2024

Nottinghamshire County Council

Digital Connectivity Framework

Nottinghamshire County Council

Nottinghamshire County Council's

Digital Connectivity Framework

This framework has been created for:

- Our Communities and Residents
- Local Businesses
- Network Providers
- The Public Sector and Partners

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Foreword

Cllr Keith Girling

Our Digital Connectivity Framework reflects a fundamental recognition that decent, reliable, high-speed internet access is no longer just a 'nice to have' convenience. It has become a necessity for anyone who wants to learn, work, shop, be entertained, or conduct business.

The Coronavirus pandemic triggered a rapid growth in the application of internet technologies to many areas of everyday life, as the need for face-to-face interactions was reassessed. We are facing a present and future where use of the internet goes far beyond browsing and social media. Connectivity is essential for remote data capture and, when coupled with Artificial Intelligence, can process huge volumes of complex data.

The number of internet-connected devices and services continues to grow massively. Hence, we see developments such as virtual wards and remote monitoring in healthcare, online banking and financial services, all of which demand high quality and reliable internet connectivity.

Because the internet now touches so many aspects of our lives, life can become challenging for those who, because of poor connectivity at their location, or unaffordable cost of getting online, or their lack of basic digital skills, are stranded on the wrong side of the 'Digital Divide'. These issues must be addressed if the County Council's ambition to make Nottinghamshire a place where people love to live, work, and visit is to be delivered.

A collaborative effort will be essential to bridge the digital divide to release the economic and personal potential it can otherwise constrain. That is why we have consulted widely during the development of our Digital Connectivity Framework, and in doing so, the document has become a focus for ideas and relationship building with a variety of interested parties in the public and private sector, bringing together Nottinghamshire Districts and Boroughs, telecoms network providers, County Council colleagues, trade bodies and charities working in this field.

Our Framework needs to be agile enough to adapt to potential changes in communications technologies and their use, while at the same time delivering progress towards sustainability goals.

It is important to state that this Framework does not mark the starting position of our connectivity journey. It continues to build upon the strong infrastructure foundation that the County Council and others have established in Nottinghamshire. As a catalyst and call to action, the Framework aims to capitalise on the combined strengths of the Council and our partners to deliver our ambition for a connected future, one in which no resident or business is left behind.

Introduction

Why Nottinghamshire Needs a Digital Connectivity Framework

At a national level the Government has committed to build the country 'a world-class digital infrastructure'[1]. This includes rolling out nationwide, full fibre broadband coverage by 2033 and increasing the geographic mobile coverage to 95% of the UK, addressing the digital divide across the nation. Despite these commitments and ambitions, the job to connect everyone is far from complete.

Against the background of this national drive to improve connectivity, the role of Nottinghamshire County Council is to:

- Advocate and lobby for improved connectivity on behalf of Nottinghamshire communities and businesses, public and voluntary sectors.
- Act as a local leader, enabler, facilitator, influencer, accountable body, investor, partner, supporter, collaborator and advisor around a shared, inclusive and well communicated vision and plan.
- Use our assets and collaborate with our strategic operating partners to trial, develop and deliver digital connectivity projects. The lessons learnt from these initiatives can then be rolled out across the county.

In today's fast-paced world, robust digital connectivity is essential for our county's growth and resilience. By investing in comprehensive digital infrastructure, we can enhance our own public services, boost local businesses, and bridge the digital divide in our communities.

Imagine seamless online access to education, healthcare, and local government services, empowering every person to thrive. Let's champion a digitally connected future, fostering innovation and ensuring that no one is left behind. Together, we can transform our local authority into a model of modern connectivity.

Delivering the Nottinghamshire Plan

Nottinghamshire County Council has committed to an ambitious 10-year vision in The Nottinghamshire Plan 2021-2031, striving for a Healthy, Prosperous, and Green county. This comprehensive plan prioritises[2]:

- Improving health and wellbeing in all our communities
- Growing our economy and improving living standards
- Reducing the county's impact on the environment
- Helping everyone access the best of Nottinghamshire

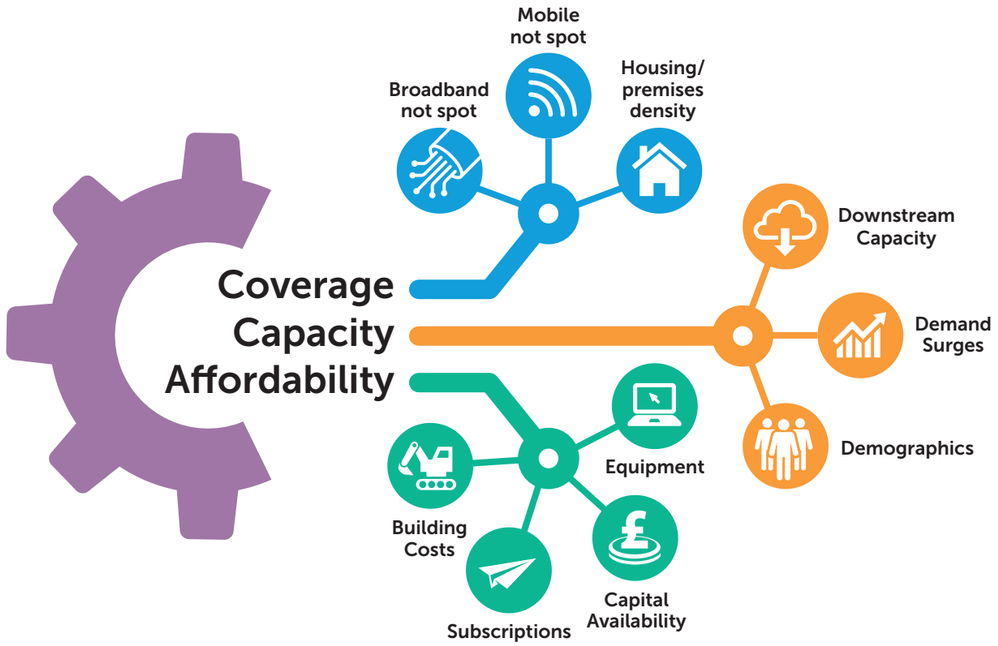
Central to achieving these goals will be the enhancement of digital connectivity across the county. As we transition into an increasingly digital age, robust and inclusive digital infrastructure becomes essential[3].

However, Nottinghamshire faces several challenges which can hinder optimal digital connectivity which our framework seeks to address:

Coverage: There are areas of our county which are not yet reached by full-fibre commercial builds, and also areas of poor mobile phone reception.

Capacity: Even in areas where good connectivity may be present, poor capacity can impact our ability to get online when there is very high network traffic, e.g. due to a large crowd at a nearby sports event.

Affordability: The cost of living crisis and its economic impact on people within our communities can act as a barrier to them taking up the connectivity which is available.



Supporting the Economic Transition Plan

Digital Connectivity is one of the six priority areas of work identified in Nottinghamshire County Council's Economic Transition Plan (ETP), which describes how the Council will maximise investment opportunities and drive sustainable growth in our local economy.

The Digital Connectivity theme has a focus on: ***Ensuring the technology and digital connectivity provision is in place so the county is well served and best placed to maximise the potential future opportunities.***

Digital Connectivity includes so much more than just connecting up premises to the internet; it's about the ways in which technology can provide an improved quality of life for local residents, boost our businesses and enable better access to services for our communities[4].

What is Digital Connectivity?

Digital connectivity is a blanket term that is used to describe mobile or fixed connections to the internet. It has never been more important for our businesses, communities and how we as a Council provide public services. Being connected to the internet has become an integral factor of everyday life – as important as a water, gas or electricity connection.

It, however, is much more than just the physical infrastructure we use to connect to the internet - high speed, reliable broadband and mobile services empowers businesses and communities. Public services can be accessed more conveniently and efficiently whilst consumers are often able to save costs by shopping online. It can support businesses to grow beyond their local area, provide efficiencies in production and introduce them to global markets to sell and buy.

People are supported to work from home which in turn can help to protect the environment by reducing the need to commute; all whilst improving their work and life balance. Improved connectivity supports visitors to the county and enables them to share their experiences with family, friends and on social media.

The impact of digital connectivity

In 2023, the communications regulator Ofcom produced a report on Adults' media use and attitudes which highlighted that use of the internet is ubiquitous and integrated into many facets of everyday life. More than nine in ten (92%) UK adults use the internet at home or elsewhere[5]. Accessing information, education opportunities, on-demand entertainment and social interaction are all present online and illustrates the ever closer ties between 'life' and 'life online'.

A report commissioned by BT and produced by Analysys Mason in 2016 highlighted that more than 90% of UK premises were already able to access superfast broadband service[6] (superfast means a minimum of 30Mbps download speed). In September 2024 data from Thinkbroadband.com now shows that over 98% of the UK's premises can access superfast, with over 84% being able to access gigabit capable services (1,000Mbps, or 1Gbps)[7]. In respect of Nottinghamshire; over 98% can access superfast, whilst over 87% of the county's premises can access gigabit level services.

We know that improved digital connectivity boosts innovation and productivity across the economy. In 2019 and 2021 Openreach commissioned the Centre for Economics and Business Research (Cebr) to conduct independent research on the impact of their full fibre rollout across the UK. The research had a strong focus on the productivity and workforce benefits and this analysis was updated in 2023. The updated report confirmed that the deployment of full fibre connectivity across the UK has overwhelmingly positive impacts on both the number of people in the workforce and output per worker. Combined, the productivity and workforce boosts to GVA will total £56 billion in 2026, rising to £72 billion in 2030[8].

Ofcom's last annual Connected Nations report[9] published in December 2023 highlights that 17 million UK homes now have access to full fibre broadband, with 4.6 million having taken up service on the new infrastructure.

Our Progress So Far

The last few years has seen continuous and significant multimillion-pound investment in connectivity interventions in Nottinghamshire. As network speeds continue to advance, there is a constant need to keep up with changing technologies which bring higher speeds and greater resilience.

These investments have been delivered through a number of digital infrastructure programmes including:

- **The Better Broadband for Nottinghamshire programme**[10]. This was a 5 year, £31m+ partnership between the County Council and a range of funding partners including Central Government, Openreach and our Districts, Boroughs and Nottingham City Council. This programme built upon the commercial rollout of fibre-based broadband which had provided superfast (>=30Mbps) access to 86% of properties in Nottinghamshire. The programme ensured that 98.8% of the county's homes and businesses could now access superfast broadband.
- **D2N2 Gigahubs**[11]. This project brings Gigabit full-fibre connectivity to selected public buildings such as schools, GP surgeries, health centres and public libraries located in rural areas across the East Midlands Combined County Authority (EMCCA) region.
- **The Government's £5bn Project Gigabit**[12] aims to connect 34,320 hard-to-reach premises with full-fibre in Nottinghamshire and West Lincolnshire in 2024/25. Lot 10 investment is worth £58m+ across both counties.
- **Small cells rental licenses** were signed with providers to make Council-owned assets such as lamp posts available to mobile network operators on which to fit 'small cell' devices to boost network capacity. Work to increase network capacity is vital to encourage investment in the County to the benefit of our communities, as it enables more people to make calls and browse the internet in busy locations.

Case studies:

Worksop Turbine

This project brought cutting-edge technology and full fibre connectivity to a Worksop business centre location that had previously suffered from poor telecoms and network capacity. The County Council's investment was explicitly designed to support and encourage businesses in the early adoption and development of 5G technologies, boosting the profile of Worksop as a destination for high-tech start-ups creating new high-value jobs[13].

Nottinghamshire's Mobile Connectivity Map

We have mapped 4G and 5G mobile connectivity across the County for all 4 Mobile Network Operators (EE, VMO2, Vodafone and Three). We have identified areas of poor signal and 'not spots' which require improvement. This will be used to influence mobile network operators to expand their coverage to better serve residents and businesses[14].

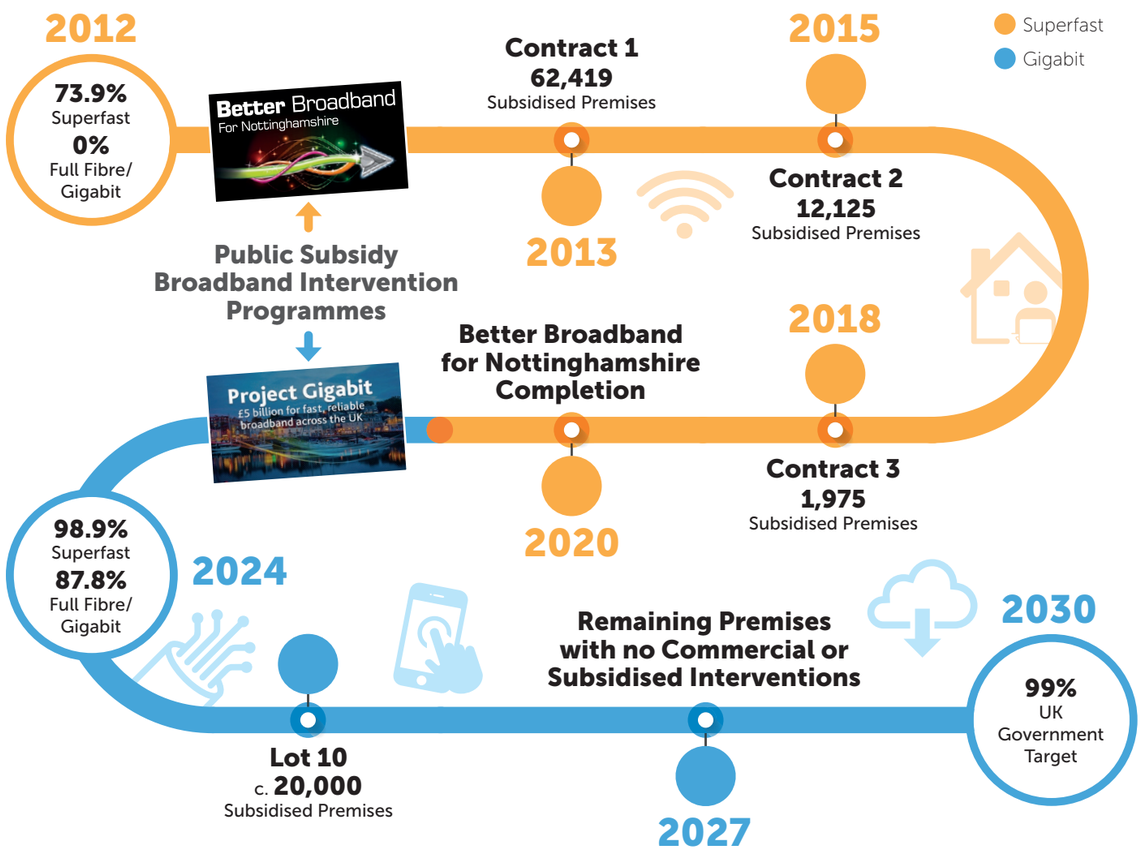
5G Connected Forest

This project helped visitors make the most of their trip to Sherwood Forest through accessing 'talkative signage' and immersive augmented reality experiences, whilst providing new data collection possibilities to those who manage and conserve this 450 acre woodland park. Undertaken as part of the UK Government's Testbeds and Trials programme, the project fostered co-operation between local universities, voluntary sector, visitor economy and technology companies[15].

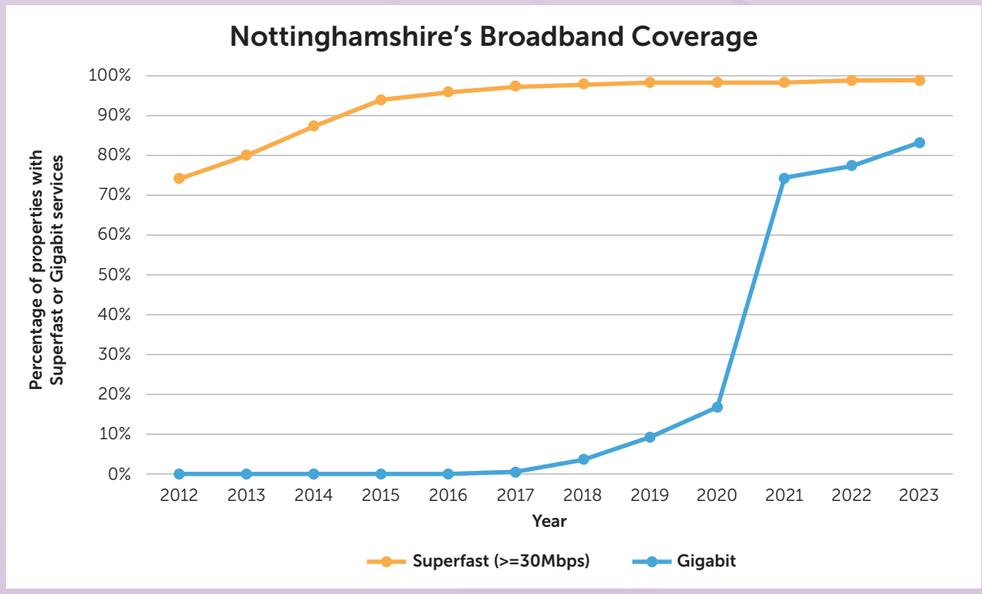
As well as improving connectivity, our contracts with network providers also deliver benefits to residents through the social value obligations we include. Examples of these might include digital literacy workshops in schools or apprenticeship programmes. Social value boosts opportunities for local communities as an outcome of the public procurement process for broadband infrastructure contracts.

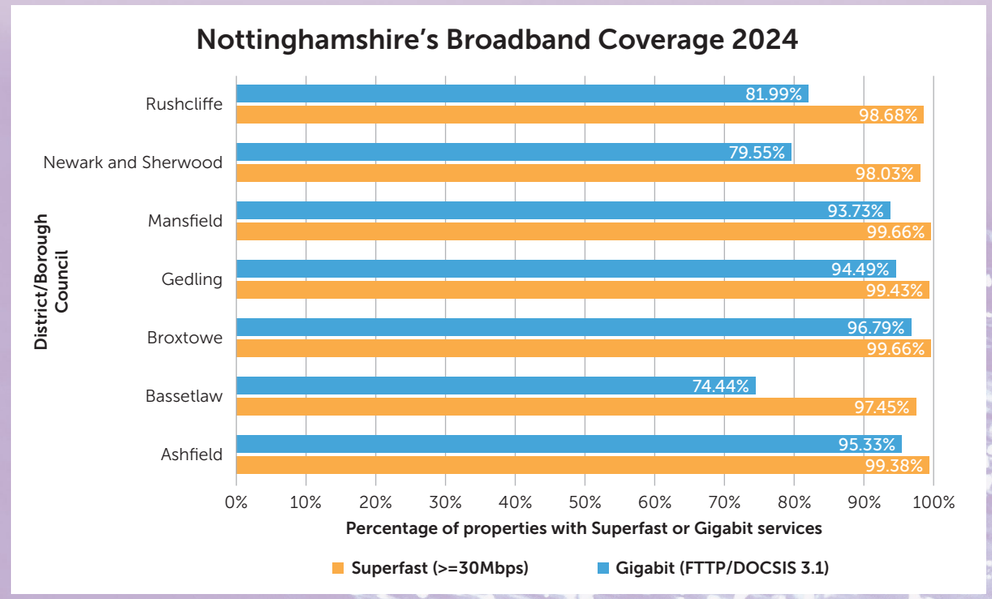
We have developed a 'Dig once' policy to encourage our delivery partners to minimise repeated excavations for installing and maintaining broadband infrastructure. This not only reduces the number of roadworks which may be required, it also cuts greenhouse gas emissions and cuts construction costs.

Nottinghamshire's Digital Connectivity Journey



Broadband Connectivity Figures for Nottinghamshire[16]





Who is this Framework for?

This framework has been created for:

Our Communities and Residents

Nottinghamshire is a large and varied county, encompassing rural village communities as well as highly populated urban areas. Each area brings its own challenges in ensuring adequate network coverage, capacity and affordability to residents. This framework outlines how the County Council is working to overcome those challenges to ensure that the location of your home or your personal financial circumstances are not a barrier to online participation. Our intention is to make sure that nobody in our county gets left behind[17].

Local Businesses

Nottinghamshire is home to a wide range of business types, from sole traders to multi-national companies. Whatever their scale or sector, all businesses have a need for fast, reliable internet access to streamline their communications, to deliver growth and customer service excellence. This framework document sets out the ways we provide support to local businesses, from supplying connectivity insights to support their planning, to nurturing collaborative innovations to solve business problems.

Network Providers

Telecommunications providers, Mobile Network Operators (MNOs) and their contractors design, build and maintain the communications infrastructure which enables us to participate in all the opportunities the internet has to offer. This document outlines our approach to ensure that Nottinghamshire achieves the highest possible level of network coverage and explains our role in supporting network builders working within the county. We do this by helping to smooth any permits, planning and wayleave issues, enabling essential street works to progress smoothly whilst ensuring minimal disruption to local residents and businesses. Wherever possible, we make Council-owned assets such as land and buildings available for the hosting of telecoms infrastructure.

Public Sector and Partners

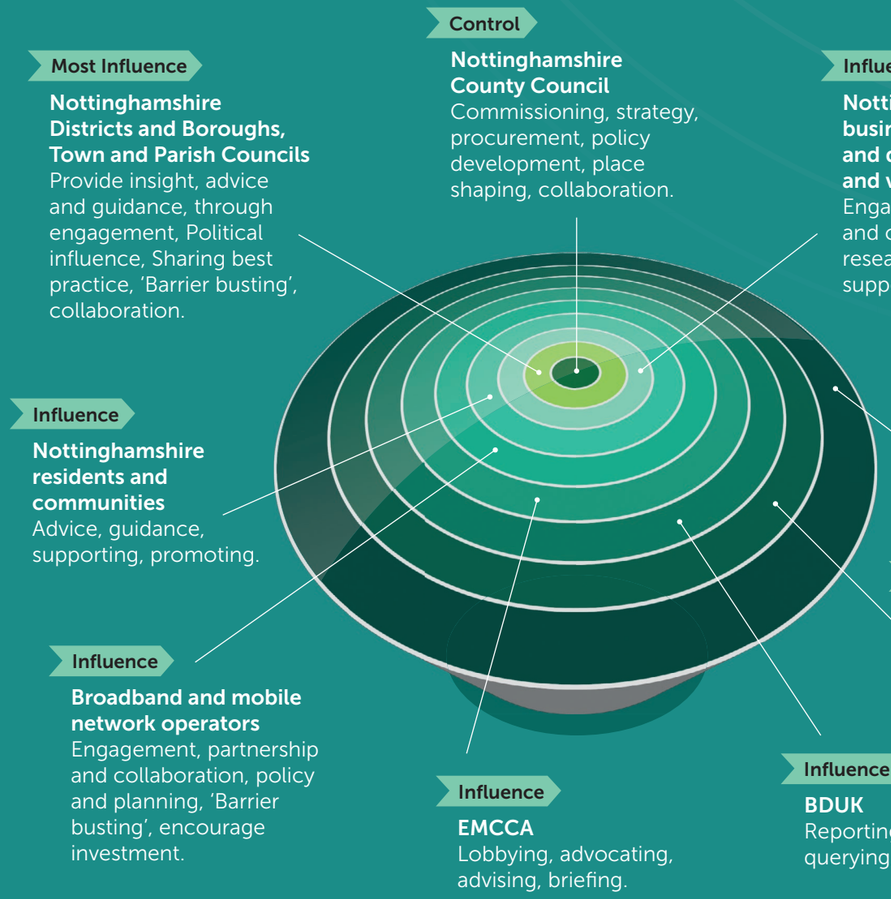
Through this framework, we will provide our colleagues in local government, health, education and other agencies with clear support and advocacy on local connectivity matters to support their transformation to the provision of digital services. The Council regards digital connectivity as the 'essential enabler' which underpins all other aspects of an inclusive, as well as a healthy, prosperous and green society. This document sets out our ambitions and vision for Nottinghamshire to become the UK's foremost digitally-connected county and is an appeal for our public sector partners to join with us to achieve this goal.

Stakeholder roles within the Nottinghamshire Digital Connectivity Landscape

Stakeholder	Role
Nottinghamshire County Council	The role of the County Council is that of leading on local digital connectivity strategy and facilitating the delivery of our Connectivity Action Plan. The overall aim of this being to ensure that Nottinghamshire has the best connectivity possible, delivered in partnership with the other constituents of our digital connectivity landscape.
Nottinghamshire Districts & Boroughs	There are seven District and Borough Councils within Nottinghamshire who work closely with the County Council and who deliver local services including housing and planning.
Town and Parish Councils	Being the level of local government closest to their community, the Town and Parish Councils represent their areas and ensure that services meet local residents' needs.
Local Businesses	We support businesses to grow within our county by providing the connectivity data they need to inform their location and resource planning. We also work in partnership with them, local universities and other stakeholders to develop and trial innovative new technology solutions aimed at increasing productivity.
Charities and voluntary sector	Like businesses, community and voluntary organisations need good connectivity to get their message out to their supporters and to improve their operating efficiency, so they can bring more benefit to the groups they serve.
Developers and Landlords of residential and commercial property	These can create commercial advantage for themselves by ensuring the highest level of connectivity for their properties. Landlords can play an important role by consenting to wayleaves/permits to allow infrastructure installation within houses in multiple occupancy and apartment blocks. Developers can ensure that installation of fibre infrastructure is a priority when planning new housing or commercial developments.
Broadband and Mobile Network Operators and Infrastructure Providers	Commercial entities responsible for the physical delivery and maintenance of network infrastructure. In the case of mobile, operators have coverage obligations as part of their licensing agreement with Ofcom. In the Nottinghamshire region, Openreach and VMO2 are the major broadband companies, both of whom have ambitious fibre broadband build programmes in our county. They are joined by an increasing number of smaller alternative network providers increasing the connectivity options.

Stakeholder	Role
East Midlands Combined County Authority (EMCCA)	The Combined Authority includes Derbyshire County Council, Nottinghamshire County Council, Derby City Council and Nottingham City Council and covers the areas of both cities and both counties. The four authorities will work together on a formal and legal basis to improve the region for local communities and businesses using devolved powers, functions and funding worth £1.14 billion from central Government.
Nottingham City Council	The Unitary Local Authority responsible for delivering services within the Nottingham City Administrative area.
Building Digital UK (BDUK)	BDUK is an executive agency of the Department of Science, Innovation and Technology which funds and oversees broadband infrastructure projects with a focus on reaching premises which are not expected to be built to by commercial network operators within a three year timeframe. An example of this in Nottinghamshire is Lot 10 of Project Gigabit, which represents £33 million of investment to improve connectivity in rural areas of the County.
Ofcom	Ofcom is the UK's telecommunications regulator concerned with broadband, landline and mobile phone services. They regulate and consult on policy on infrastructure building, e.g. through the *Communications Act 2003 Electronic Communications Code*, and also monitor competition in the industry. Ofcom provide consumer advice including national coverage data and information about social tariffs, which make services more affordable for those receiving certain benefits.
Central Government	The Department for Science, Innovation and Technology sets national strategy and targets, and releases funding for infrastructure projects, e.g. the £5 billion 'Project Gigabit' programme to meet an overall target of 85% coverage of UK premises being able to access a gigabit-capable network by the end of 2025. This programme is being delivered by Building Digital UK.

Digital Connectivity Sphere of Influence



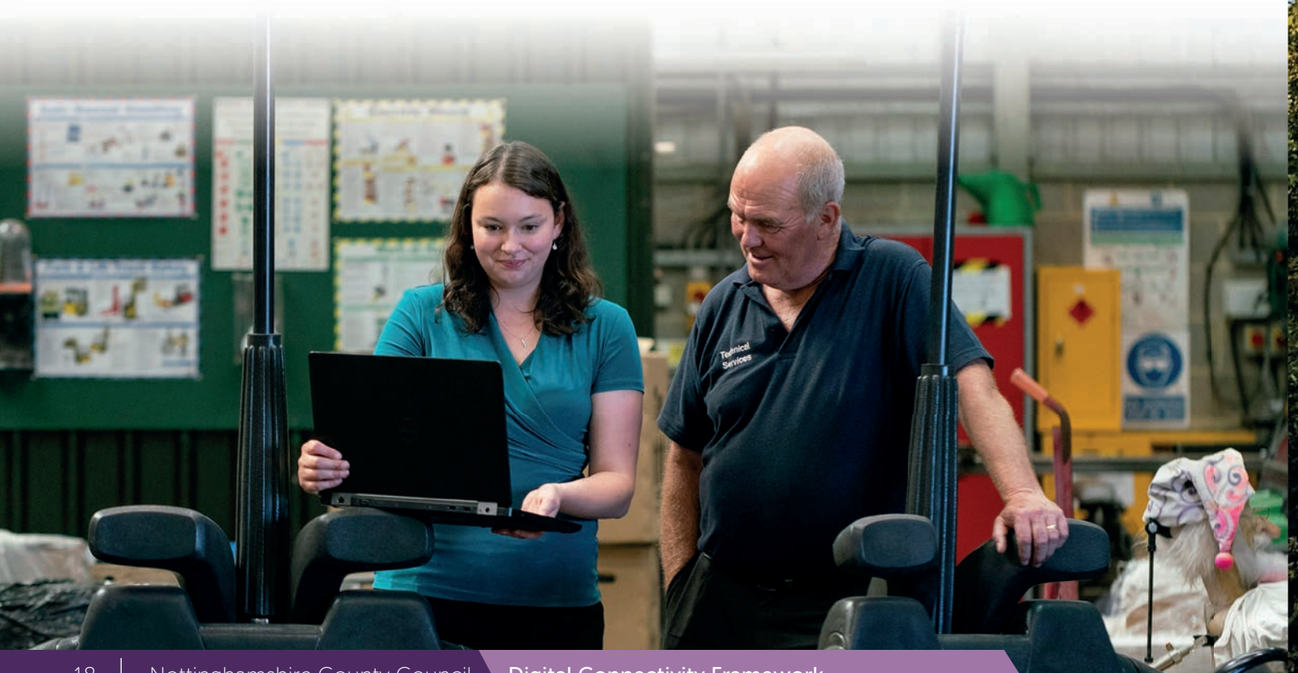
Devolution Opportunities for Digital Connectivity

Devolution to EMCCA (Derby City, Derbyshire, Nottingham City, Nottinghamshire) has the potential to significantly enhance digital connectivity across our region. EMCCA will have increased political influence and spending power compared to the individual authorities working alone[18]. Working cross-region will enable economies of scale when commissioning and delivering initiatives, reduce costs and complexities.

Our Vision for Digital Connectivity in Nottinghamshire

Our aim is to make Nottinghamshire the most digitally connected county in the U.K. We will strive to ensure that every resident, business, and community has access to world-class digital infrastructure so they can be empowered to access the opportunities that digital technology provides and to live independently.

- We will contribute to the expansion of broadband and mobile coverage to increase access to fast and reliable connectivity across Nottinghamshire.
- We will look to attract investment in infrastructure and assets in the region to drive green growth and development[19].
- We will work with partners to improve digital inclusion in the county. We know that some areas of our county are not equipped with good internet connectivity making it difficult for them to access digital services. Some groups in our community do not have the skills and confidence to use technological devices and online services without concern. Other groups cannot afford to pay for the devices that support a modern lifestyle and/or the bills to use them[20].
- We will influence our key stakeholders, share information, advice, guidance and best practice to champion digital connectivity initiatives to the benefit of our communities.
- We will help promote the adoption of digital technology where it can help to reduce greenhouse gas emissions in line with national and local net zero ambitions[21].



Our Priority Themes

Infrastructure
- ensuring the essential fibre and mobile network infrastructure is in place across Nottinghamshire to enable all online activity.

Inclusion and Skills
- supporting and delivering interventions which address affordability issues, boost digital skills and confidence to develop a digitally inclusive county.

Innovations and Efficiencies
- building collaborative partnerships to embrace new technologies, methodologies, and solutions to deliver sustainable development and investment to the county.

Leadership
- promoting, engaging, collaborating, and driving digital connectivity priorities and ambitions for the county both with internal and external partners.

Infrastructure

Networks are the essential enabling infrastructure which underpin all online activity. Fixed-line networks which traditionally employed copper telephone wires are increasingly being replaced by faster and more resilient fibre optic cables as the old analogue phone network is withdrawn from service[22]. Wireless networks including 5G mobile phone and public Wi-Fi are becoming more important due to the massive increase in demand for wire-free connectivity. Low-orbit satellite networks can offer a convenient, if expensive, connectivity solution which can reach even the most remote locations.

The availability of good connectivity in Nottinghamshire is vital, because it:

- Promotes economic growth and regeneration.
- Fosters personal development through education and employment opportunities.
- Enables people to keep in contact, supporting their wellbeing and combatting loneliness.
- Enables the delivery of efficient service provision for healthcare and independent living.
- Reduces the need for Carbon-intensive travel if people can work remotely and conduct routine appointments or business meetings online.

Recognising these impacts for our residents and businesses. The Council has worked hard over the last few years to ensure that many areas of our county enjoy access to good quality fixed-line data networks. However, more work needs to be done to achieve our goal of becoming the UK's best-connected county.

We will continue to:

Expand Nottinghamshire's Network Coverage

- Gather and collate information on fixed-line connectivity and mobile phone signal availability across the whole county, to identify those areas in need of improvement.
- Collaborate with service providers to address issues of underserved area coverage.
- Bid for government subsidies to fund the spread of connectivity such as the D2N2 Gigahubs project to connect rural public buildings.
- Support the delivery of government initiatives such as Project Gigabit and Department for Education Schools Gigahubs programme.

Smooth the Path for Network Expansion and Capacity Increases

- Make County Council owned buildings and structures available to network builders for hosting infrastructure such as 4G/5G small cells to boost mobile phone capacity[23].
- Investigate ways to resolve wayleave issues which can particularly block connectivity in multi-dwelling units and social housing.
- Engage with local highway authorities regarding roadworks permits for planned network infrastructure roll-out.
- Support local government planning departments with connectivity insights and information to inform their consideration of new development sites.

Inclusion and Skills

The County Council's ambition to be the UK's most digitally connected county goes beyond just ensuring homes and businesses can connect to the internet. We will support interventions aimed at building a digitally inclusive county, bridging the digital divide between those who can get online and those who cannot. We will work to ensure that people who need additional support can overcome obstacles posed by affordability, or a lack of skills and confidence, can access the help they need.

We will:

Tackle Affordability Issues

- Plan interventions to support those people in remote rural and very hard to reach locations where connectivity may carry a high cost.
- Work with internet service providers and mobile network operators to raise awareness of their social broadband tariffs[24].
- Encourage the recycling and reuse of computer and phone hardware through IT Asset Disposal schemes and charitable refurbishment programmes[25].
- Build partnerships with organisations operating within Nottinghamshire who distribute equipment such as data loaded SIM cards to those in need[26].

Build Digital Skills and Confidence

- Support and encourage programs across the County which help people to develop the basic skills necessary for modern life such as the Essential Digital Skills framework (EDS)[27]. A 2024 report shows that 8.5m UK adults still lack the basic skills needed to get online[28].
- Champion initiatives for digitally excluded people so they can take advantage of personal, social and financial benefits offered by the digital economy.
- Foster initiatives aimed at building confidence and empowering people to safely make use of online services.
- Collaborate with local government, charities and voluntary organisations to publicise and support their digital inclusion programs in the county.

Innovations and Efficiencies

Through innovation, we aim to harness digital connectivity to drive efficiencies across public and private sectors, empowering residents and businesses while creating a digitally inclusive, sustainable future. Our focus is on keeping abreast of new technologies, fostering partnerships to evaluate and pilot them, whilst optimising resources for maximum impact[29].

By driving innovation in digital connectivity, we will improve service delivery, reduce costs, and create a more inclusive, connected, and sustainable county.

We will:

Foster Strategic Partnerships

- Encourage Pilots: Collaborate with high-tech companies to pilot innovative connectivity solutions.
- Promote Collaboration: Foster public-private partnerships to accelerate infrastructure deployment.
- Support Innovation Hubs: Enable startups and researchers to drive connectivity advancements.
- Shape Regulations: Work with stakeholders to develop a favourable regulatory environment.

Promote Sustainable Practices

- Green Connectivity: Integrate renewable energy into connectivity projects.
- Energy Efficiency: Use Digital Connectivity to aide reductions energy consumption and costs.

Embrace Technology Adoption

- Leverage Emerging Tech: Support the Internet of Things, Generative Artificial Intelligence, and Augmented Reality/ Virtual Reality to enhance smart city/region solutions.
- Enhance Smart Solutions: Support Investment in technologies that improve public services and infrastructure.

Ensure Inclusive Connectivity

- Bridge the Divide: Address last-mile connectivity and promote digital literacy.
- Inclusive Policies: Advocate for policies that foster digital inclusion and investment.
- Data-Driven Planning: Collaborate with businesses to optimise infrastructure planning.

Drive Innovation and Efficiencies

- Maximise Resources: Promoting the sharing of digital infrastructure across sectors to enhance efficiency.
- Net Zero Innovation: Promote smart technologies that help to achieve energy efficiencies in buildings and operations.

Leadership

Nottinghamshire County Council will lead in championing digital connectivity. We will do this through close collaboration with our key partners and stakeholders, providing cooperation and advocacy, performing the role of "critical friend" whilst promoting Nottinghamshire's digital priorities. We will establish clear policies and vision to strengthen economic growth and support digital inclusion across the county.

With our broad visibility across the connectivity landscape—both from the supply side and within communities—we bring valuable insight that ensures our strategies are well-informed and responsive to the real needs of residents and businesses[30].

We will:

Strategy Development

- Create a comprehensive digital connectivity strategy aligned with community needs.
- Appoint a senior 'digital champion' to lead the strategy's implementation[31].
- Develop planning policies supporting digital infrastructure rollout in line with national frameworks.

Collaboration

- Strengthen partnerships with providers and stakeholders to ensure unified progress.
- Collaborate with public and private sectors to foster an inclusive approach.

Resource Allocation

- Secure the necessary skills and resources to implement the strategy effectively.

Policy and Asset Utilization

- Prioritise policies supporting infrastructure rollout and make public assets available to accelerate network expansion.

Future Planning

- Incorporate future digital needs, such as mobile cells and Internet of Things, into Council planning.

Economic Growth

- Ensure that digital connectivity is available to drive economic growth, inclusion and accessible public services.

Sustainability and Net Zero

- Promote smart technologies to improve energy efficiency and explore environmentally-focused digital policies, such as a 'dig once' approach to reduce infrastructure disruption and save greenhouse gas emissions.

Appendices

Digital Connectivity Glossary of Terms

The world of internet connectivity is technically complex. Various marketing claims and inconsistent terminology use by providers only adds to the confusion. Here we explain some of the more commonly used terms and provide answers to some of the more commonly asked questions:

ADSL
This is the original type of broadband connection launched by British Telecom in 2000 and is delivered over standard copper telephone wires from the telephone exchange to the premises.

Altnet
Broadband services in Nottinghamshire (and many other areas of the country) are dominated by two large suppliers, BT Openreach and Virgin Media O2. Some smaller companies are now building fibre networks here such as Cityfibre and Netomnia, they are termed 'Altnets' which simply means '**alt**ernative **net**works'.

Digital Literacy
Means having the skills to confidently and effectively use information technology and having the understanding to do so safely and responsibly.

Download Speed
The 'download' speed, means the internet traffic travelling 'down' into your PC or phone from the service provider, e.g. for downloading a game or streaming a TV show. This is usually higher than the upload speed, unless the connection is described as 'symmetric', in which case the upload and download speeds are the same. Internet speeds are measured in Megabits per second (Mbps) or Gigabits per second (Gbps).

Fibre to the Cabinet (FTTC)
A fibre optic connection runs from the telephone exchange to a distribution cabinet in the street. Copper telephone wires make the connection from the cabinet to the premises.

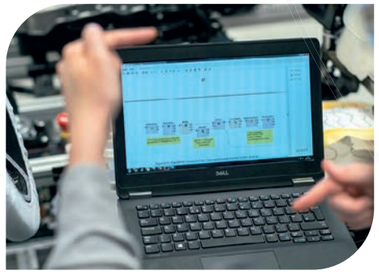
Fibre to the Premises (FTTP)
A fibre-optic connection direct from the telephone exchange to the premises.

Gigabit or Gigabit-capable Internet
Gigabit speed means a network capable of delivering a download speed of 1 Gigabit per second (1Gbps) or more, where 1 Gigabit = 1,000Mbps. To achieve this level of speed usually means a fibre optic connection running directly to the premises (FTTP).

Internet of Things (IoT)
Many newer items in use in the home, at work or for leisure now have internet connectivity and some level of digital intelligence built into them. Often termed 'smart devices', equipment such as kitchen appliances, room thermostats and all kinds of business/industrial machinery can communicate over the internet to supply a multitude of data relevant to ensuring their optimum and efficient operation. Such devices together constitute the Internet of Things.

Last-Mile
In much the same way as your driveway connects your home to the main road, the last mile is the final leg of cabling which connects your home to the telecoms network infrastructure. If you are in a remote, rural location, this final leg can be hard to build and expensive, as the build costs are not spread over multiple properties.

Latency
The time that data takes to transfer over a network from its source to its destination.



Mbps
The speed of broadband connections is measured in Mbps, meaning 'Megabits per second'. A Megabit is one million data 'bits' (binary digits - 0s and 1s). Note that speed measurements refer to 'bits' of data rather than 'bytes'. Bytes are the standard way in which file sizes are measured, e.g., a photo taken on a phone might be 20 MB (Megabytes) in size. A byte consists of 8 bits.

Not spot
A location where there is no internet access available.

Small Cell
A low-power, low cost, 4G/5G mobile phone network transmitter which can be used in localised clusters to improve network coverage and capacity.

Smart Technologies
See 'Internet of Things'.

Superfast Internet
Superfast is a line capable of delivering a download speed of at least 30Mbps, with a possible maximum of about 80Mbps. This usually refers to a 'fibre to the cabinet' connection (FTTC), where the fibre cable from the exchange terminates at a cabinet in the street, the signal then being distributed to a group of nearby premises over copper wires.

Telemedicine
The delivery of healthcare services and consultations remotely, via the internet.

Universal Service Obligation
Every home and business in the UK has the legal right to request what is termed a 'decent, affordable broadband connection'. Known as the Universal Service Obligation, this is deemed by Ofcom, the UK telecoms regulator, as being a download speed of at least 10 Mbps and an upload speed of at least 1 Mbps. If your current connection is not delivering that, you can request BT to provide you with a quote for an upgraded service. If the cost is less than a defined threshold, you will not have to pay any installation fee for your connection to be upgraded. Please see the Ofcom website for more details.

Ultrafast Internet
Ultrafast is a line capable of delivering a download speed of at least 300Mbps, with a possible maximum of about 1Gbps. This would require a fibre to the premises (FTTP) or cable TV (HFC/DOCSIS) connection.

Upload speeds
Upload speed is that of the data leaving your PC/phone back to the service provider, e.g. uploading a video shot on your phone to a social media account. If a connection is described as 'symmetric', that means that the upload and download speeds are the same.

Digital Connectivity FAQs

The question of speed - How much do I actually need?

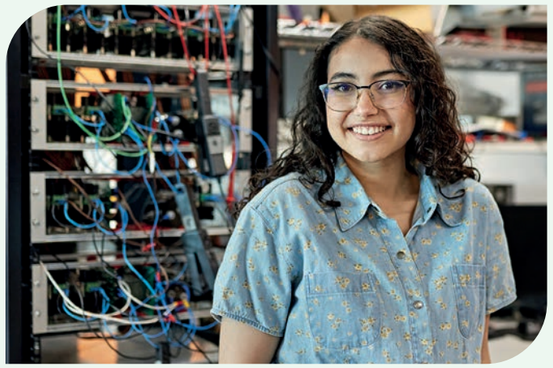
The key considerations are;

1) **What are you intending to use the internet for?**
2) **How many people will be using it at the same time?**
3) **How much do you want to spend on a broadband contract?**
4) **What services are available at your location?**

If you are a 'light user' living alone, and your use of the web doesn't extend beyond email, online shopping and perhaps an occasional video call, then a connection of 30Mbps or less might suffice.

If you are sharing a family home with a couple of teenagers who are downloading games and streaming movies, then you are going to need a very much faster connection, perhaps 300Mbps or higher.

Internet providers often offer a range of speed-capped services at different price points, enabling the subscriber to budget for the level of connectivity required. Your options will be governed by what kind of connections are available at your location.



How do I find out what kind of connection I can get?

There are a variety of online broadband comparison sites into which you can enter your postcode and see the providers and services available at your location, for example: Broadband Checker: Compare Broadband in Your Area.

Individual providers also have their own coverage checkers which may give more information about future build plans.

What types of Fixed-line Broadband are available?

When you enquire about broadband availability in your location, you may be faced with a variety of choices. Understanding the different connection technologies available can help.

Connection Type	Technology	Speed*	Comments
ADSL Asymmetric Digital Subscriber Line	This is the original type of broadband connection launched by BT and is delivered over standard copper telephone wires from the exchange to the premises.	Up to 24Mbps download, 1.3Mbps upload.	Speed worsens the further the premises are away from the exchange.
DOCSIS or HFC Hybrid part Fibre, part Coaxial cable	Used mainly by Virgin Media to deliver combined TV, phone and broadband services.	Up to 1 Gbps download, 100 Mbps upload.	Only available in cable tv wired areas.
FTTC Fibre to the cabinet	A fibre optic connection runs from the exchange to a distribution cabinet in the street Copper telephone wires make the connection from the cabinet to the premises.	Up to 80Mbps download, 20Mbps upload (If within 150m of cabinet).	Speed worsens the further the premises are away from the distribution cabinet.
FTTP Fibre to the premises	A fibre-optic connection direct from the exchange to the premises.	1 Gbps and above download, up to 220Mbps upload.	Fast, resilient connection.
XGS-PON 10 Gigabit Symmetrical Passive Optical Network	A direct fibre connection the exchange offering very high download and upload speeds.	Up to 10 Gbps download and upload.	Fast, resilient connection.

* Theoretical maximum, real world speed may be less depending on local conditions.

What types of Wireless Broadband are available?

Connection Type	Technology	Speed*	Comments
Public Wifi Networks	Transmitted by network access points provided by premises landlords, businesses, etc.	Varies, depending on signal bandwidth; Wifi 5 supports < 3.5Gbps, Wifi 6 < 9.6Gbps.	Speeds given are theoretical, real world speeds may be significantly lower.
Mobile Phone Network 4G/5G Broadband	Transmitted using mobile phone signal.	4G average 30Mbps download, 7Mbps upload. 5G average 124 Mbps download, 14Mbps upload.	Can use an outdoor antenna if the signal is weak.
Satellite Broadband	Transmitted via a geostationary or low Earth orbit satellite, you will need a dish mounting on the outside of your property.	Variable, according to provider.	Can provide web access where there are no cables or phone signal.

How do I check my broadband speed myself?

There are a number of broadband speed checkers available online, for example Broadband Speed Test. It is a good idea to try a couple of different ones and try testing at different times of the day to see if you can get a consistent result. Follow the instructions on the test website, which generally include; make sure your phone or PC is connected to your Wi-Fi and positioned close to your router, or in the case of a PC, actually plugged into the router via a network cable if you have one available.

Plugging in is preferable as this avoids any speed issues that may be being caused by your Wi-Fi within the premises rather than the incoming connection. Ideally, no one else should be using the same wifi network while the test is running.

What if I don't think I'm getting the speed I am paying for?

Bear in mind that broadband is a very competitive market and speeds advertised by internet providers are quoted as being 'up to' - in other words, an optimistic view of the highest speed likely to be possible. In reality, the actual speed achievable may be lower, dependent on a range of factors. When you place an order for a connection, your provider will confirm the expected speed for your location.

If you find your broadband is slower than the expected speed you were promised, contact your provider to diagnose the problem. If the problem lies within their network, and they can't fix it within 30 days, they must offer you the right to exit your contract without an early exit fee.

What factors might affect my available broadband connection speed?

In the case of connections using copper wires, such as ADSL, FTTC and to a certain extent HFC, the length and condition of the cables will be a factor. If cable connections become corroded due to water getting into junction boxes that can seriously impede the signal. The further the signal has to travel along the cable from the exchange or distribution cabinet to reach your premises, the weaker and slower it will get. HFC performs better in this respect because it uses a high-frequency signal on coaxial cable which is more resistant to electrical interference.

Connections employing fibre optic cables rather than copper for the whole journey from the exchange to the premises (FTTP) do not suffer from signal loss due to distance, corrosion or interference from outside electrical equipment and therefore provide a consistently faster and more reliable service.

What financial support is available to get online?

Social tariffs are lower cost broadband packages available to people claiming Universal Credit, Pension Credit and certain other benefits. Check with your internet service provider to see if you qualify and get details of pricing. It is free to switch to a social tariff, and you can do so even if you are mid-contract without penalty. In addition, there will be no in-contract price rises or charges for leaving early. See the Ofcom website for more information.

What is 3G/4G/5G?

3G (Third Generation):

- Introduced in 1991, 3G marked a leap from 2G. It offered faster data transfer and better voice quality.
- Enabled wireless internet access, paving the way for video calling and basic web browsing.
- Not lightning-fast, but a crucial step toward modern connectivity.

4G (Fourth Generation):

- Arrived in 2010, 4G revolutionized mobile data.
- Faster speeds meant mobile gaming soared, and streaming became seamless.
- A movie that took 5 hours to download on 3G takes less than 8 minutes on 4G.

5G (Fifth Generation):

- The new 5G promises lightning speed.

  Predicted to arrive between 2020 and 2030.
- Downloading an HD movie takes just 6 seconds.

Emerging Trends Impacting Digital Connectivity in Nottinghamshire

Several emerging trends are set to shape digital connectivity in Nottinghamshire, driven by technological advancements, societal shifts, and environmental considerations.

Next-Generation Wireless Technologies

- **6G Development:**
  Higher speeds, lower latency, robust connectivity.
- **Satellite Internet:**
  High-speed connectivity to remote areas (e.g., Starlink).

Internet of Things (IoT) Expansion

- **Smart Places:**
  Efficient management of infrastructure, traffic, energy, and public services.
- **Environmental Monitoring:**
  Real-time data on pollution, energy use, aiding Net Zero goals.

Artificial Intelligence and Machine Learning

- **AI-Driven Networks:**
  Optimise performance, predict outages, manage traffic, enhance cybersecurity.
- **Personalised Services:**
  Improved user experiences in education, healthcare, and public services.

Enhanced Cybersecurity Measures

- **Quantum Computing:**
  Revolutionizes data processing and encryption.
- **Blockchain Technology:**
  Enhances data security and privacy.

Sustainable Digital Infrastructure

- **Green Computing:**
  Energy-efficient infrastructure, innovations like liquid cooling.
- **Circular Economy:**
  Reduces e-waste through reuse and recycling.

Digital Inclusion and Equity

- **Universal Connectivity:**
  Affordable, high-quality internet for all residents.
- **Accessible Technologies:**
  Inclusive digital services for people with disabilities.

Regulatory and Policy Evolution

- **Digital Rights:**
  Focus on data privacy, net neutrality, and internet access.
- **Global Standards:**
  Facilitates global connectivity.

Remote and Hybrid Work Models

- **Flexible Workspaces:**
  Supports remote and hybrid work with robust infrastructure.
- **Digital Nomadism:**
  Rise of remote working from various locations.

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We want to ensure that **high-quality** digital infrastructure is available across all of Nottinghamshire to deliver **efficient** public services, **help** businesses to **grow** and bridge the **digital divide** in our communities.

Healthy *Prosperous* *Green*

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