

# Introduction - Colchester's Context

Colchester  
Britain's oldest  
town and first  
recorded city



## Key Facts

- A Borough of 324 sq km in North-East Essex
- Major transport hub, rail, sea and air
- Population of 197,200, predicted to grow to 225,200 by 2031
- Creative and Digital sector accounts for 11-12% of Borough's economy by value and is rapidly growing
- City Authority has taken the lead in generating investment in digital infrastructure and growing a large open-access fibre network

# Digital Infrastructure

- Colchester Amphora is an arms-length business created by Colchester City Council in 2017 to pursue commercial infrastructure development.
- A key focus has been the build of open-access fibre networks, attracting significant Government and private sector investment in next-generation connectivity. This includes real-life use cases of 5G.
- The built networks cover the whole of urban Colchester, with hundreds of points of presence, more than 90,000km of usable fibre in the ground, and pass 40% of households.
- Trading as Colchester Fibre, it is the largest municipal fibre infrastructure in the UK, connecting numerous public buildings, businesses, homes, a CCTV and care line infrastructure, as well as a WAN network reaching from Ipswich to Harlow.



# The Path from Zero-Fibre to 5G

- Full-fibre penetration/availability in 2017 was near-zero. Our starting point was to build the required underlying infrastructure.
- This was delivered using funding from SELEP, DCMS (LFFN) and the private sector.
- The core network build focused on the city centre but has subsequently expanded to the whole of suburban Colchester, creating a hugely diversified customer base.
- Real-life use cases of 5G technology were an aspiration of the LFFN programme and are now supported by the Town Deal Programme of levelling-up projects.
- However, 5G deployment in Colchester needed a relevant, tangible, commercially viable anchor. We found one.

## Colchester's full fibre story to date

- The Council's gigabit network built across the town centre since 2017 is within reach of almost 2,000 premises. This network was built using a mixture of SELEP and the Council's own funding. Spurs from this network already reach the Northern Gateway, the University of Essex and Berechurch. This network requires ongoing investment to expand its reach.
- In 2020, CBC and DCMS concluded negotiations over a further £3.3m of Government investment from the LFFN fund, to enable the densification of the town centre network, connection of some 12 suburban nodes, and the construction of a 'Metronet' expanding backhaul capacity to the whole of northern urban Colchester.
- Colchester Amphora Trading is overseeing the implementation of the LFFN programme on behalf of the Council, and will for the foreseeable future function as the wholesale operator of the new infrastructure.
- Following on from the LFFN investment, the Swedish fibre network builder-operator, VX Fiber, announced a multi-million pound investment to build the "local layers" in Colchester. These will form the links between the Council's core network and the customers' properties. Initially this build focuses on Berechurch, Shrub End and the Army Garrison, with Greenstead, the Northern Gateway and Wivenhoe to follow in late 2021.
- The project team is now drawing up proposals for the full transition of the entire Council connectivity requirements to the network it has built out. This is expected to deliver very significant cost savings compared with the externally sourced connectivity currently in use.

# Assessing 5G Use Cases in Colchester

Together with Intelligens Consulting, the following potential use cases of 5G technology were assessed:



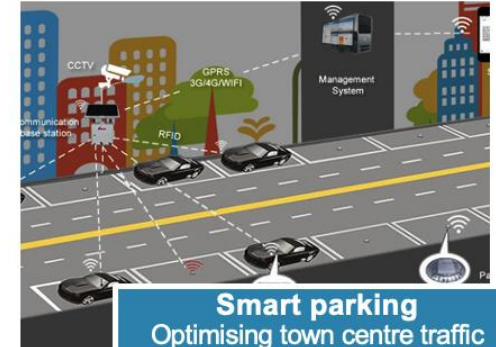
**Tech hub**  
Collaboration with academia and business to drive innovation



**Digital retail**  
Enhanced digital experience driving footfall into town centres



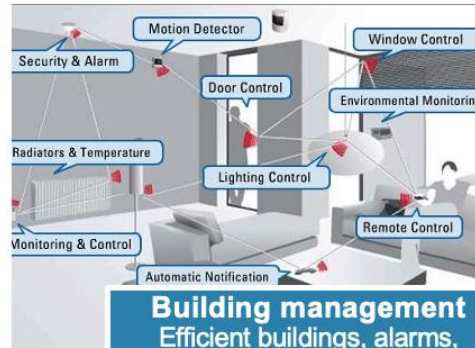
**Connected tourism**  
5G enabled immersive VR/AR experience and pods



**Smart parking**  
Optimising town centre traffic flows



**Digital signage**  
Advertising, directions, information



**Building management**  
Efficient buildings, alarms, security and access



**Construction**  
AR enabled walkthrough while on site



**Health and care**  
Connected health and social care

# Enabling AR/VR Tourism

direct resources to **existing significant tourism** product(s) within Colchester - to maximise economic impact and demonstrate the '5g' difference (noting benefit will then diffuse to all providers and the city generally)

restrict to **Council owned sites** to ease delivery and retain ownership of, and benefit from, fibre assets, and locations appropriate to fibre network (thereby aiding fibre roll-out and meeting governance standards, while ensuring no external body sees unwarranted benefit)

focus on a **compelling 'story'** - one which is authentically 'Colchester' and of general interest, but also a specialist interest (thus demonstrating both 'entertainment/attraction' relevance of the technology, and 'research / immersion' for deeper interaction)

develop the visitor appeal of each site, but with a fresh focus on the **linkages with Colchester** (thereby enhancing synergy where site visitors spend time and money in the city and vice versa)

Resulting short-listed options for assessment

- **Roman Walls** outdoor immersion (circuit, gates, events, 'Roman experience' )
- **Castle** augmented time travel (Roman temple, Norman Keep, Medieval , Civil War...)

With key underlying tech requirements:

- Neutral host model
- Hosting offered on equal opportunity basis
- Recognition of differing strategies implemented by MNOs
- Platform capable of supporting vendor agnostic interoperability
- Due attention to security and isolation between MNOs

# Measuring the Wider Economic Benefits

## Increased productivity

5G will increase the individual and business productivity

## Knowledge-based economy

5G will benefit the knowledge-based economy sector creating high value jobs

## Flexible working

5G can enhance home working lead to reductions in carbon dioxide emissions, and time savings

## Consumer surplus

Business and individuals will benefit from consumer surplus

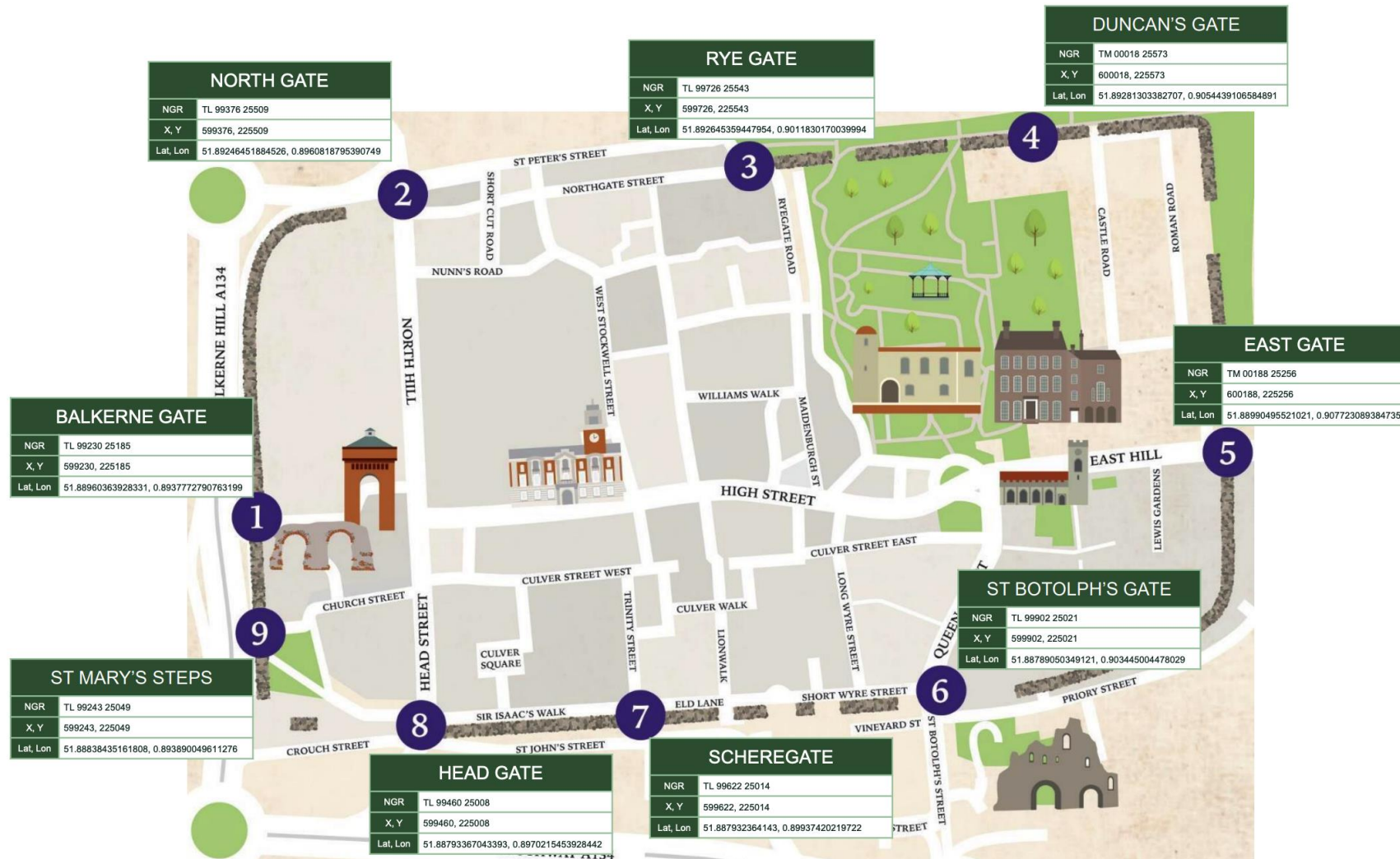
## Telehealth

5G can reduce the number of people in residential care leading to cost savings

## Immersive learning experiences

An increased participation in learning will increase the skills set and qualifications of the workforce

# 5G Network Build Focus



- Internal 5G network to Colchester Castle (largest preserved Norman Keep in the UK)
- 9 historic gateways to the city centre, each with its own story to tell by an immersive AR/VR experience
- Users will be able to access the experience using their own devices or rented headsets

# Timeline and Future Aspirations

- Initial 5G network built and operational by the end of 2024; AR/VR experience prototype ready for summer tourism season of 2025.
- Modular 5G technology means other locations can be enabled. Holy Trinity Church (key Saxon architectural site) and Roman Circus are under assessment.
- Reconstruction of an old bus depot into the £5m “Digital Forum”, a 5G-centred digital working hub, is well underway.
- Galvanising the wider market to accelerate the deployment of a greater density of Small Cell devices to improve overall 5G experience.

