

Superfast Broadband Performance in Ewhurst, Surrey

A short paper by Walter Willcox and David Cooper that presents superfast broadband speeds measured in Ewhurst to assist other similar areas to determine the broadband speeds that they are likely to receive from the SCC Superfast Surrey project.

Version Control

Issue 1	6th July 2013	First Issue
Issue 2	30th July 2013	Includes significant data on numbers unable to access FTTC services. Reformatted to emphasise conclusions.

1. Summary

Villages and rural communities should take heed and be forewarned of incomplete coverage and poor broadband performance. This is illustrated in this paper for premises in Ewhurst, Surrey that have been connected to BT's "Superfast" infrastructure. The detailed data on which this warning is based are presented in Appendix 1 to this brief note.

Appendix 2 describes some of the frustrations when dealing with BT to correct under-performing installations. Appendix 3 contains biographies of the authors.

The conclusion for Ewhurst is that an estimated 226 households are at such a distance that they will not be able to access greater than 24Mbps, the Government defined superfast minimum. This total of 226 equates to approximately 24% of premises (942) in Ewhurst. Further, this is 63% of the likely installed capacity (356) for superfast broadband in cabinets 18, 19 and 20. An even higher percentage cannot achieve the European Community requirement of 30Mbps.

Of the 226 households, it is estimated there are 69 premises, including a number with multiple occupancies, where BT's Fibre-To-The-Cabinet infrastructure is incapable of providing any service at all. 34 of the 69 are connected to cabinet 6, which provides telephone lines to Ewhurst premises but from which no household can access a broadband service via the new fibre connection to the cabinet, probably due to cable quality and length.

2. Surrey County Council and UK Targets - Discussion

In the opinion of the authors the Ewhurst data shows that the solution currently being publicly funded in other parts of Surrey will fall far short of the Surrey County Council target to provide "superfast" broadband access to more than 99% of premises. The whole solution is totally unsuitable for those businesses requiring a symmetric speed (the same for upload and download) service necessary for cloud computing, virtual private networks, video conferencing etc.

The BT solution in Ewhurst is the same design as that being joint-funded by SCC / DCMS and BT to upgrade the remainder of Surrey. Note that Ewhurst contains a dense central area of dwellings together with sparse outliers and so is a good typical existing Fibre-To-The-Cabinet deployment. The Ewhurst experience shows that the BT solution is inadequate in quantity and quality as well as lacking a sustainable long term development option. Since Ewhurst is not unique, the BT solution cannot solve Surrey's and the UK's difficulties. The BT deployment provides an alternative to the superior co-axial cable solution that Virgin Media offer in urban areas, but is quite inappropriate in rural areas where there is no appreciable competition from VM or others.

Given that our findings are at significant variance from the BT estimates, we believe, as do the Public Accounts Committee¹, that it is time that BT and local authorities publish the complete performance data set with a far more accurate prediction of the size of the failure areas and numbers to verify how the contracts will be met. BT has access to complete performance data from every “superfast” modem which is not normally available to the end users.

Ewhurst is a small village where a community broadband project was approved for EU grant funding at the end of 2010 by the South East England Development agency, SEEDA. However, after the formal grant announcement and despite having not tendered against the Ewhurst specification, BT delayed progress and finally announced that they would cover Ewhurst, which is served from the Cranleigh exchange, as part of their commercial superfast broadband investment to upgrade Cranleigh. The community project would have seen the deployment of a far superior solution to that now deployed by BT². There is no commitment from BT to provide a solution to those premises not enjoying “superfast” speed, whereas the community project included a full new fibre backbone with plans to extend fibre to premises. Such a backbone is almost entirely missing from the BT solution and it is unlikely that any other provider will now step in to fill in the gaps left by BT. Also, so far as the EU state aid rules are concerned, as BT have partially “covered” Ewhurst by their commercial solution, the area does not qualify for any state funding to improve the situation.

There can be little doubt that a full Fibre-To-The-Premises solution is the only satisfactory medium term solution which is already demonstrated in the successful Broadband for the Rural North project (www.b4rn.org.uk). This solution provides the capability of a universal 1000 Mbps symmetric point-to-point fibre service to every property in the rural Lancashire area regardless of line distance.

The Ewhurst sample data shows that some within a short distance of the green street cabinets obtain an asymmetric (upload speed is sacrificed to give a faster download speed) service suitable for domestic use, but those further away suffer much slower speeds. There is no defined mechanism to provide an adequate remedial solution, nor can other communications providers hope to cover the myriad small areas where BT fails; i.e. the infamous "10%" of premises estimated to fall outside current publicly funded projects consist mainly of very large numbers of tiny enclaves which can't possibly be covered by the current solution. In contrast B4RN are installing the whole distribution infrastructure for every house now, whether or not residents opt for the connection immediately.

Furthermore, where BT has supplied equipment the maximum capacity is quite insufficient for every property, let alone for those with multiple lines / occupants in the same building. BT's future deployment of "Fibre-on-Demand", even if it is enabled in Ewhurst, does not seem practical since the fibre backbone in the village is missing and the fibre aggregation point is some distance from the village centre. Even if it were practical, the high cost, in thousands of pounds each, will prohibit individuals and small businesses alike, nor can it provide a viable solution for the enclaves.

¹ <http://www.publications.parliament.uk/pa/cm201314/cmselect/cmpubacc/uc474-i/uc47401.htm>

² The community project specified a capacity of 500 services in each cabinet. BT has only installed 356 services in three cabinets to date. Even this has required repeat road work after the initial installation to enhance cable and equipment capacity.

Appendix 1 – Sample Data

The data in Table 1 is that measured for existing “superfast” installations. There are a total of 87 speed measurements in the sample data each representing a household in Ewhurst where a broadband service delivered via the new Fibre to the Cabinet service has been taken. The data also includes 69 premises where a FTTC service cannot be provided because of distance and/or line quality. The estimated 69 premises with no FTTC access are derived from the online BT Wholesale Broadband Availability Checker³ and post code data. The entries in bold type have a speed limited to 40 Mbps since they have elected for the “up to 40 Mbps” tariff. Similarly there are four known services which might exceed 80 Mbps if such an option were available.

Table 2 orders the data to provide the numbers of properties in the sample that cannot access greater than 15, 24 and 30 Mbps.

Table 3 shows the speed data ordered by distance and is also plotted on a scatter graph.

24 Mbps Target

Extrapolation of the sample data and those without service gives an estimated 226 households (see table below) that will not be able to access greater than 24Mbps.

Ewhurst Locality	Number of premises with less than 24 Mbps access
Lower Barhatch	6
Upper Barhatch & Horseblock	36
Ride Way, The Warren, Moon Hall, Peaslake Roads	45
Coneyhurst Lane part	24
Holmbury Road area	30
North Breache	20
Horsham Lane	28
Somersbury Lane	19
Slythurst	8
Wykehurst Lane	10
Total accessing less than 24 Mbps	226

The total of 226 equates to approximately 24% of premises (942) in Ewhurst according to Post Office postcode data. Further, this is 63% of the likely installed capacity (356) for superfast broadband. Of the 226 households, it is estimated that 69 will not be able to access any service over the new fibre to the cabinet infrastructure. 34 of the 69 are connected to cabinet 6, which provides telephone lines to Ewhurst premises but from which no household can access a FTTC broadband service, probably due to cable quality and length.

Due to varying line quality there is a spread of performance figures over line distance, but any service of more than 1000 metres is at risk of missing the 24 Mbps target over the lifetime of FTTC. Prudent engineering therefore suggests 1000 metres (1km) is a reasonable maximum line distance to meet the current Government target, let alone faster ones in the future. See the scatter graph below on page 11.

³ BT Wholesale Broadband Availability Checker - <https://www.btwholesale.com/includes/ads/main.htm>

Table 1 Raw Data for Ewhurst			
Cabinet	Post Code	Est. Road Dist metres	Downstream sync speed
20	GU6 7NR	-	No FTTC
20	GU6 7NR	-	No FTTC
20	GU6 7NR	-	No FTTC
20	GU6 7NR	-	No FTTC
20	GU6 7NR	-	No FTTC
20	GU6 7NS	-	No FTTC
20	RH5 6NU	-	No FTTC
20	RH5 6NU	-	No FTTC
20	RH5 6NU	-	No FTTC
20	RH5 6NU	-	No FTTC
20	RH5 6NS	-	No FTTC
20	RH5 6NS	-	No FTTC
20	RH5 6NS	-	No FTTC
20	RH5 6NS	-	No FTTC
20	RH5 6NS	-	No FTTC
20	RH5 6NS	-	No FTTC
20	RH5 6NT	-	No FTTC
20	RH5 6NT	-	No FTTC
20	RH5 6NT	-	No FTTC
20	RH5 6NT	-	No FTTC
20	GU6 7NH	2404	0.56
20	GU6 7NW	2320	3.40
20	GU6 7NW	2320	3.80
20	GU6 7NR	1452	4.43
20	GU6 7NW	2270	4.77
20	GU6 7NP	2146	5.21
20	GU6 7NP	2350	5.95
20	GU6 7NR	2511	6.17
20	GU6 7NR	2340	7.42
20	GU6 7NR	2340	10.00
20	GU6 7NP	1976	12.63
20	GU6 7SJ	2370	12.71
20	GU6 7SJ	2182	12.98
20	GU6 7NP	1942	13.97
20	GU6 7NP	1986	14.52
20	GU6 7NP	1986	14.98
20	GU6 7PN	1530	15.00
20	GU6 7NP	1976	15.00
20	GU6 7PL	1370	15.11
20	GU6 7PL	1210	16.00
20	GU6 7PN	1430	16.70
20	GU6 7PF	1325	16.99
20	GU6 7PF	1493	17.64
20	GU6 7PF	1310	17.79
20	GU6 7NN	1927	18.57
20	GU6 7PF	1320	18.75
20	GU6 7NN	1830	18.77
20	GU6 7NN	1838	19.69

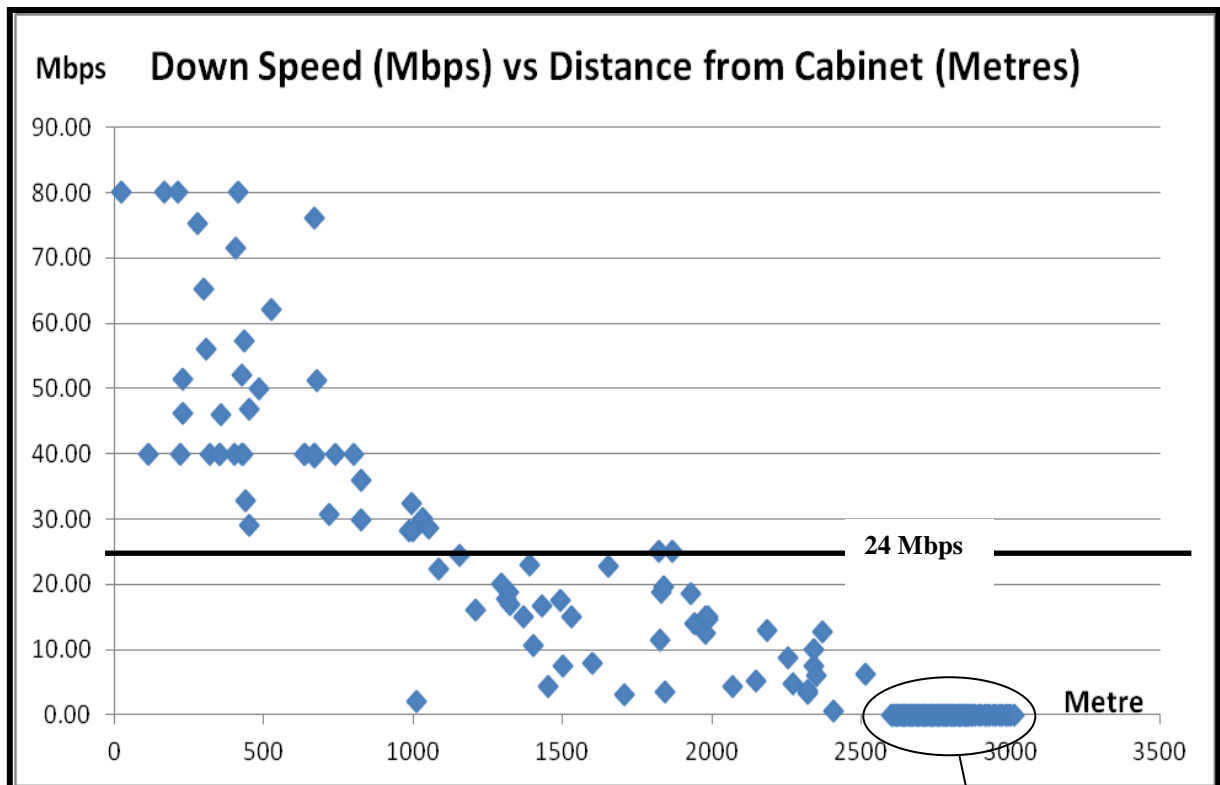
Table 1 Raw Data for Ewhurst			
Cabinet	Post Code	Est. Road Dist metres	Downstream sync speed
20	GU6 7PN	1295	20.16
20	GU6 7PL	1085	22.31
20	GU6 7PF	1390	22.93
20	GU6 7PL	1154	24.54
20	GU6 7NN	1866	25.00
20	GU6 7SJ	1820	25.00
20	GU6 7PJ	986	28.25
20	GU6 7QN	720	30.65
20	GU6 7QF	353	39.99
20	GU6 7QF	219	40.00
20	GU6 7QF	400	40.00
20	GU6 7PB	114	40.00
20	GU6 7QF	355	45.90
20	GU6 7PE	482	50.00
20	GU6 7PQ	426	52.00
20	GU6 7QB	407	71.47
20	GU6 7QD	211	80.00
20	GU6 7PP	2070	4.39

Table 2 – Totals of premises in sample less than 15, 24 and 30 Mbps					
Cabinet No.	Downstream sync speed (Mbps)	Total Count	Less than 15 Mbps	Less than 24 Mbps	Less than 30 Mbps
6	No FTTC Service	34	34	34	34
Cabinet 6 Total		34	34	34	34
18	No FTTC Service	8	8	8	8
	3.08	1	1	1	1
	3.45	1	1	1	1
	7.43	1	1	1	1
	7.95	1	1	1	1
	10.70	1	1	1	1
	11.58	1	1	1	1
	22.69	1	0	1	1
	30.11	1	0	0	0
	40.00	3	0	0	0
	46.20	1	0	0	0
	51.31	1	0	0	0
	51.36	1	0	0	0
	62.09	1	0	0	0
	75.37	1	0	0	0
Cabinet 18 Total		24	14	15	15
19	1.99	1	1	1	1
	28.22	1	0	0	1
	29.01	1	0	0	1
	29.88	1	0	0	1
	32.36	1	0	0	0
	32.72	1	0	0	0
	36.03	1	0	0	0
	39.44	1	0	0	0
	39.99	2	0	0	0
	40.00	4	0	0	0
	46.81	1	0	0	0
	56.04	1	0	0	0
	57.38	1	0	0	0
	65.29	1	0	0	0
	76.19	1	0	0	0
	80.00	3	0	0	0
Cabinet 19 Total		22	1	1	4
20	No FTTC Service	27	27	27	27
	0.56	1	1	1	1
	3.40	1	1	1	1
	3.80	1	1	1	1
	4.43	1	1	1	1
	4.77	1	1	1	1
	5.21	1	1	1	1
	5.95	1	1	1	1
	6.17	1	1	1	1

Table 2 – Totals of premises in sample less than 15, 24 and 30 Mbps					
Cabinet No.	Downstream sync speed (Mbps)	Total Count	Less than 15 Mbps	Less than 24 Mbps	Less than 30 Mbps
	7.42	1	1	1	1
	8.76	1	1	1	1
	10.00	1	1	1	1
	12.63	1	1	1	1
	12.71	1	1	1	1
	12.98	1	1	1	1
	13.97	1	1	1	1
	14.52	1	1	1	1
	14.98	1	1	1	1
	15.00	2	0	2	2
	15.11	1	0	1	1
	16.00	1	0	1	1
	16.70	1	0	1	1
	16.99	1	0	1	1
	17.64	1	0	1	1
	17.79	1	0	1	1
	18.57	1	0	1	1
	18.75	1	0	1	1
	18.77	1	0	1	1
	19.69	1	0	1	1
	20.16	1	0	1	1
	22.31	1	0	1	1
	22.93	1	0	1	1
	24.54	1	0	0	1
	25.00	2	0	0	2
	28.25	1	0	0	1
	28.72	1	0	0	1
	30.65	1	0	0	0
	39.99	1	0	0	0
	40.00	4	0	0	0
	45.90	1	0	0	0
	50.00	1	0	0	0
	52.00	1	0	0	0
	71.47	1	0	0	0
	80.00	1	0	0	0
	4.39	1	1	1	1
Cabinet 20 Total		76	45	60	65
Cabinets 6, 18, 19 and 20 Totals		156	94	110	118

Table 3 Down Speed vs Distance from Cabinet	
Est. Distance (Metres)	Down Speed (Mbps)
25	80.00
114	40.00
168	80.00
211	80.00
219	40.00
227	46.20
227	51.36
278	75.37
300	65.29
306	56.04
320	40.00
353	39.99
354	39.99
355	45.90
400	40.00
407	71.47
416	80.00
426	52.00
428	40.00
430	40.00
433	57.38
440	32.72
450	29.01
452	46.81
482	50.00
524	62.09
635	40.00
635	40.00
670	39.44
670	40.00
670	40.00
670	76.19
679	51.31
720	30.65
740	39.99
802	40.00
825	29.88
825	36.03
986	28.25
995	32.36
1000	28.22
1010	1.99
1030	30.11
1050	28.72

Table 3 Down Speed vs Distance from Cabinet	
Est. Distance (Metres)	Down Speed (Mbps)
1085	22.31
1154	24.54
1210	16.00
1295	20.16
1310	17.79
1320	18.75
1325	16.99
1370	15.11
1390	22.93
1400	10.70
1430	16.70
1452	4.43
1493	17.64
1500	7.43
1530	15.00
1600	7.95
1653	22.69
1705	3.08
1820	25.00
1825	11.58
1830	18.77
1838	19.69
1840	3.45
1866	25.00
1927	18.57
1942	13.97
1976	12.63
1976	15.00
1986	14.52
1986	14.98
2070	4.39
2146	5.21
2182	12.98
2252	8.76
2270	4.77
2320	3.40
2320	3.80
2340	7.42
2340	10.00
2350	5.95
2370	12.71
2404	0.56
2511	6.17
-	No FTTC Access



**Approximately 69
premises with no
Access to FTTC
Services**

Appendix 2 – Difficulties when dealing with BT

1. The BT Wholesale speed estimator “hides” fibre enabled cabinets where it is incapable of providing a VDSL Superfast service. The estimator is often inaccurate as it only calculates back from a DP (Distribution Point) which can have over a kilometre or more of metallic cables to the house. e.g. in one example 19 Mbps is estimated but, once the service is installed and paid for, a speed of less than 1 Mbps results. In another example less than 5 Mbps results.
2. The modem installed by BT in the customer premises is “locked” and does not allow the customer to access full information relating to substandard broadband performance.
3. BT fault finding employs unacceptable procedures by remote under-aware call-centre staff, thus “user- diversion” tactics delay satisfactory remedial works.
4. BT capped speeds do not always recover to correct speeds once a fault is cleared leaving a permanent lower speed cap applied (unless a site visit is achieved, sometimes with great difficulty).
5. Where BT employ subcontractors without a test instrument (JDSU or EXFO) they cannot do a proper final test, so substandard lines are not detected and the Dynamic Line Management equipment reduces the speed after the subcontractor has left the premises. Therefore the customer is lumbered with, at best, a monumental task of discovering what is wrong from a locked modem and then explaining that to the BT customer services line in India. This is a common problem with many wholesale and retail customers of BT not getting the best performance from their Broadband connection. This problem is not limited to Ewhurst with many reports across the country⁴. A recent installation in Ewhurst achieved 40 Mbps but was reduced to a synchronisation speed of 4.43 Mbps two days after installation.

⁴ <http://www.guardian.co.uk/money/2013/jul/27/bt-broadband-two-months-without-service>

Appendix 3 – Author Biographies

Walter Willcox

Now retired after providing telemetry consultancy services to many public utilities including British Nuclear Fuels, Amoco and Esso Pipelines. My last major project was to assist DML at Devonport Royal Dockyard with the procurement specification and factory tests of the telemetry systems for their nuclear submarine facility.

I have been assisting Ewhurst residents, amongst others, since about 2004. This work has included:-

- Fault-finding, improving house wiring and obtaining Broadband services through the better Internet Service Providers.
- Recording samples of speed tests for many broadband services in and around Ewhurst (and elsewhere too).
- In 2009 providing a parliamentary submission for the Select Committee on Broadband Speed Enquiry - Reference becpn47 0809. (... Communications “Rail Crash”)
- Starting the Ewhurst Broadband campaign with the collection of £2,300 for the Ewhurst feasibility study by the then Rutland Telecom.
- Submitting the initial Ewhurst SEEDA RDPE expression of interest document.
- Writing much of the technical aspects for the Ewhurst Fibre-To-The-Cabinet (FTTC) procurement document and providing the technical vendor assessment with members of Ewhurst & Surrey Hills Broadband (ESHB) volunteers.
- Providing much of the technical content for the successful full SEEDA RDPE Grant application.
- Organising an unsecured bridging loan for the whole Grant value of £180,000
- Observing the development of faster broadband services and in particular being associated with the successful Broadband for the Rural North project in Rural Lancashire providing full fibre directly to all premises <http://b4rn.org.uk/>
- Continuing broadband campaigning with data for MPs and the public sector including SCC.

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David C Cooper

A Chartered Engineer with a degree in Communication Engineering and 40 years experience in electronics, computing, telecommunications, power industries, education and economic development. Various engineering leadership posts within the CEGB and its successor, National Grid over a 23 year period finally introducing a modernisation programme to bring computer technology into high voltage substations to facilitate more efficient asset management, which significantly reduced capital and revenue costs.

With the South East Economic Development Agency managed projects that built capacity in the region to improve numeracy, literacy and language skills. Moved on to the SEEDA Broadband and ICT team and have worked on projects to enable broadband in areas with no service and more recently research work to map broadband speeds in the South East. Worked on the broadband agenda at national, regional and local levels and have led work with other RDAs to formulate responses to Ofcom consultations and input to government departments on Digital Britain work.

See :- <http://uk.linkedin.com/pub/david-c-cooper/23/2a9/684>

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