

Digital Infrastructure Grand Challenge: Working in an Inclusive Way with Rural Communities

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5G as a critical market infrastructure



TECHNOLOGY INNOVATION DOMAIN
[Producers]

INSTITUTIONAL DOMAIN
[Opportunities for Intervention]

TECHNOLOGY-IN-USE DOMAIN
[Consumers]

Knowledge Exchange & Education:

Sites of service production and delivery and its problematic properties. Understandings of the value of 5G Connectivity in key society groups

Scientific Knowledge:

Residing in Universities, Partners, Technical Equipment

Labour:

Expert labour & human resources

Technical design & Application

of knowledge for new Connectivity Systems

Capital/Investment

Project Partners
DCMS DEFRA RCC Funding

Product-Service Artefacts

Equipment:

Specialist transformation 'tools'

Parts:

Imported equipment

International Regulation:

producing standards and quality norms, property rights, licences, laws of operation and exchange

National Regulation:

Producing standards and quality norms, property rights, licences, laws of operation and exchange

Production of 4/5G Connectivity Network

& development of organisational networks – markets – infrastructures and possible Testbeds

Media

TV, newspapers magazines, blogs, social media, trade press

Societal Groups

Activist groups, NGOs, Welfare Concern, Work Concern Groups

Users

Consumers use

5G Technologies-in-Use

Use case market objects: that connectivity increases, enables and engages socio-economic interaction and exchange and results in the revaluing of connectivity as a service

Complementary technologies

linked into technical system of repair services; parts for recycling equipment

Institutional Voids:

Critical bundles of normalised practices (and the materials required in the performance of those practices including new 5G technologies) that prevent the market system from operating in a sustainable way

Four use cases

1. Health & Social Care

- Video Appointments – GP, Hospital, Occupational Therapy, etc.
- Isolation and Loneliness - How particularly video connectivity - seeing friends and relatives - can boost mood and mental health



2. Infrastructure and Flood Management

- Monitoring
- Early warning



3. Public Safety and Security: Mountain Rescue

- Medical telemetry; video, infrared night search
- Drones, Uni of York Helikite; Remote vehicle mounted BS



4. Tourism

- Using Augmented Reality to deliver more interactive education and storytelling experiences
- Live streaming events in real time so everyone has a front row seat

Use Case Benefits:

- Business innovation
- Wellbeing
- Safety & Security



Aysgarth Falls near Leyburn, North Yorkshire

Working with the Community

Research - Lancaster University Management School

- Independent research study
- Interviews with community & local businesses
- Opportunity to draw on academic science
- Look for patterns in the data
- Early themes: concerns, hopes & current lived experiences
- Sharing findings with the technical team to shape what the project delivers e.g. aesthetic/ health concerns

Community Engagement - NYCC

- Parish council meetings and residents - a space and place where the community can voice their opinions, have a say, and raise concern,
- Due to Covid-19 meetings held online – would have preferred ‘village hall’ events (and not everyone could access online services because of connectivity problems)

Community Experiences, Hopes & Concerns

EXPERIENCES - Poor connectivity wastes time and makes life difficult:

The broadband is really slow or drops out completely. It can literally take 2½ hours to do an online grocery shop because the signal's dropped out and we've lost our order and have to start again' (Homeworker)

'My child has had to sit in the car up the hill [to get a mobile signal] to take part in school online Zoom lessons so's not to miss out' (Parent)

HOPES - We want reliable, mobile connectivity:

'We would just like to have the reliability and consistency of being able to be connected, for our home and family, our business, but also the wider community, for example local farmers. Farming is a very lonely occupation, and probably one of the most dangerous' (Homeworker)

HOPES - Connectivity attracts and keeps people in our community:

'Having reliable connectivity for future residents will make the appeal of living in Coverdale much greater. It would help the community cohesion, the children living here, the schools, and everything that goes with it.' (Parent)

Community Experiences, Hopes & Concerns

CONCERNS - I don't understand 5G

'I don't know if 5G is the answer. I'd be happy with 4G and a decent broadband. I'm not in a position to decide what the answer is so, yeah, I'd like to know more about it because it's very vague in what's being described' (Retiree)

CONCERNS - Aesthetics of countryside

'I think we've got to be really conscious of the impact that we have on the beautiful environment that we live in..... there's a balance between people's requirements and preserving the landscape' (Homeworker)

CONCERNS - Impact on community cohesion

"there is this cohesiveness and cross-generational togetherness I've not seen anywhere else. I think it's partly... to do with the community activities. I would be interested to know where mobile technology figures on that one" (Homeworker)

Lessons Learned

- **Research and engagement are different in the time of COVID:** work *with* community to find engagement solutions
- **Communicate early and often:** be inclusive, contact everyone, update everyone on your progress
- Show active listening: *you said, we did*
- Communicate clearly the difference between **research** and **community engagement**: this is critical when emotions run high
- Work closely with **local third sector organisations**: they know the community (local knowledge is critical)



Lessons Learned



- **Share community concerns with your technical team:** this impacts how your project delivers and builds goodwill with community, shows you are listening and helps the project team develop better solutions
- Develop technical solutions **with** and **for** the rural communities you aim to serve:
 - A ***Responsible Research & Innovation*** projects puts **listening and engaging** with communities at its core: it brings different forms of knowledge and expertise into collision. These collisions produce new knowledge and move the project forward sometimes in surprising and innovative ways
 - **Co-developing use cases**

Thank you for your attention

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