Digital Super Towns

vodafone

Unlocking the UK's Digital Potential

WPI STRATEGY

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About this report

WPI Strategy would like to thank Vodafone for their support on this report. In particular, we would like to thank those who took time to discuss their specialist knowledge of digital issues to inform the report's recommendations.

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Foreword

By Nick Jeffery, CEO, Vodafone UK

Our mission at Vodafone UK is to deploy technological innovation to unlock human potential. Vodafone made Britain's first mobile phone call on New Year's Day 1985, from St Katherine's Dock in London to our headquarters in Newbury, and we've continued to innovate ever since. We're proud of our British roots, and of our part in Britain's long history as a tech innovator. We believe in this nation's potential to be a digital leader – post-Brexit and well into the future.

Today the UK boasts an advanced digital economy with thriving industries like artificial intelligence, cybersecurity, FinTech, gaming and virtual reality. But to be a digital leader in an increasingly competitive global economy, we must continue to innovate. In order to do so, we must improve our digital connectivity and the digital skills of our workforce while expanding our digital economy. We can achieve this if we work together, not just at the national level but also regionally, by engaging with policymakers, businesses and local communities in major towns and cities across the country.

Before we begin this dialogue, it's important to first understand the digital strengths and capabilities of the UK's towns and cities, as each one is unique and has different needs. This is why we've published "Unlocking the UK's Digital Potential", a report that uses three indicators – digital infrastructure, digital skills and the digital economy – to assess the digital strengths of large towns and cities across the nation. The most comprehensive study to date of the UK's digital performance on a regional basis, this report recognises that different places need different policy interventions to boost productivity and spur economic growth.

As the report makes clear, there are untapped digital resources across the nation. Places with the highest digital potential have access to better digital connectivity, workers with higher levels of digital skills and a strong base of digital businesses. To make the most of this potential, we urge the Government and local leaders to set up what we call "Digital Enterprise Zones". These are defined geographic areas created to foster the growth of digital businesses, with benefits like including incentives for companies that locate there to encourage people to learn new digital skills.

Over time, by drawing more and more investment, skilled workers, and businesses in tech-related fields to the area, Digital Enterprise Zones could pave the way for the formation of "Digital Super Towns" – places where every bit of digital potential is exploited to its fullest. Indeed, if Digital Super Towns emerged in all the places identified in this report as having the greatest potential, their development could contribute tens of billions of pounds to the UK economy. If we are to accomplish this, the private and the public sector must work together.

Vodafone is committed to doing its part – we will have spent more than £2 billion on our UK network and services since 2014, and we expect to invest a similar amount over the next few years – but we cannot work alone. To improve digital connectivity, our industry needs national policies that encourage investment in full fibre networks, as well as a supportive regulatory environment and sensible planning laws. And for the UK to fully exploit its potential and become a digital leader, we must move ahead in all three areas highlighted above: we must build better digital infrastructure, strengthen our digital skills and grow our digital economy as well.

This report suggests various ways policymakers can make progress on all three fronts. It builds on our contribution to the debate about the UK's role in the global economy and the challenges we face as a nation. Having commissioned a study by the London School of Economics that focused on how UK businesses can unlock productivity at the organisational level, with this report we're going a step further and widening the scope of our research, to examine how the policy can unlock productivity at the local and regional level. We will be publishing a second study soon that will consider exactly how to realise the vision of "Digital Super Towns" across the UK.

We hope the research we've done will bring the private and public sectors together in a nationwide conversation about how the UK can continue to drive innovation and make the most of its potential – both digital and human – in this rapidly evolving cyber age.

Executive Summary

Realising the UK's digital potential

This report identifies an approach to fulfilling the digital potential of the UK's towns and cities. The central conclusion is that the Government should pursue the idea of "Digital Enterprise Zones" as the method to help convert a number of towns across the UK into "Digital Super Towns" while at the same time lifting the overall productivity of all major conurbations.

The potential in question is the efficiencies that can be realised, the innovation that can be enabled and the economic activity that can be fostered through the adoption and use of digital technology. This could be a small business finding new customers by creating a web presence; it could be a large manufacturer adopting Internet of Things technology to improve its production processes. Whatever the example, the fulfilment of this digital potential would ultimately translate into productivity gains, stronger economic performance and a more globally competitive UK.

Digital Enterprise Zones would tailor policy initiatives to the individual digital needs of towns and cities. This report details the comparable strengths of over 50 towns and cities across the UK and suggests a range of policy solutions that could be implemented by both local and national policymakers.

The prize for achieving this is huge. Previous research has convincingly argued that tens of billions of pounds of additional economic output could be gained by the adoption and use of digital technology.

Digital Enterprise Zones – what are they?

Local leaders recognise that digital technology is crucial to the future economic success of their areas; recently elected "metro mayors" all have significant ambitions in this area. Equally, the Government's Digital and Industrial Strategies aim to develop skills, upgrade infrastructure and drive growth across the entire country. Achieving these aims is made even more important as the UK goes through the process of leaving the European Union, and adjusts its international trading relationships.

Digital Enterprise Zones would give towns and cities the policy tools to enhance their digital economies, digital skills and digital infrastructure. They would have two broad purposes:

- **To create test-beds for the adoption and use of future digital technology.** Whether this is creating supportive local conditions for a full fibre roll out, trials of 5G or innovations in how the Internet of Things can be utilised, Digital Enterprise Zones can be used for understanding how to adopt and use advancements in digital technology.
- **To implement digital policy specific to individual towns and cities.** While identifying the specific digital needs of each town or city is not straightforward, exploring new ways of understanding them to better design policy is important. In turn, this would drive economic growth within those places.

The following provide suggestions for the types of policy initiatives that Digital Enterprise Zones could implement.

A) Enhancing digital economies

- **Explore how data can be used to help towns and cities better understand their digital economies.** Data gathered by central government agencies – such as Companies House or HMRC – offer valuable insights into a particular locality's digital economy. Policymakers should be armed with all possible data as they design and target digital policy.
- **Digital marketing vouchers for SMEs with export potential.** Part of the government's export advice is that businesses should internationalise their websites by using translation services and by using colours, images and branding that are culturally appropriate. In partnership with UKTI, Digital Enterprise Zones could trial a voucher scheme for SMEs to procure services that will improve their digital marketing in selected foreign markets.

B) Enhancing digital skills

- **Trial how to improve the collection of data on digital skills within a particular locality.** As an example of the lack of data available, currently there are no published central Government statistics on the funding and take-up of digital courses within local areas (the best that is available is apprenticeship stats by sector, such as "Information and Communications Technology"). Local decision makers should be provided with this data by conducting an audit and collection of digital skills data within a particular Digital Enterprise Zone.
- **Provide financial incentives for the training and retention of digital talent.** The government has used numerous models to incentivise employers to upskill their workforce. One way of doing this within a Digital Enterprise Zone is to explore how existing funding that is raised locally can be used locally. Understanding how Apprenticeship Levy funds can be utilised for this purpose could be a consideration.

C) Enhancing digital infrastructure

- **Test new approaches to ducts and poles and access to dark fibre in Digital Enterprise Zones to support the roll-out of full-fibre.** The rapid rollout of FTTP networks is greatly helped by the ability to access existing ducts and poles; this is important beyond fixed infrastructure. Full FTTP fibre is crucial for the delivery of widespread mobile internet coverage and capacity – mobile operators' masts need to be connected to fibre networks in order to meet the current and future demand for mobile services.
- **Incentivise investment in full fibre networks.** Rewarding investment in full fibre gigabit capable networks would encourage genuine competition. Investment in full fibre networks must not be undermined by incumbent providers using investment in existing copper based infrastructure to undermine the investment case for full fibre.
- **Relax rules controlled by local authorities.** This should include planning, traffic management and road

closure rules and related access permissions. Reforms to noticing, permits, section 58 notices and traffic management processes could speed up the delivery of infrastructure.

- **Reduce the burden of Business Rates and give access to public sector land, building and street furniture.** The Government has already announced measures to introduce business rate relief for new fibre deployment; Digital Enterprise Zones could take this a step further by providing rate relief on all digital infrastructure investments. Alongside this freeing up access to public sector buildings and land would help with infrastructure provision. Street furniture could be made available for network infrastructure equipment.

Measuring and understanding digital potential

Towns and cities can only fulfil their digital potential – and effectively design bespoke Digital Enterprise Zones – if they can first identify and understand the potential that they have. This report has attempted to categorise different towns and cities by creating a scorecard of their performance on indicators of the digital economy, digital skills and digital infrastructure.

The three categories of digital potential are:

Digital Pacesetters

Digital high performers when compared to others within the scorecard.

Digital Pillars

Solid digital performers, but have not yet reached the performance levels of Digital Pacesetters.

Digital Prospects

A digital base on which to build, but have not yet reached the performance levels of Digital Pillars.

The table overleaf presents the towns and cities included in the analysis categorised by the Pacesetter, Pillar and Prospect definitions on measures of the digital economy, digital skills and digital infrastructure.

Town	Combined Authority	Economy	Skills	Infrastructure
Altrincham	Greater Manchester	Pacesetter	Pacesetter	Pacesetter
Ashton-Under-Lyne	Greater Manchester	Pillar	Pillar	Pillar
Barnsley	Sheffield City Region	Prospect	Prospect	Prospect
Bath	West of England	Pacesetter	Pacesetter	Prospect
Birmingham	West Midlands	Pacesetter	Pacesetter	Pacesetter
Bolton	Greater Manchester	Prospect	Prospect	Pillar
Bristol	West of England	Pacesetter	Pillar	Pacesetter
Bury	Greater Manchester	Pacesetter	Pacesetter	Pillar
Cambridge	Cambs & Peterboro'	Pacesetter	Pacesetter	Prospect
Cannock	West Midlands	Pillar	Pillar	Prospect
Chesterfield	Sheffield City Region	Prospect	Prospect	Prospect
Coventry	West Midlands	Pacesetter	Pacesetter	Pacesetter
Darlington	Tees Valley	Pillar	Pillar	Pillar
Doncaster	Sheffield City Region	Pillar	Prospect	Prospect
Dudley	West Midlands	Prospect	Prospect	Pacesetter
Durham	North East	Prospect	Pillar	Prospect
Gateshead	North East	Pillar	Pillar	Prospect
Halifax	West Yorkshire	Pacesetter	Pacesetter	Prospect
Hartlepool	Tees Valley	Pillar	Prospect	Pacesetter
Huddersfield	West Yorkshire	Prospect	Pillar	Prospect
Keighley	West Yorkshire	Pillar	Prospect	Pillar
Kirkby	Liverpool City Region	Pacesetter	Prospect	Pacesetter
Leeds	West Yorkshire	Pacesetter	Pillar	Pillar
Liverpool	Liverpool City Region	Pillar	Prospect	Pacesetter
Manchester	Greater Manchester	Pacesetter	Pillar	Pillar
Middlesbrough	Tees Valley	Prospect	Pillar	Pacesetter
Middleton	Greater Manchester	Pillar	Pillar	Pillar
Morley	West Yorkshire	Pacesetter	Pillar	Pillar
Newcastle	North East	Pillar	Pacesetter	Pacesetter
Nuneaton	West Midlands	Prospect	Pacesetter	Pillar
Oldham	Greater Manchester	Prospect	Prospect	Pillar
Peterborough	Cambs & Peterboro'	Pacesetter	Pillar	Pacesetter
Redditch	West Midlands	Prospect	Pacesetter	Pillar
Rotherham	Sheffield City Region	Pillar	Pacesetter	Prospect
Rowley Regis	West Midlands	Pillar	Prospect	Pillar
Salford	Greater Manchester	Pacesetter	Prospect	Pacesetter
Sheffield	Sheffield City Region	Pillar	Pillar	Prospect
Solihull	West Midlands	Pacesetter	Pacesetter	Pacesetter
South Shields	North East	Prospect	Pillar	Pacesetter
Southport	Liverpool City Region	Prospect	Prospect	Pillar
St Helens	Liverpool City Region	Prospect	Prospect	Prospect
Stockport	Greater Manchester	Pillar	Pacesetter	Pacesetter
Stockton-on-Tees	Tees Valley	Prospect	Pillar	Pillar
Sunderland	North East	Pillar	Prospect	Pacesetter
Sutton Coldfield	West Midlands	Pacesetter	Pacesetter	Pillar
Tamworth	West Midlands	Prospect	Pillar	Prospect
Telford	West Midlands	Pillar	Prospect	Prospect
Tynemouth	North East	Pacesetter	Pacesetter	Pillar
Wakefield	West Yorkshire	Pillar	Pacesetter	Pillar
Wallasey	Liverpool City Region	Pacesetter	Pacesetter	Pillar
Walsall	West Midlands	Prospect	Prospect	Pillar
Warrington	Liverpool City Region	Pacesetter	Pacesetter	Pacesetter
Widnes	Liverpool City Region	Pillar	Pillar	Pacesetter
Wigan	Greater Manchester	Pillar	Pillar	Pacesetter
Wolverhampton	West Midlands	Prospect	Prospect	Pacesetter
Worksop	Sheffield City Region	Pillar	Pillar	Prospect
York	West Yorkshire	Pacesetter	Pacesetter	Prospect

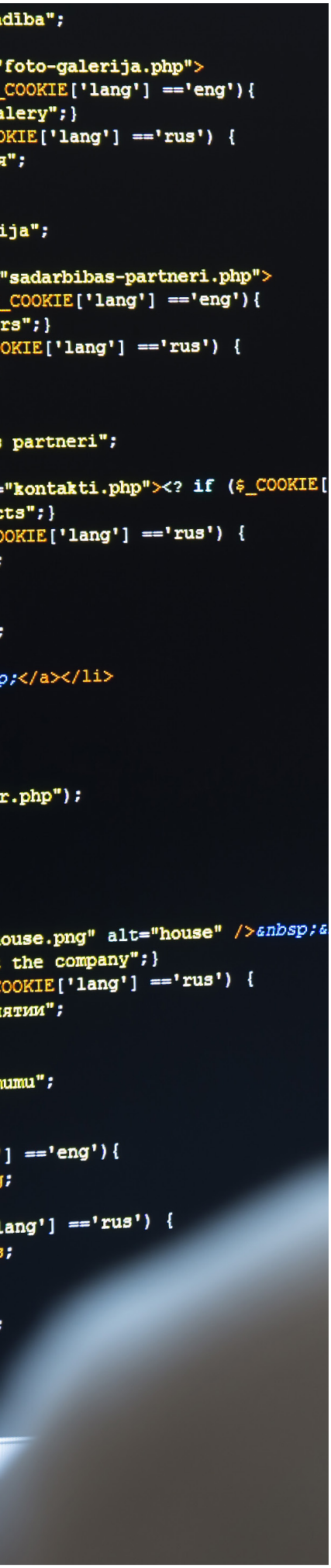
The way that the scorecard is constructed means that the major towns and cities of the devolved nations are not directly comparable to those in England, but using some proxies in the analysis does give some basis for comparison. The table below shows the categorisation of four major cities within the devolved nations.

Devolved Nation	City	Economy	Skills	Infrastructure
1. Wales 	Cardiff			
2. N. Ireland 	Belfast			
3. Scotland 	Edinburgh			
4. Scotland 	Glasgow			

Conclusion

Failing to keep pace with the digital world acts as a drag on the economy. The creation of Digital Enterprise Zones is an opportunity to give towns and cities across the UK the tools to fulfil their digital potential. Regardless of whether policymakers agree with – or in some cases, can afford – the specific ideas for Digital Enterprise Zone policies that are outlined in this report, the underlying principles of them remain sound. Test-beds will be needed to understand how to roll-out and adopt advancements in digital technology. Better data and measurement will be needed to fully understand the digital needs of each locality. There should be an ambition to create "Digital Super Towns", which are systematically identifying and fulfilling their digital potential.

The case for Digital Enterprise Zones is made even more appealing given that it can have new ideas applied to it at any point. This is especially important when considering that the UK needs to be prepared for future waves of digital advancement. The UK must embrace the "Gigabit Society", a world where gigabit connectivity can facilitate instantaneous services to homes and businesses, opening the door for better healthcare, better education and increased employment. To make this vision a reality requires a partnership between industry and policymakers – both national and local – of the type discussed in this report.



Introduction – what is digital potential?

Digital technology has fundamentally changed how people live their lives and how the economy functions, and it is now an integral part of the UK's households and workplaces. This report looks at how towns and cities across the UK can identify and fulfil their digital potential, and build upon the many social and economic benefits that digital technology has already brought.

The potential in question is the efficiencies that can be realised, the innovation that can be enabled and the economic activity that can be fostered by digital adoption and use. This is not an abstract concept. It is the employee becoming more adept at using online systems. It is the small business finding new customers by creating a web presence. It is the large manufacturer adopting Internet of Things technology to improve its production processes. It is the pop-up retailer using electronic point-of-sale technology to trade. It is the computer programming graduate designing smartphone apps. The list could go on and on.

Every part of the UK has this digital potential. This report makes a case for how public policy can help the towns and cities of the UK fulfil it – by turning them into Digital Enterprise Zones, which would exist to tailor policy initiatives to meet local digital needs.

It is an idea that is in tune with both national and local policy agendas. The government has published a Digital Strategy, which has an intent to develop the digital economy; it has published an Industrial Strategy, which has an intent to develop skills, upgrade infrastructure and drive growth across the entire country. The devolution of powers to city regions has resulted in "metro mayors" outlining their own digital visions for their parts of the country. Digital Enterprise Zones can support all of this and more, ultimately translating digital potential into productivity gains, stronger economic performance and a more globally competitive UK.

The hope is that, over time, the Digital Enterprise Zone policy framework will create "Digital Super Towns" across the country – places that are systematically identifying and fulfilling their digital potential. In turn, this will help make the vision of a "Gigabit Society" a reality, whereby gigabit connectivity can facilitate instantaneous services to homes and businesses, opening the door for better healthcare, better education and increased employment.

But to maximise the opportunities that Digital Enterprise Zones can bring requires towns and cities to have a better understanding of their digital potential. Despite living in a world where the power of big data is often referenced, gaps in local level data still hamper decisions about where resources should best be allocated. To start a conversation about this, this report presents a methodology for identifying the digital economy, digital skills and digital infrastructure potential of local geographies. This is then used to create a scorecard, categorising key UK towns and cities by the digital potential that they have.

The remainder of this report is set out in the following way:

1. An explanation of and rationale for the idea of Digital Enterprise Zones.
2. A description of how digital potential has been measured in UK towns and cities – and the results of the measurement exercise.
3. A summary of conclusions arising from the analysis and research.
4. Annexes that provide more detail of this report's analysis.

The case for Digital Enterprise Zones

What are Enterprise Zones?

The concept of Enterprise Zones – allowing defined geographic areas new policy tools to support economic activity – is not new. Throughout the 1980s and early 1990s almost 40 areas around the country were designated as Enterprise Zones. The idea was revived under the Coalition Government, with 50 parts of England given Enterprise Zone status since 2012 (the devolved nations have their own versions too).[1]

The choosing of areas for the most recent Enterprise Zones was guided by four principles, all of which were intended to recognise the lessons learned from previous experience. These four principles were:[2]

- A focus on areas of genuine economic opportunity, which would have a knock-on positive effect on the wider economic area.
- Attempting to ensure that the success of an area was viable in the long-term, rather than just via a short-term boost from Enterprise Zone status.
- Ensuring that the design of Enterprise Zones fit with other parts of the local growth agenda, such as the strategies of Local Enterprise Partnerships.
- A focus on creating growth that was genuinely additional, rather than just displacing economic activity that would have occurred anyway.

Beyond these principles, the government did not want to dictate a central model for Enterprise Zones. Instead, local areas were given a menu of options for what they could include; the idea being that each Enterprise Zone could be tailored to local needs. Their design can be described as being variations around three interrelated themes:

1. **Differentiation from national policy** – The main benefits of recent Enterprise Zones have been Business Rate discounts, allowances to incentivise capital investment and simplified planning processes. Other benefits have included the guarantee of superfast broadband availability and access to specialised international trade advice.
2. **Better targeted funding** – Enterprise Zones have been encouraged to make bids for various pots of central government money to support economic development. For example, the Capital Grant Fund and Local Infrastructure Fund paid for road improvements, the refurbishment of buildings and housing developments within Enterprise Zones.
3. **Recognition of sectoral needs** – The last few years have seen the creation of Food Enterprise Zones dedicated to food and agriculture, and University Enterprise Zones to encourage high-tech firms to engage with Universities. Other examples are the Tees Valley Enterprise Zone that has a focus on oil and gas decommissioning and the Lancashire Enterprise Zone set-up to respond to job losses at BAE systems.

Digital Enterprise Zones

Digital Enterprise Zones would be take the concept of Enterprise Zones and apply it to a focus enhancing digital economies, digital skills and digital infrastructure. They would serve two purposes:

- **To create test-beds for the adoption and use of future digital technology.** Whether this is creating supportive local conditions for a full fibre roll out, trials of 5G or innovations in how the Internet of Things can be utilised, Digital Enterprise Zones can be used for understanding how to better identify and fulfil digital potential.
- **To implement digital policy specific to individual towns and cities.** While identifying the specific

digital needs of each town and city is not straightforward, exploring new ways of understanding them to better design policy is important. In turn, this would drive economic growth within those places.

As an idea, and as outlined previously, Digital Enterprise Zones would be in tune with the government's Industrial Strategy and Digital Strategy, and the policy thinking on digital that has already taken place by metro mayors (see box, below).[3]

The digital agendas of metro mayors

While it is clear that there is still plenty to be done in providing detailed policy initiatives, most metro mayors recognise that a plan for digital is needed. The following provide some examples of what is happening:

- Andy Burnham convened a "Digital Summit" within a few months of becoming mayor of **Greater Manchester Combined Authority**. At the Summit, he asked for ideas on how to make Manchester a world-beating digital city, and also announced a £2m pot of funding to enhance digital skills.
- Steve Rotheram, the Mayor of **Liverpool City Region**, has stated that he will lobby Government and network providers for investment to improve broadband speeds and capacity. He has also said that a digital inclusion strategy will be developed for the City Region.
- Within the **North East Combined Authority** area there is a programme of support that is aimed at encouraging the adoption of digital technology within businesses. Work has been underway to try and establish a 5G test-bed within the North East.
- The **Sheffield City Region** has an ambition to increase the number of start-ups in the area. There is a particular focus on knowledge intensive sectors with export potential, of which the digital industries are listed as one.
- **Tees Valley City Region** has created a "Digital Strategy Board". While in its infancy, the Strategy Board will look at setting up a series of working groups to look at topics such as apprenticeships and infrastructure.
- Andy Street, the new Mayor of the **West Midlands**, has a whole digital manifesto to implement. Included within it is the creation of a Digital Skills Institute, speeding up the roll-out of fibre infrastructure and become a world leader in Open Data initiatives.
- The **West Yorkshire Combined Authority** has stated that it intends to: stimulate business appetite to use, develop and invest in digital approaches; nurture digital talent in schools and FE colleges; and, ensure the right infrastructure is in place to digitally enable the economy.

The following provide some ideas for what a Digital Enterprise Zone could offer in order to enhance digital economies, digital skills and digital infrastructure.

Enhancing digital economies

- **Explore how central government data can be used to help towns and cities better understand their digital economies.** Data gathered by central government agencies – such as Companies House or HMRC – may offer insights into a particular locality's digital economy. In turn, this could aid the design and targeting of digital policy. There are plenty of examples of how data has been used by local policymakers to improve the design and targeting of their initiatives; New York is a case in point, having improved its fire safety and environmental protection through the use of data analysis.[4]

- **Trial digital marketing vouchers for SMEs with export potential.** An often referenced barrier to exporting is the different languages and cultures of foreign markets.[5] The Government's export advice suggests that businesses should internationalise their websites by using translation services and by using colours, images and branding that are culturally appropriate.[6] In partnership with UK Trade and Investment, Digital Enterprise Zones could trial a voucher scheme for SMEs to procure services that will improve their digital marketing in selected foreign markets. This would make it easier to break into or expand into these markets.

Enhancing digital skills

- **Trial how to improve the collection of data on digital skills within a particular locality.** As an example of the lack of data available, currently there are no published central Government statistics on the funding and take-up of digital courses within local areas (the best that is available is apprenticeship starts by sector, such as "Information and Communications Technology").[7] Local decision makers should be provided with this data by conducting an audit and collection of digital skills data within a particular Digital Enterprise Zone.
- **Provide financial incentives for the training and retention of digital talent.** Over the years, the government has used numerous models to incentivise employers to up-skill their workforce. One way of doing this within a Digital Enterprise Zone is to explore how existing funding that is raised locally can be used locally. Looking at how Apprenticeship Levy funds can be utilised to do this is an option worth considering.

Enhancing digital infrastructure

- **Incentivise investment in full fibre networks.** Rewarding investment in full fibre gigabit capable networks would encourage genuine competition. Investment in full fibre networks must not be undermined by incumbent providers using investment in existing copper based infrastructure to undermine the investment case for full fibre.
- **Test new approaches to ducts and poles and access to dark fibre in Digital Enterprise Zones to support the roll-out of full-fibre.** The rapid rollout of FTTP networks is greatly helped by the ability to access existing ducts and poles. This is important beyond fixed infrastructure. Full FTTP fibre is crucial for the delivery of widespread mobile internet coverage and capacity – mobile operators' masts need to be connected to fibre networks in order to meet the current and future demand for mobile services.
- **Use rules controlled by local authorities, including planning, traffic management and road closure rules and related access permissions to incentivise network rollout in Digital Enterprise Zones.** Fixed and mobile operators face obstacles getting the necessary planning permissions as well as being able to close roads or repair infrastructure. Reforms to planning, noticing, permits, section 58 notices and traffic management processes could speed up the delivery of infrastructure. In addition, local authorities could specify that all new buildings should be ready to have digital infrastructure put into them, e.g. ducts for fibre.
- **Reduce the burden of Business Rates and give access to public sector land, building and street furniture.** The government has already announced measures to introduce rate relief for new fibre deployment. Digital Enterprise Zones could take this a step further by providing rate relief on all digital infrastructure investments. Alongside this, freeing up access to public sector land and buildings would help with infrastructure provision. In addition to this, street furniture could be made available for network infrastructure equipment.

Measurement matters: data and Digital Enterprise Zones

The need for measurement

Recognising that untapped digital potential could be holding back the UK's economic performance is not new. Numerous think tanks, representative bodies and charities have made the case before, and have all offered ideas for how to help address it. But all of these ideas would have their success hampered by a missing piece of the jigsaw – a lack of available data that can be used to inform policy design, and that can be used to measure the success of policy interventions. Digital Enterprise Zones are not an exception to this.

In recognition of this issue, this report attempts to measure digital potential across the towns and cities of the UK. The methodology used to do this is by no means perfect. Until more data is collected on specific digital metrics at a local level the measurement of digital potential has to include proxy indicators. This is why, as set out in the previous section, the first generation of Digital Enterprise Zones should trial methods of collecting information on local digital economies and digital skills.

The product of this measurement exercise is a scorecard, categorising key towns and cities by how they perform on different measures of digital potential. The geographic focus for the scorecard analysis is the combined authorities of England and the major city regions of the devolved nations. One reason for the focus on urban areas is because some specific applications of digital technology are only available to them (and are already being adopted in some places). An example of this is the development of so-called "Smart Cities", with interesting initiatives already being developed in some of the towns and cities included in this analysis.

The different measures of digital potential are the performance of the digital economy, the digital skills base and the availability and quality of digital infrastructure. These three categories have been chosen for analysis for two reasons. The first is that they are the areas of digital most discussed in the context of public policy (and as a result are all acknowledged in the Government's Digital Strategy). The second is that they can all be measured in some way using publicly available data at a local level.

An overview of the key issues related to each of the three scorecard categories are discussed below, as well as a brief description of the metrics used in the analysis. Although, most of the key issues are well-rehearsed discussions and so are only briefly introduced for context.

A full explanation for why combined authority geographies were chosen is set out in Annex I, and a more detailed methodology for the scorecard is included in Annex II.

Digital economy

The digital economy means different things to different people. Some think of it as the tech start-ups that use technology to disrupt traditional business models. Some think of it as the global companies – such as Microsoft, Google and Apple – that have revolutionised how people consume things like music and information.[8] Some think of it as the digital

technology – ranging from websites to cloud storage – that has changed how businesses conduct everyday commerce.[9] With such a range of perspectives in defining the digital economy, estimates of its size have inevitably varied.[10]

These measurement issues are only likely to become more pronounced given the speed and scale of digital advancement and adoption. With some forecasts suggesting that within the next two decades 90% of all jobs will require some kind of digital skills,[11] it supports the argument to say that the digital economy is fast becoming indistinct from the economy more generally.[12]

The scorecard of digital potential attempts to combine these differing perspectives of the digital economy. As a result, it uses both generic indicators of economic health as well as specific definitions of the digital economy:

- **Generic indicators of economic health** – Measures of both labour productivity and the health of the local labour market are included.
- **The stock of digital businesses** – Two indicators are included that focus on a subset of a local area's business stock. These subsets are based upon previously developed methodologies for measuring the businesses within digital industries and the businesses that require a high proportion of digitally skilled workers to operate.[13]

Digital skills

Like the description of the digital economy above, the topic of digital skills can lack precise definition and clear methods of measurement. Regardless, there is unanimous agreement among policymakers and industry that digital skills are crucial to the future functioning and success of the economy. Indeed, it is a widely held view that digital skills should be taken as seriously as numeracy and literacy in the education system.[14]

There are now a large number of organisations across government, industry and the voluntary sector trying to plug the digital skills gaps. There is a particular focus on those groups in society that it has been established have the greatest need. For example, a variety of research has shown that those in lower socio-economic groups, the elderly, the unemployed and the disabled have lower levels of digital skills.[15]

To represent some of the above considerations, the skills indicators included in the scorecard are:

- **Future digital skills** – While there are many factors that will dictate a particular area's future digital capability, the schools' system is undoubtedly a very important one. One indicator looks specifically at the levels of educational attainment in Maths and English because numeracy and literacy are the foundation of the digital economy.[16] Three other indicators use school performance data as a proxy to represent the quality of their performance in teaching the digital elements of the curriculum.
- **Existing skills deficiencies** – As lower socio-economic groups tend to have a lower levels of basic digital skills, the proportion of an area's population with a social grade of C2, D and E has been used as a proxy for the level of digital skills deficiencies within an area.

These indicators evidently do not cover all aspects of future digital skills potential or the existing skills deficiencies of a population. For example, the indicators cover how digital potential relates to schools but not to universities (see box, overleaf). The omission of these indicators is largely due to a lack of available data at a local level.

The role of universities in developing and exploiting digital potential

Universities contribute to the digital economy by developing the UK's digital skills base. Not only do they produce graduates in disciplines such as computer science, but they offer research and innovation capabilities that can contribute to the advancement of digital technology.

To put this another way, through the creation of human capital and the ability to utilise it, universities are providing digital potential. But it is clear that this potential is not being exploited to its full capacity. The government's Digital Strategy notes that computer science graduates have the highest unemployment rate of any degree course after six months of graduating; its Industrial Strategy notes that the UK has not been as successful at commercialisation and development of ideas as it has been at basic research.

In the context of this report, the combined authority areas that are analysed all have at least one university within their boundaries. The assumption should be that while these universities will be physically based in the big cities, they will benefit the entire geography of the area by producing graduates and offering skills.

The existence of these institutions gives rise to both opportunities and to challenges. As an example of an opportunity, the majority of combined authority and city regions analysed for this report have at least one university that is highly rated for the quality of its computer science degrees; out of a ranking of over 100 universities, Cambridge, Durham, Leeds, Birmingham and Manchester are placed within the Top Ten.[17] As an example of a challenge, some cities struggle to retain the human capital that they have developed through their universities. Warrington (93.08%) and Coventry (90.08%), both of which are included in this analysis, have some of the highest graduate loss rates in the country.[18]

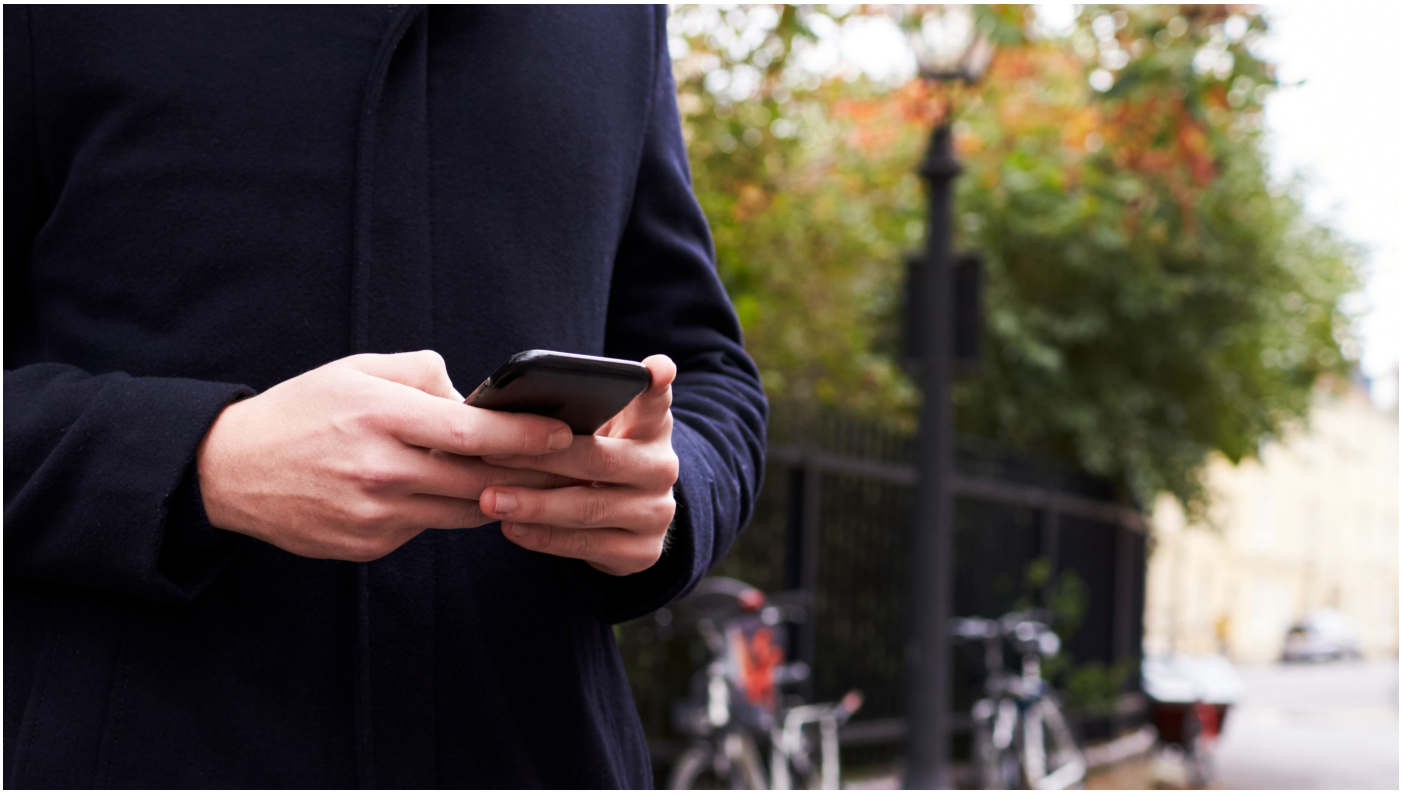
Digital infrastructure

The digital economy and digital skills are underpinned by digital networks. This is why digital infrastructure is regarded by many as being as important as the utilities of water, gas and electric in daily life. In the vast majority of the towns and cities highlighted in this report there have been improvements in digital infrastructure and connectivity over the last few years. For example, Vodafone's 4G network has been rolled out in all of these places.

But improvements need to continue. Just as the current generation of digital infrastructure is being rolled out, there is increasing concern about how to adopt and implement the next generation.[19] Businesses and communities' broadband is often still delivered by a network that uses 20th Century copper legacy infrastructure. We can't depend on networks that still rely on copper as the next wave of technological innovations driven by the internet of things develops further. This is why the idea behind a Gigabit Society is so important - only gigabit fibre networks will ensure the UK can become leaders in 5G and IoT and gain from the resulting economic benefits.

This is true in theory and in practice. As other countries roll out gigabit capable networks, it is becoming evident that there is a corresponding positive impact on economic growth. Recent OECD research on the effect of local full fibre in Sweden shows that a 10% increase in fibre penetration is correlated with 1.1% higher employment and greater business creation. A study by Analysis Group of the United States suggests that communities where gigabit broadband was widely available enjoyed higher GDP, relative to similar communities where gigabit broadband was not widely available.[20]

Unlike the topics of the digital economy and digital skills, there is consistent data available to measure



the quality and coverage of digital infrastructure. The scorecard of digital potential includes a number of variables that reflect a local area's relative strength in the provision of digital infrastructure. A brief description of the indicators is as follows:

- **Mobile infrastructure** – The indicators within this category reflect 4G coverage under different scenarios, which include outdoor and indoor coverage based upon premises and geographic locations as well as the coverage on roads.
- **Broadband infrastructure** – The indicators within this category reflect the percentage of premises that have superfast broadband availability, ultrafast broadband availability and full fibre. Also included are indicators on average upload and average download speeds.

Scorecard results – Pacesetters, Pillars and Prospects

Local economies, skills and infrastructure - the digital potential in the UK's towns and cities

The previous section of the report outlined the rationale for creating a scorecard to measure digital potential – a better understanding of local digital potential will allow the better design of Digital Enterprise Zones. This section presents the results of the scorecard analysis.

The scorecard uses indicators of a local area's digital economy, digital skills and digital infrastructure to represent the different elements of its digital potential. Performance on these indicators is used to rank the towns and cities within local areas by their digital potential. The position of a town or city within the rankings is used to categorise them under one of the following definitions:

Digital Pacesetters

Digital high performers when compared to others within the scorecard.

Digital Pillars

Solid digital performers, but have not yet reached the performance levels of Digital Pacesetters.

Digital Prospects

A digital base on which to build, but have not yet reached the performance levels of Digital Pillars.

It is important to emphasise that for whichever of the above categories a town or city falls into, it will have digital potential that it is possible to translate into future productivity gains. But that is all it is – a possibility. For example, a town or city's school students may be likely to acquire high levels of digital skills; encouraging those students to remain in that town or city after they have finished school – or to return to it after graduating from university – could be a barrier to digital potential being fulfilled.

It is also important to emphasise that because the scorecard is based upon a town or city's performance relative to others, its categorisation as a Pacesetter, Pillar or Prospect could change in the future. For example, if Pillars and Prospects improve their digital performance on the indicators within the scorecard then they could overtake some Pacesetters.

Policymakers should consider these last two examples when interpreting the scorecard results – a town or city's digital potential may not be fulfilled on its own, and there is always more that can be done to fulfil digital potential, regardless of how well a town or city is performing now. The below table presents how the towns and cities included in the analysis are categorised by the Pacesetter, Pillar and Prospect definitions on measures of the Digital Economy, Digital Skills and Digital Infrastructure. A full methodology for how the scorecard can be found in Annex II.

Town	Combined Authority	Economy	Skills	Infrastructure
Altrincham	Greater Manchester	Pacesetter	Pacesetter	Pacesetter
Ashton-Under-Lyne	Greater Manchester	Pillar	Pillar	Pillar
Barnsley	Sheffield City Region	Prospect	Prospect	Prospect
Bath	West of England	Pacesetter	Pacesetter	Prospect
Birmingham	West Midlands	Pacesetter	Pacesetter	Pacesetter
Bolton	Greater Manchester	Prospect	Prospect	Pillar
Bristol	West of England	Pacesetter	Pillar	Pacesetter
Bury	Greater Manchester	Pacesetter	Pacesetter	Pillar
Cambridge	Cambs & Peterboro'	Pacesetter	Pacesetter	Prospect
Cannock	West Midlands	Pillar	Pillar	Prospect
Chesterfield	Sheffield City Region	Prospect	Prospect	Prospect
Coventry	West Midlands	Pacesetter	Pacesetter	Pacesetter
Darlington	Tees Valley	Pillar	Pillar	Pillar
Doncaster	Sheffield City Region	Pillar	Prospect	Prospect
Dudley	West Midlands	Prospect	Prospect	Pacesetter
Durham	North East	Prospect	Pillar	Prospect
Gateshead	North East	Pillar	Pillar	Prospect
Halifax	West Yorkshire	Pacesetter	Pacesetter	Prospect
Hartlepool	Tees Valley	Pillar	Prospect	Pacesetter
Huddersfield	West Yorkshire	Prospect	Pillar	Prospect
Keighley	West Yorkshire	Pillar	Prospect	Pillar
Kirkby	Liverpool City Region	Pacesetter	Prospect	Pacesetter
Leeds	West Yorkshire	Pacesetter	Pillar	Pillar
Liverpool	Liverpool City Region	Pillar	Prospect	Pacesetter
Manchester	Greater Manchester	Pacesetter	Pillar	Pillar
Middlesbrough	Tees Valley	Prospect	Pillar	Pacesetter
Middleton	Greater Manchester	Pillar	Pillar	Pillar
Morley	West Yorkshire	Pacesetter	Pillar	Pillar
Newcastle	North East	Pillar	Pacesetter	Pacesetter
Nuneaton	West Midlands	Prospect	Pacesetter	Pillar
Oldham	Greater Manchester	Prospect	Prospect	Pillar
Peterborough	Cambs & Peterboro'	Pacesetter	Pillar	Pacesetter
Redditch	West Midlands	Prospect	Pacesetter	Pillar
Rotherham	Sheffield City Region	Pillar	Pacesetter	Prospect
Rowley Regis	West Midlands	Pillar	Prospect	Pillar
Salford	Greater Manchester	Pacesetter	Prospect	Pacesetter
Sheffield	Sheffield City Region	Pillar	Pillar	Prospect
Solihull	West Midlands	Pacesetter	Pacesetter	Pacesetter
South Shields	North East	Prospect	Pillar	Pacesetter
Southport	Liverpool City Region	Prospect	Prospect	Pillar
St Helens	Liverpool City Region	Prospect	Prospect	Prospect
Stockport	Greater Manchester	Pillar	Pacesetter	Pacesetter
Stockton-on-Tees	Tees Valley	Prospect	Pillar	Pillar
Sunderland	North East	Pillar	Prospect	Pacesetter
Sutton Coldfield	West Midlands	Pacesetter	Pacesetter	Pillar
Tamworth	West Midlands	Prospect	Pillar	Prospect
Telford	West Midlands	Pillar	Prospect	Prospect
Tynemouth	North East	Pacesetter	Pacesetter	Pillar
Wakefield	West Yorkshire	Pillar	Pacesetter	Pillar
Wallasey	Liverpool City Region	Pacesetter	Pacesetter	Pillar
Walsall	West Midlands	Prospect	Prospect	Pillar
Warrington	Liverpool City Region	Pacesetter	Pacesetter	Pacesetter
Widnes	Liverpool City Region	Pillar	Pillar	Pacesetter
Wigan	Greater Manchester	Pillar	Pillar	Pacesetter
Wolverhampton	West Midlands	Prospect	Prospect	Pacesetter
Worksop	Sheffield City Region	Pillar	Pillar	Prospect
York	West Yorkshire	Pacesetter	Pacesetter	Prospect

The way that the scorecard is constructed means that the major towns and cities of the devolved nations are not directly comparable to those in England, but using some proxies in the analysis does give some basis for comparison. The table below shows the categorisation of four major cities within the devolved nations.

Devolved Nation	City	Economy	Skills	Infrastructure
1. Wales	Cardiff			
2. N. Ireland	Belfast			
3. Scotland	Edinburgh			
4. Scotland	Glasgow			

The combination of digital potential

Measuring the relative digital potential of towns and cities on measures of the digital economy, digital skills and digital infrastructure is a useful exercise. But, ultimately, these three things could not exist without the other. Digital infrastructure is a necessary precondition for a digital economy, which can only grow with the right digital skills.

On this basis, the below table categorises towns and cities by combining their scores across measures of the digital economy, digital skills and digital infrastructure. The definitions of Pacesetters, Pillars and Prospects are the same, but on the basis of a combined score. On individual metrics, Digital Prospects and Digital Pillars may out-perform the Digital Pacesetters, but when comparing their combined economic, skills and infrastructure performance they score less well.

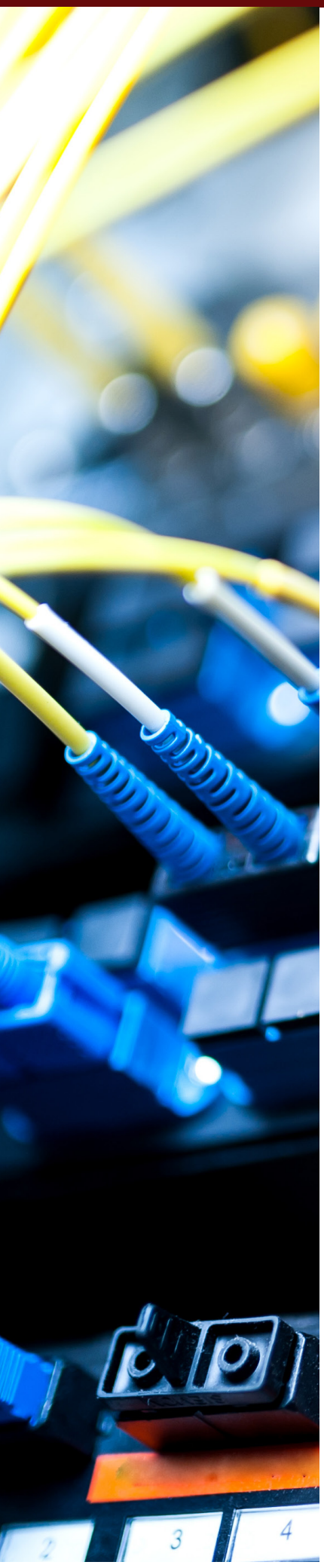
An important thing to note is that the ranking positions within the scorecard are generally only marginal (there is not much separating individual places in the rankings). This means that there is genuine opportunity for a town or city to climb in the rankings. While it would require, for example, Wigan as a Digital Pillar to improve on a number of indicators to match Wakefield as a Pacesetter, it is a genuine possibility that it could do so. If its digital economy were to grow, its education system were to improve and its infrastructure were to offer greater connectivity then the gap in its digital potential would soon close.

Pacesetters	Pillars	Prospects
Altrincham	Ashton-Under-Lyne	Barnsley
Bath	Darlington	Bolton
Birmingham	Gateshead	Cannock
Bristol	Halifax	Chesterfield
Bury	Kirkby	Doncaster
Cambridge	Liverpool	Dudley
Coventry	Middlesborough	Durham
Leeds	Middleton	Hartlepool
Manchester	Nuneaton	Huddersfield
Morley	Redditch	Keighley
Newcastle	Rotherham	Oldham
Peterborough	Rowley Regis	South Shields
Solihull	Salford	Southport
Stockport	Sheffield	St Helens
Sutton Coldfield	Sunderland	Stockton-on-Tees
Tynemouth	Wallasey	Tamworth
Wakefield	Widnes	Telford
Warrington	Wigan	Walsall
York	Wolverhampton	Worksop

To give an example of how individual towns and cities performed in the rankings, the below table outlines the top ten satellite towns and cities within combined authorities.

Top 10 Satellite Towns or Cities for Digital Potential within Combined Authorities

Combined Authority	Local Authority	Town
Greater Manchester	Trafford	Altrincham
North East	North Tyneside	Tynemouth
West Yorkshire	York	York
West Midlands	Solihull	Solihull
West of England	Bath and North East Somerset	Bath
West Midlands	Coventry	Coventry
Liverpool City Region	Warrington	Warrington
West Midlands	Birmingham	Sutton Coldfield
Greater Manchester	Stockport	Stockport
Greater Manchester	Bury	Bury



Conclusion

Untapped digital potential translates into untapped productivity gains. This is not a controversial perspective. Both national and local politicians have long recognised that failing to keep pace with the digital world will act as a drag on the economy. Numerous initiatives and numerous pots of money have previously been directed at trying to make sure that this does not happen.

The central argument of this report is that the creation of Digital Enterprise Zones is an opportunity to give towns and cities across the UK the tools to help fulfil their digital potential. This idea combines three key elements of the government's policy agenda: the Industrial Strategy's desire to develop skills, build infrastructure and drive growth across the UK; the Digital Strategy's intention to make the UK the best place in the world to start and grow a digital business; and, the devolution of powers to local leaders so that they can tailor policy interventions to suit their area.

Regardless of whether policymakers agree with – or in some cases, can afford – the specific ideas for Digital Enterprise Zone policies that are outlined in this report, the underlying principles of them remain sound. Test-beds will be needed to understand how to roll-out and adopt advancements in digital technology. Better data will be needed to fully understand the digital needs of each locality. There should be an ambition to create "Digital Super Towns", which are systematically identifying and fulfilling their digital potential.

Should the idea of Digital Enterprise Zones be adopted, there should be a long-term commitment to them. While there are some "off-the-shelf" policies that can enhance the digital outcomes of towns and cities in the short-term, others will take a lot longer to take effect. For example, digital marketing vouchers could theoretically result in overseas sales quite quickly; upgrading infrastructure after offering incentives may take much longer.

Regardless of how long it takes for interventions to result in the fulfilment of digital potential, the ultimate point is that this fulfilment of digital potential will create additional economic output. How much additional economic output can be created is difficult to judge – digital potential exists in so many interconnected ways that estimating a figure will always be highly illustrative. That does not mean figures cannot be estimated, however. Previous analysis has attempted to quantify by how much the economy would be boosted by businesses growing their digital capabilities – interpreting this result through the combined authority and city region areas included in this analysis suggests a boost to the economy in the tens of billions of pounds.

Whatever the figure, the point is that there are large economic gains to be made from digital adoption and use. Given the fast-paced nature of digital advancement, to maximise these economic gains will require flexibility in digital policy. This makes the idea of Digital Enterprise Zones even more appealing, as it can evolve with new elements added to it at any time. To this end, a follow-up report within the coming year will develop the theme of Digital Enterprise Zones, and look further at how "Digital Super Towns" can become a reality across the UK. The research for this report will include talking to combined authorities about the specific barriers they face in realising digital potential, and how they can be overcome.

Annex I
The towns and cities in the scorecard analysis

In recent years, a number of combined authorities – groups of neighbouring local authorities that are natural economic geographies – have been given new powers by central government. The new powers allow the implementation of bespoke local policy initiatives in areas such as skills and transport. In short, combined authorities have greater autonomy from central government in how they utilise resources and manage public services.[21]

As described in the main body of the report, all combined authorities have plans to realise their digital potential. The towns and cities that sit within the boundaries of combined authorities will play a part in implementing these plans. Because of this identifiable interest in digital, and because they have the ability to set bespoke policy, combined authorities are the focus of the scorecard of digital potential. The major city regions of the devolved nations are also included for comparison.

It is true that combined authority areas make-up a coherent whole, and the digital potential of them could be analysed from this perspective. But this report wanted to highlight the importance of digital potential of satellite towns and cities within combined authority areas as well as the major cities at the heart of city regions. There is a clear reason for doing this. It is often the case that combined authorities or city regions are discussed only in the context of the major city around which they are based. But the smaller urban areas that surround these major cities are an essential part of the story too. They have identities, both socially and economically, that are distinct from the metropolis that they neighbour, but contribute to the prosperity of a region as whole.[22]

The below box lists the combined authority and city region areas that are included in the scorecard analysis. Together, they contribute £323bn to the economy and have a combined population of over 15 million people.[23]

Combined authorities and city regions in the scorecard

- Greater Manchester Combined Authority
- Liverpool City Region
- North East Combined Authority
- Sheffield City Region
- Tees Valley Combined Authority
- West Midlands Combined Authority
- West Yorkshire Combined Authority
- Cambridgeshire and Peterborough
- West of England Combined Authority
- Glasgow City Region
- Edinburgh City Region
- Cardiff Capital Region

There are obviously towns and cities outside of combined authority geography that have digital potential to realise. The hope is that the conclusions and recommendations of this report can be useful to every part of the UK hoping to realise digital potential.

Annex II
Scorecard Methodology

The process for developing the rankings within the scorecard is as follows:

1. A list of desirable indicators under the headings of Digital Economy, Digital Skills and Digital Infrastructure was drawn up, after a review of previous research on the subject and after conversations with those involved with digital productivity.
2. Data for all the identified indicators was collected for all local authority areas where possible (see table, below, for a list of indicators). This data was then taken to create a distribution of performance on each indicator. For example, this could have been putting the employment rates of all local authorities order from highest to lowest. This distribution was then split into quartiles.
3. The relevant local authority data from each combined authority area was then identified. Both constituent and non-constituent local authority members of combined authorities were used in the analysis.[24]
4. Each local authority was assigned a score based upon its position within the distribution. The higher up the distribution the local authority was, the higher the score on the indicator.
5. Following this, towns or cities were identified within each local authority. Only towns or cities with a population of more than 40,000 were included in the analysis – to keep the analysis to a manageable size a cut-off was needed.
6. Following this, where there was more than one town in a local authority with a population of greater than 40,000, post-code level data was used to establish which town had the better digital infrastructure and were included in the rankings (this means that there is only one satellite town or city included in the rankings from any local authority within a combined authority).
7. The towns and cities were ranked according to an average score across indicators. When the combined scores were analysed, indicators were weighted in each category to give them equal billing.
8. The categorisation of Pacesetters, Pillars and Prospects was achieved by ranking each town or city in order of their scores, creating a league table of digital potential. This league table was then split into thirds to assign towns and cities to each category.

Indicators used in each business

Digital Economy	• Labour productivity • Employment • Industries with high levels of digital employment intensity • Digital Business Growth • Digital Business Stock
Digital Skills	• Numeracy and literacy Progress 8 increase • School progress 8 score • Maths and English GCSE • Socio-Economic Group
Digital Infrastructure	• 4G coverage indoor/outdoor premises, geographic and roads. • Superfast Broadband availability • Ultrafast Broadband availability • Full fibre broadband • Average download speed • Average upload speed

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