Broadband Solutions for Blackshawhead parish

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Background

Blackshaw is a predominantly rural South Pennine Parish within the area of Calderdale Metropolitan Borough Council and is a part of the Calder Valley Parliamentary Constituency. The bulk of the Parish is part of the Calder Terrace moorland fringe and upland pasture framed by the moorland tops, Noah Dale, the wooded Colden and Jumble Hole Cloughs and crossed by the Pennine Way.

The Parish stretches from the valley settlement of Charlestown on the busy A646 between Hebden Bridge and Todmorden to the high moorland plateau on the border with Lancashire at Hoof Stones Height (479 metres high).

The 2011 census estimated a population of 963 in the parish for mid 2010.
(http://blackshaw.net/)

Currently, fibre broadband services for the parish terminate at the New Delight public house, roughly 1000 metres from the village, and the BT Openreach DSL checker gives no indication on improved services over current ADSL2 in the foreseeable future.

http://www.dslchecker.bt.com/

To use this, simply put in your phone number to see what services are currently available, and what future offerings are on the cards.

The need for this document arose by a chance meeting between a member of the parish and the author who was then invited to attend a meeting of the Parish WayAhead group. This group, and other community members were frustrated by the lack of access to superfast broadband in the Parish, and the impact it would have on the community, jobs and the retention of younger people dependent upon access to the internet as part of their lives.

The Parish were further disappointed by the lack of support from BT who had been advised not to attend meetings of the group, even though BT are the monopoly supplier of broadband services in the UK.

The author has a background in public and private IT systems including both Fibre optic and wireless solutions including the Norfolk Openlink mass Wi-Fi trial. In the capacity as a local resident of Walsden, help was offered to provide information to assist the Parish to decide on a route forward.

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<u>Current Broadband solutions</u>

Broadband Delivery UK (BDUK), an agency of the Department for Culture, Media and Sports is in charge of delivering the Superfast Broadband programme in the UK. BDUK has a budget of £530 million (which could rise to £830 million by 2017) to be given to network providers who can connect communities and regions of the UK. BDUK money is a mixture of UK taxpayer money and funds from the European Union, with BT the winner in every region so far, and the only bidder in the remaining regions.

The DCMS also handles the UBF (Urban Broadband Fund) and the MIP (Mobile Infrastructure Project).

The current non Superfast broadband, known an ADSL (Asynchronous Digital Subscriber Line) and ADSL2 is the solution that provides most broadband with speeds from 0.5 to 8 Mbps download, though this can be higher is urban areas. Upload speeds are always much less, around 0.5 Mbps, unless the user specifies SDSL, which is a more expensive Synchronous service mostly utilised by businesses. Certain exchanges have also been upgraded with something called LLU (Local Loop Unbundling) which allows Internet Service Providers (ISP) to put their equipment into the BT Exchange and to offer customers more advanced services

The DCMS contracted solution provider countrywide (except for a few contracts) is BT Openreach who are enabling cabinets with fibre optic links back to their exchanges, and then services are sold on through the various internet suppliers such as Zen Internet, Sky and Plusnet amongst others.   BT Openreach also has an existing commercial programme in place to upgrade various exchanges not in the BDUK programme to support Superfast broadband where the costs are deemed to be acceptable to the business.

The Openreach solution is to provide a fibre optic cabled solution to the green Cabinets by the roadside which provide the copper phone line connections, installing a new Fibre ready cabinet next door to existing telephone cabinets. This then allows the BT network to use the existing copper telephone infrastructure to provide the "last mile"; this is known as Fibre to the Cabinet (FTTC) and is designed to project the BT Exchange to local cabinets by the use of "light speed" fibre optic technology, which keeping costs to a reasonable level by not replacing the existing copper infrastructure to homes.

A further solution of Fibre to the Premise (FTTP) exists to provide speeds of up to 300 Mbps but in many non urban scenarios, this is not feasible as it requires a duct to install fibre optic cables to the building.

There is also a plan to offer Ultrafast Broadband which is dependent upon BT Opreach trialling new technologies for the copper "last mile" and implementing more fibre to the home.

Superfast Broadband Programme

The ambition for the BDUK programme is to provide superfast broadband (speeds of 24Mbps or more) for at least 95% of UK premises and universal access to basic broadband (speeds of at least 2Mbps); this is now known as the Universal Obligation as broadband is now considered an essential service.

Generally Openreach is able to offer a 24Mbps, or higher, service up to around 1km from a fibre enabled cabinet; whilst this is "superfast" in British terms, over existing solutions, this is behind a lot of offering worldwide, though it is sufficient to stream Internet TV services, download films and support local small business needs.

True Superfast Broadband in the UK should provide a download speed of 75 Mbps and an upload speed of around 4 Mbps. This is the sort of service that will be available in most town centres including the centre of Todmorden, where Superfast is currently being enabled though in a limited number of cabinets.

The BDUK programme is being delivered in three phases:

Phase 1 aims to provide superfast broadband to 90% of premises in the UK
This phase is mainly complete as it covers the major urban areas.
Phase 2 will seek to further extend coverage to 95% of the UK
Phase 3 will test options to rollout superfast broadband beyond 95%.

The delivery of the programme in Yorkshire is through Superfast West Yorkshire http://www.superfastwestyorkshire.co.uk/ which involves the five West Yorkshire authorities of Calderdale, Wakefield, Kirklees, Bradford and Leeds, the City of York, in conjunction with BDUK.

A perceived problem with the programme is that the stimulated private sector investment is primarily with BT Openreach and that there is little innovation to both reach and exceed the targets set by government. BT is putting in around £400m to the programme but will end up with assets of over £1.2bn.

The focus also appears to be on urban areas to the detriment of rural ones, and this has been further confirmed in December 2015 by research by Thinkbroadband.com where the percentage of villages and hamlets with superfast broadband is substantially lower than for towns or urban areas. (http://www.thinkbroadband.com/news/7288-what-does-the-rural-versus-urban-broadband-battleground-look-like.html)

In addition many rural areas of West Yorkshire are only likely to get addressed in Phase 3 or afterwards due to complete in 2018, and these communities will exist in the broadband vacuum whilst BT understandably address the larger urban internet needs, where costs are lower.

Mobile Infrastructure Project (MIP)

The Mobile Infrastructure Project is a separate £150 million pot that's aimed at improving mobile coverage, filling out the last of the UK's mobile not-spots and ensuring that 98 per cent of the UK can get 4G by the end of 2017. Again 98% coverage will still miss out many rural areas, and existing 4G coverage in the region is primarily limited to the valley bottoms.

This provision is related to next-gen broadband as fixed-location 4G broadband can be used as a stop-gap solution for areas which won't see fibre broadband for a while.

The MIP seems to be targeted on Cornwall and Northumberland, and other regions but not West Yorkshire.

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<u>BDUK framework – Fibre alternatives.</u>

Currently, within the BDUK Framework, the main alternative to fibre is satellite based broadband. There is almost universal coverage, which is especially useful in remote rural areas.

On the surface this sounds ideal, especially with service speeds of up to 20Mbps (Megabits per second) being available from the latest satellite systems, although in reality there are many caveats to consider. Satellite systems require the installation of a special receiving dish on your property, which isn't cheap and could cause a conflict with local planning permission. It's also not uncommon for hardware and setup fees to reach £500+, while service rental often starts at around £15-25 per month. The UK government is talking about a programme to provide a dish subsidy, but this will only defray some of the costs.

Satellite usage allowances tend to be quite restrictive too and can easily attract hefty excessive use charges by exceeding the limit. Most satellite ISPs will also impose an aggressive level of traffic throttling that might, at the extreme, reduce service speeds down to a virtually unusable 64Kbps (0.06Mbps). Bad weather, such as heavy rain, can also obstruct the line-of-sight between your dish and the orbiting satellite, which sometimes results in disrupted connectivity.

Satellite is no good for VOIP (voice over IP) services such as Skype or Facetime, nor business Virtual Private networks (VPN) or fast paced multiplayer gaming, either due to the time that it takes for signals to go from the Earth, to the satellite and then back down again (high latency).

As a result it can often feel like Satellite is costly, confusing and highly restrictive. However this is still a useful stop-gap measure for isolated rural areas where broadband connectivity has yet to deliver, although it cannot compete with the lower cost and stronger flexibility of established fixed line ISPs.

In Sept 2015, Cornwall Council briefed its members that the take-up of satellite systems in the county had only reached the heady figure of 25 households in 2 years. (http://www.cornwall.gov.uk/media/14909048/150911-cms-committee-broadband-enquiry-final.doc)

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What alternative solutions exist outside of the BDUK offerings?

There are still a number of technologies available to provide broadband to the parish, and also to other surrounding communities. These will need funding through different routes, covered later, and will require some imagination and risk management, but all the technology is proven, and in addition a number of reference sites and project already exist to show what can be achieved.

Private Fibre "last mile"
The first option is closest to the current model and would involve paying for Openreach or another supplier to lay a private fibre optic cable between the New Delight and the village cabinets. This would provide the connectivity back to the BT exchange and would most likely be the easiest solution with the shortest delivery time. The problems with this are cost and any services are dependent upon the state and length of the copper lines to the homes and remote parts of the parish.

In March 2010, residents of Iwade in Kent noticed that a local BT exchange was about to be upgraded to a FTTC (fibre-to-the-cabinet) service but their more rural exchange wasn't. Residents persuaded Kent council's broadband fund to provide £13k, which persuaded BT to upgrade their exchange. To increase take up they even offered up to £75 for each household to cover the cost of installing a fibre service like BT Infinity. In April 2010, for example, local investors raised £37,000 to bring fibre broadband to Lyddington Rutland in the same way.

Private Fibre network
One mainstream alternative is a private fibre optic network connecting the parish, and houses, to the Internet and this has been championed by the B4RN (Broadband for the Rural North) who have set up a not for profit community enterprise to lay down fibre within the community to provide Gigabit (up to 1000 Mbps, 20x faster than "Superfast") Broadband for all.

Broadband for the Rural North Ltd (www.B4RN.org.uk) was launched in December 2011 by a local volunteer group led by industry expert Barry Forde. Registered as a community benefit society with the FSA (under the Industrial and Provident Societies Act 1965) it can never be bought by a commercial operator and its profits can only be distributed to their community.

The company's initial share offering raised hundreds of thousands of pounds from the local community and the first ground was broken in Quernmore in March 2012. Within months B4RN's affordable, community focused model won it the ISPA's 'Internet Hero' award.

- B4RN has over 1250 connected customers
- B4RN is active in over 41 parishes in Lancashire, N Yorks and Cumbria
- B4RN is an equal opportunities employer with 6 full and 2 part time staff
- uptake of B4RN averages about 65% of all properties in the completed communities
- communities have invested over £1.25m of share investment

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<u>Wide Area Networking</u>

Mobile Technology

3G
3G is an older data transmission technology known to mobile phone users which is well supported in the UK by the mobile operators and provides speeds of up to 5-7Mbps. Wallis in the Shetlands is part of a rolling trial of Vodafone's Open "Femto" technology, building on the Sure Signal femtocell technology many Vodafone users have adopted to get good signals in their home.

However this does require a fibre or radio backhaul service to connect to the internet and each femtocell can support only 4 users and data rates are much lower for superfast but any improvement over nothing is good.

4G (LTE)
4G – the advanced service being rolled out on the phone network, offering speeds up to 12Mbps to mobile users – is the preferred choice of mobile operators for connecting high speed internet, and is really good at supporting mobile service users, in cars etc. However its major disadvantage is the amount of "femtocells" (local transmitters) that need setting up and the respective costs.

4G in the Blackshaw area is limited to the valley bottoms on the road between Todmorden and Hebden Bridge, and connection to either the BT internet structure or existing 4G services would still require a "backhaul" radio link to provide the connectivity. Costs would also be higher for residents to connect into the network, as 4G is not a common technology beyond mobile phone handsets.

4G is primarily used in the USA as a Wide Area Networking Technology, rather than the UK. However Cotswold Wireless in Swindon has implemented a 4G (LTE) Service around the city based upon a central mast system and it is delivering speeds of between 20-40 Mbps data only to homes and businesses http://www.cotswoldwireless.co.uk/ccn/news.cfm?articleID=68).

In addition EE have promised to install more 4G microcells around the country to provide improved coverage but their plans are unknown at present.

Wireless Solutions

Wide area networking, utilising radio links is a more proven, cost effective and lower risk technology, when used to provide community based internet services. Wi-Fi, under the 802.11 standard is a mature technology with a large number of suppliers, and with many trained – and un-trained – experts in the technology. Any house with Wi-Fi uses this technology to provide services within a premise and the basis of the wide area network is just an escalation of that technology.

In principle a link is made to an internet service provider within a town to provide the core service connection. This is then "beamed" out to the community over a Point To Point (PTP) link – that may be many 10s of miles long – and this is the "Wide" in Wire Area.   This link can either be a superfast broadband line, with a 75 Mbps download speed, or a Fast Ethernet link, up to 1GB, which provides the same speed both "up" and "down".

One way to increase capacity over using a single broadband line is to "bond" a number of lines together. A number of products allow users to bond 4 or even 6 ADSL lines together such that the end user or community can have access to a 300 or 400 Mpbs downlink service, but of course only a 16-20 Mbps uplink. This is a much cheaper option than using an Ethernet link, though Ethernet

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provides a more scalable service up to 1 Gbps and is synchronous, offering greater flexibility. The choice normally boils down to cost and usage.

The added advantage of using a dedicated Ethernet circuit to the base router is that it has no contention with other users; with Standard ADSL lines there is usually a 20:1 or 50:1 contention ratio which means that you are sharing the specific circuit with 20 or even 50 other users; on business circuits the contention can be as low as 5 or 10:1. This may sound like a lot but in reality, the internet is only used in bursts of traffic rather than full on and sharing a circuit can still often give a high speed link. If however this is being used for a community network, the contention might have more of an impact given how many households, and people, might be covered by one "user".

Once a broadband signal has been beamed to a village, it can then be broadcast out to the residents on another frequency, on a Point to Multi Point (PTMP) service with individual receivers attached to subscribing houses, or connected out the more distant parts of the community, or other villages through addition point to point links. Access can be controlled to the system on a subscribed basis, and packages sold to earn revenue, and with some of the platforms available, commercial services such as visitor "hot spots" can also be provided.

<u>Fixed wireless links solutions</u>

2.4GHz – Wi-Fi

2.4Ghz is the frequency known as "Wi-Fi" and is the common wireless standard for users in their houses or when connecting to the internet in a cafe or fast food outlet. 2.4GHz Wi-Fi was first pioneered by AT&T under the 802.11 standard with their Wavelan products back in 1992 with a 2Mbps system and was soon adapted with high gain antennas to provide simple bridged building to building links.

This is the most understood wireless system and has been adapted by a number of communities worldwide to provide inter-community internet links, and as the standard has envolved it can now give speeds over 100Mbps.

One of the first projects to explore the use of community Wi-Fi was the Norfolk Openlink service around Norwich and south Norfolk (https://en.wikipedia.org/wiki/Norfolk_Open_Link) that Norfolk County Council trialled to provide free internet access, albeit at low speed, over a 40 km^2 area to the public and public services from 2006 to 2008.

Since then Tegola in Scotland (www.tegola.co.uk) has pioneered and help support the growth of community Wi-Fi services in Scotland, and now through the HUBS (High speed Universal Broadband for Scotland) is assisting remote communities in getting access to the web.

One of the successes from this programme is Hebnet (www.hebnet.co.uk) which provides an 8Mbps internet service on Eig from the mainland; this could provide a 50 Mbps service but is limited by the connectivity at its mainland connection (at present they have 3 x 8Mbps circuits "bonded" together to provide a 24Mbps pipe).

Another success in shared Wi-Fi, and community ownership, is The Bay Broadband Co-operative (www.rhbmesh.net). This company provides a broadband facility to the residents and visitors of Robin Hoods Bay in North Yorkshire. The 150 members enjoy a reliable and high quality broadband connection through a Wi-Fi mesh of up to 8 Mbps, good enough for streaming services. Members pay £5 a month for the service. The co-operative survives on its income and is currently making a sustainable profit.

The broadband service is purchased from one of a number of suppliers (currently NYnet) and comes into the system at Whitby via fibre. This is purchased as a business package and has a very low contention ratio compared with standard domestic lines. The signal is broadcast out (over a 7 mile radius) and reinforced through about 30 strategically placed repeaters in the village and surrounding area.

The members have formed a company limited by Guarantee. All full time users are automatically members. There is no formal committee or Board. The company has several named Directors, a company secretary and a treasurer. All members are invited to well attended open weekly meetings, held in the local pub every Thursday evening. There is a core of about 12 members who regularly turn up to most meetings and form an informal "executive".

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5GHz – WiMax

WiMax is an evolution for Wi-Fi and was once called "Wi-Fi on steroids" due to its ability to use a much greater transmission power and for its links to carry a much greater amount of data.

It uses the same basic technology and methods as Wi-Fi - 802.11g (54Mbps) wireless but operating in the 5.1-5.8GHz frequency bands instead of the 2.4GHz band.

Operating at the 5GHz radio bands has several advantages over the more common 2.4GHz band:

a. Better penetration

b. Better scatter, so useful in a non line of sight operation

c. No abnormal absorption by water or damp; ideal for the wet north

d. Larger number of non-overlapping channels which means less radio congestion – and greater throughput.

On the downside, the Free Space Loss (how much signal is lost transmitting through the air) for 5GHz is about 6db worse than 2.4Ghz but, on the good side, the UK permitted power levels are 3-10db (depending upon the actual frequency) higher than 2.4GHz. This means, if you are using 5GHz for long range site-to-site connectivity you need to use a higher power level to cover the same distance which is good as the power usage is from twice to forty times more than for Wi-Fi.

However these raised permitted power levels and the better non-line-of-site capabilities makes it the preferred method for short range building-to-building connectivity and for in-building use.

There are three 5GHz frequency ranges permitted for wireless networking use in the UK:

Band A (5150-5350MHz), Licence free use

Band B (5470-5725MHz), Licence free use

Band C (5725-5850MHz), Licence required for operation (currently £50 pa)

In the UK, the licenced high band, 5725-5850 MHz (Band C), can only be used for the Installation of Fixed Wireless Access (FWA) services between stationary points - PTP. Band B (5470-5725 MHz) can be used licence free for indoor or outdoor links but the permitted power levels are much lower than those allowed in Band C.

(www.solwise.co.uk)

A number of WiMax systems are already deployed in the UK, even though LTE was pushed as a better solution for mobile. WiMax has proven to be popular as it is cheaper and easy to deploy, whilst offering high throughputs and scalability. These include WiSpire in Norfolk, run in conjunction with the diocese of Norwich and which extends the Internet out to a large number of rural villages in Norfolk. www.Wispire.co.uk. In addition Cotswold Wireless have a number of deployed wiMax solutions (www.cotswoldwireless.co.uk) and AB Internet (www.abinternet.co.uk) who have operations in Lincolnshire (where they started), North Wales and Merseyside, Middlesbrough, Thetford and more recently Scotland where they are providing superfast broadband for over 1400 homes.

AB Internet is a good example of a company using technology to bridge the gap between fibre superfast by BT and low rate broadband services.

A new contender on the block is SugarNet (www.sugarnet.co.uk) who have launched their own self funded wireless network in Oxfordshire to provide superfast broadband to local residents.

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<u>Licensed bands</u>

Licensed radio provides dedicated backhaul radio links over "reserved" frequencies up to 60Ghz, and is often used by organisations to provide mission critical data links where fibre is not a consideration. The advantages are primarily that of high data rate, guaranteed availability and security though this offset by the licensing costs which for a 42GHz link would be around £22k pa on top of any data rates and equipment costs

WiSpire use some licenced band links in their Internet solution.

<u>Licensed verses unlicensed comparison</u>

When are licensed links mostly used?

- Organisations looking to create a long distance LAN connections
- Organisations looking to reduce the cost of existing leased lines
- In high density areas suffering from RF interference
- Mission critical data requiring 99.999% uptime such as for Telecoms systems

When to consider opting for an unlicensed (or low cost licence)

- Low density areas not suffering from RF interference
- Budget constraints
- Non-critical data transmission, such as for community internet.

Just using these criteria, the most cost effective for Blackshaw when considering a radio based solution would be a low cost licenced one, possibly using the 5.8Ghz Band C for backhaul and a mix of 5 Ghz and 2.4Gz links within the parish.

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<u>Funding routes</u>

BDUK

As BDUK is the main supplier of Superfast Broadband in the UK, and in our area with Superfast West Yorkshire, this should be the first point of call to understand what the current plans are for gthe region and rurally, and what changes are likely to be made in Phase 3 of the plan.

There might also be specific funds available for local trials similar to the Rural Broadband Initiative which trialled a number of solutions for BDUK up to 2015.

http://www.computerweekly.com/news/2240216750/DCMS-to-fund-rural-trials-of-superfast-broadband

Local Councils

Todmorden and Calderdale Councils should in many ways be the first point of call for any funding enquiries. Whilst Money may not be the easiest thing for them to find, they will have the connections to the relevant funding routes, and can provide the political connections and support to help drive this through to completion.

They will also have their own local strategies and access to experts in different fields, plus knowledge of other local requirements and solutions which may be complementary to the Parish's needs. If more communities can be drawn into the projects objectives there is a greater chance of securing funds from the Councils.

Calderdale Council also has a Strategy and Policy Manager responsible for Broadband Delivery who would be a useful person to help understand the council's position.

Big Lottery Fund

The Big Lottery Fund is one source of funding for a community organisation or parish council to investigate alternative options on broadband delivery. They only provide money for communities to ascertain what is possible, ie a radio survey of the area and possible backhaul links and link all other funding groups have a fairly lengthy procedure to apply for the money.

They will however offer up to £10,000 for such projects and have recently streamlined this process and made it more user friendly, and promise a fairly rapid response once accepted. This may be a very good route to look at one or more of the options, and to provide information to any second round funding provider, be it at local or European level.

https://www.biglotteryfund.org.uk/funding/Awards-For-All

DEFRA

Defra has recently seen budget cuts of 15% implemented across the board, except for such area as flood defences, but it is not known what the current position is in relation to rural broadband which the department has championed over previous years.

However contacts here may prove useful in identifying routes to market.

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The European Regional Development Fund (ERDF)

The EU has a say in the rollout of next-gen broadband in the UK because of the ERDF, the European Regional Development Fund, and its role in providing money for BDUK.

The ERDF has provided cash for projects such as Superfast Cornwall (www.superfastcornwallorg) which has recently connected its 10,000th premises to its new fibre network. Superfast Cornwall is a joint project between the European Union, Cornwall Council and BT and aims to have fibre broadband in 80 per cent of Cornish homes and businesses by the end of 2014.

The EU has set out a Digital Agenda for Europe in a separate plan. The main aims of this plan are to provide:
- 30Mbps or more for 100 per cent of EU citizens by 2020
- 100Mbps or more for 50 per cent of EU citizens by 2020

The Digital Agenda proposes funding of high-speed broadband through EU instruments such as the ERDF, as outlined above.

(www.ec.europa.eu/digital-agenda/en/news/broadband-investment-guide)

Community Company and local subscriptions

A community Interest company (CIC) is one owned and primarily paid for by the residents in the community, and which cannot be sold on to a commercial enterprise.

https://www.gov.uk/government/organisations/office-of-the-regulator-of-community-interest-companies

CICs are limited companies which operate to provide a benefit to the community they serve. They are not strictly 'not for profit', and CICs can, and do, deliver returns to investors. However, the purpose of CIC is primarily one of community benefit rather than private profit. Whilst returns to investors are permitted, these must be balanced and reasonable, to encourage investment in the social enterprise sector whilst ensuring true community benefit is always at the heart of any CIC

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/480471/12-1333-community-interest-companies-guidance-chapter-1-introduction.pdf

(The author is talking to a contact within Todmorden with greater knowledge of the various funding routes including the EU, and will update accordingly)

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<u>Options going forward</u>

Do Nothing – wait for BT and BDUK to provide a solution.

This is the lowest risk solution and would depend upon BT either providing a commercial fibre solution to the parish or with BDUK paying for one in the Phase 3 of their plan but this might not happen to 2018.

Push for Satellite Services in the Community

Satellite may not be the fastest solution, but it is ready now. This may be an interim solution for a number of users without services, but other more flexible options exist.

Invite a commercial company in to connect the parish to the Superfast Highway

This offers the next lowest risk. One such route could be to pay for BT Openreach to connect fibre up to the parish as previously mentioned.

In addition firms such as AB Internet could offer a solution based upon a set number of parishioners signing up. They would provide all of the equipment, but they would also expect to make a profit from the arrangement, which is understandable.

However there would be no speed guarantees, nor agreed coverage, which would most likely be in the most dense population areas. However with a wireless based solution, coverage would be quite good, and with any service offering over a 10 Mbps download service, it would most likely be a very positive outcome for all. A Lot of commercial Wi-Fi/WiMax solutions do offer faster download rates than that, but most also have caps on data, and the decision to deploy would be based upon their criteria, and not the parishes.

Set up a community company to provide a local service

A community company, owned and run by the community is often best placed to work out the needs of the communities it serves, and to deliver accordingly. It requires active participation, and a financial commitment too, though this isn't necessarily large. Specialist technical support can be brought in, but the active participation of the members, and employing local resources, is a proven method to keep both setup, and on-going, costs down and to also allow "profits" to be re-cycled back into the company and to expand out the service to more sparsely populated areas, to increase services, or to keep costs down.

Community services can also be imaginative. They can connect across a number of different communities, provide access to the emergency services, so that, for example, the police could run a mobile police station from the village or mountain rescue could communicate further. They could get local bus companies involved showing when buses are due in real time, or provide capability for the NHS to provide "electronic medicine" services remote, or monitor patients who have difficulty travelling. In fact, what the community wishes to do, is up to the communities involved.

> **Options within a community company**
>
> Invite a commercial company in as item 2, but set out the requirements and manage the funding.
>
> Pay BT to connect the fibre optic cable to the parish out of community funds
>
> Develop a solution for the parish and use parish and local resources to roll it out

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Improving support

One additional point is getting political support both locally and regionally. This can be aided by showing that the solution proposed can serve more than once community, and that in fact it can help meet the shortfall in broadband provision for many rather than few.

From the authors own knowledge, the communities of Lumbutts, Mankinholes, Harvelin Park, and even part of Todmorden and Walsden could benefit from improved broadband access, and many more communities exist who have been marginalised in the current BDUK rollout. More members would give access to greater funds and skills, and also provide greater pressure on our political representatives to support their constituents.

It also makes any solution more attractive financially, as the Government is keen to see value for money in Rural Broadband initiatives and parliamentary committees have felt that this has not always been the case.

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