

Aims & Objectives

Aim

To ensure the development, availability and use of affordable, accessible and appropriate first generation and next generation broadband infrastructures in Norfolk.

Broadband infrastructure to serve the needs of businesses, communities and the public and voluntary sectors in both the urban and rural areas which receive good to little or no broadband at present.

Objectives

Awareness, Demand, Influencing and Submission

- 1 Raising Awareness - to ensure businesses understand the advantages of using broadband and other ICT as a way to improve competitiveness, and to make use of the broadband and technologies currently available.
- 2 Assessing Demand – to ensure that we are lobbying and working towards the needs of local businesses and residents in primarily the rural areas and poorly served urban areas.
- 3 Raising Demand – ensure take-up rates show communication providers that there are a significant number of customers who would benefit- therefore making it economically viable for them to invest in Norfolk.
- 4 Influencing – lobby communication providers that there are significant numbers of existing and new customers who would benefit from an improved service. This will encourage them to lobby BT to include Norfolk in their plans to upgrade the exchanges and lay fibre to the cabinet. Lobby the government, regional and regulatory bodies, ministers and MPs to make sure high speed broadband in Norfolk is high on their agendas.
- 5 Submission - encouraging submission by communication providers and businesses, public sector and community groups for funding initiatives to enable the deployment of broadband infrastructure in Norfolk

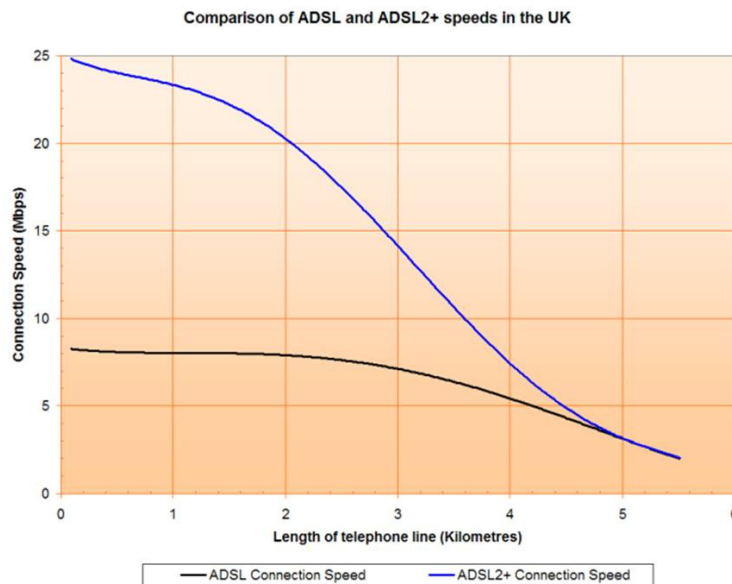
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1. Why do we need a strategy?

- 1.1 Enhancements and improvements to broadband are occurring at a rapid pace along with the applications that use it. It is important to ensure that Norfolk does not miss out on the deployment of next generation broadband in order to remain a good location to live and do business.
- 1.2 In Norfolk the majority of businesses and homes receive broadband via copper wires. If a premise is more than 6km from an exchange then no broadband can be received as seen in the graph below, it has to be through dial up. This strategy will look to reduce the widening gap between those that can and cannot access broadband.

Fig 1: broadband speeds over distance from exchange



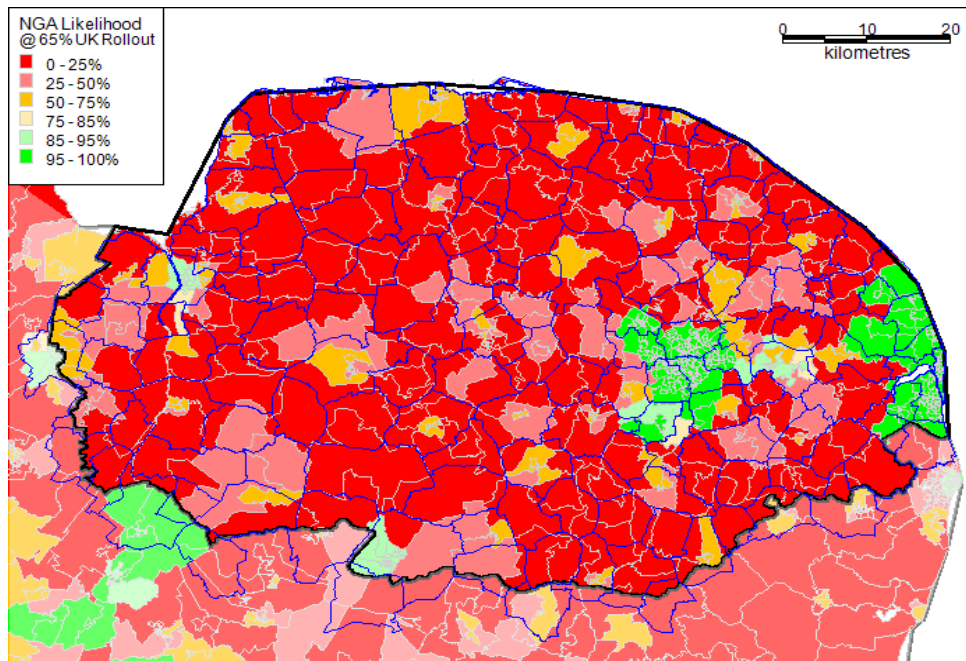
- 1.3 We need to have a clear idea of what the county has at present to determine the gaps and the most appropriate solutions as it is unlikely to be 'a one solution fits all' approach. **Appendix A** shows the location of BT and Virgin Media exchanges.
- 1.4 A map (**Appendix B**) has been produced showing the location of BT exchanges in Norfolk and the area covered within 2.5km to indicate the areas which should in theory be able to access broadband based on the graph above. The white areas on the map indicate not-spot areas which receive no, or very poor broadband. The white areas are our main target in terms of finding broadband solutions. We believe the market should cover the purple areas and we hope to meet in the middle in the green areas where a mixture of the market (after lobbying) and broadband

solutions will be present.

The map below loosely correlates with Appendix B with the red areas indicating the 'white areas' of Norfolk which are unlikely to receive next generation broadband during the telecoms rollouts.

Fig. 2: NGA Likelihood at 65% UK Rollout

The red and dark pink areas of the map show, that in the case of Norfolk the 'final third' where commercially viable NGA broadband services are unlikely to exist, is actually predicted to be closer to two thirds.



- 1.5 To ensure that Norfolk's economy has the most suitable broadband infrastructure to meet our objectives we need to ensure that there is appropriate recognition of the:
- 1 Fundamental importance to the overall economy of the county of fast and reliable broadband
 - 2 Importance for communication within a rural county of receiving a fast and reliable broadband service
 - 3 Importance of connecting up areas and initiatives
 - 4 Importance of learning best practice
 - 5 Importance of recognising different needs
 - 6 The potential business benefits

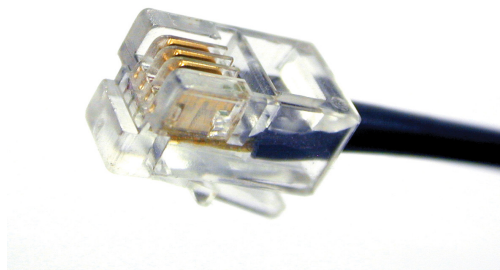
- 1.6.1 [Lord Carter's Digital Britain report](#), released in June 2009 and Britain's Superfast Broadband Future, released in December 2010, both set a target of ensuring every household have access to broadband of at least 2Mbps by 2012. This target is in spite of Ofcom stating the average broadband speed across the UK is 3.6Mbps and Britain's Superfast Broadband Future stating the average UK broadband speed is 5.2Mbps.

With the majority of business and home users currently requiring more than 2Mbps for present applications including downloading music and videos, watching i-player, online gaming, video conferencing, video surveillance and VoIP (voice over internet protocol) telephone use we believe this strategy should aim for 10Mbps service with 4Mbps as a minimum for rural and urban areas.

We need to ensure investments in any first generation broadband infrastructure is future-proof, so it can easily and cost effectively be upgraded to Next Generation Access broadband as soon as this becomes necessary and available.

2. What is Broadband?

- 2.1 In general, broadband refers to telecommunication in which a wide band of frequencies is available to transmit information. Because a wide band of frequencies is available, information can be multiplexed and sent on many different frequencies or channels within the band simultaneously, allowing more information to be transmitted in a given amount of time. Useful definitions can be found in **Appendix C**.



3. Why is Broadband important?

3.1 Broadband is a key to both economic competitiveness and raising skill levels because:

Business reasons

- 1 The majority of businesses now rely on the internet to communicate with their customers, or to use for research in their work. According to research, by 2012, £1 in every £5 of all new commerce in this country will be online.
- Access to broadband is needed for many businesses to get onto supplier lists with larger businesses. It is becoming one of the standard minimum requirements.
 - From 1 April 2010 businesses with an annual turnover of £100,000 or more (exclusive of VAT) or those that have registered for VAT on or after 1 April 2010 (regardless of turnover) will have to submit their VAT Returns online and pay any VAT due electronically.
 - Farmers now have to apply for cattle passports and report births, movements and unregistered deaths of cattle online unless they specially opt-out.
 - SMEs using broadband are shown to be more competitive than those who do not.
 - Marketing online opens new global markets, even to Norfolk based SME businesses.
 - Broadband improves marketing with use of rich media, particularly important for tourism which operates in a highly competitive environment.
 - Broadband connections at home can finally enable homeworking, reducing journeys to work which promotes sustainability, to become a realistic option for many people. Bad weather in the form of snow and ice disrupts working, snow in late 2009/early 2010 saw an estimated 6.4m workers stay home costing the economy £1.2bn a day (Federation of Small Businesses). In turn it would change methods of working with employees judged by outputs rather than by time spent in the office.
 - Broadband can enable/encourage more people to consider starting up in business using their home as a base, improving indicator NI171 (proportion of business registrations per 10,000 residents)

- Increasingly key decision makers (and other professionals) are looking to change the work/life balance and broadband does enable them to achieve that.
- Broadband enables multi site businesses to operate as a single entity, using a single common data source as well as video interfaces.
- Broadband cuts costs of travel through online meetings and helps counter the perceived isolation of Norfolk based service businesses.
- Broadband enabled CCTV improves security, particularly important with isolated rural businesses.

Norfolk's economic reasons

- Availability of broadband is a key factor in attracting and retaining investment in an area.
- Digital content is one of the key drivers of growing areas of the economy including digital and creative industries, and these depend increasingly on fast broadband availability which can carry multimedia and allow applications to function.
- Lack of good broadband can have a knock on effect on house prices and property sales

Public service reasons

- Aid service delivery in terms of information, online form filling, centralisation of services
- To enable all public sector buildings, both main and satellite, to be connected and able to use the most up to date online services and facilities
- Public sector uses in medicine and e-government etc. are a growing market for broadband which can stimulate private sector investment – telemedicine (remote consultancy) and telecare (remote monitoring). In June 2010, the UEA hosted Telemedicine 2015 conference, which saw World technology leaders in this field present their vision of the nature and role of Telemedicine services in healthcare delivery in 2015.
- Officers who work out in the community would be able to access reports/information without needing to return to the office
- It would enable technology to advance allowing emergency services to

live-stream accidents/emergencies to experts based elsewhere

Environmental Reasons

- 1 Broadband connections at home can finally enable homeworking, reducing journeys to work which promotes sustainability, to become a realistic option for many people.
- 2 Allows businesses to use smart metering
- 3 Ability to control heating and lighting controls and can monitor and control the environment in offices and buildings

Learning and skills reasons

- ICT skills are seen as key to employability, and broadband enables (especially) IT training to be undertaken online. This can take place both in the workplace and in the home.
- Online training, over broadband, cuts training costs – and costs of implementing legislation e.g. health & safety
- Distance learning – via virtual college and virtual schools
- ICT access in schools can also support other learning in ways that make it both more attractive and effective

Consumer/community reasons

- As consumers embrace broadband technology, they will increasingly demand better product/service information and the ability to deal directly on-line.
- Broadband helps empower the disabled and disadvantaged as it can provide an always on, easy to use and access point of contact to multiple agencies e.g. through a single point of public service contact (possibly through surgeries or parish halls).
- Migrants workers can communicate with their families in their home countries, and by using online services can feel more part of the community they are living and working in
- Research by the [UK Online Measurement company \(UKOM\)](#) in May 2010 found that British web users are spending 65 percent more time online than three years ago. The average surfer spends 22 hours and 15 minutes on the net each month

4. What do businesses say?

4.1 In June 2009, the FSB responded to Lord Carter's Digital Britain Report.

They welcomed the Government's commitment to ensure universal access to fast broadband but warned the expected 2Mbps by 2012 lacks ambition.

"Research by the FSB shows that a third of small businesses already have 2Mbps broadband speed, yet struggle to do core, day-to-day business activities. More than half of small businesses rely on the internet for up to 50 percent of their annual turnover, yet simple tasks such as emailing, marketing, buying and selling, are time-consuming because their broadband speeds are letting them down.

"By 2012, £1 in every £5 will come from online commerce, but if small businesses are to compete, the Government must take bolder action. Around 60 percent of small businesses want a minimum broadband speed of 8Mbps. But with Japan leading the way, making high speed broadband of 90Mbps available to everyone, the FSB urges the Government to do more."

Source: FSB Press Release, 18/06/09

In 2007, 64.6 percent of VAT registered enterprises in Norfolk were located in rural locations, compared with an England average of just 29.3 percent. Seventy-eight per cent of these rural enterprises employed less than five people and 90.5 percent employed less than ten.

To encourage further start ups and survival of SMEs in the county we need to ensure there is adequate infrastructure to support them in the rural areas where many set up. In South Norfolk there is currently a business coaching project in the parishes of Wymondham and Costessey. The project will enable individuals to develop their entrepreneurship and provide them with the support they require to establish and setup their own successful business. Through the provision of business coaching and personal development, individuals will gain the confidence, knowledge and contacts to develop a local business of their own.

4.2 Earlier research by The Federation of Small Businesses (FSB) includes the East Anglian Broadband Surveys in 2008 and 2009.

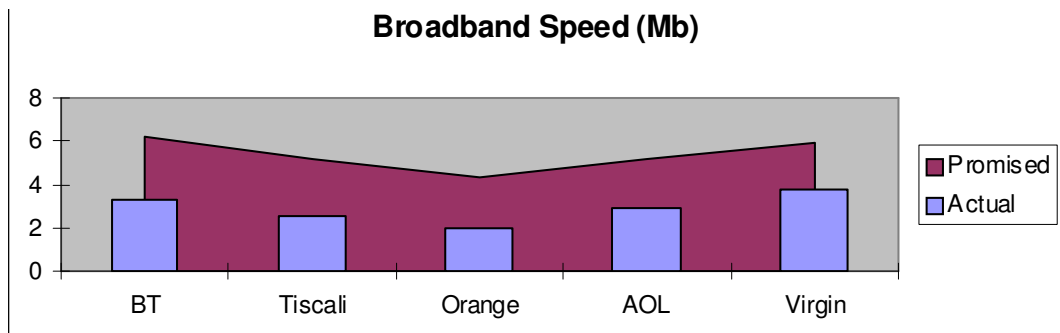
907 FSB members took part in 2008 and 1157 in 2009 and the results included:

Type of Broadband	2008	2009	% change
Dial Up	6%	5%	-1%
Broadband landline	80%	84%	+4%
Broadband satellite/wireless	2%	1%	-1%
No internet connection	12%	10%	-2%

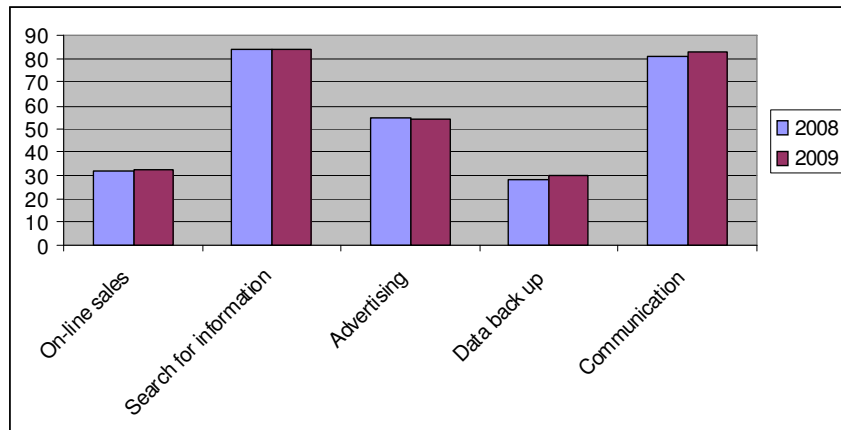
The speed claimed by the suppliers has increased from an average of 5.52Mbps to 8.4Mbps. This is to be expected as technology improves.

In 2008, the average speed delivered was 2.38Mbps, with a range between 0.026Mbps and 8Mbps. In 2009 the download and upload speeds were both considered. On average people received a download speed of 2.9Mbps, with a range between 0.042 and 9.6Mbps. The upload speed average was 1.5Mbps, with a range between 0.056Mbps and 6Mbps.

Promised and actual speeds received by supplier (Source: 2009 survey)



What do you use internet for



Conclusion of the FSB research was that a strategic plan for ensuring that investment in infrastructure within the county as a whole, with targets for roll out of fibre optic cabling and improved services is essential to the future well being of business within the county.

This strategy recognises that Norfolk is unlikely to receive fibre in the rural areas due to the financial costs and return on investment to providers and will therefore consider a 'patchwork' of solutions to suit different areas of the county including wireless, 3G and satellite.

Our strategy is for fibre to be deployed wherever possible, but other solutions such as wireless, 3G and satellite used to bridge the final gap.

- 4.3 A further survey the FSB carried out among 1,300 businesses demonstrates the importance of broadband and the fact that some may move premises to obtain a better connection and faster speeds. The results of the FSB survey were as follows:

Satisfaction with broadband provision at business premises:

- 14% – Very Satisfied
- 44% – Fairly satisfied
- 19% – Neither
- 14% – Fairly dissatisfied
- 9% – Very dissatisfied

Of the 24% who said that they were dissatisfied to some degree:

- 63% – Unhappy with provide speed/reliability of connection
- 30% – The area where my business is based has unreliable broadband connection
- 17% – Unhappy with provider price
- 13% – Unhappy with provider customer service
- 6% – Speed/reliability of connection
- 4% – The rural area where my business is based has low speed
- 2% – Infrastructure/BT line does not meet speed/ reliability requirements
- 1% – Too far from exchange

- 4.4 Norfolk business responses on Eastern Region Broadband Uplift Scheme, EREBUS, a web based initiative which was led by the East of England Development Agency and aimed to encourage commercial suppliers to invest in next generation broadband infrastructure in the East of England (map of registrations can be found in **Appendix D**).

“I have a small, home based business and rely on the Internet for communicating with my customers and for e-commerce. I need at least 10Mbps broadband to allow me to work efficiently”

“We are in the tourism industry and offer our customers broadband. Often we have complaints that our connections are slow and as such would

benefit from faster broadband”

“As an Architectural and Project Management based design practice we need equally fast upload and download speeds”

“Our clients are mostly around London and our suppliers can be anywhere in the country, we therefore rely on the internet to conduct much of our business by email, scanning documents and proofs etc. We also bank online and need a fast and reliable service to administer our business efficiently”

“Faster broadband would allow more sophisticated use of Internet advertising features like video feeds”



5. Broadband availability in Norfolk

Figures from the government body Broadband Delivery UK show Norfolk is among the eight worst-served local authority areas in the country. With a total of 51,128 premises receiving speeds of less than 2Mbps – the minimum considered acceptable by the government.

BT

- 5.1 BT has 142 ADSL enabled exchanges in Norfolk, which are all able to supply up to 8Mbps with BT working on improving the capabilities of the exchanges to deliver faster speeds through ADSL2+ of up to 20/24Mbps.

Four of these exchanges are SDSL enabled (2.82%): King's Lynn, Nordelph, Norwich City and Norwich North.

10 of these exchanges are/due to be ADSL2+ enabled-

Dereham (enabled Dec 2010)	Norwich Central
Drayton (enabled Apr 2011)	Norwich Worth
Gorleston (enabled Apr 2011)	Norwich West
Great Yarmouth	South Wootton (Apr 2011)
Kings Lynn	Norwich Thorpe

- 5.2 There are a total of 26 unbundled exchanges which allows other service providers to buy or lease portions of BT's network and deliver their services direct to the consumer.

Attleborough	Hethersett
Aylsham	Kings Lynn
Brundall	North Walsham
Costessey	Norwich City
Dereham	Norwich North
Dersingham	Norwich West
Diss	Ormesby
Downham Market	Saint Faith
Drayton	South Wootton
Fakenham	Swaffham
Framingham Earl	Thetford
Gorleston	Thorpe
Great Yarmouth	Wymondham

LLU Operators present in Norfolk are as follows:

AOL, Cable & Wireless, Orange, Pipex, Sky/Easynet, Talk Talk and Tiscali

Source: www.samknows.com

- 5.3 In September 2010 it was announced that exchanges at Drayton, South Wootton and St Faiths would be receiving fibre to the cabinet (FTTC) as

part of BT's Next Generation Broadband upgrade plans. These should be enabled by September 2011 and would allow businesses and residents to access speeds of up to 40Mbps as the service travels for long distances over fibre without degrading. In January 2011 it was announced that Dereham and Sheringham would also be receiving FTTC from Spring 2012. The quality and speed of broadband that residents and businesses receive in these areas will depend on their distance to the cabinet as the final connection is still over copper. BT have said that not all cabinets connected to these exchanges will be upgraded to fibre meaning not all residents and businesses who are served off this exchange will benefit. These are the first exchanges to be included in BT's rollout but we anticipate there will be others to follow, namely in the purple circles on the map in **Appendix B**.

FTTC has enabled a small number of community Internet Service Providers (ISPs) to be set up across the country which provide services to rural communities, an example is Rutland Telecom (**Appendix E**). With the prospect of Norfolk now having FTTC, options around these broadband solutions can start to be investigated and facilitated.

Talks continue with BT regarding the upgrade of further exchanges in Norfolk, both through their commercial rollout plan but also looking at market intervention in exchanges which are not commercially viable to upgrade.

Virgin Media

- 5.4 Virgin has exchanges in the following areas, which provide broadband speeds of up to 50Mbps by DOCSIS. By the end of 2011 they plan for 100Mbps to be made available.

Caister-on-Sea	Costessey
Gorleston	Great Yarmouth
Norwich City	Norwich North
Norwich West	Thorpe

On meeting with Virgin Media it is clear that they are unlikely to extend their fibre rollout in the near future, and indicated that it would be at least five years (2015) to make fibre to the home/premise commercially viable. They have been piloting aerial broadband solutions - broadband over telephone and electricity poles which may be a viable option for areas in Norfolk which are close to Virgin Media's current network. More information on the pilots can be found in **Appendix E**.

Virgin Media also indicated that if take up from the majority of businesses

in a business park could be guaranteed there is potential that they would provide broadband to them. Talks are continuing with Virgin Media on this possible solution.

5.5 Local Internet Service Providers (ISPs)

The majority of people associate BT and Virgin Media with broadband provision, however, local ISPs based in Norfolk can supply broadband, particularly to businesses. Local ISPs invest in both hard infrastructure (fibre, ducts, switches) and softer infrastructure (masts, transmitters & satellites for wireless) in order to connect their clients. Although these ISPs themselves connect to the internet with lease lines provided by national carriers such as BT, Cable & Wireless or Virgin Media, if you buy broadband through an ISP your support will be directly with them.

Part of the work of this strategy is to ensure broadband coverage across Norfolk for large populations. It is also about recognising solutions already present, and so researching present ISPs and providing them with not-spot data, in particular businesses.

6. **Actions and Initiatives in Norfolk**

As well as BT and Virgin Media's deployment plan, there are a number of other initiatives underway and planned in Norfolk, with solutions being offered as the issue becomes more prominent in the local media. Below are some solutions that we are aware of and/or have played a part in initiating. This list will continue to grow as solutions come forward off the back of FTTC upgrades and the availability of funding for rural broadband projects.

6.1 **Hemsby, Winterton, Horsey and Hickling, County Wi-Fi.net**

Providing broadband using the very latest in wireless-mesh technology with the aim of complete coverage of the holiday parks in Hemsby. There is also coverage at Winterton Valley estate and the moorings at Hickling on the Norfolk Broads.

6.2 **Sharedband**

Sharedband can increase broadband speeds by aggregating the bandwidth of up to four ADSL lines connected to a customer's premises. Sharedband has been talking with a number of villages in Norfolk to assess the possibility of aggregating lines into community buildings so a faster service is available in certain locations.

6.3 **Norfolk Rural Community Council**

NRCC are actively engaging with local communities to raise awareness and demand for broadband and to identify areas where residents are

active and willing to participate in rural broadband pilots. The NRCC are proposing a pilot with partners Intouch Systems and Anglia Farmers at Cawston with the aim to deliver a community based model, delivering a wireless internet service into homes and businesses. In addition to infrastructure they plan to provide training to support businesses, individuals and organisations to achieve maximum benefit from the internet.

6.4 **Anglia Farmers**

Anglia Farmers are considering their role and how they may be able to offer their services to help providers roll out broadband into rural areas of Norfolk. They are working with the NRCC on their pilot mentioned above.

6.5 **Lyng**

Lyng village are taking action against the poor broadband and mobile reception it receives. The Lyng Broadband Action Group has been established. Vocal and active villages can help make a stronger business case for broadband investment as it proves there is demand for the service.

Lyng is just one of a number of villages taking action.



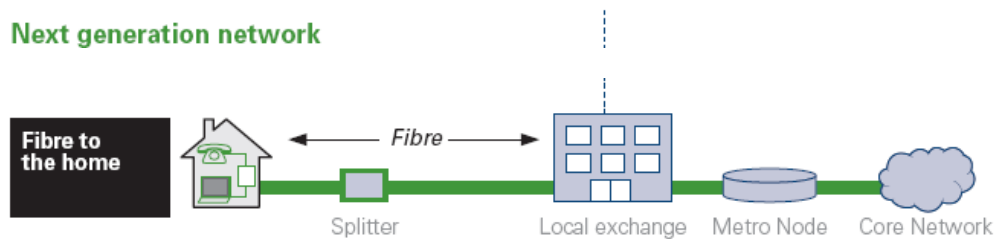
7. Next steps

The list below shows the priorities for the deployment of broadband in Norfolk.

- 7.1 In terms of quality of infrastructure service the following show the priorities. However, it needs to be recognised that in some areas of the county, particularly the rural areas, it will not be economically viable for the private sector to invest in this level of hard infrastructure, due to the economic costs and return on investment by the providers. Therefore options such as satellite, wireless and mobile need to be recognised as valuable options for getting a connection to areas which currently have very little or no connection.

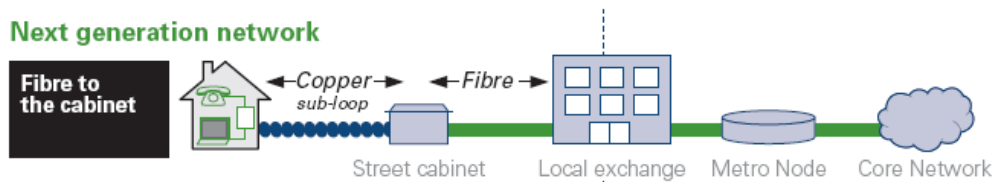
1 Fibre to the home/workplace - premise (FTTP)

Next generation network



2 Fibre to the cabinet (FTTC)

Next generation network



3 Wireless

4 Satellite

- 5 Mobile (3G) – research by Ofcom has found that 90 percent of people in Norwich have a mobile, five percent of people in Norwich already use mobile broadband, and for 18 percent of people mobile is their primary means of communication. There is every expectation for the potential that mobile broadband usage will grow. New radio spectrum for mobile broadband services comes available across the UK after the analogue TV 'switch-over' is complete in 2013. Known as the 'Digital Dividend' spectrum, it will be available for mobile broadband and wireless services, and combines 'high bandwidth' with a large coverage area. The Government is currently concluding on how and in what way, mobile broadband services will be accessible to larger coverage area than current mobile services.

7. 2 Norfolk is a diverse county and the needs for and availability of broadband differs between areas. There are three different situations which need to be considered:
- 1 Medium to large business or public sector agencies, business parks and new commercial and residential developments, particularly in growth point areas (King's Lynn Borough, Greater Norwich and Thetford) - we will be lobbying and encouraging the deployment of fibre to the premise or cabinet in these developments
 - 2 Homes and small businesses in Norwich and Norfolk's major towns - we will be lobbying for fibre to the cabinet in these locations and encourage providers such as Babcock Networks to extend their wireless services and their lease line replacement services for businesses
 - 3 Homes and small businesses in rural areas - the schools model is being developed to cover a large proportion of rural Norfolk, but support for providers such as Sharedband to provide services in those areas that will not be covered. In addition we will support ISPs that may set up using the FTTC infrastructure to reach more rural locations.

8. Broadband Action Team Plan

Norfolk County Council, Shaping Norfolk's Future and districts have established a Broadband Action Team to oversee the strategy and implement roll out of high speed broadband to Norfolk. This action plan is based upon this team and is not exclusive with additions and priorities changing as and when required.

	Action	End Date
1	Creating electronic maps	Ongoing based on data
2	Lobby providers	On-going
3	Funding bids	On-going
4	Identify public sector network opportunities	Ongoing based on opportunities
5	Local partnership development	Ongoing
6	Support the development of BDUK rollout	Ongoing

BAT – Broadband Action Team

1. Creating Electronic Maps

The Electronic Maps will bring together data from multiple sources that support the Broadband bid decision making processes. Geographical information such as BT exchange locations can be overlaid with technical, community and social data to inform the choices of which areas to target.

2. Lobby Providers

To explore potential solutions and levels of interest for provision of Broadband service in Norfolk with service providers, including possible partnerships and matched funding opportunities, and to increase the level of cooperation and information sharing with the Council.

3. Funding Bids

To investigate and bid for potential sources of funding to provide basic or Next Generation Broadband Access to all of Norfolk.

4. Identify Public Sector Network Opportunities

To identify potential opportunities for Public sector organisations to share broadband resources to drive efficiencies. Use that shared infrastructure to benefit the wider economy / community.

5. Local Partnership Development

Develop and maintain links within NCC and the community that promote and support the developing Broadband Agenda

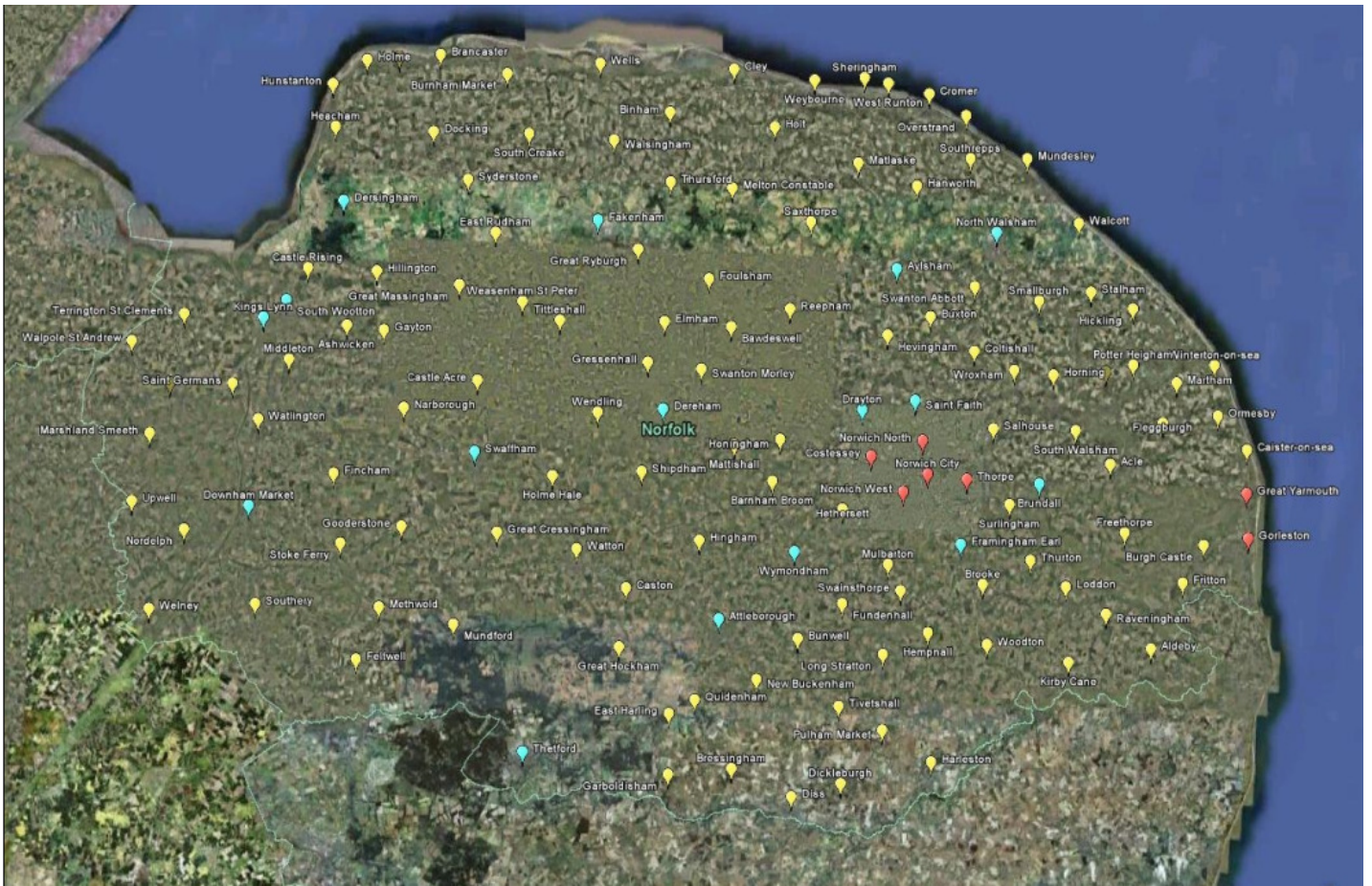
6. Support the development of BDUK rollout

With BDUK funding secured, work now begins on procurement, demand stimulation and rolling out the infrastructure.

9. **Actions and Achievements to date**
BAT

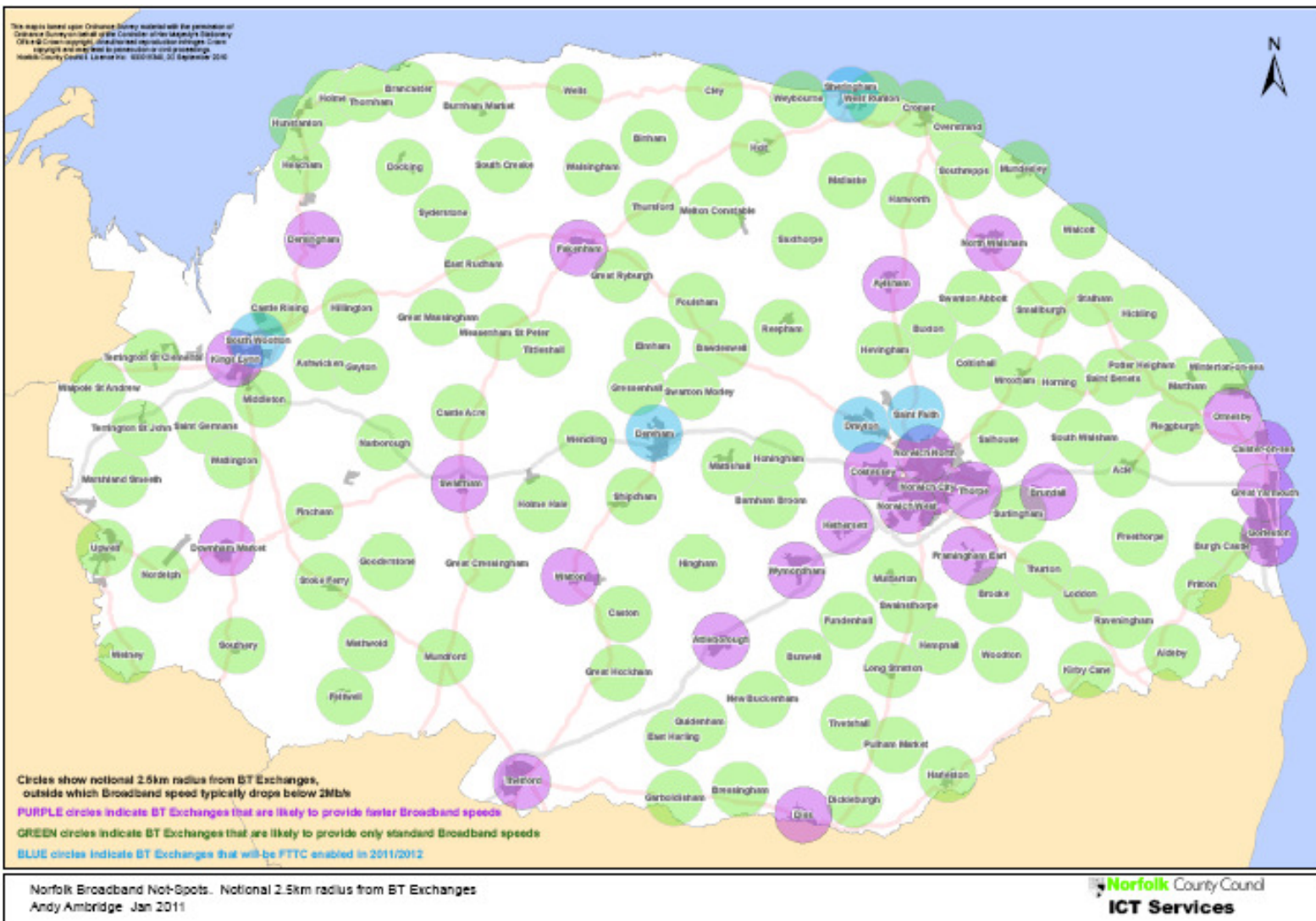
Action	Outcomes
Set up a dedicated website	Completed February 2010 www.broadbandnorfolk.com
Create a Broadband team to help ensure actions are carried out	Broadband Action Team in place
Create a not-spot map	Completed – see Appendix B
Website and media campaign/ conference/ workshops	<ul style="list-style-type: none"> • Workshop on 20th November • Conference on 28th February • Public Broadband Meeting 29th July
Took part in the EREBUS scheme	<ul style="list-style-type: none"> • 4,336 registrations in total between Nov 2009 and March 11
Lobbying communication providers that there are significant numbers of customers who would benefit from an improved service	Meetings with BT and Virgin Media
Encourage submission of ideas to EEDA - SONGBIRD	<ul style="list-style-type: none"> • Bid submitted 13th September 2010 • Successful at first stage and asked to submit full business case • Results of BDUK round two funding led to this project being superseded.
Look at successful broadband projects in the rest of the UK that could be adapted for Norfolk	<ul style="list-style-type: none"> • Meeting held with NYnet 12th April • Meeting with Avanti 24th Feb • Meeting with Vtesse 7th June
Bid submitted to BDUK round two for funding	<ul style="list-style-type: none"> • Norfolk successful in its £15m bid – announced 27th May 2011

Appendix A: Locations of BT and Virgin Media Exchanges



Red – cable enabled Blue - local loop unbundled Yellow –standard

Appendix B: Not Spot map

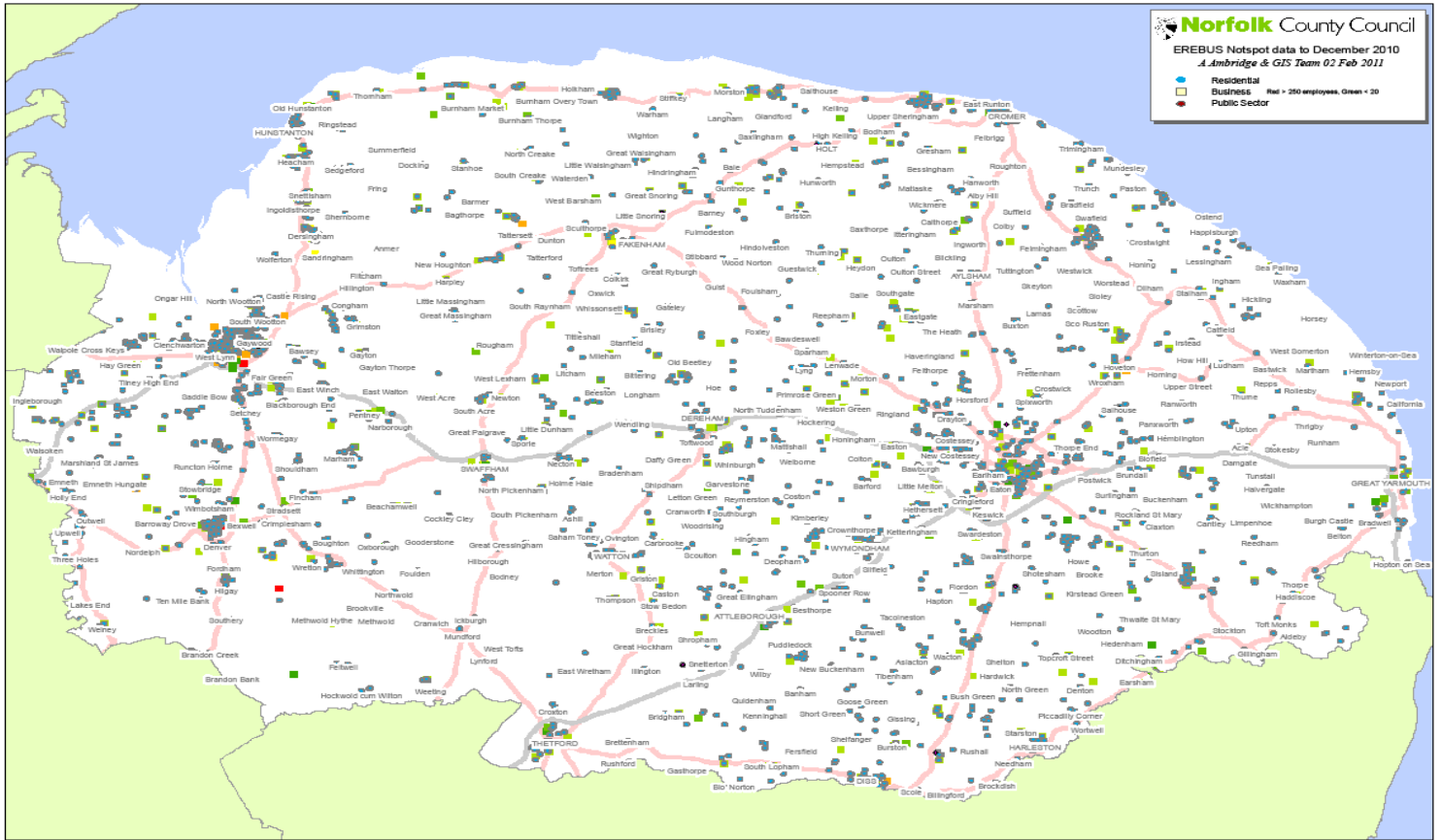


Appendix C: broadband definitions/options

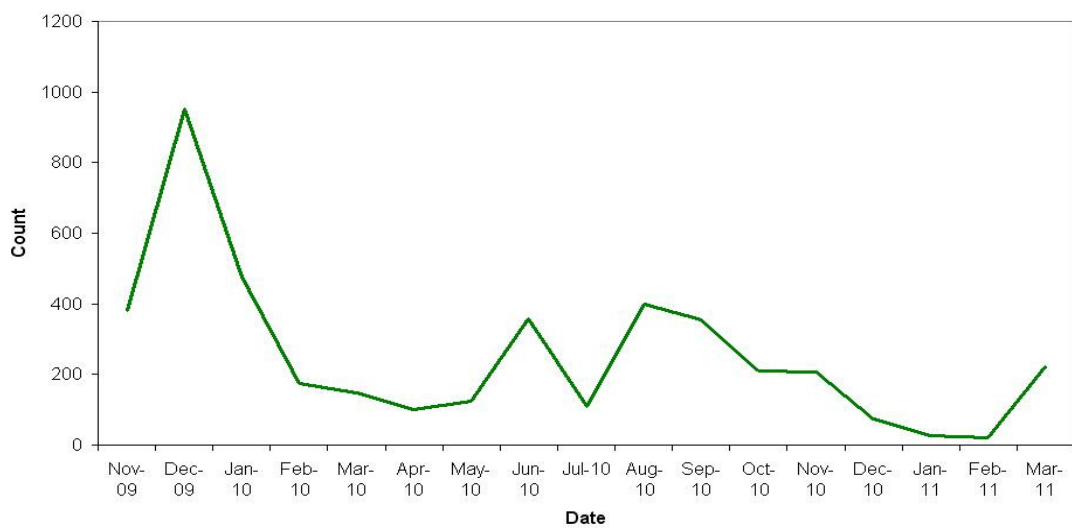
- 1 ADSL - Asymmetric Digital Subscriber Line – upstream bandwidth is lower than the downstream bandwidth
- 2 SDSL - Symmetric Digital Subscriber Line – the same upstream and downstream bandwidth.
- 3 Mbps – mega bits per second - the total information flow over a given time, the higher the figure the quicker the download or upload of information, photos etc
- 4 Fibre to the Home – would bring speeds of between 50Mbps and 100Mbps, with the added benefit of being able to offer those speeds both upstream and downstream. Unlike DSL technologies – which are carried along copper cables – it is not subject to noise issues.
- 5 Fibre to the Cabinet (FTTC) – hybrid solution utilising both copper and fibre delivering speeds of around 60Mbps making it a cheaper option than fibre optics. It is capable of supporting new high bandwidth applications such as HDTV as well as voice-over IP and general internet access, over a single connection.
- 6 As with ADSL, speeds will be dependent on how close people live to the street cabinet. The final part of the connection to the home would run over ADSL or the latest flavour of ADSL, known as VDSL2, which can provide rates exceeding 100Mbps in both upstream and downstream directions.
- 7 DOCSIS - Data Over Cable Service Interface Specification - it permits the addition of high-speed data transfer to an existing Cable TV (CATV) system.
- 8 VDSL2 - Very High Speed Digital Subscriber Line 2 - is an access technology that exploits the existing infrastructure of copper wires. It can be deployed from central offices, from fibre-fed cabinets located near the customer premises, or within buildings.
- 9 VDSL2 is the newest and most advanced standard of DSL broadband wireline communications. Designed to support the wide deployment of Triple Play services such as voice, video, data, high definition television (HDTV) and interactive gaming. VDSL2 is purported to enable operators and carriers to gradually, flexibly, and cost efficiently upgrade existing xDSL-infrastructure.
- 10 DSL - digital subscriber line - provides digital data transmission over the wires of a local telephone network.
- 11 ADSL2+ - variant of existing DSL, and offers speeds of up to 24Mbps, but as it is distance dependent a lot of people will not actually achieve those kind of speeds.

- 12 Because the copper lines it operates on pick up electro-magnetic noise the line can be affected.
- 13 Cable – NTL uses their cable lines to transmit internet data at speeds similar to an ADSL connection
- 14 Wi-Fi - a Wi-Fi enabled device such as a PC, video game console, mobile phone, MP3 player or PDA can connect to the Internet when within range of a wireless network connected to the Internet.
- 15 Mobile Broadband – comes either as a dongle or via a wireless router. It can be delivered from a range of technologies from 2G to 3G, with the highest speed currently possibly in the UK being around 7.2Mbps. Speeds are set to get faster with the advent of 4G technologies.

Appendix D: map of registrations on the Eastern REgion Broadband Uplift Scheme (EREBUS)



Norfolk EREBUS Registrations



Appendix E: Initiatives in the UK, most relevant to Norfolk

Broadband availability, speed and reliability is an issue in many parts of the UK and it is important to recognise what has been done elsewhere to learn from best practice, and also to recognise what (planned) services are available from different organisations/businesses.

- 1 The Country Land Owners Association (CLA) is offering its members satellite broadband – which offers a two way broadband service up to 2Mbps. The CLA believes this offers a positive solution to rural areas with no broadband coverage or speeds below 2Mbps.

- 2 Maldon, Essex - wireless

Essex County Council, Maldon Local Strategic Partnership and Maldon District Council created a project to allow residents to connect to broadband with speeds of up to 100Mb/s, which is being delivered through radio transmissions.

The service is being run by [FibreWifi \(www.fibrewifi.com\)](http://www.fibrewifi.com). The service is delivered by long range wireless connections from base stations located around Essex to properties.

- 3 Woolhampton, Berkshire – Virgin Media telegraph pole pilot

Virgin Media is using existing telegraph poles to link the area directly to Virgin's fibre optic network. It would give the residents the same 50Mbps access as those in larger towns without having to bury lines or relying on the existing, ADSL-only BT network. The trial will start in March 2010 and should last for six months. Virgin estimates that over 1 million homes outside of urban areas could stand to benefit.

- 4 Crumlin, Caerphilly – Virgin Media electricity pole pilot

Virgin Media is using electricity poles to link the area directly to Virgin's fibre optic network. The company have signed an agreement with Surf Telecoms, a Western Power distribution company.

- 5 Lincolnshire – Sharedband and BT

Sharedband and BT are working together to deliver a faster broadband connection to rural businesses by aggregating the bandwidth of up to four ADSL lines connected to a customer's premises. Sharedband technology involves 'bonding' multiple ADSL lines into one and is being used across the country with a number of Internet Service Providers (ISPs).

6 Scotland – Avanti Communications

In August 2001 – Scottish broadband coverage, as a result of the private sector's commercial investment, was just 43 percent – compared to 63 percent in the UK. The Scottish Executive's Broadband Strategy was launched; its aim was for pervasive and affordable broadband in Scotland. In June 2004, a target of affordable broadband to every community by the end of 2005 was set; reflecting the need to deliver to rural and remote areas where broadband was still unavailable. The Scottish Government made a £3.3m capital budget available to support the project.

Following an international tender, Avanti was chosen as the primary supplier of a satellite based broadband solution and over 2100 installations were completed – a near 50 percent take up rate of those in not-spot areas that had expressed a serious interest in buying broadband

7 Hertfordshire – Vtesse 'Final Third' pilot

Vtesse will be deploying new infrastructure in Hertfordshire designed to demonstrate that super-fast broadband can be viable for residents of "Final Third" communities. Vtesse is running the pilot for up to 500 properties in the Hertfordshire communities of Birch Green, Bramfield, Hertingfordbury and Stapleford. Whilst each is close to the county town of Hertford, they are all a considerable distance from their local telephone exchange and none currently has access to super-fast broadband.

Results from the pilot will be used by Vtesse Networks to support applications for grants from the Government's 2Mbps Universal Service Commitment Fund, and also from the Next Generation Broadband Fund announced in the recent Pre Budget Report.

8 South Yorkshire - Digital Region Ltd

Yorkshire Forward worked with local councils, and unlocked European, regional, local and private investment of more than £90m, including £30m from the European Regional Development Fund to create Digital Region Ltd (DRL). DRL has been formed to provide super-fast broadband including products of up to 25Mbps high-speed service using state of the art technology across South Yorkshire. DRL has procured a technology partner led by Thales UK and including Alcatel-Lucent and KCOM, to design, build and operate the Superfast Broadband Network for DRL.

The DRL, infrastructure network will be a wholesale, carrier-class network that enables IP-based services to be provided to citizens, businesses and the public sector throughout South Yorkshire. Key to the ambition of the project is a recognition that the DRL, infrastructure will be able to meet the needs of Internet Service Providers in a way that existing infrastructure is unable to do at present.

9 North Yorkshire – NYnet

NYnet – a public and private sector partnership, which became fully operational during 2008, has provided a faster and cheaper broadband infrastructure. It was established through a collaboration between Yorkshire Forward and North Yorkshire County Council with funding from the European Union.

Nynet provides a high speed network backbone through North Yorkshire, and primarily delivers services to 500 NYCC sites at profit. It offers surplus bandwidth to Internet Service Providers (ISPs) in the area and encourages them to offer their services to local businesses and the public by providing lower cost backbone network facilities. Nynet also works in partnership with local community groups to set up “collective ISPs” in areas where no other services exist.

10 Cumbria – ‘Cybermoor broadband co-operative’

In 2001 communities living in Alston Moor bid successfully for £1.2m of government funding as one of seven disadvantaged areas recognised as needing help to access a broadband internet connection. The following year the Cybermoor broadband co-operative was launched to try and bring high-speed broadband to the area. Masts were put up in areas which were not being served by the main operators, and upgrades occur to keep up with what you would expect in a city, most recently Cybermoor is installing new fibre-optic cables.

At present the co-operative has 350 members, all of whom have access to fast broadband. Members pay for their broadband package and also £1 in membership fees as an investment in Cybermoor.

11 Shropshire – ‘Switch on Shropshire (SOS)’

The SOS project was created in 2002/03 to overcome market failure and to stimulate broadband demand in levels of take-up that encourage the private sector to invest in and roll out broadband infrastructure to all communities within Shropshire. The SOS project focused on businesses and communities in eligible Rural Regeneration Zones areas of Shropshire.

SOS was a partnership of the public, community/voluntary and private sectors with £4.8m funding from Shropshire County Council, European Regional Development Fund (ERDF), Advantage West Midlands Rural Regeneration Zone and the private sector.

One area that the project focused on was the creation of ‘Broadplaces’, as a facility within the heart of rural communities, such as village halls, community centres, or even the local pub, where everyone could learn

about, access and experience broadband internet.

12 Lyddington, Leicestershire and Erbistock, Wales – Rutland Telecom

Village residents and businesses in Lyddington will expect to receive broadband speeds of up to 40Mbps, with average speeds reaching 25Mbps. The service is delivered using VDSL2 equipment from Zhong Technologies which are housed inside a street cabinet. This cabinet, acting as a 'mini telephone exchange' is then connected to the BT cabinet in a process known as 'sub-loop unbundling' with Rutland Telecom being responsible for the backhaul from the cabinet all the way to the Internet.

Residents have had to put in up to £3,000 in investment with £37,000 raised in total. They will be paid a 10% gross return for three years after which their investment will be fully refunded.

Rutland Telecom are now working with the community in Wales to explore ways of raising the necessary capital such as looking at partnerships or joint ventures, which will ensure local investors get a financially attractive and acceptable rate of return.

Initiatives in UK, for interest

- 1 NHS - National programme for IT to bring modern computer systems into the NHS with the aim of improving patient care and services. This is currently delivered over fast broadband networking N3 – The National Network - which could represent a model to work with.

- 2 Cornwall – Virgin Media and Vtesse

Virgin Media and Vtesse have had a successful trial delivering TV and broadband services via copper phone lines as part of plans to expand Virgin Media's footprint beyond the cable network laid in the 1990s.

Residents of Hatt and Higher Pill in Cornwall, were offered free broadband at up to 50Mbps downstream via a VDSL2+ line to a roadside cabinet. The cabinets were linked to Virgin Media backhaul via new fibre laid by Vtesse Networks.

The success of the trial has meant 574 households in Higher Pill and 262 in Hatt can now get access to broadband at speeds of up to 40Mbps for £30 a month.

- 3 Kent – Virgin Media

Virgin Media is piloting the real-world deployment of 200Mbps speeds in Ashford, Kent. The 200Mbps pilot will mark the fastest deployment of cable broadband in the world, with only fibre offering faster services. The trial was launched in May, and will run for at least six months, but no dates

are being mentioned as to when the 200Mbps trials may expand to other regions outside Ashford.

4 Sheffield – H2O Networks

Homes in Sheffield are set to benefit from super-fast broadband as H2O Networks begins work on a city-wide fibre network. The network will run via the city's sewers and follows similar schemes in Bournemouth and Dundee.

The network will be laid in a 15km ring around the city and will build on an existing fibre network which serves luxury flats and student accommodation.

The new fibre-optic broadband service that is set to be introduced in Sheffield is being designed and built by Thales UK and will cover 1.3 million people, as well as 40,000 businesses. Bodies including Yorkshire Forward and a range of local authorities are backing the scheme.