



Bringing it all together

Superfast Broadband

Boosting Business and
the UK Economy

regeneris

ECONOMICS • RESEARCH • ANALYSIS

A report prepared by
Regeneris for BT Group

Foreword



BT is the UK's largest communications services provider and we play a key part in the economic, business and community life of the nation.

In our 2012 **'Economic Impact of BT in the UK'** report (<http://www.btsocialstudy.co.uk/download.php>), we showed how BT's £2.5 billion investment in superfast broadband is making a substantial contribution to national regeneration. To flesh out the picture, this report examines and quantifies the economic impact of superfast broadband at a local level.

We believe that superfast broadband has the potential to transform local economies, businesses, households and public services, and to bring new opportunities to all parts of the community. To highlight the impacts for local businesses in particular, we asked independent economic consultants Regeneris Consulting to prepare a supplementary report **'Superfast Broadband – Boosting Business and the UK Economy'**.

This is the first report to look in detail at superfast broadband at a local level – for rural counties, towns, cities and the capital city. Based on an analysis of Openreach rollout plans published to date and local conditions, the report projects and quantifies the likely impacts of superfast broadband on growth over the next 15 years.

Superfast broadband will help improve the performance of existing firms, enable new businesses to emerge and encourage flexible working. It is key to opening up global markets, to providing new job opportunities and to boosting productivity at a local level.

Investment in superfast broadband is not only about making an economic impact. This report challenges you to think about what superfast broadband could do to bring change for the better to all parts of your community. Consider the potential, think about what you would like to achieve, then come talk to us at BT and we'll show you how we can help you overcome the barriers.

Brendan Dick
Managing Director, BT Regions
March 2012

Regeneris Consulting is an independent economics firm that provides research-based advice to major corporates, developers, national government bodies and local government. Regeneris specialises in preparing robust assessments of economic impact, focusing on the impact of new technology, physical developments, policy changes or corporate impact. Regeneris work across the UK from our offices in London and Manchester.

See: www.regeneris.co.uk for further information.

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2 This study

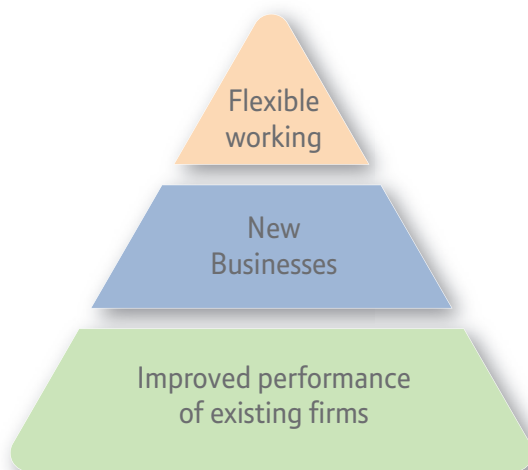
Introduction

- BT is investing £2.5bn to roll-out superfast broadband to two-thirds of UK consumer and business premises by the end of 2014.
- Regeneris Consulting was commissioned to assess the potential economic benefits of BT's investment in superfast broadband for businesses focusing on four case study areas:
 - **A rural area in the UK:** Norfolk and Suffolk
 - **A UK town:** Caerphilly
 - **A UK city:** Sunderland
 - **The capital city:** London
- This report sets out the findings of their work.

Regeneris Consulting is an independent economics firm that provides research-based advice to major corporates, developers, national government bodies and local government. They regularly assess the economic impact of broadband investments in a number of locations across the UK. This work has informed business planning and bid development, including for a number of the current crop of BDUK projects and projects to help secure investment from European funding sources.

See: <http://www.regeneris.co.uk> for further information.

Benefits of Superfast Broadband



- Superfast broadband can lead to a number of benefits which include:
 - Benefits to households
 - Benefits to businesses
 - Improvements to public service delivery
 - Benefits to the economy as a result of user payments made for superfast broadband services to various providers
- The Regeneris work models the **business benefits** of superfast broadband as shown above and described overleaf:

Business Benefits

Supplying commercial premises with superfast broadband will help businesses grow and benefit the local economy in several ways. These impacts have been modelled focusing on the following:

- **Improved performance of existing firms:** superfast broadband will allow businesses to operate more efficiently and to develop new products and services. Knowledge based industries, and the places where they are most concentrated, are expected to exploit faster broadband most effectively and generate the greatest impacts.
- **New businesses:** superfast broadband is expected to help greater numbers of new businesses emerge by reducing barriers to entry in certain sectors. Although there are many ways in which this can occur, cloud computing is perhaps the most significant as it dramatically reduces the upfront capital and ongoing support costs of setting up in business and allows steady, flexible growth.
- **Flexible working:** widespread availability of superfast broadband will allow much more flexible working patterns, opening up new employment opportunities and enhancing the productivity of existing staff.

The cumulative impact on jobs and Gross Value Add (GVA) among new and existing firms exploiting faster next generation broadband services over 15 years has been estimated.

Although early days, Regeneris have assumed that the uptake and exploitation of these faster services will in time approach those currently found for **ADSL services**. They have drawn upon **research from across Europe** to inform their assumptions. Further details on their approach are included in an **appendix**.

This research has informed a number of key observations which are of relevance to locations across the UK. The findings demonstrate that superfast broadband will benefit a wide range of areas. However, it should be recognised that the **actual business benefits** in any one area will vary depending on various factors including the number of exchanges enabled and the businesses within reach of these. The findings are based on the following assumptions:

- A **rural area** in the UK focuses on Norfolk and Suffolk where BT has announced plans to enable 30 exchanges to date, reaching an estimated 23,200 firms
- A **UK town** focuses on Caerphilly where BT has announced plans to enable five exchanges (within the county borough) to date, reaching an estimated 2,300 firms
- A **UK city** focuses on Sunderland where BT has announced plans to enable 11 exchanges to date, reaching an estimated 5,310 firms
- The **capital city** focuses on London where BT has announced plans to enable 280 exchanges (across Greater London) to date, reaching an estimated 356,000 firms

3 Executive Summary

Based on the case studies reviewed, this suggests that for **any one location** such as a rural area, town or city, superfast broadband could create between £143 million and £19.8 billion in additional GVA. This equates to an annual increase in GVA of between 0.3% and 0.5%. The focus is on the business impacts which result from superfast broadband, which arise from a combination of improved business performance; business creation as a result of cloud computing and enhanced home working opportunities.

- For a **rural area** (or set of rural counties) superfast broadband could lead to –
 - An annual increase in GVA of 0.3% per annum over 15 years. For every £1 a business invests in superfast broadband, this will create nearly £15 in additional GVA for the UK economy.
 - 1,470 business start-ups as a result of cloud computing and support for 7,780 home workers.
 - Around 1,810 jobs created through business creation and improved business performance.
- For a **UK town** superfast broadband could lead to –
 - An annual increase in GVA of 0.5% per annum over 15 years. For every £1 a business invests in superfast broadband, this will create nearly £16 in additional GVA for the UK economy.
 - 140 business start-ups as a result of cloud computing and support for 1,030 home workers.
 - Around 225 jobs created through business creation and improved business performance.
- For a **UK city** superfast broadband could lead to –
 - An annual increase in GVA of 0.4% per annum over 15 years. For every £1 a business invests in superfast broadband, this will create nearly £14 in additional GVA for the UK economy
 - 320 business start-ups as a result of cloud computing and support for 1,580 home workers.
 - Around 436 jobs created through business creation and improved business performance.
- For the **UK's capital city** superfast broadband could lead to –
 - An annual increase in GVA of 0.5% per annum over 15 years. For every £1 a business invests in superfast broadband, this will create nearly £10 in additional GVA for the UK economy.
 - 6,600 business start-ups as a result of cloud computing and support for 73,000 home workers.
 - Around 26,200 jobs created through business creation and improved business performance.

4 Rural Counties: Norfolk and Suffolk

Local Context

- BT is committed to **reaching many of the more rural**, less populated parts of the UK such as Norfolk and Suffolk
- The area's population of 1.6 million is sparsely spread and there are an average of 1.7 residents across every hectare
- Collectively, this is a **£25.5 billion economy** and there are 54,500 businesses which employ 442,000 people
- In terms of **key sectors**:
 - There are strong levels of specialisation in **manufacturing, property and other services**
 - **Professional, scientific and technical services** accounts for a high proportion of the business stock
- The area has an emerging **knowledge economy**. In total, there are 13,400 knowledge based businesses employing 82,000 people
- It is these businesses which stand to benefit most from superfast broadband

Roll-Out

Of the 257 exchanges, BT has announced plans to enable the following to date (shown in **Figures 2 and 3**):

- 14 in Norfolk
- 16 in Suffolk

Nevertheless, **22,000** existing firms and **1,190** new firms are expected to benefit from the existing planned roll-out by BT as shown in the **chart below**

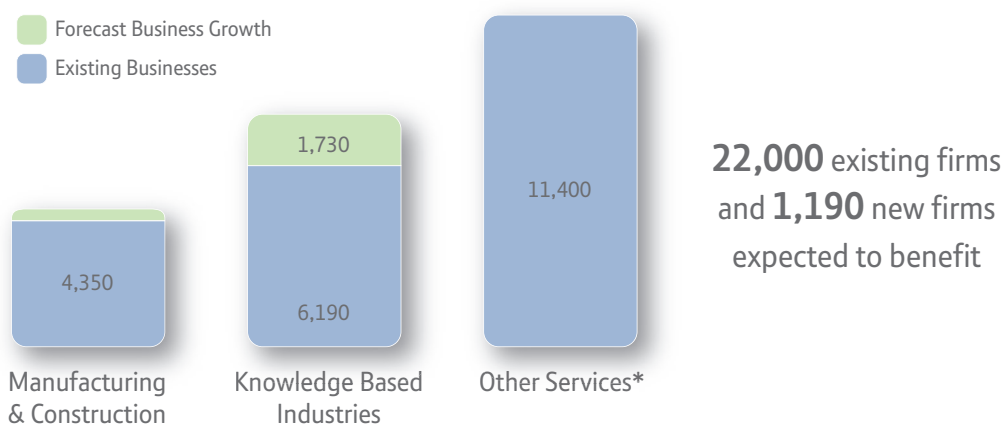


Figure 1: Businesses within exchanges listed on the latest BT roll-out plan

* Business growth in the service sector has not been included due to inconsistencies in sector definitions over the period. It is therefore assumed that the business base will remain static.

Enabled Exchanges in Norfolk and Suffolk

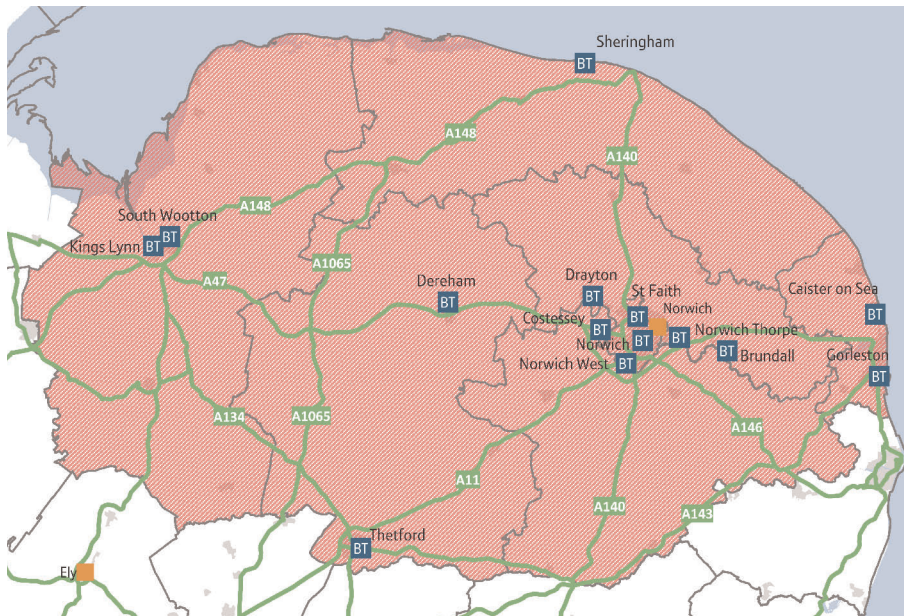


Figure 2: Map of exchanges which BT has announced it will enable in Norfolk

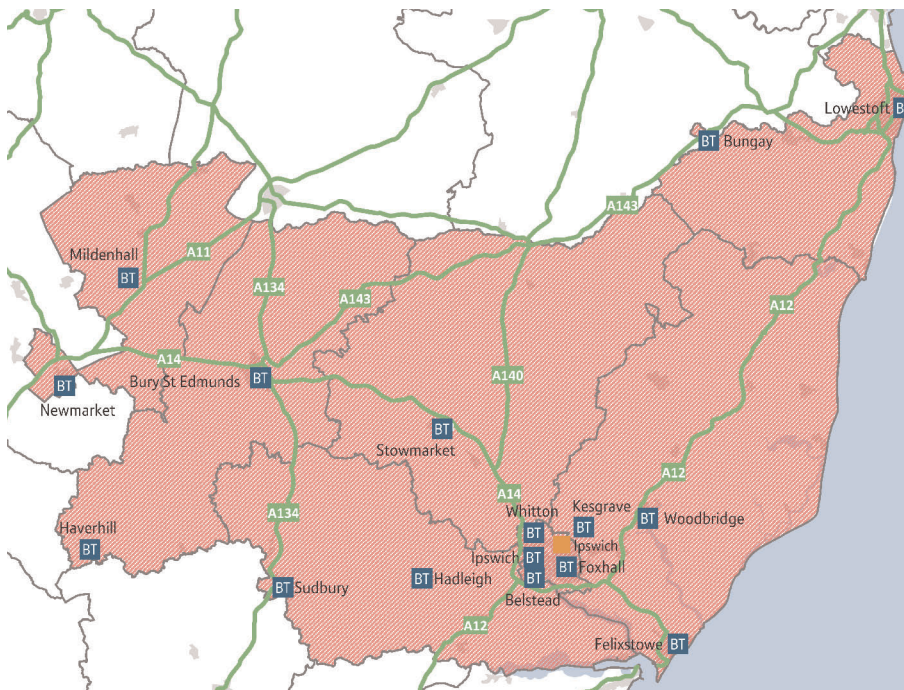


Figure 3: Map of exchanges which BT has announced it will enable in Suffolk

Summary of Impacts over 15 years

In total, new superfast broadband announced by BT to date (30 exchanges) could create almost **£1.3 billion in GVA** for the Norfolk and Suffolk economy over the next 15 years (around £86 million annually). This is equivalent to an annual increase in GVA of 0.3%. The impact comprises:

- £558 million created through improved **business performance** – as shown in **Figure 4**
- £613 million through new **business creation** (as a result of cloud computing, creating 1,470 new start-ups)
- £111 million due to the benefits of increased **home-working** (supporting 7,780 teleworkers)

This is equivalent to £43 million in GVA per exchange enabled and £63,000 per existing business. For every £1 a business invests in superfast broadband this could create nearly £15 in GVA for the UK economy.

Around 1,810 jobs could be created through business creation and improved business performance.

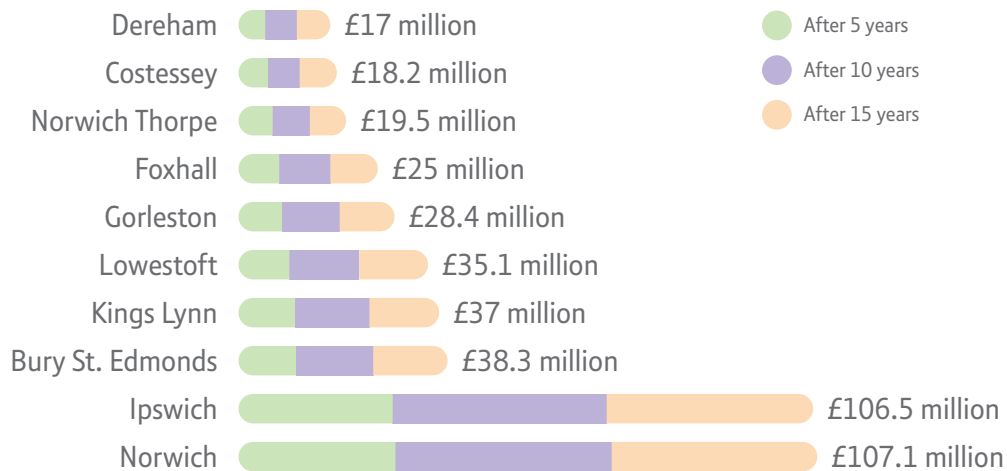


Figure 4: Cumulative impacts across Norfolk and Suffolk up to 15 years (for the 10 exchanges which have the greatest impact)

Figures in Context

The results are even more **positive** in the light of:

- Declining GVA. Between 2007–2009, GVA in Norfolk and Suffolk declined by around £711 million
- A declining business base. Between 2009–2011, the business base in Norfolk and Suffolk declined by 2,500 firms
- Declining employment. Between 2008–2010 employment declined by 3% or 10,800 jobs

NB that the figures are provided for the most recent years for which data is available.

GVA growth of £1.3 billion over 15 years is **broadly equivalent** to:

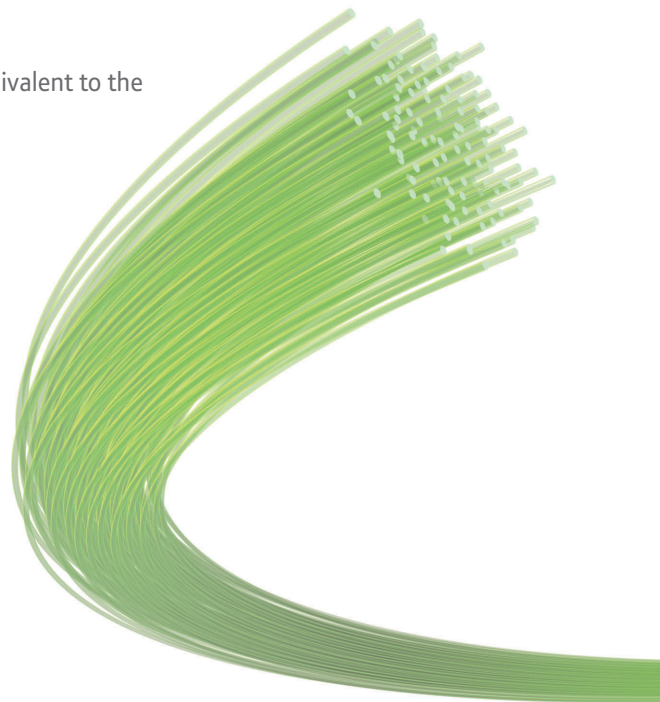
- The annual GVA contribution that would be expected of a town in the UK with a population of 55,000, such as Great Yarmouth
- The annual GVA contribution of the Information and Communications sector in Norfolk and Suffolk

Possible Future Impacts

If the remaining exchanges across Norfolk and Suffolk were to be enabled, an additional **£1.2 billion in GVA** could be created:

- £305 million GVA through **enhanced business performance**
- £820 million GVA and 2,150 new start-ups through **business creation**
- £70 million due to the productivity benefits associated with increased **home-working**

Collectively, this would result in **£2.3 billion GVA** which is broadly equivalent to the total annual GVA of Southend.



Local Context

- This research focuses on the whole of the county borough, which the town of Caerphilly sits within. The county is home to 173,000 people
- It is a **£1.8 billion economy** and there are 3,460 businesses which employ 34,800 people
- In terms of **key sectors**:
 - Employment in manufacturing is significantly above average
 - There are also above average levels of employment in construction
- The area has a small but emerging **knowledge economy**, which will benefit most from superfast broadband
- In total, there are 610 knowledge based businesses, employing 3,900 people

BT Superfast Broadband Roll-Out

- BT has announced plans to enable five of the 12 telephone exchanges in Caerphilly to date, giving them access to superfast broadband. These are shown on the map in **Figure 6**
- **2,180** existing firms in Caerphilly and **112** new firms are expected to benefit from superfast broadband, as shown in the **chart below**

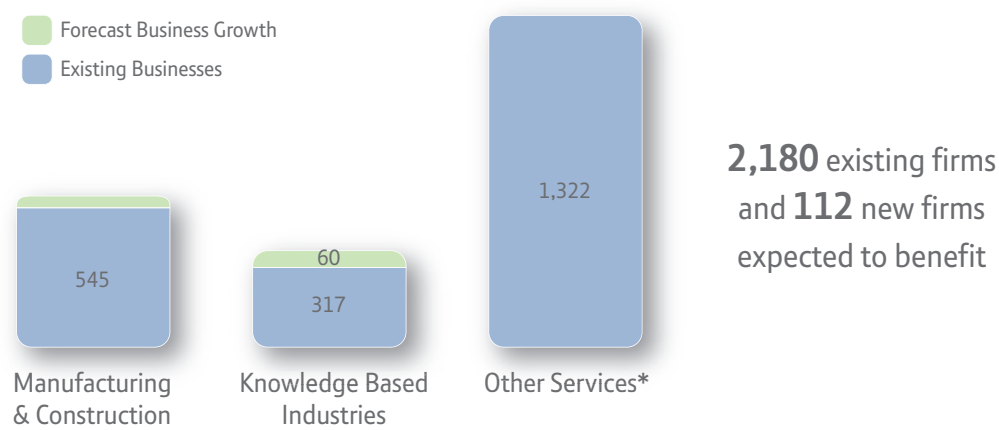


Figure 5: Businesses within exchanges listed on the latest BT roll-out plan

* Business growth in the service sector has not been included due to inconsistencies in sector definitions over the period. It is therefore assumed that the business base will remain static.

Enabled Exchanges in Caerphilly

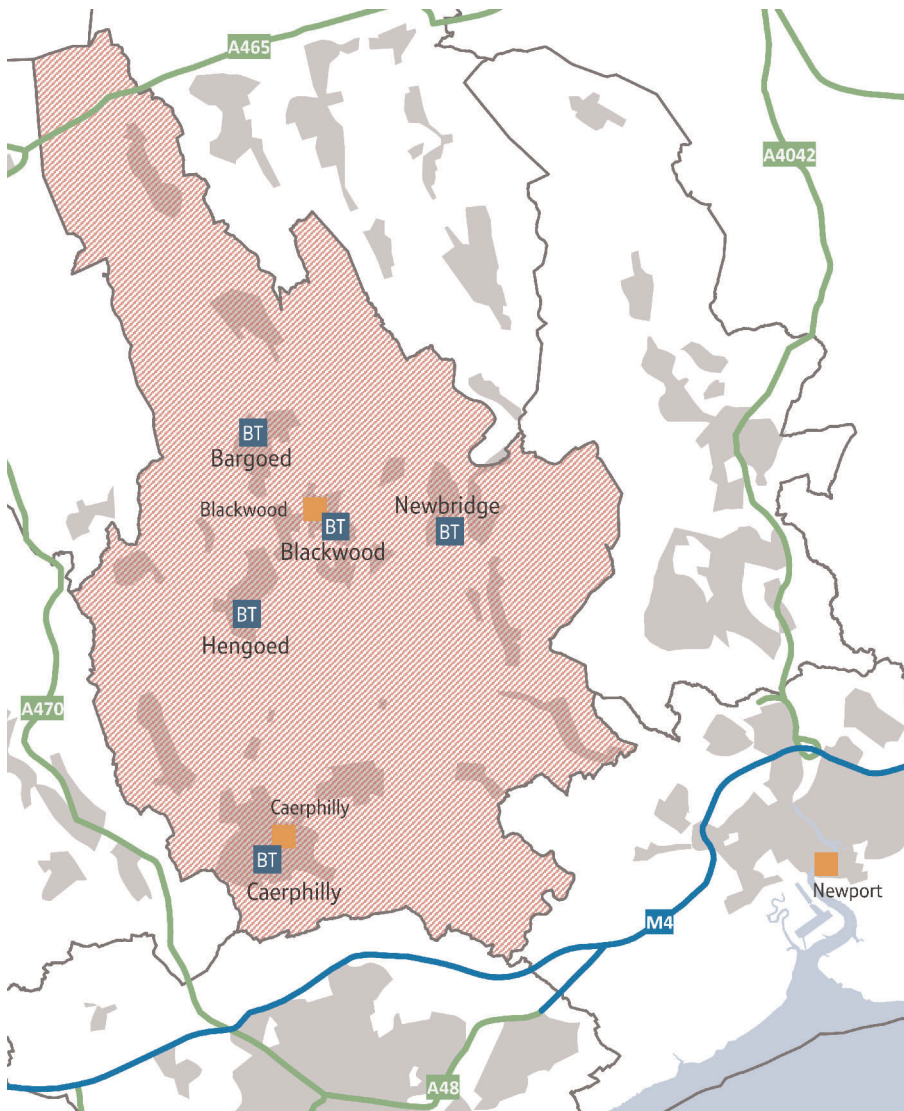


Figure 6: Map of exchanges which BT has announced it will enable

Summary of Impacts over 15 years

In total, new superfast broadband announced by BT to date could create **£143 million in GVA** for the Caerphilly economy over the next 15 years (or around £10 million annually). This is equivalent to an annual increase in GVA of 0.5%. This comprises:

- £81 million GVA through improved **business performance** (as shown in **Figure 7**)
- £46 million GVA through new **business creation** (as a result of cloud computing, creating 140 start-ups)
- £16 million GVA due to the benefits of increased **home-working** (supporting 1,030 teleworkers)

This is equivalent to £29 million in GVA per exchange enabled and £68,000 per existing business. For every £1 a business invests in superfast broadband this could create nearly £16 in additional GVA for the UK economy.

Around 225 jobs could be created through business creation and improved business performance.

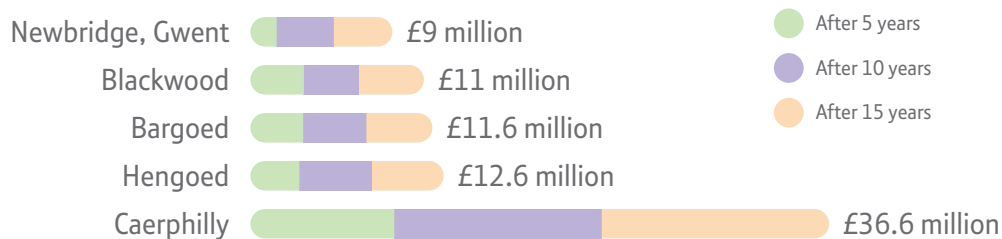
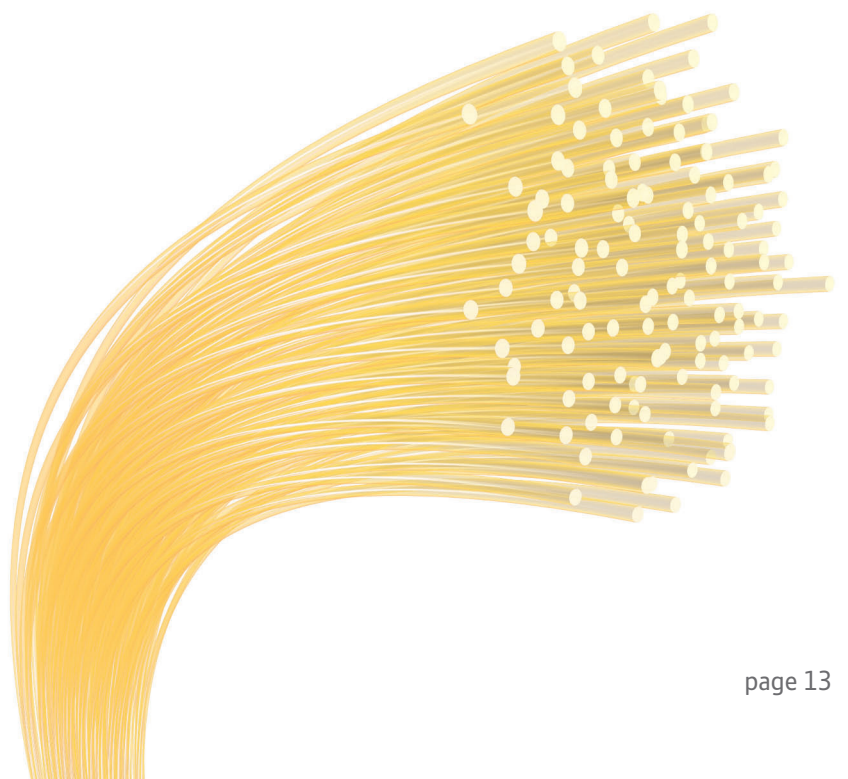


Figure 7: Cumulative GVA impacts in Caerphilly (up to 15 years)



Figures in Context

The results above are even more **positive** in the light of:

- Declining GVA. Between 2007 and 2009, GVA in Caerphilly declined by around £43 million.
- A declining business base. Between 2009 and 2011, the business base in Caerphilly declined by 100 firms.
- Declining employment. Between 2008 and 2010, employment fell by 5% or 2,500 jobs.

NB that the figures are provided for the most recent years for which data is available.

GVA growth of **£143 million** over 15 years is equivalent to:

- The annual GVA contribution that would be expected of a small town in the UK with a population of 7,000 such as Pembroke or Monmouth
- The annual GVA contribution of the Business Service Activities sector in Caerphilly

Possible Future Impacts

If the remaining exchanges across Caerphilly were to be enabled, an additional **£208 million in GVA** could be created:

- £100 million GVA through enhanced **business performance**
- £107 million GVA and 320 new start-ups through **business creation**
- £0.3 million GVA due to the benefits of **home working**

Collectively, this would result in around **£344 million in GVA**, which is broadly equivalent to the annual GVA contribution that might be expected of a small town the size of Bangor.

6 City: Sunderland

Local Context

- Sunderland suffers from a number of economic issues faced by some UK cities, which include levels of unemployment which are above national levels (at 10.5%) and below average GVA per head (£16,500)
- It is a **£4.6 billion economy** and there are 5,430 businesses which employ 75,000 people
- In terms of **key sectors**:
 - The area has a strong specialism in manufacturing
 - There are also high levels of employment in the financial and property sectors
- Sunderland is making the shift towards more knowledge based industries
- In total, there are 1,130 **knowledge based businesses** employing 12,900
- It is these businesses which stand to benefit most from superfast broadband

BT Superfast Broadband Roll-Out

- BT has announced plans to enable nine of the 11 exchanges in Sunderland to date, pushing Sunderland towards full coverage in just a few years. These are shown on the **map** in **Figure 9**
- **4,970** existing firms in Sunderland and **347** new firms are expected to benefit, as shown in the **chart below**

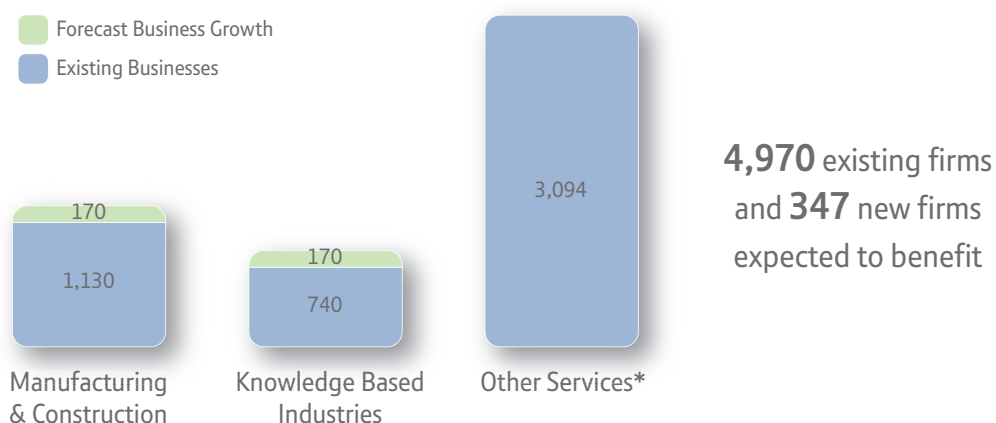


Figure 8: Businesses within exchanges listed on the latest BT roll-out plan

* Business growth in the service sector has not been included due to inconsistencies in sector definitions over the period. It is therefore assumed that the business base will remain static.

Enabled Exchanges in Sunderland

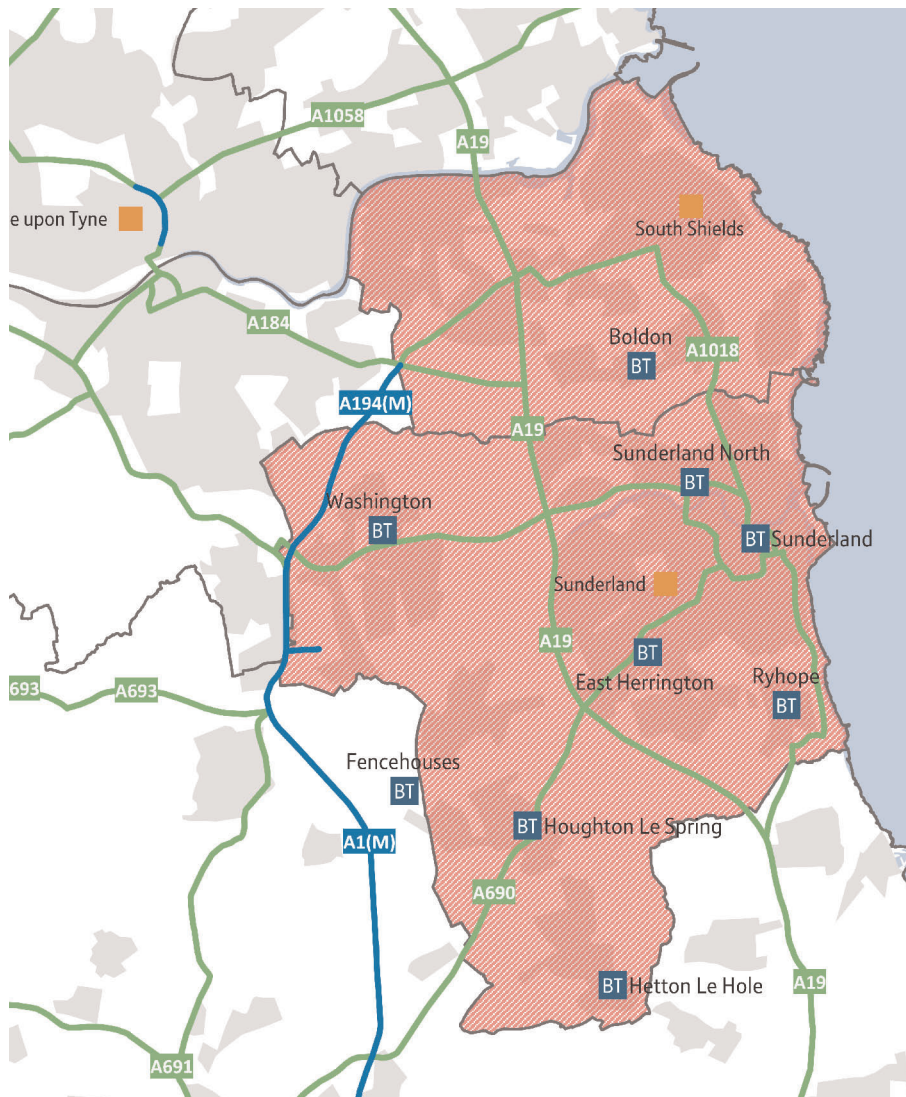


Figure 9: Map of exchanges which BT has announced it will enable in Sunderland

Summary of Impacts over 15 years

In total, new superfast broadband announced by BT to date could create **£296 million in GVA** for the Sunderland economy over the next 15 years (or around £20 million annually). This is equivalent to an annual increase in GVA of 0.4% per annum. This comprises:

- £167 million GVA through **improved business performance** – the impact per exchange is shown in **Figure 10**
- £106 million GVA through new **business creation** (as a result of cloud computing, creating 320 start-ups)
- £23 million due to the benefits of increased **home-working** (supporting 1,580 tele-workers)

This is equivalent to £33 million in GVA per **exchange enabled** and **£59,600 per existing firm** that takes-up superfast services. For every £1 a business invests in superfast broadband, this will create nearly £14 in additional GVA for the UK economy.

Around 436 jobs could be created through business creation and improved business performance.

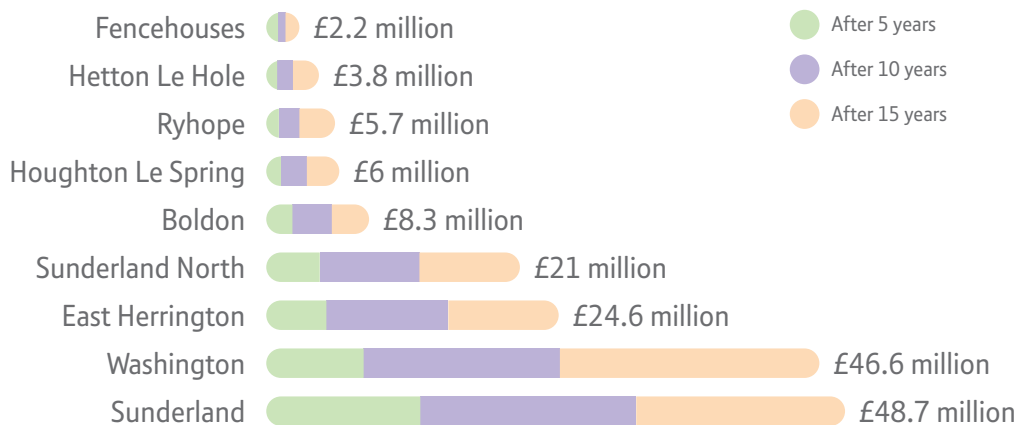


Figure 10: Cumulative GVA impacts of superfast broadband due to improved business performance (up to 15 years)

Figures in Context

The results are even more **positive** in the light of:

- Declining GVA. Between 2007 and 2009, GVA in Sunderland declined by around £140 million.
- A declining business base. Between 2009 and 2011, the business stock in Sunderland declined by 600 firms.
- Declining employment. Between 2008 and 2010, employment declined by 10% or 12,600 jobs.

NB that the figures are provided for the most recent years for which data is available.

GVA growth of £296 million over 15 years is **equivalent** to:

- The **annual GVA** contribution that would be expected of a town in the UK with a population of around 13,000 such as Morpeth or Selby
- The **annual GVA** contribution of the business service activities sector in Sunderland

Possible Future Impacts

A further **£99 million in GVA** could be generated if the remaining two exchanges in Sunderland were to be enabled and superfast broadband rolled out across the county through:

- £67 million GVA through enhanced **business performance**
- £30 million GVA and 90 new start-ups through **business creation**
- £2 million in GVA and 190 additional tele-workers due to increases in **workplace flexibility**

Combined, this results in around £371 million in GVA, which is broadly equivalent to the annual GVA contribution of a small town such as Beverley.

Local Context

- As the capital city, London is a significant economy. This analysis focuses on Greater London, an economy which contributes **£274 billion in GVA** annually.
- There are 363,000 businesses which employ **3.1 million** people
- As a major global economic centre, London is home to a higher proportion of knowledge based businesses compared to the national average
- In total, there are **155,000 knowledge based businesses** employing 1.2 million people
- It is these businesses which stand to benefit most from superfast broadband

BT Superfast Broadband Roll-Out

- BT has announced plans to enable 180 out of the 188 exchanges in London to date. These are shown on the **map** in **Figure 12**.
- **319,000** existing firms in London and **36,700** new firms are expected to benefit, as shown in the chart below

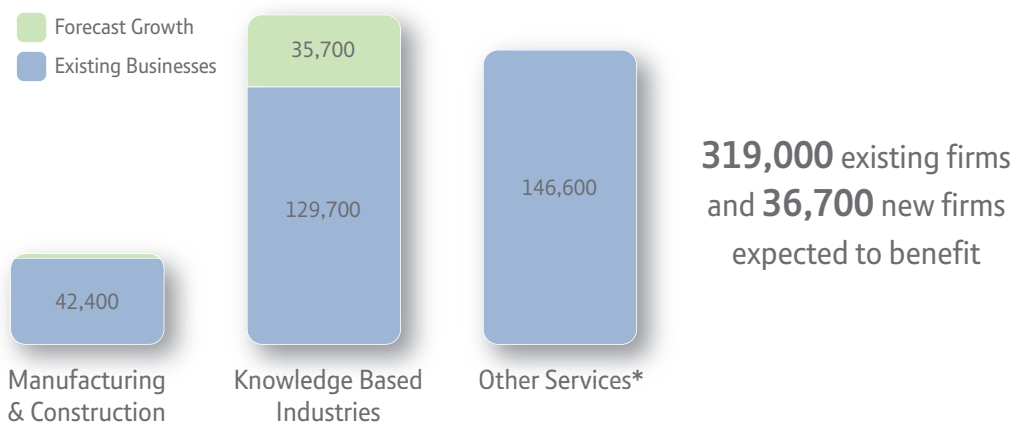


Figure 11: Businesses within exchanges listed on the latest BT roll-out plan

* Business growth in the service sector has not been included due to inconsistencies in sector definitions over the period. It is therefore assumed that the business base will remain static.

Enabled Exchanges in London

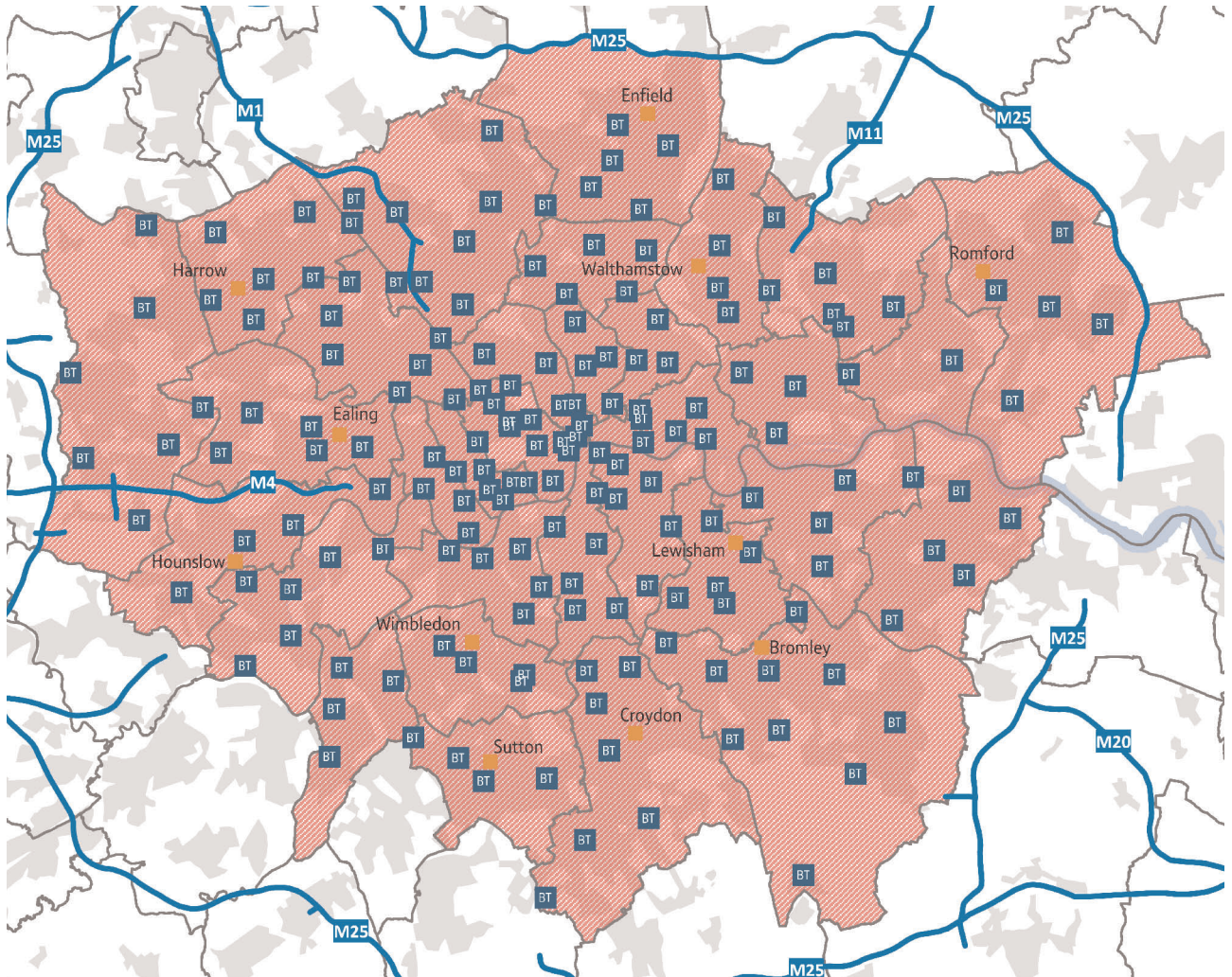


Figure 12: Map of enabled exchanges

Summary of Impacts over 15 Years

In total, new superfast broadband announced by BT to date could create **£19.8 billion in GVA** for the London economy over the next 15 years (or around £1.3 billion annually). This is equivalent to an annual increase in GVA of around 0.5%. This comprises:

- £7.3 billion through **improved business performance** – see **Figure 13**
- £11 billion through new **business creation** (as a result of cloud computing, creating 6,600 new firms)
- £931 million due to the benefits of increased **home-working** (supporting 73,000 teleworkers)

This is equivalent to £30 million in GVA per exchange enabled and £42,900 in GVA per firm. For every £1 a business invests in superfast broadband this will create £10 in additional GVA for the UK economy.

Around 26,200 jobs could be created through business creation and improved business performance.

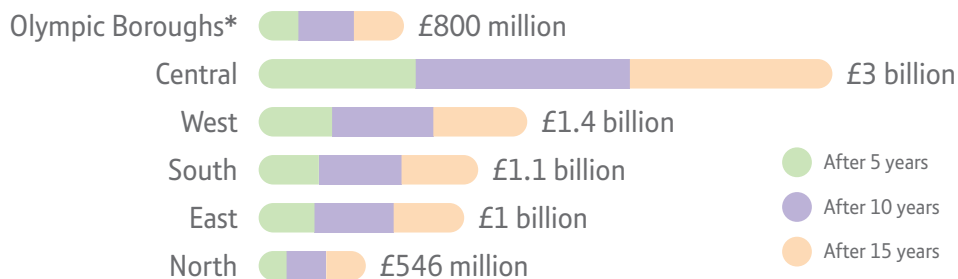


Figure 13: Cumulative GVA impacts of superfast broadband across London



Figures in Context

The results above are even more **positive** in the light of:

- Declining employment. Between 2008 and 2010, employment declined by 4% or 162,200 jobs
- Decreasing business numbers. Between 2009 and 2011, the business base in London declined by 7,400 firms

NB that the figures are provided for the most recent years for which data is available.

GVA growth of **£19.8 billion** over 15 years is broadly equivalent to:

- The annual GVA contribution that would be expected of a major city such as Birmingham
- The annual GVA of the Real Estate sector across London

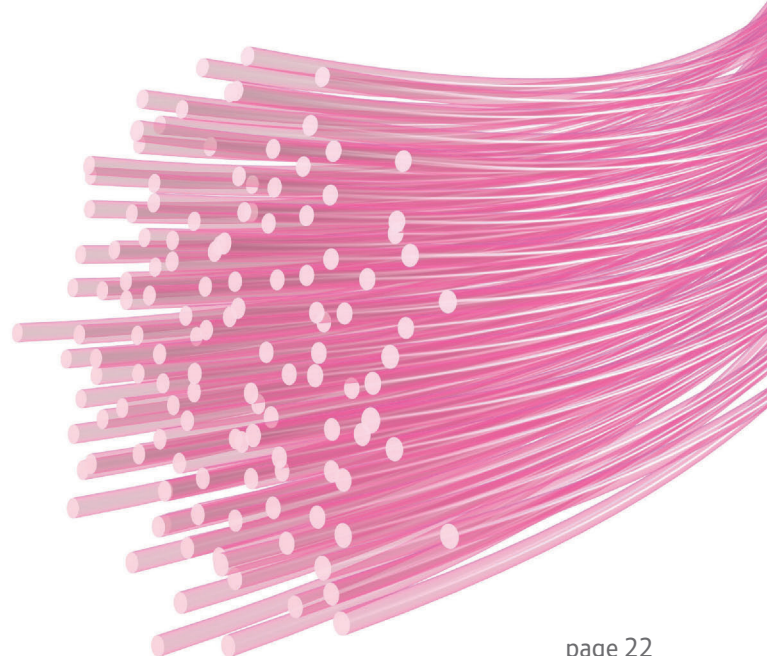
Possible Future Impacts

A further **£5.6 billion of GVA** could be created by enabling the areas of London currently excluded from BT's plans:

- £3.4 billion GVA in **improved business performance**
- £1.7 billion in GVA and 5,300 new businesses as a result of the increase in **business start-ups**
- £478 million as a result of the benefits of increased home working with 36,000 employees taking up **flexible working** practices

Collectively, this would result in around £25.4 billion in GVA which is broadly similar to the total annual GVA of the East and North East areas of Outer London*.

*this includes the Boroughs of Barking and Dagenham, Bexley, Enfield, Greenwich, Havering, Redbridge, Waltham Forest.



Improved Business Performance

- We provide an estimate of employment and wealth (GVA) created by existing local users. Our assumptions are discussed below:
- **Network enablement:** we have assumed that 70% of premises served by the exchange will get the superfast service in the first 12 months. Thereafter, the roll-out will slow down, reaching 90% of premises after four years and 100% coverage after 10 years. In practice the pace of roll-out will vary according to local demand and conditions, but these simplifying assumptions provide a reasonable estimate of the expected schedule, based on our experience and knowledge.
- **Adoption:** an overall adoption rate equal to that seen for first generation ADSL across each of the areas has been applied as follows¹:
 - Sunderland: 64%
 - Caerphilly: 65%
 - Norfolk: 56%
 - Suffolk: 42%
- Adoption is assumed to be higher in knowledge based sectors, lower in other manufacturing and construction sub sectors and lower still in other service sub sectors. Adoption rates are expected to be higher among firms which employ more people.
- The increase in speed will be conditioned by the distance from the network. For firms located in the 30% least densely populated locations, a 25% reduction in impact has been assumed. By year 10, only 10% of the least densely populated areas will be affected.
- **Exploitation and the Value of Services:** superfast broadband will generate productivity gains. A 2008 EC study estimated the productivity impacts under first generation ADSL broadband²:
 - Manufacturing and construction: 0.14% increase in GVA per firm per annum
 - Knowledge intensive: 0.58% per annum
 - Other services: 0.32 per annum (efficiency benefits only)
- **Time dependency:** we have assumed the following build-up periods:
 - Service provided: 1 year (after announcement)
 - Assumed business adoption levels reached: 3 years
 - Full productivity improvements reached: 1 year
 - Full innovation benefits reached: 4 years
- **Technological change:** we have assumed a 5% uplift on annual impact in the ST (5yrs), a 10% uplift in impact in MT (10 yrs) and 20% in LT (15yrs).
- **Multiplier Effects:** a combined induced and indirect economic multiplier effect of 1.25 has been applied.
- **Displacement and substitution:** these are assumed to be zero since the effects are expected to be limited.
- **Discounting impacts:** impacts are discounted at a rate of 3.5% per annum. While an increasing uplift in business performance due to technological developments has been applied over time, no allowance has been made for the expected uplift in worker productivity separate from that created by technological change.

New Business Starts

- We have estimated anticipated business growth due to reduced barriers to entry in certain sectors. The assumptions have been informed by a study which estimates levels of business creation due to cloud computing³. The model makes the following assumptions:
 - We have assumed that the annual business growth rate builds up to the peak growth rate in year five, then persists in year six, seven and eight decreasing by 10% per year.
 - A peak growth rate of 1.2% is applied across manufacturing and construction and the other services sectors which is consistent with the Etro study. Growth rates for knowledge based industries are higher at 25%.
 - Survival rates were applied for two broad sectors (KBI and Other) based on national business demography data. We have assumed that survival rates decline at around 5% per annum.
 - It is assumed that all firms are micro businesses (1-10 employees) in year one, but this builds over time. By year 15, the size composition of newly created firms reflects the current mix in each area. Average employee numbers for each area are applied across micro, small and medium sizes and large businesses for each sector.
 - Employment of the first employee is attributable to superfast broadband. Five years after start-up, impacts created by new businesses are no longer considered attributable to superfast broadband.
 - GVA estimates have been generated by applying GVA per worker figures for each area across knowledge based industries, manufacturing and construction and other services.

Flexible working benefits

- Our estimates of the flexible working benefits are based on the following:
 - We have assumed that rates of teleworking increase at an annual rate of 3% in the financial and professional services sector (the sector most likely to utilise these technologies)
 - Rates of teleworking attributable to SFB will increase at a rate of 1% per annum in all other sectors.
 - Productivity, as measured by GVA per worker is assumed to be 20% higher for tele-workers than normal employees. This is conservative since other studies assume 25%⁴.
 - It is assumed that teleworking jobs are not additional i.e. They replace a job which would otherwise not have been there.

Comparators

- Examples used to contextualise GVA growth are based upon information from ONS's Regional Gross Value Added dataset. Caerphilly is the only exception and we have estimated annual GVA for Caerphilly based upon its share of employment within the Gwent Valleys.
- When making a comparison with certain sectors such as the business services sector, Standard Industrial Classification (SIC) 2007 definitions have been used.
- Where direct comparisons are made to the GVA of a certain locality, or to recent change in GVA, information has been taken directly from the Regional Gross Value Added dataset.
- Where contextualising smaller levels of GVA growth than typical at NUTS Level 3, we have undertaken supplementary analysis. By applying the average figure for GVA per Capita in the UK to the Broadband Case Study estimates of GVA growth, we estimate the average population size in the UK which would produce this level of GVA (annually). UK towns/cities of a similar size are then named to put this population figure into context.

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