recently reviewed in the Broadband Stakeholder Group’s report “Will Next Generation Broadband Deliver Next Generation Benefits”⁴, which concluded:

By looking at the potential private value (value accruing to commercial investors and consumers) and the wider economic and social value, the BSG has found that the long-term benefits to the UK associated with the wide-scale deployment could outweigh the cost of deployment, which could be as much as £16 billion (to reach 80 per cent of UK homes).

The government is supporting initiatives to upgrade the national network infrastructure and provide wider universal access to improved broadband services. At the same time, community development stakeholders must also consider the following when developing their digital connectivity strategy:

- Specific local service requirements and expectations
- The delivery capabilities of different service providers
- Delivery timescales and scope of existing infrastructure plans, and whether these can meet the demands of their prospective residents and workers

⁴ A pdf version of the full report is available here:
http://www.broadbanduk.org/component/option,com_docman/task,doc_view/gid,1009/Itemid,63/

- Potential growth in demand in terms of both subscriber numbers, range of services and demands on bandwidth
- Investment and operational costs.

These considerations and their impacts should then be factored into the physical master planning and community design for any development to ensure that solutions are both cost effective and tailored to local demand.

How will the digital infrastructure be delivered? The procurement, design and installation of a digital infrastructure involves the following steps:

- Feasibility analysis
- Commercial and social imperatives
- Interfacing
- Installation
- Commissioning
- Post design services
- Relevant technical investigations
- Configuration/ system/ user / maintainer documentation systems.

The method of implementing these steps is dependent upon the chosen delivery model, as outlined in section iii below.

Who will organise and manage the delivery and who will take care of operations and maintenance over the long term? ICT service partners such as BT, Virgin Media, O2, Sky and other technology providers should be consulted and engaged in the infrastructure planning process. Any plans to develop and maintain a digital infrastructure for a community should be accompanied by comprehensive maintenance and support plans, which will include consideration of:

- Contracts (length, type, roles and responsibilities of different providers)
- Upgrades and disposal of obsolete equipment
- Maintenance
- Service level agreements (SLAs) and related contractual clauses in case of failure to provide expected levels of service
- Resilience and contingency planning.

Digital Infrastructure and Services Delivery Options

There exist several models for the delivery of digital infrastructure:

i) Multiple providers for different services

This is the established standard model that has evolved in most communities in the UK, where a number of different technology service providers compete to provide broadband and other digital services to individual homes and businesses over a variety of different technologies, often using multiple networks.

ii) Open Access Model (Municipal Broadband)

In this model, one organisation makes the initial investment (sometimes partially funded by local authorities or grant funding) to build a network, then subsequently allows other communications service providers to utilise that network to provide digital based services for a fee.

iii) Bundled Service Provision

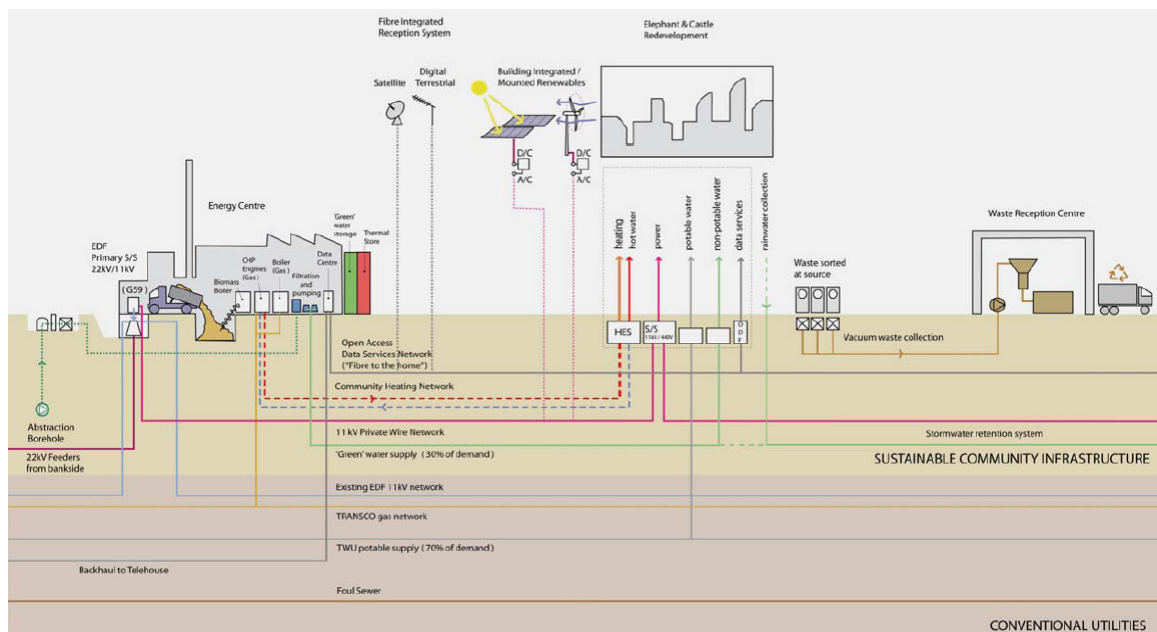
One company is appointed to provide both the network and a range of ICT services such as telephony, HDTV, and broadband.

iv) Community Led Model

This approach has been successfully adopted in areas where local residents have found it challenging to access high quality digital services from the private sector. The local community, often supported by local authorities, makes the investment for the telecommunications infrastructure to be provided rather than the private sector.

v) MUSCo Utilities Model

In a MUSCo (Multi Utility Service Company) model, a consortium is formed among the major utility providers to provide multi-utility services to the community, including ICT services. Co-ordinating service provision in this way can offer opportunities to integrate services in new and innovative ways, minimise capital investment, reduce disruption by utilising shared ducting, and limit the need for multiple duplicate networks.



Source: Brian Dunlop Associates/Southwark Council

Case Studies

Open Access Model – Thornton Street Estate – Hull⁵: Residents in Hull rely on the services of Kingston Communications, which controls Hull's telecoms network and its broadband arm, Karoo. Other ICT service providers do not currently provide services over this network, since they do not consider it commercially viable.

Fibrestream, a technology and communication solution provider has teamed up with NextGenUs (a private, public community partnership) to deploy fibre line broadband in the Hull Thornton Street area of Hill, providing speeds of up to 100Mbps.

About 1,000 residents living in the Great Thornton Street Estate in Hull are being provided with fibre broadband connections in the first phase. Dependent on potential grant funding from the EU, the fibre broadband network will be extended to more than 5,000 residents, covering all the areas in Great Thornton Street Estate and even beyond Hull. ICT service providers may utilise the Fibrestream network on a wholesale basis, providing value-add digital services to their customers.

Bundled Service Provision: One early adopter of this model is the Oakgrove Millennium community in Milton Keynes^{6,7}. In this 158 acre community of 2,000 homes, English Partnerships teamed up with lead developer Crest Nicholson, and The Milton Keynes Partnership to provide a world-class ICT enabled community.

Data infrastructure is being provided to all houses, commercial properties, schools and other community facilities. The community vision is to provide new opportunities for social interaction, leisure, flexible working practices and connections to the local schools and shops.

BT has been selected to install a fibre-optic cable infrastructure providing broadband to all homes and offering free local phone calls. Homes will also have 'intelligent infrastructure' enabling residents to activate household alarms or turn heating on remotely.

A second example is Quintain Estates apartment development of 12,000 dwellings known as Wembley City⁸. Here, developer Quintain estates has teamed up with Industria, a UK based fibre and wireless IP network builder, to both build and operate a high speed data network providing services to residents and businesses in the community.

Among the first-phase private tenants there is almost 100% take-up of the fibre service, Velocity 1, providing a variety of broadband options of 8Mbps,

⁵ <http://www.fibrestream.co.uk/2009/06/23/daddy-of-all-broadband/> and <http://www.broadbandanalyst.co.uk/uk-broadband/hull-area-100mbps-fibre-broadband/>

⁶ http://www.miltonkeynespartnership.info/media_centre/press_releases.php?ID=38

⁷ http://www.miltonkeynes.gov.uk/planning-policy/documents/Oakgrove_SPG.pdf

⁸ <http://news.bbc.co.uk/1/hi/technology/7856725.stm>

16Mbps and 32Mbps, upgradable in the future to 100Mbps. The packages come bundled with TV services, some free landline phone calls and IT support.

MUSCo Utilities Model – Elephant and Castle⁹: A MUSCo consortium has been created to support the redevelopment of the Elephant and Castle Area between the following utility and technology partners: Dalkia & Three Valleys Water, Inexus Fibre Networks Ltd, London ESCo, Veolia Water Outsourcing Ltd & BskyB, Thamesway Energy Ltd, Albion Water Ltd and Redstone. The delivery objectives of the MUSCo can be summarised as follows:

- Deliver integrated low carbon energy, non-potable water and data services infrastructure via a combined services corridor
- Planning, design, construction, operation and then management and administration of the infrastructure and services
- Meet performance targets including carbon emission targets and water quality standards
- Manage the use of the infrastructure in the case of heat, cooling, power and water services as the sole provider. And ensure equitable access to data services for all potential service providers (telephony, TV, internet connectivity) and other procurers of bandwidth available in the network
- Make provision for the integration of renewable energy technologies and locally derived sources of biomass fuel

Access will be provided for all ICT service providers to an area-wide ducted fibre-optic network. The MUSCo will finance and install the optical distribution network to the basement plant room in each building and provide the network termination equipment at either end. Building developers can then install the fibre distribution within the building to the customer premises equipment “gateway box” in each apartment. The MUSCo charges service providers for access to the network.

Community Driven Model – Alston Moor (Cybermoor)¹⁰: Working with key partners, Cumbria County Council and the DfES, the remote Cumbrian community of Alston Moor set out on an ambitious programme to develop the first co-operatively-run community broadband service in the UK in 2002. Aided by funding from the NW Development Agency Broadband Fund, the Cybermoor partnership contracted Proxim Wireless Corporation to deliver a wireless broadband solution to provide local users with internet, television and telephone services. The stated aims of the project were to:

- Encourage lifelong learning / home school links, better ICT skills
- Take up of e-government services
- Economic regeneration through improved ICT skills / broadband
- Improve social inclusion through community website

⁹ <http://www.elephantandcastle.org.uk/downloads/muscodocuments/>

¹⁰ <http://www.cybermoor.org>

The project is now in the process of upgrading its hardware to bring fibre-optic based digital infrastructure to the area to support new services such as e-health and e-learning.¹¹

Planning Considerations and the Strategic Impact of Digital Connectivity

To maximise the effectiveness of any digital connectivity strategy, wide-ranging consideration should be given to the potential impact of ICT on the design and functioning of the community. A balance needs also to be struck between the capital cost of the digital connectivity investment and the performance limitation of the technology deployed, whilst ensuring that development plans take into consideration the predicted growth in demand for ICT services and network capacity in the coming years.

If managed correctly, a high-speed digital network can be leveraged to provide benefits to a wide range of community services and benefits above and beyond the standard voice, data and television services. Relating these to the triple bottom-line of sustainability, these can include:

Economic Opportunities:

- Creation of new wealth generation, skills and employment opportunities;
- The flexibility for organisations to support and develop new ways of working such as tele-presence and home working, potentially also reducing the requirements on the transportation infrastructure;
- The provision of high-speed digital networks and associated technology to develop local ICT expertise, and attract new businesses that are reliant on this hardware and skills.

Social and Healthcare Opportunities:

- Health and care services
- Education
- Transport management and traffic management
- Energy management
- Security and CCTV
- Enhanced retail, social and entertainment services

Environmental Applications and Opportunities:

- Community development and support applications
- Local information and communication services
- Local support and management services
- Linkage to local and national government services
- Access to wider digital based networks, applications and services
- Support to community consultation and empowerment

¹¹ <http://news.bbc.co.uk/1/hi/technology/7520240.stm>

- Management, maintenance, problem resolution for social housing homes and services
- Linkage to education and training services
- Linkage to health and care services
- Linkage to security and safety services
- Impact on local retail, social and entertainment services

Conclusions: As identified, the strategic provision of digital infrastructure is essential for the economic and social prosperity of any 21st Century community. The far-sighted planning of digital connectivity for any sustainable community will have significant implications for:

- Community masterplanning
- The design and functioning of homes and community buildings including healthcare, education, entertainment, retail and commercial property
- Transport planning, design and management
- Security and safety
- Utility services

The scoping and integration of digital infrastructure provision into delivery plans must be considered early in order to maximise:

- Return on investment
- Service availability
- Service continuity
- Future proofing