

HATCH



BDUK Vouchers Evaluation: Impacts and Value for Money Assessment. Summary Report

A Report by Hatch, Belmana and Winning Moves

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Glossary

ASHE	Annual Survey of Hours and Earnings
BDUK	Building Digital UK
BCR	Benefit Cost Ratio
BSD	Business Structure Database, an Office for National Statistics dataset providing information on business characteristics and performance.
GBVS	Gigabit Broadband Voucher Scheme; the first voucher scheme for gigabit-capable broadband connectivity launched in 2018. The Scheme used the voucher product to prioritise connections for Small to Medium Enterprises, alongside connections for residential premises. The original scheme closed in May 2020.
Gigabit-capable broadband	Any technology that can deliver 1 gigabit-per-second download speed
OA	Output area: geographical areas for the purpose of local data analysis. OAs have between 40 and 250 households and a resident population of between 100 and 625 people.
Project voucher	A project is a group of two or more premises (business or residential) that together constitute a supplier's build proposal. Vouchers are claimed against some of the premises proposed up to a pre-agreed overall budget value. Vouchers claimed for a project (project vouchers) will therefore tend to focus on a specific geographical area and a project enables suppliers to aggregate multiple voucher applications and increase the subsidy available (up to a pre-agreed project budget limit).
PSM	Propensity Score Matching – a statistical technique used to estimate the effect of a treatment, policy, or other intervention by accounting for the observable characteristics that can predict treatment.
RGC	Rural Gigabit Connectivity: the second voucher scheme launched in May 2019 and was focused on rural areas.
SME	Small and medium-sized enterprises – business voucher eligibility was restricted to SMEs and referred to in the report as 'small businesses'.
Standard voucher	Standalone vouchers where an application was submitted for a single premise.
Superfast broadband (SFBB)	Any technology that can deliver more than 30 megabits-per-second.
SWB	Subjective Wellbeing
Ultrafast broadband (UFBB)	Any technology that can deliver more than 300 Mbps download speed.

Executive Summary

Purpose of Report

- i. Hatch, Belmana and Winning Moves were commissioned to undertake an evaluation of the Building Digital UK (BDUK) voucher schemes. These schemes offer subsidies to households and businesses towards the cost of gigabit-capable broadband. The evaluation includes two voucher schemes which had different objectives and eligibility criteria:
 - The Gigabit Voucher Scheme (GBVS): the original gigabit-capable broadband voucher scheme aimed to stimulate the rollout of gigabit-capable infrastructure and enable the market to extend its own plans further and faster by offering a single business connection voucher (standard voucher) or vouchers for mixed premises projects (project vouchers). This launched in 2017 and closed in 2021. As of December 2021, GBVS vouchers had been used to connect 29,400 premises.
 - The Rural Gigabit Connectivity (RGC) programme: eligibility was focused on the least viable areas for gigabit-capable broadband (e.g. restricting to rural areas and low connection speeds) and only offered the vouchers for mixed premises projects. This launched in late 2019 and continued in to 2022. As of December 2021 (the cut-off date for this evaluation), RGC vouchers had been used to connect 23,100 premises.
- ii. This is the second of three evaluation reports assessing the impact and value-for-money of the voucher schemes. The findings in this report relate to the emerging impacts of vouchers which can be measured to date. This includes their economic, social and environmental impacts. It also assesses the effects of vouchers on broadband performance (average download speeds in local areas) and availability (the proportion of premises that can access different speed levels). The full impacts and value-for-money of the voucher schemes will be assessed in the third and final evaluation in 2026. This is to allow the required time for impacts on businesses to have emerged and to be measurable in economic datasets.

Impacts of vouchers to date

- iii. While it is still too early to assess the full impacts of the voucher schemes, the report provides clear evidence of a range of benefits for households, businesses and the environment. The main benefits are described below.

Accelerating increases in average download speeds

- iv. Areas that receive vouchers have experienced significantly higher increases in average download speeds than control areas, meaning vouchers have boosted average speeds in local areas. For output areas supported in 2021, the change in average download speeds was 28 Mbps higher as a result of vouchers. There is also evidence that these additional effects last for at least two years and possibly longer.

Increasingly targeted on areas that most need support

- v. The additional effect of vouchers on download speeds was significantly higher in areas that received vouchers through the later RGC scheme than the GBVS scheme, even after controlling for the numbers of vouchers in an area. This is consistent with the findings of the resident and business surveys, which showed RGC beneficiaries were significantly more likely than GBVS beneficiaries to say that they could not have upgraded their broadband connection without the voucher. This shows that the decision by BDUK to focus on the more rural areas has been successful, resulting in higher levels of additionality.

Supporting growth of high productivity jobs

- vi. The number of employees in businesses that received vouchers grew by 9.9% in the two years after receiving a voucher; four percentage points higher than in control areas, meaning vouchers had an additional effect on employment. People moving into these jobs received higher than average pay-rises, indicating vouchers have contributed to the growth of more productive employment. We estimate these benefits to be worth £37.5m to the UK economy (in 2022 prices).

Improving the wellbeing of households

- vii. Households have derived a wide range of benefits from their broadband upgrade including an improved work-life balance, reduced stress, new skills and qualifications, increased earnings and reduced loneliness. There is also evidence of certain groups deriving particular benefits from the upgrade. For example, lone parents are more likely to have gained new skills or qualifications or found a new job. As a result, just over half of residents (53%) reported that the upgrade had increased their life satisfaction. Using Green Book guidance we estimate the net additional impact of vouchers on wellbeing is between £32m and £54m per annum. For a large number of households this benefit is expected to persist for a number of years as they continue to derive benefits from their connection until such time as they are likely to have received access through the market rollout. After accounting for persistence we estimate the total value of wellbeing benefits is between £113m and £195m.

Carbon savings through reduced travel

- viii. Since the upgrade, households have reduced their travel by over 500,000 miles per week (mainly as a result of working from home), resulting in substantial carbon savings. After accounting for increased domestic energy usage and avoided energy consumption in the workplace, we estimate vouchers have led to a net reduction of 7,600 tonnes of CO₂e over a three-year period.

Helping households to adapt through the pandemic

- ix. 79% of households that received vouchers said their broadband upgrade helped them to adapt during the Covid pandemic, with 55% saying it had a 'major positive effect'. This was vitally important in helping families to work from home, attend online school lessons, stream entertainment services and do online shopping. The open responses to the

residents survey underline just how important it was to many households during lock downs, with some describing it as “transformational”, a “lifeline”. “life-saving” or “a God-send”.

Study challenges and areas for further research

- x. There are a number of areas where it is not yet possible to provide definitive conclusions on the impacts of vouchers. This is due to time-lags and other issues with the available data sources, which has made it difficult to assess some impacts at this stage. In some cases, this means that the impacts above are likely to understate the total benefits of the voucher schemes.

Estimating impacts on availability of broadband technologies

- xi. The evaluation has used Connected Nations data for output areas (published by Ofcom) to assess changes in the percentage of premises that can access different broadband speeds at a very local level. The study needed to do this local analysis because of the highly scattered nature of voucher delivery. Connected Nations is the most comprehensive dataset available and the most accurate in any given year. However, due to the way in which the data is collected from suppliers, there are some inconsistencies between different years of Connected Nations which make longitudinal analysis of changes in coverage at this very local level difficult. As a result, it has not been possible to provide robust conclusions about the impacts of vouchers on coverage at this stage.

Estimating indirect benefits

- xii. If a property has been connected through a voucher it increases the chances that neighbouring premises will also gain access to gigabit capable broadband as it lowers the cost to the supplier of making this available. This is particularly the case for project vouchers, where suppliers aggregate the subsidy from a number of vouchers but also extend coverage to premises that do not receive a voucher (indirect beneficiaries). These premises may in turn take up the service and derive the same benefits as voucher recipients, such as those described above.
- xiii. The evaluation has found evidence that this model is working. For instance, areas that received project vouchers experienced a greater additional effect on average download speeds than areas that received standard vouchers, even after accounting for the number of vouchers. However, without reliable evidence on the impact of vouchers on the availability of high-speed broadband or take-up rates, it has not been possible to quantify the number of indirect beneficiaries. This means the impacts above **underestimate the total benefits of the voucher schemes**.

Impacts on business performance

- xiv. The first evaluation report showed high proportions of businesses that received vouchers reported benefits for business performance, including improved productivity (82%), profitability (50%) and turnover (42%). The findings in this report provide some evidence to support this; businesses that received vouchers have grown at a much faster rate than

the wider business population and businesses with similar characteristics (controlling for factors such as size, sector and rurality).

- xv. However, when compared with similar businesses who had an application for a standard voucher cancelled (our preferred control group), there is no statistical difference in the change in turnover or labour productivity (turnover per FTE). This is the preferred control group because it passed all robustness checks and is the only one which controls for selection bias; businesses in both the treated and control groups have shown an interest in and willingness to apply for a voucher, which is another important way in which businesses are similar that is not applicable to other control groups. Therefore, at this stage, we cannot say with confidence that vouchers have had a net additional impact on business performance (other than employment).
- xvi. However, this comes with important caveats. Firstly, the performance indicators do not capture other benefits for businesses such as productivity improvements as a result of cost savings, which the business survey suggested are important. Secondly, these findings relate mainly to the GBVS voucher scheme. Time-lags in economic datasets mean the latest available data relates to the 2020/21 financial year, which is too early for the impacts of the RGC scheme to have emerged. Since there was high take-up of GBVS vouchers in urban and commercial areas, businesses with cancelled applications may still have been able to access broadband connections which meet their needs. This is less likely to be the case for the RGC scheme which has been delivered in rural and uncommercial areas where businesses had fewer options for upgrading their broadband. This will be assessed in the third and final evaluation in 2026.

Initial assessment of value for money

- xvii. The evaluation provides an initial assessment of value for money of vouchers schemes based on the impacts which can be measured at this stage, and comparing these to the estimated public sector costs of the intervention.
- xviii. It is still too early to draw conclusions about the value for money of voucher schemes as there are a number of impacts which will take time to emerge or which it has not been possible to measure in this report. Furthermore, the benefits of voucher schemes are likely to grow over time as businesses adapt their business processes and strategies to maximise the value of their broadband connection (e.g. through use of new applications and software). In contrast, the full public sector costs of the voucher schemes are already known and have been incurred. This means any cost-benefit analysis undertaken at this stage is likely to **understate the value for money of the public investment**.
- xix. With these caveats in mind, based on the impacts measurable so far, we estimate the voucher schemes have delivered between £1.22 and £1.88 in benefits for every £1 of gross public sector spending, meaning the benefits have outweighed the costs.
- xx. At this stage it is not possible to separately assess the value for money of the GBVS and RGC schemes. This is because of time lags in the economic datasets which meant it

was not possible to construct a separate model for RGC vouchers due to low sample sizes.

Plans for final evaluation

- xxi. Although it has only been possible to provide a partial assessment of the impacts of the voucher schemes in this report, these will be assessed in full in the third and final evaluation, scheduled for 2026. This will:
- **analyse change over a longer period.** By 2026, the analysis should be able to access data for the 2023/24 financial year, giving us three additional years of data. This will allow more time for businesses to change their processes and activities in response to their upgrade and to have derived a greater range of benefits.
 - **distinguish between the impacts of GBVS and RGC.** By this stage, it will be possible to include all of the business vouchers from the later scheme, which has been far more targeted on areas that are unlikely to receive access. This will allow us to construct separate counterfactuals for each scheme, reflecting the differences in approach and the areas connected.
 - **estimate indirect benefits.** Assuming issues with the consistency of Connected Nations data at a local level can be addressed¹, we will be able to provide more conclusive evidence of the number of premises who have gained access to high-speed broadband without receiving a voucher. If these issues cannot be overcome, we will work with BDUK to understand how their monitoring data can be better used to estimate these indirect benefits. For example, using data available for projects which show how many additional premises have gained access.
- xxii. The final evaluation will also assess whether GBVS was successful in stimulating the broadband market which was a key objective of this scheme.

¹ These issues are unlikely to reoccur in future years of the data as it becomes increasingly accurate in terms of UPRN coverage, comprehensive in terms of supplier contribution and therefore internally consistent from one year to the next.

2. Purpose of Report

- 2.1 Hatch, Belmana and Winning Moves were commissioned to undertake an evaluation of the Building Digital UK (BDUK) voucher schemes. These schemes offer subsidies to households and businesses towards the cost of gigabit-capable broadband. The evaluation includes two voucher schemes which had different objectives and eligibility criteria:
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 - The Rural Gigabit Connectivity (RGC) programme: eligibility was focused on the least viable areas for gigabit-capable broadband (e.g. restricting to rural areas and low connection speeds) and only offered the vouchers for mixed premises projects. This launched in late 2019 but has continued in to 2022. As of December 2021, RGC vouchers had been used to connect 23,100 premises.
- 2.2 This is the second of three evaluation reports assessing the impact and value-for-money of the voucher schemes. The findings in this report relate to the emerging impacts of vouchers which can be measured to date. This includes their economic, social and environmental impacts. It also assesses the effects of vouchers on broadband performance (average download speeds in local areas) and availability (the proportion of premises that can access different speed levels). The full impacts and value-for-money of the voucher schemes will be assessed in the third and final evaluation in 2026.
- 2.3 The main research tasks have included:
- counterfactual analysis of the impacts of vouchers on average download speeds and availability of broadband in local areas, using a treatment and matched control group approach.
 - counterfactual analysis of the impacts of vouchers on firm-level performance (turnover, employment and productivity) and area level economic performance using a treatment and matched control group approach.
 - a residents survey of 4,298 households that have received vouchers, which explored the uses and benefits of their upgraded connection.
- 2.4 This report is a summarised version of the main report, providing the key findings and conclusions. The main report provides all of the underpinning evidence and methodology, and detailed analysis of the residents survey.

3. Initial impacts on local area broadband performance and availability

Method and research challenges

- 3.1 The evaluation needed to analyse changes in broadband performance and availability at a very local level. This is because vouchers have been scattered all around the country, often benefitting individual premises, streets or neighbourhoods. Therefore the effects can only be measured at a low geographical level. This is unlike other BDUK interventions which focus on large, contiguous geographical areas.
- 3.2 This was done using counterfactual analysis; by comparing change in broadband coverage and download speeds in output areas² (OAs) that received vouchers (treated areas) with control areas of OAs with similar characteristics that did not receive support. This allowed us to estimate how much of the change would have happened anyway (deadweight), and the change that can be attributed to vouchers (additionality). Nine counterfactual models were constructed for assessing impacts, using different variables and control groups. This was done to increase confidence that the findings are robust.
- 3.3 The change in coverage and download speeds in OAs was measured using data from Connected Nations, published by Ofcom. This is the most comprehensive dataset available for broadband infrastructure and performance in small areas. The data is collected from suppliers, and is as accurate as possible in any given year. However, not all voucher suppliers report their coverage to Connected Nations and the way in which the data is collected means there are inconsistencies over time (e.g. due to changes in the suppliers who report their coverage in a given year). These inconsistencies are disguised and averaged-out for large areas but are more prominent for output areas due to their small size.
- 3.4 Table 3.1 shows that, according to Connected Nations, only around half of the areas connected through vouchers in 2019 and 2020 experienced an increase in availability of ultra-fast broadband (UFBB) or gigabit services in the year after the voucher was connected. The other OAs experienced either no change or a decrease in availability. Although control areas are also subject to these inconsistencies, there is no way of controlling for this, meaning there is a risk of bias in the results. This means it is very difficult to compare changes in availability in treated and control areas over time on a consistent basis³.
- 3.5 In contrast, the proportion of treated OAs that experienced an increase in download speeds was much higher, at 94% or higher in each year. This data is based on the average of download speed tests and is therefore less sensitive to changes in the number of premises in an area, changes in the suppliers who report to Connected Nations or reporting errors. It is therefore a more stable and robust indicator for measuring the effects of vouchers. The main focus of the analysis is therefore on changes in download speeds.

² These are small geographical units with a population of between 100 and 625 people

³ This challenge is unique to this evaluation because evaluations of other BDUK interventions focus on larger areas and do not need to carry out analysis at this very local level.

Table 3.1 Percentage of output areas that received vouchers which experienced an increase in availability or performance in year after support

Performance/availability indicator	% of areas connected in 2019	% of areas connected in 2020	% of areas connected in 2021
Increase in number of premises able to access UFBB	49%	48%	56%
Increase in number of premises able to access gigabit capable broadband	49%	54%	60%
Increase in average download speed	94%	95%	97%

Source: Hatch analysis of Connected Nations

Key Findings

Impacts on average download speeds in local areas

- 3.6 The evaluation has found **clear evidence that vouchers had a significant additional effect on the average download speed of local areas**. All nine models found that the increase in average download speeds in the year after support was significantly higher in areas that received vouchers than in control areas (see Table 3.2). This was true for areas that received vouchers in 2019, 2020 and 2021. There is therefore strong evidence that vouchers have led to an increase in average download speeds in treated areas i.e. this change would not have occurred without the voucher.
- 3.7 **The scale of the additional effect on average download speeds was much higher for areas connected in 2021 than earlier years. However this can be explained by these areas receiving more vouchers.** The median additional effect from the nine models was 3.3 Mbps for vouchers connected in 2019, 3.9 Mbps for 2020 and 27.9 Mbps in 2021. The larger effect in 2021 can be explained by two factors:
- 1) Areas that received vouchers in 2021 received a larger number of vouchers. The average number of vouchers per OA was 2.8 in 2019 and 2020, but this increased to 7.5 in 2021 (2.7 times higher). This was due to greater use of projects in 2021 where suppliers aimed to encourage greater take-up of vouchers in local areas.
 - 2) All areas (including treated and control areas) experienced a larger increase in average download speeds in 2021-22 than they did in earlier years. This reflects increased take-up of higher speed connections by households and businesses over time and is unrelated to vouchers.
- 3.8 We can control for the growing demand for faster speeds by focusing on the last column in the table below. This shows the proportion of the change in average download speeds which was due to vouchers increased from 21-22% for areas connected in 2019/20 to 57.8% for areas connected in 2021. The proportion of change which is due to vouchers was therefore between 2.6 and 2.7 times higher in areas supported in 2021 than earlier

years. This is in line with the difference in the average number of vouchers per OA in those years.

Table 3.2 Additional change in average local area download speeds in year after support (Mbps)

Treatment year	Gross change in treated areas	Median additional change due to vouchers	Additional change range	Proportion of gross change due to vouchers
2019	14.8	3.3***	1.9 to 4.6	22.2%
2020	18.1	3.9***	3.0 to 4.4	21.3%
2021	48.2	27.9***	25.9 to 31.0	57.8%

Source: Belmana

Note: Results for the three models considering three different samples. Significance levels are 1% (***), 5% (**) and 10% (*).

- 3.9 **The positive effects of vouchers on local area average download speeds persist for at least two years.** All nine models found that areas with vouchers experienced a significantly larger increase in average download speeds after two years than control areas. This was true for areas supported in 2019 and 2020. The positive effects of vouchers may persist for longer than this, although it is not possible to assess this with the data currently available.

Table 3.3 Additional change in local area average download speeds two years after support (Mbps)

Treatment year	Gross change in treated areas	Median additional change due to vouchers	Additional change range	Proportion of gross change due to vouchers
2019	31.2	9 of 9	4.04***	3.1 to 6.9
2020	44.3	9 of 9	7.41***	6.3 to 9.4

Source: Belmana. Note: Results for the three models considering three different samples. Significance levels are 1% (***), 5% (**) and 10% (*).

- 3.10 There is a broadly linear relationship between the number of vouchers an area has received and the change in average download speeds. Focusing on areas that received vouchers in 2021, each additional voucher that an OA received was associated with an increase in average download speeds of 2.3 Mbps. There is no evidence to suggest there is an optimum number of vouchers in an area. That is, there is not a point at which the marginal effects of additional vouchers on download speeds start to diminish.

Differences by scheme and voucher type

- 3.11 The evaluation investigated how impacts on average download speeds varied in areas that received vouchers through the two schemes (RGC and GBVS) and the two types of voucher (project and standard).

- 3.12 **Vouchers delivered through the RGC scheme had a greater impact on average download speeds than GBVS vouchers⁴:** The additional effect of vouchers was 10.8 Mbps for RGC areas for vouchers connected in 2020, compared to 0.12 Mbps for GBVS areas which was not significantly different to control areas. For vouchers connected in 2021, the additional effect was 33.7 Mbps for RGC areas compared to 7.6 Mbps for GBVS areas. Most of this can be explained by the larger number of vouchers per OA in RGC areas. However, when we control for this and the number of premises in these areas, we find that each RGC voucher, on average, had a greater effect on average download speeds than GBVS areas. This is most likely explained by the fact that RGC vouchers were more likely to be used in rural areas which were less likely to receive access to faster connections via the market rollout.

Table 3.4 Average effect of vouchers on local area average download speeds in year after support by voucher scheme (Mbps)

Indicator	Scheme	2020	2021
Average additional effect on average download speeds	RGC	10.8***	33.7***
	GBVS	0.1	7.6***
Speed change per voucher per 100 premises	RGC	2.0	5.4
	GBVS	0.1	3.6

Source: Hatch and Belmana. Note: Based on the average additional effects from six models. Significance levels are 1% (***), 5% (**) and 10% (*).

- 3.13 **Project vouchers had a greater impact on average download speeds than standard vouchers, except in 2019.** Areas that received project vouchers experienced a greater additional change in average download speeds than those that received standard vouchers in each of the treatment years (2019, 2020 and 2021). However, when we control for the average number of vouchers per OA and the number of premises in these areas, we find that, on average, project vouchers had a greater effect than standard vouchers on average download speeds in 2020 and 2021, but a lower effect in 2019. The different results for 2019 could be explained by the fact that most project vouchers in this year were delivered through the GBVS scheme.

Table 3.5 Average effect of vouchers on local area average download speeds in year after support by voucher type (Mbps)

	Type	2019	2020	2021
Average additional effect on average download speeds	Project	6.4***	8.6***	29.58***
	Standard	2.4***	-1.4	3.0
Speed change per voucher per 100 premises	Project	1.1	2.1	5.7
	Standard	3.4	-3.1	1.1

Source: Hatch and Belmana. Note: Based on the average additional effects from six models. Significance levels are 1% (***), 5% (**) and 10% (*).

⁴ This modelling only focused on vouchers connected in 2020 and 2021. The RGC scheme launched in late 2019 meaning there is a small sample size in that year.

Impacts on availability

- 3.14 Table 3.6 shows a summary of the additional effects of vouchers on the availability of superfast broadband (SFBB), UFBB and gigabit-capable broadband. This is based on the median results from nine models.
- 3.15 It shows that the only broadband technology where we consistently identify statistically significant effects on availability is for SFBB. The increase in the number of premises with access to SFBB is significantly higher for areas that received vouchers than control areas in each of the treatment years. This is the case in almost all models⁵.
- 3.16 For UFBB and gigabit-capable broadband, the only year in which we find a statistically significant positive effect is in 2020 (this was the case in all nine models). In 2020, the increase in the proportion of premises that can access UFBB is 2.1 percentage points higher in areas that received vouchers than control areas, and 4.5 percentage points higher for gigabit-capable broadband. In the other treatment years, the models find that the difference is either not significant or negative. In other words, the increase in availability is higher in control areas than areas that received a voucher.
- 3.17 As noted above, we do not believe that these results are an accurate reflection of the effects of vouchers. This is due to inconsistencies in Connected Nations data which result in an underestimate of change in availability in treated areas. If these issues disproportionately affect areas that have received vouchers more than control areas, this would also bias the results.

Table 3.6 Median additional change in availability of different broadband speeds in year after support

Treatment year	Superfast broadband (number of premises)	Ultrafast broadband (percentage points)	Gigabit-capable broadband (percentage points)
2019	7.7***	-0.3	0.8
2020	5.5***	2.1***	4.5***
2021	4.2***	-1.4*	-1.6

Source: Belmana. Note: Significance levels are 1% (***), 5% (**) and 10% (*).

- 3.18 We have not been able to draw clear conclusions about the effects of the two voucher schemes on availability of UFBB or gigabit-capable broadband. For vouchers connected in 2020, areas that received vouchers through GBVS experienced a larger increase in availability than RGC areas. For vouchers connected in 2021, the change in availability was higher in control areas than both RGC and GBVS areas, resulting in a negative effect for both schemes in all models.
- 3.19 The results by voucher type were also mixed and inconclusive. Areas that received project vouchers experienced a larger increase in availability than standard voucher areas in 2019, but the reverse was true in 2020. In 2021, the change in availability was higher in control areas than both project voucher and standard voucher areas.

⁵ One of the models does not find a statistically significant effect for vouchers connected in 2020.

4. Initial economic impacts

Method and challenges

- 4.1 The analysis of economic impacts to date has been undertaken at two levels:
- **Firm level:** this analyses changes in employment, turnover and productivity (turnover per employee) in businesses that have received vouchers.
 - **Area level:** this focuses on the same outcome indicators, but the analysis is undertaken for OAs that contained at least one business that received a voucher. This is on the basis that other businesses in the local area may also have benefitted from a faster broadband connection as an indirect result of vouchers (meaning there may have been spillover effects which have affected the economic performance of the area).
- 4.2 In both cases, the analysis compares the performance of businesses/areas that have received vouchers with control groups that have similar characteristics but have not received a voucher⁶. Any statistically significant difference is an estimate of the additional effects of the voucher on business/area performance. In this summary report, we show the results for the preferred counterfactual model and an alternative model, which were selected on the basis of a number of robustness tests including the quality of the matching and whether the control groups experienced similar past trends. The results of other models are shown in the main report.
- 4.3 In total 27,536 businesses had received a connection via a voucher by the end of December 2021. However the analysis is based on a sample of 15,436 businesses that received a connection before April 2021 and could be matched in the Business Structure Database (BSD). Further detail on the sector profile and other characteristics of these businesses is provided in Appendix B of the main report.
- 4.4 It is too early to assess the full impacts of vouchers on economic performance for a number of reasons:
- **Time-lags in the data:** the main dataset used to analyse business and area performance is the BSD⁷. The latest available data from the BSD is for the financial year 2020/21, meaning the modelling has only been able to capture the effects of business vouchers connected before April 2021. Any vouchers connected towards the end of the 2020/21 financial year will also have had limited time to translate into a measurable impact on business performance.

⁶ Matching variables included turnover, employment, the number of premises, age of the company, industry sector, average broadband speed, various innovation indicators and whether the business had received furlough payments.

⁷ This is an Office for National Statistics (ONS) dataset based on a snapshot of the Inter-Department Business Register. It is the most robust and comprehensive dataset available which provides data on business performance metrics and the characteristics of businesses and can therefore be used to construct a control group and compare change over time on a consistent basis. Although there are other business databases which are more recent (e.g. Companies House) these do not provide the data required for this evaluation.

- **Insufficient time for businesses to derive the full range of benefits from their broadband connection.** It may take some time for businesses to derive the full range of benefits from their upgraded broadband connection, particularly if this involves further investment in software, changes to business processes or training for staff.

- 4.5 The time-lags also mean that the modelling results are based mainly on the effects of vouchers delivered through the GBVS scheme rather than the RGC scheme which were only used to connect premises from 2020 onwards. As a result, the findings below only represent the measurable impacts of vouchers to date. The third and final evaluation will include two additional years of data which allows us to assess impacts over a longer period of time, and to separately assess the impacts of the GBVS and RGC schemes.
- 4.6 It should also be noted that the time period covered by this analysis coincides with the Covid 19 pandemic, a period of unprecedented economic turbulence. While the method has taken steps to control for this (e.g. by including whether a business received furlough payments as a matching variable) the scale of the impact of the pandemic means it is very difficult to fully account for this. This is particularly relevant to the impacts on business turnover. This was more badly affected than employment, which was protected to a large extent by Government support through the Job Retention Scheme.

Key Findings

Firm level analysis

- 4.7 Table 4.1 shows the results of the firm level analysis, where the performance of businesses receiving vouchers is compared to:
- The preferred control group: these are businesses with similar characteristics to businesses who applied for a standard voucher which was subsequently cancelled⁸. This control group showed the best fit with robustness tests. A further important advantage of using this control group is that these businesses have shown an interest in applying for a voucher⁹. This helps us to mitigate the risk of ‘selection bias’ which occurs when there are important characteristics which influence whether a business receives support or not, which cannot be measured.
 - An alternative control group: these are businesses with similar characteristics to treated businesses, but drawn from the wider business population.
- 4.8 The results show that businesses that received vouchers have performed strongly, increasing their turnover and employment over a period of significant economic instability due to the Covid pandemic. This is consistent with the findings of the business survey

⁸ Vouchers could be cancelled for a number of reasons including a request from the supplier, the business being found to not be eligible for support, or the business failing to validate the voucher by a certain date.

⁹ Although the voucher schemes have been supplier led, BDUK’s terms and conditions state that all applications made on behalf of businesses must have the business’s consent, meaning all businesses in the control group must have shown an interest in applying for a voucher.

from the first evaluation report, which showed 70% of businesses said their broadband upgrade had helped them to adapt during the pandemic.

4.9 However a comparison of performance with the two control groups shows very different results:

- Businesses that received vouchers outperformed the alternative control group across all measures (turnover, employment and turnover per employee). In each case the difference was statistically significant at the 1% level.
- Businesses with vouchers grew their employment at a faster rate than the preferred control group (comprised of cancelled standard voucher applicants), although this was only statistically significant in the first two years¹⁰. For the other indicators (turnover and turnover per employee), there was either no significant difference or the control group outperformed businesses with vouchers.

4.10 This means, at this stage, we can only confidently conclude that vouchers have had an additional effect on firm level employment (+4.0% by the second year). Although there is some evidence that the broadband upgrade has also helped businesses to grow turnover and labour productivity (based on the business survey and the alternative control group), we cannot be confident that these would not have occurred in the absence of vouchers.

Table 4.1 Additional effects of vouchers on firm-level performance

Outcome indicator	Time period	Change in treated business	Change in preferred control group	Change in alt control group	Difference with pref control group	Difference with alt control group
Employment	Year of support	6.1%	4.5%	0.0%	+1.6%***	+6.1%***
	2 nd year	9.9%	5.7%	-0.3%	+4.0%***	+10.2%***
	3 rd year	14.5%	13.6%	0.0%	+0.8%	+14.5%***
Turnover	Year of support	5.6%	6.5%	-2.6%	-0.8%	+8.2%***
	2 nd year	11.2%	12.5%	-5.0%	-1.2%	+12.4%***
	3 rd year	14.4%	16.1%	-6.1%	-1.4%	+20.5%***
Turnover per employee	Year of support	-0.5%	1.9%	-2.6%	-2.3%***	+1.8%***
	2 nd year	1.1%	6.4%	-4.7%	-5.0%***	+6.1%***
	3 rd year	-0.2%	2.2%	-6.0%	-2.3%	+2.1%***

Source: Belmana. Note: Significance levels are 1% (***), 5% (**) and 10% (*)

4.11 There are, however, a number of important caveats to these findings. Firstly, the turnover per employee indicator does not capture productivity improvements that might occur as a result of cost savings. The business survey in the first evaluation report showed that

¹⁰ this was based on a smaller sample of businesses than in the other years, made up only of businesses that received a voucher in the 2018/19 financial year. This may suggest additionality of business benefits was lower for vouchers delivered in earlier years when the only voucher scheme in operation was GBVS.

businesses were far more likely to report an improvement in productivity than an increase in turnover (82% and 42% respectively). This suggests productivity growth in beneficiary businesses has been driven mainly by reduced costs, which cannot be measured through this analysis.

- 4.12 Secondly, the results mainly relate to the impacts of the GBVS voucher scheme. Time-lags in the data mean the majority of businesses in the treated group, and all of the businesses in the preferred control group, applied through the GBVS scheme. The few RGC vouchers that are included in the treatment group will have had limited time to translate to improved business performance.
- 4.13 There are good reasons why additionality of business impacts may be lower for GBVS vouchers than for RGC. The GBVS scheme had few restrictions on eligibility and, as a result, vouchers were more likely to be used in urban and commercial areas. Cancelled applications were also likely to be in areas where a supplier was already actively using vouchers and interested in building gigabit capable infrastructure in the near future. This means it is likely to have been easier for businesses in the control group to access the broadband connection they need than it would be for rural businesses. There is some evidence for this:
- The business survey conducted as part of the first evaluation report found GBVS voucher beneficiaries were far less likely than RGC voucher beneficiaries to say they had not upgraded because the infrastructure was not available in their area (57% for GBVS vs 87% for RGC). It follows that it would have been easier for GBVS applicants to secure an upgrade without a voucher.
 - Table 4.2 shows that the change in average download speeds was significantly higher in postcodes where vouchers were used compared to postcodes with cancelled vouchers (indicating vouchers had a significant positive effect), but the change in average speeds in cancelled voucher postcodes was still higher than the average for all postcodes. Some caution is needed when interpreting this data, as it still relates to average speeds for postcodes which include multiple premises. However it means businesses with cancelled standard vouchers are in locations with above average increases in speeds, which may be due to these businesses upgrading their broadband. Businesses in more rural areas will have had fewer options to upgrade.

Table 4.2 Gross change in average download speeds between treatment year and 2021 (Mbps)

	2019	2020
Postcodes with connected business vouchers	66.9	48.9
Postcodes with cancelled standard business voucher applications	34.8	15.7
All postcodes	25.2	10.3

Source: Hatch analysis of Connected Nations. Note: Analysis is shown up to 2021 because data on economic performance is not available after this date.

The additional jobs created by voucher beneficiaries have been in more productive roles.

- 4.14 Although the analysis has not identified any impacts on business productivity to date (as measured by turnover per employee), the evaluation has shown that the jobs created by businesses receiving vouchers have been in higher productivity roles, evidenced by the fact that workers moving into these roles have enjoyed a wage premium. To be clear, this does not mean that the vouchers have caused the wage premium itself. The additionality of vouchers in this case relates to the jobs that have been created, which happen to be in more productive roles.
- 4.15 Using analysis of the Annual Survey of Hours and Earnings (ASHE), we show that workers who changed jobs from an unsupported business to a business that received a voucher experienced an average pay rise of 14.2%. This was 6.7 percentage points higher than the average for workers moving between businesses that have not received vouchers (7.5%).
- 4.16 In line with HM Treasury Green Book, these can be counted as an additional economic impact at the national level. This states: “productivity effects should be included in the calculation of UK costs and benefits where they can be objectively demonstrated. Productivity effects may arise from movement to more or less productive jobs”.
- 4.17 Using the ASHE analysis, we estimate the average value of these wage premiums was £1,362 per worker in 2018 prices. Based on 24,300 additional jobs as a result of vouchers, the total improvement in productivity is therefore £33m in 2018 prices. Adjusting for inflation, this is equivalent to £37.5m in 2022 prices. This is assumed to be a one-off effect which lasts for one year; on the basis that there is no significant difference in employment growth between the treated and control group by the 3rd year.

Area level analysis

- 4.18 The area-level analysis is subject to a number of important caveats:
- **Scale of intervention:** 15,436 business vouchers were included in the analysis, which were spread across 8,512 output areas, meaning there were 1.8 vouchers per output area. On average there were 101 businesses¹¹ per output area, meaning fewer than 2% of businesses in treated areas received a voucher. There may be a small number of other businesses that have gained access as a result of the voucher, but this still represents a very modest scale of intervention. This makes it very difficult to robustly assess the effect of vouchers on area level performance, given the wide range of other factors which affect this.
 - **Limitations of turnover data:** the BSD only provides sales data for enterprises rather than local units. Therefore, for multi-site businesses, it is necessary to apportion the sales data to all of the local units on the basis of their share of employment in the enterprise as a whole. We did consider restricting the analysis

¹¹ This is based on the number of “local units” according to the BSD. Local units refer to individual workplaces, which include all of the individual offices, branches, shops and depots of multi-site businesses.

to single site enterprises, however this would not have provided a sufficiently large sample size. This means it is very difficult to accurately measure the effect of vouchers on the turnover of local units belonging to multi-site businesses.

- 4.19 As a result of the above, the analysis of effects on turnover should only be treated as indicative. The analysis of effects on employment is more robust but is still subject to much greater uncertainty than the firm level analysis because of the much lower scale of intervention.
- 4.20 The results of the analysis are shown in Table 4.3. This compares the change in employment and turnover in treated areas with two counterfactuals (or control areas):
- Preferred counterfactual: this matched areas on the basis of employment levels, past growth in employment, sales/turnover, the level of new businesses created in an area before support, the level of relocations into an area before support and average download speed.
 - Alternative counterfactual: this used all of the variables above except past growth in employment and the level of relocations into an area.
- 4.21 The key findings are as follows:
- Areas that received vouchers experienced a fall in employment over time in each year of the model. However the fall in employment was lower than in both of the control areas, indicating that the fall would have been even greater were it not for the voucher. The difference was statistically significant at the 10% level in the first two years and at the 1% level by the third year.
 - Turnover has also fallen over time in all areas, although not to the same extent as employment. Again, the decrease in turnover was lower in treated areas than control areas, although the difference was only statistically significant in the first year.
- 4.22 The decrease in employment could be explained by the effects of the Covid pandemic. It should also be noted that the output areas that experience high levels of employment growth tend to be in city centres and those where there are new developments. Vouchers have primarily been used outside city centres and to upgrade existing business sites, meaning they are less likely to be used in areas with new development.
- 4.23 When interpreted alongside the firm level analysis, which showed businesses with vouchers had experienced strong growth in employment over and above comparator areas, this may suggest that receiving a voucher has helped businesses to navigate some of the challenges facing other businesses in the local area and, as a result, avoid further job losses.

4.24

Table 4.3 Additional effects of vouchers on area level performance

Outcome indicator	Time period	Change in treated areas	Change in preferred control areas	Change in alt control areas	Difference with pref control area	Difference with alt control area
Employment	Year of support	-1.0%	-1.6%	-1.7%	+0.6%*	+0.7%*
	2 nd year	-2.5%	-3.2%	-3.6%	+0.7%*	+1.1%*
	3 rd year	-3.3%	-5.1%	-5.5%	+1.8%***	+2.3%**
Turnover	Year of support	0.2%	-1.7%	-1.2%	+1.9%***	+1.4%**
	2 nd year	-0.1%	-1.0%	-1.3%	+0.9%	+1.2%
	3 rd year	-0.7%	-2.1%	-2.3%	+1.4%	+1.6%

Source: Belmana. Note: Significance levels are 1% (***) , 5% (**) and 10% (*)

5. Wellbeing impacts of vouchers

Findings of the residents survey

- 5.1 A residents survey was used to understand how households are using their improved connectivity and the types of benefits they have derived from it. A total of 4,298 completed responses were received from residential voucher recipients, representing a 20% response rate.
- 5.2 The broadband upgrade has generated a wide range of benefits for households. The detailed report provides a comprehensive analysis of these benefits, with a summary provided below¹².

Wellbeing and loneliness

- 53% of residents reported that their broadband upgrade had **increased their life satisfaction**, and this was even higher for working age people (56%) and households with children (57%)
- 7% of respondents said they **feel less lonely** after the upgrade, but this was significantly higher for some at risk and vulnerable groups, including one-person households (18%), low income households (16%) and people who are economically inactive (20%).

Uses of the internet and impacts on quality of life

- The upgraded connection has **enabled a significant proportion of older households to do a range of things for the first time**, including streaming entertainment services (20%), keeping in touch with friends and family through video chat (11%) and accessing health and other services online (9%). In each case over 80% said the upgrade was important in enabling them to do so, and over 70% said it had a positive impact on their quality of life.
- 64% of households with children are **using the internet for their children's education**. Of these, 88% said their upgrade was important in enabling them to do so and 83% said it had a positive impact on their quality of life.
- 62% of working age respondents are **using the internet to work from home**. Of these, 91% said their upgrade was important in enabling them to do so and 86% said it had a positive impact on their quality of life.

Benefits for specific groups

- Working age respondents have derived the greatest range of benefits from their upgraded connection. Examples are as follows:
 - 70% said they have benefitted from a **better work-life balance**

¹² The sample sizes for all of the groups can be found in Appendix D of the main report

- 41% have **gained a new skill or qualification** as a result of the upgrade
- 32% have **found a new job or have improved their career prospects**
- 18% have **started a business**.
- 24% of young respondents (18 to 24) report that the broadband upgrade has helped them to **start a business**, while 14% say it has helped them to run an existing business¹³.
- 26% of **lone parents have gained new skills or qualifications** and 20% have **found a new job or improved their career prospects**.
- 10% of people in lower skilled occupations (carers and manual workers) say they have used the internet to **study for a professional qualification**.

Quantifiable benefits¹⁴

- 54% of those who found a new job or improved their career prospects reported an increased salary. We estimate this has led to **net additional earnings of £9.5m per annum**.
- For those who have gained new skills and qualifications, we estimate these could lead to **net additional earnings of £1.6m per annum in the future**.

Adapting to the Covid pandemic

- 79% of respondents said their upgrade had a positive effect on their households **ability to adapt during the Covid pandemic**, including 55% who said it had a major positive effect.
- The comments provided by respondents to these questions underline how beneficial the upgrade was in helping many households to adjust, with several comments describing the upgrade as **“transformational”, a “lifeline” or a “God-send”**.

Wellbeing impacts of vouchers

- 5.3 The evaluation has sought to estimate the value of wellbeing improvements enabled by vouchers using HM Treasury Green Book Guidance. This recommends an approach whereby life satisfaction is rated on a scale of 0 to 10, with the change in life satisfaction before and after an intervention then converted into a monetary value (referred to as a ‘WELLBY’). Since the evaluation could not undertake a ‘before and after’ survey, wellbeing effects were estimated in the following way:
- The residents survey asked respondents who had received vouchers to retrospectively rate their life satisfaction before the broadband upgrade and to rate it now (after the upgrade). 53% said their life satisfaction had improved, 44% said

¹³ Note that this was based on a very low sample size of 18 people

¹⁴ Note these benefits are not additional to the wellbeing impacts summarised below as the benefits will have contributed to the change in life satisfaction.

it had stayed the same and 3% said it had declined. Among those that reported an improvement in life satisfaction, the average improvement on a scale of 0 to 10 was +3. However these results are subject to bias and are likely to significantly overstate the wellbeing improvement. Nevertheless, the survey did provide valuable information on the characteristics of people who were most likely to report an improvement in life satisfaction, which include working age people (between the ages of 16 and 64).

- To ensure that we are not overstating the value of wellbeing improvements we used the findings of an earlier evaluation of the impacts of superfast broadband on subjective wellbeing¹⁵. This drew upon data from the Annual Population Survey (APS) which included a question on life satisfaction, and included a breakdown by age. The change in life satisfaction for each age group was then applied to the voucher population. The only adjustment related to the 36 to 64 year old age group. The SFBB evaluation found that life satisfaction declined among this group, however the residents survey showed that this age group was just as likely to report an improvement in life satisfaction as younger age groups. It was therefore assumed that the average improvement for 36 to 64 year olds would be comparable with 18 to 39 year olds, although the results were presented as a range to reflect the uncertainty.
- A further adjustment was made for deadweight (the improvements that would have occurred in the absence of vouchers). For example, some households would have upgraded their connection anyway and would have been able to secure some of the improvement in life satisfaction. This was informed by the responses to the residents survey which asked respondents what they would have done without the voucher. This was estimated to be 40%.
- It is assumed that, for a large number of households these wellbeing benefits will persist for a number of years. The persistence period depends on the number of years it would have taken for households to gain access to high speed broadband through the market rollout. This has been estimated using DSIT's Fscore model, which has modelled an estimated cost of delivering fibre to each premises in the UK for the purpose of policy development and is a useful tool for drawing conclusions on the number of premises reaching levels of commercial feasibility, at a national scale.

5.4 The results are presented in Table 5.1. We estimate the total net additional effect of vouchers on wellbeing is **between £32m and £54m per annum in 2022 prices, or between £1,262 and £2,168 per household per annum**. After accounting for persistence the total impact of vouchers on wellbeing is estimated to be **between £114m and £195m**.

5.5 It should be noted that this is **an under-estimate of the overall wellbeing effects of vouchers** as it only relates to the direct benefits for voucher recipients. It does not include the wider wellbeing benefits for households that have been able to upgrade their broadband connection due to wider project delivery in the areas where vouchers have been used. It is not possible to estimate this at this stage as it has not been possible to

¹⁵ Simetrica (2018): Subjective wellbeing analysis of the Superfast Broadband programme

establish a reliable estimate of the additional premises that have gained access or what take-up was among these households.

Table 5.1 Gross and net additional effects of vouchers on wellbeing (2022 prices)

Scenario	Gross value of WELLBYs (£m)	Net additional value of WELLBYs per annum (£m)	Net additional value per household per annum (£)	Total net additional value including persistence (£m)
Lower estimate	53.5	32.2	1,262	£113.5
Upper estimate	90.0	54.1	2,168	£195.0

Source: Hatch

6. Environmental impacts of vouchers

6.1 The evaluation has investigated the potential impact of vouchers on carbon emissions due to reductions in travel, increased domestic energy usage and reduced energy usage in workplaces (primarily offices)¹⁶. This has used the following methods and information sources:

- **Reductions in travel:** The residents survey asked respondents whether the broadband upgrade has resulted in them reducing the amount they travel and, if so, to quantify the change and specify the mode of transport used. This was used to quantify the total reduction in miles travelled for the voucher population as a whole. This was converted to avoided carbon emissions using DfT benchmarks for different modes of transport. We estimate that, since the upgrade, households have reduced their travel by over 500,000 miles per week, resulting in a gross carbon saving of over 116 tonnes of CO₂e each week, or 6,000 tonnes per annum.
- **Increased domestic energy usage:** although the residents survey did show that 28% of households reported increased domestic energy consumption as a disbenefit of their upgraded connection, this did not ask them to quantify this. We therefore drew upon research by the Carbon Trust¹⁷ which has estimated the average increase in domestic energy carbon emissions per teleworker (a person working from home). This was then applied to the proportion of the survey sample who said they are using the internet to work from home more often or for the first time (also 28%) and grossed up for the voucher population as a whole. We made further adjustments for those households that contain more than one working age person. We estimate that this has resulted in increased carbon emissions of 4,300 tonnes of CO₂e per annum for the voucher population as a whole.
- **Avoided office energy consumption:** the residents survey did not include questions about avoided office energy consumption. Therefore this was modelled using the findings of the Carbon Trust report, which quantified energy savings per teleworker¹⁸. This was applied to the survey sample in a similar way to that described above for domestic energy usage. This results in a total carbon saving of 2,500 tonnes of CO₂e per annum for the voucher population as a whole.

6.2 The cumulative gross effect of these changes was estimated to be a reduction in carbon emissions of 4,300 tonnes CO₂e per annum¹⁹ (see Table 6.1). However, given the inherent uncertainty in modelled estimates, this should be treated as the central estimate,

¹⁶ The analysis does not include the potential increase in carbon emissions associated with increased data being transmitted across the fibre network which increases energy usage. The evaluation could find no way of estimating this, but this will be revisited as part of the final evaluation.

¹⁷ Carbon Trust (2021): Homeworking Report

¹⁸ We made an adjustment to this figure because it assumed a linear relationship between office utilisation and energy usage. In practice certain types of energy consumption such as office heating and lighting do not have a linear relationship with the number of people in the office.

¹⁹ The figures above do not sum to 4,300 due to rounding

with the true impact likely to fall within the range 3,900 to 4,700 tonnes CO₂e (based on a +/-10% margin of error).

- 6.3 Further adjustments were then made for deadweight (assumed to be 40% based on the findings of the residents survey about what voucher beneficiaries would have done if the voucher had not been available). This results in a net-additional carbon saving of 2,500 tonnes CO₂e per annum based on the central estimate (ranging from 2,250 to 2,750 tonnes CO₂e per annum). It is assumed that the effects persist for three years. This is on the basis that increased levels of homeworking have persisted since the Covid pandemic, and that for voucher beneficiaries, this has been enabled by the broadband upgrade²⁰. This is a conservative assumption as the change in travel patterns could last for a number of years. Over three years, this is equivalent to **a net reduction of 7,600 tonnes CO₂e due to vouchers**, based on the central estimate (ranging from 6,900 to 8,400 tonnes CO₂e).
- 6.4 As above, this only captures the direct environmental benefits due to increased homeworking by voucher recipients. It does not include any wider benefits for households that have been able to upgrade their broadband connection due to wider project delivery in areas where vouchers have been used. It is therefore an **under-estimate of the carbon savings**.
- 6.5 For the purpose of the cost-benefit analysis, these carbon savings have been converted in to monetary values using carbon values from supplementary guidance to the Green Book²¹, with future savings discounted. The total value of carbon savings is estimated to be £1.85m in 2022 prices, ranging from £1.68m to £2.04m.

Table 6.1 Central estimate of gross and net change in carbon emissions due to vouchers (tonnes CO₂e)

Outcome	Gross	Net
Avoided commuting emissions p.a.	-6,000	-3,600
Additional domestic energy related emissions p.a.	+4,300	+2,600
Avoided office emissions p.a.	-2,500	-1,500
Total per annum	-4,300	-2,500
Total over three years	-12,900	-7,600

Source: Hatch. Figures may not sum due to rounding

²⁰ This is a conservative assumption as the change in travel patterns could last a lot longer than three years

²¹ [Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/442222/green-book-supplementary-guidance-valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal.pdf)

7. Initial cost benefit analysis based on measurable impacts

- 7.1 The report provides an initial cost-benefit analysis of vouchers based on the impacts which can be measured to date. As noted, this is an early assessment which is likely to significantly understate the benefits of the voucher schemes for a number of reasons:
- It has not been possible to estimate some impacts, particularly the benefits for households that did not receive a voucher but were still able to upgrade their broadband connection as a result of wider project delivery in areas where vouchers were used.
 - Time-lags in economic datasets mean it has not been possible to estimate economic impacts after the 2020/21 financial year. This means it has not been possible to estimate the impact of vouchers delivered through the RGC scheme where additionality was likely to be higher.
 - The benefits of the voucher schemes are likely to grow over time as take-up by other businesses and households in areas that have received vouchers rises. It may also take some time for businesses to derive the full benefits from their upgraded connection. This may only occur when they have made changes to business processes or invested in new applications or software. There are also likely to be new applications that come to market that allow businesses to use their connection to make improvements to connectivity.
- 7.2 In contrast, the full public sector costs of the voucher schemes are already known and have been incurred. This means any cost-benefit analysis undertaken at this stage is likely to **understate the value for money of the public investment**.
- 7.3 The costs of the voucher schemes have been estimated using information provided by BDUK (see Table 7.1. This shows the present value of the net cost to the public sector associated with the delivery of the voucher schemes up to the end of 2021 was £125m (in 2022 prices).

Table 7.1 Estimated costs for management and delivery of voucher schemes

Type of cost	GBVS	RGC	Total
Cost of vouchers	62.8	48.6	111.4
Management costs	9.8	3.8	13.6
Total	72.6	52.4	125.0

Source: BDUK

- 7.4 Combining the costs and estimated benefits described above gives a total benefit to cost ratio (BCR) of between £1.22 and £1.88 per £1 of gross public sector spending based on the measurable impacts to date (see Table 7.2). The cost-benefit will be revisited as part of the third and final evaluation in 2026. This will also provide a separate assessment of the value for money of the GBVS and RGC scheme. It is not possible to provide a separate assessment for the two schemes at this stage due to time-lags in the economic datasets.

7.5

	Low	High
Productivity effects (wage premiums associated with additional employment growth)	37.51	37.51
Wellbeing improvements	113.50	195.03
Carbon savings	1.68	2.04
Total value of benefits	152.69	234.58
Total value of costs	125	125
Value of benefits for every £1 invested	1.22	1.88

Source: Hatch

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