

Cambridgeshire and Peterborough Digital Connectivity 2021-2025 Business Case

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2 Executive Summary

The Covid-19 pandemic has dramatically accelerated reliance on digital connectivity in almost every aspect of 21st Century living.

At a time when access to healthcare, jobs, education and training have all become highly dependent on digital connectivity, it has also highlighted and exacerbated the “digital divide” excluding those without access to connectivity.

It is increasingly evident that digital connectivity can play an important part in meeting some of the key challenges of our age, from the reduction in transport related emissions to climate change mitigation and the management of scarce resources including water and energy.

The Cambridgeshire and Peterborough Digital Connectivity Infrastructure Strategy 2021-2025 will deliver a future facing, long lasting digital infrastructure that will ensure that digital connectivity is available to all – supporting effective public service delivery, thriving communities and sustainable business growth.

The delivery of the Strategy is a key contributor to the Combined Authority’s sustainable Growth Ambitions for Cambridgeshire and Peterborough including:

- Improving internet access to reduce digital exclusion and health inequalities.
- Using ‘Smart’ technology to support sustainable lifestyles and mitigate climate change.
- Attracting investment in fibre broadband and mobile connectivity infrastructure to strengthen the local economy and create jobs.
- Ensuring businesses have access to leading-edge digital connectivity to help them grow and succeed.

This business case sets out detailed proposals for the delivery of the Digital Connectivity Strategy and seeks approval for the 2022/3-2024/5 funding allocation of £4.5m.

3 Strategic Case

3.1 Context

“In pursuing economic growth, we have a responsibility to ensure that rising prosperity makes life better, healthier and fairer, and does not exhaust the resources our children will need for the future.”

From the Combined Authority’s Growth Ambition Statement November 2021

The Covid-19 pandemic has dramatically accelerated reliance on digital connectivity in almost every aspect of 21st Century living. At a time when access to healthcare, jobs, education and training have all become highly dependent on digital connectivity, it has also highlighted and exacerbated the “digital divide”. It means that families and individuals without access to connectivity are effectively excluded from the benefits of economic growth, health inequalities are exacerbated, and children’s life chances are damaged.

Furthermore, it has become increasingly evident that digital connectivity can play an important part in meeting some of the key challenges of our age, from the reduction in transport related emissions to climate change mitigation and the management of scarce resources including water and energy.

The delivery of the Digital Connectivity Strategy 2021-25 (attached as Appendix A) is a key contributor to the Combined Authority’s sustainable growth ambitions for Cambridgeshire and Peterborough, helping to ensure that a ubiquitous and accessible digital connectivity infrastructure is available to all – supporting effective public service delivery, thriving communities and sustainable business growth.

3.2 Background

The Cambridgeshire and Peterborough area has long had a reputation for the advanced use of technology but has not always had a digital connectivity infrastructure to match. In 2011 when ‘Superfast Broadband’ (24+mbps) coverage issues reached national prominence and became a pressing local concern the area lagged behind the national average with less than 60% coverage.

Over the last decade this deficit has been addressed with an ambitious strategy that has focused not only on broadband connectivity but on mobile coverage, ‘Smart’ technologies and the provision of public access Wifi.

However, as the Digital Connectivity Strategy details, it is necessary to ensure that the Cambridgeshire and Peterborough’s digital connectivity infrastructure continues to expand and develop – encompassing future facing “Gigabit” technology, 5G mobile services and “Smart” technologies to ensure that it meets the needs of residents, businesses and public services for today and tomorrow.

3.3 Aims and Objectives

“Digital connectivity is hugely important for meeting some of the key challenges of our age - from sustainable growth to climate change mitigation and the management of scarce resources including water and energy.

Dr Nik Johnson, Mayor of Cambridgeshire & Peterborough

In November 2021 the Combined Authority’s Housing and Communities Committee approved an updated Digital Connectivity Strategy for the period 2021-2025. The strategy builds on the foundations of the multi-agency Connecting Cambridgeshire Programme, which is hosted by Cambridgeshire County Council and has been primarily led by the Cambridgeshire & Peterborough Combined Authority since 2017.

The key outcomes of the strategy are to ensure that by 2025:

- All businesses have access to the leading-edge digital connectivity needed to help them succeed and to deliver sustainable growth.
- Communities, particularly in rural areas, are digitally connected and able to access education, jobs, health, social care and other public services.
- Digital connectivity supports home working and remote training alongside other agile working practises, which can contribute to reduced commuting, less traffic congestion and more flexible and more inclusive job opportunities.
- ‘Smart’ technology, including ‘Internet of Things’ based connectivity helps to provide ready access to real-time transport information and environmental monitoring, leading to increased use of sustainable transport solutions, reducing private car usage and contributing to a reduction in carbon emissions and meeting climate change targets.
- As a key part of the Oxford-Cambridge Arc, businesses, communities and public services in our area are able to harness digital connectivity and advanced technology to support sustainable growth, good quality of life and a strong local economy with no communities left behind.

Cambridgeshire and Peterborough is a hugely diverse area with a rich mix of cities, market towns and rural areas, which presents both challenges and opportunities in achieving the leading edge digital infrastructure needed for businesses and communities to thrive. Therefore, in addition to a unified digital infrastructure strategy, local digital infrastructure plans will be co-created with constituent authorities, taking into account the geography, opportunities and needs in each locale.

3.4 Strategic Drivers

“The availability of high-quality infrastructure is essential for our lives and work, and our future growth and prosperity...Digital infrastructure allows us to lead modern lives and to do business in the technologies and industries of the future. Providing the right infrastructure in the right places boosts the earning power of our businesses, people and places.”

HM Government's Industrial Strategy: Building a Britain Fit for the Future.

In 2017 the UK Government set out the importance of digital connectivity infrastructure in supporting prosperity, productivity and a competitive modern economy.

In 2019 the incoming Government reinforced its commitment to improving the digital connectivity infrastructure for the UK with more challenging mobile and fixed broadband targets, acknowledging that public funding would be required in some areas in order to ensure they are met and that commercial investment alone will not suffice.

Since then the Covid-19 pandemic has sharpened and accelerated the imperative to develop a world class digital infrastructure and the Department for Digital, Media, Culture and Sport (DCMS) has set targets to improve broadband and mobile coverage, including:

- A minimum of 85% Gigabit Capable infrastructure coverage by 2025
- 95% 4G coverage to UK landmass by end 2025
- A 5G programme to accelerate deployment and maximise the productivity and efficiency benefits to the UK from 5G

The Government's target for a minimum of 85% gigabit-capable coverage for the UK is an average for the country and there is a danger that without a specific focus, as a predominantly rural area, we will no longer be at the leading edge and will not have the ubiquitous forward-facing infrastructure we need for our area to prosper. Therefore it is important to set a target to meet 85% coverage by 2025 and we will be aiming to exceed this if possible.

This coverage target will be met by a combination of coverage provided by commercial operators, investing their own funds to roll out infrastructure in our area, and by coverage provided on a 'gap funded' basis, which uses public funding to supplement market investment for those areas which would otherwise not be commercially viable.

Cambridgeshire and Peterborough is in the initial pilot phase and therefore will be among the first areas in the country to benefit from the Government's [Project Gigabit scheme](#), bringing gigabit speeds to harder to reach areas. This will attract over £40m of Government investment to our area, and support is required from the Connecting Cambridgeshire Programme in order to ensure its success.

The Cambridgeshire and Peterborough Digital Connectivity Strategy 2021-2025 (Appendix A) sets out the gaps and impact of unequal access to digital connectivity and highlights the importance of having the same target for social housing connectivity as for market housing which is key to ensuring that the Combined Authority's ambitions of fairer and more equal access to the benefits of growth are met.

This is even more important given the UK's plans for "copper switch off" which will mean phasing out the existing (analogue) public switched telephone network (PSTN)

from 2026 onwards, having an even greater impact on the digitally and financially excluded.

3.5 Benefits

The Cambridgeshire and Peterborough Digital Connectivity Infrastructure Strategy 2021-2025 will deliver a future facing, long lasting digital infrastructure that will ensure that Cambridgeshire and Peterborough residents and businesses have the access they need to digital connectivity, supporting the Combined Authority sustainable

Growth Ambitions:

Reducing Inequalities

- Communities, particularly in rural areas, are more digitally connected and this, together with reduced digital exclusion will enable more people to access education, jobs, health, social care and other public services.

Health & Skills

- Increased access to digital connectivity, leading to a reduction in health inequalities and better access to jobs, education and public services.

Climate & Nature

- Smart' technology, including 'Internet of Things' based connectivity helps to provide ready access to real-time transport information and environmental monitoring, leading to increased use of sustainable transport solutions, reducing private car usage and contributing to a reduction in carbon emissions and meeting climate change targets.
- Better digital connectivity supports home working and remote training alongside other agile working practises, which can contribute to reduced commuting, less traffic congestion and more flexible and more inclusive job opportunities

Infrastructure

- Better digital connectivity and commercial telecoms investment will deliver additional fibre infrastructure and support a thriving local economy – fibre broadband will bring £315m GVA uplift and 10,000 extra jobs/new entrants to the job market by 2025.

Innovation

- Businesses will have access to the leading-edge digital connectivity needed to help them succeed and to deliver sustainable growth.

3.6 Impact of not proceeding

Without a continuing focus on digital connectivity there is potential for the infrastructure gains of the last decade to be lost.

The impact on equality and inclusivity would undermine the Combined Authority's ability to deliver it's sustainable growth ambition as well as having a negative impact on the area's reputation for innovation and high value growth, which in turn would impact business growth and inward investment.

The current high levels of commercial telecommunications investment in the area would reduce and the success of the Government's Project Gigabit rollout would be in doubt, which would have a further negative impact on digital connectivity.

3.7 Options for delivery

The telecommunications market is complex, heavily regulated and impacted by state subsidy constraints which limit the options in relation to delivery. Commercial delivery backed by private sector investment would be the preferred approach in all cases, and there is evidence of a highly dynamic local market for fibre based fixed broadband offering Gigabit capable coverage. However there will be some, mostly rural, areas which are not commercially viable and left to market delivery would not be covered.

Given the Government's Project Gigabit and Shared Rural Networks Programmes, which will deliver state subsidies where needed, the most effective approach for the Programme is to work collaboratively with Government and telecommunications providers – stimulating investment, facilitating deployment and reducing barriers thereby lowering delivery risk.

In the case of social housing provision and ensuring that fibre ducting is deployed in all infrastructure schemes a more direct leadership approach will be required along with associated funding, to overcome the existing barriers to delivery.

3.8 Risks, Constraints and dependencies

Given the inherent nature and in particular the current state of the telecommunications market, successful delivery of the Digital Connectivity strategy is highly dependent on collaboration between the Connecting Cambridgeshire team, constituent authorities within the Combined Authority, telecommunications providers and Government.

An example of this can be seen in relation to the targets for Gigabit capable infrastructure which will be delivered by investment from telecommunications operators and gap funding from Government, with planning and street works access granted by local authorities. If any one of these contributions fails then coverage targets will not be met and the outcomes will not be achieved.

In addition the ongoing pandemic, with associated supply chain problems and labour shortages could inevitably impact delivery.

There are also some particular factors impacting both the fixed and mobile infrastructure:

Fixed Broadband

Delivery of Project Gigabit in our area within the planned timeframe is dependent on a successful outcome to the procurement process which is being conducted by Government.

In a high growth area such as our even with a contract in place the successful bidder will face stiff competition for access to road space and civils sub-contractors.

Furthermore the highly dynamic local market for fibre deployment which reflects the national picture suggests an inevitable market contraction and consolidation in future

years, which could impact delivery if this occurs during the period of infrastructure build in our area.

One of the key policies (outlined in more detail in the Strategy) includes provision of fibre ducting alongside all new infrastructure schemes. This reduces cost, reduces the disruption of retrofitting and helps to ensure that the area has a future facing infrastructure. However whilst local infrastructure delivery partners, including Cambridgeshire County Council, the Greater Cambridge Partnership and the Combined Authority have adopted this policy, significant infrastructure schemes are also commissioned and delivered by external agencies such as National Highways (eg the A428 upgrade scheme). Whilst the inclusion of fibre ducting in these schemes can be facilitated and encouraged it cannot be mandated.

Mobile

Government and mobile operators are currently engaged in the Shared Rural Network (SRN) programme which is a joint investment to reduce total “not spots” by 1% and increase 4G coverage in England from all four operators from 84% to 90% coverage by 2025. As part of this programme Government has set targets to increase landmass coverage in England to 90% from all four operators by 2025.

As Cambridgeshire and Peterborough has very few “not spots” but more significant issues with capacity and coverage from all four operators, alongside planned 5G deployments, this is creating the need for significant upgrades to existing infrastructure – including new higher and more robust masts which can carry more equipment and locations to deploy “small cells”, typically on street furniture.

State subsidy controls mean that there is no equivalent “gap funding” model that can be used to incentivise mobile operators to deploy infrastructure where there is already coverage from one or more operator. This means that the focus needs to be on collaborative work and cooperation between local district planning teams and mobile providers to create conditions which will enable acceptable and timely deployments of upgraded mobile infrastructure.

Key Risks

In summary key delivery risks include:

- Dependency on external agencies
- Delivery risks – ongoing pandemic, competition in relation to civis and access to road space
- Market risks – dynamic and fractured market likely to see consolidation in the near future

The key risk mitigation approach includes: close working with Government to support Project Gigabit procurement and delivery; extensive and ongoing market engagement; liaison, support and additional resource where required for local authority planning and street works teams.

3.9 Stakeholders

As outlined above, the Connecting Cambridgeshire programme works collaboratively with a wide range of stakeholders across business, government, academia, other public bodies and communities (shown below).

Stakeholder groups	Core representatives
Elected Representatives	County and District Councillors MPs for Cambridgeshire and Peterborough Secretary of State for Digital, Culture, Media and Sport (DCMS) and Minister for Digital
Government, regulatory organisations and local Councils	Department for Digital, Culture, Media and Sport (DCMS) Department for Transport (DfT) Building Digital UK (BDUK) Ofcom ADEPT Group representing local authority digital programmes Greater Cambridge Partnership (GCP) Cambridgeshire County, Cambridge City Council, Peterborough City Council, East Cambridgeshire District Council, Fenland District Council, Huntingdonshire District Council, South Cambridgeshire District Council. Cambridgeshire and Peterborough wide town and parish Councils
Community groups and broadband champions	Connecting Cambridgeshire Broadband Champions network Village Hall Committees, Digital Skills/Library groups, Cambridgeshire ACRE
Universities and academic research	University of Cambridge; Anglia Ruskin University, new Peterborough University, Cambridge Biomedical Campus,
Telecoms suppliers and mobile operators	Cornerstone, MBNL, Vodafone, EE, O2 (Telefonica UK), Three, MLL Telecoms, BT, Openreach, Virgin Media, Air Broadband, Cambridge Fibre Networks, CityFibre, County Broadband, Gigaclear, Netomnia, and others
Tech industry research organisations	Cambridge Wireless, MobileUK, INCA, Thinkbroadband, ISP Review, UK5G
Business Networks, Forums and major local employers	Cambridge Ahead, Cambridge Cleantech, Cambridge Network, Cambridgeshire Chambers of Commerce, Federation of Small Businesses (FSB), Opportunity Peterborough, Country Landowners Association (CLA), National Farmers Union (NFU) Arm, Astra Zeneca, Marshalls, Microsoft, Wellcome Genome Campus and others
Housing Associations and new housing developers	Cambridge Housing Society (CHS), Hundred Housing Society, Bedford Pilgrims Housing Association (BPHA), Metropolitan Thames Valley (MTC) Housing Association, Urban & Civic and others
Health partners	Department of Health, Cambridgeshire and Peterborough Clinical Commissioning Group (CCG), Cambridge University Health Partners (CUHP)
Utility Providers	Anglian Water, UK Power Networks, Network Rail

4 Economic Case

4.1 Economic impact

“Digital infrastructure is central to the future of the UK economy”

Future Telecoms Infrastructure Review DCMS 2018 ¹

The economic impact of digital connectivity for the UK was set out in 2018 by the Government’s *Future Telecoms Infrastructure Review* ¹ and this has been underlined by the Centre for Business Economic Research (CEBR) 2019 (with a 2021 Covid update) ² report into the economic impact of broadband. The research was initially commissioned by Openreach in 2019 and was subsequently updated with a Covid update in April 2021.

Taking the projections from the CEBR in the context of Cambridgeshire and Peterborough it is estimated that by achieving at least 85% Gigabit capable infrastructure by 2025 the area will benefit from a £315m GVA uplift from an increase in productivity and up to 10,000 people in work who would otherwise not be.

The pandemic has sharpened inequalities of access to digital infrastructure across the UK and this is particularly acute in Cambridgeshire and Peterborough where even prior to the Covid-19 pandemic significant existing health inequalities and areas of deprivation were highlighted in the CPIER independent economic review³ in 2018. The Access and Inclusion workstream, with targets to match social housing coverage to market housing provision and increased public access Wi-fi, will help to ensure that the economic and social benefits of improvements to the telecommunications infrastructure are felt across all parts of the area with no communities being left out.

It is readily understood how important digital connectivity is to businesses engaged in knowledge intensive sectors, however as identified in the Cambridgeshire and Peterborough Digital Connectivity Strategy 2021-2025, research from the Lloyds Bank 2021 Consumer Digital Index Study ⁴, shows that manual workers with high or very high digital engagement, earn £421 more per month than their less digitally engaged peers, in the same roles. This highlights the direct economic value to all sectors of the local economy.

4.2 Indicative Economic Costs

The Digital Connectivity Strategy for 2021-2025 incorporates a series of targets which will mostly be delivered through stimulation of the local market, facilitating infrastructure delivery and working in collaboration with Government.

It is estimated that the strategy will help leverage commercial telecommunications infrastructure investment of over £200m, (conservative estimate derived from supplier

¹ Future Infrastructure Telecoms Review <https://www.gov.uk/government/publications/future-telecoms-infrastructure-review>

² CPIER <https://www.cpier.org.uk/final-report/>

³ CEBR Ultrafast Fibre Broadband: A platform for growth Cebr report for Openreach 2021 https://www.openreach.com/content/dam/openreach/openreach-dam-files/images/hidden-pages/full-fibre-impact/Blueprint_online.pdf

⁴ Lloyds Bank 2021 Consumer Digital Index Study <https://www.lloydsbank.com/banking-with-us/whats-happening/consumer-digital-index.html>

announcements, known supplier plans and government fibre delivery cost estimates), in addition to a planned £40m gap funding investment for Project Gigabit from Government into the Cambridgeshire and Peterborough area.

4.3 Cost Benefit Analysis

In leveraging £240m Government and private investment, the Combined Authority's investment will help to deliver a GVA benefit from an increase in productivity of £315m and create 10,000 additional/new entrants to the job market. It will also contribute to the Authority's climate change mitigation approach and to targets to reduce reliance on private cars and reduction in individual journeys as part of the Local Transport and Connectivity Plan.

5 Commercial Case

5.1 Market Engagement

The Connecting Cambridgeshire Programme team regularly engage with telecommunications providers who are delivering both fixed broadband and/or wireless and mobile services and who are active in the area as part of the existing Enabling Digital Delivery (EDD) service as outlined in the Digital Connectivity Strategy (Appendix One). There is ongoing dialogue with these providers to understand their commercial rollout plans for full fibre as well 4G and 5G mobile services.

In addition, as part of the Government's Project Gigabit pilot, the Connecting Cambridgeshire Programme formally undertook the initial formal market engagement (known as OMR – Open Market Review) on behalf of DCMS. This exercise demonstrated how dynamic the current local telecommunications infrastructure market for fixed broadband is and revealed the significant amount of commercial coverage which is planned over the next four years. However, it also highlighted that around 40,000 premises – “the final 10%” across Cambridgeshire and Peterborough – will not gain access to gigabit capable broadband services without public funding. It is the 10% of homes and businesses that will otherwise not be able to access gigabit capable services which will be targeted by the Government's Project Gigabit gap funded rollout contract for Cambridgeshire and Peterborough.

However, engagement with mobile operators has provided a more mixed picture, with mobile operators reporting that Cambridgeshire is considered to be a “difficult” place to deploy upgrades and enhancements to the mobile infrastructure. As set out in Section 3.8 above, whilst mobile operators have investment plans to deploy improved infrastructure and coverage, the local market conditions are more challenging than for fixed broadband.

5.2 State Subsidy Control

Prior to the UK's exit from the European Union in 2020, state aid in relation to telecommunications infrastructure was a highly complex and somewhat contested environment with some high profile UK wide projects halted due to state aid challenges. Typically the accountable body awarding public funding is deemed to

bear responsibility for any breaches of regulations and recipients may be required to repay any inappropriate state subsidies.

Parliament is currently still discussing the replacement regime, via the State Subsidy Control Bill which was introduced by Government in June 2021. Until the Bill is finalised and enacted the UK is following an “equivalence” approach which retains the principles of the EU’s state aid regime.

This significantly constrains the use of public funding to support the telecommunications industry but does allow subsidy where demonstrable market failure is proven. In the mobile environment this pertains to total “not-spots” only and in terms of fixed broadband, where it can be reasonably ascertained that there will be no commercial build within a 3 year period.

Unlike the Superfast Broadband Contracts for which Cambridgeshire County Council was the awarding body, in the case of both the Shared Rural Network (SRN) and Project Gigabit, as Government is the funding body, accountability for state subsidy control lies with Government.

5.3 Procurement Strategy

All procurement activities will be undertaken in compliance with UK Government and Cambridgeshire County Council state subsidy and procurement guidelines and regulations.

In line with the partnership agreement in place, Cambridgeshire County Council will act as the accountable body for any procurement activities in relation to the programme, with the exception of Project Gigabit.

Whilst Connecting Cambridgeshire is supporting the process, Broadband Delivery UK (BDUK), as the Executive Agency of the Department for Media, Culture and Sports (DCMS) retains overall responsibility and will act as the accountable body for the award of the gap funded contract for Lot 5 (Cambridgeshire and Peterborough) which is part of Project Gigabit. Lot 5 includes approximately 40,000 premises in Cambridgeshire and Peterborough and bordering areas of some surrounding counties. Procurement activities are already underway and expected to complete, with contract award during 2022.

6 Financial Case

6.1 Financial Table

The budget for 2021/22 is approved. This business case seeks approval for the budget for 2022-2024.

Funding profile	2022-23	2023-24	2024-25	Total
Broadband	300,000	300,000	630,000	1,230,000
Mobile	370,000	400,000	170,000	940,000
Smart	120,000	110,000	40,000	270,000
Access & Inclusion	160,000	140,000	100,000	400,000
Cross cutting/Programme Delivery	550,000	550,000	560,000	1,660,000
Totals	1,500,000	1,500,000	1,500,000	4,500,000

6.2 Delivery milestones 2022-25

Workstream	Objectives	Milestones 2022-3	Milestones 2023-4	Milestones 2024-5
BROADBAND	Gigabit broadband coverage Fibre ducting in infrastructure schemes	Project Gigabit procurement launch Rural Gigabit Voucher top-up scheme re-launched Ducting in schemes	Project Gigabit delivery starts Ducting in schemes	 Ducting in A428 and other schemes
MOBILE	Continue to identify areas of poor mobile coverage Specialist telecoms planning resource recruited to facilitate improved coverage and 5G Small cell trial deployment Smart street furniture Neutral host network trials	Initial baseline coverage testing Specialist resource recruited Small cell trial deployment Neutral host trial in Peterborough	Targeted coverage testing Specialist planning resource Small cell strategy Smart pole development Neutral host trial in Ely	Final baseline coverage testing Small cell deployments Smart pole exploitation
SMART	Gap analysis of the LoRa network, once initial deployment of gateways has been completed (2021/22) Develop IoT data hub, working with County and District Councils and the GCP Pilots and trials of new technologies	LoRa network Phase 1 roll-out and gap analysis complete LoRa network deployment Phase 2 roll-out IoT data hub development Flood sensor pilot Air quality sensors	LoRa network deployment Phase 2 roll-out IoT data hub development Flood sensor pilot Other sensor pilots	 IoT data hub further development Other sensor pilots

ACCESS & INCLUSION	Identify barriers to social housing connectivity and implement solutions	Workshops and events with suppliers and housing associations	Grant scheme for HAs (legal/property resources)	Grant scheme for HAs (legal/property resources)
		Expand CambWifi locations in Cambridge	CambWifi in village halls/community centres	
	Expand Public Access Wifi availability via CambWifi	Investigate CambWifi delivery in South Cambs main towns		
	Signpost Digital Inclusion activities and opportunities	CambWifi Infrastructure upgrades Membership of the Digital Partnership Signposting	Signposting and liaising with providers Awareness raising	CambWifi Infrastructure upgrades

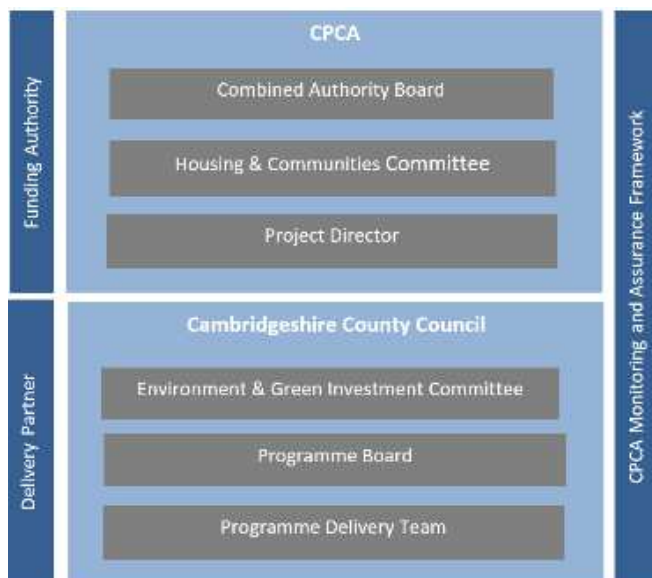
7 Management Case

7.1 Project Management arrangements

CCC will use the existing Connecting Cambridgeshire Governance processes. CCC's experience through delivering its Digital Connectivity Programme since 2011 means that the Council has a well-established assurance framework that includes project options and financial appraisal; consultation and officer and councillor scrutiny prior to sign off and subsequent programme monitoring. The programme will be subject to section 151 officer scrutiny; internal and external audit review; and value for money assessments.

Programme updates, consideration of milestones and risks are reported on a regular basis to the Connecting Cambridgeshire Programme Board, which includes C&PCA representation.

Major risks and budget reviews are reported to the Combined Authority through monthly highlight and financial reports and monthly meetings of the project director and Connecting Cambridgeshire programme director and strategy manager.



Governance

The Connecting Cambridgeshire Deputy Programme Director is responsible for maintaining the Programme Risk Log. Risks will be assessed against the criteria of impact and probability and scored accordingly. Each risk will be assigned an owner who will determine and action a mitigation plan that is reviewed at regular intervals. Formal programme risk reviews every 2 months. Attended by Programme Director, Deputy Programme Director, Strategy & Partnerships Manager and Programme Manager.

Key risks will be discussed at Programme Board meetings and Management Team meetings where appropriate and will be flagged in the CPCA Highlight report. If the risk materialises, the risk owner (in conjunction with the Connecting Cambridgeshire Programme Manager) will try to resolve this in the first instance. If the risk cannot be resolved, it will be referred to the programme board, and/or the CPCA Project Director for further guidance or resolution as appropriate.

7.2 Monitoring and evaluation

Monitoring and evaluation will be undertaken in line with the CPCA Monitoring and Evaluation Framework.

Monitoring and evaluation (M&E) is a critical component of an effective performance management regime. Monitoring supports the effective tracking of a scheme or series of policy interventions ensuring that intended outputs are being achieved. Evaluation quantifies and assesses outcomes, including how schemes were delivered and whether the investment generated had the intended impact and ultimately delivered value for money. M&E forms a significant part of the policy feedback loop to inform future policy development, priorities and budgets

An annual Digital Connectivity report will be produced which will: track and monitor delivery of outputs; benchmark against targets and provide an analysis of the levels of private telecommunications investment across Cambridgeshire and Peterborough

The measurement of impacts, and outcomes, will be included in the overall measurement and monitoring by the CPCA of their plans linked to the LIS and LERS in a range of areas such as GVA growth, Business growth and Market Town health etc.

Performance Management and Financial controls outlined in Appendix B and the programme Logic Model in Appendix C.

APPENDICES

8 Appendix A Digital Connectivity Strategy 2021-2025



Cambridgeshire and Peterborough Digital Connectivity Strategy 2021-2025

In collaboration with:



Foreword



Dr Nik Johnson, Mayor of Cambridgeshire & Peterborough

Digital connectivity is hugely important for meeting some of the key challenges of our age -from sustainable growth to climate change mitigation and the management of scarce resources including water and energy.

I want Cambridgeshire and Peterborough to have a future-facing digital connectivity infrastructure that reflects the ambitions and aspirations of our area, shaped by our core values of compassion, co-operation, community, and tackling climate change.

Reliance on connectivity accelerated in an unprecedented manner during the Covid pandemic and is still incredibly important as we move towards recovery. However, at a time when access to healthcare, education and jobs has become increasingly dependent on digital connectivity it has also highlighted inequality of access and the need for us to show compassion by supporting digital inclusion.

Cambridgeshire and Peterborough is a hugely diverse area with a rich mix of cities, market towns and rural areas, which presents both challenges and opportunities in achieving the leading edge digital infrastructure needed for businesses and communities to thrive. Therefore, it is right that we have a unified digital infrastructure strategy that takes a multi-layered, co-operative approach that is tailored to needs and priorities at a local level.

This updated digital infrastructure strategy builds on the past success of our collaborative work with local councils, government and commercial providers, and sets new challenging targets to help ensure that we remain at the leading edge and well positioned to take full advantage of current and emerging technology advances.

Whilst the delivery of digital connectivity infrastructure involves a complex combination of technology, civil engineering and investment, the overarching objectives of this strategy are about community; connecting people and places and supporting businesses to meet their full potential.

A handwritten signature in black ink, reading 'Dr Nik Johnson'.

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Introduction

The Cambridgeshire and Peterborough area has long had a reputation for the advanced use of technology but has not always had a digital connectivity infrastructure to match. In 2011 when 'Superfast Broadband' (24+mbps) coverage issues reached national prominence and became a pressing local concern the area lagged behind the national average with less than 60% coverage.

Over the last decade this deficit has been addressed with an ambitious strategy that has focused not only on broadband connectivity but on mobile coverage, 'Smart' technologies and the provision of public access Wifi.

This strategy for the period 2021-2025 builds on the foundations of the multi-agency Connecting Cambridgeshire Programme which is hosted by Cambridgeshire County Council and has been primarily led by the Cambridgeshire & Peterborough Combined Authority since 2017.

It incorporates multiple workstreams, targeting the different aspects of digital connectivity from broadband, mobile, 'Smart' technology and public access Wifi to ensure that the Cambridgeshire & Peterborough Combined Authority area has the leading digital connectivity infrastructure required to ensure that:

- All businesses have access to the leading-edge digital connectivity needed to help them succeed and to deliver sustainable growth.
- Communities, particularly in rural areas, are digitally connected and able to access education, jobs, health, social care and other public services.
- Digital connectivity supports home working and remote training alongside other agile working practises, which can contribute to reduced commuting, less traffic congestion and more flexible and more inclusive job opportunities.
- 'Smart' technology, including 'Internet of Things' based connectivity helps to provide ready access to real-time transport information and environmental monitoring, leading to increased use of sustainable transport solutions, reducing private car usage and contributing to a reduction in carbon emissions and meeting climate change targets.
- As a key part of the Oxford-Cambridge Arc, businesses, communities and public services in our area are able to harness digital connectivity and advanced technology to support sustainable growth, good quality of life and a strong local economy with no communities left behind.

Building on success

This strategy builds on Connecting Cambridgeshire's strength in delivering leading-edge digital connectivity, particularly the successful rollout of broadband and public access Wifi. The programme has established a national reputation for collaborative working at the forefront of innovation, which has attracted significant public and private sector funding to invest in future facing digital infrastructure.

Highlights include:

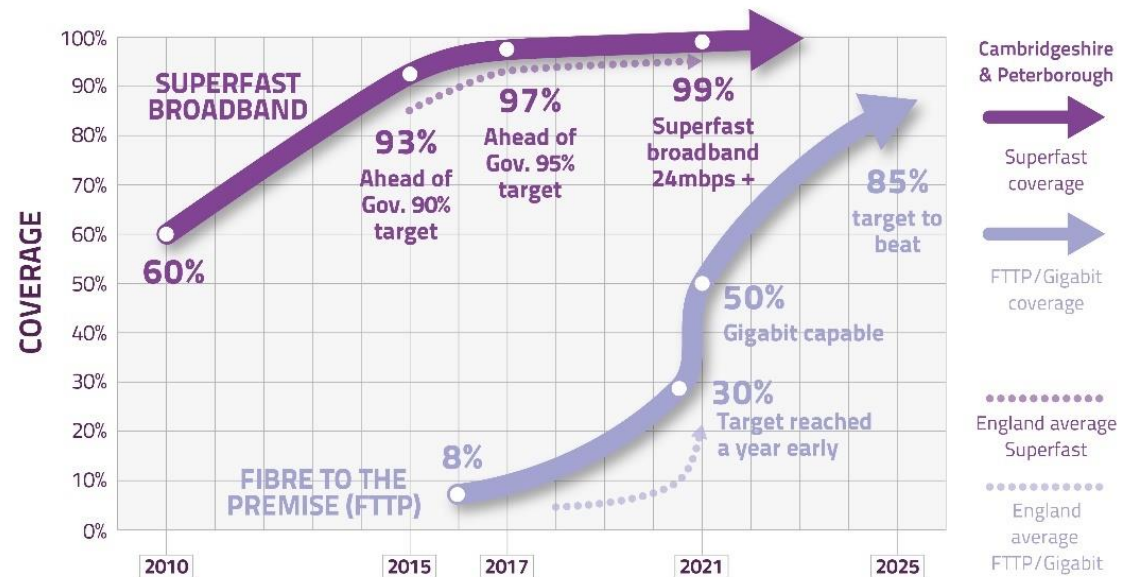
Broadband Rollout

Connecting Cambridgeshire's ambition to improve broadband connectivity for all has meant setting stretch targets to ensure that the programme not only delivers the infrastructure needed, but also keeps pace with evolving technology.

When the Superfast Broadband Programme was first launched in 2012, fewer than 60% of homes and businesses could access superfast broadband. The majority of premises can now upgrade to superfast broadband speeds of at least 24mbps and less than 1% of premises that are harder to reach get below 10mbps.

Both the superfast and the full fibre broadband coverage figures are above the national average and ahead of Government targets.

Full fibre coverage is increasing at pace through a mix of direct intervention and stimulating the market to provide commercial coverage. The full fibre target of 30% by 2022 was reached more than a year early and gigabit capable coverage has climbed rapidly to 50% in 2021.



Broadband champions

Convening a network of 150 broadband champions to work with local communities and business groups to explain and promote the benefits of superfast broadband helped boost take-up of the gap-funded superfast broadband infrastructure to record levels of over 70%.

Community benefit

Residents and businesses in the rural Huntingdonshire village of Spaldwick have experienced the benefits of upgrading from superfast to gigabit broadband speeds since July 2021, following a successful Community Fibre Partnership with Openreach using the Government's Gigabit Broadband Voucher scheme to fund the installation of Fibre to the Premises (FTTP) to the majority of premises.

Broadband Champion Mark Heath said: *"While Fibre-to-the-Cabinet (FTTC) improved speeds over basic broadband, some businesses and families in the village still needed greater speeds and reliability. Fibre-to-the-Premises (FTTP) has transformed the village by giving every single building the opportunity to reliably access ultrafast speeds up to 900 Mbps. Those who have already taken up FTTP are reporting improved reliability and much faster speeds at affordable prices. For example, my next door neighbour is delighted that he has doubled his speeds while saving £3 per month."*

Significant investment

The programme has been successful in attracting several competitive funding streams to improve the digital infrastructure for businesses, communities and public services including over £8m from Government's Rural Development for England (RDPE) and Local Full Fibre Networks (LFFN) programmes to supplement CPCA funding.

As well as supporting the full fibre rollout, this funding has enabled: 117 public sites including council buildings, schools and libraries to be upgraded with full fibre to support gigabit-capable services; the inclusion of fibre ducting in several Cambridgeshire transport infrastructure schemes to avoid costly retrospective installation; and the delivery of public access Wifi across Cambridgeshire market towns at affordable cost by leveraging existing infrastructure.

Free CambWifi

Public access Wifi, is available at over 200 public buildings, village halls and community sites across Cambridgeshire and Peterborough. The secure CambWifi network has recently been expanded to market town and city centres, working in partnership with District and City Councils, to support digital inclusion and Covid recovery initiatives.

Following the rollout of CambWifi across Huntingdonshire market towns, Councillor Ryan Fuller, Executive Leader of Huntingdonshire District Council said: *“Free wifi on our high streets offers opportunities for businesses, previously unable to operate digitally, to diversify their offering. Residents and visitors can now be seamlessly connected online from town to town, just one of the steps we are taking to promote the market town experience.”*

Business impact

Digital Technology Grants

Over 156 SMEs across Cambridgeshire and Peterborough have benefitted from the allocation of more than £1m of Digital Technology Grants funded by the Cambridgeshire & Peterborough Combined Authority leveraging EU money to boost growth and recovery.

Butlers Auto Electrical Ltd used a digital technology grant to buy the latest diagnostic equipment for hybrid and electric vehicles together with a laptop to develop the business’s online presence.

David Butler, Director, said: *“We have been able to future proof the business... which is getting noticed for being able to deliver faster, more accurate results than most garage workshop diagnostic equipment.”*

Digital connectivity has proved vital for business survival and recovery throughout the Covid pandemic. The programme has supported businesses through grant schemes, information and advice enabling SMEs to make the most of digital technology to grow and compete in a rapidly changing market.

Agile working and virtual training

World leading engineering group Marshalls of Cambridge is a traditional engineering company with a large, skilled workforce of over 1,600 people based in Cambridge. The experience of remote working using digital connectivity during the Covid pandemic has helped to develop their future business plans for agile working to support employees, from apprentices to skilled technicians and engineers.

Patrick Wood, Chief Technology Officer, said: *“Before the pandemic we had design engineers using workstations with powerful computer-aided software on-site. Covid 19 has meant we’ve had to adapt to remote working for over half of our employees, invest in our digital capacity and resilience, and modify our office environment to support ‘smart’ working. We’ve also had to be flexible for those who have to be on-site. Feedback has been very positive and it has improved the work/life balance for many of our employees.”*

Enabling Digital Delivery

Connecting Cambridgeshire’s proactive approach to ‘barrier busting’ has been instrumental in speeding up digital delivery for fixed and mobile infrastructure. This has been achieved by working closely with Government’s Barrier Busting Taskforce, telecoms providers, Street Works permitting teams, local authority planners and landowners to identify and resolve challenges ranging from complex wayleaves to planning applications for new mobile masts.

Since 2019, public sector organisations in Cambridgeshire and Peterborough have adopted new policies for the delivery of fibre trunking in all transport infrastructure schemes, which both minimises delivery costs and the disruption of retrofitting fibre infrastructure. As part of this initiative a joint venture, Light Blue Fibre, was set up between the University of Cambridge and Cambridgeshire County Council to develop and make both organisations’ existing extensive duct and fibre networks available on a commercial wholesale basis.

Dig once policy

As part of the 'dig once' policy, fibre ducting has been successfully installed during extensive re-working of a major road junction in Cambridge and will form part of the extensive Kings Dyke road scheme at Whittlesey providing a springboard for the development of fibre infrastructure.

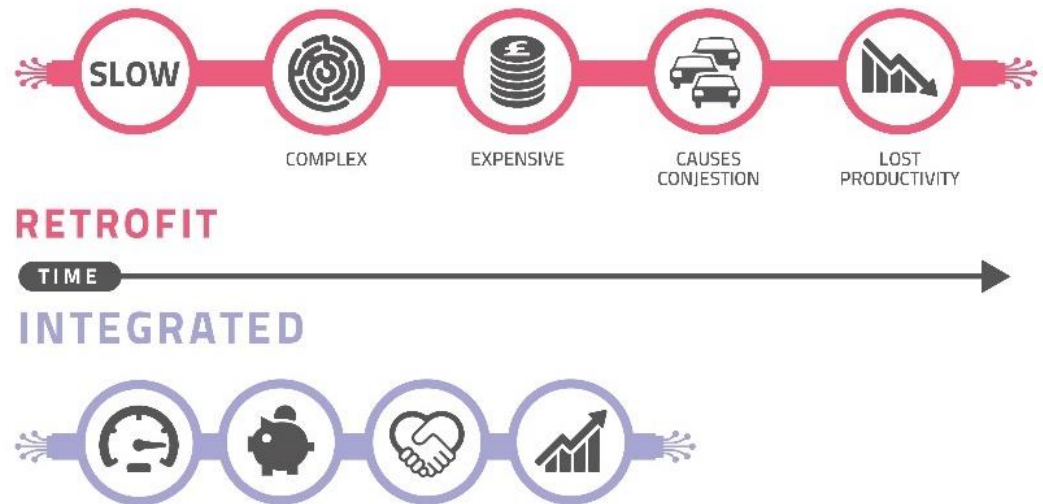


Image: Fibre ducting in transport infrastructure schemes

Mobile

Local surveys mapping mobile coverage have provided more accurate data which has been shared with mobile operators and Ofcom. This has made a significant contribution to understanding of the issues and has resulted in a number of solutions being found to improve coverage, particularly at key train stations, business parks and research campuses.

Improving mobile coverage

Following liaison with mobile operators, coverage has improved at Cambridge Station and work is underway to highlight gaps in coverage on main train lines because of the impact for the economy.

Optimising the range and capacity of mobile coverage at the Wellcome Genome Campus has supported staff and students undertaking internationally significant scientific research.

Smart Innovation

The Connecting Cambridgeshire Programme has developed and delivered the 'Smart Cambridge' programme in partnership with the University of Cambridge for the Greater Cambridge area as part of the Greater Cambridge Partnership Programme over the last five years. A new workstream, sponsored by the Combined Authority was established in 2020/21 to extend elements of the Smart programme to Cambridgeshire market towns.

New technologies are now supporting market towns in their post-Covid recovery plans. Digital totems, and smart panels are being installed to provide useful visitor and journey planning information. Sensor networks are being deployed to collate data on air quality, traffic movements and flooding.

Smart market towns

Digital totems are being installed in Huntingdon town centre to display useful information for residents and visitors about what's on, shopping, and travel options, which will also be accessible via mobile phones.

Pocket SmartPanels have been launched in 11 market towns - providing real time bus and train information via smartphones.

SmartPanels displaying location-specific travel information on large screens are also being deployed in a range of buildings to help people make sustainable transport choices.

Cambridgeshire and Peterborough Digital Connectivity Strategy 2021-2025

Digital connectivity has never been more important for businesses, communities and public services and the key objectives for the future strategy, which builds on the current programme, are set out below. However, each area within the Cambridgeshire & Peterborough Combined Authority is unique with its own challenges and priorities, requiring a local approach to digital infrastructure planning.



Collaborative work with several of the Combined Authority's constituent Local Authorities is already underway to create local digital infrastructure plans, taking into account the geography, opportunities and needs in each locale. The 2021-2025 strategy will further develop this local approach, working with each of the Combined Authority Councils to co-create a dashboard and digital infrastructure plan.

Broadband

Introduction

Although reliance on mobile data continues to increase at a rapid pace, this does not change the need for broadband (or 'fixed' connectivity), which provides connectivity directly as well as underpinning mobile and Wifi solutions. In fact, faster and higher capacity mobile connections have an even greater reliance on fibre connectivity to provide the 'backhaul' between mobile towers and other wireless infrastructure.

Increased home and remote working during the pandemic has significantly impacted the bandwidth requirements for domestic users and key providers saw an immediate 30% increase in data usage by their subscribers in March 2020. However this trend was clear even before the Covid-19 pandemic, as this graph shows.

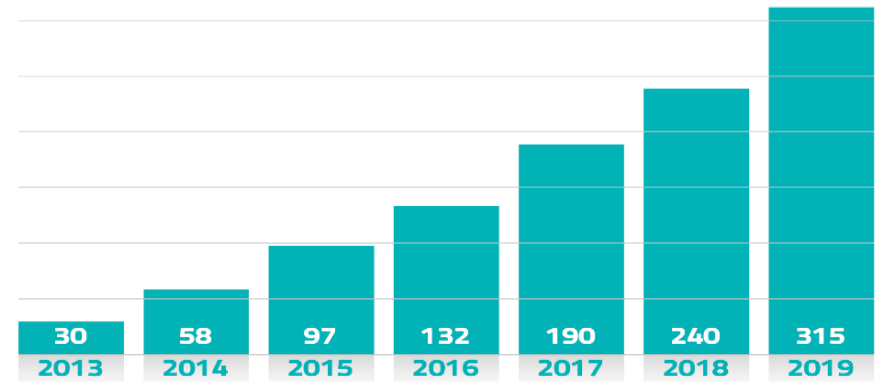
Broadband Infrastructure

Target

Government has a target of 85% gigabit-capable coverage for the UK by 2025, however this is an average for the country and there is a danger that without a specific focus, as a predominantly rural area, we will no longer be at the leading edge and will not have the ubiquitous forward facing infrastructure we need for our area to prosper. Therefore it is important to set a target to meet 85% coverage by 2025 and we will be aiming to exceed this if possible.

MONTHLY BROADBAND DATA USE IS INCREASING EVERY YEAR

Average fixed broadband use per month, gigabytes (GB)



Source: House of Commons Briefing Paper (April 2021): Gigabit-broadband in the UK: Government targets and policy.

This coverage target will be met by a combination of coverage provided by commercial operators, investing their own funds to rollout infrastructure in our area, and by coverage provided on a 'gap funded' basis, which uses public funding to supplement market investment for those areas which would otherwise not be commercially viable.

Our area now has a very dynamic commercial environment with a number of active suppliers planning significant investments in gigabit-capable infrastructure, however the challenges involved in rolling out broadband infrastructure means that the operators need a supportive local environment in order to deliver successfully.

Challenges

The rollout of broadband infrastructure is increasingly complex and there are a number of factors which can make the process time consuming and expensive, increasing the potential for market failure.

- The wide range of challenges includes: obtaining wayleaves and planning permissions from unresponsive landowners; securing Streetworks permits, including road closures; lack of accurate data in relation to the location and condition of some existing infrastructure; and high cost civils causing unpopular disruption to streets and pavements.

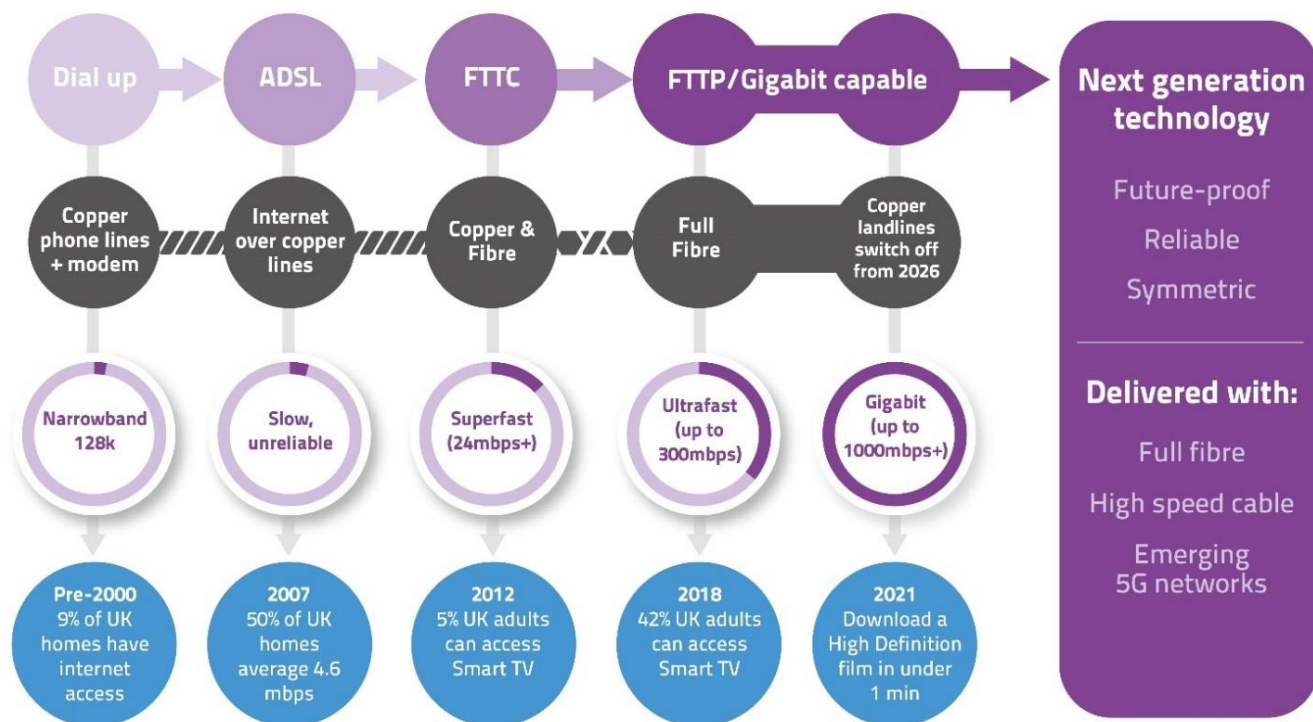
Solutions

Building on existing work, over the next four years we will target exceeding 85% gigabit-capable coverage by:

- Working with commercial providers and continuing to facilitate industry investment. The target to reach over 30% full fibre by 2022 has been met early and gigabit-capable coverage is currently just under 50%. Work with operators to support investment, remove barriers and facilitate coverage will help to ensure planned commercial investment is delivered.
- Working with government to deliver public funded solutions where commercial coverage is not viable – this includes being in the vanguard of the government's new 'Project Gigabit' programme which will attract ~£40m central government investment to the area. This also includes supporting/extending the national Gigabit Broadband Voucher scheme, which provides government funded vouchers, with a local top-up where needed, for homes and businesses that will not be covered by commercial or gap funded schemes.

- Integrating fibre ducting in transport and other infrastructure schemes where it is feasible to do so, including exploring innovative new solutions such as fibre in water infrastructure and making public sector ducting available to operators on a wholesale basis, via the Light Blue Fibre joint-venture with the County Council and the University of Cambridge.

The Evolution of Broadband



Copper switch off

The Public Switched Telephone Network (PSTN) will start to be phased out from 2026 and replaced with digital systems delivered over broadband connections. This will affect all public services, businesses and domestic premises, making people even more reliant on digital connectivity and will require signposting and awareness raising, particularly among those who do not use mobile phones, or cannot access the internet.

Digital Infrastructure resilience and risk

With increased reliance on digital technology comes greater risk of the impacts of system failures, cybersecurity risks and cascade failures in relation to extreme climate events. Telecommunications is one of 13 sectors overseen by Government as part of the Critical National

Infrastructure (<https://www.ncsc.gov.uk/section/private-sector-cni/cni>) . The Programme team will work with local and national stakeholders and suppliers to mitigate and protect against systems failures which might impact on the availability of telecommunications services.

Mobile – 4G and 5G

Introduction

Mobile services are now at the heart of how most people stay in touch and go online. 95% of adults have access to a mobile phone while Ofcom reported that in 2020, the vast majority (85%) of all adults used a smartphone to go online for a wide range of activities, particularly when face-to-face interactions were restricted due to the Covid pandemic.

People of all ages increasingly rely on mobile internet access for socialising, shopping, home working, banking, public service information, news, and entertainment. Mobile internet has also supported a move to digital payments, particularly where businesses are unable to access fixed-line broadband. Mobile connectivity is also an important underpinning technology to the Cambridgeshire & Peterborough Combined Authority's work to improve bus services. To be successful, Demand Responsive Transport and new travel hubs will need travellers to be able to book, track services and understand disruptions to give the best possible customer experience.

5G is the next generation of mobile communications and is required to underpin future connectivity including 'Internet of Things' (IoT) technology.

Challenges

There are several key challenges that are slowing the delivery of mobile infrastructure:

- **Planning** – Planning authorities have seen a marked increase in planning applications to upgrade masts for 4G and 5G from mobile operators and new legislation has revised guidance on permitted infrastructure. The provision of mobile masts continues to divide public opinion and mast upgrade planning submissions are problematic for both planning teams and the infrastructure providers supporting mobile operators. 65% of the 44 planning applications for new mobile phone masts across Cambridgeshire and Peterborough decided between April 2019 and August 2021 were refused - particularly taller structures of 18-20m required to upgrade 4G and deliver 5G coverage.

- Access to Infrastructure – street lighting columns are key structures for ‘small cell’ based deployment of mobile services. As in many other areas of the UK, streetlights in Cambridgeshire are managed under a Private Finance Initiative (PFI) contract with terms which do not allow for the deployment of telecoms equipment and limit opportunities for other uses. Working with the Government’s newly established Digital Connectivity Infrastructure Accelerator (DCIA), offers an opportunity to model a new approach, which includes trialling multi-use

utility poles called 'Smart Poles' hosting a range of functions including electric vehicle charging, environmental sensors, small cells and Wifi as well as micro energy generation systems.

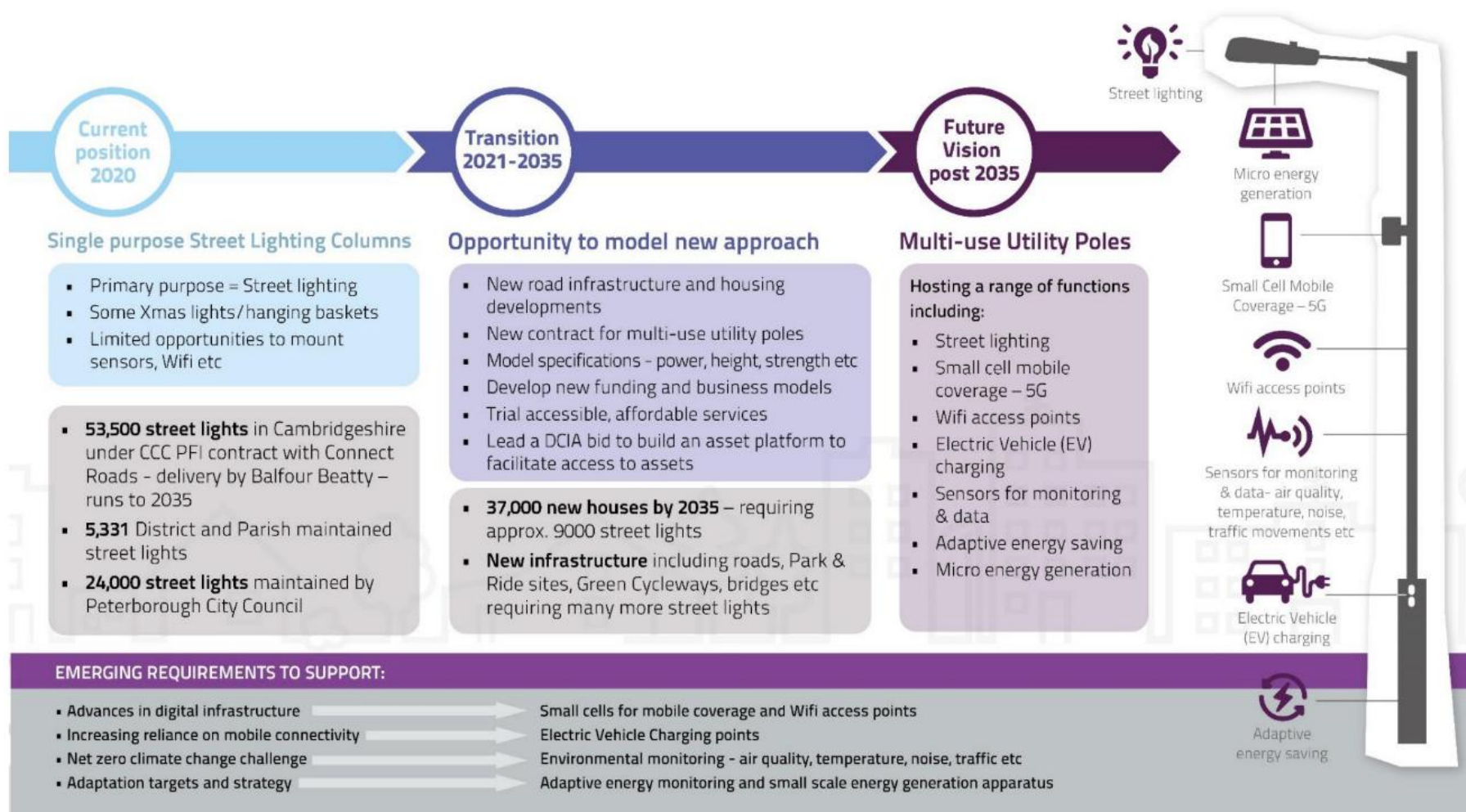


Image: Future Smart Streets

Solutions

The Connecting Cambridgeshire programme is working with planning authorities, mobile operators, leading businesses, and government to improve mobile coverage and capacity to:

- Continue to identify areas of poor mobile coverage affecting businesses and communities and work with stakeholders and operators to find solutions.
- Continue to facilitate mobile infrastructure delivery, supporting operators in deploying masts and equipment to improve connectivity by liaising with key stakeholders.
- Put in place specialist telecommunications planning resource to support operators deploying both 4G and 5G and target increasing successful applications related to new phone masts by 100% over the next two years. The planning resource will ensure that all mobile applications are determined within the statutory limit of 56 days.
- Be at the forefront of innovative use of local authority assets to support the rollout of mobile connectivity by submitting a bid to the Governments Digital Connectivity Accelerator Programme, which is developing online tools to digitalise and, where possible, automate the process of finding and securing rights-of-use of suitable locations.
- Explore opportunities for initial trial deployments of small cells and a longer-term strategy to support access to street furniture.
- Work with Government to develop standards for Smart Poles that will accelerate their development and deployment.
- Collaborate and learn from other leading areas, such as the West Midlands Combined Authority's WM5G unit, to explore barriers to mobile connectivity in greater depth and to trial and test solutions.

5G

Introduction

The Future Communications Challenge Group estimates that if the UK takes full advantage of the opportunities offered by 5G - the next generation of mobile services - the economic impact could be around £164bn (or £2,500 by head of population) by 2030. With a local economy well-placed to take advantage of technology advances, it is imperative that mobile operators are able to deploy 5G in Cambridgeshire and Peterborough as early as possible. However, given the high costs of deployment and the relatively low population density, this area would not naturally achieve ubiquitous coverage very soon. Reducing the barriers to deployment and encouraging rapid 5G infrastructure deployment is therefore extremely important to ensure that this area maintains its leading edge.

Mobile operators are at the beginning of the rollout of 5G, which is more than just faster mobile Internet. 5G will become a vital building block of the wider digital transformation that is taking place throughout society. With 5G peak speeds will reach and exceed 1Gbps with the ability to manage traffic more efficiently than with 4G and network capacity will increase. New techniques including 'network slicing', 'software defined networks' (SDN) and 'virtualisation' will mean that a single network can be 'sliced' into multiple virtual networks that can support different radio access. For example, a network may be partitioned to allow consumer access, secure access to emergency services and to allow Internet of Things (IoT) devices to connect, which can then be controlled via software, allowing the spectrum of radio frequencies to be used differently.

These advances mean that users will be able to enjoy higher and more consistent average speeds. Even in crowded scenarios or in areas with less-than-ideal coverage, 'real-time' applications will become possible and more devices will be able to connect to a 5G cell site - supporting the expected explosion in the number of devices as part of the IoT.

Agritech

Agricultural IoT devices will allow farmers to better measure crop health: using sensors to monitor moisture, fertilization and nutrition levels and report on current/predicted weather patterns to allow for improved crop management. This will mean agriculture can become more productive and more sustainable, with benefits such as a reduction in the amount of water needed to grow crops.

Consequently, 5G will unlock a number of technology developments including: the provision of high-speed broadband to properties using mobile networks particularly in areas where it is hard to deploy fibre; delivering telehealth care into people's homes using high definition video and Artificial Intelligence (AI); and Agritech technologies and mass-sensing of infrastructure, for improved industrial processes.

Challenges

To deliver increased speeds and capacity, mobile operators will need to deploy a network of small cells which will be located on-street. Issues include:

- Access to infrastructure to deploy small cells, lighting columns are the ideal location to deploy small cells and issues with the PFI contractual arrangements will slow the deployment of 5G.
- Additional 'street clutter' and capacity on street lighting columns could be a problem if all four main mobile network operators attempt to deploy small cells in similar locations. Potential solutions include greater infrastructure sharing and the deployment of a 'neutral host model'.
- Roll out of 5G into areas such as market towns, villages and rural areas is not currently a priority for mobile operators. A study has been recently commissioned to understand more about the challenges and opportunities to accelerate 5G deployment in market towns and rural areas, and the analysis will be used to inform future planning.

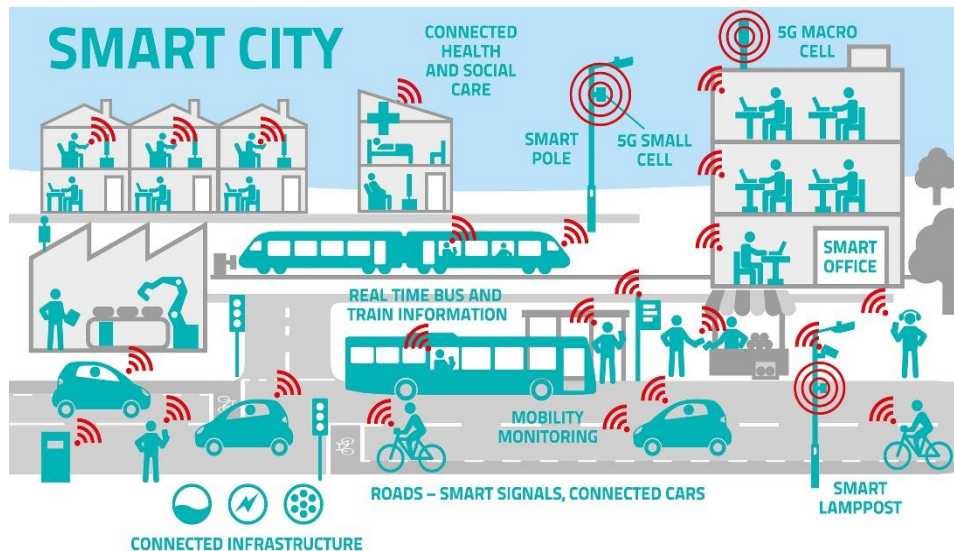
Solutions

- Work with operators to support the initial deployments of 5G ready infrastructure including small cells, which will result in the first 5G deployments in Cambridge and Peterborough.
- Work with business and campuses to support the deployment of private 5G networks (deployed for the use of private companies or developments) and identify opportunities for private networks to support public connectivity through network slicing.
- Develop an approach to support a passive neutral host model while working with operators to understand how an active neutral host model could support 5G connectivity.
- Work with operators and industry to submit bids for Government funding through the Department for Digital, Culture, Media and Sport (DCMS) to fund the trialling of 5G technologies specifically small cells which will support the development of a deployment model and use cases.
- Work with Government on reducing the barriers to the deployment of 5G services.

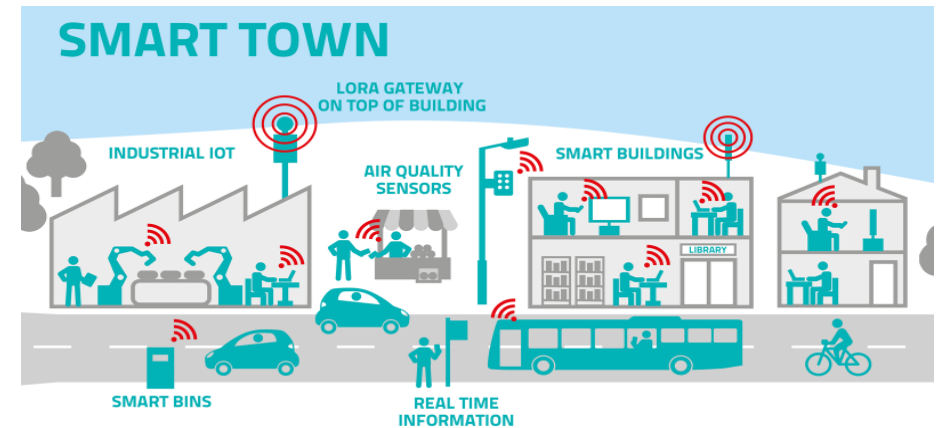
Smart

Introduction

Advanced data techniques, sensor technology and digital connectivity are creating opportunities to support the sustainable growth of local economies, create better places and to help address some of significant challenges of our time, such as moving towards net zero, climate change mitigation and adaptation and the reduction in transport congestion and air pollution.

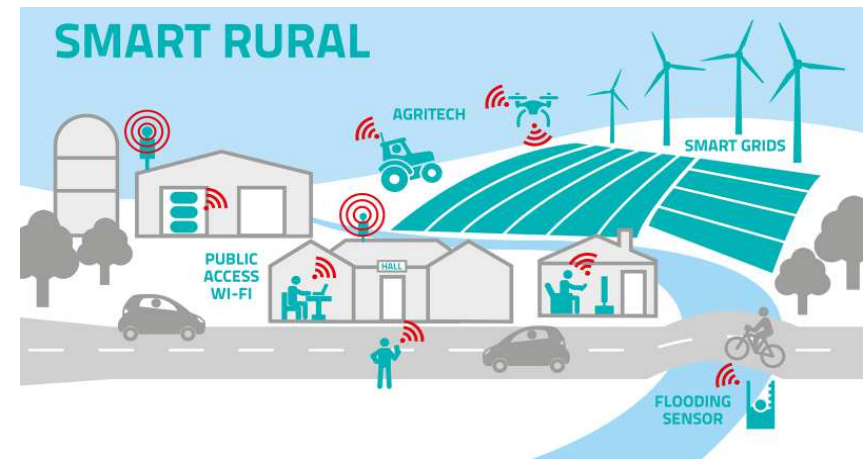


These infographics illustrate the range of opportunities for smart technology and digital connectivity to enhance how we live and work in our cities, towns and rural areas.



IoT – Internet of Things - where things such as sensors, devices and cars are connected to the internet.

LoRA – a low powered communication network for sensors.



Data collected from sensors can help in addressing these issues, for example:

- Health and Social care - supporting in-home care by sensing whether someone has fallen, is using their cooker and kettle, or has left their home.
- Water Consumption - monitoring of water usage and flooding, allowing better management regimes to lower water consumption and give better warning of flooding events. Low-cost IoT-based networks such as LoRa can support the deployment of flood sensors which are inexpensive to install and maintain due to their long battery life. The sensors can measure the level of water in streams and culverts giving an early warning alert and even averting flooding.
- Air Pollution - air quality sensors can measure pollution, informing policies to reduce the impact on residents' health.
- Better real-time travel information can help residents make more sustainable journeys.
- Smart Energy Grids Data underpins advances in the way energy is managed through smart grids.
- Monitoring of new developments - sensors can be used by planners and developers to understand the impact new developments are having on infrastructure such as water and power, traffic movements and the impact on air quality, for the site and surrounding communities.

Challenges

To be able to begin to collect and exploit data to address these challenges there needs to be in place:

- Connectivity – Making sure sensors can connect via local low power wide area networks (LPWAN). Because these networks are low power, batteries can last for up to 10 years and the networks cover large areas. LoRa networks have already been deployed in Cambridge, Ely, South Cambridgeshire and St Neots and work with district council partners is underway to extend the networks to Soham, Huntingdon, St Ives and Ramsey.
- Data Platform – A means to collect data into one place, making the sharing and re-use of data easy as well as making it available to be fed into tools which support the modelling and visualisation of data to draw intelligence and insight from it.

Solutions

- Once initial deployment of gateways has been completed (2021/22), a gap analysis of the network will be undertaken and additional gateways deployed as needed to ensure complete coverage.
- Working with the District Councils, County Council and the GCP, a data hub will be developed that allows data sharing between public sector organisations and with businesses and communities.
- Collaborating with partners on pilots and trials of new technologies including deployment of air quality sensors, water level and flooding sensors as well as a investigation of use cases driven by the needs of the District and Town Councils.
- Assisting the inclusion of future proof digital connectivity infrastructure in the Local Plan, with consideration of how emerging technologies may support sustainable developments. Providing input to the NE Cambridge Area Action Plan (AAP) process, and supporting the development of other AAP documents, to incorporate Future Mobility, Advanced Connectivity and Environmental Monitoring.
- Collaborating with infrastructure delivery, utility and housing organisations to exploit advanced connectivity, including Anglian Water, UK Power Networks, , Network Rail and Highways England.
- Working with the Greater Cambridge Partnership to deliver its Smart Workstream, which will support more sustainable travel, create more sustainable developments and support work in addressing climate change.

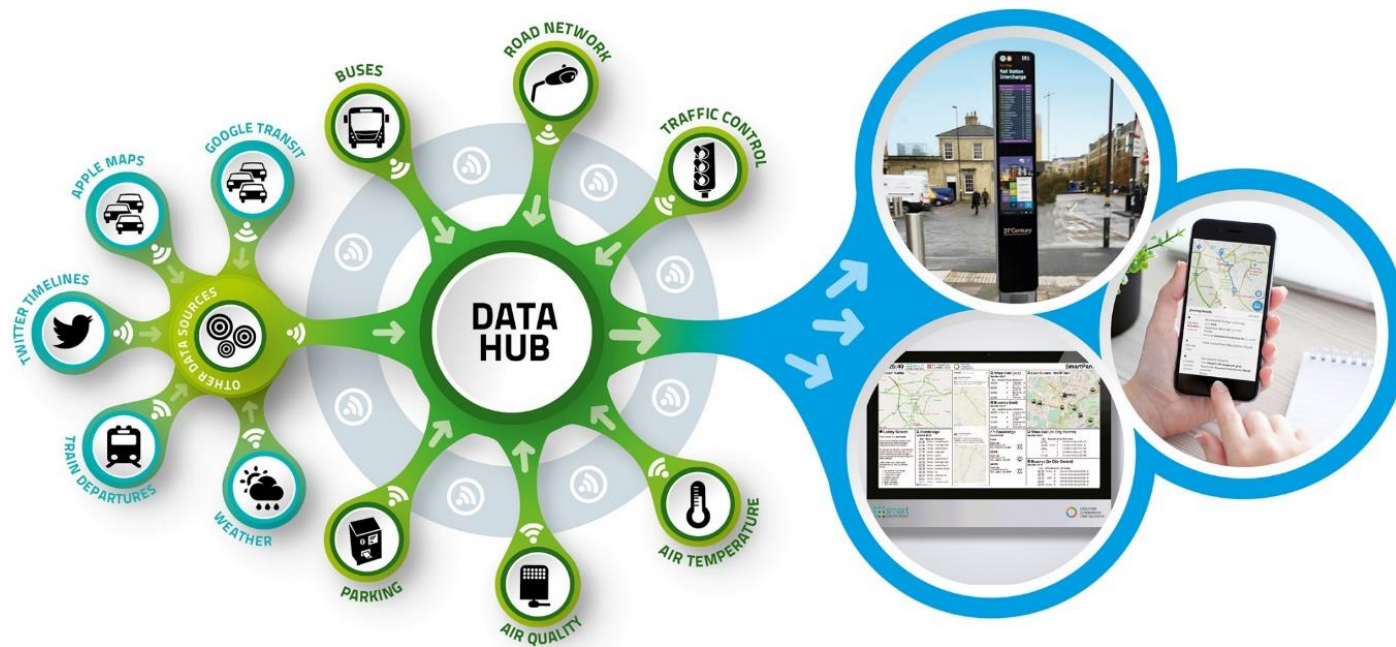


Image: Real world applications using data collated through the digital platform

Flooding resilience

The LoRa network and the increasing availability of other types of low powered networks will make it increasingly simple to deploy sensors that measure water levels and flow. An application could show waterway segments, allowing thresholds to be set on each sensor for high, normal and low water levels. Alerts can then be set that warn of problems such as blocked culverts and drainage ditches or give early warning of flooding. This information can then be passed on to the County Council's Flood Risk team, or other responsible bodies, to ensure that early interventions are made. Residents could also receive an early warning of potential flooding giving them more time to prepare and helping communities to become more resilient.

Access and Inclusion

Introduction

Many more people are now connected to the Internet as a direct result of the challenges of Covid-19, however whilst simultaneously accelerating our reliance on connectivity, the pandemic has also sharpened and exacerbated the digital divide in the UK.

Whilst the reasons for digital exclusion are multi-layered, research from Dr Gemma Burgess at the Cambridge Centre for Housing and Planning Research highlights that access to digital connectivity is one of the key issues.

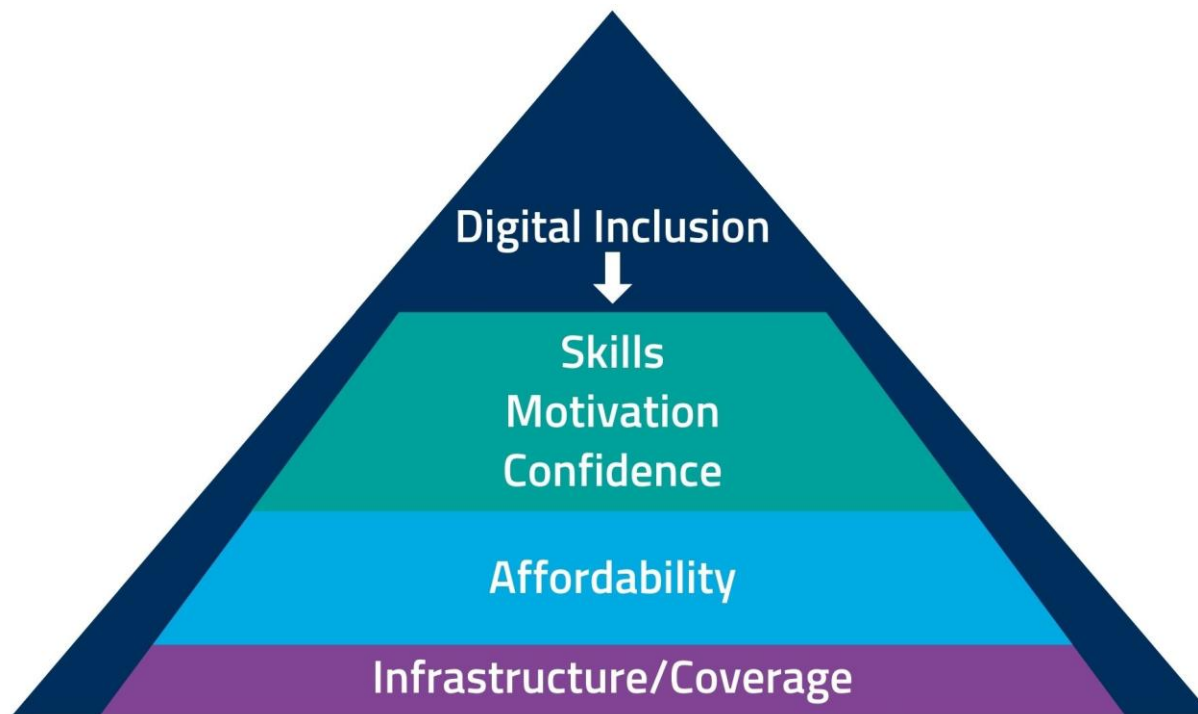


Image: Factors influencing digital inclusion

***“Pay the Wifi or feed the children”
Coronavirus has intensified the UK’s
digital divide... What we are seeing is an
increasing divide between those who have
access to information and
communications technology and those
who do not, giving rise to inequalities in
access to opportunities, knowledge,
services and goods....***

This point is emphasised by the Lloyds Bank 2021 Consumer Digital Index Study, whose research shows that manual workers with high or very high digital engagement, earn £421 more per month than their less digitally engaged peers, in the same roles.

Whilst addressing the full range of issues which impact on digital inclusion – motivation, skills, confidence and affordability – is beyond the scope of the digital infrastructure strategy, supporting increased access to digital connectivity is a key part of the picture and this strategy focuses on two specific aspects: public access Wifi provision and digital connectivity infrastructure for social housing residents.

Public Access Wifi

Free to use public access Wifi can be an important factor in helping to ensure that as many people as possible have access to digital connectivity as well as supporting struggling high streets as part of the economic recovery from the Covid pandemic.

In recent years the Connecting Cambridgeshire programme has enabled the roll-out of the single-sign-on ‘CambWifi’ service which provides free to use, seamless Wifi connectivity in hundreds of locations across the area, including cities, market towns and rural village halls in both indoor and outdoor places.

In Peterborough the newly installed public access Wifi service will play a key part in supporting the vibrant nature of the revitalised City Centre, encouraging a wider demographic and increased dwell time. Additionally, some of the most rural village halls now have access to CambWifi, enabling a range of community activities supporting community cohesion and greater well-being, and in Huntingdonshire CambWifi will provide connectivity to support service delivery to residents of the Oxmoor Estate.

Targets

Moving forward the focus for public access Wifi will be to:

- Investigate opportunities and funding to further expand the CambWifi services into more locations across Cambridgeshire and Peterborough.
- Consolidate existing public access Wifi services by broadcasting CambWifi in as many locations as possible.
- Publicise logon information and the locations where CambWifi is available to ensure that as many people as possible benefit from the service.

Social Housing Broadband Infrastructure Access

It is estimated that out of the 11m people in the UK without access to the Internet, 37% live in social housing and anecdotally it's clear that reliable access to the Internet amongst social housing tenants across Cambridgeshire and Peterborough is far lower than in market housing. Although affordability is a factor, initial research amongst local Registered Social Landlords (RSLs), telecommunications providers and Council Housing Teams highlights that the commercial provision of broadband infrastructure is poor, which means connectivity options are limited. There appear to be multiple reasons why commercial broadband infrastructure coverage is lower than in market housing, including: wayleaves and access; complex ownership models; legacy gaps in infrastructure and the capacity of housing associations to engage in the technical and legal steps required. Meanwhile telecommunications providers find it difficult to find an appropriate point of contact within RSLs and Government-funded connectivity vouchers are oriented towards owner occupiers rather than tenants.

Some local Councils which operate their own housing stock have been able to address this issue for their properties. For example, Cambridge City Council has recently devised and implemented a standard 'bulk' wayleaves scheme for their properties, which has resulted in a marked increase in access to full fibre provision for tenants. However, only a small proportion of social housing across Cambridgeshire and Peterborough is overseen directly by local Councils and therefore a wider approach is needed to resolve the current issues.

Solutions

- Explore the issues that affect digital connectivity for social housing and develop approaches to resolve these issues.
- Make more public access Wifi available via CambWifi: seek further funding streams and look to extend and expand current provision, working with local District and City Councils.
- Continue to liaise with partners and key stakeholders to signpost digital inclusion activities to support access to jobs, health and education.

Targets

- Improving gigabit-capable broadband coverage for social housing, matching the 85% target for market housing by 2025.
- Develop and agree policy for all new homes commissioned by the Combined Authority from 2022 to include gigabit-capable broadband provision.

Glossary

A comprehensive [glossary of digital connectivity infrastructure terms](#) can be viewed as a pdf on the Connecting Cambridgeshire website.

Useful links

Broadband

House of Commons Briefing Paper (April 2021): [Gigabit-broadband in the UK: Government targets and policy](#)

Openreach re.Covid impact <https://www.fiercetelecom.com/telecom/openvault-covid-19-pandemic-drives-51-spike-broadband-traffic-2020>

Copper Switch off <https://www.openreach.co.uk/cpportal/products/product-withdrawal/wlr-withdrawal>

Mobile

Ofcom [Adult's Media Use and Attitudes report 2020/21 \(ofcom.org.uk\)](#)

5G [Microsoft Word - 5G Literature Review - final report 05062018c.DOCX \(publishing.service.gov.uk\)](#)

Smart

[Connected Nations Spring Update 2021 \(ofcom.org.uk\)](#)

Housing data <https://cambridgeshireinsight.org.uk/housing/>

Access and Inclusion

Dr Gemma Burgess, Cambridge Centre for Housing and Planning Research, University of Cambridge

<https://www.cam.ac.uk/stories/digitaldivide>

Lloyds Bank 2021 Consumer Digital Index Study <https://www.lloydsbank.com/banking-with-us/whats-happening/consumer-digital-index.html>

Good Things Foundation <https://www.goodthingsfoundation.org/the-digital-divide/>

Contact

For further information, email Connecting Cambridgeshire team at connectingcambridgeshire@cambridgeshire.gov.uk or call 01223 703293.

9 Appendix B Performance Management and Financial Control

[illegible]

Stage	Requirements	Monitoring activity	Owner	Reports to Frequency
	<ul style="list-style-type: none"> Exceed 85% gigabit capable coverage across Cambridgeshire & Peterborough by 2025 Increase successful new mobile mast applications by 100% by 2023 and develop a 5g strategy to underpin leading edge digital connectivity Support advanced connectivity with IoT gateways and pilot new technologies including air quality and flooding sensors Improving connectivity for social housing residents matching the 85% gigabit capable target Expand access to free public Wifi <p>Across the CPCA area against national data. Review to also include comparative data for nearby areas.</p> <p>Note: CCC has in place:</p> <ul style="list-style-type: none"> Contract management procedures Budgetary control systems Governance arrangements – progress reporting: <ul style="list-style-type: none"> On an ‘exception’ basis, that is, regarding significant slippage, variations in cost and time. 			<p>Annually</p> <p>To CPCA H&C committee and board as appropriate – agreed with the Project Director</p>
Post Contract	<p><u>Outcomes</u></p> <p>Targets and Outputs</p> <ul style="list-style-type: none"> Has the project succeeded in achieving the expected targets and outputs? <p>Broader economic outcomes.</p>	Tracking and confirmation of performance	CCC Connecting Cambridgeshire Programme Director	<p><i>Final Connectivity Review</i></p> <p>Connecting Cambridgeshire Programme Board CPCA H&C Committee CPCA Board</p>

Stage	Requirements	Monitoring activity	Owner	Reports to Frequency
	<p>Attribution of GVA impact will be analysed in line with the overall CPCA evaluation framework.</p> <p>In the meantime, proxy attribution will be developed by tracking the private financial investment across the county combined with fibre and mobile coverage statistics using the current available research measures as outlined in the business case.</p> <p>Lessons learnt and data generated in evaluation to inform future policy.</p> <p>Indirect outcomes include:</p> <ul style="list-style-type: none"> • Improved business connectivity • Improved digital inclusion • Better local data available as an evidence base for technology trials and policy decisions • Greater use of sustainable transport modes contributing to reduced carbon emissions and meeting climate change targets • improved services and operational savings via the trial & selection of optimal technology <p>It is recommended that a final post-completion review is commissioned within approximately 12 months of programme completion. To include an economic and social impact assessment including a range of qualitative and quantitative measures.</p>	Evaluation of economic impact	CPCA Monitoring and Evaluation team	<p>Post completion review and economic impact assessment</p> <p>CPCA Board</p>

10 Appendix C Logic model

