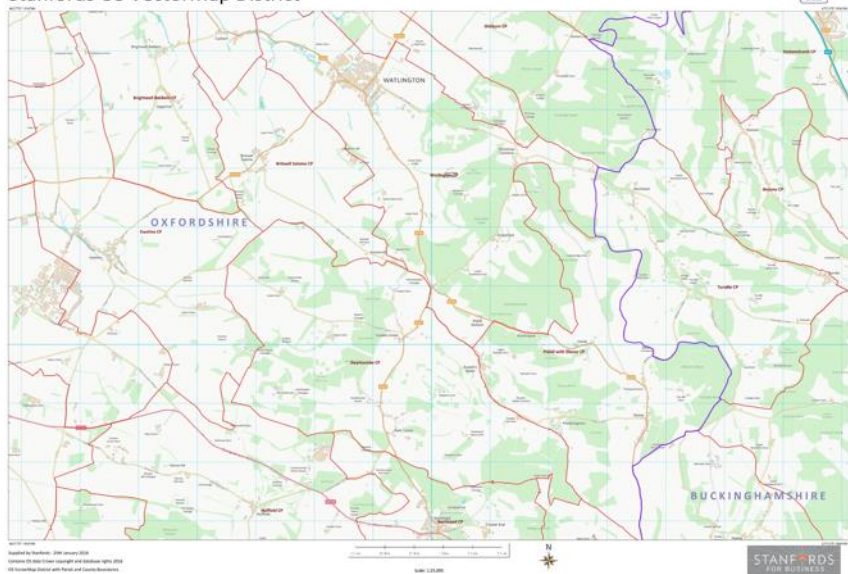




1. **Background and evidence for Culture Media and Sport Select Committee visit to South Chilterns on 11 February 2016.**
2. Connect8 is a campaign to bring modern broadband to the South of the Chiltern escarpment. We have about 300 subscribers, five to ten of us meet in a pub every few weeks, Peter Richardson and William Perrin are the lead volunteers. Connect8 is technology neutral and politically non-aligned, we have excellent support from our elected representatives. Our approach has been to channel local people's frustration at the current provision into finding a constructive alternative solution.
3. Connect8 seeks to implement a proposal to deliver 25Mb/s broadband by 5Ghz radio from a local altnet Village Networks. Alongside this, we are pleased to see BT Openreach and Oxfordshire County Council BDUK in the last few weeks unveil surprise proposals for DSL in our area.
4. **The Connect8 Area**

Stanfords OS VectorMap District



5. There is a larger map at the Annex. The South end of the Chiltern escarpment and AONB, 13 miles from Oxford, 25 miles from Heathrow comprises the Connect8 area. The escarpment rises abruptly 100 metres from the Oxford plain and then descends to the East through steep valleys over four miles to the Thames floodplain at Henley. This hilly terrain exposed to high winds is more reminiscent of the Dartmoor foothills than the Home Counties. The campaign area runs from near Watlington and Britwell Salome in the North, to Turville Heath in the East, Park Corner and Nuffield in the south and Swyncombe Parish in the West. We have interest from other areas.
6. There about 400 houses in the Connect8 area, scattered though small villages and tiny hamlets or isolated in the countryside. The population density is low, house prices high. Inhabitants are relatively prosperous, with a high proportion of people who work in the service sector or have retired. Rural businesses range from the ultra-modern vineyard at Pishill to a very large poultry farm at Britwell Hill, a large Christmas tree farm at Greenfield, several pubs as well as livestock grazing and, on the flattish bits some arable. The extremely rural character and proximity to London makes the area popular for filming – Chitty, Chitty, Bang-Bang, The Vicar of Dibley and Brad Pitt's Fury were all filmed in the area.
7. Connect8 covers at least 8 parishes but with interest from two more.

## **8. Existing telecoms**

9. Broadband is poor and for some houses non-existent. We have at least one person running a small business from home who still uses a dial up modem (at 56kb/s) with monthly charges over £300 (see case study). Another has had his money back from BT who have given up on his DSL. A further person has had her complaints formally closed off by BT as unresolvable. One local businessman estimates that lack of decent broadband costs him £4,000 a year. Many of our subscribers report speed of around 0.5-1.0 Mb/s with generally unreliable connections. Some have tried satellite but are frustrated by its limitations. In general people in the Connect8 area struggle with those aspects of modern life that require online social, economic, educational, administrative connection. It was this impact on modern lives that motivated us to set up the campaign.
10. The Select Committee will be familiar with such stories from other areas but we attach several case studies supplied by local people in their own words about the impact on their business and family lives.
11. Land line, mobile phones and broadband are a nightmare in this area. Our activists consistently complain of poor quality voice lines with hisses, cross talk and low volumes. Especially when it rains. Distance from the exchange are heroic – up to 7,500 metres.

Overhead lines take a battering from the high winds, wearing away their insulation leading to water penetration and faults. This rural dilapidation increases resistance in the phone lines, causing increased signal attenuation or weakening and reduces the distance over which a given broadband signal can carry. Under investment in local infrastructure has left at least one of the green cabinets full with no available pairs.

12. The weakness of the existing infrastructure was an important factor in driving Connect8 to a radio solution that bypassed local copper. Residents and businesses find it almost impossible to buy modern telecoms services over this infrastructure – for instance BT Openreach quoted one resident £54,000 for a leased fibre to the premises that would only deliver 10 Mb/s.
13. The whole of the Stonor Valley is a recognised mobile not spot – the valley was due to get a mast under the Mobile Infrastructure Project, before that was cancelled. Mobile coverage across the Connect8 area is poor to non-existent and predominantly 2G with no meaningful data service.
14. A few houses, mainly on an edge of the escarpment have managed to find a 4G or 3G signal from several miles away with the aid of a simple external antenna connected to a 4G router. This can deliver very good results (17Mb/s down, 10 ms ping), but has low data caps making it expensive and only available to those who happen to be in the right place.
15. Connect8 covers the fringes of three telephone exchange areas spread across eight parishes and two counties. The Nettlebed and Watlington exchanges are modern, Turville (in Buckinghamshire but serving some of our Oxfordshire patch) is very small with no LLU services. BT has strict rules about not moving connections between exchange areas. So any solution we seek with BT has to be done three times over, once for each exchange area.
16. In the analogue era several large radio masts were built on the escarpment either to overcome the ridge topography blocking communications from London to military bases in the West or to cover the plains around. The large pair of masts owned by Thames Valley Police at Britwell Hill are of interest to Connect8 for the Village Networks radio solution.

#### **17. Public subsidy for broadband 2013-late 2015**

18. Until very recently 90% of the Connect8 area did not feature in the BDUK Oxfordshire County Council plans for superfast. Local politicians made it clear at meetings that our area was 'not a priority' (prosperous, low population density). We much preferred this candour to being strung along. All we stood to get from BDUK OCC was a faint chance that one cabinet in Christmas Common (Watlington Cabinet 2), in reach of fifty properties for superfast could perhaps have been in Phase 2. BDUK OCC were helpful to us but confirmed what we knew – this area was difficult and expensive to serve and wasn't a priority.

19. We lobbied our local councillors, our MP and Ed Vaizey MP the Minister. They were all very helpful. Mr Vaizey, who came to a community meeting organised by John Howell MP put us in contact with Bill Murphy at BT and his office have been helpful in providing Whitehall contacts.

## **20. Engagement with BT**

21. We observed that the very long local line lengths and weak signals due to rural dilapidation would require very substantial investment from BT, repeated three times across our exchange areas. Connect8 activists spoke with BT at varying levels of seniority from contact centres through senior planners and senior regional 'partnership directors' to Bill Murphy. We found this a confusing process. On and off the record contacts made it clear that there was not enough money available and we weren't regarded as a high enough priority by OCC BDUK. And that the new technologies such as remote nodes etc would also be rationed according to budget and priority and we would lose out there too. There was also no willingness to tackle rural dilapidation issues. One senior manager said to us 'You need to make a political fuss'.
22. We tried to buy consultancy services from BT Openreach's consultancy arm, (ie paying their planners to come and advise us). Many of us in Connect8 are well used to buying consultancy, but found it impossible to do so from BT Openreach. BT mentioned 'community funded' schemes where money is raised by a village to buy a DSLAM cabinet and some wiring, but these were clearly expensive at c. £40,000 each. And we would have to do that at least three times, once for each exchange area even if our lines were up to it. BT was clear that radio-based solutions for distribution to the home had failed their own internal costings when compared to using existing infrastructure with its sunk costs.
23. Overall, until very recently Connect8 was politely, if chaotically managed by BT but given no credible hope of a BT solution even if we could come up with the money.

## **24. Alternative network proposal**

25. In 2014 even a cursory look at our local situation, basic contacts with BT and BDUK suggested that they would not provide a solution. As a senior BT manager said to us recently 'I understand entirely why you are where you are' (with a competing infrastructure solution).
26. In 2014 it was becoming clear that there wasn't enough OCC money to subsidise BT to bring DSL to our communities. And BT solutions were expensive and unlikely to work at the £40,000 x 3 level if we raised money ourselves. Against this background we set up Connect8 in Autumn 2014 to bring broadband to eight parishes. We sought an alternative approach, but did not feel that we had the capacity nor skills to deliver our own 'fibre to the home' project along the lines of the remarkable B4RN in Lancashire.

27. Instead we found two wireless broadband providers within 15 miles and have worked up a proposal with Village Networks. Village Networks supply wireless broadband to the nearby Hambleden Valley and other communities near Aylesbury. The core of a wireless solution requires a mast to transmit from and a high capacity connection from that mast to the internet, known as backhaul. Each house needs a small aerial the size of a side plate in a dinner service and line of sight to the transmitting mast. This would supply 25Mb/s at a cost of £30 a month. VN drew up a range of financing options for connect8 involving us raising the money to cover capital costs and underwriting the first year's backhaul costs. Local soundings of the Big Lottery and offers of support from the council suggest that we could raise the money easily – it costs much less than extending or rebuilding a village hall. About £14,00 plus VAT for the initial build costs and underwriting up to £20,00 per annum in backhaul fees in case subscriber numbers do not materialise. The full proposal can be found at <http://connect8.org/2016/01/11/happy-new-year-from-connect8/>

## **28. Delivering the Village Networks proposal**

29. VN selected the police masts on Britwell Hill as a likely transmission point (see Annex). I consulted Cabinet Office following their publication 'Telecommunications and digital infrastructure maps: March 2015' about reusing public sector assets for broadband and they confirmed that community use of police masts was the sort of thing that they had in mind. Our District Councillor and the Police and Crime Commissioner have supported us in accessing the police masts.

30. Whilst we have had some goodwill from Thames Valley Police, this has not translated into practical work to enable us to deploy on the masts. We have been stuck for over three months in what should be a quick and simple process of informal frequency use planning in this unlicensed 5Ghz spectrum, with no access to police technicians. We would like Village Network technicians to speak direct to police technicians but this hasn't been possible. This is critically delaying our deployment and causing us some frustration.

31. Backhaul has been difficult – see Annex – there is no commercial fibre in our patch to use for backhaul. We are working slowly with nearby RAF Benson to see if we can use any of their higher bandwidth government services for backhaul, relayed to the masts by radio. Otherwise we shall just buy several BT lines in a house near a Superfast cabinet on the plain and send that by radio – it's sub optimal but would work.

32. The coverage map for phase one from Britwell Hill is at the Annex. Phase two would follow quickly afterwards with a simple repeater to send the signal back up the Stonor Valley which is in the radio shadow of the escarpment edge.

## **33. BDUK funds suddenly become available for Connect8 in Phase2**

34. We have recently been pleasantly surprised to learn that efficiencies in OCC/BDUK Phase1 and now planned into Phase 2 have made funds available for the Connect8 area. BT assumes that it will be possible to connect about 70% of the properties across our postcodes

with expenditure of up to £1,100 each. Deployment is primarily using DSL with many new cabinets and much infrastructure upgrading required. Surveying and detailed planning is now taking place, with planning notices already coming through for the first new cabinets.

35. We met with a BT Partnerships Director and the contract manager for OCC and Rutland who ran through some of the detail. It was clear that there are huge caveats to the 70% target. These caveats are an intrinsic part of planning for deployment in an area that suffers from rural telecoms dilapidation. Some hamlets will miss out completely even if BT can hit 70%. BT's 'community funded' solutions that they might deploy for the last 30% are very expensive compared to Village Networks, about three times the cost.

36. We have invited BT to present to the Connect8 communities in June when they say the detailed planning will be complete.

### **37. Connect8 Current plans**

38. We shall (subject to contract) continue to develop and implement the Village Networks proposal. It is low cost, low risk, flexible and almost instant. It is easier to work with a small company than with BT. The BT Openreach BDUK roll out is most welcome but at present contains too many, legitimate uncertainties for us to rely upon it. The low costs of the VN proposal continue to make it viable and there will be many customers who might prefer a more human, local service than one from BT.

### **39. Observations for the Committee**

40. Rural people suffer real economic and social disadvantage from the current broadband situation. For Connect8 a combination of strong communication, local activism, people with time and skills to give, political support and importantly a credible competing network proposal has led to a transformation in our local broadband prospects. But we aren't there yet, it's only prospects. We shall not rest until everyone locally can actually get modern broadband in their home or business.

41. Rural users need good upload speeds and responsive ping/latency times as our case studies show. Satellite doesn't provide this and can never do unless the speed of light suddenly increases. 4G can help but isn't widely available. As internet consumption moves overwhelmingly to mobile phones the rural not spots like the Stonor Valley still need plugging.

42. Information has been a huge problem for us in devising an approach. Any regular citizen starting a community broadband campaign faces a massive information deficit in the following areas:

- a. Technology – what are the options other than waiting for BT/BDUK? What companies should you ring up?
  - b. Roll out – the BDUK scheme is impenetrable, this causes frustration and uncertainty and makes planning around it very hard.
  - c. Who to talk to – community groups face a glass wall at telecoms companies. Unless you have private connections you can't get beyond the contact centre.
  - d. Government infrastructure – the Cabinet Office makes the right noises but its work is obscure and the practicalities of actually using public assets and networks are vastly complex.
  - e. Existing telecoms infrastructure – you need to know this for backhaul, it's very hard to find out what is where
  - f. Postcodes – BDUK works on post codes not places. BT works on post codes and phone numbers. It isn't possible to get a map of all post codes in a given area without paying for it (Stanfords provide a good service). This causes huge confusion when you are trying to mount an area based campaign and its easy to miss some out.
43. Rural dilapidation of phone lines in the remote fringes of the network doesn't seem to be fully understood by planners. The rural network is clapped out and over capacity. This significantly decreases the distance a broadband signal will travel, especially a VDSL one. It's like trying to get a formula one car down a cart track.
44. Rolling out a simple radio network serving hundreds of homes is well within the competence of an SME, at a fraction of the cost of a wired service, but the small 'altnets' need to be taken seriously by BDUK. We get the sense that BDUK and BT Openreach think this a big boys' game.
45. Boundary issues will become more important – the last few percent will by definition be at the edges of their exchange (and subsidy) areas. BT's policy of not crossing exchange areas is very odd and needs examination or it could lead to a huge waste of money.

William Perrin  
Connect8  
5 February 2016  
william@cankfarm.com



[illegible]





## **Annex – Transmission and Backhaul**

### **Transmission**

Village Networks considered several masts for Connect8 transmission

**Stokenchurch Tower** – a colossal 120m structure on the M40 part of the 1950s civil defence ‘backbone’ network designed to resist nuclear attack, owned by BT. Insufficient line of sight into the valleys, unclear how we could access it without large fees. Might be able to provide backhaul to other masts though.

**(former) USAF Christmas Common** – part of the nuclear firing chain relaying signals to the nuclear bases such as RAF Uppper Heyford, Greenham Common etc. Massively fortified structure. Now retired and bought by neighbouring landowner who plans to turn it into a house. Excellent visibility into valleys. Enquired of NSA at RAF Croughton re backhaul, no reply as expected. Power supply uncertain. Could not reach agreement with landowner.

**Thames Valley Police Masts at Britwell Hill** – 50 metre pair of masts for emergency services originally built in the 1950s, replaced in the 1980s. Now providing Airwave and ee 2G signals with microwave backhaul. TVP own the masts and their site. Excellent power supply etc, but no wired backhaul. Good visibility into valleys. Unexplained difficulty agreeing frequencies with TVP.

**Pye Telecommunications Mast – Christmas Common** – an early experimental microwave relay tower from 1960s, now operated by Arqiva as a mobile phone mast with microwave backhaul. c25m high. Reasonable visibility into some valleys.

### **Backhaul**

The transmission system has to have a good link to the internet known as backhaul. In an isolated area such as Connect8 this is in short supply. It has been very hard to track something down.

We could not find any ‘commercial’ fibre within reach of us. This always surprises telecoms engineers who presume that ‘there is always some somewhere’.

Mobile masts – all the local mobile masts are fed by microwave backhaul and are in general 2G only.

Public sector – we don’t have as school or doctors surgery upon which to piggy back. We have located a school about five miles away with line of sight to the masts that might have fibre, but it’s hard to establish and difficult to connect to the education network.

Police – backhaul for Airwave on the TVP masts at Britwell Hill was an old kilostream circuit, now transited we think to microwave.

Military – American – we did think that there would have been fibre to USAF Christmas Common but we have no way of knowing. A letter to the nearby NSA base at RAF Croughton that would have connected directly to the mast yielded no response, perhaps unsurprisingly.

Military – British – RAF Benson is about four miles away with line of sight to the Britwell Hill masts, making several 5Ghz circuits possible for backhaul by radio. With DCMS, Cabinet Office and MOD support we have a dialogue with the base services at Benson and MOD, but things progress slowly.

## **Annex Case Studies – provided by local people**

### **1. Humphrey Cobbold**

To Whom it May Concern

Re: Provision of Broadband to Russells Water and the surrounding area

My family and I have been part time residents of Russells Water since May 2014. I run a fast growing and successful business, my wife is the former CEO of the Portland Trust and my children are in secondary or university education.

I am a subscriber to BT Broadband and buy the best package available. However, the current provision of broadband in the Russells Water area is all but unworkable for any normal work. The base speed is poor – rarely timed at over 1MB and usually much slower. All too frequently during the base speeds drop to a snails pace (presumably due to contention) and this makes usage even for basic email and the like quite haphazard. Downloading files or making skype calls often not possible and general media streaming or higher bandwidth applications is rarely if ever possible.

This means that we are virtually unable to work at the house. My children are not able to study effectively – which is a real problem given so much work is now sent and executed online. My wife and I have to travel (usually to London) to be able to complete even basic work tasks. This contributes to congestion and pollution as we travel rather than work when we can from home.

I am entirely supportive of the work being undertaken by Peter Richardson and others to solve this problem. Indeed, I have offered to support these efforts financially if necessary to accelerate the delivery and distribution of a viable service to the people of this small but vibrant rural community.

It seems to me that there is a de facto discrimination against people in rural communities such as ours by the infrastructure providers (especially BT Openreach?) and a manifest failure by the government to ensure that such discrimination is not allowed. I cannot believe that this situation would be tolerated in city communities and I do not see why it should be 'allowed' in Oxfordshire. We are told that the area may be linked up by the end of 2017 – but such commitments are hard to believe with any confidence.

This problem needs to be solved here and elsewhere as soon as possible so please can we seek support and progress as soon as possible.

Humphrey Cobbold

Russells Water, Nr Henley on Thames, RG9 6EU

## 1. Beverley Davison: Case History

My husband John James and I moved to Pishill in the Summer of 1989. We were attracted to this area because of its outstanding beauty, and it being not too far from London or both of our families. My work performing a one woman show around the world upon cruise ships also meant that we are in striking distance of London Heathrow.

At the time that we moved the mobile signal was poor and still is and the only way of achieving any mobile signal at all is to go outside and drape myself over the bonnet of the car! Then, of course came the beginning of getting a decent land line call quality through BT which took over three years and endless visits to sort out as we are nine miles from the nearest telephone exchange. It's still not right now seventeen years later with difficulty on hearing a voice at a reasonable volume.

I started working with my show on cruise ships twelve years ago and I of course needed to be able to use the internet. For twelve years now we have been only able to use an excruciatingly slow dial-up from our home. Several years ago, a neighbour suggested we try BT Broadband and we signed up for an eighteen month broadband service. This was worse than useless, a paid service with no service, with only a tantalising and all too brief two minute spluttering into life at 2.30 a.m. for a few nights and then be plunged back again into cyber darkness. It meant I would have to stay awake all night to get just a few short rides on the merry-go-round. We got contractually stuck in having to pay the full eighteen month contract having paid initially for the service. A mobile dongle won't work as the signal is too weak.

Because of the work I do it makes it impossible to deal with anything other than an email. Documents, contracts that are mandatory to being able to board ships, Visas, flight tickets, viewing websites, absolutely everything to do with my work depends on the internet connection. The cruise business is a very fast business and I am emailed for work opportunities. If I don't respond quickly I can lose out on the offer as the fixers can move on, with the obvious consequences of potential loss of work.

It's embarrassing for me to have to explain to the offices I work through that I can't perform ANY of these procedures and I have to ask them all yet again to help me receive vital information. Sometimes just a normal short email without attachments can take minutes to download. My work also involves receiving musical arrangements, searching for backing tracks, not able to download backing tracks. I can't even download the demo clips as it would take forever, so it has had the effect of dangerously impeding the forward thrust of my career and can push me away from the facilities other colleagues have at their fingertips. It's often quite humiliating trying yet again to explain my situation.

In order for me to achieve a proper connection I have a ten mile round trip to Henley with my heavy laptop and no printer!! This has been a considerable cost in travelling, and my precious time, back and forth to Henley and untold amounts of coffee expenditure in Starbucks in order to get an internet connection! Plus no printing facilities. You can go to Henley library for an hour's use but I usually have work that far exceeds that time premise.

We have just received our phone bill to cover the last quarter. It amounts to £317.73. This is ridiculous as we hardly make any phone calls at all and haven't done so for many years now. My husband doesn't use the computer at all and uses the phone very little. The £317.73 is ninety five percent all the internet related charges. BT charges us for every connection we make. I am away on and off for several months of the year and only use it on the occasions when I am home so it's a massively expensive bill every 3 months. I have tried a number of times to get help but end up routed

to India and find it very difficult to understand what they are actually saying, so it's extremely frustrating. I don't know how I can continue with this and also find the strength to try and get it sorted. I kept on hoping that we would get a connection and sort it out then but it's been years in coming despite all the promises. So BT gets a big fat zero out of ten!!

If we wanted to move,(we don't because it is such a beautiful place to live), it would obviously have a considerable downside affect on our house price .Most families wouldn't be interested with no internet connection and for the following reasons:

At this time we also have virtually no radio signal here at all.

We have almost no mobile signal. Very variable up to 2 bars and drops out.

We have no Television signal at all.

No internet, so basically we could be living deep in the Amazon jungle with virtually no outside connection.

As for leisure use,it means I can't order anything. It would be a dream to be able to download or stream films, or books, organise holidays or flights or visit any website at all. I won't bore you with the list I could write! But as you can understand it would be a very very long one!

I know the internet connection and other communications are a great source of constant frustration for many people in the vicinity but I honestly think we get the prize for being the worst scenario of all.I am immensely frustrated and feel very isolated, and have done so for many years with a constant an uphill battle in front of me.

It's very heart warming to know that there are other people out there with battles to get a service and it's good to know that collectively Connect8 are trying their utmost to get the internet properly installed here in the countryside.

Thank you for your time and attention with our case history.

Beverley and John James

Beverley Davison

info@classicalcabaret.com

Pishill

Henley on Thames

Oxfordshire

RG9 6HJ

## 2. Ian Beecher Jones

Hello my name is Ian Beecher-Jones, 45 and live in Russells Water. I have my own business, it is a precision farming company which involves helping farmers around the world become more efficient in the production of food.

My business is based at home and I try to communicate with farmers in the UK, Australia, New Zealand, South Africa and North America. My work involves helping farmers make the best of data collected on combine harvesters and then convert the information they have it to maps that allows them to spread fertilisers and plant seeds more accurately across their fields. This results in increased performance and reduces the waste created from over use of fertilisers and crop protection products.

My job involves connecting to the farmers computer over the internet to ensure I can give them the correct advise and support with the problem they have. As a lot of work is in Australia and New Zealand my working day will start at 2 or 3 am to meet customer demand.

At that time of day I can just about connect my computer to their over the internet, but the opportunity of using Skype or other Voip technologies is not possible. Once it gets past 7am in the morning the quality gets noticeably poorer and then job becomes harder and I become much more inefficient.

Working with Customers in the UK is even more challenging as I'm working when the broadband usage is at its highest in the UK, therefore I have greater challenges working in my home country than I do overseas.

I had the opportunity of working in Switzerland over the Christmas & New Year period where I was 1500m up a mountain doing my work with a broadband speed of 10mbps per second. It was amazing, I had a whole new experience of working with high speed broadband.

I was able to Skype, Video conference and provide a much better service to customers with a guaranteed 10mbps let alone 20, 30 or 40mbps. All I could think of was what I could do to grow my business if I had speeds like that back at home. I had to reinstall the OS on my macbook air last week, it was a total of 21 hours to download it....

I also provide customers with training videos to help them self learn and remind them how to carry out tasks on the computer for themselves. I create the videos, post them on to my website making them available for farmers anywhere in the world. The file size can be anything up to 100mb a time.

They are streamed to the customer on an on demand service and the compression allows for a slower connection to view them. When I create my videos I have to go and search for a location where I can upload the videos as they can take many hours to upload with the upload speed we have. A faster upload speed would enable me to create more higher quality videos for my farmers and many more to meet customer demand.

I estimate that slow broadband speed would cost me about £4000 in extra costs, overseas calls via a conventional phone line rather than Skype, lost productivity as I have to wait many hours for customer's data to download when they have a problem they would like me to check.

I was inspired, fired up and extremely enthusiastic in Switzerland when I had a faster connection speed and I only hope that I can have that same experience in Russells Water if we were able to have the same connection speeds.

I look forward to the day when the connection speed I have is faster than farmers in the middle of the outback in Australia. They are massively surprised when I tell them the connection speeds I have.

[ENDS]