August 2021

Superfast Broadband Process evaluation

Ipsos MORI

Contents

Glossary of key terms

Category	Term / acronym	Meaning
Broadband / technology terminology	NGA	**Next Generation Access** – This refers to new or upgraded access networks that will allow substantial improvements in broadband speeds.[1] This includes Fibre to the Cabinet, Fibre to the Premises (Fibre to the Home), Wireless and Cable broadband connections.
	FTTP / FTTH	**Fibre to the Premises / Fibre to the Home** – This refers to an access network structure in which the optical fibre runs from the local exchange to the end user's living or office space.
	FTTC	**Fibre to the Cabinet** - An access network structure in which the optical fibre extends from the exchange to the cabinet. The street cabinet is usually located only a few hundred metres from the subscriber's premises. The remaining part of the access network from the cabinet to the customer is usually copper wire.
	Cable	Telecommunications infrastructure which utilises cable networks, such as Data Over Cable Service Interface Specification (DOCSIS-3) networks.
	Wireless	High-speed internet access where connections to the premises use radio signals rather than cables.
	ADSL	**Asymmetric Digital Subscriber Line** - A technology used for sending data quickly over a conventional copper telephone line. It is used in current internet services with download speeds up to 24Mbps.
	Superfast broadband	Download speeds from 30 Mbps up to 300 Mbps.
	Ultrafast broadband	Able to deliver download speeds equal or greater than 300 Mbps.
	Gigabit broadband	Able to deliver download speeds of at least 1 Gbps
Type of telecoms provider	ISP	**Internet Service Provider** – An organisation which provides households / businesses access to the internet. ISPs do not always own the infrastructure used to provide services, and can utilise the infrastructure owned by network providers to provide services.
	Network provider	Telecommunications providers which own infrastructure which is used to deliver internet services.
	Programme beneficiary	One of the five network providers that were awarded Superfast Broadband Programme contracts.
	Alt-nets	**Alternative network** – Smaller network providers that are not reliant on the Openreach network.
Public sector organisations involved in delivery	BDUK	Building Digital UK
	DCMS	Department for Digital, Culture, Media and Sport.
	Local Bodies	Local Authorities / devolved Governments responsible for delivering local Superfast Broadband Programme projects.
	NCC	**National Competency Centre** – an entity within BDUK which is responsible for ensuring the Superfast Broadband Programme complies with the European Commission State aid legislation.
Financial terms	IRR	**Internal Rate of Return** - a measure of an investment's expected future rate of return.
	WACC	**Weighted Average Cost of Capital** - the rate that a company is expected to pay on average to finance its assets.
	Capex	**Capital expenditure –** expenditure to buy/maintain/improve fixed assets.
	Opex	**Operational expenditure –** ongoing expenditure associated with delivering a product / running a business.
Economic and evaluation terms	Turnover	The amount of money generated by a business (value of sales).
	GVA	**Gross Value Added** – The additional value generated from economic activity (in monetary terms).
	Outcome	Outcomes are social or economic measures that could be affected by the Programme (e.g. jobs, turnover, life satisfaction)

[1] The term was first used by the European Commission in 2010 to refer 'to upgrades to ADSL networks which had previously relied on end to end copper connections for the delivery of broadband services' – see para 11 at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010H0572

Category	Term / acronym	Meaning
	Impact	Impacts are the effects on the outcome that are attributable to the Programme over and above what would have occurred in the absence of the Programme. Impacts occur over a longer time period.
	Benefit	A measurable improvement of a positive outcome (as perceived a by one or more stakeholders), which contributes towards one or more organisational objectives
	Efficiency	A measure of the extent to which a project, or policy's associated throughputs are increased
	Opportunity Cost	The value of the best alternative use of resources or assets (the benefits foregone on alternatives courses of action when deploying resources or assets).
Superfast Broadband Programme terms	NBS	UK National Broadband Scheme (the Superfast Broadband Programme).
	Implementation Clawback	A mechanism to recover underspend. In the event of any underspend, the network provider was required to place unused funds in an Investment Fund to help resource further schemes or extend the contract coverage to a greater number of premises than originally offered.
	Take-up clawback	If take-up proved to be higher than anticipated at the tendering stage, network providers were required to return a share of the excess revenues generated from additional take-up to the investment fund.
	OMR	**Open Market Review:** A process by which network providers outlined their existing broadband networks and their network roll out plans for the coming three years.
	'White' areas (postcodes)	Areas identified in the OMR process where there were no commercial plans to roll-out superfast broadband within three years.
	'Grey' areas (postcodes)	Areas identified in the OMR process where one provider was offering or expected to offer superfast broadband services within three years.
	'Black' areas (postcodes)	Areas identified in the OMR process where multiple providers were offering or expected to offer superfast broadband.
	SCT	**Speed and Coverage Template** - a list of premises or postcodes that were identified as 'white' in the OMR process and therefore eligible for subsidised infrastructure.
	PFM	**Project Financial Model –** a document which includes all of the financial information (build costs, expected take-up, WACC etc.), which is developed by Programme beneficiaries at the start of the local project.
	C3 reports	A list of premises or postcodes where the Superfast Broadband Programme has provided upgraded connectivity.

Executive summary

Ipsos MORI and partners[2] were commissioned by the Building Digital UK (BDUK) directorate of the Department for Digital, Culture, Media and Sport (DCMS) in May 2019 to undertake the evaluation of the UK National Broadband Scheme (the Superfast Broadband Programme). The evaluation activity took place between May 2019 and March 2021. This document presents the process evaluation report, examining how effectively the Programme has been implemented, the key learning from the delivery of the Programme and the impacts of the Programme on public service provision in the UK.

The aims and objectives of the process evaluation were to provide evidence for three key evaluation questions:

- How has the behaviour of individuals / organisations changed for these outcomes to come about?
- How effective and efficient has the delivery of the Programme been?
- What can we learn to improve future policy designs and implementation?

Methodological approach

The data collection and analytical approaches used to inform this paper are presented below:

- A review of project information and literature, and interviews with five members of BDUK staff (Programme lead, Programme financial officer and project directors) to develop an understanding of how the Programme operates (June to July 2019);
- Interviews with Local Bodies delivering local Superfast Broadband Projects (31 interviews), to collect information about how the projects have been delivered and the outcomes and impacts achieved by the projects in their local area (October 2019 to January 2020);
- Interviews with telecommunication providers (16 interviews), to explore how providers engaged with the Programme, how the Programme has been delivered and the impacts of the Programme on telecommunication providers (November 2019 to April 2020);
- Validation interviews with BDUK staff (four interviews), to corroborate the information collected in the Local Body and telecommunication provider interviews (April 2020);
- Interviews with public service providers (42 interviews), including Local Body staff, schools, libraries and health and social care staff, to explore the outcomes and impacts that the Superfast Broadband Programme has had (May 2020 to January 2021); and
- Analysis of Programme Management Information and secondary data sources (such as Ofcom Connected Nations data), to provide objective data points to complement the qualitative findings (June 2020 to October 2020).

[2] Ipsos MORI's partners are: George Barrett, Richard George Feasey, Plum Consulting and Simetrica.

Key findings

Programme / project delivery

The processes employed by the Superfast Broadband Programme were well designed and implemented, which has led to the Programme being delivered in an efficient and effective manner. More details, and recommendations of how to potentially improve Programmes in the future are presented below.

Allocation of subsidies

- **Nearly half of the funding for Phase 3 contracts came from non-BDUK public sector match funding** (either from the Local Body or other Government / European funding sources). The increased dependence on match funding in Phase 3 (compared to Phase 2) may have led to some local projects being scaled down from their original targets. **The appropriateness of sources of match funding should be considered alongside their availability**.

- In developing business cases for funding, Local Bodies most commonly used national evidence which focussed on economic outcomes, and did not include public service impacts or impacts on households. These additional impacts should be included in future business cases for publicly funded projects, and the findings from this evaluation should support this.

Supplier engagement and Open Market Review

- There was a high level of engagement with the Open Market Review (OMR) process, and it appears that Local Bodies were able to secure responses from most of the telecommunication providers offering broadband services in the local project area. Local Bodies should not be reluctant to ask providers for an OMR response in future projects.

- The investment cycles for many telecommunication providers were determined over relatively short time horizons (12 to 24 months) which did not match the OMR cycle. This made it difficult for providers to deliver an accurate response as to where they may provide networks in future years. **It may be beneficial to undertake OMRs at more regular intervals to improve the accuracy of responses, although this would increase the burden on providers, Local Bodies and BDUK.**

Tendering and contracting

- **There was no evidence that utilising an alternative tendering and / or contracting approach to that recommended by BDUK had beneficial outcomes for Local Bodies**, and lotted contracts offered better value (in terms of the value for money achieved for the project or project delivery). **Therefore, it is recommended that Local Bodies follow the approach recommended by BDUK, and that lotting of contracts is utilised where possible in any future broadband delivery Programmes** to improve cost effectiveness. Building strong relationships with providers was also seen as important to ensuring a good number of responses to tenders issued.

Project delivery and management

- Most Local Bodies utilised similar project management approaches, with day to day project managers overseen by steering groups / committees. A small number of projects described working with the Programme beneficiary as being a partnership rather than a client-contractor relationship, and felt they got more out of the provider this way. This again reinforces that Local Bodies should work hard to develop and maintain relationships with providers.

- The delivery of Phase 3 contracts had been delayed, with roll out behind where providers anticipated it would be. Some of the reasons for this were highlighted as being the capacity of Programme beneficiaries to deliver their contracts and the duration of time required to resolve change requests. **Local Bodies need to ensure that their processes allow for a rapid response to change requests and escalate significant change requests to BDUK expediently**.

Programme outcomes

Market outcomes

The key findings from the market analysis undertaken are:

- **Phase 3 contracts increased the number of premises passed by Next Generation Access (NGA) services by 2,300 to 16,600 on postcodes benefitting from subsidised coverage by the end of September 2019** (with the weight of evidence to the lower end of this range). The share of the 79,100 premises upgraded by the end of September 2019 that would not have otherwise benefitted from Next Generation Access (NGA) coverage is estimated at between 3 and 21 percent.

- **Phase 3 contracts increased the number of premises with superfast availability by 10,800 to 29,300, and the number of premises with Fibre to the Premises (FTTP) coverage by 19,000 to 30,300.** The additionality of superfast and FTTP coverage was higher than for NGA coverage at between 14 and 55 percent of premises receiving subsidised coverage. This indicates that some premises benefitting from subsidised upgrades would have otherwise received from NGA coverage that did not deliver superfast speeds.

- **The results suggest that the processes used to identify the commercial plans of providers were not fully effective in establishing those premises that would not benefit from commercial deployments in the near term.** Several explanations for this emerged from the research, including that their investment cycles were determined over relatively short time horizons (12 to 24 months) which did not match the OMR cycle.

- Most Local Bodies and Superfast Broadband Programme beneficiaries took part in activities to promote the take-up of superfast broadband connections, and as this activity was undertaken in most areas (mainly for Phase 1 and Phase 2 contracts) it is difficult to measure the impact of the activities, although interviewees suggested they felt it was important in raising awareness of superfast connections and encouraging take-up, although there was no quantitative evidence to support this.[3]

- **Based on projections provided by network providers at the tendering stage, the proposed network build under Phase 3 contracts was expected either to generate losses or to deliver positive rates of return that were substantially lower than the cost of capital faced by the network provider**. This indicates that public subsidies would have been needed to create a sufficient economic incentive to deliver these investments.

- While **the contracts have proven largely effective in containing subsidies to the minimum needed for the project to go forward**, the public sector has incurred opportunity costs by tying

[3] BDUK has carried out internal analysis of the factors driving take-up, and a light-touch evaluation of the Superfast Take-up grant in a separate piece of research

resources up in the Programme. BDUK may wish to consider whether seeking to contain these opportunity costs in future procurements could be justified.

- Whilst an attempt has been made to compare the costs per connection for the Programme to comparative schemes, there is little evidence on comparable interventions. One study attempts to estimate the projected cost per premises passed for different EU schemes. This showed that in general, the Superfast Broadband Programme had a lower cost per premises passed than the expected cost for most other EU schemes. However, this may be due to geographic differences, rather than the delivery model.

Public sector outcomes

The key effects of the Superfast Broadband Programme on the public sector, and particularly public service providers, are:

- **Support the delivery of local plans:** The Superfast Broadband Programme had supported the advancement of local digital plans, particularly digital inclusion plans. The availability provided through the Programme was viewed to have allowed Local Bodies to focus on the other key aspects of their strategy such as digital skills.

- **Support to deliver local public service transformation:** Local public service transformation was described as having been supported by the Programme through the indirect effects on residential connectivity. These were thought to be behind the increased use of online services and accelerating widespread adoption of these over face to face means.

- **Increased engagement of primary school children with online learning:** There was a reported increase in engagement from children with online resources from the interviews undertaken. Children obtained more enjoyment from online learning resources relative to before the Programme.

- **Improved administrative processes for schools:** General administration processes for staff at schools were reportedly quicker and easier since upgrade of the school connection. This also led to increased communication with parents through online means.

- **Increased awareness of online GP services:** The evidence suggests an increase in awareness of online services at GP practices for local residents as a result of the Superfast Broadband Programme. These impacts also translated into impacts on the use of online services.

- **Mixed impacts on GP satisfaction:** Subsidised coverage appeared to increase the proportion of patients that were satisfied with the amount of time given to them for their last appointment. However, it had a negative impact on measures of access and continuity of care.

- **Increased patients numbers:** Subsidised coverage increased the number of patients registered with GPs by 3.2 to 5.9 percent on average. However, the number of staff employed by GP surgeries did not rise to the same degree, with no effect on the number of GPs.

- **Covid-19 resilience and remote working:** Remote access for council, school and healthcare workers was highlighted as necessary in the pandemic climate with the Programme seen to have provided connections to many who may not otherwise have access. This in turn had enabled children to learn remotely, video consultations to take place and council services to continue running services.

For some school stakeholders however, the Programme was only part of the solution and for some disadvantaged children access to IT equipment was the prohibitive factor in enabling remote learning. A similar issue was raised for GP services with those digitally illiterate or remote at more risk in the pandemic, either needing to visit in person or not visit at all.

1 Introduction

Ipsos MORI and partners[4] were commissioned by the Building Digital UK (BDUK) directorate of the Department for Digital, Culture, Media and Sport (DCMS) in May 2019 to undertake the evaluation of the Superfast Broadband Programme. The evaluation activity took place between May 2019 and March 2021. This document presents the process evaluation report, examining how effectively the Programme has been implemented, the key learning from the delivery of the Programme and the impacts of the Programme on public service provision in the UK.

1.1 Evaluation aims and objectives

The objectives for the evaluation were set out in the Invitation to Tender (ITT), and the table below presents the five key evaluation questions (in bold) and highlights the objectives covered in this paper. Underneath these five key evaluation questions are a series of specific research questions which were developed for the process evaluation.

Table 1.1: Evaluation questions and coverage of process evaluation paper (sub-questions in italics)

Evaluation question	Covered in the process evaluation
What are the outcomes of the scheme?	(✓)
How has the behaviour of individuals / organisations changed for these outcomes to come about?	✓
How effective and efficient has the delivery of the Programme been?	✓
What did and did not work well (if any) in terms of the partnerships between Local Bodies and central government?	✓
What worked well in delivering the projects? What did not work well and why?	✓
What was the role of the OMR in the delivery of the Programme?	✓
How effective was the market engagement exercise undertaken by Local Bodies?	✓
How effective and efficient has the tendering process been?	✓
How have the specific parameters of the Programme, such as 'clawback', and 'in contract' reporting influenced its outcomes and delivery?	✓
How effectively have the projects been managed?	✓
How frequently were change requests submitted, and what were the reasons for this?	✓
What were the main challenges involved in delivering the project, and how were these overcome?	✓
What were the main challenges involved in delivering the project, and how were these overcome?	✓
Was the investment cost effective?	(✓)
What are the different procurement models employed by Local Bodies to deliver Superfast?	✓
Why were different contractual models and arrangements put in place and what were the benefits of this?	✓
How effective and efficient has the tendering process been?	✓
How have the specific parameters of the Programme, such as 'clawback', and 'in contract' reporting influenced its outcomes and delivery?	✓
What can we learn to improve future policy designs and implementation?	✓
What can we learn in terms of effective procurement practice?	✓
What can be learned from differences in the management of projects?	✓
How can the number of change requests be reduced in the future?	✓
All sub-questions highlighted above	✓

(✓) – partial coverage. This report highlights the outcomes achieved by public service providers, but not the wider outcomes of the Superfast Broadband Programme.

[4] Ipsos MORI's partners are: George Barrett, Richard George Feasey, Plum Consulting and Simetrica.

The process evaluation focusses mainly on Phase 3 of the Superfast Broadband Programme. This reflects the fact that some of the processes and the number of providers delivering Superfast Broadband Programme contracts have changed between Phases 1 and 2 and Phase 3 of the Programme. However, the process evaluation includes descriptions and assessments of the processes used in the earlier phases of the Programme, to inform why the processes used in Phase 3 have been implemented and how successful they have been.

1.2 Methodology

The findings presented in this paper are based on information collected and analysed using the following approaches:

- A review of project information and literature, and interviews with five members of BDUK staff (Programme lead, Programme financial officer and project directors) to develop an understanding of how the Programme operates (June to July 2019);
- Interviews with Local Bodies delivering local Superfast Broadband Projects (31 interviews), undertaken over the phone or by teleconferencing facilities, to collect information about how the projects have been delivered and the outcomes and impacts achieved by the projects in their local area (October 2019 to January 2020). These projects were sampled from areas which had been awarded Phase 3 contracts at the time of sampling;
- Interviews with telecommunication providers (16 interviews), undertaken over the phone or by teleconferencing facilities, to explore how providers engaged with the Programme, how the Programme has been delivered and the impacts of the Programme on providers (November 2019 to April 2020). These providers included all Programme beneficiaries, and a sample of non-beneficiaries which agreed to take part in the research when approached by BDUK;
- Validation interviews with BDUK staff (four interviews), undertaken over the phone or by teleconferencing facilities, to corroborate the information collected in the Local Body and provider interviews (April 2020);
- Interviews with public service providers (42 interviews), undertaken over the phone or by teleconferencing facilities, including Local Body staff, schools, libraries and health and social care staff, to explore the outcomes and impacts that the Superfast Broadband Programme has had (May 2020 to January 2021). These public service providers were based in five case study areas, which were selected because the Local Body lead suggested the Programme delivery targeted public sector services in some way during their interview; and
- Analysis of Programme Management Information and secondary data sources (such as Ofcom Connected Nations data), to provide objective data points to complement the qualitative findings (June 2020 to October 2020).

1.3 Structure of the report

The remaining sections of this report are structured as follows:

- Section 2 presents a brief overview of the Superfast Broadband Programme;
- Section 3 provides an assessment of the delivery of the Superfast Broadband Programme;

- Section 4 sets out the impact the Superfast Broadband Programme has had on the telecommunications market;
- Section 5 describes the extent to which the Programme has complied with State Aid regulations;
- Section 6 discusses the impact the Programme has had on public service providers;
- Section 7 presents the conclusions and recommendations from the process evaluation research; and
- The Annexes presents the local l body case studies and the detailed process evaluation framework.

2 Superfast Broadband Programme

2.1 Programme Overview

Private investment in superfast broadband infrastructure in less densely populated areas of the UK was expected to be constrained due to the cost characteristics of the industry and the level of demand from users. In the first Ofcom Infrastructure report published in November 2011, superfast broadband was only available to 58 percent of UK households and the overall take-up of any broadband connection was just 68 percent of UK households.[5] The costs of investing in the infrastructure needed to provide these services are usually substantial, particularly for fixed line networks where the final connection to the end consumer is costlier. Where population density is low, these factors will reduce the commercial viability of superfast broadband provision, as the consumer base will be smaller (and the costs of the provision may be higher, for example, if properties are more distant from the serving telephone exchange).

The Superfast Broadband Programme was announced in 2010 to respond to concerns that the commercial deployment of superfast broadband would fail to reach many parts of the UK due to the cost of installing the technology relative to expected revenues. On the expectation that extending superfast broadband coverage to these areas would produce economic, social and environmental benefits that would not be captured by network providers, the Government established the Programme to provide £530m of public resources to fund further deployment with the aim of enabling 90 percent of UK premises to access superfast broadband speeds by early 2016. The Programme was extended in 2015, with a further £250m made available to extend coverage to 95 percent by the end of 2017.

The Superfast Broadband Programme was extended a second time under a new State aid approval covering the 2016 to 2020 period. Contracts awarded under this State aid scheme (commonly known as Phase 3) are the focus of this evaluation report. These projects had a greater focus on gigabit connectivity than those funded in prior phases, aligning with broader Government objectives to increase Fibre to the Premises (FTTP) coverage in the UK.

2.2 Schemes funded

The National Broadband Scheme (the Superfast Broadband Programme) was approved twice by the European Commission with a decision in 2012 and 2016. In approving a project, the Commission explicitly recognise that the scheme is State aid, but that the benefits from the Programme outweigh the level of market distortion generated by the scheme, following the application of the so-called ‘balancing test’. In a decision, the Commission give a set of requirements that must be followed precisely in order to comply with State aid norms.

2.2.1 2012 scheme

The key aspects of the procurement models under the 2012 scheme were:

- All procurement models were based on an Open Tender Process. The tender process must ensure transparency, non-discriminatory treatment, and objective evaluation criteria, and contracts must be awarded to the most economically advantageous offer.
- A National Procurement Framework (known as Broadband Delivery Framework) was prepared by BDUK with the intention to provide Local Bodies with a panel of potential suppliers. To do this, BDUK

[5] Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0025/69262/infrastructure-report.pdf

held an industry day to provide potential suppliers with information about the framework and allow suppliers to provide feedback, and then published an Official Journal of the European Union (OJEU) notice.

  - Nine companies had pre-qualified to submit tenders, and three were chosen to submit final tenders.

  - Two suppliers (BT and Fujitsu) were appointed to the National Procurement Framework. However, Fujistu did not take part in the Superfast Broadband Programme after this point, and did not deliver any local projects.

- Local Bodies ran mini-competitions to select one single supplier (BT / OpenReach) from the framework for each project.

  - Local Bodies and chosen suppliers would agree a call-off contract, outlining any project-specific terms and conditions, a detailed design and implementation plan, and a complete financial model.

- Local Bodies were also free to run their own public tender process or use another framework agreement.

  - **Phase 1:** In the first Phase, where most contracts (75 percent) were commissioned using the Superfast Broadband Programme framework (which only BT / OpenReach bid for work from), all of the contracts were awarded to BT / OpenReach.

  - **Phase 2:** Most Local Bodies still used the Superfast Broadband Programme framework to contract providers, although some Local Bodies did use alternative mechanisms. As a result, most contracts were still awarded to BT / OpenReach, although contracts were awarded to a further four organisations.

2.2.2 2016 scheme

The key aspects of the procurement models under the 2016 scheme are:

- Local Bodies were required to conduct its procurement in an open, transparent and non-discriminatory manner.

- All Local Body procurement notices were OJEU tenders and were open to all the EU suppliers wishing to submit bids.

The differences between the procurement models used under the 2016 decision and 2012 decision are:

- No framework contract was used; the tendering process was completely open and followed an OJEU model.

- Local Bodies were given the freedom to decide how to disaggregate the project: a single contract (or lot) for the whole project or splitting the project up geographically into multiple lots (allowing different suppliers to bid for different lots).

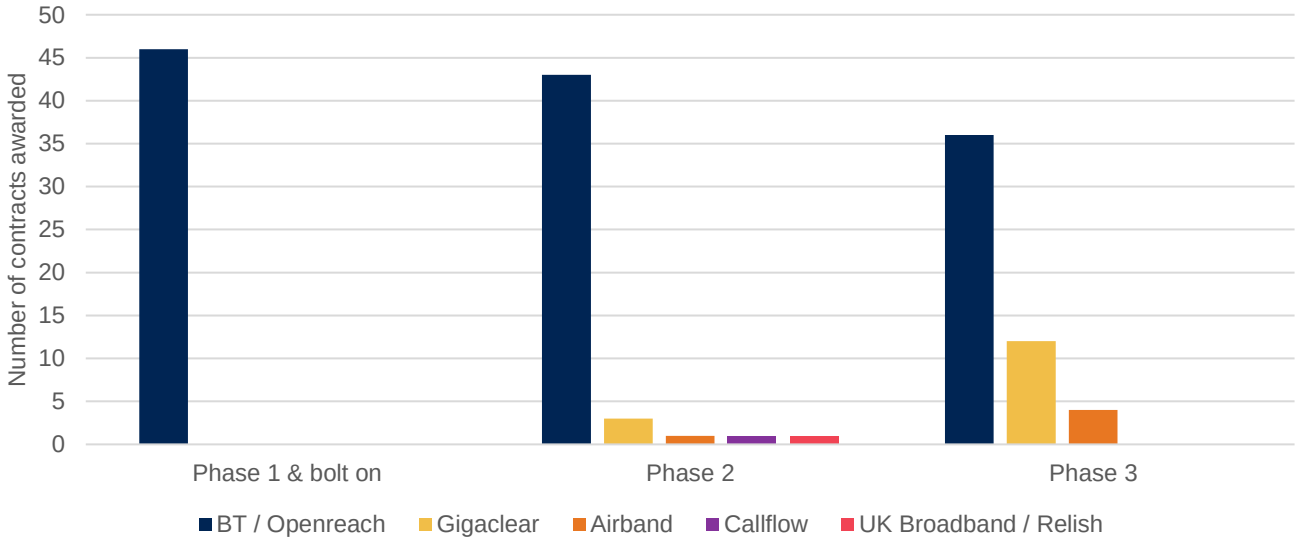
- Local Bodies also had to decide the scoring strategy for the tenders – different weightings could be assigned to elements of the bid (for example the speed of the coverage being offered).

In Phase 3, where all contracts were awarded using an OJEU notice, there was a more even distribution of providers awarded contracts, with BT / OpenReach being awarded just over two thirds of the contracts (68 percent), and Gigaclear being awarded a significant number of contracts (12 contracts, 40 percent).[6]

2.2.3 Average value of contracts

The number of contracts awarded by beneficiary and phase is presented below.

Figure 2.1: Number of contracts awarded by beneficiary and Phase of Programme



Source: Cora Management Information, June 2020

The table below provides a breakdown of funding for contracts awarded under Phase 1, 2 and 3 of the Programme by source of funding. This table illustrates that gap funding requirement over the three phases has remained relatively constant (with the share of costs funded by the network provider rising from 24 percent in Phase 1 to over 31 percent in Phase 3). Given that, in principle, the postcodes covered by Phase 3 contracts would have been less commercially viable than those covered by Phase 1, this could be taken as a signal that greater competition has helped to reduce the gap funding requirement over time, above other possible explanations (such as the development of new methods or increased skills / knowledge of the beneficiary workforce).

[6] Gigaclear were originally awarded a further five contracts in Phase 3 of the programme (a total of 17 Phase 3 contracts). However, five of these contracts have since been terminated, and are therefore not included in this analysis.

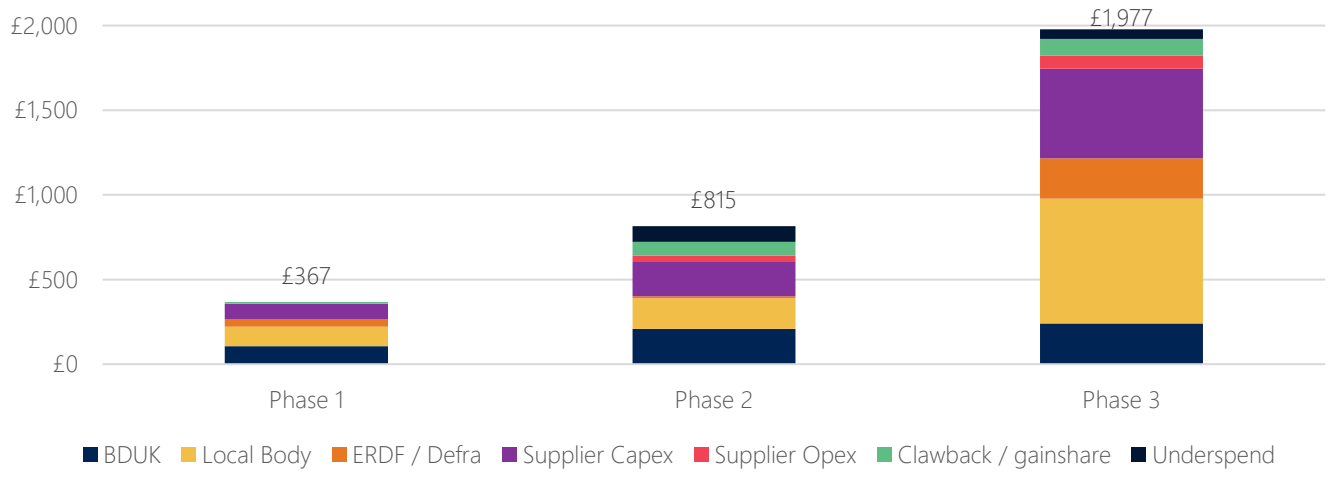
Table 2.1: Superfast Broadband Programme expenditure by phase

	Phase 1	Phase 2	Phase 3
Average premises	95,405	16,952	6,372
Average contract value (£m)	£35.0	£13.8	£12.3
Funding source:			
BDUK	*29%*	*26%*	*12%*
Local Body	*31%*	*22%*	*37%*
ERDF / Defra	*12%*	*1%*	*12%*
Supplier CAPEX	*24%*	*25%*	*27%*
Supplier OPEX	*0%*	*5%*	*4%*
Take-up clawback	*3%*	*10%*	*5%*
Underspend	*0%*	*11%*	*3%*

Source: Cora Management Information, June 2020

The Superfast Broadband Programme issued contracts which aimed to provide superfast broadband coverage to 5.5 million premises. The average cost per premises contracted to be upgraded by Phase is presented in the figure below. This shows that the average cost per premises upgraded has increased by Phase. This is not surprising as the projects maximised the number of premises upgraded, therefore easier / cheaper premises were upgraded first. Additionally, in Phase 3, there was more of a focus on the more expensive FTTP connections (rather than FTTC), which may also contribute to the increase in unit cost.

Figure 2.2: Cost per premise upgraded and funding source[7]



Source: Cora Management Information, June 2020

There are significant differences between the cost per contracted premises by provider and Phase (see the table below). In Phase 1, the cost per premises for BT / OpenReach was relatively low (£366), but the unit cost to BT / OpenReach increased through the Phases to £1,703 in Phase 3. Similarly, the cost per premises delivered was high for Gigaclear in Phases 2 and 3 (approximately £1,555 to £1,749). The costs to Airband are also relatively high. However, the unit costs to UK Broadband (Relish) and Callflow are low in comparison, at £253 and £460 per premises upgraded.

[7] Gainshare was an agreement between the programme beneficiary (network provider) and Local Bodies to access the expected clawback monies before the end of the take-up clawback period, with the monies to be used to fund further network upgrades.

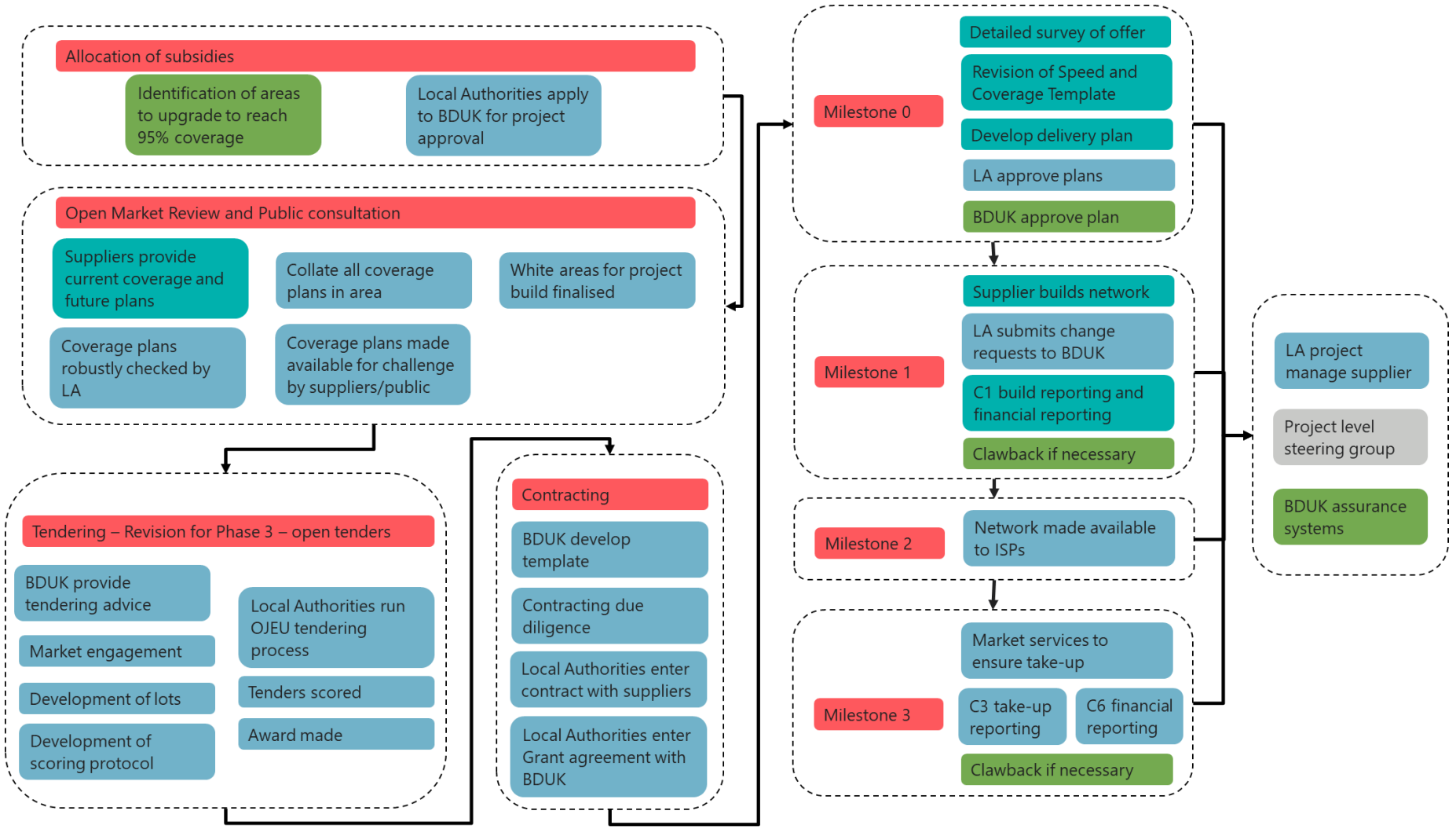
Table 2.2: Cost per contracted premises by Phase, provider and funder

Beneficiary	Phase	BDUK	LB	ERDF / Defra	Supplier capex	Supplier Opex	Gainshare / clawback	Previous underspend	Total
BT / OpenReach	1	£107	£115	£44	£89	£1	£9	£0	£366
	2	£191	£163	£11	£163	£36	£68	£94	£727
	3	£209	£209	£402	£560	£97	£144	£82	£1,703
Gigaclear	1	-	-	-	-	-	-	-	-
	2	£235	£235	£0	£1,279	£0	£0	£0	£1,749
	3	£235	£196	£29	£965	£19	£15	£96	£1,555
Airband	1	-	-	-	-	-	-	-	-
	2	£353	£353	£0	£81	£0	£0	£0	£786
	3	£391	£261	£223	£172	£0	£0	£0	£1,047
Callflow	1	-	-	-	-	-	-	-	-
	2	£137	£137	£0	£187	£0	£0	£0	£460
	3	-	-	-	-	-	-	-	-
Relish	1	-	-	-	-	-	-	-	-
	2	£47	£47	£0	£159	£0	£0	£0	£253
	3	-	-	-	-	-	-	-	-

Source: Cora Management Information, June 2020; figures may not sum due to rounding

2.3 Overview of Programme processes

The figure below presents the processes that are in place for the delivery of Phase 3 of the Superfast Broadband Programme. More details of the processes are provided below.



2.3.1 Resource allocation (how resources allocated to Local Bodies)

The aim of the resource allocation processes was to engage with Local Bodies where superfast broadband coverage was low. Eligible Local Bodies are identified on the basis of an ex-ante assessment (by BDUK) of the areas which require upgrades to reach the 95% coverage target and the gap funding requirement to upgrade each area in the UK. In Phase 1, BDUK funding was allocated based on local share of the projected gap funding required to reach the initial target of 90 percent superfast coverage in each area. In Phase 2, resources were allocated on the basis of the gap funding needed to reach the 95 percent coverage at the lowest cost (maximising the number of premises covered for the available subsidy). In Phase 3, the funding is being targeted at areas selected by the Local Bodies, which could include the remaining areas with below 95 percent superfast coverage. Local Bodies were asked to match BDUK resources with local funds on at least a 1:1 basis (including their own funds, ERDF funding and the Local Growth Fund). Local Bodies submitted an application to BDUK setting out the areas identified for the project, the match funding arrangements, known commercial plans in the area and the potential local benefits of the project. BDUK selected projects using the information submitted in these applications.

2.3.2 OMR & Consultation process

The aim of the OMR was to identify the future roll out plans of telecommunication providers and identify areas where no provider was currently planning to build superfast networks, to maximise additionality. Local Bodies were required to manage an OMR and public consultation process. This involved requesting plans from broadband providers operating in their area which showed the current coverage of their networks and their commercial plans to roll out the network in the next three years. The information was requested at a postcode level in Phase 1 and Phase 2, and at a premises level for Phase 3. The Local Body then analysed and collated this information to produce a complete picture of network coverage in their area. The Local Body was required to scrutinise the plans submitted by the providers, to ensure that the information was reliable and did not include strategic behaviour (for example one provider claiming they had plans to cover an area to prevent another provider building there through the project).

The public consultation process presented an initial identification of postcodes where there were no commercial plans to roll-out superfast broadband (‘white’ postcodes), postcodes where one provider was offering or expected to offer superfast broadband services (‘grey’ postcodes), and postcodes where multiple providers were offering or expected to offer superfast broadband (‘black’ postcodes). In Phase 3, a further category, ‘under review’, was introduced. This was for postcodes which were covered by one provider (a ‘grey’ postcode), but the Local Body and BDUK had concerns that the plans to cover the postcode were not robust. These postcodes could revert to ‘white’ during the project if the Local Body was not satisfied that the provider was going to deliver superfast coverage to the postcode over the lifetime of the project. Telecommunication providers and in some cases members of the public were invited to comment on the accuracy of the categorisation of postcodes.

Following the OMR and Public Consultation process, the white postcodes / premises in the local area were finalised.

2.3.3 Tendering Process

The aim of the tendering process was to receive high quality bids from providers that were capable of delivering the required network build. The Local Bodies entered a tendering process to commission a provider to deliver superfast coverage in the white postcodes. BDUK provided tendering advice and guidance to the Local Bodies prior to the process beginning. The tendering process in Phase 3 differed slightly from Phases 1 and 2 (as described in Section 2.2).

Prior to the tendering process Local Bodies had to undertake a market engagement exercise, where the Local Body would engage with potential providers to outline the requirements of the project and gather the views of providers. The Local Body was also given the freedom to decide how to disaggregate the project – a single contract (or lot) for the whole project, or splitting the project up geographically into multiple lots (allowing different providers to bid for different lots). The tendering process concluded with providers submitting bids and the Local Body selecting the preferred bidder.

2.3.4 Contracts

The aim of the contracting process was to ensure that providers delivered the required network build, whilst protecting the public purse. The Local Body would undertake some due diligence of the selected provider, to ensure that the provider was able to complete the work as stated. BDUK developed a standard contract template for Local Bodies to use in the procurement, which included all relevant information and clauses, and Local Bodies were encouraged to use this template as it would allow BDUK to provide support in contract disputes with the Programme beneficiary. However, Local Bodies had the freedom to use their own contract provided that it was State aid compliant. The BDUK contract included clauses for:

- **Implementation clawback:** Protections for the public sector against the risk that providers overestimated their build costs were put in place through the introduction of a mechanism to recover any underspend. The principle underlying contracts was that the provider paid first, then BDUK and lastly Local Bodies. In the event of any underspend, funds are returned to Local Bodies and BDUK through a clawback mechanism (the provider could opt to place these funds in an 'investment fund' to help resource further schemes, or extend the contract coverage to a greater number of premises than originally offered).

- **Take-up clawback:** Further protections for the public sector were introduced through take-up clawback clauses in contracts. If take-up proved to be higher than anticipated at the tendering stage then providers are required to return a share of the excess revenues to BDUK (and again, these funds could be recycled through an investment fund set out within the contract). In Phases 1 and 2, some of this clawback was recycled by the Local Bodies to spend on further digital infrastructure. This came in the form of an 'early gainshare offer' from Openreach where the provider provided an advance on assumed take-up clawback funds solely for reinvestment into their contracts.

The Local Body would enter into a contract with the provider, and receive a grant funding agreement letter from BDUK to demonstrate that they were receiving funds from BDUK.

2.3.5 Project delivery

The delivery of the project can be split into four main sections or milestone categories. These align with the drawdown process for grant funding received from BDUK.

The first stage, aligned to milestone zero (M0) involves the selected provider undertaking a detailed survey of the proposed build, to ensure that the postcodes do not have any existing superfast coverage and that the build can be completed for the value specified in the contract. If changes need to be made to the Speed and Coverage Template (SCT), the provider makes these in the form of a change request and resubmits a finalised plan to the Local Body for approval. The Local Body reviews these, and if it agrees to the changes will send the change requests on to BDUK for approval. Once all parties are satisfied with the changed plan, the final delivery plan is signed off.

The second stage of delivery involves the provider building the agreed network (M1). If during the course of the build the provider needs to make further changes to the delivery plan (for example timing or the

premises included in the project) they notify the Local Body. If the Local Body agrees to these changes, then they submit a change request to BDUK. Once BDUK are satisfied that the changes are justified the provider can deliver to the new plan and complete the network build. If there is an underspend in the project, the Local Body and BDUK can claw back funding. This is undertaken as part of the end of implementation review process once the full contract delivery has been completed.

The third stage involves the provider making the network available to other Internet Service Providers (ISPs), which corresponds to Milestone two (M2). The final stage of the project delivery is the service providers marketing the new network to promote take-up of superfast connections in the local population (M3). The provider needs to monitor take-up and provide reports to the Local Body on a quarterly basis (both financial reports and take-up reports), which are used to determine whether BDUK and the Local Body need to claw back any further money (through take-up clawback).

The overarching management of the project was undertaken by the Local Body, who worked closely with the provider to ensure delivery. Oversight for the project was provided by steering groups and projects boards, membership of which included BDUK. The make-up of these varied across projects, but usually included the Programme beneficiaries and various senior council members in addition to BDUK. Further oversight for the project was provided by BDUK, through the project directors, commercial, State aid and value for money assurance teams, which analyse and make recommendations about change requests and project progress

3 Delivery of the Programme

This section provides an assessment of how effective and efficient the delivery of the Superfast Broadband Programme has been. The section draws on evidence from qualitative interviews with Local Bodies, providers that have engaged with the Programme and an analysis of Programme Management Information.

3.1 Key findings

The key findings from the analysis of the processes used to deliver the Superfast Broadband Programme and recommendations for future Programmes *(presented in italics)* are:

- **Nearly half of the funding for Phase 3 contracts came from public sector match funding** (either from the Local Body or other Government funding sources). The increased dependence on match funding in Phase 3 (compared to Phase 2) may have led to some local projects being scaled down from their original targets. However, this does align with BDUK aim for the Local Bodies to become less dependent on BDUK to deliver local broadband connectivity projects. For more detailed information see Section 3.2.

  - The sources of match funding were described as having an impact upon where the local Superfast Broadband Project was targeted. Where match-funding was sources from DEFRA or EAFRD, the focus of the project was more likely to be on more rural areas, and where LEP or ERDF match funding was used the project area had to be more focussed on covering businesses. ***The appropriateness of sources of match funding should be considered alongside their availability***.

- In developing the business cases for funding, Local Bodies most commonly used national evidence which focussed on economic outcomes, and did not include public service impacts or impacts on households. Additionally, Local Bodies did not include potential disbenefits in their business cases. These additional impacts should be included in future business cases for publicly funded projects, and the findings from this evaluation should support this. For more detailed information see Section 3.2.

- There was a high level of engagement with the Open Market Review (OMR) process, and it appears that Local Bodies were able to secure responses from most of the telecommunication providers offering broadband services in the local project area. Although it was reported that some providers had difficulty in providing responses to OMR requests in the earlier phases of the Programme, this had improved by Phase 3 as the providers had grown and had more advanced software and processes in place. Therefore, Local Bodies should not be reluctant to ask providers for an OMR response in future projects. For more detailed information see Section 3.3.

  - There were some issues with the responses to OMRs being provided from wireless network providers being rejected. Although Local Bodies were theoretically correct to dismiss these responses, potentially more could have been done to communicate the reasons for the dismissal, to prevent a deterioration in the relationship between Local Bodies and wireless providers.

- Telecommunication providers faced some challenges in providing accurate responses to OMRs. Primarily, some large providers had difficulty in providing data and responses that were accurate or in the correct format (due to internal data quality and storage issues). It was reported that this has

improved over time, but still remains an issue. This was not an issue that newer, smaller providers faced, as the quality of the data they held was more robust. ***Therefore, Local Bodies and BDUK should continue to quality assure OMR responses from al providers.***

- Additionally, the investment cycles for many telecommunication providers were determined over relatively short time horizons (12 to 24 months) which did not match the OMR cycle, and that the areas eligible for investment were selected based on a static view of network provider's plans, which have evolved in response to regulatory innovation and growth in demand. This made it difficult for providers to deliver an accurate response as to where they may provide networks in future years. ***It may be beneficial to undertake OMRs at more regular intervals to improve the accuracy of responses, although this would increase the burden on providers, Local Bodies and BDUK.***

- **There was no evidence that utilising an alternative tendering and / or contracting approach to that recommended by BDUK had beneficial outcomes for Local Bodies, and lotted contracts offered better value** (in terms of the value for money achieved for the project or project delivery). It was reported that the alternative approaches to tendering were more resource intensive than the recommended approach. ***Therefore, it is recommended that Local Bodies follow the approach recommended by BDUK, and that lotting of contracts is utilised where possible in any future broadband delivery Programmes****, to improve cost effectiveness.* ***Building strong relationships with providers was seen as important to ensuring a good number of responses to tenders issued.*** For more information see Section 3.4.

- Most Local Bodies had utilised similar project management approaches, with day to day project managers overseen by steering groups / committees and where required support was provided by BDUK. This was described as an appropriate model to manage the contracts by the Local Bodies. A small number of projects described working with the Programme beneficiary as being partnership rather than a client-contractor relationship. These bodies felt they got more out of the provider on the delivery of the project with barriers addressed through close partnership working. This again reinforces that Local Bodies should work hard to develop and maintain relationships with providers. For more information see Section 3.5.

- The delivery of Phase 3 contracts has been delayed, with roll out behind where providers anticipated it would be. Some of the reasons for this were highlighted as being the capacity of Programme beneficiaries to deliver their contracts, the duration of time required to resolve change requests and the enforcement of milestone zero within contracts. BDUK has been working to develop new approaches to ensure change requests are resolved in a timely manner and this should help to resolve this issue, but ***Local Bodies also need to ensure that their processes allow for a rapid response to change requests and escalate significant change requests to BDUK expediently****.*

3.2 Allocation of subsidies

3.2.1 Business case development

Superfast gap funding was disbursed as matched funding with Local Body[8] funding matched by BDUK. However, Local Bodies were able to supplement funding for their projects through application to other grant Programmes or through other public funding sources. A number of other funding sources were described and utilised by many bodies including:

[8] Local Bodies are the Government organisations which delivered the Superfast contracts. These could be devolved national Governments or local authorities (or combinations of local authorities.

- **Other local sources**: Such as Local Enterprise Partnership (LEP) funding, Local Growth Deal funding or district council funding where projects were county council led.

- **Grant funding:** From both UK and EU sources, including European Regional Development Fund (ERDF), European Agricultural and Rural Development Fund (EARDF) and DEFRA funding.

In addition to those above, take-up clawback funding was utilised to top-up funding for Phase 3 contracts or to extend Phase 2 contracts. This process was seen to be an efficient mechanism to deliver publicly funded projects by most interviewees and the option to utilise this funding in this manner was appreciated, potentially avoiding some issues raising funding in later phases.

Whilst in general Local Bodies did not encounter many barriers to raising match funding for early phases, challenges were encountered in some localities when it came to securing Phase 3 match funding. In many cases, the extent of coverage to be provided in Phase 3 was limited when compared to ambitions as a result of the amount of Local Body match funding that could be secured. This was seen to be a result of wider resource constraints faced by Local Bodies, and not a result of a lack of commitment, with those seeking funding from district councils for Phase 3 particularly unable to raise as much as sought.

Local Bodies were required to submit business cases to justify the use of public funds for local projects. In general, Local Body interviewees explained that business cases, and those for Phase 1 in particular, were produced with the main aim of attaining as much coverage as possible from a limited budget and with limited tailored evidence required to substantiate the proposed benefits. Several interviewees stated that they used evidence produced at the national level where possible.

"There was a report produced nationally on fibre and how much it would cost to upgrade fibre broadband infrastructure. So, a lot of it went back to the same, sort of, base material, and source material." Local project lead

Most Local Bodies explained that the business case focussed on extending availability to residents as a key benefit, deriving from a decrease in the digital divide. Amongst the more tangible benefits emphasised most heavily in business cases were those associated with the strength of the local economies, including GVA and employment, with these particularly relevant where LEP or ERDF funding was sought. Only in a very small number of cases were disbenefits considered, with a handful of interviewees were aware of the potential for some of these to arise, but these were not included in the business case. Business cases for Phase 3 contracts, where required, were developed by updating the existing business cases, rather than developing a new business case.

"It's an investment in infrastructure which in time could allow everyone to benefit, but that's not the rationale behind it. The rationale behind it is to give people access. So, it might be working from home, it might be playing games, it might be watching the telly, or it might be for accessing health things, but who knows?" Local project lead

The development of business cases were in almost all cases done in conjunction with economic development colleagues and drew upon the wide range of stakeholders internally with business cases having to be approved by senior staff at the Local Body. In a small number of cases, this posed a challenge, particularly where Local Bodies were seen to be either particularly risk averse or required a more in-depth description of the expected benefits, which slowed down some early projects. Overall though, connectivity was a priority for Local Bodies and the Superfast Broadband Programme was seen to provide a helpful mechanism to achieve local aims.

Where funding came from multiple sources, Local Bodies were required to produce multiple business cases. For example, ERDF and EAFRD funding also came with business case requirements, albeit different requirements to those for the Local Body business case. These funding sources also came with associated emphasis on certain benefits. ERDF application involved a focus on the benefits to the local economy leading to Local Bodies emphasising and substantiating the potential business implications most prominently, whereas EARDF application emphasised wider benefits but specifically those relating to rurality, and social care as described by one Local Body. Interviewees did not highlight any particular difficulties in applying for these funding sources (although they required more information than needed to secure BDUK funding) and the resource required was deemed to be reasonable.

However, not only did other funding sources impact upon the business cases of projects, they also had implications for the direction of projects more generally. For LEP and ERDF funding, interviewees described projects being targeted more at business in general in an effort to realise those benefits as outlined in their business cases with ERDF funding in particular only being paid for eligible business premises. Both DEFRA and EAFRD funding also led to some projects being targeted more towards very rural areas through their emphasis on rural businesses.

"Because the ERDF funding is business related. ERDF aren't there to put superfast broadband in people's homes. They're there to help you put superfast broadband into businesses. So the ERDF funding focused very much on the economics and putting it into the SME market." Local project lead

As presented in Section 2.2, in Phase 3 of the Superfast Broadband Programme the proportion of funding coming from BDUK was lower than in Phase 1 and Phase 2 of the Programme, with nearly half of the funding for the Phase 3 projects coming from public sources other than BDUK (compared to under one quarter in Phase 2). The nominal value of match funding per premise to be upgraded is also higher in Phase 3 than previous phases (£976 in Phase 3 compared to £193 in Phase 2). This suggests that in Phase 3 of the Programme, the subsidies have been allocated to areas that could secure significant match funding, and reduce the level of reliance on BDUK funding (which was one aim of Phase 3 of the Programme).

3.3 Open Market Review and public consultation process

3.3.1 Supplier engagement

Interviews with Local Bodies highlighted some initial difficulties in engaging effectively with providers at the start of the Programme (the beginning of Phase 1). These were caused by a lack of existing relationships with telecommunication providers in their area, as these issues were not present where strong links were already present between the Local Body and local providers. This emphasises the reliance and added value of these relationships where they exist. All Local Bodies believed that they had improved their provider engagement over the duration of the Programme, with the development of local links with provider contacts key to this improvement.

Contact with providers was predominantly made via email at the time of the OMR process with subsequent telephone calls to chase a response in some places. Some Local Bodies stated that they would have liked access to a central list of contacts prior to their OMR process.

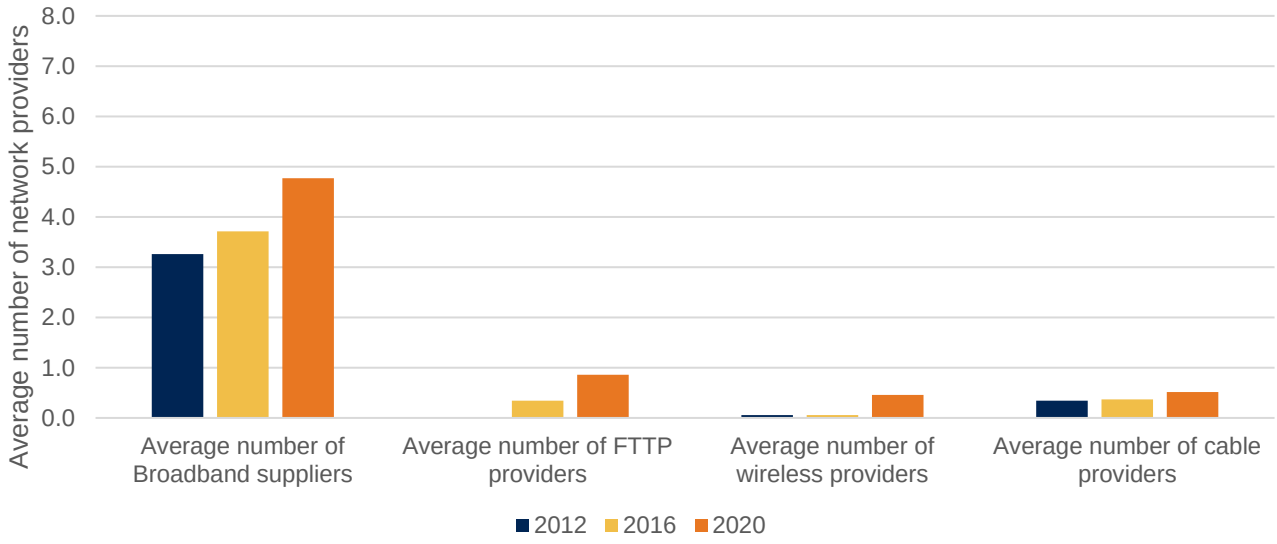
In terms of the responses to the OMR process, Local Body interviewees were in general happy with the number and, in particular, coverage of those providers responding. There was though a general consensus that coverage of the OMR was good enough even if only BT / Openreach and Virgin Media responded due to the extent of their coverage overall, unless an area also included a relatively large regional provider.

Alt-nets were most likely to respond in Phase 2 and 3 predominantly in the areas they anticipated delivering in and wireless networks were not responding to all requests (particularly in Phase 2, see Section 3.3.2) with this not considered cause for concern to Local Bodies as their coverage was limited and often not able to provide superfast speeds (see Section 3.3.2).

In most cases, between two and six providers responded to OMR requests and Local Body interviewees did not identify any particular issues with providers being able to respond within the allotted timeframes. In one case, an extension was allowed where a provider was approached last minute whilst another provider requested further time but did not respond at all in the end.

In 2016 in the Phase 3 Programme delivery areas, there was an average of between three and four providers which offered connectivity.[9] By 2020, this had risen to between four and five network providers. The majority of these providers were offering FTTC services. This aligns with the number of responses which most Local Bodies said that they received to their OMRs, suggesting that in most cases, Local Bodies did receive responses from most providers which operated in, or had plans to operate in the delivery areas.

Figure 3.1: Average number of broadband providers operating in Phase 3 delivery areas, 2012 - 2020



Source: ThinkBroadband data

Local Bodies described a degree of variation in the responses received from providers in terms of detail, with smaller providers viewed by one Local Body to be `overwhelmed with what was being asked of them'. Local Bodies reported that smaller providers were in many cases not able to provide the postcode level data required in early phase OMRs and subsequent UPRN data in later phases and instead submitted higher level plans. Local Body interviewees suggested that the certainty of these plans were variable and in some cases seen to be very ambitious (see below for wireless providers).

"I think each supplier potentially wants to give you the information in a different format, no matter how many times you tell them you want it in a certain format." Local project lead

[9] Based on an analysis of ThinkBroadband data and C3 and SCT coverage data

"Quite a few small, niche satellite and wireless providers... they've basically taken the view that they're not going to bother responding to OMR, and they haven't." Local project lead

Concurrent to this, some issues were highlighted by Local Bodies with regards to the accuracy of some data provided by larger providers. Openreach in particular was highlighted by Local Body interviewee as having provided inaccurate data on several occasions, seen to be driven by legacy systems (see below).

"We are having increasing problems with (network provider) ... the data quality of their internal systems is so bad that we have seen wild swings in the OMR responses from them, between our different phases." Local project lead

The consultations with providers indicated that there was a noticeable difference in the issues faced by smaller and larger providers, and the experiences of smaller providers do not always align with those described by Local Bodies.[10] Smaller providers often felt they were not engaged by the Local Bodies in the earlier phases of the Programme, and had to pursue the Local Bodies themselves after finding out about the Programme through the press or from BDUK. This was despite some of the smaller providers already working with some of the same Local Bodies on different projects. These smaller providers then found out about the OMR process after proactively contacting Local Bodies rather than the other way around. This is different to the engagement larger providers reported, with the largest providers reporting that the Local Bodies contacted them about the OMR and to ask for a response, in line with the description of the Local Bodies. Additionally, it was reported that in some instances larger providers were followed up with, chased for a response and granted extensions to the deadline in order to ensure that Local Bodies could get a response – although this level of engagement was not reported by smaller providers.[11] It should be noted that as the Programme has progressed (into Phase 3), providers reported that the level of engagement from Local Bodies has improved (in terms of being contacted to provide an OMR response).

As a result of this, and the responses some of the smaller providers received from Local Bodies, there was a general feeling that the Local Bodies were not interested in receiving a response from smaller providers. Two providers did state that the Local Bodies did not want to receive a response from them as it would jeopardise the size of the project they were able to deliver (as it would reduce the white postcodes).

Some of the smaller providers, and in particular wireless broadband providers, reported that their ability to provide robust and accurate responses to OMR requests improved over time. There were two reasons for this:

- **Technological advances in modelling software:** Providers had either developed their own or purchased more advanced modelling software, which enabled them to more accurately model which premises and postcodes their network covered at particular speeds (for example more accurately capturing how physical geography could impact on coverage). This increased the robustness of their OMR responses and reduced the time required to prepare a response.

- **Growth in the business:** Nearly all of the smaller providers interviewed reported that their company had grown since 2012, in terms of customers, turnover and number of staff employed. As the businesses now had more staff, there were often staff members within the company whose job role

[10] 'Larger' providers are the providers that were more established and with a larger customer base at the start of the programme in 2012. These were BT/Openreach and Virgin media (of the companies that took part in the consultation).

[11] This does seem a logical approach for the larger providers, as without their involvement the OMR results would lack credibility and reliability.

and skill set covered responding to OMRs. Therefore it was easier for these businesses to respond to the OMR request (reducing the opportunity cost of responding to the business).

In summary, smaller providers felt they were treated differently from large providers, both in terms of the leeway they were given to provide responses and the level of engagement they received from Local Bodies. As the Programme has progressed, the level of engagement with smaller providers, and their ability to respond has improved.

3.3.2 Robustness of information provided

As described above, Local Body interviewees expressed some concerns with the quality of the information provided by providers as part of the OMR processes. Responses provided by Openreach in Phase 1 were seen to have caused a myriad of issues later on in projects (and in subsequent phases) with the data being inaccurate. This led to areas included in the intervention area that already had superfast networks in some cases and areas being wrongly excluded in others. Premises level data was seen to be even less accurate with limited numbers of providers aware of their network at such a level. Overall, this led to a significant amount of resource on the part of the Local Bodies and providers to descope areas wrongly included once the project was underway. Management of change requests as a result of this stretched Local Body resources. This issue was somewhat less prominent in Phases 2 and 3 as the data supplied was described as having improved 'substantially' albeit with the lack of suitably granular data issues still present.

Alongside data inaccuracies, difficulties were evident in terms of recognising what were realistic and unrealistic expected delivery plans outlined in provider responses. Local Bodies described support provided by BDUK and the use of external consultants in a handful of cases. This support was used to fill in the gaps in the capabilities of Local Bodies who had little experience of this sort of activity and was received positively. One Local Body also mentioned the use of past delivery reports for earlier phases to validate responses.

Views were somewhat mixed but a small number of Local Bodies would have liked more power to disregard some claimed expansion in network coverage where they felt the provided plans were unrealistic. These Local Bodies pointed to a number of areas in their locality that were put under review following the OMR and referral to the National Competency Centre (NCC) (marked as grey and monitored) and have not been delivered to through the commercial plans outlined in the OMR. This implies that the general process to discount provider responses was relatively cautious, particularly in the early stages. Local Bodies highlighted that the process became easier in later phases as they got used to dealing with provider responses and had more information from which to assess them.

In addition, several Local Bodies outlined some suspicions of 'gaming' by providers leading to an overstatement of commercial plans in an attempt to discourage competition thus contributing to the issues above. Local Bodies cited areas where providers claimed they were / had rolled out Superfast coverage to in their OMR response, which now do not have superfast broadband coverage.

"We have another wireless operator, who quite aggressively responded to all our OMR's, and very generously stated their existing and potential future coverage, which has some issues, basically, they land-grabbed, if I can put it that way." Local project lead

The static nature of the OMRs, completed at the outset of each phase, posed a barrier to the OMRs ability to provide an accurate reflection of commercial coverage in the views of many Local Bodies. Some of those interviewed pointed towards the delivery of superfast broadband infrastructure in white areas by providers that responded to OMRs (stating they would not build in white areas) as evidence of this. In

addition, wireless network providers were seen to be most readily able to change plans at relatively short notice and could encroach upon white areas. One Local Body proposed regular reviews of the landscape after the setting of the intervention area, to include consultation with providers, in an effort to remain informed of changes in commercial plans.

"I think three years is an incredibly long time to expect things to remain as they were, you know, here we are in 2019 and we are still working on the basis of a data set that we collected in 2016. You know, if you think where the market, particularly around full fibre, it's exploded in the last two years." Local project lead

"So, we did the OMR back in June 2016. Subsequently, we had that drive to 95, (network provider) built a whole load of cabinets and communities they weren't planning on going to originally as part of the OMR. And lo and behold, it turns out those communities are actually in our intervention area, and we were planning to go into them as part of the BDUK Programme." Local project lead

A large number of providers reported that they had difficulty in providing data for the OMR for their future plans, as these were not always set out for the next three years. This was the case for both smaller and larger providers. This could be because the providers did not have robust plans for future deployment for the next three years (for example being more responsive to customer demand and building rapidly), or their plans were not specified in sufficient detail to be included. One provider stated that they could only provide (or were only willing to provide) concrete roll-out plans for 12 months, and not the 36 months requested – and their less robust plans for months 13-36 were rejected by Local Bodies.

Additionally, providers with future roll out plans could see these plans change depending on commercial considerations, meaning that OMR responses were just the best estimate at a specific point in time. This meant that these providers could not include their future plans in the OMR process, which could potentially lead to difficulties with overbuild and the additionality of the Programme.

Wireless broadband providers had further problems with the OMR process. Many had their responses rejected by Local Bodies (all wireless providers spoken to). The most common reason was that the Local Bodies did not recognise their technology as suitable to provide superfast speeds. This was despite providing evidence to the Local Bodies to the contrary. Providers reported that this additional evidence included providing additional technical details about their network, technical demonstrations of how their network operated and the speeds that could be achieved by customers on the network, and details about the business case of their company. They reported that they did not feel that wired broadband providers were subject to the same level of technical scrutiny, and therefore it was more expensive / time consuming for them to provide responses to the OMR process.

The wireless broadband providers said that the reasons for rejecting their OMR responses were based on historical views of wireless networks that were outdated, and advice from external consultants. Others felt they were excluded and Local Bodies provided the reason that their business case was not solid. The providers felt this was not a fair assessment, evidenced by the fact that they have now built where they said they were going to. This view opposes the view of the Local Bodies that they were cautious when disregarding OMR responses.

Despite the concerns raised by the wireless providers, there are reasons why the Local Bodies (and to an extent BDUK, in terms of guidance) took this approach. These are:

- Wireless technologies require external aerials on premises with a line of sight to the station supplying the broadband signal. Without this line of sight (or using internal aerials), connection speeds can fall

below Superfast speeds – therefore the line of sight needs to be guaranteed for the premises claimed to be covered. This is not needed for wired solutions.

- The ability to deliver Superfast speeds from wireless networks depends on the number of households connected to the network (this is also the case for wired solutions) – therefore claiming coverage of a very large area with wireless solutions required some confirmation that the network had the technical capabilities to cover this number of households.

- In the earlier stages of the Superfast Broadband Programme, wireless providers could be operating on parts of the radio spectrum which had licence exempt status, which meant that there was no guarantee of service through Ofcom. Therefore, the Local Bodies would examine the networks to try to establish that the Superfast service could be guaranteed. More recently, a wider and better range of wireless options have been made available on radio spectrum, meaning that wireless network providers are not licence exempt (and customers have recourse to go to Ofcom) and the connection speeds / number of households that can be served have improved. This means that now wireless networks are more able to provide reliable broadband connections at the required speeds.

There were further difficulties with the OMR process in that there was a change in Physical Infrastructure Access (PIA) agreement with Openreach, which made areas more distant from existing networks more commercially viable for providers.[12] This change was not factored into their original OMR responses, which meant that the responses were no longer the best representation of their roll out plans.

A final issue raised with the OMR process is that there was sometimes a mismatch between the time period covered by the OMR (three years) and the time period covered by the delivery contract (which could extend beyond the three year period covered by the OMR).

Providers delivered evidence of commercial plans being rolled out in areas designated as white.[13] They suggested that this showed there were some issues in the robustness of the OMR process, or of strategic behaviour from providers.

Despite the static nature of the OMR and the duration of the OMR process (three years) causing some issues for the Programme, the providers could see that there needed to be a lengthy period for the OMRs to support Programme delivery, and felt that all in all a three year approach was a reasonable compromise between accuracy and being able to deliver the projects.

Providers were split on the duration of time required to complete an OMR response. Some small providers claimed that it was very time consuming and potentially detrimental to their other business activities (taking several members of staff numerous days to complete). However, others felt it was a straightforward exercise to run off the required data, particularly for their current infrastructure. Most felt that this was easier in later stages, when organisations had got used to completing the responses, and many had introduced new software that made it easier to complete (as mentioned above).

3.3.3 Responses to public consultation

Many Local Bodies and providers highlighted that the public consultation process was mis-named, as it was not intended to be a consultation for the public. It was intended to be a process through which providers and Local Bodies could review the plans to make sure they felt their submissions were accurately

[12] This relates to the Ofcom revision to Duct and Pole Access (DPA), which began in 216 and was adopted in 2018/19.

[13] These were either areas where OMR responses had been disregarded by Local Bodies, or where commercial roll out plans had changed.

represented and they could assess where the project could operate. However, in many areas some members of the public did respond to the consultation exercise.

Local Bodies experienced varying degrees of engagement to the public consultation overall. In around half of local areas they reported that they did not experience any engagement with the public consultation by the general public. As part of Phase 1, interviewees did highlight some members of the general public using the consultation to air frustrations they may have at their area not being included as an eligible area. These areas did not see any changes resulting from the public consultation. In other areas, the public consultation generated more engagement from the public regarding the inclusion / exclusion of areas. In one case this resulted in the re-inclusion of around 1,000 premises reclassified white in Phase 3. Where engagement was wider, it was in those areas that placed a larger amount of resource in delivering it. Accompanying marketing and publicity in these areas were associated with more responses.

Amongst the other responders to the public consultation in several areas, described by Local Bodies, were smaller providers who, it was suggested by Local Bodies, may have been unable to respond to the OMR adequately.

Most providers interviewed stated that they viewed the combined OMR responses that were presented as part of the public consultation exercise. However, few reported that they responded to this to the Local Bodies. This was due to them seeing no need to respond if the combined OMR responses accurately reflected their responses.

However, this is not to say that the public consultation exercise was not useful to some providers. One provider stated that by observing the areas that were categorised as white and knowing the Programme would look to cover the maximum number of properties, they could identify where the Programme was likely to build. Therefore, they chose to build their own networks elsewhere, to avoid competition with subsidised network build.

3.4 Tendering and contracting[14]

3.4.1 Procurement models and lotting

For Phases 1 and 2, Local Bodies predominantly used the BDUK framework to procure the provider services to deliver the infrastructure. This approach in practice restricted the number of possible bidders. In the small number of cases not using the framework for Phases 1 and 2, either a competitive dialogue or OJEU notice was used, with some of these occurrences before the standard framework came into being. These approaches would have led to responses from either one provider or a small number of respondents (two to three).

Local Bodies highlighted some benefits of the framework in that it had been developed specifically for this Programme and was in keeping with State aid requirements. Most Local Bodies stated that they did not possess the skills or resource locally to be able to design and apply such frameworks effectively with many new to this type of procurement.

"Absolutely, and we just didn't have the capacity or resource to do anything other than that, to be honest." Local Body utilising BDUK framework for procurement

[14] BDUK provided guidance to Local Bodies as to the recommended approach to tendering and contracting. However, as the projects were run by the Local Body, there was no obligation to follow this approach, and therefore not all projects followed the recommended approach.

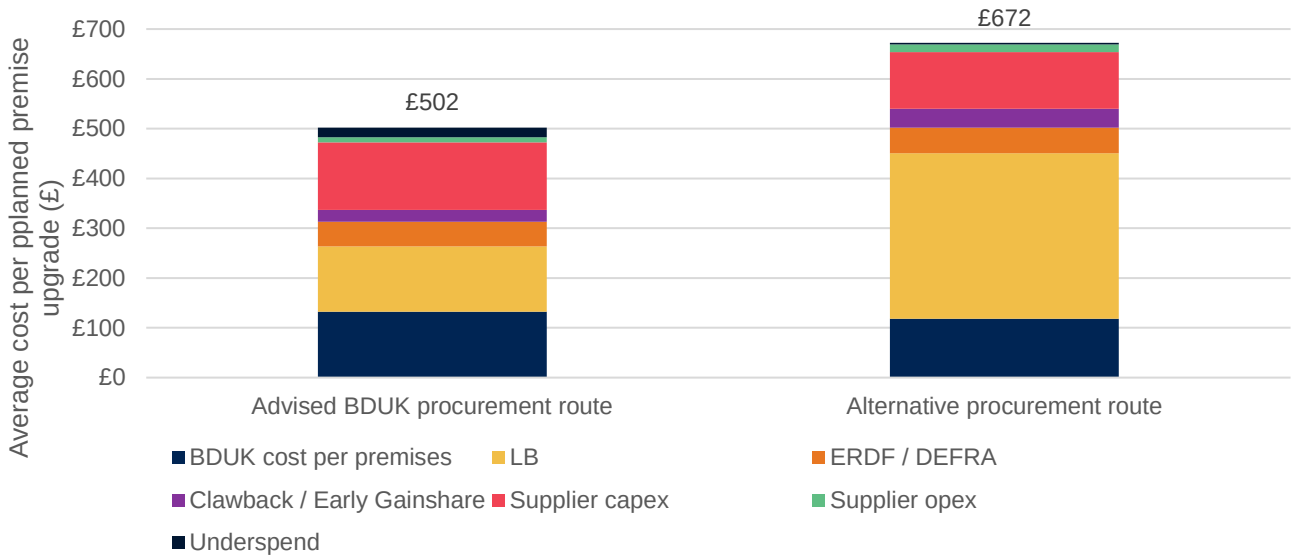
"So, we felt that we would be better going with the framework that would save us money, effectively." Local Body utilising BDUK framework for procurement

A total of three Local Bodies described a competitive dialogue process for their Phase 1 procurement. One of these Local Bodies described their intention to work through their specification with two or three providers to reach the most preferred option with one provider, however they found that there were not enough alternative providers willing to work with the body to generate a realistic second or third option. They found that this approach required a lot of energy in terms of engagement to produce a similar result to what they could have achieved through an open tender. Two other Local Bodies used a competitive dialogue process to better effect however. One was able to 'whittle' their options down to a single provider through competitive dialogue following an initial Pre Qualification Questionnaire (PQQ) stage that eliminated unviable providers. One further Local Body had eight bidders at the first stage. This was converted to three refined solutions before two final bids were submitted. This Local Body found the process worked effectively, with them iterating plans successfully with providers. Initial contact with providers in this case was made through existing contacts Local Body staff held with private industry, having previously worked in the private sector. They described the advantage of the competitive dialogue process as being a means through which they could define the most preferred route to achieve their aims. They described having little knowledge at the start of the process as to how best to achieve their aims and the iteration of plans with providers somewhat filled this gap.

"It helped us an awful lot to understand what the market was offering or could offer, and narrow that down stage by stage into something that was going to deliver what we wanted." Local Body using Competitive Dialogue approach to tendering

When comparing the relative value for money offered by different procurement routes, the Management Information suggests that all contracts tendered through competitive dialogue were won by the same provider, and that the average cost per premise delivered to was higher. This could be due to the specific areas that the small number of contracts awarded by competitive dialogue cover (more large, rural and dispersed areas), but this evidence, and the evidence from the interviews does not suggest that utilising an approach other than that advised by BDUK provides better value for money for Local Bodies. However, the additional cost for these projects was borne by the Local Body, with similar values of BDUK and provider funding being used for projects using the advised and alternative procurement methods.

Figure 3.2: Average cost per planned premise to be delivered to by procurement route



Source: Cora Management Information, June 2020

Phase 3 OJEU procurements were used by Local Bodies, in addition to meet state aid requirements, to target specific areas and / or clusters with the ability to target faster connection speeds, but the main benefits were expected to come from increased competition. Lotting[15] was used in some areas to try to encourage further competition but views on its effectiveness were mixed with some areas forgoing this entirely given a lack of feasible geographic splits of the target areas. Where lotting was used, some Local Bodies think it may have marginally increased the number of responses.

"I guess the other difference we found was under the first contract, because there was very little competition, there was no competitive tension really in the procurement, we didn't get a particularly good deal in terms of the amount of funding that [beneficiary] were putting into the delivery.

"So, we've had a number of alternative network providers for one or other of our contracts."

"So, it was something like 90% of the costs of Phase 1 were public subsidy, whereas in the later phases... it's something, like, 30% of the costs is public subsidy... the level of interventions in the private partner is much higher." Local Body which did not lot contracts

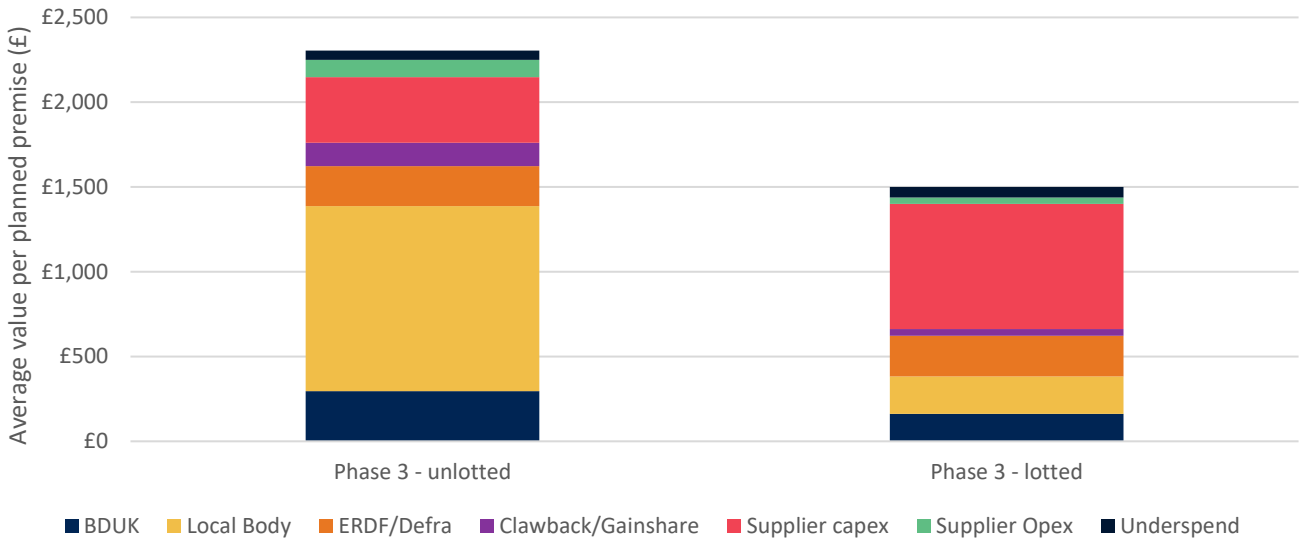
Activities to engage providers were more notable for Phase 3 procurements with Local Bodies describing provider days before and after tender and consultation with providers before to refine the tender. The approach to lotting was also taken in conjunction with provider consultation in one area. The conclusion they reached following provider engagement was that the lots should be around 18,000 premises in size and geographically consistent. Another Local Body used market engagement before the public consultation to explore options for lotting but based upon feedback did not apply a lotting approach to the procurement.

[15] Lotting is a process by which the Local Body divides their broadband project into multiple contracts (lots) rather than one single contract

"Actually, interestingly, with the exception of one, they (suppliers at the engagement event) all concluded, that it should be a single county lot...(because) you couldn't create that, kind of, small artificial boundary. It just wasn't a practical thing." Local Body which did not lot contracts

One potential benefit of the increased competition from lotting contracts was thought to be an increase in the value for money the contracts would offer Local Bodies. An examination of the Management Information shows that in Phase 3 of the Programme, Local Bodies which used a lotting approach to contracts had a lower average cost per planned premises delivered to, and a higher proportion of the value of the contract being provided by the provider than in unlotted contracts. Part of this could be due to differences in the geographies of lotted and unlotted contract areas (as described above), but it does suggest that lotting contracts has had a positive impact on the value for money Local Bodies were able to receive for their contracts (see figure below). This finding was also described in the interviews with the smaller Superfast Broadband Programme beneficiaries, who indicated that they were willing to submit bids that had a large degree of self-finance involved.

Figure 3.3: Average cost per planned premise to be delivered to, lotted and unlotted contract areas



Source: Cora Management Information, June 2020

Local Body interviewees highlighted a good degree of engagement from providers to Phase 3 procurement exercises with several bodies receiving five or six Expressions of Interest (EOIs). However, these ultimately translated into much fewer responses, between one and three, to the full tender.

These findings are consistent with the responses to the provider interviews. Providers described a much higher degree of engagement with Local Bodies before and during the Phase 3 procurement process. All the providers spoken to described being invited to and participating in provider engagement days with Local Bodies.

The providers did make suggestions for the size of lots. In general, smaller providers would prefer smaller lots, however there was an acceptance that the lots needed to be a suitable size to make them worthwhile bidding for, and for the management burden to Local Bodies and providers (it is more difficult to manage a large number of small contracts than one large one).

The smaller providers stated that they would be more able to bid for contracts following dividing up some of the areas (into lots). This was because they would not have the resources or capacity to deliver contracts across the whole Local Body area, and therefore would not have put in a bid for the contract. Therefore, in this respect the lotting approach did increase competition, as it encouraged more providers to put in bids for contracts.

However, when the ITTs came out, there were still large restrictions on which organisations could apply (turnover of applicants and other qualification criteria). This restricted the level of competition that was possible, but again providers were generally understanding that there needed to be some restrictions to provide reassurance that the publicly funded networks would be completed.

3.4.2 Tendering and awards process

Providers felt that for the tendering processes using an OJEU notice they were involved with, the information provided by the Local Bodies was very clear. The documents set out exactly what was required and how the tenders would be scored. The providers felt that, although the tenders were substantial documents which required a lot of inputs, there was sufficient time allowed between the issuing of the ITT and the submissions deadline.

"Yes. Very clear. The bidder scoring is very detailed in the ITT documents, and then the three or four that we lost, the Local Body sends you your score compared to the winning bidder so you can see where it was you scored lower." Project applicant

The providers stated that it was very time consuming to complete the tender documentation. The cost of putting these together was in the tens of thousands of pounds in terms of opportunity cost (staff time that could have been spent on other work). One provider engaged a sub-contractor to write the bid, at a significant cost to the company. However, they felt that this was appropriate, as the contracts were often multi-million pound contracts.

However, some providers were unhappy with the clarity of the scoring. One provider queried the decision made (after the provider was excluded from the process) as one of their files did not upload correctly. Others were unhappy with how different Local Bodies interpreted the scoring criteria, suggesting that they knew who they wanted to award contracts to and made up the scoring to arrange this. An example of this was one company submitting similar responses to the same questions in two Local Body areas, and seeing their scores differ by 120 percent.

Multiple providers stated they had issues uploading documents from Mac computers, which caused difficulty in getting tenders submitted.

3.4.3 Contracting

In terms of the use of the BDUK contract structure, nineteen Local Bodies stated that they used the BDUK contract structure, for at least one phase, with minor amendments. Where amendments were made, these were described as being made to ensure the contract reflected the Local Body needs, for example tagging of postcodes to local authorities and reflecting the priorities of the local council. The Local Bodies that stated they did not use the BDUK template had used their own because their original project predated the template and they continued to use their own contract. Local Body interviewees who made use of the BDUK templates were positive in describing it, stating that a major benefit was that it was state aid compliant, so they did not have to use resources ensuring their own contract complied with State aid decisions – meaning that using this was cost-effectiveness for Local Bodies while still offering a degree of

flexibility. This was welcomed by a number of Local Bodies, who also praised the support of BDUK in implementing those.

Whilst Local Bodies overall viewed the support provide by BDUK throughout tendering and contracting positively, there was a view that the dissemination of guidance documentation could be tweaked. Interviewees described some difficulties being able to quickly access the information they need due to the amount of info available and they mentioned some instances in which guidance and templates had been updated but which were not clear leading to some wasted effort on the part of the Local Body. Documentation was described as being made available online by BDUK with version control an issue as guidance was updated.

Local Bodies did not highlight any particular issues with getting contracts signed in a timely manner, particularly where the BDUK framework was used and the provider was au fait with the information required and the clauses included within the contract.

Value for money was seen by Local Bodies to be protected most notably through the clawback mechanisms in place as part of the contracts. As mentioned previously, in many places underspend has been re-invested to expand coverage. The majority of Local Bodies were also expecting to receive substantial amounts from take-up clawback, particularly from Phase 1 contracts.

The Programme beneficiaries were generally satisfied with the contracting process, although they stated they had no power over the contracting terms as they were stated in the tender documents (in Phase 3). However, providers did have the opportunity to contribute to what was included in the contract through provider engagement held by BDUK. This led to changes in the contracts compared to the contracts used in Phases 1 and 2. These included the way in which milestones were enforced, such as Milestone 0 (validation of build plan). In Phase 3, this milestone was more strictly enforced with providers requiring a complete validated build plan before any physical work on the contract could begin (previously they reported being able to start physical work and amend the build plan on an ongoing basis).

One provider stated that the enforcement of Milestone 0 in the contract had caused delivery issues, mainly the ability to complete build within the allotted contract length. This is because the validation of the build plan often took a long time, and in that period no actual building work could take place. They reported that the approval of the build plans was outside their control, but impacted on their ability to fulfil the contract. Another issue with the contract was that they took longer to get signed than stated in the tender documents. However, this was a minor issue as it did not impact upon their ability to deliver the contracts to time.[16]

The providers were satisfied with the clawback mechanisms in the contract, and appreciated why there was a need for the mechanism. There was only one minor criticism of the mechanism, which was the duration for delayed projects. The clawback mechanism runs for seven years from the end of the project – but for projects with significant delays to the end point of the project this meant the clawback period ran for longer than anticipated. This would mean the financial modelling which underpinned the initial bid for the contract was inaccurate.

The Management Information analysis presented in Section 2 of the report shows that the clawback mechanisms have contributed significantly to the funding of Phase 3 projects, representing five percent of the cost of Phase 3 delivery. This is lower than in Phase 2 of the Programme, but this would be expected,

[16] It should be noted that this provider had proposed the stricter enforcement of milestone 0 in the provider engagement events.

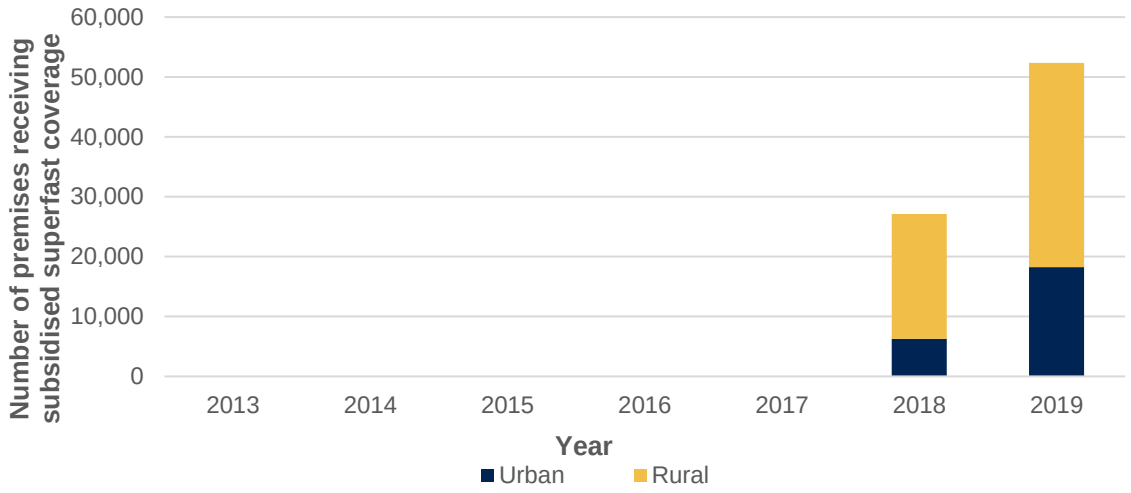
as Phase 2 contracts were more accurately budgeted given improvements in knowledge around take-up and improvements in the robustness of the data used in the application and OMR processes.

3.5 Project delivery

3.5.1 Delivery of Phase 3 contracts

Delivery of upgrades in Phase 3 began in 2018, as illustrated in the figure below. Analysis of Management Information provided by BDUK showed that 79,100 premises received subsidised coverage by September 2019. This represents around 17 percent of the contracted premises to be upgraded and indicates that delivery of Phase 3 was behind schedule. While some contracts are not due to complete until 2024, 18 of the 51 contracts – accounting for 93,600 premises upgraded – were due to be completed by September 2019. A further ten contracts (accounting for a further 60,600 premises upgraded) were originally scheduled for completion by December 2019.

Figure 3.4: Number of premises receiving superfast (30Mbps) subsidised coverage by September 2019, Phase 3



Source: C3 reports, Ipsos MORI analysis. Note that delivery has been assigned to the period covered by the relevant annual Connected Nations report and do not always cover a 12-month period.

Qualitative research with Local Bodies and network providers awarded contracts explored the factors driving these delays:

- **Change requests:** A key explanatory factor put forward was the need for formal requests for changes to contracts (discussed in Section 3.5.5).
- **Capacity:** Interviews with Local Bodies highlighted a perception that there were some issues with a lack of capacity amongst providers throughout the Programme (discussed in detail in Section 3.5.3).
- **Milestone Zero:** Contracts awarded through the Programme included an initial milestone (Milestone 0), to validate the build plan. In Phase 3, this milestone was reportedly more strictly enforced, with providers required to complete validated build plan before any physical work on the contract could begin (discussed in Section 3.4.3).

3.5.2 Local Body project management

Local Bodies all maintained similar regular management activities throughout the lifetime of contracts with interviewees describing regular meetings which included the provider. These meetings included quarterly delivery boards and, in some cases, weekly contact to aid implementation. More regular informal calls were described by local project leads, particularly in cases where delivery was delayed or at risk. In general, Local Bodies managed projects with one or two key staff members acting as project managers, from IT and / or economic development backgrounds. One Local Body referenced taking a PRINCE2 approach to its management.

Steering groups / committees were organised in all cases with these including the Local Body leads, provider representatives and often included councillors. These were described as more strategic group meetings which would involve the elected members and more senior members of staff who needed updating on progress and issues. Implementation meetings were more frequent and used to address delivery concerns and remedial plans, with one example of these occurring more frequently when Phase 2 contracts for a Local Body entered default. These would typically involve the Local Body leads, provider staff and BDUK. One Local Body described the addition of other departments such as planning and highways in relevant implementation meetings to unblock or assess issues related to those departments.

Ongoing contract management by Local Bodies also included assurance activities. These involved the checking of provider invoices and the delivery of work, through site visits or audits of provider provided information. This was often delivered by a small internal team but in very few cases was contracted out to external consultants at cost to the Local Body.

Three Local Bodies described their relationship with providers (particularly OpenReach) more as a partnership rather than a client-contractor relationship. These Local Bodies felt they got more out of the provider on the delivery of the project with barriers addressed through close partnership working. In one case, this was seen to have led to more premises being delivered than originally set out.

The providers generally confirmed this approach to project management. One provider would nominate a delivery manager, a contract manager and a finance manager for each project, and a regional director to oversee a wide range of projects. The delivery manager would be responsible for working closely with the Local Bodies. Most delivery managers would be responsible for up to three local projects. The delivery managers would have at least one meeting in person with the Local Body project manager, and ongoing contact with them. The contract and financial managers were less involved on a day to day basis, but became involved with specific issues in the project and invoicing / payment issues. For other, smaller providers, there would be a general / project manager for each project, responsible for all aspects of the project. These project managers would receive support from other departments in the organisation.

3.5.3 Capacity

Local Bodies described limited local resource from which to draw on for the management of contracts internally. This led to some activities being contracted to external consultants. As mentioned earlier, the management of contracts involved colleagues from multiple departments within the Local Body, most notably economic development, IT and legal / finance. Activities for the Superfast Broadband Programme were on top of their day to day responsibilities, but most Local Bodies felt that they were able to balance resource requirements to a satisfactory degree.

Interviews with Local Bodies also suggested there were some issues with a lack of capacity amongst providers throughout the Programme. In particular, civil engineering capacity was seen to be limited with the contracts stretching sub-contractors delivering the infrastructure on the ground. Interviewees saw this to be the result of the scale of delivery nationally. In some cases, alt-nets were not considered to have had the resource to expand in contract areas as quickly as anticipated and lacked the organisation to effectively apply for wayleaves etc thus delaying contracts.

“Well, we've already missed the time when we hoped the entire build would be completed. They have had capacity issues with subcontractors to actually do the work.” Local project lead

Some frustrations were also apparent on the part of Local Bodies in relation to the amount of time planning of changes could take amongst providers with a perceived lack of planning resource.

Some of the criticism described above was acknowledged by the providers who delivered contracts. One provider stated that they had issues with their subcontractors, in terms of them having the capacity to deliver the work specified in the contracts, the quality of the work provided and their ability to manage the contracts. One of the reasons behind this issue was that the provider had to start working with new subcontractors as a result of winning the contracts. As they did not have existing relationships and a large supply of future work after the contract, these new providers did not provide the service needed to deliver the Superfast Broadband Programme contracts. However, there were failings at the provider to properly manage the relationships, ensure that there was sufficient resource to deliver contracts and quality assure

the work delivered. As a result of these problems the provider has changed their internal processes and are more confident of successful delivery in the future.

Another large provider of Superfast Broadband Programme contracts stated that there had not been significant issues with build capacity for the Programme. Where there have been delays, these have been due to contractual issues (for example delays with milestone zero) and change requests (for example having to rescope project delivery). They did not recognise the planning issues raised by the Local Bodies. It was not possible to reconcile the differences in opinion between the large providers of local projects and the project leads through quantitative data (the change request log).

Most of the providers consulted indicated that the project had not had an impact on their ability to deliver commercial contracts, or other BDUK contracts. This was the case for both providers who delivered Superfast Broadband Programme contracts and those that did not. Large providers explained that they used tier one (large) subcontractors, which were able to absorb any additional capacity. But also that the Superfast Broadband Programme timings tied in with other types of delivery finishing, so there was capacity within their supply chain.[17] Smaller providers described how they used smaller, often local subcontractors with a different workforce to the tier one subcontractors, and therefore they did not feel any effect of the Programme on labour supply for their commercial deployment. However, as mentioned above, one provider did report capacity issues due to working with new providers to meet the demand the Superfast Broadband Programme had created.

The skills needed in the workforce as a result of the change in focus to faster speeds in Phase 3 was also explored. However, all providers stated that there were no differences in the skills required by the workforce to deliver networks capable of delivering faster speeds – therefore the change in focus of the Superfast Broadband Programme had no adverse labour supply issues.

3.5.4 BDUK Programme management

Local Bodies were positive when discussing their relationships with BDUK, although some Local Bodies felt the level of support from BDUK had reduced in recent years. However, this was intended by BDUK, who wanted to make Local Bodies take more responsibility for the local connectivity projects they were delivering. Overall, Local Bodies were happy with the degree of support provided and that provided through their designated contact. BDUK were seen in one case to have *"functioned well to offer advice, and guidance, and support to the council in something that obviously the council can only really have a limited level of understanding of how these processes work"*. This idea of the council land BDUK acting as partners with the latter providing support and assurance was prevalent across Local Bodies.

BDUK support was described by Local Bodies to have been provided through a combination of participation of contract leads in regular implementation meetings and through the provision of guidance and templates. Support was more intense when issues arose for example where contracts go into default with regular attendance at meetings designed to understand and resolve delivery constraints.

3.5.5 Change requests

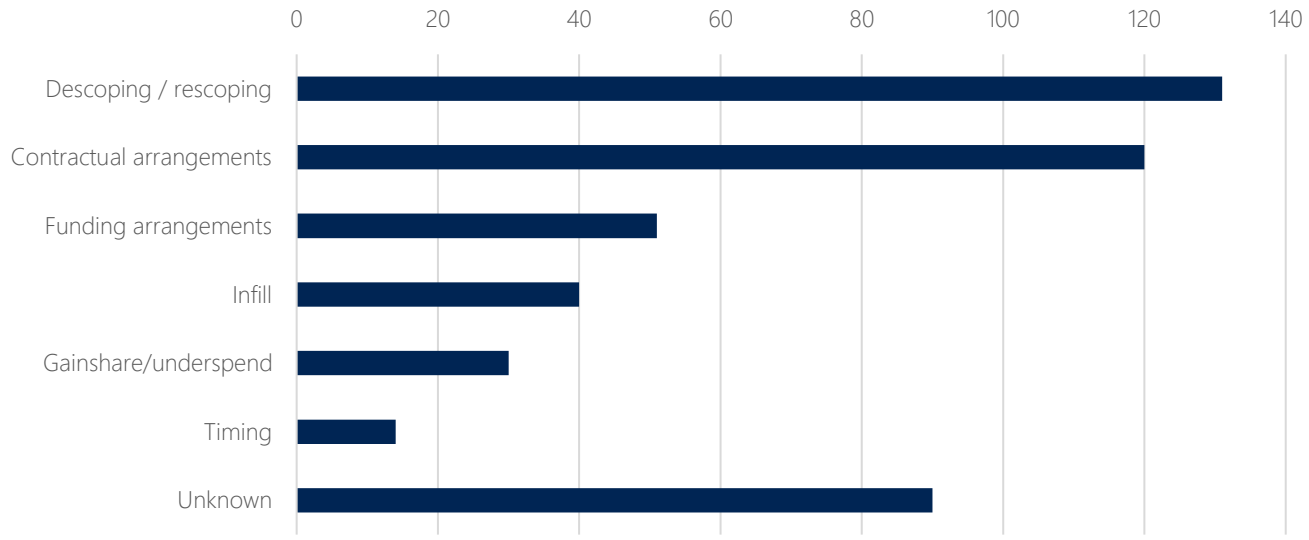
A summary of change requests was made available to the research team and have been analysed. These were taken from the Change Request pipeline. The pipeline is a summary of change requests submitted to BDUK.

[17] It is not clear whether this other programme would have continued in the absence of the Superfast Broadband Programme.

The analysis of the change requests showed that there were 476 change requests submitted to BDUK up to September 2019. Nearly all Local Bodies were recorded as having submitted at least one change request to BDUK. The number of change requests ranged from two to 19, with 21 Local Bodies submitting ten or more change requests to BDUK. However, this understates the actual number of changes, as some change requests included multiple changes rolled into a single request. Additionally, not all change requests are submitted to BDUK for approval. There are a number of change requests (minor changes, which do not affect delivery, timescales or funding) which are agreed between the Local Bodies and providers directly, and do not require BDUK approval. These are omitted from the pipeline.

The identified reasons for the change request have been analysed, and the results are presented in the chart below. This shows that the most common identified reason for a change request was reasons for descoping and / or rescoping, followed by contractual issues (such as moving premises between Phases of contract, re-drafting contractual documents such as Project Financial Monitoring or terms and conditions, milestones etc.). The qualitative interviews with Local Bodies confirmed that this pattern of reasons for change requests was accurate.

Figure 3.5: Reasons for change requests[18]

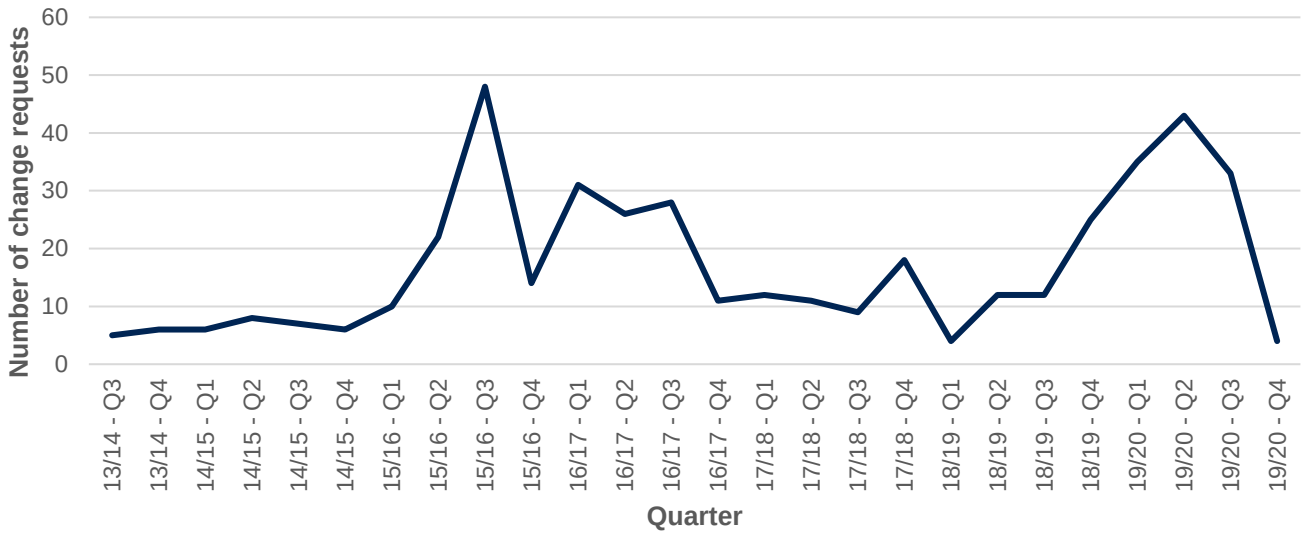


Source: BDUK management data.

The timing of the submissions of change requests to BDUK has also been explored. This shows that since October 2013, there has been at least four change requests submitted every quarter, peaking at nearly 50 change requests in October to December 2015. However, for most quarters (16 quarters) there were fewer than 15 change requests submitted.

[18] Descoping / rescoping were Change Requests which involved taking premises out of build plans or adding new premises into build plans; Contractual arrangements were change requests querying the contract being used; Funding arrangements were change requests about the level of funding; Infill were change requests about connectivity delivered between white postcodes; Gainshare / underspend were change requests about the use of gainshare or previous underspend funding, and Timing were change requests about the timeline of delivery.

Figure 3.6: Change request submissions over time



Source: BDUK management data.

Change requests were viewed by Local Bodies as being resource intensive to manage overall with the responsibility on the Local Body to manage these with assurance provided by BDUK. Local Bodies described many occasions where change requests were approved with these driven by a multitude of factors including the descoping of areas wrongfully included or other delivery constraints such as delays to delivery of the infrastructure (see below). In general, these were described as being processes that take months to finally approve. In one case, change requests were seen to remain in discussion for up to 3 years with a reluctance on the part of the provider to approve these that was not entirely understood by the Local Body. BDUK were seen to be supportive in this context and important in escalating the issue at the national level with the provider.

Some Local Bodies reported that change requests and associated assurance activities took longer than necessary, in part driven by providers but also seen to be in part due to delays within BDUK. During the delivery of Phase 3 contracts, BDUK has been working to enhance the management of change requests, and introduced a new system to expediate the approval of change requests (introduced in 2018). This aimed to approve (or reject) change requests within three weeks.

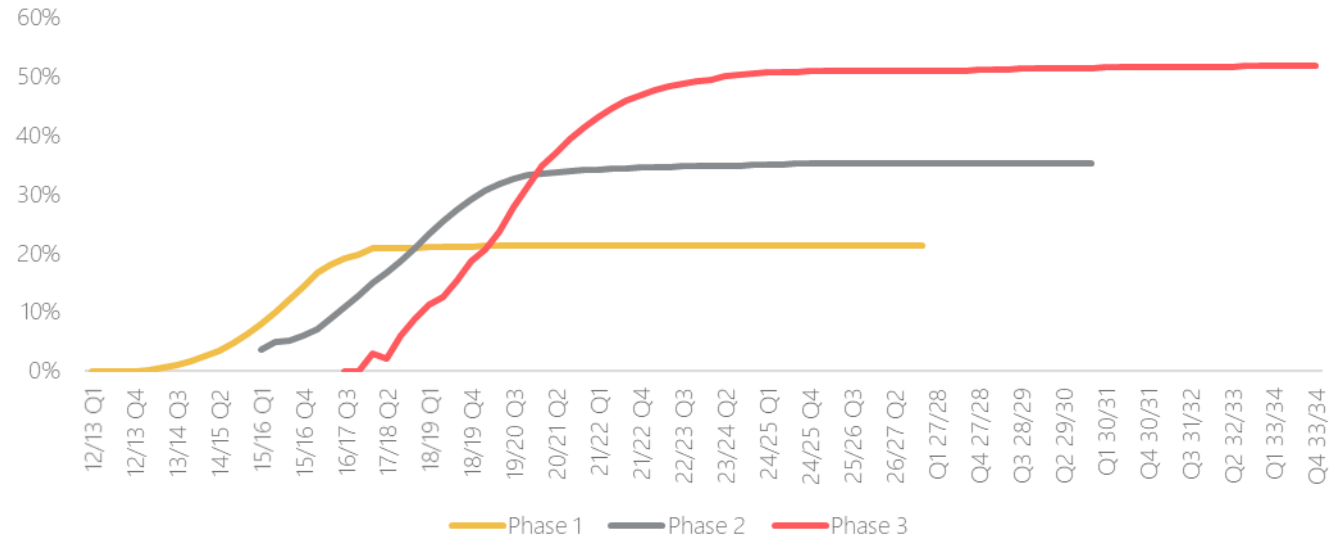
All of the providers that delivered contracts highlighted challenges faced during delivery, and all the providers stated that there were challenges around the timing of delivery due to contractual issues and the time it took to resolve change requests. Unlike the Local Bodies, the providers were more likely to state that it took Local Bodies and BDUK a long time to agree and sign off change requests, which was the main cause of a lot of the delays in the projects. However, two providers did acknowledge that it could be time consuming for providers to fully research and develop change requests (this could take months), if it involved a lot of survey work or a lot of rescoping. This could take months to develop – however they also pointed out that it would be at least an equal amount of time to get the change requests signed off.

3.6 Take-up of Superfast Broadband Programme connections

The Project Financial Models (PFMs), produced by each provider of a local project, included a model of expected take-up in the area. This showed that in all phases, the providers projected that there would be a rapid increase in the take-up over the first years following completion of the build, followed by a plateauing of take-up rates in future years. However, there were differences between the phases. In Phase 1, the expected take-up plateaued at 21 percent. In Phases 2 and 3, the take-up limit was 35 percent and

52 percent (respectively) and even greater in some instances, showing that as time passed the providers gained a better understanding of how to model future take-up.

Figure 3.7: Provider modelled take-up by phase



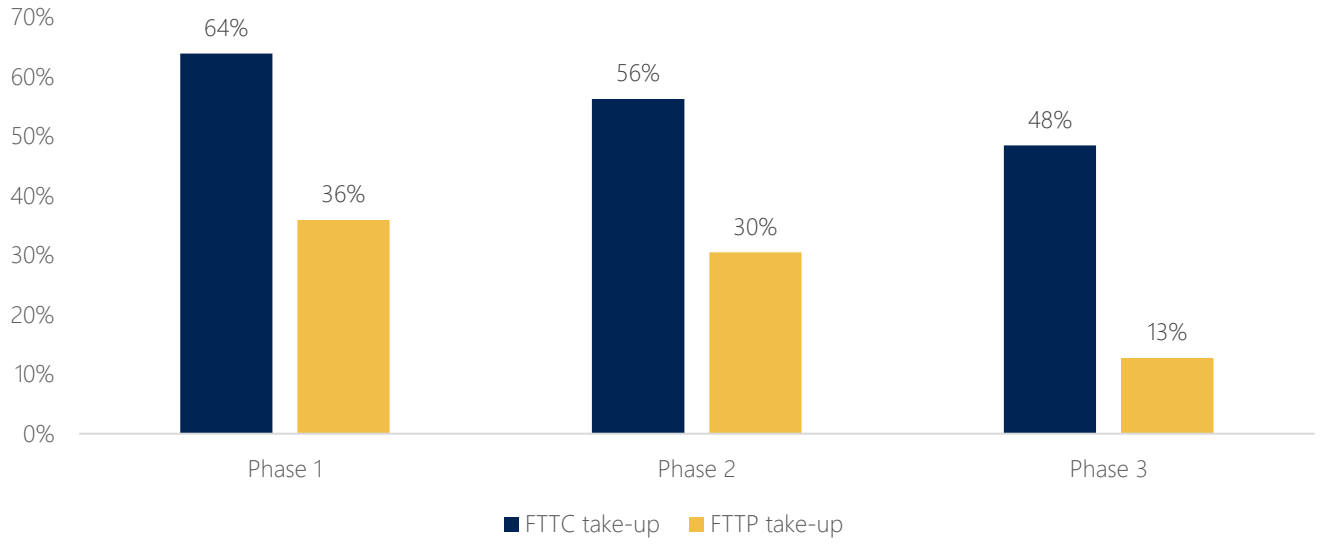
Source: BDUK PFM reports

The actual take-up by contract was reported to BDUK by the providers and Local Bodies.[19] The take-up, as of June 2020, is presented by Phase in the figure below. This shows that the average take-up for Phase 1 contracts was 62 percent (ranging from 55 percent to 73 percent) for FTTC connections (the majority of connections) and 36 percent for FTTP connections (ranging from 5 percent to 76 percent), both far in advance of the modelled take-up of 21 percent.

For Phase 2 contracts, the average take-up rate was 56 percent for FTTC connections and 30 percent for FTTP connections, again above the modelled maximum take-up of 35 percent (ranging from six percent to 73 percent for FTTC and 11 percent to 60 percent for FTTP). For Phase 3, 33 of 51 contracts had reported take-up (to June 2020), which is unsurprising given when some of the contracts were commissioned. Of these contracts, the average take-up rate was 46 percent for FTTC connections and 13 percent for FTTP connections (ranging from two percent to 62 percent for FTTC and one percent to 34 percent for FTTP), still some way behind expected take-up of over 50 percent (given that the majority of deliver for Phase 3 is FTTP).

[19] 121 contracts had provided information about the number of marketable premises and the number of connections. Therefore, the analysis is based on these 121 contracts, and not all 145 contracts.

Figure 3.8: BDUK reported take-up of superfast broadband connections by technology



Source: Cora Management Information, June 2020

The expected level of take-up presented in the PFMs by the beneficiaries was compared to the reported level of take-up by the beneficiaries to the Superfast Broadband Programme in June 2020. This comparison is presented in the table below. This shows that take-up in June 2020 was below the expected level of take-up at the start of the projects for all Programme beneficiaries, and in some cases was significantly lower than expectations. However, the lower level of take-up was expected, given that the delivery of Phase 3 contracts is behind schedule.

The differences between the expected and actual take-up was explained during the qualitative interviews as being due to the estimations (particularly for Phase 1 and some Phase 2 contracts) being based on 2009 modelling assumptions, which were not accurate when the build was complete. The provider updated these for some Phase 2 and Phase 3, and by Phase 3 the estimates were more accurate. The smaller providers who delivered contracts in later phases were generally more accurate in there modelling of take-up, which would be expected as there was more information to base their assumptions on.

Despite the take-up in Phase 3 areas being below the expected levels in the PFMs by June 2020, no beneficiary responded that in the long term they expected take-up to be significantly below their forecasted level. This is because the delivery of Phase 3 contracts was behind schedule (as discussed in Section 3.5.1). Additionally, the evidence from Phase 1 and Phase 2 contracts on take-up suggests that take-up for Phase 3 contracts will continue to rise in the future and that the expected levels of take-up will be observed or more probably exceeded in the Phase 3 contract areas.

A description of how Local Bodies have promoted take-up of superfast broadband connections is presented in Section 4.4.

4 Market impacts

This section provides an assessment of how the Superfast Broadband Programme has impacted upon the superfast connectivity and take-up, and the wider impacts on the telecommunications market. The successful delivery of the Superfast Broadband Programme (and local projects) using the processes described and assessed in Section 3 should lead to impacts on the number of premises with superfast broadband connectivity, the number of premises with superfast broadband connections, and the telecommunications providers offering superfast broadband services. An assessment of how the processes used in the Superfast Broadband Programme have contributed to the cost-effectiveness of the Programme is also provided. The section draws on evidence from qualitative interviews with Local Bodies, providers that have engaged with the Programme, an analysis of Programme Management Information and secondary data sources.

4.1 Key findings

The key findings from the market analysis undertaken are:

- **Phase 3 contracts increased the number of premises passed by Next Generation Access (NGA) services by 2,300 to 16,600 on postcodes benefitting from subsidised coverage by the end of September 2019** (with the weight of evidence to the lower end of this range). The share of the 79,100 premises upgraded by the end of September 2019 that would not have otherwise benefitted from Next Generation Access (NGA) coverage is estimated at between 3 and 21 percent. For more detailed information see Section 4.3.

- **Phase 3 contracts increased the number of premises with superfast availability by 10,800 to 29,300, and the number of premises with FTTP coverage by 19,000 to 30,300.** The additionality of superfast and FTTP coverage was higher than for NGA coverage at between 14 and 55 percent of premises receiving subsidised coverage. This indicates that some premises benefitting from subsidised upgrades would have otherwise received from NGA coverage that did not deliver superfast speeds.

- **The results suggest that the processes used to identify the commercial plans of providers were not fully effective in establishing those premises that would not benefit from commercial deployments in the near term.** Several explanations for this emerged from the research, including that their investment cycles were determined over relatively short time horizons (12 to 24 months) which did not match the OMR cycle, and that the areas eligible for investment were selected based on a static view of network provider's plans, which have evolved in response to regulatory innovation and growth in demand.

- Most Local Bodies and Superfast Broadband Programme beneficiaries took part in activities to promote the take-up of superfast broadband connections, and as this activity was undertaken in most areas it is difficult to measure the impact of the activities, although interviewees suggested it was important in raising awareness of Superfast connections and encouraging take-up. For more detailed information see Section 4.4.

  - One important pattern observed by a Programme beneficiary was that provider performance during the build phase – whether the provider had struggled to deliver the network build in a high quality or timely manner or not being able to deliver the network at the time originally advertised had a significant impact on the take-up of superfast broadband services.

- **Based on projections provided by network providers at the tendering stage, the proposed network build under Phase 3 contracts was expected either to generate losses or to deliver positive rates of return that were substantially lower than the cost of capital faced by the network provider**. This indicates that public subsidies would have been needed to create a sufficient economic incentive to deliver these investments. For more detailed information see Section 4.5.

- While **the contracts have proven largely effective in containing subsidies to the minimum needed for the project to go forward**, the public sector has incurred opportunity costs by tying resources up in the Programme. BDUK may wish to consider whether seeking to contain these opportunity costs in future procurements could be justified.

- Whilst an attempt has been made to compare the costs per connection for the Programme to comparative schemes, there is little evidence on comparable interventions. One study attempts to estimate the projected cost per premises passed for different EU schemes. This showed that in general, the Superfast Broadband Programme had a lower cost per premises passed than the expected cost for most other EU schemes. The lack of evaluation evidence (ex-post) may in part be because of a relative lack of public Programmes on the same scale as the Superfast Broadband Programme and a consequent lack of published evaluative work. This means it is difficult to form conclusions as to the effectiveness of the gap funding model, although it does appear that the cost per premises covered for the Superfast Broadband Programme is lower than the projected costs for comparable schemes in the EU. However, this may be due to geographic differences, rather than the delivery model. For more information see Section 4.6.

4.2 Theory of Change

A detailed description of the Theory of Change of the Superfast Broadband Programme on the telecommunication market is provided in the Technical Annex 1 document of the State aid evaluation report.[20] A summary of the key aspects of the Theory of Change are presented below.

4.2.1 Direct effects on superfast broadband availability

The Superfast Broadband Programme aims to provide subsidies to network providers to extend superfast broadband infrastructure to areas that would not otherwise benefit from commercial deployments. Making subsidies available for infrastructure delivery involves a risk that private providers have an incentive to seek public funds for (deadweight) investments that they would have made anyway, enabling them to earn a higher rate of return. The impact of the Programme on the number of premises covered by superfast broadband services will be limited where public resources are allocated to schemes that would have been considered commercially viable otherwise. A range of mechanisms were introduced in the implementation of the Programme to mitigate against these risks, which are discussed in detail in Section 2 of the report. These are:

- The allocation of subsidies;

- Open Market Review (OMR) and public consultation process;

- Tendering process;

- Completion of Speed and Coverage Templates;

[20] Available at: https://www.gov.uk/government/publications/superfast-broadband-programme-state-aid-evaluation-report-2020

- Completion of Project financial models;
- Implementation clawback; and
- Take-up clawback.

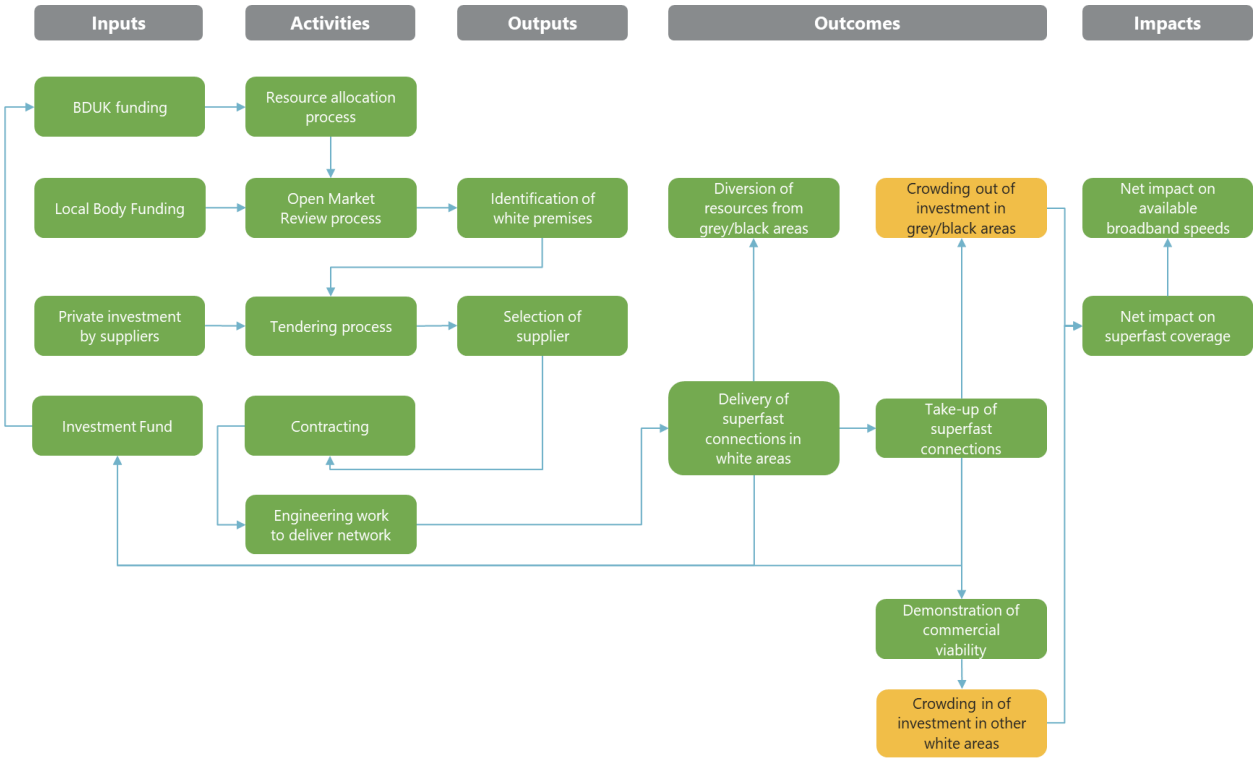
While the Programme involved actions to minimise the risk of deadweight associated with the contracts awarded, factors such as the robustness of the data collected through the OMR process and strategic behaviour by network providers could impact the additionality of the Superfast Broadband Programme.

4.2.2 Indirect impacts on the market

The processes used to deliver the Programme may also be expected to have indirect impacts on local telecommunications market, such as crowding out (where the funding provided discourages other network providers from building in the Programme delivery areas), crowding in (where Programme demonstrates that project delivery areas are commercially viable leading to other network providers offering services there) and by changing the patterns of competition in the area.

The figure below presents a summary of the Theory of Change.

Figure 4.1: Theory of Change for market impacts



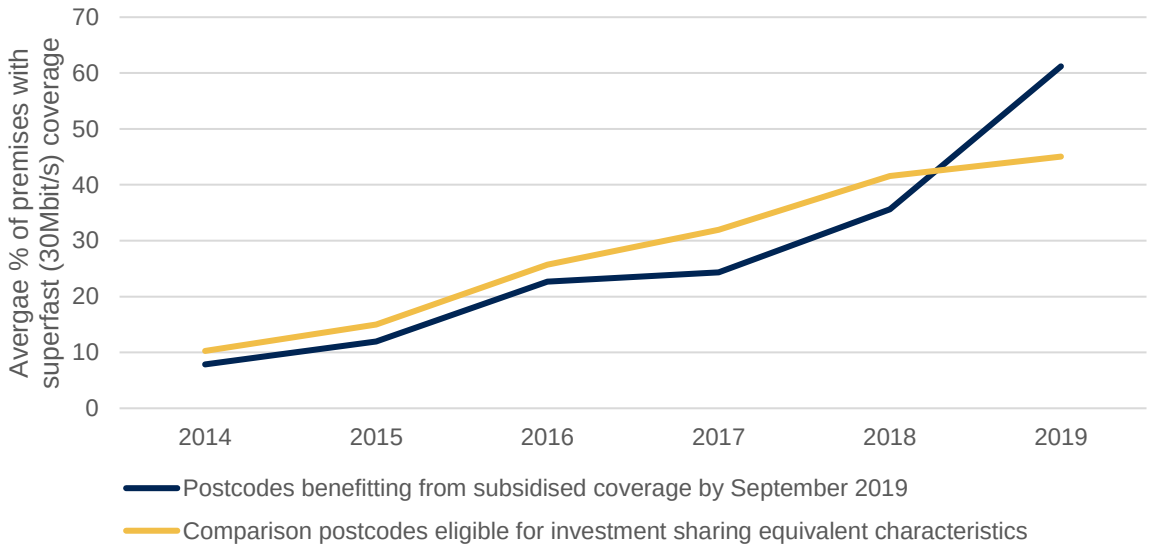
4.3 Impact on superfast deployment

The Superfast Broadband Programme aimed to increase the number of premises which had access to superfast broadband connectivity by providing subsidies to network providers. This section provides the results to an analysis of the additional effect the Programme has had on the coverage of superfast broadband connectivity. The analysis used a panel dataset which drew together data from multiple sources, including: Ofcom Connected Nations data, ThinkBroadband data, data from the Office for National Statistics (including census, Annual Survey of Hours and Earnings and Annual Population Survey) and data provided by BDUK about the Superfast Broadband Programme and other publicly funded broadband interventions. Regression based analysis using difference-in-differences and longitudinal panel

models were used to identify the impact of the Programme. For more details about the data, methodology and detailed results, please see the Technical Annex 1 document of the State aid evaluation report.[21]

The results of the analysis indicated that the Programme had a positive impact on NGA, superfast and FTTP availability in those postcodes benefitting from subsidised coverage by September 2019. Superfast availability rose from 22 percent of premises in 2016 to just over 60 percent on postcodes that benefitted from subsidised upgrades by September 2019. Superfast availability rose in postcodes in the matched comparison group at a slower rate (from 25 percent to just over 45 percent). Most of this apparent impact on broadband availability occurred in the 2019 which aligns with the delivery profile of Phase 3 contracts (see figure below).

Figure 4.2: Evolution of superfast availability, postcodes receiving subsidised coverage by September 2019 and matched group of eligible postcodes, Phase 3



Source: Connected Nations, Ofcom, Ipsos MORI analysis

The statistical analyses provided estimates of the increase in share of premises benefitting from NGA, superfast and FTTP availability between 2016 and 2019 that could be attributed to the delivery of Phase 3 contracts. These estimates were applied to the number of premises on the postcodes benefitting from the Programme to reach an estimate of the number of additional premises receiving subsidised coverage by September 2019. These results are summarised in the table below:

On postcodes benefitting from subsidised coverage by September 2019, Phase 3 contracts were estimated to have increased the number of premises:

- Passed by NGA coverage by 2,300 to 16,600 (with the weight of results towards the lower end of this range).
- With superfast coverage (30Mbps) by 10,800 to 29,300.
- With FTTP coverage by 19,000 to 30,300.

[21] Available at: https://www.gov.uk/government/publications/superfast-broadband-programme-state-aid-evaluation-report-2020

The effect on superfast availability was larger than the effect on NGA availability. This indicates that a share of premises would have been passed by NGA coverage delivering sub-superfast speeds in the absence of the Superfast Broadband Programme. The effect of the Programme on FTTP availability was also larger than its effect on superfast availability – indicating that the priority given to gigabit speeds in tendering was effective in bringing forward full fibre networks.

Table 4.1: Impacts of Phase 3 contracts on broadband availability by September 2019, postcodes benefitting from subsidised coverage

Measure of broadband availability	Estimated effect on availability by September 2019 (% of premises)		Increase in the number of premises with enhanced broadband availability	
	Min.	Max	Min.	Max
NGA availability	2.1	10.7	2,300	16,600
Superfast availability	9.9	25.2	10,800	29,300
FTTP availability	25.2	27.8	19,000	30,300

Source: Ipsos MORI analysis. The ranges show the low to high range implied by the statistical findings

4.4 Take-up

The enhanced provision of superfast broadband connectivity as a result of the Programme, coupled with efforts made by Local Bodies to promote the use of superfast broadband connections was expected increase the take-up of superfast broadband connections. The take-up of superfast broadband connections in the areas where the Programme has been delivered is presented in Section 3.6. However, the discussion there presents the gross take-up of connections, and does not account for any increase in superfast broadband take-up that would have happened in the absence of the Programme. This section presents an analysis of the counterfactual case and the additional impact the Programme has had. The analysis used the same dataset as described in Section 4.3, and used the same regression based analysis techniques (difference in differences and longitudinal panel analysis). For more details please see Technical Annex 1 document of the State aid evaluation report.[22]

Given the small share of planned Phase 3 delivery that had come forward at the time of writing and the relatively low rates of take-up reported by the end of Q3 2019/20 (see Section 3.5), there was little evidence of material change in take-up measures in the Programme area relative to other postcodes eligible for investment:

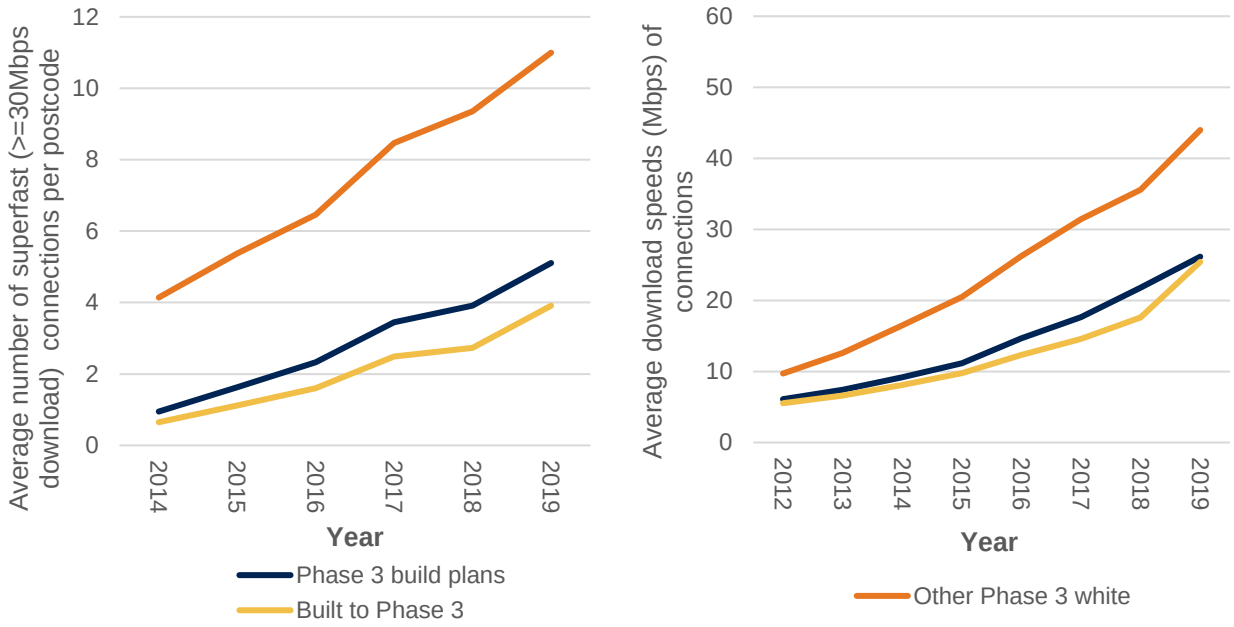
- **Number of superfast (30Mbps) connections:** The average number of superfast connections on postcodes in the build plans of Phase 3 schemes rose by 121 percent between 2016 to 2019 (from 2.3 to 5.1). Growth in the number of superfast connections rose slightly more rapidly (143 percent) on postcodes receiving subsidised coverage by 2019. However, demand for superfast connections also rose rapidly on other 'white' postcodes not included in the build plans of Phase 3 schemes (by 71 percent) over the same period.

- **Average download speeds:** The average download speeds of connections on postcodes included in the build plans of Phase 3 contracts rose from 14.7 Mbps to 26.2 Mbps between 2016 and 2019 (78 percent). Average download speeds rose more rapidly on postcodes receiving subsidised coverage by September 2019 (106 percent). However, growth in average download speeds was more rapid on postcodes that were not included in the build plans of Phase 3 schemes (115 percent) over the same period.

[22] Available at: https://www.gov.uk/government/publications/superfast-broadband-programme-state-aid-evaluation-report-2020

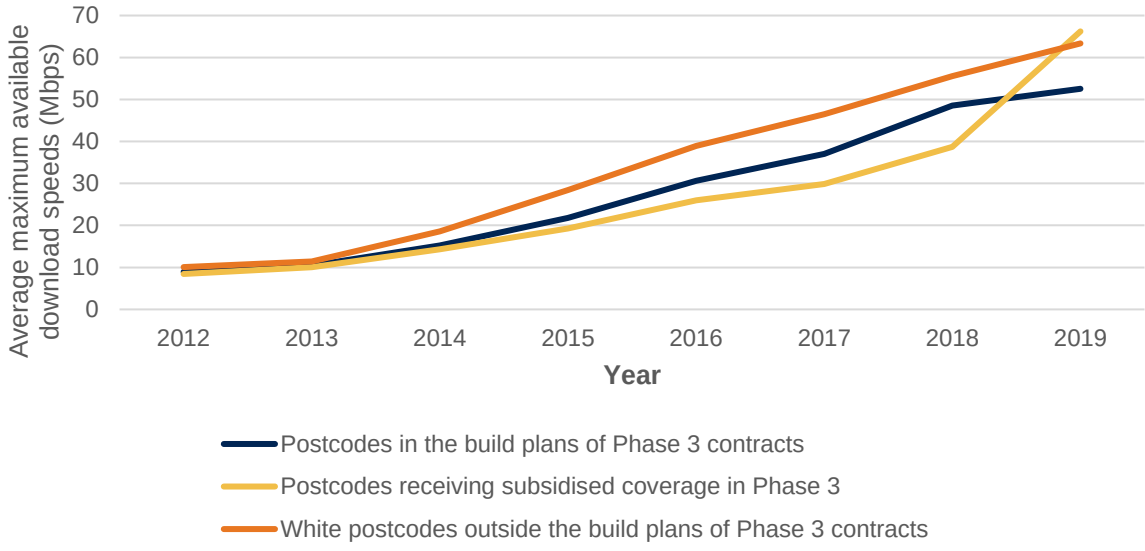
There were more marked differences in the maximum download speeds of connections (shown in the figure below). Maximum download speeds on the postcodes included in the build plans of Phase 3 schemes rose at a similar rate to those on other 'white' postcodes. However, maximum download speeds rose most rapidly in those areas that had received subsidised coverage by September 2019 (reaching an average of 66 Mbps in September 2019). This evidence suggests that early adopters may be taking advantage of the faster speeds made available through FTTP (the availability of which was more widespread in these areas in 2019).

Figure 4.3: Number of superfast (30Mbps) connections and average download speeds of connections – areas in Phase 3 build plans and other 'white' postcodes, 2012 to 2019



Source: C3 reports, Ofcom Connected Nations, Ipsos MORI analysis.

Figure 4.4: Maximum download speeds of connections, areas in Phase 3 build plans and other 'white' postcodes, 2012 to 2019



Source: C3 reports, Ofcom Connected Nations, Ipsos MORI analysis.

4.4.2 Impacts on take-up

The statistical models described above were applied to explore the effect of the Programme on the take-up of superfast services - as visible in the number of premises that had a live superfast connection (30Mbps or more), the average download speeds of connections, and the average upload speeds of connections. The results showed that:

- **Superfast connections:** The findings indicated that the Programme led to a reduction in the number of premises with superfast connections (by 1.1 to 2.4 premises per postcode) by September 2019. This was likely explained by a combination of the effect of the Programme in delaying the availability of superfast for some premises that would have otherwise benefitted from commercial deployments, and the limited time that had elapsed for businesses and households to take-up subsidised coverage by September 2019.

- **Average download speeds:** There was no conclusive evidence that the Programme had a positive or negative effect on the average download speeds of connections by September 2019. The findings ranged from an effect of reducing average download speeds by 2.1Mbps to increasing download speeds by 2.2Mbps.

- **Maximum download speeds and upload speeds:** The results indicated that the Programme increased the average upload speeds of connections (by 0.9Mbps to 3.9Mbps) and the maximum download speeds of connections by 6.2Mbps to 16.9Mbps. It was assumed that this reflected the effect of FTTP delivery, which has enabled some users to obtain higher capacity connections that may have been available from FTTC or other NGA technologies.

At the time of writing, it was premature to draw any conclusions in relation to the impact of the Programme on take-up. Take-up of superfast broadband services appeared to increase with time and the analysis of the long-term effects of the Programme set out in Technical Appendix 1 highlighted that, in the long-run, the Programme has had positive effects on a wide range of take-up measures. As such, this analysis will be revisited in 2022.

4.4.3 Local Body contribution to take-up

The majority of Local Bodies interviewed were or had undertaken some form of demand stimulation exercises or activities. For most, this took the form of an advertising campaign to stimulate awareness. Some areas went further and were planning activities with local charities and associations to coincide with completion of work by the provider in areas. For those bodies with more intensive marketing, e.g. have a full-time marketing officer, this was seen to be at risk as was being funded locally but was keenly recognised as having been important in accelerating initial take-up. The level of take-up realised on these contracts, and most others, was much higher than originally anticipated but is difficult to say resulted from Local Body or provider promotion activity.

Superfast Broadband Programme beneficiaries reported engaging in marketing activity to promote take-up – these included direct marketing to households in areas that had been upgraded, advertising on cabinets and community engagement and information exercises throughout the course of delivery. It is not possible to examine differences in take-up by marketing channel, but one provider did notice some interesting patterns in take-up in different project areas. These particularly related to the provider performance during the build phase – where the provider had struggled to deliver the network build in a high quality or timely manner (for example long delays in digging up roads, damage to grass verges, not delivering build on time), or not being able to deliver the network at the time originally advertised (due to

not having sufficient backhaul) take-up was lower than anticipated. The provider has found that this is due to the poor reputation of the company in these areas – households are unwilling to use what they see as an unreliable provider for their broadband connection.

Network providers and ISPs which were not directly involved in the Programme did not report any changes in their marketing approach, or undertaking any targeted marketing in the areas that had been upgraded through the Programme. They described undertaking standard marketing activities to advertise services when Openreach upgraded a network that they already used to provide services. However, the ISPs are competing with other providers who are able to offer exactly the same connection speed, meaning additional advertising for increases in speed is not an effective point of differentiation between providers.

Providers that reported that they had been overbuilt by the Superfast Broadband Programme also reported that they did not engage in targeted marketing as a result of the overbuild. For some, it meant no advertising in the area at all (due to not utilising the network – see below), whereas for others it meant simply continuing their existing marketing strategy. The approach to marketing in areas that had been overbuilt depended on the providers views on take-up and churn of current and potential customers.

Take-up among providers that were not delivering the contracts was also explored. This provided some interesting views about how the Programme has and could potentially impact upon the market. In general, providers tried to avoid building in areas that the Superfast Broadband Programme was operating in. However, in some cases, this was not possible (see OMR discussion). Where this was the case, many alt-net providers felt they could not compete with the publicly funded provider. This was both on cost, and particularly for wireless providers on perceived quality from the consumer. This could mean that providers would lose close to 100 percent of their market share in these areas.

"We knew that within one fell sweep, [Programme beneficiary] could decide to upgrade our area and wipe us out." Wireless provider

This has led to some inefficiencies in some areas, where wireless networks have been built (using public funding) but never switched on, as following the build FTTC networks funded by the Programme have been built. The wireless provider did not think it would be cost-effective to run the wireless network.

"We have spent several months planning and building a network which... has served a particular area and then, several months later, BT then rolled out fibre to a number of our customers.... we've lost pretty much all of the customers that we'd connected."

"it completely destroys [our market]" Wireless provider

Other wireless networks have indicated that hypothetically the same would happen to their business, and so deliberately avoid areas that the Superfast Broadband Programme could potentially deliver in. This could lead to some white areas remaining white.

However, other alt-nets were more optimistic about their ability to compete with the publicly funded networks. These were generally alt-nets that built FTTP networks in hard to reach areas. They felt that the quality of the service they provide, in in many cases the fact that they were the first provider to deliver there (which involved a large degree of community engagement) had meant there was a lot of customer loyalty. This would mean that the impact on their take-up would be minimal – and in the small number of areas where there is overbuild (for example due to gaining access to remote villages) this is backed up by the number of households that remained with the original provider.

"It's a really high quality network. So, we are perfectly happy to compete on the basis of the quality of our network and our pricing." Alt-net provider

4.4.4 Take-up of wholesale services

The alt-nets which delivered Superfast Broadband Programme contracts said that they are currently the only providers using their network – and other internet service providers have not used the networks yet. These networks are FTTP or wireless networks. They do not expect other providers to attempt to use these networks until there is sufficient demand for FTTP connections. For Openreach networks, ISPs can utilise the networks through Openreach wholesale products.

One provider mentioned a regulatory pricing issue which may prevent smaller internet service providers from using the networks built for the Superfast Broadband Programme – particularly on Openreach networks. There is a pricing differential for the use of cabinets in different location (urban areas are Category B and rural locations are Category A) – and where the project has been delivered to many of the cabinets would be expected to be Category A. Access to these Category A cabinets was described as prohibitively expensive by one provider, which would mean that there would be limited competition in the areas that the Superfast Broadband Programme has built in (as ISPs struggle to form a reasonable business case to access these cabinets due to the product pricing). However, this is a regulatory issue which Ofcom are responsible for.

"We wouldn't be able to sell services to any of those customers because the wholesale price that we can buy services for from [network provider] is so prohibitively high that we could never retail the service to any of those users and make a profit." Alt-net provider

This view was reinforced by an ISP which does not own their own network. They stated that if wholesale prices are considered too high (meaning that they cannot sell their product while maintaining a sufficient retail margin) they would not deliver services to an area. For this ISP to utilise the wholesale access for the networks upgraded through the Superfast Broadband Programme would require significant investment on the part of the ISP (to access networks / cabinets and establish handover infrastructure). Therefore, the ISP would require a significant number of customers in the upgraded areas to sign up to their service to make offering the service in these areas economically feasible. This, coupled with the lower population density in upgraded areas (compared to in towns and cities where the ISP operates) and higher wholesale access prices can make offering services in these areas unattractive to ISPs.

In summary, the take-up and use of the networks funded by the Superfast Broadband Programme by ISPs other than those participating in the Programme depends upon:

- The pricing of wholesale access to the networks (largely controlled by Ofcom regulation);
- The investment required to utilise the network access
- The number of customers they could expect to provide services to in a specific area.

ISPs have reported that currently the combination of the factors above mean that it is not economically viable for them to utilise new networks that have been upgraded by the Superfast Broadband Programme.

4.5 Internal rates of return

This section examines the effectiveness of contractual arrangements described in Section 2.3.4 in ensuring that the Superfast Broadband Programme is cost effective. An analysis was undertaken to

compare the estimated future income Programme beneficiaries would generate from the networks built with Programme subsidies (the expected rate of return on the contracts awarded (the Internal Rate of Return[23] or IRR)) to their cost of undertaken the network build (their Weighted Average Cost of Capital (WACC[24])). A detailed description of the methodological approach used in this analysis is provided in State aid evaluation Technical Annex 2.[25]

Economic theory suggests that the private sector will maximise profits by implementing all projects that generate a rate of return that at least equal their cost of capital. The rationale for the Superfast Broadband Programme is underpinned by an assumption that there are some areas of the UK where investments in superfast broadband infrastructure will not generate a rate of return that exceeds the cost of capital for private companies, leaving some areas at risk of being excluded from superfast broadband coverage (producing a 'digital divide'). The Programme seeks to provide the minimum subsidy that would be required to make these investments commercially viable for the private sector (i.e. the subsidy that would make their rate of return equal the cost of building the network).

However, it is not feasible for Local Bodies or BDUK to accurately observe the expected costs and revenues associated with potential investments in superfast coverage before the award of subsidies. Network providers also have an incentive to seek subsidies for investments that would have been commercially viable in the absence of public support to maximise profitability and minimise risk exposure. The design of the Programme by BDUK anticipates these risks through the implementation of the OMR process and the contract design.

The key results from the analysis showed that:

- **Phase 3 projects were not commercially viable without subsidy at the tendering stage:** Based on projections provided by network providers at the tendering stage, the proposed network build under Phase 3 contracts was expected either to generate losses or to deliver positive rates of return that were substantially lower than the cost of capital faced by the network provider without a subsidy.

- **Contractual mechanisms are likely to be effective in ensuring value for the public sector:** The protections put in place by BDUK are likely to protect the public sector from the risk that it provided more than the minimum subsidy needed. While the provision of subsidies is expected to increase the IRR on Phase 3 contracts, this falls to below the WACC once the activation of these contractual mechanisms is accounted for.

- **Public sector opportunity costs are high:** While the contracts have proven largely effective in containing subsidies to the minimum needed for the project to go forward, the public sector has incurred opportunity costs by tying resources up in the Programme. BDUK may wish to consider whether seeking to contain these opportunity costs in future procurements could be justified. The evidence in this analysis indicates that increased levels of competition (in Phase 3 of the Programme, discussed in Section 3.4) limit the extent to which network providers can transfer risk to the public sector (as doing so results in less competitive tenders). However, other options could include using the information on the tail end of the distribution of observed take-up rates across Phase 1, 2 and 3 contracts to set a maximum level of subsidy to be offered as part of a given procurement. This may still allow network providers to understate profitability by adjusting revenues via price schedules

[23] The discount rate that sets the present value of an income stream to zero.

[24] For the purposes of this analysis, an average comparison between IRR and the network provider WACC has been made. A comparison to the marginal cost of capital would be preferable approach and may therefore produce different results from average rates.

[25] Available at: https://www.gov.uk/government/publications/superfast-broadband-programme-state-aid-evaluation-report-2020

(though if BDUK are able to monitor revenues earned on connections as well as volumes of customers, this may limit scope to do so).

- **Future competition:** The results of these analysis also do not factor the possibility that the network providers' market share and any excess profits are eroded by the entry of competitors via the open access arrangements required by the Programme. This could only be realistically assessed if BDUK was able to monitor revenues earned by network providers alongside customer volumes (as this would help explore issues in relation to both market share and prices). It should be noted that this issue is likely to be more significant for vertically integrated operators that act as both wholesalers and retailers.

4.5.1 Market position of beneficiaries

When examining the market position of the Programme beneficiaries, it can be seen that there has not been significant changes in the market share of Programme beneficiaries in the broadband market between 2016 and 2020, with Openreach dominating the market, with more than three quarters of the total broadband market and over 60 percent of the NGA market in both 2016 and 2020. The other Programme beneficiaries cumulatively make up less than 0.5 percent of the total broadband and NGA markets. There appears to have been a decrease in the market share of Virgin Media in the total broadband market (not a Programme beneficiary), but this market share appears to have been taken by non-beneficiary network providers.

In the areas where the Superfast Broadband Programme has been delivered, the Programme appears to have had little impact on the market position of Openreach in either the overall broadband or NGA market as Openreach maintains a dominant market position in both 2016 and 2020. However, the market share in both the overall broadband and NGA market for the smaller Programme beneficiaries has increased between 2016 and 2020 in Phase 3 delivery areas which is not observed at a national level, suggesting the Programme has positively affected the market share of the Programme beneficiaries in local project areas.

In areas where Openreach have delivered contracts, they have maintained their market share between 2016 and 2020 in both the overall broadband and NGA markets. However, in areas where the other, smaller Programme beneficiaries have delivered contracts, the market share for Openreach has fallen (particularly in areas where Gigaclear have delivered contracts), with the market share of the other beneficiaries increasing. This suggests that the other beneficiaries are taking market share from Openreach in these local areas.

4.5.2 Competition in project delivery areas

The average number of infrastructure providers operating on the postcodes benefitting from subsidised upgrades rose from 2.3 to 2.6 between 2012 and 2020, indicating the Programme has helped promote greater competition in these areas. Although there has been an increase in the number of network providers offering services in Superfast Broadband Programme areas, most non-beneficiary network providers tended to provide services to only a small number of postcodes within the Superfast Broadband Project areas. This suggests there has not been a large degree of overbuild.

The number of ISPs operating in Superfast Broadband Programme areas has increased between 2016 and 2020. There are a higher number of ISPs with customers in Phase 1 contract areas than Phase 2 and Phase 3. This would be expected, given that the Phase 1 areas were larger and more commercially viable. Additionally, all Phase 1 contracts were delivered by Openreach, and the qualitative findings suggested

that at present no ISPs were utilising the subsidised networks built by Programme beneficiaries other than Openreach.

4.6 Value for money

Data on the costs of delivering the Superfast Broadband Programme have been drawn from BDUK monitoring data and the outputs of the modelling exercise. A total of £1.9bn of public sector funding was committed across Phase 1, 2 and 3 contracts with a total of 5.5 million contracted premises passed. This equates to a gross cost per premise passed of £342. There was significant variation across the various phases. Phase 1 had the lowest gross public sector cost per premises passed of £266. Phase 3 had the highest public sector cost per premise at over £1,216. This is expected given the proportion of full fibre build expected in Phase 3 delivery which was expected to come at a higher cost.

Table 4.2: Contracted cost per premises passed by Phase

Contract phase	Contracted public sector cost[26] (£m)	Contracted premises passed	Gross public subsidy per gross premises passed (£)
Phase 1	1,169.1	4,388,618	266.39
Phase 2	332.6	830,654	400.39
Phase 3	391.9	322,242	1,216.29
Overall	1,893.6	5,541,514	341.72

Source: Ipsos MORI analysis; CORA Management Information June 2020; BDUK

4.6.2 Expected cost

The table below provides estimates of the current expected public sector cost per premises passed by March 2019. The current expectations of public spending (before implementation and take-up clawback) differ significantly to the contracted costs outlined above (primarily driven by underspend on Phase 1 contracts). The expected gross public spend per premises passed was lower overall at £268. and the expected gross public spend per premises passed fell from £1,216 to just above £497 (primarily due to expected underspend, though note that these projections are highly uncertain at this stage).

Factoring in the likelihood that some of those premises passed to date would otherwise have received coverage through commercial deployments, the table below also includes the estimated number of additional premises passed. This applies estimated additionality over the first three years following delivery (to align with the period covered by the OMR process) of 56 percent. The gross public sector cost (i.e. before clawback) per additional premises passed over three years was £500 (in 2019 prices).

Figure 4.5: Expected gross cost per premises and additional premises passed

Contract phase	Expected public sector cost (£m)	Premises passed by March 2019	Additional premises passed to date	Expected Gross public subsidy per gross premises passed (£)	Expected Gross public subsidy per additional premises passed (£)
Phase 3 to date	25.5	51,285	28,720	450	890
Overall	**1476.1**	**5,268,398**	**2,950,303**	**280**	**500**

Source: Ipsos MORI analysis; CORA Management Information June 2020; BDUK. 2019 prices.

[26] In nominal terms, not in present value terms. Taken from CORA management extract

4.6.3 Net public sector cost per additional premises upgraded over three years

The table below outlines the expected public sector costs net of the clawback mechanisms. This is expected to reduce the net cost per additional premises upgraded from £890 to £790 for Phase 3 contracts (though, again, given the early stage of delivery, these estimates are highly uncertain).

Figure 4.6: Net public sector cost per additional premises passed

Contract phase	Net public sector cost (£m)	Additional premises upgraded	Net public subsidy per additional premise upgraded (£)
Phase 1	429.8	2,818,651	150
Phase 2	274.3	500,273	550
Phase 3	22.6	28,720	790
Overall	726.7	3,353,638	220

Source: Ipsos MORI analysis; BDUK

4.6.4 Benchmarking

Whilst an attempt has been made to compare the costs per connection outlined for the Programme above, there remains little evidence on comparable interventions. There are very few studies that have sought to examine the cost-effectiveness of broadband Programmes in the EU after delivery had been completed. This may in part be because of a relative lack of public Programmes on the same scale as the Superfast Programme and a consequent lack of published evaluative work. However, there are some examples where the expected unit cost of premises passed has been estimated. It should be noted that these are projected public sector costs per gross premises passed, rather than observed costs. The estimated costs are: [27, 28]

- In Austria, the cost per premises passed was approximately £1,900 and £3,600 across two projects.
- In Germany, projects estimated the average of cost per premises passed was between £1,100 and £9,300.
- In Finland, the projected cost per premises passed was estimated to be between £1,300 and £5,800 across three projects.
- In Hungary there are multiple projects, and the average cost per premises passed was estimated to be between £200 and £660
- In Ireland, the estimated cost per premises passed was £4,900.
- In Italy, several projects estimated that the cost per premises passed was between £230 and £330.
- In Portugal there are several projects and the estimated cost per premises passed was estimated to be between £220 to £810.

These show that in most countries, the average cost per premises upgraded is higher than the cost observed in the Superfast Broadband Programme. However, this may be due to geographic differences,

[27] European Commission (2020) The role of State aid for the rapid deployment of broadband networks in the EU. Available at: https://ec.europa.eu/competition/publications/reports/kd0420461enn.pdf
[28] Values converted from € to £ using exchange rates from xe.com

rather than the delivery model. There was insufficient evidence available to explore the reasons behind the differences in costs.

A recent study evaluating parts of the Superconnected Cities Programme (SCCP)[29] in the UK did include a cost benefit analysis of the Connection Voucher Scheme element of that Programme. This made vouchers up to a value of £3,000 available to small to medium sized businesses (SMEs) to put towards upgrading their internet connection. To be granted, the connection would need to provide at least superfast speeds but was technology agnostic. The study found the average cost of subsidised connections through this Programme was £1,400, although this also varied substantially by technology type (ranging from £1,100 for FTTC connections to £2,800 for Fixed Wireless / Microwave connections). The cost per installation was estimated at £1,400, though each installation led to a further 4.7 additional connections per postcode. This equated to an estimated cost per additional connection of £290. However, this is not directly comparable to the figures above as it focuses on the cost of connections rather than the cost of coverage.

[29] Description of project available at: https://www.gov.uk/government/news/superconnected-cities-scheme-helps-14000-small-businesses

5 Validation of State aid compliance

This section assesses the extent to which the Superfast Broadband Programme Phase 3 contracts have complied with the guidance set out in State aid SA. 40720 (2016/N). It is based on a review of the project documentation from 15 Phase 3 projects, and a consultation with the State Aid team at BDUK.

5.1 Key findings

The key findings from the validation of State Aid compliance research were that:

- Across all the project contracts, there has been a high level of compliance with the State aid guidance. However, there are some gaps in the evidence provided for some projects. Given the other evidence that has been provided for these projects, it has been assessed that these are gaps in the evidence base, rather than evidence of non-compliance. For more information see Section 5.3 to 5.5.

- The one area where there was evidence of a lack of compliance with European Commission Guidelines was around the timing of the ITT being issued, with this being more than a month after the public consultation exercise closed in most cases.

5.2 Approach to validation and projects selected

This sub section assesses the extent to which the Superfast Broadband Programme Phase 3 contracts have complied with the guidance set out in State aid SA. 40720 (2016/N). An evaluation framework was developed to assess the compliance of Superfast Broadband Projects at three stages of project delivery, with 10 main evaluation questions. These stages and questions are set out in the table below:

Table 5.1: Validation evaluation framework

Stage of Programme	Evaluation question
B0: Ready to commence Procurement; and B1: Ready to commence network provider engagement	Did local projects provide appropriate information and data to underpin public funding?
	Did local projects use appropriate mechanisms to engage with all relevant network providers?
	Did Local Bodies / NCC take appropriate steps to ensure the validity of OMR responses?
B2: Ready to procure	Did the local project follow EC guidelines during the OPC phase?
	Did local projects accurately account for responses received during the OPC phase?
	Did the local project follow EC guidelines about the geographic areas to be covered by the intervention?
	Did the local project follow EC guidelines when issuing the ITT?
C: Ready to contract	Were the bids assessed in a manner compliant with EC guidelines?
	Have the Local Bodies provided contracts which are State Aid compliant?
	Approval of Change requests

In order to undertake the validation exercise, the following documents have been reviewed by the research team:

- The State aid decision letter for projects;

- The State aid application form prepared by the Local Body delivering the project and submitted to the NCC to secure funding for the project;
- The State aid approval summary spreadsheet – prepared by the NCC to record evidence of how the local project complied with State Aid guidance and legislation;
- The ITT prepared by BDUK to use in the OJEU process;
- The contract signed by the Programme beneficiary, including the network provider solution section;
- The documentation and evidence collected by the NCC to assess whether the projects would pass the B0, B1, B2 and C checkpoints; and
- The database of change requests submitted to the NCC, recording the changes requested and how these were handled by the NCC.

A sample of 15 project contracts were selected to evaluate the compliance of the Programme with the State aid guidance. These project contracts were selected to represent different locations within the UK and contracts with each of the Phase 3 Programme beneficiaries.

5.3 Ready Commence Procurement and supplier engagement

For just over half of the projects (eight projects) a competed determination of project design questionnaire or provided evidence of a local broadband plan as part of the submission of the state aid application form. This provided evidence that a local broadband plan had been developed and used to inform the design of the local project. However, in the documentation for the remaining projects, there was no evidence of a local broadband plan. However, for all projects the NCC confirmed that the information provided in local broadband plan complied with the relevant legal basis from the European Commission, which suggests that there are local broadband plans that were reviewed by the NCC. It is most likely that these plans had been developed and sent to the NCC as part of applications for the Phase 1 and Phase 2 contracts, therefore Local Bodies did not include these again for their Phase 3 applications.

There was evidence that most of the projects had collected appropriate information to define the potential project intervention area. This information was collected through network provider engagement and the OMR process. Again, for the remaining projects there is no information in the evidence provided that the projects collected appropriate information, rather than confirmation that no or inappropriate information has been provided. Again, the NCC realised no concerns about the intervention area for these projects, which suggests that appropriate information has been provided but was not available to the evaluation team.

Most projects were able to provide evidence that a long list of relevant network providers had been invited to take part in the OMR process. This included all main network providers that were operating in their local area, as well as a longer list of potential network providers that could enter their local telecommunications market. The evidence assessed also showed that the projects had also followed up with network providers to encourage responses to the OMR process. This approach was assessed to be appropriate by the research team.

The projects provided evidence that they had received responses from the main network providers operating in their area. However, in some projects the network providers were not able to provide data at a premise level and only provided data at a postcode level, despite the projects asking for premises level

data. Given that many network providers were unable to provide premises level data, the NCC and the project decided that postcode data would be acceptable for the projects and the NCC to develop a robust delivery area for the local projects.

Where relevant network providers had been invited to take part in the OMR process but had not submitted a response, the projects had not collected information (or the evidence had not been provided to the research team) as to why the network provider decided not to take part. Therefore it is not possible to assess whether there were any systematic causes for non-responses across the Programme. An analysis of network providers which provided coverage in 2016 in the 15 local areas covered in this exercise suggests that there were some providers which were active but did not provide a response to the OMR process. Some of the reasons why network providers did not take part in the OMR process were captured in the in-depth interviews with network providers, and these included small network providers not having the resources (either in terms of human resources or having the required technology to develop a response), and network providers being put off from submitting a response (for example previous responses to OMR processes being rejected).

The projects and the NCCs were able to provide evidence that they had validated the OMR responses from network providers, to ensure that the responses were accurate and robust. This included excluding some responses from network providers where there were concerns that the submission was not accurate, comparing OMR responses to BDUK databases about coverage, and marking some postcodes as “under review” where the project and the NCC could not be certain of the designation of a postcode (for example due to a postcode being designated white in this OMR exercise that had been designated as grey in previous OMR processes). Where these changes have been made the changes were recorded in the evidence provided to the research team.

5.4 Ready to procure

All of the projects analysed were able to provide evidence that they had undertaken a public consultation exercise, and most provided evidence that the exercise had been open for a month, in line with the European Commission guidelines. Most of the projects were able to provide evidence that they had acknowledged the receipt of responses to the public consultation process, and explained how their responses had been used to inform the final intervention area. The projects also provided evidence as to how the responses had changed the intervention area (for example changing postcodes from white to grey, or “under review”). However, not all responses to the public consultation resulted in changes to the intervention area. Where no action was taken, the projects did not provide evidence of the reasons why they decided not to amend the intervention area. However, the decision not to change the intervention area in line with the response to the public consultation was reviewed and confirmed by the NCC who raised no concerns to this.

In most cases the projects indicated that they had provided a response to all network providers that had submitted queries as part of the public consultation process, in line with European Commission guidance. Again, where this was not the case it has been assessed to be due to their being no evidence of a response being submitted, rather than evidence that no response was provided. Finally, in all cases there is evidence that the NCC reviewed the final intervention areas (following any changes made in the public consultation process) and were satisfied that the potential intervention area included only white postcodes.

There appears to have been less compliance with the European Commission guidelines around the timing of issuing an ITT for the projects. This was supposed to be within a month of the closing of the Open Public Consultation (OPC). However, most projects issued the ITT at least one month after the completion of the

OPC process. No reasons were provided for this delay. Other than the delay in issuing the ITT, there is evidence that all projects followed European Commission guidance in issuing the ITTs, in terms of the information included in the ITT and that the tenders were open to all potential bidders. The NCC was aware of this issue, and although issuing guidance and encouraging local projects to meet this timeline, they had to respect that most projects did not have the resources in place to develop a procurement approach and issue an ITT within one month of the completion of the public consultation process.

5.5 Assurance of bidder solution

There was a high level of compliance at the ready to contract stage of the Programme. All projects provided evidence that the assessments of bids received was technology neutral, in many cases providing the assessment criteria. Evidence was also provided that the successful bids included the required wholesale access agreements, confirmation that the solution needed to be NGA compliant and that the solution provided a step change. This information was validated by the NCC in all cases. All of the projects and the NCC confirmed that the procurement was conducted in line with EU and UK public procurement rules and principles of equal treatment, non-discrimination, transparency and proportionality

Additionally, all of the contracts included the required references to wholesale access and pricing benchmarks, clawback mechanisms and the reporting and monitoring requirements. This is expected as BDUK issued a guide contract to all projects, and the projects assessed had all used this template (with some amendments, although not in the clauses that were assessed in this exercise.

6 Public sector impacts

This section explores how the Superfast Broadband Programme has impacted on the provision of public services. This section draws on information collected through qualitative interviews with Local Bodies and public service providers, and an econometric analysis of publicly available educational and healthcare data. It should be noted that the econometric analysis presented here is experimental – there are several data availability issues and which potentially limit the robustness of the findings - and should be interpreted with caution.[30]

6.1 Key findings

The key findings in relation to the Superfast Broadband Programme and its impact on public service providers are outlined below:

- **Support delivery of local plans:** The Superfast Broadband Programme had supported the advancement of local digital plans, particularly digital inclusion plans. The availability provided through the Programme was viewed to have allowed Local authorities to focus on the other key aspects of their strategy such as digital skills. Local authorities viewed the Programme as having provided a foundation for them to work on digital inclusion. For more detailed information see Section 6.3.

- **Support to deliver local public service transformation:** Local public service transformation was described as having been supported by the Programme through the indirect effects on residential connectivity. These were thought to be behind the increased use of online services and accelerating widespread adoption of these over face to face means. For more detailed information see Section 6.4.

- **Increased engagement of primary school children with online learning:** There was a reported increase in engagement from children with online resources from the interviews undertaken. Children obtained more enjoyment from online learning resources relative to before the Programme. Teachers hoped that this would lead to an increase in pupil attainment, but noted that these learning resources needed to be used alongside traditional teaching approaches to get the most impact. For more detailed information see Section 6.5.

- **Improved administrative processes for schools:** General administration processes for staff at schools were reportedly quicker and easier since upgrade of the school connection. This also led to increased communication with parents through online means.

- **Increased awareness of online GP services:** The evidence suggests an increase in awareness of online services at GP practices for local residents following he Superfast Broadband Programme. Overall, awareness of the three main services, booking, prescriptions and viewing medical records, increased by between five, and seven percent. Interview evidenced implied that this was likely due to more residents becoming aware of them naturally in addition to promotion by surgeries which continued throughout. These impacts also translated into impacts on the use of online services. For more detailed information see Section 6.6.

[30] The data analysis and methodology used to assess these impacts is new. The analysis will be repeated in 2022 with more data included in the modelling.

- **Mixed impacts on GP satisfaction:** Subsidised coverage appeared to increase the proportion of patients that were satisfied with the amount of time given to them for their last appointment by one to two percentage points. However, subsidised coverage had a negative impact on measures of access and continuity of care. Subsidised coverage led to a reduction in the share of patients satisfied with the availability of appointments (by three to four percentage points) and the share of patients able to see their preferred GP most or all of the time (by eight percentage points). Overall, subsidised coverage appeared to reduce the share of patients that described their experience as fairly or very good by two percentage points.

- **Increased patients numbers:** Subsidised coverage increased the number of patients registered with GPs by 3.2 to 5.9 percent on average. However, the number of staff employed by GP surgeries did not rise to the same degree. While subsidised coverage led to an increase in the number of nursing and non-clinical staff of 5.3 to 5.4 and 5.4 to 7.4 percent respectively, there was no effect on the number of GPs. Qualitative evidence supported the findings on patient lists but not on staffing levels with no impacts reported here.

- **Covid-19 resilience and remote working:** Remote access for council, school and healthcare workers was highlighted as necessary in the pandemic climate with the Programme seen to have provided connections to many who may not otherwise have access. This in turn had enabled children to learn remotely, video consultations to take place and council services to continue running without the need for face to face contact at a time when such contact had the potential to spread the virus.

  For some school stakeholders however, the Programme was only part of the solution and for some disadvantaged children access to IT equipment was the prohibitive factor in enabling remote learning. A similar issue was raised for GP services with those digitally illiterate or remote at more risk in the pandemic, either needing to visit in person or not visit at all.

6.2 Theory of change for effect of Superfast Broadband Programme on public service provision

An overarching Theory of Change for public sector organisations was produced at the evaluation planning stage and is presented below.

The Theory of Change identifies the inputs for public sector organisations as the improvements in superfast coverage to the public sector building as a result of the Superfast Broadband Programme. Where public sector organisations take-up superfast broadband connections, the public sector organisation (Local Body, health care practice, school, library or other public sector buildings) can adopt new technology due to the increased speed and reliability of the internet connection. Additionally, the improved speed and reliability can lead to improved management and administration, for example using cloud computing which will improve the reliability of computing services and make it easier for organisations operating across multiple sites to share documents.

A further output of the take-up of superfast services was expected to be achieved through an increased opportunity for public sector to work flexibly, for example through allowing working from home and reducing commuting time – aided by shifts to cloud computing and reliable access to documents. This output is dependent on the public sector worker having a fast and reliable broadband connection at home.

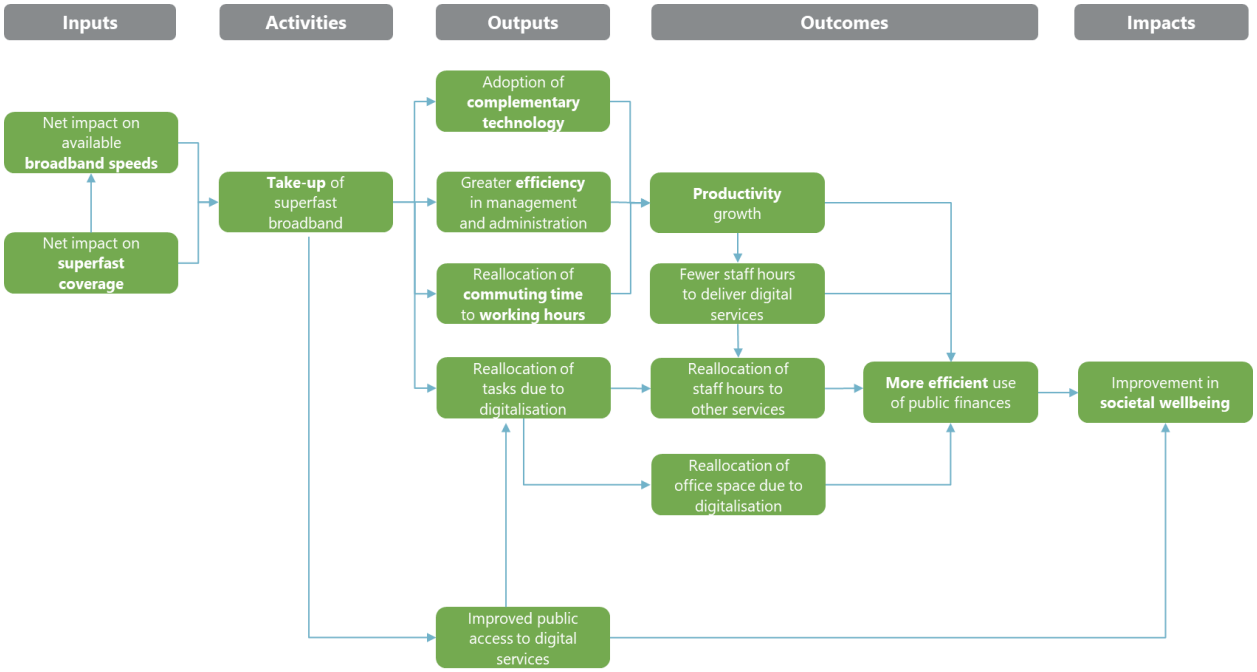
If public sector organisations are able to provide more services via digital means instead of face to face, it will free up both staff time and physical space (for example, space previously used for servers, or for face to face consultations) that can now be used for other services. This will allow the public sector

organisations to provide a wider variety of services, or improve efficiency in other areas. However, this could potentially limit access to services for those that do not have a superfast broadband internet connection.

These short-term outcomes will lead to an increase in productivity at the public sector organisation, ensuring that public sector finances are spent more efficiently. This will then lead to increases in societal wellbeing, as the public sector organisation is able to provide more services to the general public.

Underpinning these potential benefits are an improvement in the access to digital services among the general population in the area, as many of the potential benefits to public service providers require the population to have access to fast and reliable broadband connections (for example to make health appointments or access Local Body systems). Without the public having access to faster and reliable broadband connections, the public sector organisations may struggle to realise the potential benefits of digitalisation, and this may also increase the effects of the digital divide to those without superfast broadband connections.

Figure 6.1: Theory of Change for public service provision impacts



6.3 Impact on implementing digital strategies

The local authorities engaged with in the interview process had Local Body developed digital strategies and plans in varying stages of delivery at the start of the delivery of the first Superfast Broadband Programme contract. However, towards the end of 2019 and into 2020 new plans were being developed and were in part informed by the Superfast Broadband Programme. Most notably, the South Yorkshire Digital Connectivity Strategy was produced by the Superfast South Yorkshire consortium in late 2019.[31] The strategy focussed directly upon building on the foundations the Superfast Broadband Programme had provided. The plan aimed to extend superfast broadband coverage to all premises in the areas covered by the superfast contract. Alongside this, the plan set out ambitions to provide full fibre to business areas as well as provide the capability for 5G in the areas covered.

[31] https://barnsleymbc.moderngov.co.uk/documents/s61401/Appendix%201.pdf

For other local authorities, digital inclusion strategies were produced that set out a variety of aims focussed upon increasing accessibility to digital tools and skills supported through access to reliable and fast broadband connections. Cornwall's digital inclusion strategy defined digital inclusion in terms of digital literacy and skills, accessibility, affordability as well as in terms of motivations for use, trust and confidence. The Superfast Broadband Programme was seen to primarily support in addressing the accessibility aspect through the provision of superfast connections. For the authority, the existence of the Superfast Broadband Programme meant they could begin to address other key elements, including skills and affordability through the provision of leadership in championing digital skills across the area, direct provision of public WIFI and equipment and through engagement and work with local partners.

"Superfast broadband has been the flag ship nationally for delivery of infrastructure to Cornwall and as such there is now a rich coverage of broadband within the area. This is something that underpins the challenge of ensuring that everyone has access to broadband and consideration is needed regarding how this is achieved" – Digital Inclusion Strategy for Cornwall and the Isles of Scilly 2019-2023

Similarly, the Isle of Wight Digital Island Strategy set out similar aims in terms of increasing the availability of digital skills but placed a much larger emphasis on Local Body public service transformation. Superfast broadband was viewed as key to underpinning the intended transformation given the need for access being available to the public to use online services. A shift to online delivery leaving behind many members of the local public without suitable connections to access public information and services was argued would not lead to any cost savings as intended but may instead increases costs.

Overall, the Superfast Broadband Programme was viewed as a catalyst for local authorities, removing some of the burden on them to build upon digital connectivity. The access to superfast broadband for the general public and less so access for the public sector service providers could be seen to be the key component driving the Superfast Broadband Programme's relevance to advancing local digital plans.

6.4 Impact on Local Body services

It was reported that superfast broadband connectivity was being delivered at a time when local service transformation was becoming more of a priority for authorities, with more services being moved online in an effort to save cost and provide services in a more efficient manner. The process had started before the initiation of the Superfast Broadband Programme but was viewed by Local Body stakeholders to have been accelerated by the Programme. This was again put down to the availability of connections for users of public services who were now able to access online services that might not have been accessible to them before without the need to visit a public WIFI spot.

The digital shift in service delivery was evident in specific public services including the provision of refuse services, library services, delivery of administrative services and complaint / query handling. In respect to the provision of refuse services, transformation took the form of provision of information online as opposed to via post.

Libraries were perhaps the most likely public sector bodies to directly benefit from connectivity delivered through the Superfast Broadband Programme, with many of these in Norfolk not having access to superfast connectivity before the Programme. Access to superfast broadband at libraries was described as enabling some libraries to continue to provide digital skills and inclusion activities but in a more efficient manner whilst for others they could now begin to provide these services where they were unable to before. Amongst the activities provided by libraries were session with children on safe use of the internet, session focussed upon use of internet enabled devices such as tablets with families and session for elderly members of the community on accessing the internet safely.

"We can now run sessions with members of the local community, teaching them the basics of the internet, some IT skills and accessing content [as] well as other local services" – Library representative

The delivery of other public services including applications and payments in particular were seen to have benefitted from Superfast in so far as more members of the public would be able to access them. In South Yorkshire for example, the relative use of online tools for queries had risen compared to phone services, however the latter still made up the majority of queries before the Covid-19 pandemic. Whilst it was not possible to say conclusively whether or not the increased use of online services in any Local Body would lead to reductions in face to face service costs, there was the suggestion that space could be freed up to provide other services in council buildings (although nothing specific was suggested).

The COVID-19 pandemic highlighted a potentially significant impact of superfast broadband connectivity on all councils, but the impact was most notable for the Isle of Wight in the form of access to remote working. Access to superfast broadband from the residential premises of council workers was seen to be a key factor in maintaining the running of council services when being in the office presented constraints. Representatives in the Isle of Wight described this as the main benefit of the Programme from their perspective, particularly given the time at which interviewing took place. Beyond the current pandemic, stakeholders across councils were also open to the view that more frequent remote working could be considered the norm and something enabled to some extent by superfast coverage to residential connections.

6.5 Impact on educational facilities

Consultations were undertaken with primary schools across three Local Body areas to explore the impacts of the Superfast Broadband Programme on the provision of education and the finances of schools. Consultations took place with schools that were known to have been in areas upgraded through the Programme and had upgraded their internet connection since their areas was targeted. It should be noted that these schools described having very poor internet connectivity prior to the Programme and may not be entirely representative of other schools.

In terms of teaching, those interviewed did not highlight any particular changes to the way children were taught at the schools as a result of having increased broadband speeds. Instead the main benefit in terms of teaching was said to come from the increased reliability provided by the connection with more children able to access online resources at the same time and without as much of a delay as was previously the case. This enabled teachers to cover more in their lesson which has potential implications for pupil achievement (discussed further below). In addition, teachers reported an increase in engagement from children with online learning resources. Anecdotally, children generally obtained more enjoyment from online resources relative to the resources accessed before the schools connection was improved. It was hoped by teachers that this would lead to an increase in their attainment.[32] Related to this, attendance was mentioned but not considered a factor likely to be impacted by the improved broadband connection.

"I would say there has been a marked increase in engagement with online resources by the kids in my classes. Although, I don't think it will necessarily mean they will do better in their reading, writing and maths test. They still need supervision and person to person teaching" – Primary school teacher

[32] An exploration of attainment outcomes would ideally form a part of future work on the subject however this has its complexities in terms of time to see effects and potential confounding factors.

Online tools need to be utilised in support of traditional classroom methods in the view of several teachers consulted. Therefore, the extent to which improved internet connections would be solely responsible for measurable increases in attainment was questioned.

For most schools however, administrative processes were described as more efficient with faster internet connections and the use of online mediums to inform parents of updates utilised more often. In addition, administrative staff were able to complete many day to day tasks more efficiently.

The COVID-19 pandemic highlighted to teachers / school staff a need for good home connectivity to support children's learning at home. At the time of interviewing, schools remained largely open however pupils and teachers were often required to self-isolate should they come into contact with someone who had tested positive with the virus. In addition, many schools had been providing some form of remote education earlier in the year during the UKs first national lockdown beginning in March 2020. For several of those engaged with in this research, a mix of remote and in person education was implemented at one stage with key worker children in schools and all others being taught remotely.

For many stakeholders, particularly the teachers, residential access to superfast broadband at this time was essential to enable as close to usual an education as possible. Teachers felt that home broadband was generally important prior to the pandemic as a means of providing young children and their families access to educational resources to support in school learning and provide avenues for children's curiosity to explore. However, the pandemic had in their view made home broadband a must have without which many children may have fallen further back than otherwise would have been the case. It is often argued that long breaks between education can stifle learning and remote learning was a means to continue these activities. Not specifically related to the Superfast Broadband Programme but of importance more generally was the fact that a number of stakeholders raised concerns over access to the equipment required for remote learning such as laptops, tablets and smartphones. Children from poorer backgrounds, whilst technically able to have a superfast broadband connection, may not be able to afford a suitable fast connection or the tools mentioned above. In these cases, provision of further support was a key priority.

"It's all well and good having good broadband but there are several families that can't afford basic IT equipment. Without that a connection is useless." – Primary school teacher

Interviewees were also asked about the financial effects for the schools taking up a faster internet connection. In one case a school was able to run an online fundraiser to collect funds to provide IT equipment to those in need at the school early in 2020, which may have been more difficult without an online platform whilst school attendance was low. The econometric analysis produced by Ipsos MORI found inconclusive evidence as to any financial implications for ICT Expenditure and the expenditure on teaching staff. This was borne out in the interviews with interviewees not identifying any examples where ICT expenditure had changed as a result (most were happy with their equipment but might consider upgrading in the future) nor were any changes in staff related to connectivity.

6.6 Impact on health and social care providers

Through both the qualitative interviews and the econometric analysis, impacts were described and evidenced on the awareness and usage of online services for GP services. The results of the econometric analysis indicated that the Programme had an impact in both raising awareness and usage of online services amongst patients registered with GP surgeries:

- **Awareness:** Awareness of the availability of online services to book appointments, order repeat prescriptions and review medical records online rose by 7, 5 and 6 percentage points respectively in response to the provision of subsidised coverage.

- **Usage:** Usage of these services increased between 2 and 4 percent. Implied take-up of opportunities to order repeat prescriptions was highest (at around 66 percent of those newly aware of the availability of these services).

The findings suggested that patients have found new ways to access primary care services as a result of the Superfast Broadband Programme. Qualitative evidence suggested that patients had become more aware of the services provided digitally as time passed but also highlighted the promotion of online services undertaken by themselves and similar practices. Moving as much activity as possible online enabled more efficient practices for GPs, freed up telephone lines for the most vulnerable patients and reduced human error in administration.

In terms of patient satisfaction, the econometric analysis found mixed results:

- **Time with GP:** Subsidised coverage appeared to increase the proportion of patients that were satisfied with the amount of time given to them for their last appointment by one to two percentage points.

- **Access and continuity of care:** However, subsidised coverage had a negative impact on measures of access and continuity of care. Subsidised coverage led to a reduction in the share of patients satisfied with the availability of appointments (by three to four percentage points) and the share of patients able to see their preferred GP most or all of the time (by eight percentage points). These are indicative of capacity pressures on GP surgeries benefitting from subsidised coverage.

- **Overall satisfaction:** Overall, subsidised coverage appeared to reduce the share of patients that described their experience as fairly or very good by two percentage points.

In addition, the econometric analysis found impacts on patient lists and staffing:

- **Number of patients:** Subsidised coverage increased the number of patients registered with GPs by 3.2 to 5.9 percent on average.

- **Staffing:** However, the number of staff employed by GP surgeries did not rise to the same degree. While subsidised coverage led to an increase in the number of nursing and non-clinical staff of 5.3 to 5.4 and 5.4 to 7.4 percent respectively, there was no effect on the number of GPs.

This was somewhat supported in the two interviews with GPs. Since the bulk of their services were moved online in 2015 and 2016 respectively, the number of patients registered with them had continued to rise whilst cost pressures had kept the number of GPs employed at the practice stable. The implied effects on nursing and non-clinical staff identified in the econometrics were not found with these two surgeries.

These interviews once again covered the Covid-19 pandemic in detail. Since the pandemic, the GPs interviewed described rapid rises in the use of telephone and video consultations as they sought to provide as many of their appointments as possible through these mediums. In general, telephone consultations were the go-to, hover superfast broadband connectivity in the local area was highlighted as being important for the ever increasing number of video consultations being undertaken. Video was more likely to be used

where a visual inspection was required. In addition, images were often requested by GPs over email so that they could be reviewed by the GP before a telephone consultation.

It is difficult to link the Programme to impacts definitely in this space, but the two GPs were confident that a significant proportion of their residents, particularly in the more rural areas, would not have been able to access their online services as easily without it in the pandemic. A key issue raised by them however was that, once again, the option of taking up a superfast connection did not always mean this was done. For the GPs, the elderly patients were more often than not relying on in person appointments and telephone where necessary.

"I worry about those elderly folks in some of the more remote villages that don't know how to use the internet, don't know how to get broadband either if it's available to them. They're the ones that are potentially not booking appointments at the moment thinking they need to go in person and that it's not safe to do so" – General Practitioner

7 Conclusions and lessons learned

This section provides a brief summary of the key process findings and recommendations from the research. These focus on the main areas covered in the report – the delivery of the projects and the market and public sector outcomes achieved.

7.1 Programme / project delivery

The processes employed by the Superfast Broadband Programme were well designed and implemented, which has led to the Programme being delivered in an efficient and effective manner. More details, and recommendations of how to potentially improve Programmes in the future is presented below.

7.1.1 Allocation of subsidies

- **Nearly half of the funding for Phase 3 contracts came from non-BDUK public sector match funding** (either from the Local Body or other Government funding sources). The increased dependence on match funding in Phase 3 (compared to Phase 2) may have led to some local projects being scaled down from their original targets. However, this does align with BDUK aim for the Local Bodies to become less dependent on BDUK to deliver local broadband connectivity projects.

  - The sources of match funding were described as having an impact upon where the local Superfast Broadband project was targeted. Where match-funding was sources from DEFRA or EAFRD, the focus of the project was more likely to be on more rural areas, and where LEP or ERDF match funding was used the project area had to be more focussed on covering businesses. **The appropriateness of sources of match funding should be considered alongside their availability**.

- In developing the business cases for funding, Local Bodies most commonly used national evidence to develop their cases, and this focussed on local economy outcomes, and did not include public service impacts or impacts on households. Additionally, Local Bodies did not include potential disbenefits in their business cases. These additional impacts should be included in future business cases for publicly funded projects, and the findings from this evaluation should support this.

7.1.2 Supplier engagement and Open Market Review

- There was a high level of engagement with the Open Market Review (OMR) process, and it appears that Local Bodies were able to secure responses from most of the telecommunication providers offering broadband services in the local project area. Although it was reported that some providers had difficulty in providing responses to OMR requests in the earlier phases of the Programme, this had improved by Phase 3 as the providers had grown and had more advanced software and processes in place. Therefore, Local Bodies should not be reluctant to ask providers for an OMR response in future projects.

  - There were some issues with the responses to OMRs being provided from wireless network providers being rejected. Although Local Bodies were theoretically correct to dismiss these responses, potentially more could have been done to communicate the reasons for the dismissal, to prevent a deterioration in the relationship between Local Bodies and wireless providers.

- Telecommunication providers faced some challenges in providing accurate responses to OMRs. Primarily, some large providers had difficulty in providing data and responses that were accurate or

in the correct format (due to internal data quality and storage issues). It was reported that this has improved over time, but still remains an issue. This was not an issue that newer, smaller providers faced, as the quality of the data they held was more robust.

- Additionally, the investment cycles for many telecommunication providers were determined over relatively short time horizons (12 to 24 months) which did not match the OMR cycle, and that the areas eligible for investment were selected based on a static view of network provider's plans, which have evolved in response to regulatory innovation and growth in demand. This made it difficult for providers to deliver an accurate response as to where they may provide networks in future years. **It may be beneficial to undertake OMRs at more regular intervals to improve the accuracy of responses, although this would increase the burden on providers, Local Bodies and BDUK.**

7.1.3 Tendering and contracting

- **There was no evidence that utilising an alternative tendering and / or contracting approach to that recommended by BDUK had beneficial outcomes for Local Bodies** (in terms of the value for money achieved for the project or project delivery). It was reported that the alternative approaches to tendering were more resource intensive than the recommended approach. **Therefore, it is recommended that Local Bodies follow the approach recommended by BDUK, and that lotting of contracts is utilised where possible**, to improve cost effectiveness. **Building strong relationships with providers was seen as important to ensuring a good number of responses to tenders issued.**

7.1.4 Project delivery and management

- Most Local Bodies had utilised similar project management approaches, with day to day project managers overseen by steering groups / committees and where required support was provided by BDUK. This was described as an appropriate model to manage the contracts by the Local Bodies. A small number of projects described working with the Programme beneficiary as being partnership rather than a client-contractor relationship. These bodies felt they got more out of the provider on the delivery of the project with barriers addressed through close partnership working. This again reinforces that Local Bodies should work hard to develop and maintain relationships with providers.

- The delivery of Phase 3 contracts has been delayed, with roll out behind where providers anticipated it would be. Some of the reasons for this were highlighted as being the capacity of Programme beneficiaries to deliver their contracts, the duration of time required to resolve change requests and the enforcement of milestone zero within contracts. BDUK has been working to develop new approaches to ensure change requests are resolved in a timely manner and this should help to resolve this issue, but **Local Bodies also need to ensure that their processes allow for a rapid response to change requests and escalate significant change requests to BDUK expediently**.

7.2 Programme outcomes

7.2.1 Market outcomes

The key findings from the market analysis undertaken are:

- **Phase 3 contracts increased the number of premises passed by Next Generation Access (NGA) services by 2,300 to 16,600 on postcodes benefitting from subsidised coverage by the end of September 2019** (with the weight of evidence to the lower end of this range). The share of the 79,100 premises upgraded by the end of September 2019 that would not have otherwise benefitted from NGA coverage is estimated at between 3 and 21 percent.

- **Phase 3 contracts increased the number of premises with superfast availability by 10,800 to 29,300, and the number of premises with FTTP coverage by 19,000 to 30,300.** The additionality of superfast and FTTP coverage was higher than for NGA coverage at between 14 and 55 percent of premises receiving subsidised coverage. This indicates that some premises benefitting from subsidised upgrades would have otherwise received from NGA coverage that did not deliver superfast speeds.

- **The results suggest that the processes used to identify the commercial plans of providers were not fully effective in establishing those premises that would not benefit from commercial deployments in the near term.** Several explanations for this emerged from the research, including that their investment cycles were determined over relatively short time horizons (12 to 24 months) which did not match the OMR cycle, and that the areas eligible for investment were selected based on a static view of network provider's plans, which have evolved in response to regulatory innovation and growth in demand.

- Most Local Bodies and Superfast Broadband Programme beneficiaries took part in activities to promote the take-up of superfast broadband connections, and as this activity was undertaken in most areas (mainly for Phase 1 and Phase 2 contracts) it is difficult to measure the impact of the activities, although interviewees suggested they felt it was important in raising awareness of Superfast connections and encouraging take-up, although there was no quantitative evidence to support this.[33]

  - One important pattern observed by a Programme beneficiary was that provider performance during the build phase – whether the provider had struggled to deliver the network build in a high quality or timely manner or not being able to deliver the network at the time originally advertised had a significant impact on the take-up of superfast broadband services.

- **Based on projections provided by network providers at the tendering stage, the proposed network build under Phase 3 contracts was expected either to generate losses or to deliver positive rates of return that were substantially lower than the cost of capital faced by the network provider**. This indicates that public subsidies would have been needed to create a sufficient economic incentive to deliver these investments.

- While **the contracts have proven largely effective in containing subsidies to the minimum needed for the project to go forward**, the public sector has incurred opportunity costs by tying resources up in the Programme. BDUK may wish to consider whether seeking to contain these opportunity costs in future procurements could be justified.

- Whilst an attempt has been made to compare the costs per connection for the Programme to comparative schemes, there is little evidence on comparable interventions. One study attempts to estimate the projected cost per premises passed for different EU schemes. This showed that in general, the Superfast Broadband Programme had a lower cost per premises passed than the expected cost for most other EU schemes. The lack of evaluation evidence (ex-post) may in part be because of a relative lack of public Programmes on the same scale as the Superfast Broadband Programme and a consequent lack of published evaluative work. This means it is difficult to form conclusions as to the effectiveness of the gap funding model, although it does appear that the cost per premises covered for the Superfast Broadband Programme is lower than the projected costs for

[33] BDUK has carried out internal analysis of the factors driving take-up, and a light-touch evaluation of the Superfast Take-up grant in a separate piece of research

comparable schemes in the EU. However, this may be due to geographic differences, rather than the delivery model.

7.2.2 Public sector outcomes

The key effects of the Superfast Broadband Programme on the public sector, and particularly public service providers, are:

- **Support the delivery of local plans:** The Superfast Broadband Programme had supported the advancement of local digital plans, particularly digital inclusion plans. The availability provided through the Programme was viewed to have allowed Local authorities to focus on the other key aspects of their strategy such as digital skills. Local authorities viewed the Programme as having provided a foundation for them to work on digital inclusion.

- **Support to deliver local public service transformation:** Local public service transformation was described as having been supported by the Programme through the indirect effects on residential connectivity. These were thought to be behind the increased use of online services and accelerating widespread adoption of these over face to face means.

- **Increased engagement of primary school children with online learning:** There was a reported increase in engagement from children with online resources from the interviews undertaken. Children obtained more enjoyment from online learning resources relative to before the Programme. Teachers hoped that this would lead to an increase in pupil attainment, but noted that these learning resources needed to be used alongside traditional teaching approaches to get the most impact.

- **Improved administrative processes for schools:** General administration processes for staff at schools were reportedly quicker and easier since upgrade of the school connection. This also led to increased communication with parents through online means.

- **Increased awareness of online GP services:** The evidence suggests an increase in awareness of online services at GP practices for local residents following he Superfast Broadband Programme. Overall, awareness of the three main services, booking, prescriptions and viewing medical records, increased by between five, and seven percent. Evidence from interviews implied that this was likely due to more residents becoming aware of them naturally in addition to promotion by surgeries which continued throughout. These impacts also translated into impacts on the use of online services.

- **Mixed impacts on GP satisfaction:** Subsidised coverage appeared to increase the proportion of patients that were satisfied with the amount of time given to them for their last appointment by one to two percentage points. However, subsidised coverage had a negative impact on measures of access and continuity of care. Subsidised coverage led to a reduction in the share of patients satisfied with the availability of appointments (by three to four percentage points) and the share of patients able to see their preferred GP most or all of the time (by eight percentage points). Overall, subsidised coverage appeared to reduce the share of patients that described their experience as fairly or very good by two percentage points.

- **Increased patients numbers:** Subsidised coverage increased the number of patients registered with GPs by 3.2 to 5.9 percent on average. However, the number of staff employed by GP surgeries did not rise to the same degree. While subsidised coverage led to an increase in the number of nursing and non-clinical staff of 5.3 to 5.4 and 5.4 to 7.4 percent respectively, there was no effect on

the number of GPs. Qualitative evidence supported the findings on patient lists but not on staffing levels with no impacts reported here.

- **Covid-19 resilience and remote working:** Remote access for council, school and healthcare workers was highlighted as necessary in the pandemic climate with the Programme seen to have provided connections to many who may not otherwise have access. This in turn had enabled children to learn remotely, video consultations to take place and council services to continue running without the need for face to face contact at a time when such contact had the potential to spread the virus.

  For some school stakeholders however, the Programme was only part of the solution and for some disadvantaged children access to IT equipment was the prohibitive factor in enabling remote learning. A similar issue was raised for GP services with those digitally illiterate or remote at more risk in the pandemic, either needing to visit in person or not visit at all.

Annex 1: Case studies

Norfolk

This case study covers the research undertaken with the co-operation of Norfolk County Council in 2020 and 2021.

Case study overview

Better Broadband for Norfolk (BBfN) was setup to oversee the investments in Norfolk of superfast broadband through Phase 1,2 and 3 of the Superfast Broadband Programme. This included £15m of funding in Phase 1 and a further £9.2m in Phase 2 and the local Programme was led by Norfolk County Council.

This research set out to understand the public service provider impacts of the Superfast Broadband Programme and therefore involved consultations with representatives of the council and public service providers. Norfolk was selected with a view to focusing on school and library services and it was highlighted that almost all schools would have been upgraded as part of the local project. However, there was a complicating factor in that it is likely some have been subsequently targeted by the Local Full Fibre Network Programme (LFFN). These areas were exempted from research. A number of libraries were also anticipated to have had improved connectivity made available through the Superfast Programme.

The first consultation was undertaken with a representative of the council before representatives of both local authority run schools and libraries were then consulted. Interviews then took place with three schools and three libraries for a total of nine interviews for the case study.

Findings

The initial consultations identified potential impacts on schools as it was expected that most schools in rural areas would have been in a position to upgrade their connectivity as a result of the Superfast Broadband Programme. This was largely confirmed when rural schools were mapped to Programme delivery and identification of schools upgrading their connection led to a number of leads for further interview.

Libraries were highlighted by council representatives as being potentially impacted through the Programme and a similar exercise was undertaken to map these to Programme delivery, once again delivering a number of leads for further interview.

The findings from the interviews are organised under libraries and school impacts below.

Library impacts

The consultations undertaken with libraries emphasised a major role of connectivity in their ability to provide services to the local community effectively. Norfolk is largely rural and connectivity was seen to be very important in enabling access to library services in many places. This highlighted the importance of residential connectivity most prominently as a means through which access to services could be widened, saving long journeys to use library services.

"The library covers a huge area really and there are lots of little communities around the area so bringing people together virtually is good. Loaning and extending loans online should be better for people that live further away" – Library employee

For the libraries themselves, the impacts of improved connectivity took the form of productivity improvements most notably with day to day tasks made quicker, but digital skills classes / events with patrons were also able to be run more effectively. The use of PC terminals was said to have increased steadily since a new connection was installed for one of the libraries, as had the demand for booking terminals, placing requests for books online and enquiries using online media.

"We've definitely seen more people use the computers we have in the library. That's also seen in the people using the full range of online services we provide" – Library employee

Two of the three libraries consulted were also able to expand the range of services they provide to their local areas to include further sessions on getting the most out of digital technology with these targeted primarily at children and young families and the elderly.

"We can now run sessions with members of the local community, teaching them the basics of the internet, some IT skills and accessing content [as] well as other local services" – Library employee

These sessions had very different focusses with the former more targeted towards the effective use for education purposes and lessons on how to safely use the internet, apps and related content as well as how to effectively control what can be accessed and how long technology is used for by younger family members. Other classes focussed more upon basic digital skills such as how to use video calling facilities on devices such as tablets and laptops with a view to supporting the wellbeing of the elderly population.

In providing the sessions described above, the two libraries had taken on further volunteer staff to support in their delivery thereby providing opportunities for members of the community to get involved in supporting that community. These were filled by young men / women who sought experience that might help them get jobs in the future. This would suggest that improved connectivity for other libraries could support more volunteering roles and that there may be workforce impacts present.

Through facilitating libraries to provide more services and services more effectively and efficiently, those interviewed thought that the libraries were playing a more important role in supporting local communities and improving digital inclusion. Their role in supporting digital inclusivity could be viewed to be in providing the means for those disadvantaged to acquire the basic skills required to get the best from digital technology and provide a place from which these families could access the internet should cost prove an issue at home.

The Covid-19 pandemic was also discussed in conversations with library representatives. Whilst most libraries were closed in practice in winter 2020, they were offering some limited services such as the option to collect books ordered online. Residents therefore required an online account and connection to use online booking services should they want to take out or return a book on loan. In reality, superfast connectivity was not necessarily required for this, but the Programme may have stimulated take-up of any form of connectivity, superfast or not, which could have enabled users to continue to use the library. All three library representatives were concerned that the inability for some vulnerable users to make use of the libraries connectivity and engage with library led sessions may have detrimental impacts on their wellbeing, potentially increasing feelings of loneliness.

It should be noted that provision of improved connectivity to libraries was not a target of the local Programme and therefore the effects described above were not targeted or anticipated explicitly by BBfN. Therefore, these effects could be replicated across other libraries in other schemes.

School impacts

The local authority run primary schools interviewed in Norfolk were located in very rural areas of the county and described having very poor internet connections prior to upgrade in recent years. These three schools were located in Programme areas which had been delivered to and the interviews confirmed that they had upgraded connectivity since then.

"Our connection a few years back was terrible! We could just about have [school secretary] using the internet at once. No one else could be on at the same time for sure" – School staff member

The rurality of these schools means that they are not particularly representative of primary schools across the country and it is important to keep in mind that the effects for these schools from improved connectivity could be hypothesised to be larger than would be for the average school, given the lower baseline connectivity.

All three schools described improvements in their ability to utilise online resources in classes, with the use of such resources barely considered possible before the improved connection. Whilst staff were unable to provide any evidence of this leading to impacts on pupil attainment, they did feel that this enabled a greater variety of resources to be used and that one or more of these could resonate with pupils which in turn may have knock on impacts on pupil attainment.

"We've made much more use of different learning resources for the children. The variety of things we have available to use has got better and hopefully pupils will connect with them, some of them at least, but I can't say that pupils will get better grades as a result. I'm hopeful though" – School staff member

As with interviews with other schools in other areas, interviewees described good engagement from pupils with online tools, however the ability of some pupils to make use of digital technology was limited, with this thought to be a function of a limited exposure at home. One interviewee highlighted a concern that in some cases the use of digital tools in schools could exacerbate inequalities in this regard and required some thought was needed in how to use online / digital resources equitably.

Communication with parents was also something that was highlighted by two of the schools with them shifting to utilise regular newsletters sent via email for a main method of informing parents of upcoming events and related news. This was at the time done alongside physical newsletters and letters more generally so as not to exclude those without access to email. In the long term though it was hoped that they could shift to online being the predominant means through which information is provided to parents, hence reducing the number of in person questions received and physical means of communication required reducing costs.

Residential connectivity was seen to have become more important for primary school education since the onset of the Covid-19 pandemic as the closure of schools and use of remote learning at points required an adequate connection at home. In this regard, the Superfast Programme would very likely have provided connections suitable for most parents to facilitate remote learning but access to equipment was described by teachers as a key factor. For the disadvantaged, a lack of access to computing equipment such as a PC, laptop or tablet could have hindered their progress relative to other pupils and this concern was raised by all three schools consulted in Norfolk. Some equipment was made available to those unable to afford it, however even in these cases the skills required to make the most of these were less developed.

Conclusions

Key findings for this case study:

- The research with libraries in Norfolk suggests that provision of superfast connectivity has productivity benefits for the libraries affected as well as potential impacts on workforce and volunteer opportunities at the libraries. The range of services provided may also increase and / or the provision of digital related activities may also become more efficient. However, wider residential connectivity within the local communities should be considered an important part of getting the most from local libraries.

- The schools in Norfolk consulted in this research should not be considered representative of the general population of primary schools, but the consultations do suggest that where baseline connectivity is particularly poor, there are benefits to be had from improved connectivity. For these schools, the primary benefits were in the variety of resources available for use in teaching, engagement with children and in expanding communications with parents.

- Across both libraries and schools an issue of inequality was described in relation to access to the equipment required to utilise a superfast connection and in purchasing such a connection. Those disadvantaged in the local areas were viewed to potentially be at risk of falling further behind should they be unable to afford either of the above. Therefore, digital inclusion work was required to build upon the foundation of superfast availability to widen digital participation.

- Finally, residential coverage was seen as key for mitigating the impacts of the Covid-19 pandemic. The communities around the schools and libraries engaged wit in this research were rural in nature and may not otherwise have had access to a superfast connection by the time the pandemic struck.

Isle of Wight

This case study covers the research undertaken with the co-operation of Isle of Wight Council in 2020 and 2021. This case study involved consultations with representatives and former representatives of the local council with a focus on the Isle of Wight Digital Island Strategy and particularly remote working.

Case study overview

The Isle of Wight Rural Broadband project plan was formally approved in February 2012.The project aimed to reduce the digital divide between the Island and the mainland and to enable economic growth and digital inclusion for all residents and businesses, through access to faster broadband. The island had inconsistent broadband coverage and there were a significant number of private and commercial properties across the Island in broadband 'not spots' either having no broadband access, or suffering very slow internet speeds of less than 2Mbps (megabits per second) with co-existing pockets of digital, social and economic exclusion. Access to superfast broadband was, therefore, required to address local disparities across the Island as well as reducing the performance gap with the South-East and UK. The project included £2.5m in funding as part of Phase 1 of the Superfast Broadband Programme.

This research set out to understand the public service provider impacts of the Superfast Broadband Programme and in particular the local council productivity impacts for the local council in this case study.

The first consultation was undertaken with a representative of the council before representatives of both IT services and Digital Strategy development were then consulted. Interviews then took place with three local authority colleagues and two representatives of local healthcare commissioning libraries for a total of eight interviews for the case study.

Findings

The initial consultations identified significant impacts on local council working practices resulting from the Superfast Broadband Programme, particularly as at the time the research was undertaken coincided with the Covid-19 pandemic.

In addition to impacts relating to the local Digital Strategy, initial consultations indicated potential for Superfast rollout to have supported local health care services, in particular through video consultations.

The findings from the interviews are presented below.

Local council and digital strategy impacts

The Isle of Wight Digital Island Strategy[34] was published in April 2019 but had been in development since 2017. The rationale behind its development was to identify the opportunities where digital technology can be used to enable solutions to regional challenges. These were expressed as:

- Supporting delivery of existing plans and policies (economic growth, regeneration, carbon, environment, tourism)
- Supporting digital transformation of council services
- Enabling economic growth through digital technology, identifying priority economic areas for growth

[34] https://iwightinvest.com/the-isle-of-wight-digital-island-strategy-2019/

- Identifying key skills required for individuals and businesses to engage with the digital agenda and benefit from the opportunities to grow

- Building the island's Sense of Place and overcoming the feeling of 'dislocation'

Having been developed after the rollout of the local Superfast Broadband Project, the plan seeks to build upon the base the Programme has provided in the local area. In the digital maturity section of the plan, the island is described as being in "a relatively strong position" with the presence of some localised connectivity black spots.

"While there are some issues with connectivity and "not-spots", the Isle of Wight is in a relatively strong position compared to many regions and communities, and most connectivity challenges will be addressed over the next five years. The challenge is around uptake and realisation of opportunities that flow from fast and reliable connections. This is fuelled by a skills and knowledge deficit amongst businesses, leaders and employees. Improving core digital skills across the workforce will play a key role in improving the ability of regular businesses in current core sectors such as tourism, agriculture and public services to improve productivity with relatively modest investment or changes in practice." - Isle of Wight Digital Island Strategy

Interviewees highlighted the likely role that the Superfast Broadband Programme had played in establishing a relatively good base of connectivity in the area. Ongoing Programmes such as the Better Broadband Scheme were hoped would fill the remaining gaps and the Gigabit Island project with WightFibre was described as taking connectivity on the island to the "next level" but the Superfast Broadband Programme provided the foundation levels of connectivity required more widely across the island.

As a result of a good connectivity base, the strategy set out aims in terms of increasing the availability of digital skills but also placed significant emphasis on local authority public service transformation. Superfast was viewed as key to underpinning intended transformation given the need for access being available to the public to use online services. A shift to online delivery leaving behind many members of the local public without suitable connections to access public information and services was argued would not lead to any cost savings as intended.

The Covid-19 pandemic highlighted a potentially significant impact of Superfast on all councils that was most notable for the Isle of Wight in the form of access to remote working. Access to superfast broadband from the residential premises of council workers was seen to be a key factor in maintaining the running of council services when being in the office presented constraints. Representatives working for the Isle of Wight Council described this as one of the main benefits of the Programme from their perspective, particularly given the time at which interviewing took place. For them, the pandemic had accelerated a trend towards remote working and, beyond the current pandemic, stakeholders across councils were open to the view that more frequent remote working could be considered the norm and something enabled to some extent by superfast coverage to residential connections. Stakeholders reported that before Superfast they did not think that coverage was good enough to enable remote working on a large scale and it was only through the Programme that this was addressed.

"Before [the Superfast Broadband Programme], I don't think I would be bale to work from home and I think that is the same for a lot of people here. Connectivity wasn't good enough I don't think. "- Isle of Wight Council representative

Health and social care impacts

The Isle of Wight has an aging population that puts significant pressure on the health and social care resources of the island with health and social care identified as a priority for the digital strategy. Interviewees for these services identified two main initiatives being driven through the Hampshire and Isle of Wight Local Digital Roadmap as benefiting most significantly from the rollout of superfast broadband coverage. These were:

- **Patient Portal:** A patient portal will allow patients to co-manage their healthcare online reducing the need for hospital visits. It will offer 24/7 support and information, allow patients to cancel and re-book appointments online, view their record and facilitate online consultations thereby, helping to keep relatives / carers informed and engaged. It will also provide patient access to self help interventions for smoking, alcohol interventions, weight self-management and increasing activity levels.

- **eConsultations**: Provides access to online resources 24 / 7 and reduces the need for face-to-face consultations, leading to practice efficiency savings. Provides opportunity to collect comprehensive history and early identification of symptoms leading to more productive consultations.

Health and care organisations across the Island have been offering appointments by telephone or video, as an alternative to in person appointments which have gained in traction since the start of the Covid-19 pandemic. During the pandemic, the use of video helped many staff and patients stay safe, allowing people to keep in touch with their healthcare and support teams in a new way during a period of social distancing restrictions.

"Video consultations have meant that appointments can go ahead with both the patients and staff kept safe" – Health and social care representative

In addition to the shorter-term benefit of maintaining services through the pandemic, future use of video consultations could help reduce trips to the mainland for follow up outpatient appointments, improve communication between community teams, GPs and care homes, and reduce patient and staff travel where clinically appropriate.

These initiatives were considered most likely to be affected by the Superfast Broadband Programme because of their reliance on patient access to connectivity at home in order to work efficiently. Whereas many health care providers would already have had decent connectivity before the Programme, this was likely not the case for many residents. Moving forward the focus will be on encouraging the continued take-up of online services through communication and engagement activities

"We need to continue to encourage the use of things like the video consultations and online booking past the pandemic. In some ways it [the pandemic] has helped us transition into them quicker. But these are reliant on people's connections at home which is where I think the Superfast Programme comes in to it" - Health and social care representative

Conclusions

Key findings for this case study:

- Local digital plans were shaped in part by the Programme, and widespread connectivity of superfast speeds was seen to provide a good base to build upon and facilitate local service transformation as well as encourage the development of local digital skills. Local councils would benefit from this as it removes the first barrier to potential productivity and welfare gains associated with use of digital technology.

- In terms of remote working, the residential coverage enabled by the Programme was seen to be the key factor facilitating a swifter transition to a flexible working environment. Many council staff members were unlikely to have been able to continue to operate from home as effectively as they did had the Superfast Broadband PProgramme not provided coverage.

- Once again, it is likely that the wider residential coverage of superfast provided by the Programme was important in terms of the use of video consultations and other online health and social care related services. The Covid-19 pandemic has emphasised the importance of residential connections to continue to enable care when social distancing is in place. Disparities in the use of online services for age groups however remains a concern with older residents most at risk but less likely to use online services.

Cornwall

This case study covers the research undertaken with Cornwall Council and Superfast Cornwall in 2020 and 2021. This case study involved initial consultations with the local council before interviews with representatives of the key services identified in the areas as having been impacted by the Superfast Broadband Programme, those being schools and libraries. The final stage of the research involved consultations with both primary schools and libraries likely to have upgraded their broadband connections after the Programme had delivered to their area.

Case study overview

Funded by the EU, BT and Cornwall Council, and managed by Cornwall Development Company, Superfast Cornwall was set up in 2011 to manage investments in connectivity across the county. The first Programme (not related to the BDUK managed Superfast Broadband Programme) was the 2011 to 2015 EU Programme which saw over 132,000 km of optical fibre and 700 new roadside cabinets installed to help support the new network. The project was funded through a £132 million investment: £53.5 million from the European Regional Development Fund and £78.5 million from BT.

The second Programme formed part of the Superfast Broadband Programme with £5.96m in BDUK funding. The Superfast Cornwall Broadband Extension Programme aimed to upgrade 8,000 premises by the end of 2017, achieving over 10,000 premises by 2018.**For this project, there was a small** weighting towards schools, which motivated the selection for a case study. However, consultations also highlighted libraries and skills services as being targeted to varying degrees alongside digital inclusion and community work that could be explored.

The first consultation was undertaken with a representative of Superfast Cornwall before representatives for the digital strategy and inclusion work. Interviews then took place with three schools and two libraries for a total of eight interviews for the case study.

Findings

The findings from the interviews are organised under libraries and school impacts below.

School impacts

The primary schools engaged with in Cornwall were located in very rural areas which lacked superfast connectivity prior to the Superfast Broadband Programme. They each reported having taken up an upgraded connection since 2016 that provided a superfast (>24mbps download speed) or just below connection.

Two of these schools highlighted some changes to the way children were taught at the schools as a result of better broadband, with the addition of digitally based learning becoming more common in classes. However, the main benefit in terms of teaching was said to come from the increased reliability provided by the connection with more children able to access online resources at the same time and without as much of a delay as was previously the case. This enabled teachers to cover more in their lesson which has potential implications for pupil achievement.

"The kids seem to engage better now, it was hard to keep their attention when the connection couldn't handle it and most of the time we would just give up" – Primary school representative

Staff said that the children generally received more enjoyment from online resources relative to that before the schools connection was able to manage faster speeds. It was hoped by teachers that this would lead

to an increase in their attainment. Related to this, attendance was mentioned but not considered a factor likely to be impacted by Superfast.

"I would say there has been a marked increase in engagement with online resources by the kids in my classes. Although, I don't think it will necessarily mean they will do better in their reading, writing and maths test. They still need supervision and person to person teaching" – Primary school teacher

Administrative processes were described as more efficient by two schools. One of these schools highlighted better connectivity amongst the residents in the area meaning that parents had more of an incentive to engage with electronic communications from the school without the constant reliance on letters.

Residential connectivity was also seen to have become more important for primary school education since the onset of the Covid-19 pandemic as the closure of schools and use of remote learning at points required an adequate connection at home. In this regard, the Superfast Programme would very likely have provided connections suitable for most parents to facilitate remote learning but access to equipment was described by teachers as a key factor.

A lack of access to computing equipment such as a PC, laptop or tablet could have hindered their progress relative to other pupils and this concern was raised by two schools consulted in Cornwall. Some equipment was made available to those unable to afford it, however even in these cases the skills required to make the most of these were less developed.

When asked about the financial implications of the new connections, all three schools in Cornwall reported no real effects aside from a small increase in ongoing connection costs. However, two of the schools were keen to upgrade their IT equipment in the future especially given that this was outdated.

Library and digital inclusion impacts

Once again, the two libraries consulted in Cornwall were situated in relatively rural places and had benefited from superfast rollout. Both of them highlighted the access to broadband as important for the service they provide to the local community through provision of IT space for those lacking access at home.

As with other libraries in other areas, the impacts of improved connectivity took the form of productivity improvements most notably with day to day tasks made quicker. The use of PC terminals was said to have increased steadily since a new connection was installed for one of the libraries, as had the demand for booking terminals, placing requests for books online and enquiries using online media.

"We certainly saw more people using the equipment before Covid but at the same time we think people here have also started to seriously consider getting their own now. Especially since the lockdown" – Library employee

The two libraries interviewed were both largely closed at the time of interviewing as a result of the Covid-19 pandemic and lockdown measures imposed in Winter 2020. However, online tools could still be used for limited services.

Digital inclusion work undertaken by the Cornwall Development Company to support Superfast Cornwall also highlighted a range of community-based interventions building upon connectivity provided through the subsidised schemes (not just the Superfast Broadband Programme). The Centre of Pendeen was one such case study highlighted by the CDC both in interview and on their website. The centre had utilised it's superfast connection to help develop digital skills in the area with basic digital skills taught over seven

weeks to local residents including showing people aged over 55 how they can save money on household energy bills by using online comparison sites. This work was only made possible through the connectivity available at the centre and in such a rural area this was considered unlikely to occur commercially.

Conclusions

Key findings for this case study:

- Research in local schools highlighted benefits for pupils in terms of the range of teaching materials available and potential for better engagement. Covid-19 resilience was also provided by the Programme with remote learning a possibility not considered achievable a few years prior.
- The research with libraries in Cornwall suggests that provision of superfast connectivity has productivity benefits for the libraries impacted and can lead to greater demand of IT services. Residential coverage within the local communities should still be considered an important part of getting the most from local libraries.
- Engagement with local community venues in rural areas through charitable ventures has the potential to support the development of local digital skills, particularly where the resident population are older. Local authorities could consider ow they engage with smaller bodies in local areas to achieve wider benefits.

South Yorkshire

This case study covers the research undertaken with Superfast South Yorkshire (SFSY) and local councils in 2020 and 2021. This case study involved consultations with representatives of the delivery body and the relevant local councils with a focus on the SFSY Digital Connectivity Strategy and local council service transformation.

Case study overview

Superfast South Yorkshire (SFSY) was setup in 2014 by the four South Yorkshire partner local authorities: Sheffield, Barnsley, Doncaster and Rotherham. SFSY received BDUK funding as part of the Superfast Broadband Programme in Phase 2 with £9.6m in BDUK funding and £13.6m in local funding. The project is contracted to deliver superfast broadband to 103,290 premises and had reached 98,742 as of December 2020.

The Superfast South Yorkshire Programme Digital Connectivity Strategy was published in September 2019 setting out a vision in which the area would be recognised as one of the best connected regions in the country: where coverage, choice and speed of communication stays ahead of demand; and where connectivity enables residents and businesses to use digital solutions to improve their lives and to sustain, grow and create new business. Within the strategy, better delivery of public services was highlighted as something that could be enabled by digital connectivity and included local authority transformation and healthcare services.

This research set out to understand the public service provider impacts of the Superfast Broadband Programme and in particular what impacts have been for local authority transformation and the development / delivery of the digital strategy in this case study.

The first consultation was undertaken with a representative of SFSY before representatives of two local authorities were consulted. Interviews then took place a further two local authority colleagues for a total of five interviews for the case study.

Findings

The strategy delivered as part of the Superfast Broadband Programme forms the basis for this case study[35]. Relating to public services, this focuses upon the NHS, Emergency Service Network (ESN) and local authority service transformation. Interviewees focussed upon the latter of these alongside conversations around the development of the strategy itself.

The findings from the interviews are presented below.

Digital strategy development and delivery

The 2019 Digital Strategy recognised the progress made in South Yorkshire in terms of the availability of connectivity. It highlighted that:

- Coverage of superfast broadband had increased from 80% to over 95% and was expected to reach 99% by 2021
- The take-up of superfast broadband had increased from 18% to over 45%

[35] https://barnsleymbc.moderngov.co.uk/documents/s61401/Appendix%201.pdf

Both of these were linked to the Superfast Broadband Programme and interviewees described the role of superfast as being critical to achieving these aims. In addition to coverage from the Programme, business parks in South Yorkshire were able to access gigabit full fibre broadband, business development Programmes had helped businesses to use digital to sustain and grow and voucher schemes had covered 50 percent of some SMEs digital connection and innovation costs.

The strategy goes on to describe the benefits of digital connectivity and classifies them under the following themes:

- **Economic competitiveness:** Connectivity provides access to, and use of, products, services and resources that are increasingly digitally enabled; Increased efficiency and effectiveness, increasing productivity and reducing costs; Growth of existing markets and entry to new global markets; Innovation and the creation of new products and services; and, workstyles that attract skilled employees. Superfast broadband coverage across the area was considered important in stimulating economic activity and the minimum requirement for business to benefit from digital connectivity.

  "Businesses in the area need access to superfast broadband as a minimum really to get the benefit connectivity can provide and the Programme has helped us to reach those business in more rural places. We can now focus on raising awareness and building skills and knowledge to get the best from what we have" – Local authority stakeholder

- **Quality of life:** Digital connectivity was also hypothesised to enable access to public services which were increasingly available online (supported through channel shift); Improved education outcomes through the use of web-based learning materials; Better employability through more effective job hunting and the ability to work remotely; Improved health and well-being through remote health monitoring, better communications and access to health services; Reduced isolation through internet enabled communications and social engagement; Access to streaming services which were increasingly replacing physical methods of distributing recreational content such as TV, movies and music; Access to savings and discounts offered through online shopping; and, more opportunities to interact with new digital services and experiences in the environment, both urban and rural. These benefits were seen to be most likely to be brought about through residential coverage on the whole by interviewees.

- **Better delivery of public services:** Online public service delivery could also enable the public sector to deliver services electronically to the public who are then able to access them 'any time, any place, anywhere'; Delivering access to public sector services electronically online was considered more efficient than delivering them through face-to-face or telephone contact centre channels. The 2016 LGA 'Engaging Citizens Online' report estimated the initial costs per transaction of face-to-face contact at £8.21, £2.59 for a telephone contact and £0.09 for an online transaction. Interviewees described these benefits as potential at this stage as channel shift required not insignificant amounts of investment to get off the ground with cost benefits not likely to be seen until later; Connectivity would also enable the public sector to improve its business processes, to take advantage of digital products and services to improve efficiency and effectiveness, to innovate and be responsive to changes in demand; Enable the public sector to reduce costs by using lower cost cloud based services rather than more expensive on premise alternatives; Enable the public sector to share information, to deliver joined up services, and to implement alternative organisational models such as shared services; Enable the delivery of other organisational strategies such as public service transformation; education and skills; and, economic development; and, enables the public sector to

use modern ways of working which offer employees better work / life balance, helps attract new recruits, and helps retain skilled and experienced employees.

"There are definitely cost benefits to moving interactions online, but there will always be a need to maintain some physical presence. In terms of the services we provide, we are seeing the potential for benefits most in those areas that involve numerous but small interactions with residents, so things like council tax, waste and recycling and permits." - Local authority stakeholder

Building upon the public services impacts, council employees described increased usage of online services across the authority areas in recent years (these could not be quantified). The prevailing view was that widespread access to connectivity in the local areas for residents was the driving force behind the increased usage and there was a clear demand amongst residents for online services with that likely to become the default route through which residents and councils interact.

"We know people want to use the simplest and quickest means to resolve their query, payment or application for example and a good online platform lends itself to that. As residents, particularly those more elderly, become more confident and have a connection then we expect to see the trend continue" - Local authority stakeholder

Increased usage has led to a greater emphasis in the councils to promote their online services and invest further in developing the online tools required. This came at a cost however, with the expected reduction in face to face contacts anticipated to lead to reduced fixed costs in some areas with resources redeployed to more efficient roles.

Finally, the availability of connectivity across South Yorkshire facilitated by the Superfast Broadband Programme was considered to have also supported public sector resilience through the Covid-19 pandemic. One interview highlighted the importance of residential connectivity in enabling the continued access to services when in-person contact was limited. In addition, it was likely that some staff at local councils were able to work remotely that would not have in the absence of subsidised connectivity.

Conclusions

Key findings for this case study:

- Superfast availability provided through the Superfast Broadband PProgramme gave South Yorkshire a broad base of connectivity that would enable significant benefits to be realised from digital connectivity. Development of the Digital Strategy could focus on developing skills and encouraging wider take-up to get the most from the economic benefits associated with connectivity, however it was recognised that full fibre connectivity was required in order to future proof benefits.

- For public service transformation, significant cost savings were expected from channel shift, but which were not quantified in detail here. Since the Programme, demand had risen significantly with this facilitated both by wider residential connectivity and local authority investments in online tools. Demand for online council services was seen to justify public investment.

- Connectivity across South Yorkshire was viewed by stakeholders to have supported public sector resilience through the Covid-19 pandemic. Residential connectivity was important for providing continued access to services when in-person contact was limited. In addition, it was likely that some staff at local councils were able to work remotely that would not have in the absence of subsidised connectivity.

East Riding (Yorkshire)

The final case study included research with East Riding Council in 2020 and 2021. This case study involved initial consultations with the local council before interviews with representatives of the key services identified in the areas as having been impacted by the Superfast Programme, those being schools and libraries.

The final stage of the research involved consultations with both primary schools and libraries likely to have upgraded their broadband connections after the Programme had delivered to their area.

Case study overview

The East Riding of Yorkshire Council has participated in the first two phases of the Superfast Broadband Programme. Through Phases 1 and 2 the area received £16.6m in BDUK funding matched with £8.4m in Local Body funding to provide superfast broadband to 50,876 premises. Phase 1 and 2 delivery had achieved 49,768 premises as of December 2020 according to BDUK figures[36].

Initial conversations with the authority identified local service digitisation as a key focus for the authority. Library services were also discussed as having been impacted by increased superfast availability. Schools were also mentioned as an area for exploration.

The first consultation was undertaken with a representative of the council before representatives for IT, library and school services. Interviews then took place with two schools and two libraries for a total of eight interviews for the case study.

Findings

The findings from the interviews are organised under libraries and school impacts below.

School impacts

The two schools engaged with in East Riding discussed the use of connectivity during the Covid-19 pandemic. These primary schools had begun using Google Classroom as their online learning platform to manage learning remotely for pupils. The platform was the means through which work was set, homework submitted and interactions with teachers managed whilst schools were closed for all but key workers in 2020. Staff reported initial difficulties in setting up a system for remote working and it took time for parents to build a routine around the new way of remote learning.

"It was great for us! We did have some trouble getting things set up but once we got past that it was really good to keep in touch with pupils and keep them learning." – Primary school staff member

Being able to access a remote learning platform such as Google Classroom however, had enabled pupils to continue with some form of learning. This was of course enabled through home connectivity and the availability of a broadband connection in a pupil's home was considered vital to enable the technology (other options such as mobile broadband was mentioned but would come at additional cost).

"It does rely on having a decent connection at home, so there is that. There were definitely some people who didn't have broadband at home but not many." – Primary school staff member

Whilst the two schools were not considered to be very remote, the areas they were situated in would not likely have been covered by commercial suppliers in early plans given the relative high levels of deprivation

[36] https://docs.google.com/spreadsheets/d/1Hs00bNsyRV1WoOt-fow3rsNXzpcKg26AsOWvk1bvJRk/edit#gid=1411146266

likely to reduce demand. As a result, it was not clear whether or not the areas would have had widespread superfast coverage by 2020. Staff at both schools were also not aware of good connectivity being available in the area prior to 2013.

When asked about how a lack of connectivity available at home would impact pupil learning over the last year, staff at both schools were confident that it would put pupils further behind unless they were able to attend school in person. It is too early to say anything definitive about the impacts of the lockdowns on pupil attainment or the impact of connectivity, but it is likely that subsidised coverage has helped avoid some pupils falling further behind in their learning than they would otherwise have.

"I'm sure we would find some of the children falling further behind without access to Google Classroom. However, we did have contingency in place for in person schooling as we did for key worker children if needed" – Primary school staff member

In addition to potential difficulties accessing connectivity, access to equipment (e.g. tablets, laptops, PCs) was considered a larger issue for parents and schools. Where the two areas were relatively deprived, not all families with children at the schools had access to the equipment required and this posed significant constraints. Competition for such resources at home could also pose problems for families. The schools had some level of equipment to loan to families which could help alleviate this.

Libraries

Library membership in East Riding allows residents with library membership to access the Digital Library. This allows residents access to eBooks, emagazines, eaudiobooks and enewspapers online using various apps. A relatively recent service, the Digital Library was thought by interviewees at the two libraries to be a service that is expected to grow further as library members move online. It offers a range of products for members to read in a convenient form which can be access through tablets and mobile devices on demand. This removes the limitations of physical books that either require reading at a library or to be loaned out and returned in person. However, the majority of older physical books at libraries were not available in this format and so would still require traditional library access.

"I think the appeal of it is the convenience. There's no need to go to a library and find the book, you can access it wherever you want." – Library employee

Access to broadband connectivity at home and in public spaces is required to access the Digital Library and so the coverage from the Superfast Broadband Programme will have enabled more residents to utilise the service.

"The more customers with broadband he more people who can access the Digital Library which is great." – Library employee

Throughout the Covid-19 pandemic, East Riding libraries have also continued to offer order and collect services at premises for those customers who prefer to use it, many also remained open for limited browsing (maximum of 30 minutes, which was reduced at busy times). In order to order books, residents could either phone the library or reserve online, and then collect from their library once available. Representatives of the two libraries discussed continued usage of these services as residents continued to want to make use of library resources with booking online becoming the most common means through which books were ordered for collection at the time.

Conclusions

Key findings for this case study:

- Access to broadband at home was essential for primary school children throughout the Covid-19 pandemic and has helped teachers and pupils keep a degree of interaction going in the absence of in-person learning. Without decent connectivity at home, large scale remote learning would have been made much worse with some families encountering problems still (contingencies were in place).
- Access to equipment such as laptops, PCs and tablets remained a barrier for some families when trying to home school. In deprived areas in particular, there was a need for equipment to be available to loan. This is linked to a lack of skills using technology through the lack of familiarity.
- Increased residential connectivity enables grater use of online Digital Library services which in turn offer a more convenient and efficient means to access some books and resources available through libraries. This was considered to have been enabled through access to superfast broadband connections.
- In addition to the above, residents have embraced the ability to order books online for collection throughout the pandemic. This was expected to continue in the future and the continued use of library resources should lead to wellbeing impacts for local residents.

Annex 2: Process evaluation framework

Table 7.1: Process Evaluation Framework

Topic area	Process	Process Objectives	Evaluation question	Metrics	Evidence from LB interviews	Evidence from Supplier interviews	Evidence from BDUK docs and data	Evidence from LB docs and data	Evidence from CN data
Allocation of subsidies	Identification of cost of upgrades to superfast speed	Allocate subsidies to areas to achieve maximum increase in coverage at lowest cost	▪ How accurate were the estimated gap funding requirements? ▪ Were subsidies allocated to areas with the capacity to absorb the subsidies (both in terms of ability to match fund the Programme and manage the investment Programme)?	▪ Modelled costs of upgrades versus budget and actual costs by contract ▪ Level of public sector match funding vs BDUK funding by contract					
Allocation of subsidies	Development and assessment of business cases[37]	Allow BDUK to make funding decisions the value or money from the subsidies received	▪ Were the business cases received of the desired quality and clarity? ▪ Did business cases received offer the desired value for money? ▪ How did iterations with BDUK improve the value for money or other aspects of the quality of the proposed investment? ▪ What learning was incorporated in iterations between waves? ▪ Was the process of agreeing the business case efficient and timely?	▪ No process metrics – purely qualitative.					
OMR and public consultations	OMR and public consultation process?	To ensure that subsidies were allocated as far as possible to areas that would not receive superfast coverage under existing	▪ Did all relevant suppliers respond to the OMR and public consultation process? ▪ Did those responding provide accurate information on their commercial plans? ▪ Did Local Bodies have the required skills and knowledge to evaluate the validity of the information received? ▪ Was the OMR sufficiently responsive to changes in commercial plans, the wider environment, or strategic behaviour by suppliers (e.g. growing demand for superfast?)	▪ Number of respondents to OMR versus number of ISPs active in the contract area, by contract ▪ OMR responses versus actual roll-out of superfast by supplier, by contract ▪ % of superfast grey or black postcodes / premises with no superfast roll-out ▪ % of Phase One great/black postcodes / premises becoming superfast white in subsequent OMRs					

[37] Our understanding of this process is based on a single interview with a Local Body. This process will be explored further in the scoping interviews with Local Bodies

Topic area	Process	Process Objectives	Evaluation question	Metrics	Evidence from LB interviews	Evidence from Supplier interviews	Evidence from BDUK docs and data	Evidence from LB docs and data	Evidence from CN data
		commercial plans	▪ Did the OMR process result in any adverse outcomes by requiring suppliers to reveal their plans (or via other mechanisms)?	▪ % of superfast white postcodes not included in Superfast build plans with actual superfast roll-out					
Tendering	Selection of procurement model	To optimise value for money from the Programme	▪ What procurement models were chosen by Local Bodies, and for what reasons? ▪ How did the choice of procurement model influence value for money from the Programme? ▪ How did the choice of procurement model influence competition and the number / type of responses? ▪ Did the procurement model chosen have any adverse effects (e.g. excluding potential tenderers from the exercise)?	▪ Cost per premises upgraded (budget and actual – including take-up gainshare and underspend clawback) by procurement model ▪ Cost per premises upgraded vs BDUK modelled costs by procurement model ▪ Number of tenderers by procurement model					
Tendering	BDUK Framework	To maximise levels of competition for to deliver contracts awarded through the Programme	▪ How effectively were suppliers engaged in the process of establishing the BDUK Framework? ▪ What efficiency gains were realised as a result of establishing the BDUK Framework? ▪ Did the BDUK Framework promote competition between suppliers and value for money? ▪ Were there any adverse effects associated with the Framework?	▪ Number of tenderers – BDUK Framework lots and non-BDUK Framework lots ▪ Cost per premises upgraded (budget and actual – including take-up gainshare and underspend clawback) by BDUK Framework and non-BDUK Framework					
Tendering	Development of lots	To ensure that all relevant suppliers were able to bid to deliver	▪ How effectively were suppliers engaged in the process of dividing contracts into lots? ▪ Did the process of dividing contracts into lots stimulate greater levels of competition?	▪ No metrics from MI.					

Topic area	Process	Process Objectives	Evaluation question	Metrics	Evidence from LB interviews	Evidence from Supplier interviews	Evidence from BDUK docs and data	Evidence from LB docs and data	Evidence from CN data
		the project while still ensuring Value for Money	▪ What additional costs were incurred in the process and was this offset by greater value for money or other benefits?						
Tendering	Tendering advice	To ensure that Local Bodies received high quality bids from suppliers that met the project needs	▪ How far did the tendering advice provided by BDUK to Local Bodies improve the effectiveness of the tendering process?	▪ No metrics from MI.					
Tendering	Tendering and award process	Award funding to the highest quality bids which most accurately reflect the aims of the project in a timely manner	▪ Was sufficient time provided to enable suppliers to prepare a bid? ▪ Did the tendering process yield sufficient information on all relevant aspects to make effective decisions? ▪ Did the award process involve proportionate costs for Local Bodies, BDUK and suppliers? ▪ Was the process completed in a timely manner?	▪ Time elapsed from launch of tendering exercise to signature of contract					
Contracting	Local Body contracts	Put contractual arrangements in place to ensure that suppliers delivered the required network build while protecting the public purse	▪ How effectively did the contractual advice provided by BDUK support Local Body contracting processes? ▪ Were the terms of the contract correctly specified to ensure delivery of the network build? ▪ Did the clawback arrangements in the contract work protect the public sector sufficiently from possible threats to value for money? ▪ Did any aspects of the contracting arrangements introduce inefficiencies (e.g. requirements for change requests)?	▪ Number of premises upgraded versus contracted premises upgraded ▪ Budget versus actual network build costs ▪ Cost per premises upgraded before and after take-up gainshare and underspend clawback ▪ Number of change requests by contract					
Project delivery - BDUK	Programme management	To monitor the delivery of the local	▪ Did the Superfast Broadband team provide sufficient information to Local Bodies about other DCMS	▪ Time profile of premises upgraded versus initial plans					

Topic area	Process	Process Objectives	Evaluation question	Metrics	Evidence from LB interviews	Evidence from Supplier interviews	Evidence from BDUK docs and data	Evidence from LB docs and data	Evidence from CN data
		projects and ensure projects remained state aid compliant	Programmes and other Government strategies? ▪ Was the level of monitoring of the local projects sufficient to ensure the projects were State Aid compliant and delivered on time? ▪ Were change requests handled in an efficient manner by the Superfast team? ▪ To what extent did BDUK identify and disseminate examples of good practice in the Superfast Programme?	(i.e. was the network build completed on time)?					
Project delivery – Local Bodies and suppliers	Project management	To successfully deliver the specified network build	▪ To what extent did the project management approach taken by the Local Bodies ensure the project was delivered on time, to budget, and in line with the project aims? ▪ Were all relevant individuals and organisations included in the project management structures (steering groups)? ▪ How effectively were risks and managed? ▪ Did suppliers have sufficient capacity to deliver at the scale anticipated? Did the Programme have any adverse effects on parallel Programmes of investment?	▪ No metrics from MI.					
Take-up	Marketing and benefits realisation[38]	To promote take-up of superfast broadband connections in the local area	▪ What benefits realisation plans were in place at the local level? How effective was the implementation of these plans? ▪ To what extent have additional ISPs entered the local market to provide Superfast Connections, taking advantage of the open access agreements?	▪ No metrics from MI.					

[38] The aim of the programme was to deliver coverage, not take-up. However, the suppliers have undertaken processes as part of the programme to increase take-up. A cautious approach to reporting these processes will be required.

Topic area	Process	Process Objectives	Evaluation question	Metrics	Evidence from LB interviews	Evidence from Supplier interviews	Evidence from BDUK docs and data	Evidence from LB docs and data	Evidence from CN data
			▪ Is the take-up of Superfast connections in line with expectations?						

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