



Department
for Culture
Media & Sport

Broadband Connection Voucher Scheme Impact and Benefits Study

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Executive Summary

1. The Connection Voucher Scheme ran from March 2014 to March 2016. During that time it helped many thousand businesses and third sector organisations reap the benefits of an improved broadband connection, by subsidising the upfront capital costs of getting a connection to their premises. It placed the grant directly in the hands of the small business, avoiding centralised procurements and letting them choose the solution that worked best for them. In April 2015, due to its success, the scheme expanded to 50 cities and their surrounding areas, with £40m of challenge funding.
2. An impact study was carried out and found that the scheme made a big difference to thousands of small businesses, it revealed demand previously not met by the market by allowing groups of organisations to pool their vouchers and it encouraged competition and consumer choice by supporting several hundred suppliers including many smaller suppliers. Key headlines figures are:
 - **42,500 small firms were able to substantially improve their internet connection: on average new services were 18 times faster.**
 - **The UK benefitted by at least £8 for every £1 spent.**
 - **One in four firms employed an extra full time member of staff and each made an average of £1,300 more profit per annum, through being more efficient and effective, and providing more reliable and faster delivery of goods and services.**
 - **Over 6,000 firms pooled their voucher with others in group schemes to get ultrafast connections at guaranteed speeds in areas previously prohibitively expensive and at reduced ongoing costs.**
 - **The scheme encouraged competition and consumer choice with 87% of funding going to smaller suppliers providing specialised services, only 13% of the funding went to the top 3 of BT, Virgin and TalkTalk.**

3. The scheme was part of the delivery of the Government's commitment to increase economic growth by investing in and supporting world class connectivity across the UK through a range of measures, including investing in broadband. A commitment outlined in Connectivity, Content and Consumers: Britain's Digital Platform for Growth (2013).
4. The economic rationale for the Connection Voucher Scheme in particular had four motivations: to maintain the UK's position as a global hub for the knowledge economy; to overcome cost barriers that result from SME's having imperfect foresight about technology changes and connectivity charges when choosing a location; to help SMEs understand the value of high quality/high speed internet; and for the full potential value to the UK economy to be realised, e.g. the value that is not accounted for in an individual SME's assessment of the benefits of the investment, such as the value of improved industry collaboration and spill-over effects in the supply chain.

Connection vouchers have made a big difference to thousands of small businesses

5. During the scheme's lifetime, over 54,000 small firms had grants approved, **42,500 small firms now have a substantially improved internet connection** totalling £81m, and 42,500 firms took up the opportunity for an improved internet connection. On average services taken were 18 times¹ faster than the existing connection. 1 in 4 connections were for an uncontended line with guaranteed speeds and service and 9,000 firms (a fifth) opted for ultrafast broadband with download speeds of 100 Mbps or more.
6. Two waves of a benefits survey, with over 550 firms responding, found the average additional impact of a better broadband connection to be £1,300 per year extra profits and 0.27 extra full time staff per business. This takes account of deadweight², where some firms would have upgraded their broadband without the scheme. Overall this equates to the UK benefiting by over **£8 for every £1 invested.** In reality the benefit to the UK is higher as many cited benefits are not included in this calculation.
7. SMEs report that faster broadband makes a huge difference to their business. The survey revealed that:

More efficient
More effective staff
More reliable and faster delivery of goods and services

¹Estimated from reported download speeds. Mean average taken.

² *How likely would you have been to upgrade your broadband connection w (Connection Vouchers) / How likely would you have been to upgrade your t £{value of voucher}? (Pre-Registered Packages).* (This analysis could be outcomes to a control group of SMEs not in receipt of a Connection

- 86% of firms who responded reported that their broadband upgrade had increased their employees' effectiveness,
- 83% reported improved efficiency,
- almost 70% reported increased speed and reliability of delivering goods or services
- 45% reported that their upgrade had improved their ability to develop new goods or services.
- Over 35% reported that their upgrade has generated new sales and provided access to new markets and 19% reported their upgrade had an impact on exports.

This is supported by the evidence from case studies, demonstrating how quicker, more reliable connections enable cloud computing, improve resilience and efficiency, improve delivery of goods and services, leading to growth potential.

8. The scheme was designed to help businesses and third sector organisations meet the capital costs of the infrastructure upgrade required for an improved broadband connection to their premises. By subsidising the capital costs the vouchers reduced, not only the upfront cost to SME's, but also reduced monthly costs because suppliers would normally spread the capital costs over the contract period. In this way the scheme addressed the two cost barriers: a) upfront costs and b) ongoing monthly costs. Research conducted in July 2013 by 'IFF Research' on behalf of BDUK found that monthly costs were a bigger barrier to improving broadband for SMEs than the upfront costs: 68% of firms thought the monthly cost was highly important, whilst 57% thought the upfront connection costs were highly important.
Two big barriers reduced: connection cost and ongoing costs
9. The introduction of Pre-Registered Packages (services with pre-approved funding contributions that suppliers could sell directly), putting suppliers at the centre of issuing vouchers has further supported the market to develop products to suit more small businesses. For example, as part of their standard product range one supplier: Optimity, offered dedicated services for less than £100 per month. The same services usually retailed at £200 - £300.

Pooling connection vouchers together into group schemes is enabling firms to address areas with poor connectivity

10. Group schemes enabled a number of small firms to pool resources to aggregate their vouchers, which was particularly helpful for small business clusters and business parks. 15% of firms taking up vouchers did so through one of 470 group schemes. Group schemes were more likely to install better connections than non-groups schemes³, with 28% of group scheme vouchers being for ultrafast connections and 31% uncontended lines.

Firms pooling vouchers were able to get ultrafast connections at guaranteed speeds in areas previously prohibitively expensive

The pooled funding can be sizeable enough to purchase a significant upgrade to connections in areas with poor or no connectivity. For example, at Perseverance Works in Shoreditch, 30 businesses pooled their vouchers to provide an ultrafast connection. This connection filled a gap that had previously remained unfilled for 2 years, at a reasonable cost. The total installation costs of £89,281 were fully covered by the vouchers. The same model was replicated at the Custard Factory in Birmingham, benefitting 350 firms. The average connection cost for a group scheme was £45,800, this would have equated to an average capital cost to each firm of £3,481; a significant cost barrier.

11. In a survey of 103 firms representing group schemes, 71% had previously considered improving their internet, over half quoted problems with their existing service as being a trigger for considering a new connection. The most common reasons for not having done so already was the unavailability of a better service and the costs, demonstrating that the market had not met demand in these areas.
12. By sharing a connection, group schemes helped further reduce ongoing costs. For example, at the Waterfront Studios in London, 134 SMEs pooled resources to provide infrastructure with a range of service options between 30-100 Mbps with Telappliant, a supplier dedicated to connecting SMEs. Ongoing costs average £50/month per SME reduced from an average of £150/month per SME as a result.

³ Connections in group schemes were more likely to be ultrafast and uncontended. Statistically significant differences at 5% significance level.

Connection vouchers are making a positive impact on the market and suppliers

13. The scheme promoted choice and competition with over 700 suppliers receiving business from the scheme. 87% of the funding went to smaller suppliers, only 13% of the funding went to BT, Virgin and TalkTalk; the top 3 suppliers in the UK broadband market. These smaller suppliers were providing a more specialised service: they accounted for nearly all (96%) of vouchers for bespoke connection solutions and 89% of uncontended lines connected in the scheme. For example, Metronet (UK), a regional supplier based in Manchester, supplied over a thousand small firms with new internet connections. Typically, Metronet use more expensive wireless equipment, in hard to serve areas where it is difficult to provide fibre, to deliver connections quickly. As a result, the average voucher value of the smaller suppliers was over four times that of the top-3 suppliers.
- The scheme encouraged competition with 87% of funding going to smaller suppliers**
14. The top 3 suppliers (BT, Virgin Media and TalkTalk) connected 44% of vouchers, however this represented only 13% of the total value of vouchers as they typically concentrate on quick, easy to connect and therefore low cost options.
- Some smaller suppliers reported dramatic increases in their revenues, staff numbers and an increased profile**
15. Eight of the larger regional suppliers were surveyed on the effect the voucher scheme had on their business. Three, of the eight, attributed dramatic increases (c.50% year on year) to their revenue as a result of increased customer bases, and across the eight suppliers, they employed over 80 additional full time staff as a result of the scheme. In the survey, suppliers also reported that their profiles are increasing as a result of the scheme so more small businesses and potential partners are approaching them directly. These smaller suppliers offered choice and alternative solutions to SMEs.
- Regional and local broadband suppliers growing significantly due to the voucher scheme**
16. Group schemes have been integral to the success of many suppliers, with some, for example Telappliant, building a business model around them. Nearly all vouchers in group scheme (99%) were connected by non-top-3 suppliers.

Background

17. The Connection Voucher Scheme was part of the Super-Connected Cities Programme. The programme opened in December 2013, following a period of

market testing. All 22 Super-Connected Cities were live and issuing vouchers by March 2014.

18. Government has an active role to play in driving forward the transformation of the digital communications market to benefit as many people and businesses as possible. In *Connectivity, Content and Consumers: Britain's Digital Platform for Growth* (2013), the Government sets out its commitment to increase economic growth by investing in and supporting world class connectivity across the UK through a range of measures, including investing in broadband.
19. The economic case for the Super-Connected Cities Programme outlined four motivations for the policy:
 - Retaining the UKs attractiveness as a global hub for businesses in the knowledge economy, and ensure that established UK businesses are able to compete in the global marketplace.
 - Enabling SMEs to understand and fully value the benefits of high quality/high speed internet, the full benefits cannot be understood until all firms in an industry and customers are connected.
 - Overcoming cost barriers stemming from choosing an imperfect location. SME's would have had imperfect foresight about technological changes, or may not have been aware of the costs of connectivity, when deciding on a location. Cities and suppliers suggested co-ordination failures whereby the areas they were targeting for improved connectivity were not properly communicated. In these instances, SMEs may be willing to pay for the on-going rental charges but do not, or cannot, take a service because of the connection charges or the lack of network provision in their area.
 - Spill over effects into the supply chain and industry partners of any benefitting SME.
20. Initially only bespoke connection vouchers could be issued, where firms applied to local authorities with a quote from a supplier. From September 2014, when the scheme was re-launched, Pre-Registered Packages were introduced. These enabled suppliers to pre-register connection deals with Broadband Delivery UK (BDUK), so they could sell connections benefiting from a voucher directly to firms. This, alongside increased marketing and awareness of the scheme, increased take-up of vouchers.
21. In April 2015, due to its success, the scheme expanded to 50 cities and their surrounding areas and extended with a £40m challenge fund. Two further cities joined the scheme shortly after, bringing the total coverage of the scheme to cover three quarters of the UK⁴.
22. The Scheme is funded by Broadband Delivery UK (BDUK) part of the Department for Culture Media and Sport and operated by city authorities.

⁴ 72.4% of postcodes were eligible, covering about 76.2% of all premises and 76.7% of non-residential premises.

23. This report draws on research and analysis throughout the programme lifecycle. Any monitoring data represents the position at programme close.

Findings

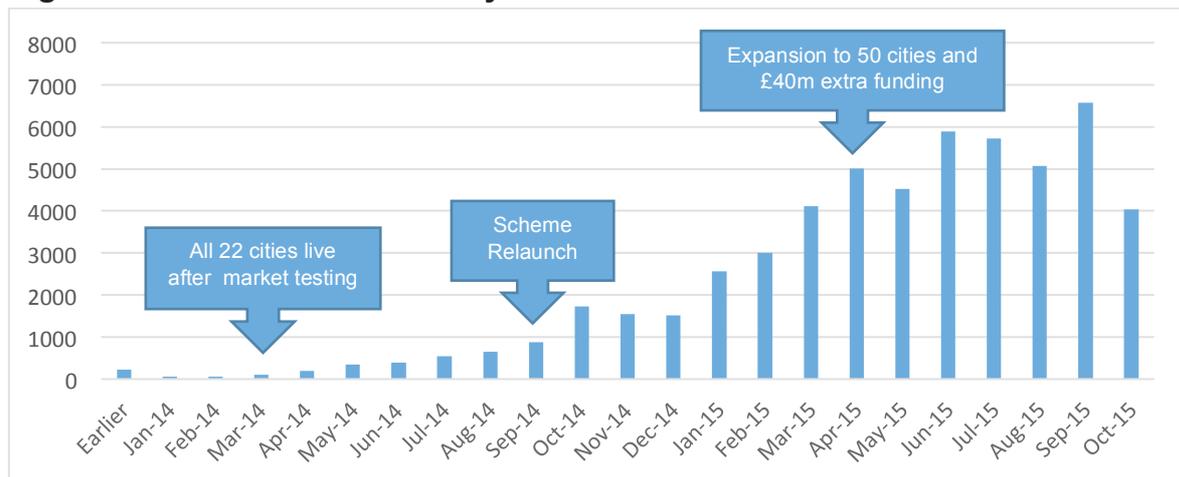
Connection vouchers made a big difference to thousands of small businesses

Vouchers issued and connections

24. During the scheme over 54,000 small firms had connection vouchers issued, accounting for £81m of funding. Of these 42,500 took up the opportunity for a new connection, accounting for £63m of funding in total.

25. The changes made to the scheme, firstly at re-launch in September 2014 and secondly the expansion from 22 cities into a further 50 cities (along with the additional £40m of funding) in April 15, accelerated take-up with 10 times the number of vouchers being issued between Apr-Sept 15, compared to Apr-Sept 14.

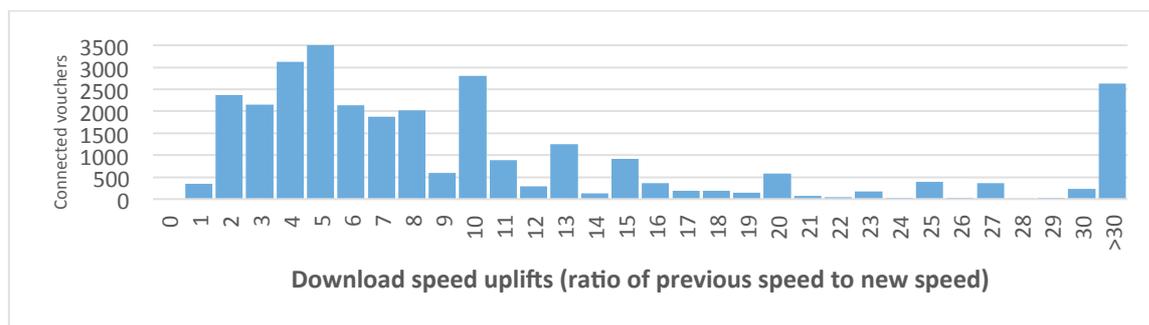
Figure 1 Issued vouchers by month of issue



26. Monitoring data on vouchers⁵ shows that firms took broadband services that had on average 18 times faster download speed (mean average). However, the mean average is slightly misleading as there were a small number of very high download speed uplifts (ratio of the new speed offered to previous speed). The median was 7 times faster, which tells us that half the firms had a speed uplift of more than 7 and half less than 7. This analysis uses maximum available speeds not measured speeds which could be lower.

⁵ Speeds are reported by individuals applying on behalf of their SME and therefore limited by that individual's understanding of their existing and new broadband service.

Figure 2 Download speed uplifts (ratio of previous speed to new speed)



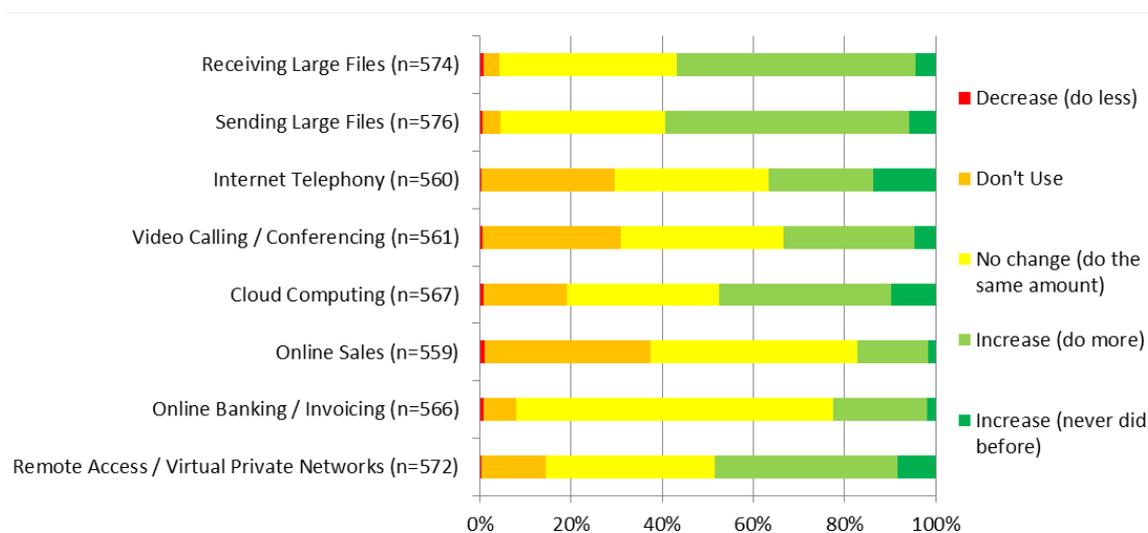
27. The data also shows that a one in four firms took an uncontended service with guaranteed up and download speeds and a fifth opted for ultrafast broadband with download speeds of 100 Mbps or more.

SME Survey

28. Two waves of benefit surveys, the first in October 2014 and the second in June 2015, assessed the initial impact to SMEs of having a voucher. Across the waves, over 5,500 SMEs that had had a connection as a result of a Connection Voucher for at least 3 months were surveyed with over 550 responding, a 10% response rate.

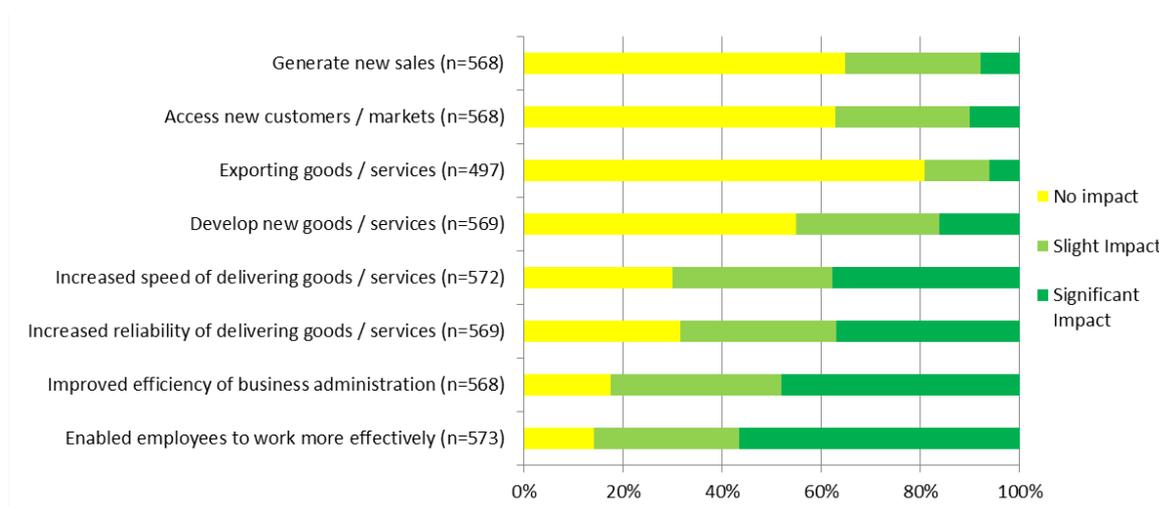
29. Figure 3 shows that firms are using the internet more and using it for functions they were not using it for before. The biggest changes are to uploading/downloading large files, remote access/Virtual Private Networks (VPNs) and Cloud Computing. The finding that SMEs are using it to do things they hadn't done previously was also supported with interviews with eight regional suppliers.

Figure 3 Since upgrading your broadband connection, how has your use of the internet changed for the following functions?



As a result, SMEs reported a wide range of impacts (figure 4) with many seeing improvements in efficiency and effectiveness of employees, as well as improvements in the speed and reliability of delivering goods/services.

Figure 4 To what extent has upgrading your broadband connection resulted in the following impacts?



Note: exporting goods/services was added in the June 2015 survey phase, hence the lower number of responses

Impact and Cost Benefit Analysis

30. The survey calculated deadweight⁶ at 29%, and accounting for this, firms reported an additional increase in profits of £108 per month per SME⁷. This equates to an annual additional increase in profits of £1,300 per SME. The survey also found an additional increase in employment⁸ of 0.27 employees per SME.
31. When costs are accounted for, these profit and employment benefits, give a central estimate of the benefit to cost ratio of 8 to 1.
32. The costs per voucher are modelled as the sum of: the average voucher value of £1,485, a 10% uplift to estimate the administration costs of individual cities and the average BDUK administration cost per voucher of £228.

⁶ How likely would you have been to upgrade your broadband connection without a Connection Voucher? (Connection Vouchers) / How likely would you have been to upgrade your broadband if it had cost an additional £{value of voucher}? (Pre-Registered Packages). (This analysis could be improved by comparing outcomes to a control group of SMEs not in receipt of a Connection Voucher.)

⁷ What has been the impact on your business' profit as a result of upgrading your broadband connection, since upgrading?

In pounds per month, what has been the impact on your business' profit as a result of upgrading your broadband connection, since upgrading?

⁸ As a result of upgrading your broadband connection, by how much has the number of people your business employs changed?

33. Employment benefits are assumed to be realised six months after the connection and the value of increased employed to the UK is estimated by the avoided cost of employee compensation.⁹ Both benefits, employment and profit, are assumed to be realised over the average contract length of a voucher, 2 years, and are discounted by 3.5% as recommended by the Treasury Green Book.

Table 1 Cost Benefit Analysis of the Connection Voucher Scheme

	Y1	Y2	Total
Benefit	6,954	10,256	16,210
<i>of which:</i>			
<i>profit</i>	<i>1,293</i>	<i>1,249</i>	<i>2,543</i>
<i>employment</i>	<i>4,661</i>	<i>9,007</i>	<i>13,667</i>
Cost	1,861	0	1,861
Net Present Value (NPV)			14,349

34. This under-estimates the cost benefit ratio to the UK economy as these are only direct benefits reported only by SMEs that received the connection voucher, it does not account for a wide range of indirect benefits including the spill-over effects in the supply chain and within clusters of collaborating organisations in the knowledge industries.

Case Studies

35. Additionally, case studies illustrate the impact on firms of upgraded broadband:
- Vespasian Security, a security business based in Portsmouth, used a Connection Voucher to upgrade in June 2014. A combination of slow speeds and poor service meant they were struggling. An upgraded service has enabling the company to address Disaster Recovery challenges by removing IT from the office and enabling access from any location through the use of Cloud solutions for server virtualisation.
 - Re:production, a leading Newcastle production company, was one of the first to benefit from the city’s voucher campaign. They needed to send large files regularly, but their speed was so slow they tried to send files overnight it took so long. Quicker broadband meant Re:production were able to send its large files in just two to three minutes, saving time, money and a lot of frustration. It made a huge difference to the way the team worked, giving them more time to concentrate on other tasks.

⁹ Average compensation costs from the total cost of employee compensation available at <https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/dtwm/pn2> divided by total number of employees as reported by the Labour Market Statistics available at <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/fulltimeparttimeandtemporaryworkersseasonallyadjustedemp01sa>.

Connection and Monthly Costs

36. The scheme has addressed the two cost barriers. Suppliers typically spread the cost of the connection over the life of the contract. By subsidising the connection the scheme reduced both upfront and ongoing costs to companies. The introduction of Pre-Registered Packages, putting suppliers at the centre of issuing vouchers has further supported this. For example, Optimity offers dedicated services for less than £100 per month. The same services usually retails at £200 - £300. This reduction in average costs means that many more businesses can benefit from a voucher.

Pooling connection vouchers together into group schemes is enabling firms to address areas with poor connectivity

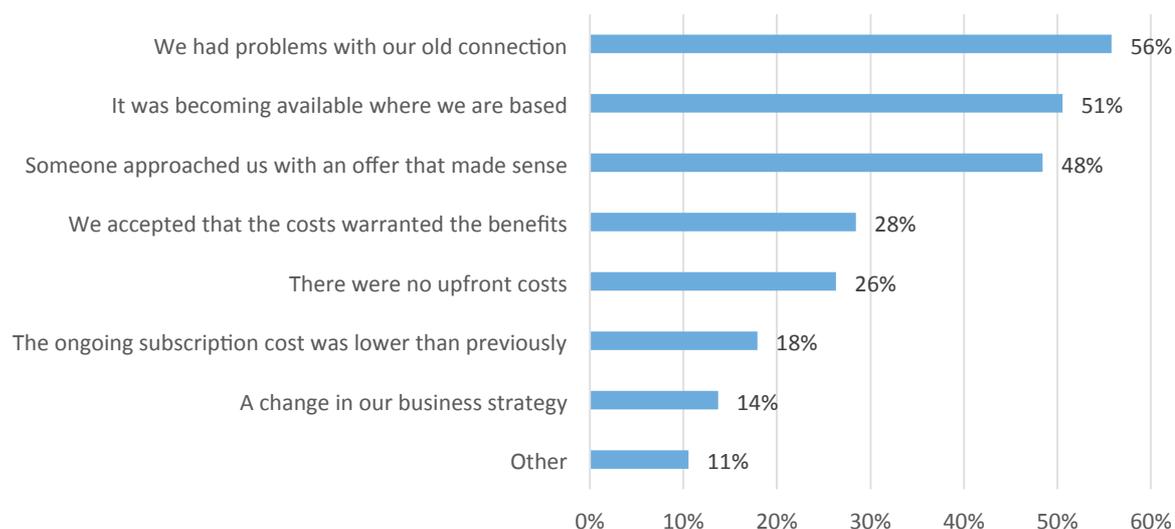
37. Group schemes are where a number of small firms pool resources to aggregate their vouchers to receive a significant upgrade to their connection in areas of poor or no connectivity and are therefore particularly helpful for small business clusters and business parks. Over 470 group schemes were connected successfully, across 140 suppliers, accounting for 6,200 vouchers (15%).

38. Group schemes were more likely to install better connections than non-groups schemes¹⁰, with 28% of group scheme vouchers being for ultrafast connections and 31% uncontended lines. The pooled funding can be sizeable enough to purchase a significant upgrade to their connection in areas of poor or no connectivity. The average connection cost for a group scheme was £45,800, this would have equated to an average cost to each firm of £3,481; a significant barrier.

39. In a survey of 103 firms representing group schemes carried out in April 2017, 71% had considered improving their internet previously. The most common reasons for not doing so was the unavailability of a better service (60%) and the cost (36%), demonstrating that the market had not met demand in these areas Figure 5 shows the reasons given for pursuing an improved connection.

¹⁰ Connections in group schemes were more likely to be ultrafast and uncontested. Statistically significant differences at 5% significance level.

Figure 5 Q4 - What was the trigger for upgrading your broadband connection?



40. Case studies show the benefits these group schemes can give:

- At Perseverance Works, a creative hub in Shoreditch, 30 businesses with download speeds typically below 10Mbps pooled their vouchers to provide an ultrafast connection (that delivers 100Mbps). This connection filled a gap that had remained unfilled for 2 years, at a reasonable cost and enabled the businesses to be more competitive. The total installation costs of £89,281 were fully covered by the vouchers.
- At The Custard Factory in Birmingham, 350 businesses pooled their vouchers to provide infrastructure that delivers a range of speed options to the end users from 20 Mb/s to 50 Mb/s. This infrastructure filled a gap at a reasonable cost, after several years of effort. The total installation costs of £780k were fully covered by the vouchers from participating SMEs.
- One of the very first landlords to utilise a group scheme was Northern Way Properties, owners of Universal Square in Manchester, which is now truly a SuperConnected business Campus. They facilitated a Joint Application for a Broadband Connection Voucher on behalf of their tenants addressing connectivity issue since 2009. It doubled the available speeds without any increase in tenant costs. Enabling the office campus to stay on the 'leading edge'.
- At the Waterfront Studios in London, 134 SMEs pooled resources to provide infrastructure with a range of service options between 30-100 Mbps with Telappliant. Ongoing costs average £50/month per SME reduced from an average of £150/month per SME as a result.

- At CodeBase, an Edinburgh-based business incubator for tech start-ups, the company submitted a Joint Voucher Application on behalf of 10 companies and secured a 1Gbps internet connection to their building in April 2014. Tenants ‘Administrate’ and ‘Float’ have both doubled their revenue as a result of product development and online deployment. The incubator has grown rapidly, so much so that CodeBase are looking to submit a second Joint Application for companies who have recently joined the incubator.

Connection vouchers are making a positive impact on the market and suppliers

41. More than 700 suppliers received business through the scheme.

Table 2 Voucher numbers, total funding and average voucher value split by top 3 and other suppliers.

	Connected Vouchers		Total Funding Received		Average voucher value
	Number	%	£	%	
Top 3 (BT, Virgin, TalkTalk)	19,000	44%	£9.5m	13%	£438
Other suppliers	24,000	56%	£61m	87%	£2,304

42. Table 2 shows that the top 3 suppliers (BT, Virgin Media and TalkTalk) connected 56% of vouchers but only accounted for 13% of the funding. They typically concentrate on quick, easy to connect and therefore low cost options with the average voucher value being £438.
43. The remaining circa 700 suppliers account for 87% of the funding and 44% of vouchers, showing that the scheme supports competition and choice. Seven smaller suppliers made 500 or more upgraded connections and a further 45 suppliers supplied at least 100.
44. Non-top-3 suppliers were providing a more specialised service: they accounted for nearly all (96%) of bespoke connection vouchers and 89% of uncontended lines connected in the scheme. And often smaller suppliers operate in areas that are harder to serve, offering alternative solutions, often with greater connection (and therefore voucher) costs. For example, Metronet, a regional supplier based in Manchester, typically use more expensive wireless equipment, in hard-to-serve areas where it is difficult to provide fibre, to deliver connections quickly.
45. Of the 9,000 ultrafast connections, Virgin supplied a third with other suppliers supplying most of the rest. Pre-Registered Packages were favoured by the top-3, but smaller suppliers also made good use of them: 4 in 10 Pre-registered Packages were sold by a non-top-3 supplier.
46. A survey of 8 relatively large regional suppliers revealed:

- in combination they have taken on over 80 additional FTEs, that could be attributed to the scheme, as well as knock on effects for their suppliers.
- the majority have had growth in revenues, with 3 firms quantifying the impact at c.50% year on year, due to increased customer bases
- these suppliers were extending their existing networks and building in new areas, for instance Metronet (UK) has extended its Birmingham and Leeds networks and built new networks in Newcastle and Bradford.
- their profiles increased so more SMEs and potential partners approached them directly.
- that group schemes were integral to the success of many suppliers, with some (eg. Telappliant) building their business model around these. Indeed, nearly all group scheme vouchers (99%) were supplied by non-top-3 suppliers.

Limitations and Improvements

47. A proportionate response to evaluation was taken given financial and resource constraints. As with all research and evaluation projects, the approaches used can be improved and expanded on. Areas for further study could include:

- the approach to estimating the additional impact of the voucher scheme, i.e the impact over and above what would have happened in the absence of the scheme, could be improved by a rigorous assessment of the difference between SME's with and without and connection voucher.
- the study would be improved by looking for evidence of the market failures, particularly SMEs under-valuing of high-quality/high speed internet through a lack of information and the costs barriers resulting from imperfect site location. Other market failures are harder to evidence, such as spill-over effects to the supply chain.
- the contribution of the connection voucher in overcoming barriers to SME's up-taking better broadband connection be better understood and the pathways to wider impacts
- the cost benefit analysis would be improved by accounting for more benefits: in particular benefits to society that would not be part of the private cost benefit analysis of SMEs; and
- the sustainability and longer-term impacts to SME's could be evaluated.

These considerations will feed into the planning of the ongoing work to evaluate our telecoms delivery programmes.

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