

Rise of the Gigabit City

Transformational Fibre Infrastructure
for the 21st Century.

Introduction

In this series of short knowledge update papers, CityFibre will be examining the Gigabit City movement, an emerging group of urban communities, determined to prepare themselves to make the most of the digital age.

We shall be looking at a growing number of Gigabit City projects around the world as well as the economic and social benefits, savings and excitement that these are generating. We will also explore the rise of the UK's first Gigabit Cities, transformed by rapid, city-wide deployments of pure fibre infrastructure, and explore them as templates for other UK cities to follow.

The Digital Bottleneck

Over the last decade, the evolution of digital technologies has radically changed the ways that we live and work. At the same time it has also changed the demands that citizens, businesses and other organisations make upon the communications networks that support a digital society.

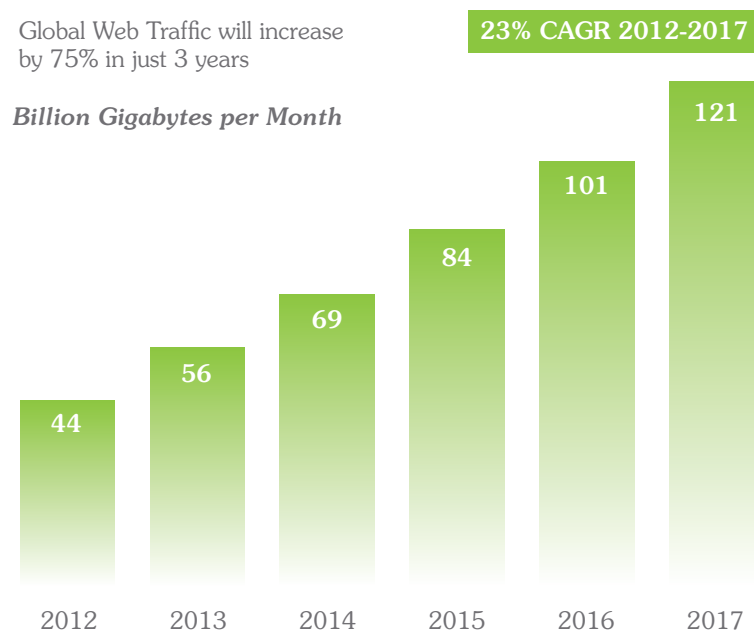
Most urban communities still face severe bottlenecks in those networks when it comes to taking advantage of the huge benefits technology adoption can bring. For many, they're still stuck in the last century, limited to using broadband services that run, at least in-part, over obsolete copper-based networks. For others, supposedly able to access new, so-called 'fibre' networks, they soon find that coverage is both limited and expensive, and that it frequently doesn't deliver the promised improvements to their online experience.

Local governments, businesses and consumers increasingly recognise that their connectivity is inadequate to support emerging digital services and lifestyles. Poor digital infrastructure is widely inhibiting innovation, economic and social growth.

Data Traffic Worldwide is Exploding

Global Web Traffic will increase by 75% in just 3 years

Billion Gigabytes per Month



To visualise this forecast, by 2017, the data traffic equivalent of all the movies ever made will cross the global Internet every 4 minutes!

Fit For Purpose Digital Infrastructure

Just as certain communities rose to prominence in the industrial age due to their connection via roads, canals and railways, the emerging centres of economic activity and prosperity in a digital age will be those that enjoy access to state of the art broadband infrastructure. Currently this is in short supply, particularly outside the country's largest cities.

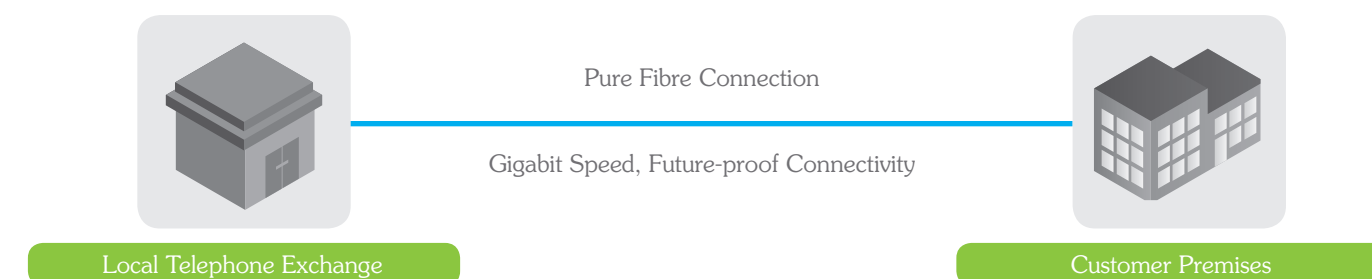
It is generally accepted that the only fit-for-purpose, future-proof digital infrastructure is a pure fibre optic network. Pure, 100% fibre networks operating at Gigabit speeds are over 100 times faster than most current broadband links in the UK. What's more, they are capable of supporting data uploads as fast as downloads.

1000 Megabits (one Gigabit) of pure fibre bandwidth, both up and downstream, is a step-change even more dramatic than the shift from dial-up to broadband.

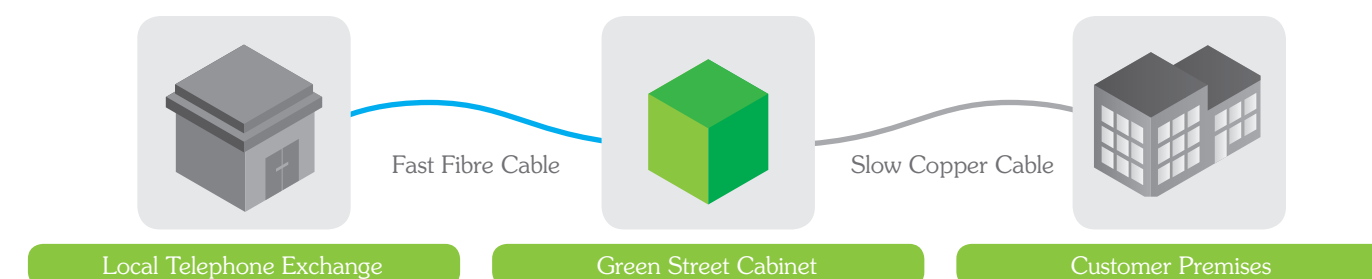
In addition to the vastly improved speeds, a pure fibre network is an elegantly simple, future-proof solution to a city's unrelenting and increasing appetite for bandwidth. With no copper to interrupt the data passing at the speed of light through the fibre, increasing bandwidth availability in the future, simply involves upgrading the equipment at each end and leaving the fibre network untouched.

The Key Technology Differentiator

Pure Fibre Network



Fibre to the Cabinet Network



A cunning marketing game of smoke, mirrors and industry buzzwords has played out over recent years when it comes to the availability of true fibre-based services and connectivity, usually hidden away in the small print of a number of service provider contracts. In most cases, what's branded as 'fibre broadband' actually still involves copper cable. This technology is known as 'Fibre to the Cabinet', but it relies on a final leg of copper wire, from the cabinet into the premises. This slows data down and causes congestion.

While these so-called 'fibre' services are undoubtedly better than older technology, they cannot compare with the new era of gigabit speeds and are woefully inept at supporting the crucial uploading of data, leaving users as largely passive participants of the digital age.

A Gigabit City Vision

Victorian-era visionaries saw the need to invest in infrastructure to bring order to industrialisation chaos. Now, a similarly urgent, broad and dynamic vision is needed to support the next step change in our lives, societies and businesses.

The broadband infrastructure development in this country has largely been in the hands of two giants with national agendas, that often do not align with the interests of individual cities. It is time to put the interests of cities first.

By attracting and facilitating a privately funded, bespoke and future-proof pure fibre deployment, built quickly to minimise disruption and accelerate the benefits, a town or city can take control and transform its digital future. This deployment will create a Gigabit City.

To compete and succeed, the UK requires many such Gigabit Cities. Together they will spark innovation and draw new investment; they will develop new approaches to familiar services such as transport, education, health, blue-light, and utilities; and, where appropriate, kick-start new ways of doing business that can take full advantage of an increasingly virtualised global economy.

US FCC Chairman Julius Genachowski issued a “Gigabit City Challenge,” calling for at least one gigabit community in all 50 states by 2015.

“Economic history teaches a clear lesson about infrastructure. If we build it, innovation will come. The U.S. needs a critical mass of gigabit communities nationwide so that innovators can develop next-generation applications and services that will drive economic growth and global competitiveness.”



The Stokab fibre network in Stockholm has delivered

€1.8bn

Return on Investment

A wealth of research and data from both the UK and around the world clearly shows the wide ranging financial, commercial and social benefits that having a reliable and future-proof pure fibre network brings to a community. In one such example, Stockholm's fibre network, now nearly 20 years old, has had a hugely positive effect on the city's economy, saving the local government over €250m in IT and telecoms services alone and delivering an estimated €1.8bn return on investment.



Build Once, Build Right, Build Fast

A Gigabit City's fibre infrastructure is tailor-made to that city's unique requirements. Once a city-wide deployment begins, the physical installation of the cables and connection of a city's key sites proceeds rapidly. In practice, with new deployment technology this can take as little as one to two years.

Typically, the network would first connect those public sector and commercial sites with the most urgent and intensive demand including council offices, libraries, schools, hospitals and surgeries, emergency services and the large enterprises. Once connected, there follows a wave of businesses, data centres, innovation hubs, business parks and industrial estates that rely on data in any form for their commercial existence.

Ultimately the pure fibre network can function as a backbone for deployment of fibre to individual homes, providing residential access to ever-richer forms of digital services and entertainment.

Once the first sites are connected, service providers large and small can begin offering services over the network, bringing new applications, services, features and content to run over the effectively near-infinite capacity provided by the pure fibre technology.

Public Sector Network Providers:
Schools, Hospitals, Council Sites etc.

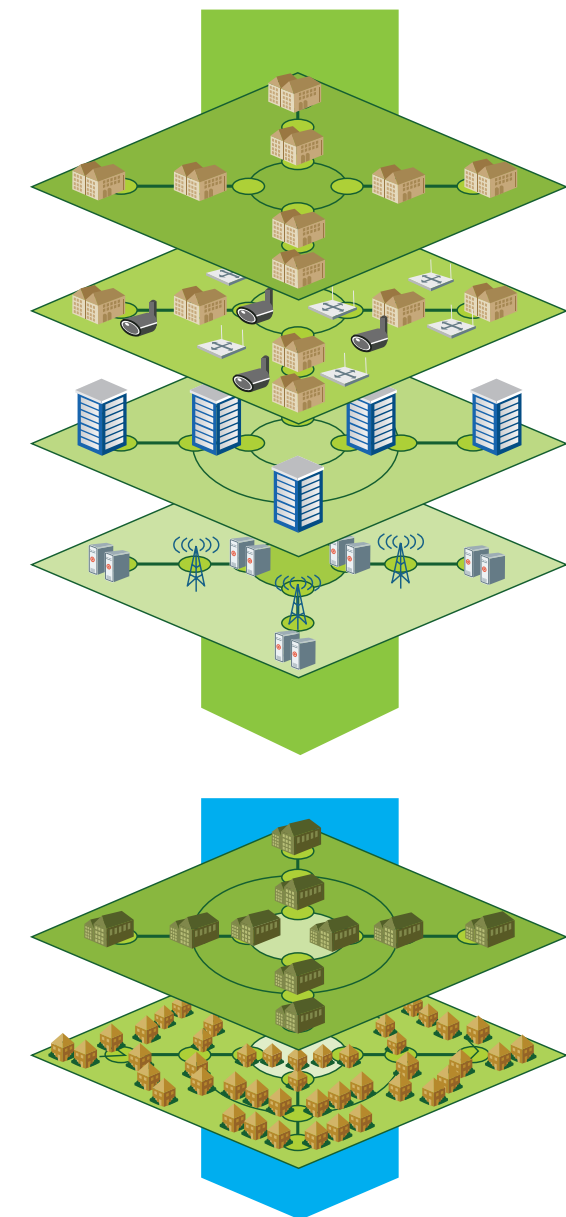
Additional Public Sector Sites: CCTV,
Traffic Control, Public WiFi etc.

Large Business & Enterprise
Markets Connected

Mobile Cell Sites and Data
Centres Connected

Business Service Providers Offer
Gigabit Speeds for SMEs

Consumer Service Providers Offer
Gigabit Speeds to the Home



The Benefits of Becoming a Gigabit City

Transformational fibre infrastructure at the heart of a Gigabit City brings measurable benefits to both the public and private sectors, and to the citizens themselves.

Economic

With readily available gigabit connectivity in place, business and councils become more nimble and efficient, while the Gigabit City becomes a magnet for new business development and investment, creating new jobs and opening up fresh opportunities for small companies and start-ups to compete on a level playing field.

The country gains £20 in net economic benefit for every £1 of public investment in digital infrastructure



Research commissioned by the Department of Culture, Media and Sport

Social

Many councils have already implemented E-Government initiatives, transforming the ways that citizens access and pay for services while simultaneously lowering operating costs in the process. With a Gigabit City, these strategies can be extended much further, linking schools, libraries and community centres to eliminate the digital divide that currently affects all ages.

The average cost of one interaction between a council and a citizen is £8.62 for face to face, £2.83 over the phone, but only 15 pence when a website was used.



2012 SOCITM study across 120 local councils

Health and Security

Building on the Gigabit City platform, E-Health, M-Health, Telemedicine and Wellness projects can be quickly introduced to bring a range of new, emerging technologies to better diagnose, treat, monitor and support patients and help improve the overall health of the entire population. In addition, the Blue-Light services and essential utility and transport operators can also manage urban risk in better and more cost-efficient ways, using high-definition CCTV, video-equipped emergency services, and the ever-growing range of alarms and sensors to integrate responses faster and more intelligently.

The City of York Council has merged three CCTV networks onto its pure fibre network enabling state of the art HD video capture, sufficient future capacity and extensive cost savings.



Mobile and 4G

With increasing pressure on mobile networks to support the rise in data usage resulting from the introduction of new mobile services and 4G/LTE, network operators are looking for new solutions. Cities with pure fibre connectivity that can be extended to cell towers, will help remove these capacity issues, helping to encourage 4G deployments or maximise the benefits of existing 4G roll-outs.

In Portugal, mobile operators have already connected over 90% of the country's cell towers with pure fibre infrastructure.



Public WiFi

One vital building block of public WiFi projects involves placing antennas on street lights, advertising hoardings and inside public premises like shopping centres and sports stadia. With a gigabit fibre infrastructure in place, ISPs are able to connect those antennas directly to the network, instantly solving their need for high-bandwidth connectivity and providing a new experience in public WiFi.

In the Home

Most people couldn't care less about technology – but they do care about getting faster, better, and more reliable access to the online services that inform and entertain them. Currently, many are trapped with slow and unreliable broadband connections, or have to pay unnecessarily high fees to service providers. A Gigabit City has the potential to support a revolutionary new era of fibre to the home-based services which will forever change the way in which consumers can use the internet.

The early success of Google Fibre highlights the incredible levels of demand for Gigabit services by the general public and the recognition by many cities that this infrastructure is essential to their longer-term survival and growth.

- Google is currently building its networks in 3 US cities and is in discussions with 34 others as municipal authorities across the country clamour to be selected next.
- In an effort to attract the first Google Fiber investment, Google received over 1,100 community submissions and 194,000 individual submissions.
- Just 10 days after launching a registration program in Kansas, more than 8700 residents had paid a \$10 deposit for a gigabit service.



CityFibre – Builder of Gigabit Cities

As the UK's only independent operator of open-access, pure fibre infrastructure, CityFibre builds and operates networks that bring the benefits of Gigabit connectivity to communities throughout the country.

With network in over 50 towns and cities, we are helping cities to compete globally by unlocking the potential of new services in the public, private and residential sectors.

Our privately funded Gigabit City model is gaining momentum and already transforming cities including York and Peterborough.

If you would like to find out more about becoming a Gigabit City please get in touch.

Gigabitcity@cityfibre.com
www.cityfibre.com
[@cityfibre](https://twitter.com/cityfibre)