

5G Mobile Network Pilot - Western O-RAN Deployment" (WORD).

The Department for Science, Innovation and Technology (DSIT) put out an [Open Networks Ecosystem \(ONE\)](#) funding call in March 2023. The £80m ONE fund was developed in order to tackle key barriers to the adoption of open mobile networks: with trials in areas of high demand, and to allow for development of new Open Radio Access Network (Open RAN) software and hardware solutions to improve performance of these networks. The two-year programme aims to de-risk investment for operators by market testing emerging technologies.

“OpenRAN” (Open Radio Access Network technology), allows Mobile Operators to build networks using a wide variety of vendors, but the industry needs to build more sites to roll out and test the approach first.

A consortium, named Western O-RAN Deployment (WORD), was put together and led by [Telet](#), a 5G mobile communications company headed up by Peter Gradwell (founder of Gradwell Communications, a successful digital company based in Bath). The full consortium consists of the following partners: -

- B&NES Council
- West of England Combined Authority
- Antevia
- Radisys
- Telet
- Cellxica
- IQ
- Virtuser
- Leicestershire Council
- Cardiff Council
- Worcestershire Council
- Shropshire Council

As a part of the consortium, we submitted a bid for £9.9m of grant funding and received news of the bid being successful in the first week of July. This information was embargoed until September and the project will last until 2025. In total, the project has a value of £14.5m and provides Bath & North East Somerset Council with £773,132.00, 100% of which comes from DSIT. A Grant Funding Agreement was agreement between DSIT and the lead partner in December 2023, allowing parties now to progress the project.

The ONE WORD project, led by Telet, will provide the City of Bath with a new 5G network utilising around 24 small cells deployed in the central area. The project will build new Open RAN systems integration and will focus on testing how the network copes with “High Demand and Dense” environments. Telet will project-manage ONE WORD, while the ask of B&NES Council is to provide support with installation of the infrastructure, managing communications around the project and also providing

support with at least one test event, where a high number of users will be using the network to create a high demand environment.

There is also a heritage aspect to the bid, whereby the mobile network infrastructure will be designed in keeping with Bath's World Heritage Status, something that to date has been a blocker on digital connectivity in the city.

The project will create a legacy in terms of an active, working 5G mobile network which operators will then be able to use in order to boost connectivity in the City of Bath. There are also opportunities to expand the scope of this project into the B&NES market towns in future, however due to the "high density" demands of this funding call, the initial project will focus on Bath in particular.

We see this as an opportunity to build on what has been learnt through a 5G pilot that took place in 2019, which used 5G technologies applied to a cultural site (the Roman Baths) – allowing visitors to view the Baths in different points in time using Augmented Reality.

WORD has a strong alignment with the forthcoming West of England Digital Plan which lists maximising 5G coverage in the region as a key action, as well as building a regional coordination function (the Combined Authority is also a partner in the WORD project). The West of England Digital Plan also focuses on innovation; building a 5G network in the City of Bath will lead to productivity gains for our business community. The project is also in line with the Liberal Democrat Manifesto Commitment; "work with all stakeholders to ensure the heritage buildings in Bath can receive full fibre connectivity, and a fully upgraded 5G network".

There is a wide demand for improved connectivity across the public and private sector. High Demand Density Areas are the most challenging for Mobile Networks and Bath has a number of unique challenges – not least significantly lagging behind Bristol in terms of digital connectivity.

Key Project Aims for B&NES

1. Deployment of High Demand Dense Network in City of Bath, consisting of circa 24 mobile nodes installed in a manner that is acceptable and sensitive to our World Heritage Status
2. Base load operation - traders, council workers, regular users
3. Demand events - festivals, major events, pop up technical tests
4. Public Sector Readiness - learning from West of England Combined Authority involvement in DCIA, asset readiness "winning hearts and minds", working sympathetically in World Heritage locations
5. Developing Open RAN Technology - significant technology investments in "Real Time Control" (energy use, spectrum efficiency) and "Multi Operator Functionality", thus acting as a pilot for future use by a number of commercial 5G network operators
6. Radio hardware developments

In addition to the City of Bath, ONE WORD, the **Open Networks Ecosystem Western Open RAN Deployment**, will deploy a new mobile network in three other High-Density Demand (HDD) scenarios; Cardiff's Principality stadium, the historic Shelsley Walsh motorsport venue, and Shrewsbury's Quarry Park.

The consortium will address issues of providing dense coverage in different types of high traffic environments with technically and commercially viable solutions based upon mobile small cells managed using cutting-edge technologies.

Community Interest Company, Neutral Host Networks (NHN CIC), will create an Integration Centre in Bath for staging of deployments and training technical personnel. NHN CIC will provide the local technical services required to keep all deployed assets operational.

In terms of Bath & North East Somerset Council, the project will provide funding for the following: -

- Digital Project Manager (full time for project duration). The first dedicated digital projects post at B&NES Council since 2017
- 54 days salary and on-costs for the council's Principal Enterprise Officer to support the project
- 36 days salary and on-costs for IT to support the project
- 36 days salary and on-costs for Street Lighting to support the project

The pilot (ONE WORD) will address the visual issue of deploying small cells in a world heritage city. It will take the approach of cells visually supporting the local environment, and install the minimum necessary infrastructure to provide high density coverage.

Following lessons learnt with City WiFi and best practices, as well as work done by the DCIA programme regarding deployment of small cell mobile infrastructure, the project will use a Neutral Host Open RAN. This will demonstrate how a single network can aid multiple operators in minimising visual clutter while improving capacity and lowering installation and maintenance costs.

The network will be deployed in a key pedestrian corridor towards the Roman Baths and Abbey, using approximately 20 remote radio heads (RRU) and potentially indoor within Heritage Buildings, such as the Baths and Guildhall, using indoor RRUs as this area receives over 850,000 visitors a year.

The network will be mounted on street furniture and buildings, connected via a fibre network. In each case maximum use will be made of existing public fibre networks and the project will deliver multiple high-density tests, targeting three events per site across the second half of the project. In each, a pool of over 1,500 test mobile handsets and devices, to complement any that trialists may have.

Risk assessments will be actioned at the start, regularly during the course of the project and when any relevant changes are made which may include technical changes to networks and systems, changes in procedure or new threat information.

The **West of England Combined Authority** will develop the lessons learned and develop digital team capacity in the project trial areas as an integral component of the new West of England Digital Strategy.

Key outcomes of the pilot:

- provide Local Authorities with a technically proven model, a **solid business case** and a **cost/benefit analysis** for **authority-owned 5G Neutral Host networks**.
- **Tracking the benefit of improved 5G network coverage in the deployment communities**
- **assessing the socio-economic impacts of delivering 5G coverage and capacity**

Councils benefits of 5G will include:

- Greater tourist volumes and spend
- Easier navigation
- Innovation, new ways of delivering services, products and tourism / cultural offer
- Improved trader connectivity (more sales) leading to greater demand for commercial locations
- Improved inbuilding coverage, (a particular issue in Bath as majority of MNO assets are located away from the City Centre)
- Reduced H&S issues (lone worker/security cameras)
- Reduced and predictable OPEX costings
- Operation of local services e.g. car parks, waste collection, cameras