

# Spotlight On ...

## The River Severn Partnership Advanced Wireless Innovation Region

Shropshire Council - River Severn Partnership



Department for  
Science, Innovation  
& Technology



Advanced  
Wireless  
Innovation  
Region

# River Severn Partnership



# River Severn Partnership



Our aim is to make the Severn, Wye, Warwickshire Avon and Teme the most vibrant and resilient river network, where an exceptional quality of life, prosperous local economies and an outstanding natural environment is driven by a programme of innovation to reduce flood risk, secure future water resources and improve and deliver shared natural assets.

The area consists of:

- **18,500Km<sup>2</sup>**
- **3 million people**
- **7 counties** (across Wales, the West Midlands and South West England)
- Current land value at risk of fluvial flooding > **£30bn**
- Average cost of current fluvial flooding > **£28m per year**
- **1mha** of agricultural land generating farm profits of over **£300m pa**
- Over **50,000** public sector jobs across the RSP
- Average farm size **56ha** vs UK average of **86ha**
- Range of farming sectors with poultry and upland sheep farms prevalent



# Our Partners



# Advanced Wireless Innovation Region



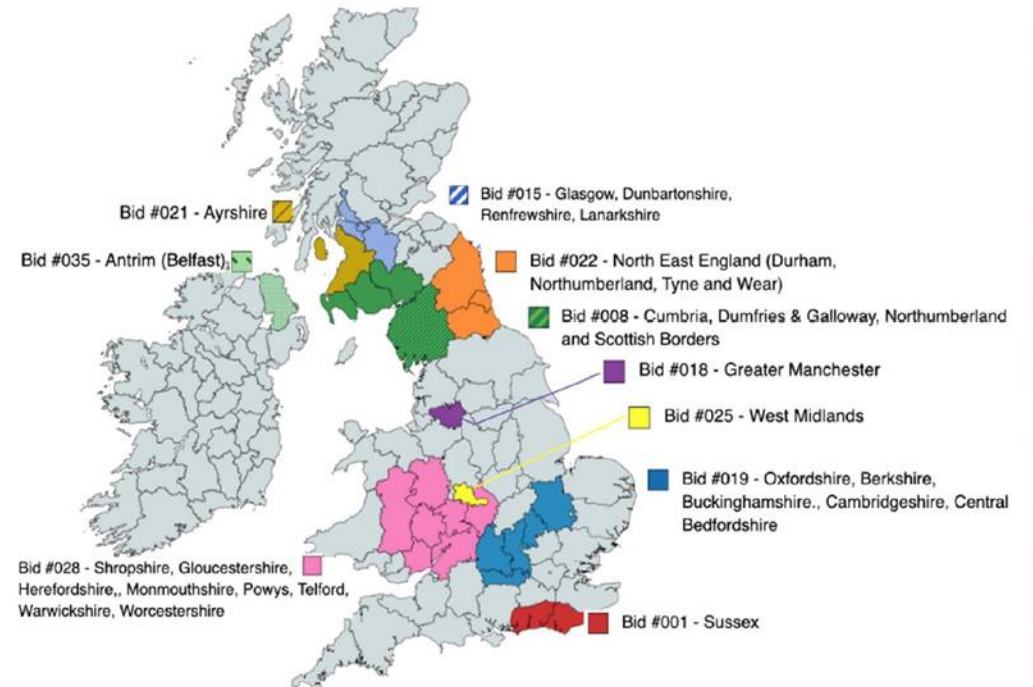
Advanced  
Wireless  
Innovation  
Region

Rhanbarth  
Arloesi  
Di-wifr  
Uwch

- One of 10 5GIRs in the UK
- £3.7m of DSIT funding
- Managed by Shropshire Council
- Supported by Birmingham City University, Water Resources West, Warwickshire & Worcestershire CC

## Aims to

- Develop use cases that demonstrate viability of advanced wireless technology
- Encourage the adoption of advanced wireless technologies in the **water, rural & public sectors**
- Drive economic growth and environmental impact
- Invest in activity that benefits every part of the region



# Advanced Wireless Innovation Region

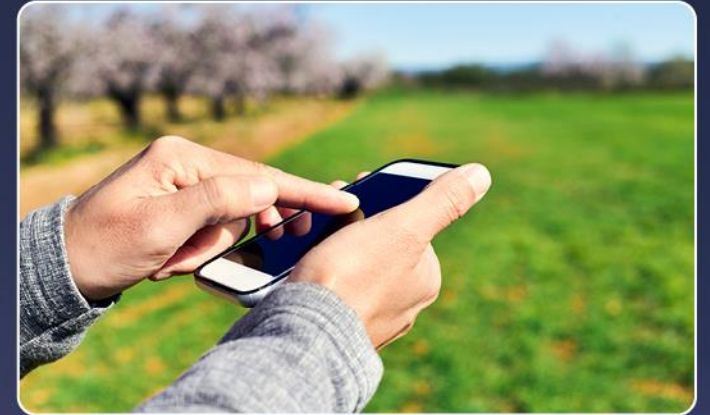


Advanced  
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## The RSPAWIR is not solely focused on 5G

- Commercial 5G coverage is and will likely remain patchy
- Looking at the full spectrum of connectivity increases the prospects of adoption
- Central aim to embed 'wireless' in the decision-making process of local organisations which will stimulate demand for higher speed, lower latency and higher capacity connectivity

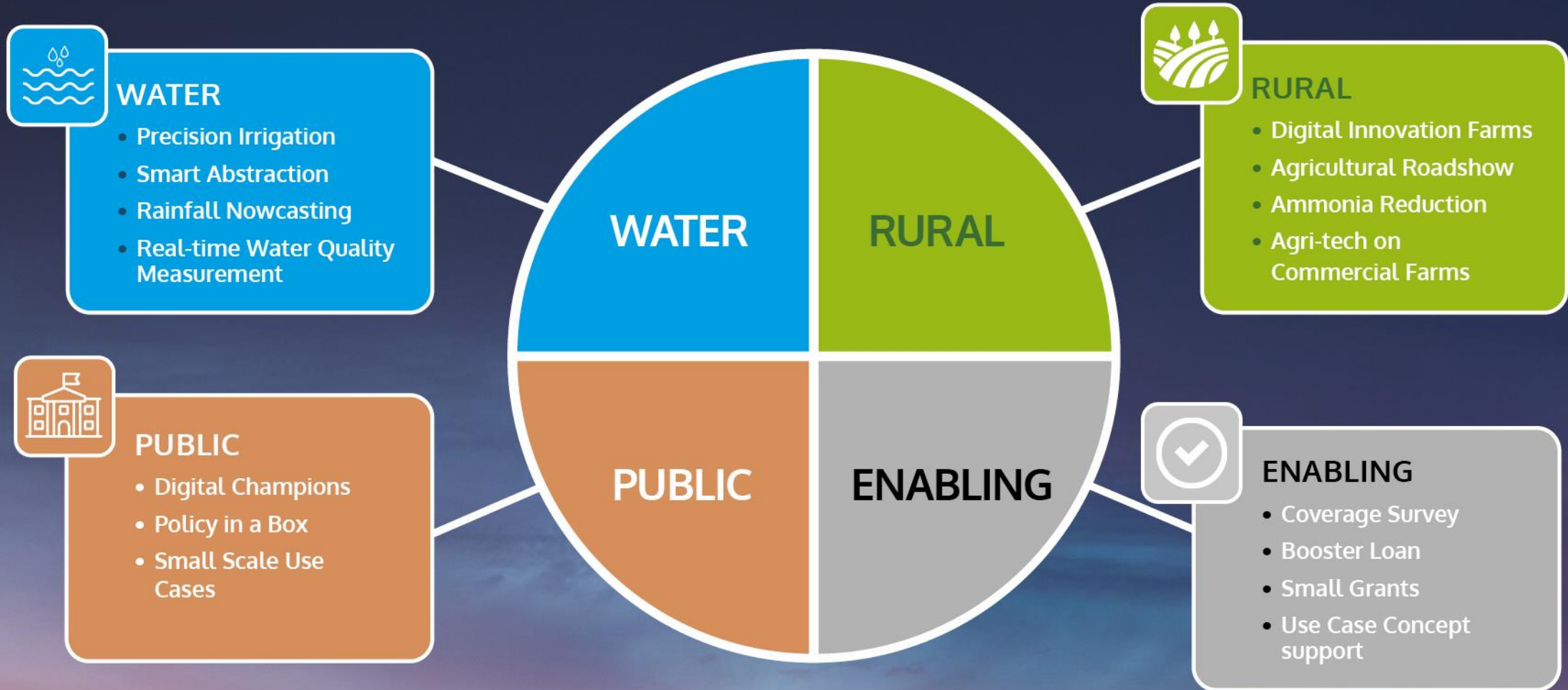


## What is Advanced Wireless Connectivity?

- Cellular Mobile Coverage 4/5G
- Private 5G Networks
- NB-IOT • Satellite • LoRaWAN
- Wi-Fi • Bluetooth



# Use Cases & Projects



# Anticipated Benefits

469

FIRMS FROM KEY SECTORS IN THE REGION WHO ENGAGE WITH THE PROJECT

10%

INCREASE IN CROP YIELD AND QUALITY ON IRRIGATED LAND AND BROILER SHEDS INVOLVED IN THE PROGRAMME

£500K

OF IRRIGATED AGRICULTURE NOT LOST THROUGH ABSTRACTION RESTRICTIONS



30

FARMERS INVESTING IN AWC TECHNOLOGY

500,000m<sup>3</sup>

WATER HARVESTED FROM HIGH FLOWS AVAILABLE FOR STORAGE

10%

REDUCTION IN DIRECT SUMMER ABSTRACTION



39

DISSEMINATION EVENTS

5%

REDUCTION IN AIRBORNE AMMONIA EMISSIONS WITHIN PARTICIPATING FARMS

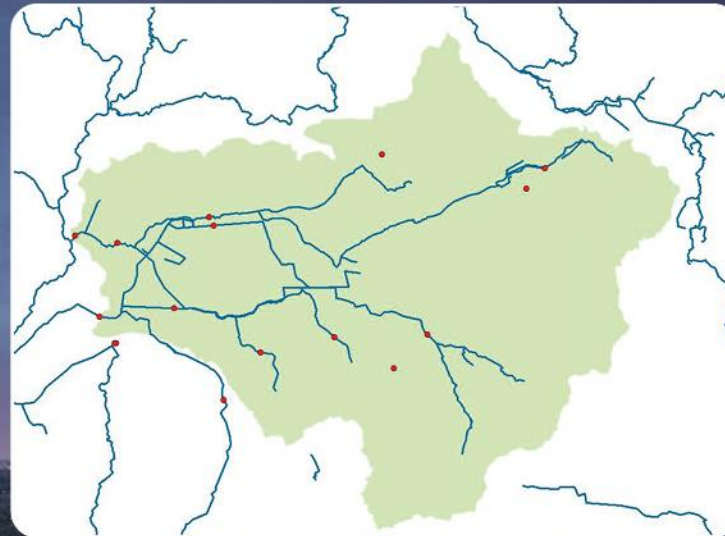
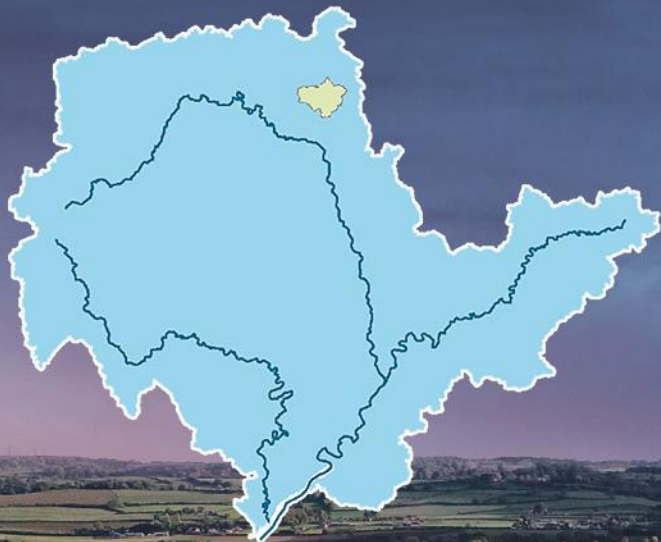
10%

DECREASE IN ENERGY CONSUMPTION FOR IRRIGATION WITHIN PARTICIPATING FARMS



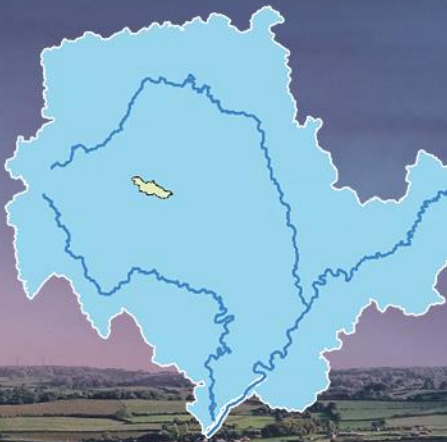
# Sub Catchment Smart Abstraction

- Wireless sensors providing real-time guidance and instruction of when to “scalp” & when to “spill”
- Focused on the River Strine Catchment
- Led by Cranfield University
- Involves 10 local landowners
- Significant potential for water resource & flood management if scaled up



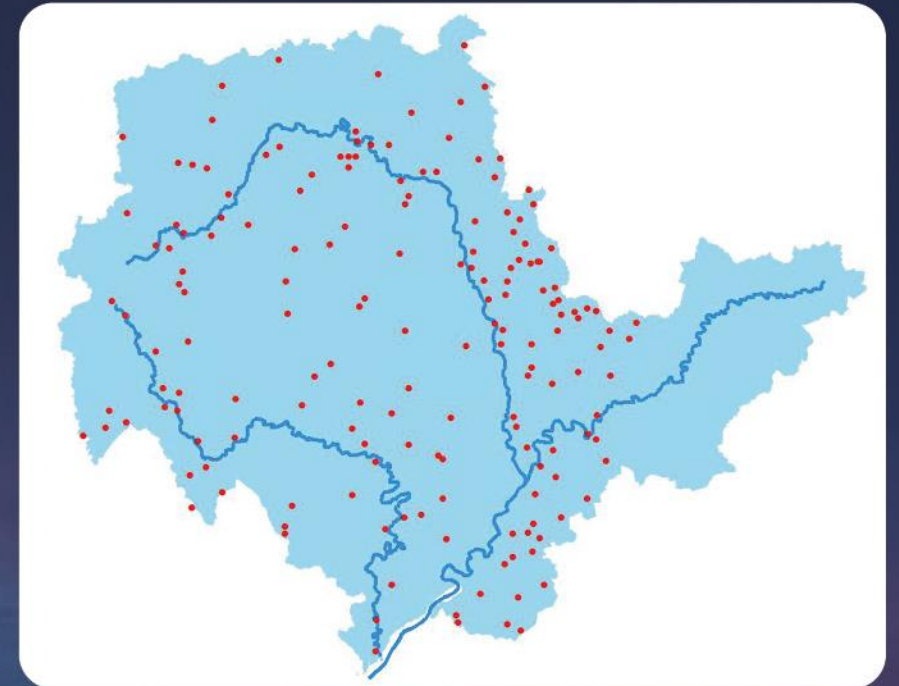
# Clun Catchment Water Quality

- River Clun
- Baseline and real-time monitoring of phosphate levels
- Measuring Ph to an extreme degree of granularity
- Demonstrating the potential to replicate manual testing
- Evidencing the effectiveness of sediment traps
- Unlocking sustainable housing development
- Without harming the endangered freshwater pearl mussels



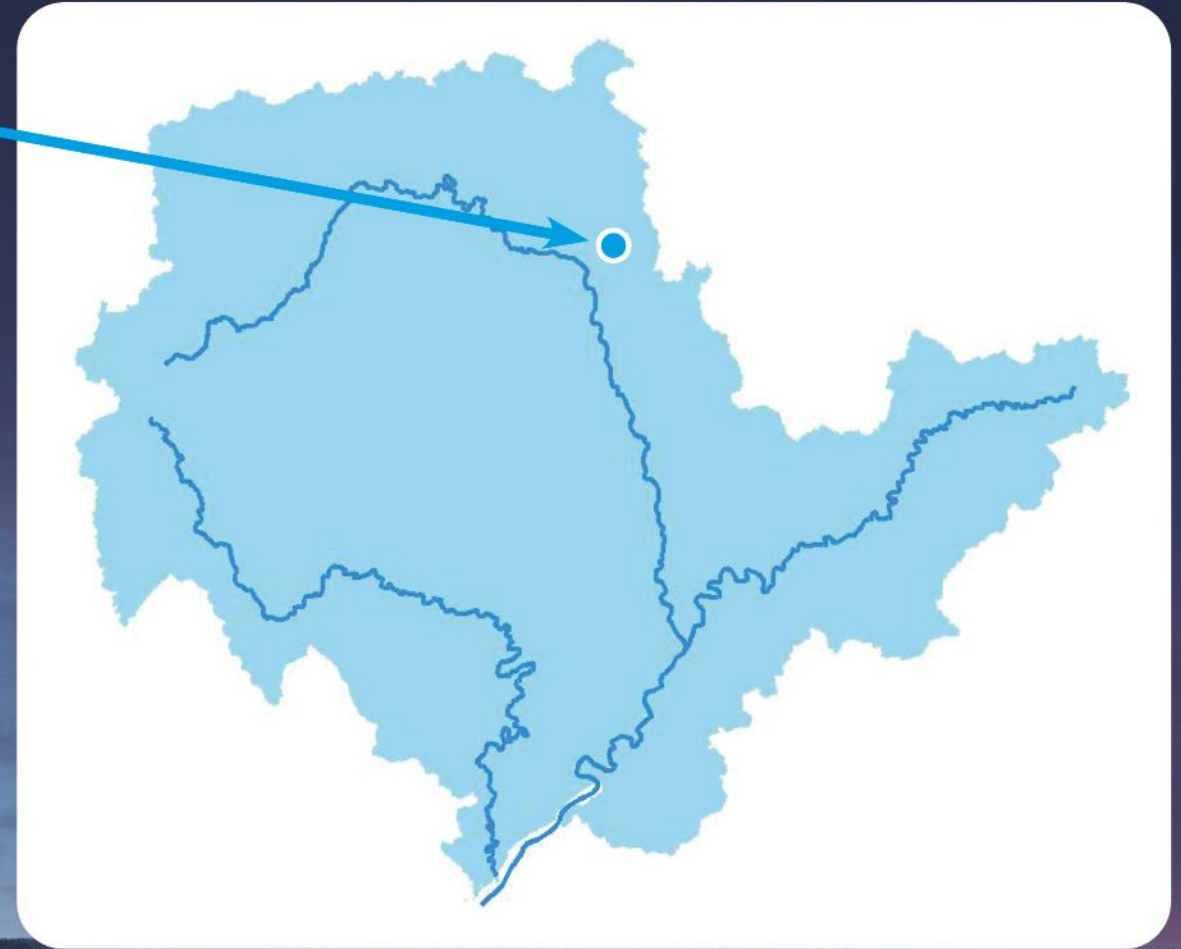
# Network as a Sensor

- Low atmosphere virtual rain gauges
- 170 datapoints
- Adding to radar and ground surface water measurements
- Working with the Met Office and local groups to
  - Improve weather modelling
  - Find new ways to exploit the data
  - React to real time rainfall events
- Clear links to other use cases



# Precision Irrigation

- Real time irrigation based on soil moisture sensors and evapotranspiration data
- Aiming to boost yield by 10% and reduce energy and water costs



# Digital Innovation Farms



## Harper Adams University

- Focus on Biodiversity Net Gain on site and LoRaWAN in a box with neighbouring farms to monitor livestock, the environment, soil moisture and security

## Overbury Farm

- Private 5G Network in partnership with VMO2.
- AI enabled CCTV to monitor livestock behaviour and location, carbon sequestration, nitrate loss and liquid fertiliser levels and leaks

## Hartpury University

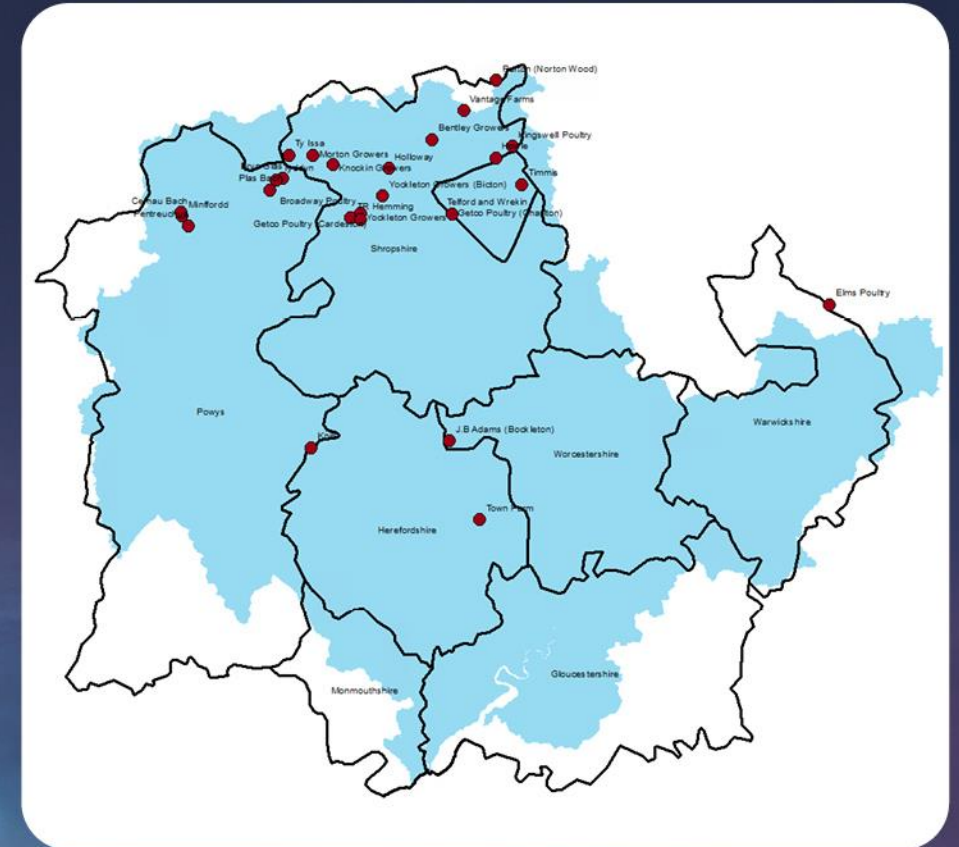
- 5G mobile network and repeaters
- Drone enabled crop management
- Range of other use cases



Growing list of showcase events between October and March

# Ammonia Reduction

- 22% of UK poultry sector resides in the RSP area
- Assumed to be a major contributor to airborne ammonia emissions
- Deploying biological sensors to 26 commercial broiler farms
- Blending measurements & a range of input and environmental datasets will
  - Improve husbandry practices to reduce ammonia levels
  - Increase flock weight
  - Contribute to more accurate modelling for the sector's emission rate



# Rural Roadshow



- **Mobile Connectivity Unit**

- Satellite Backhaul
- 5G
- 4G LTE
- NB-IOT
- LoRaWAN
- Wi-Fi

- **Engaging demonstration of new technology**

- Augmented reality
- Tactile applications

- **Followed up with**

- Digital health checks
- Invites to demonstration days



## Digital champions

- Senior officer with strategic influence
- Tasked to support the adoption of AWT and the deployment of mobile connectivity
- Supported by co-ordinators and elected member ambassadors

## Policy in a box

- Different councils leading on policy development

## Use cases

- Small scale
  - 5G footbridge
  - Legionella
  - Gully maintenance
  - Damp and mould
  - Public realm

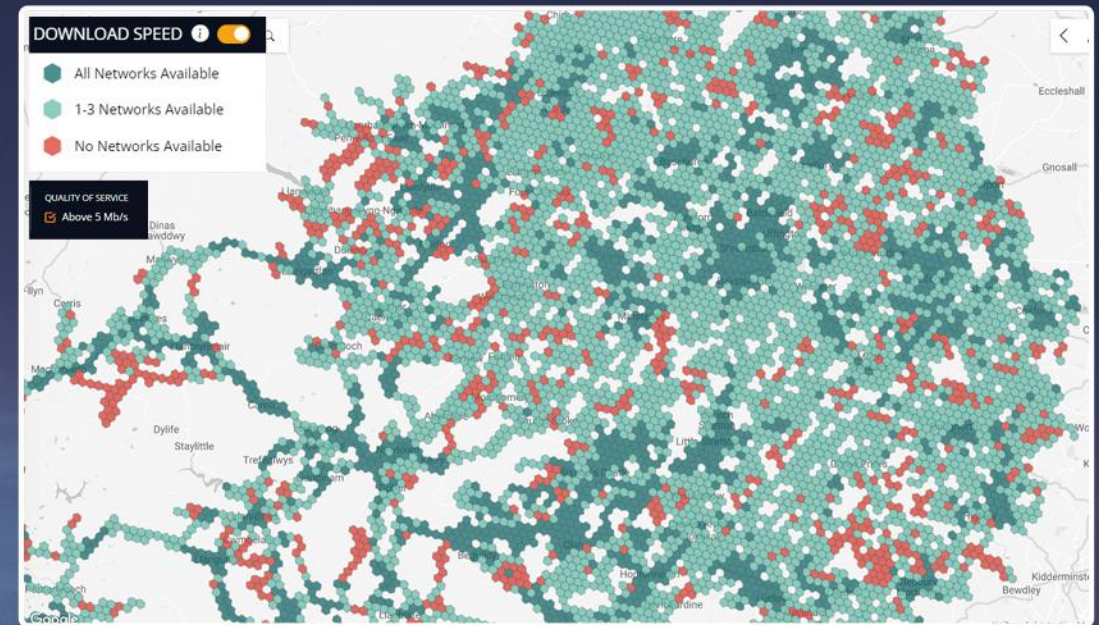




# UK's largest independent mobile signal survey



- Measuring all generations and all 4 mobile networks
- Also mapping LoRaWAN coverage
- On-street by default with equipment for loan to undertake off street surveys
- 20,000Km of public road measured
- Publicly available data
- Augmented with a mobile booster loan scheme



# Contact us



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