

INTERIM EVALUATION OF 5G TESTBEDS AND TRIALS PROGRAMME

Annex 2: UK5G Survey Results & Sustainability and Collaboration Report

29 April 2023

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1. UK5G ECOSYSTEM SURVEY RESULTS

1. Introduction

This note summarises the results of a survey launched to members of the UK5G Innovation Network in August 2022.

The UK5G Innovation network is dedicated to the promotion of research, collaboration and industrial application of 5G in the UK. The network's mission is to ensure that the UK is seen as a leader and at the cutting edge of the ongoing 5G development.

The aim of this survey was to understand if the UK5G innovation network members think they are gaining the benefits which the innovation network aims to generate. The survey also includes a broader assessment of the motivations of organisations to join the network, an assessment of how members have used the network and an assessment of which network activities are seen as beneficial. This survey builds on the previous survey administered by DCMS in 2021.

2. The UK5G Innovation Network

The UK5G Innovation Network includes over 1,700 members spanning a range of different types of organisations including businesses of varying sizes, local government bodies, and universities. The Innovation Network includes several firms that received funding from the DCMS 5GTT programme.

The network aims to create opportunities for those different types of organisations to interact, share knowledge and learnings and collaborate. The network also organised activities and shared information. This includes:

- Member specific activities such as training sessions and other activities which were designed to generate increased levels of engagement.
- E-Newsletters and magazines - to increase awareness on the approach taken by some members around 5G and encourage other organisations to test/apply such approaches within their own organisation.
- Events hosted to bring together 5GTT participants and wider ecosystem members.
- Detailed reports and guides on their website detailing latest 5G activities and developments.

3. Methodology

The survey was distributed and promoted by UK5G among the 1,700+ members of the UK5G Innovation Network. The survey was sent out in August and was kept open for just under two months. After removing duplicates and blank responses, the total number of respondents that filled in all or part of the survey questionnaire is 136. The low number of responses suggests that the network may include passive members that are not actively engaging with the network, incorporating individuals and organisations that have an interest in the application of 5G technology. The email list may also include organisations that are no longer trading. The overall number of responses is close to the number of respondents (140) gained from previous surveys launched through the network.

Some respondents are 5GTT grant holders. 27% of the respondents belonged to organisations that had applied and successfully received 5GTT funding on at least one occasion. 3% of respondents has been unsuccessful in their application to 5GTT. Most respondents represent an organisation that had not applied to the 5GTT Programme.

Table 1 Engagement with the 5GTT programme

Yes and the project was successfully awarded funding	We applied for funding for more than one project and some applications were successful, but others were not	Yes but the application was unsuccessful	No	Not sure
29	8	4	85	10
21%	6%	3%	63%	7%

Note: N=136

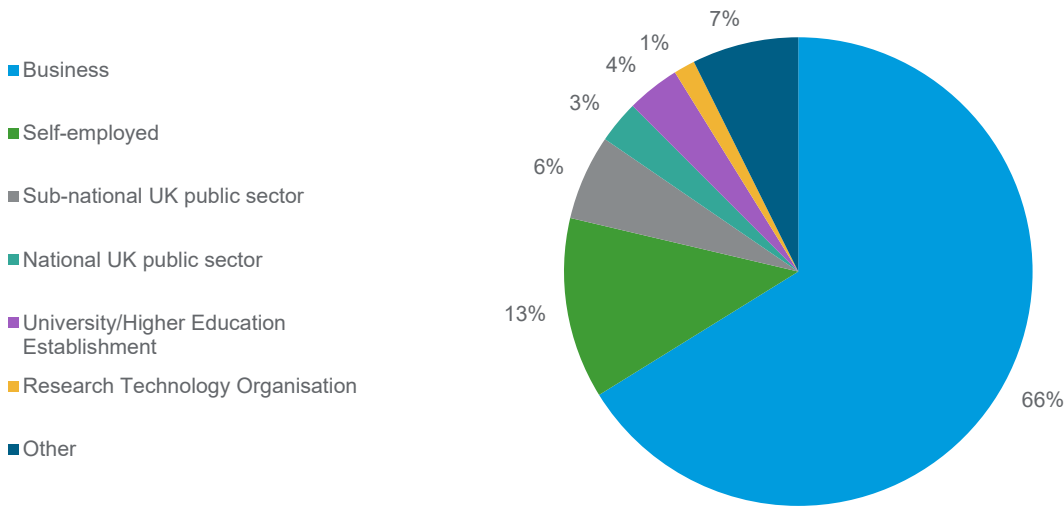
4. Results and analysis

Overview of respondents

82% of respondents are based in the UK and all regions of the UK are represented. 17% of respondents are based in London and another 17% are based on the South-East. 5% of respondents are from EU countries and another 5% respondents are based in the USA. The survey was also completed by one respondent in Taiwan, one in Canada and one in Israel.

Whilst there are a range of organisations that are members of the UK5G innovation network, two-thirds of those who responded to our survey are private firms or self-employed individuals. Another 13% of respondents identify themselves as self-employed.

Figure 1 Type of organisation

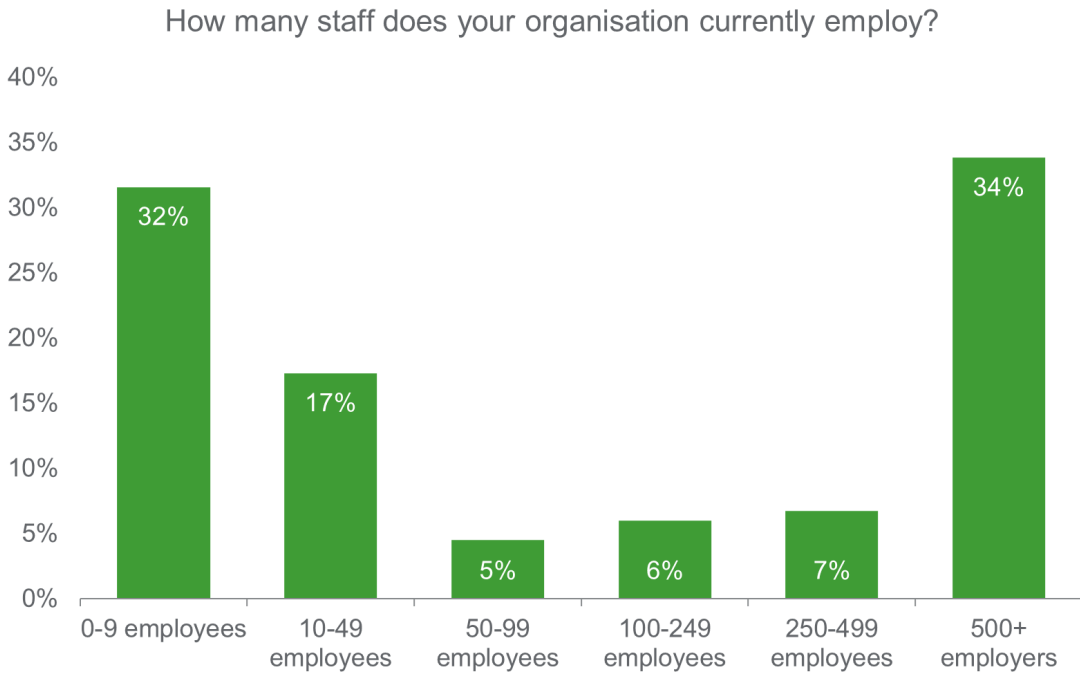


Note: N=136

The range of organisations who responded to the survey are varied in size. The majority of respondents represent either very small organisations between 0-9 employees (32% of responses) or organisations that have more than 500 employees (34% of responses). This is an interesting observation and may point to the fact that the UK5G Innovation network looked to bring together small firms who may well have been involved in the 5GTT programme with larger organisations. Many of the projects were designed to highlight to larger network operators the

viability of 5G solutions in previous unutilised scenarios such as in rural locations or in industries which had previously been thought of as low technology. The engagement of these larger firms may point to the effort made by both DCMS and the UK5G innovation network to keep them engaged.

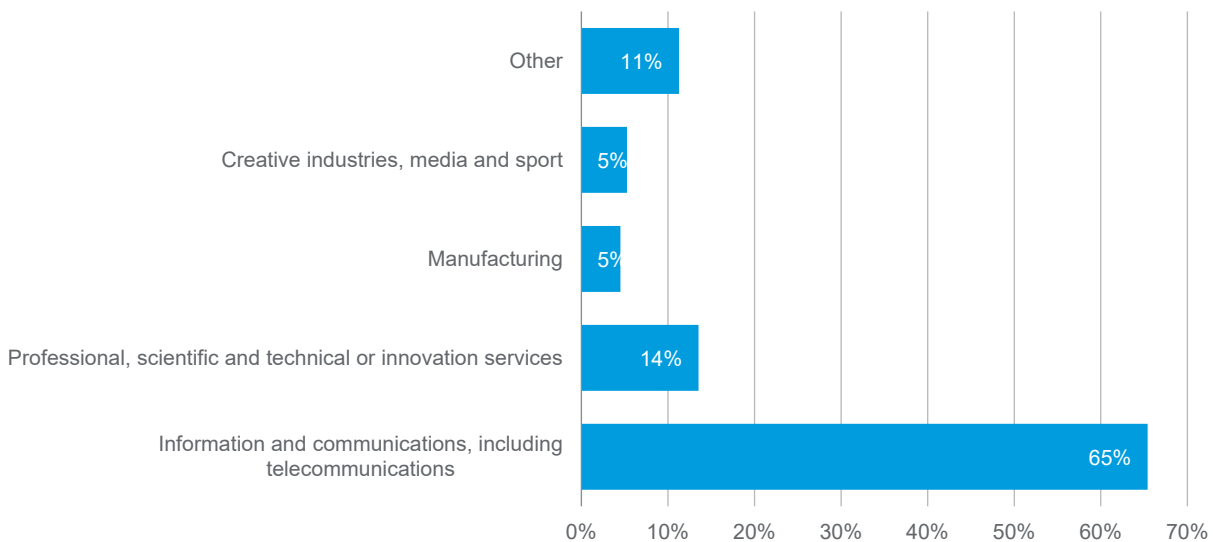
Figure 2 Size of the organisations



Note: N=136

65% of respondents are active in the information and communications sector. A further 14% of respondents are active in the Professional, scientific, and technical services sector. 5% come from the manufacturing sector and another 5% come from the creative industries.

Figure 3 Sectors represented



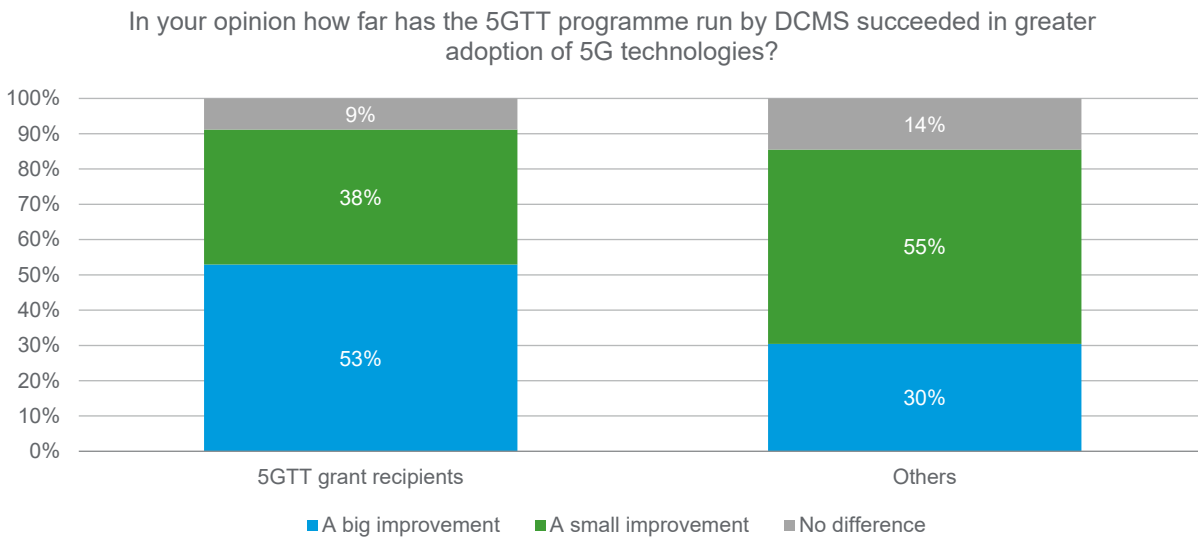
Note: N=133

Outcomes of the 5GTT funding programme

In reflection of the extent to which the 5GTT programme has succeeded in generating greater adoption of 5G technologies, 53% (18 of 34) of grant recipients find that the programme has resulted in a big improvement and another 38% (13 of 34) of grant recipients find that it has resulted in a small improvement (see figure below). Only 9% of grant recipients find that the programme has not made a difference. A lower percentage of the other members of the network find that the 5GTT programme has succeeded in greater adoption of 5G technologies. 30% (21 of 69) of other members reported having seen a big improvement and 55% (38 of 60) reported having seen a small improvement.

What this demonstrates is that within the UK5G Innovation Network ecosystem, that those who received grants felt that the 5GTT programme has resulted in greater 5G adoption. Whilst it was to be expected that grant recipients would experience a greater level of 5G adoption it is encouraging that so many non-recipients still believed that the programme had been impactful. The answers to this question are likely to be subject to sample bias as we would expect grant recipients to report that they had experienced greater levels of adoption. However as noted, although amongst those surveyed although a greater proportion of grant recipients thought the project had generated a large improvement in adoption compared to their counterparts, the fact that over 85% of respondents in both cohorts believed there was at least some impact was very encouraging.

Figure 4 Impact of 5GTT on the adoption of 5G technologies



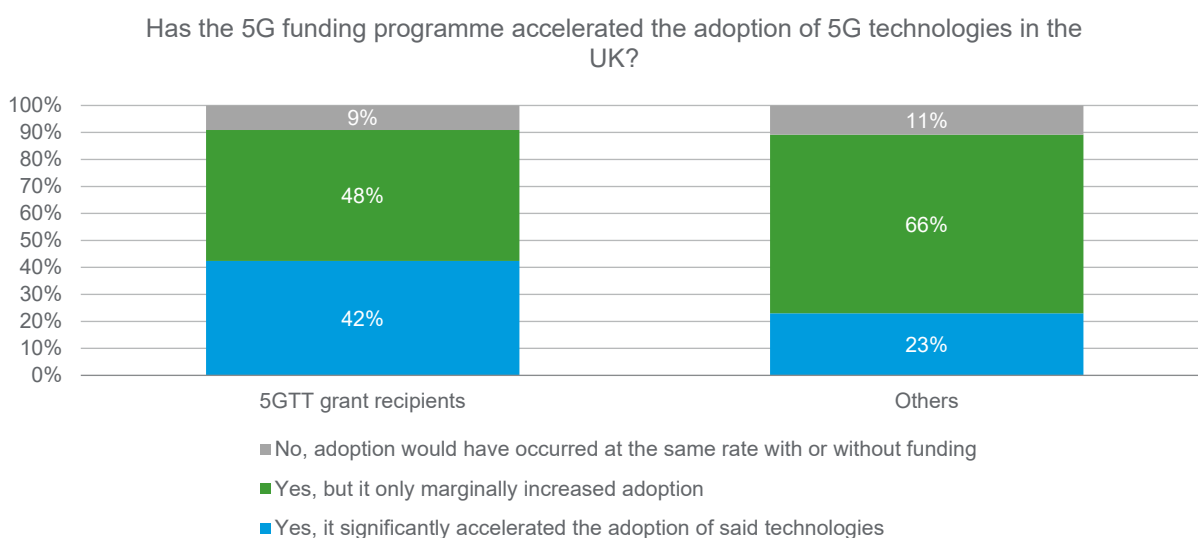
Note: N=133 (excluding 32 respondents that noted 'don't know/unsure')

Most members find that the funding programme has accelerated the adoption of 5G technology in the UK (see figure below). 91% (30 of 33) of grant recipients and 89% (66 of 74) of other members find that the programme has increased adoption. 42% of grant holders find that the programme has significantly accelerated the adoption.

Similar to Figure 4 above, it is important to note that the respondents captured in Figure 5 also subject to some degree of sample bias. It may well be the case that those respondents who did not receive grant funding are more objective in their responses than those who did receive funding and may have a vested interest in saying that the programme was a success. As such, it

is perhaps not surprising that a greater proportion of the grant recipients thought that the 5GTT programme had significantly accelerated the adoption of 5G technologies compared to their counterparts who had not. However what is encouraging is that 90% of funded recipients compared to 89% of non-recipients did agree that the level of adoption was at least increased somewhat because of the programme. The similarity of these rates across the two cohorts might indicate that there is a difference of opinion in, **to what extent** the programme accelerated adoption but there appears to be consensus that the programme **did to some degree** accelerate adoption.

Figure 5 Impact of 5GTT on the accelerated adoption of 5G technologies in the UK



Note: N=107 (excluding 26 respondents that noted 'not possible to determine/minimal impact')

Outcomes of the 5GTT network

One of the primary aims of the UK5G innovation network is to foster an environment which would result in an increased number of collaborations and allow the formations of new relationships and partnerships which could blossom and generate ongoing business opportunities moving forward. Figure 6 below highlights the high level impact of the UK5G Innovation network but some of the key findings can be found below:

- 42% of respondents find that the UK5G innovation network has led to new or enhanced collaborations, partnerships or contracts with other individuals and organisations working with 5G technologies and/or use cases.
- Some of the survey respondents indicate that the UK5G innovation network allowed organisations to work together on (new) research engagements or on communication activities with partners met through this network.
- Another respondent indicated that the network provided a good environment for sounding out potentially new commercial activities. Such activities may have remained unknown to network members had they not joined the network.

Several respondents remark on the benefits generated from this increased collaboration. Not only do organisations believe that the network will help with greater visibility and knowledge of 5G but that through new research streams and outputs that it will help to accelerate their digital transformation journeys. Commercial benefits referenced include the generation of new products. One respondent commented that collaboration had resulted in increased revenues, growth and

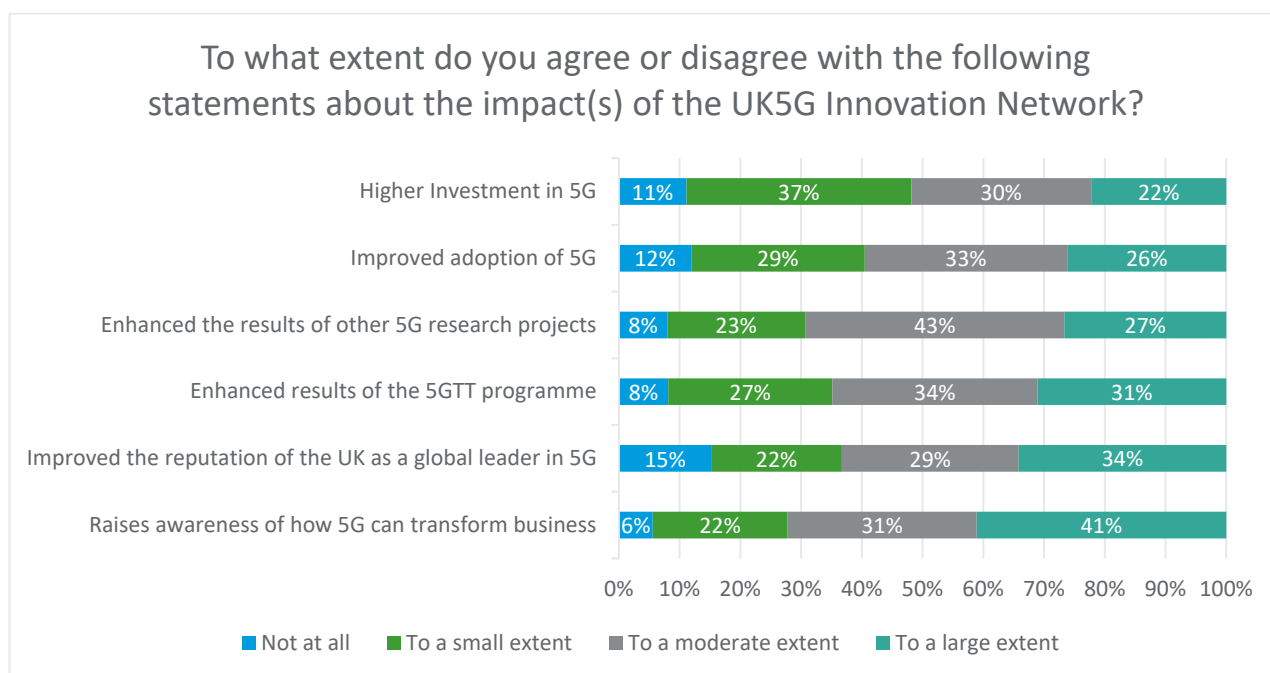
job creation. Respondents also noted that simply having access to such a network will help to build a stronger 5G ecosystem in the UK which would subsequently lead to the UK being seen as a centre of technological excellence.

The UK5G Innovation Network was (also) designed to help boost the perception of the UK as a global 5G leader and 85% of respondents find that the network has made a contribution. 34% find that the network has made a large contribution to boost the reputation of the UK.

- The survey results show that the Innovation network has led to the increased awareness of how 5G can transform businesses. 85% of survey participants said that the innovation network had at least some impact on raising awareness and 72% of respondents indicate the network has had a moderate or large impact.
- With regards to adoption of 5G, 88% of respondents find that the UK5G network has had some impact on the adoption of 5G technologies with nearly 60% of these respondents claiming that this network had either a large or moderate impact. Most respondents also find that the network has helped enhance the results of the 5GTT programme and of other 5G research programmes.
- 89% felt that the UK5G network had an impact on boosting 5G investment with 22% responding that the network has had a large impact on boosting investment.

Overall Figure 6 indicates that the UK5G Innovation network was very impactful across a range of areas. Respondents appeared to be most positive about how the network helped to raise awareness of the business transformation applications of this technology. Across other areas of note such as improved adoption, higher investment and improving the reputation of the UK as a global 5G leader, respondents were positive that the network had led to improvement in all these areas. It is important to note that this included grant recipients and non-grant recipients and serves as clear evidence that the UK5G innovation network was an organisation which was very beneficial to its members across a variety of aspects.

Figure 6 Outcomes of the UK5G network



Note N ranges from 74-90 excluding respondents that indicated 'Don't know'

52 respondents provided a comment on how they have applied knowledge gains. 19 of these respondents had received some manner of funding from DCMS as part of the Testbeds and Trials programme. This serves to show how many of the respondents not only had knowledge gains as a result of being part of the network but that they were able to have a number of tangible examples of how these gains have been practically applied. These range from the creation of new services to product generation and new processes being adopted.

8 of the abovementioned 52 respondents commented that the new knowledge gained from being part of the UK5G network enabled them to generate additional new business opportunities in various guises (resulted in winning business, resulted in business growth, resulted in the development of apps etc.). Only 3 of the 8 are respondents that were part of the 5GTT suggesting that impact on business extends beyond the 5GTT beneficiary group. Other examples of use reported include:

- Understand options and opportunities; Redefine the business narrative
- Seek collaboration with a company to distribute 5G; Connect with suppliers/systems manufacturers and integrators
- Formulate new innovative proposals
- Expand 5G testing capability with additional vendors
- Install a private 5G network for remote sensors and video cameras
- Realise business growth; Raise capital

These examples go in many ways beyond those which were expected from the Innovation network. It was hoped that the network would help to increase collaboration both between 5GTT members and the wider ecosystem along with lead to added investment and generate growth but some other benefits were arguably more surprising. The fact that respondents noted that the network led to an expansion of 5G testing capability highlights that the impact of the network extended beyond just sharing knowledge but actually led to some tangible benefits being manifested. The benefits caused by collaboration are especially crucial as it is this which would lead to wider knowledge sharing and the positive spillovers of the acquired knowledge to not just members of the wider 5G ecosystem but to the economy as a whole.

Impact of the 5GTT funding programme and UK5G network

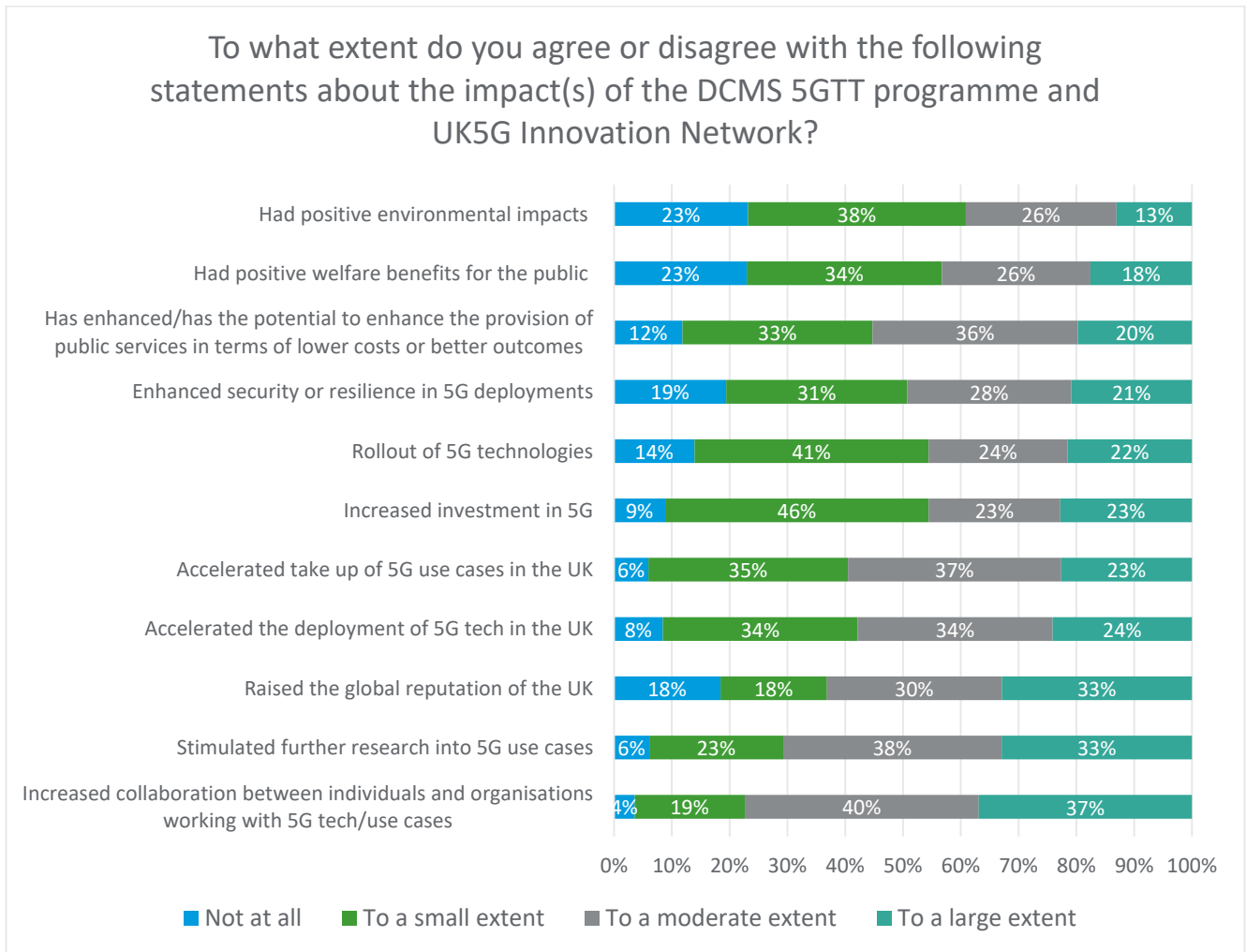
To evaluate the impact of the overall programme we look at the combined effect of the 5GTT funding programme and the UK5G network. It may be that the organisations which took part in the DCMS funded programmes bring positive spillover effects on other organisations that are members of the Innovation network but did not receive funding. In view of the potential wider benefits of the programme, most respondents saw benefit from the 5GTT programme and/or the Innovation network.

- **Collaboration** - some 96% of respondents find that the 5GTT programme had some positive impact on increasing collaboration with 77% of respondents believing that the network has had either a moderate or large effect.
- **Further research into 5G use cases** - 94% of respondents find that the programme stimulated further research into 5G use cases, 71% of these respondents indicate that this impact was at least to a moderate extent.
- **Rollout of 5G technologies, take up and accelerated deployment** - On the impact which the 5GTT programme had on the roll out of 5G technologies, accelerating the take up of 5G

use cases and accelerating the deployment of 5G technology, the survey respondents appear to be generally positive.

- 94% of the respondents believed that the DMCS 5GTT project had some positive impact of accelerating the take up of 5G use cases, with 92% responding that the programme had some positive impact on accelerating the deployment of 5G technology within the UK.
- Additionally, over 86% of respondents believed that the programme had some positive impact on the rollout of 5G technologies.
- This compares very favourably to the previous survey conducted by DCMS in 2021. In that previous survey 83% of respondents believed that the UK5G Innovation Network had at least some impact on the deployment of 5G technologies.
- In addition, when looking at the take up of 5G use cases, the 2021 survey from DCMS 82% of respondents stated that the network had at least some impact in accelerating this.
- **Investment** – 91% of respondents report some positive impact of the programme on increased investment in 5G. However, a substantial percentage of respondents found that the DCMS 5GTT programme did not have a sizeable impact on further 5G investment, with 54% of respondents finding that there was either a small impact or no impact at all. The high percentage of respondents who reported that the programme had increased investment indicates that the 5GTT had helped to promote funding in this area. This point combined with the following point that over 50% believed that the programme had not stimulated further investment indicates an atmosphere of disappointment that this has not occurred. This disappointment suggests that there is appetite for more to be carried out to help increase investment in 5G and that more sources of funding need to be available for this to occur.
- **Wider benefits** – 77%-88% of respondents find at least some positive effects on increasing welfare, on enhancing the security and resilience in 5G deployments and on the potential to enhance the provision of public services in terms of lower costs or better outcomes
- **Global reputation** - 82% of respondents are of the opinion that the 5GTT programme and the UK5G Innovation network has been successful in having some positive impact on boosting the global reputation of the UK as a leading 5G nation. This is compared to the previous survey led by DCMS in 2021 where 60% of respondents either agreed or strongly agreed that the UK had improved as a leading 5G nation. This illustrates that not only is the UK is on the right path with regards to being a leading 5G nations but that organisations such as the UK5G Innovation network along with programmes like the 5GTT initiative would be key facilitating factors in helping this to be realised.

Figure 7 Impact of the 5GTT and the UK5G network



Note N ranges from 74-84 excluding respondents that indicated 'Don't know'

One of the key elements which the 5G project was aiming to achieve was to increase the standing of the UK as a leading 5G nation.

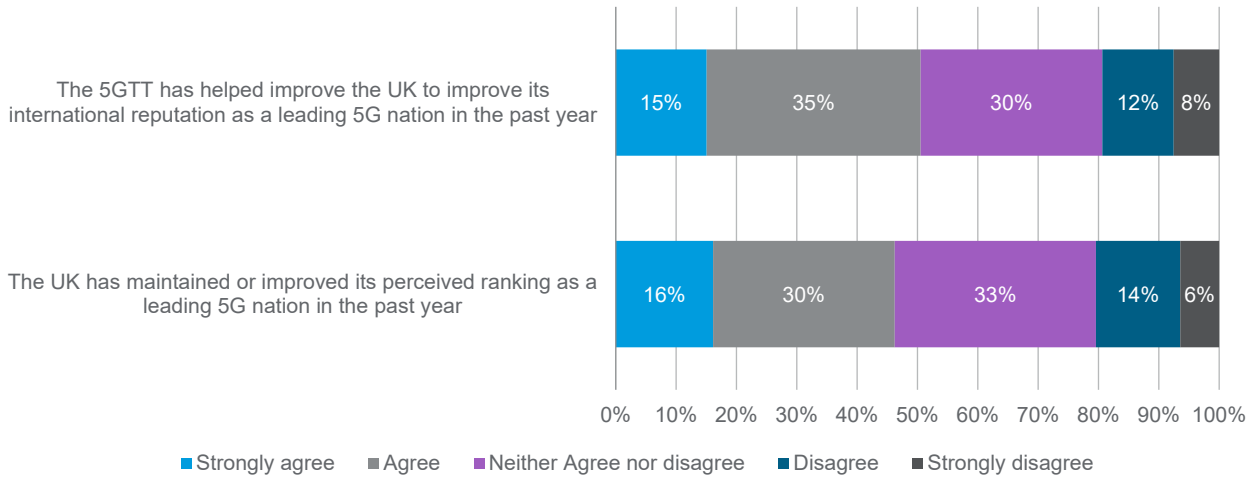
- On the point of whether the UK has increased or improved its perceived ranking as a leading 5G nation over the past year 46% of respondents either agreed or strongly agreed.
- By comparison on the question looking at the impact that the 5GTT programme has on improving the international reputation of the UK 50% of respondents either agreed or strongly agreed with this statement.
- Only 20% of respondents who either disagreed or strongly disagreed with the two statements. Compared to the previous UK5G survey conducted in 2021, the overall percentage of respondents who agreed that the UK had maintained or improved its ranking as a leading 5G nation was 61%.
- Additionally, the proportion of respondents who felt that the 5GTT programme had helped in expanding the profile of the UK in this regard was 56%.

The encouraging theme of these results is that it appears to be evidence that as the network, along with the 5GTT projects became more established, knowledge about the benefits which

arose similarly became more widespread. This gives confidence that as the 5G technologies continue to mature and UK firms become more skilled and adept at utilising them, that the reputation of the UK as a nation at the centre of driving the use of these cutting edge technologies will go from strength to strength.

Figure 8 Impact of the UK5G network on the international reputation

Considering the work of UK5G and the wider DCMS 5G Testbed and Trials Programme as a whole, do you agree or disagree with the following two statements



Note N=93

Assessment of the 5GTT network

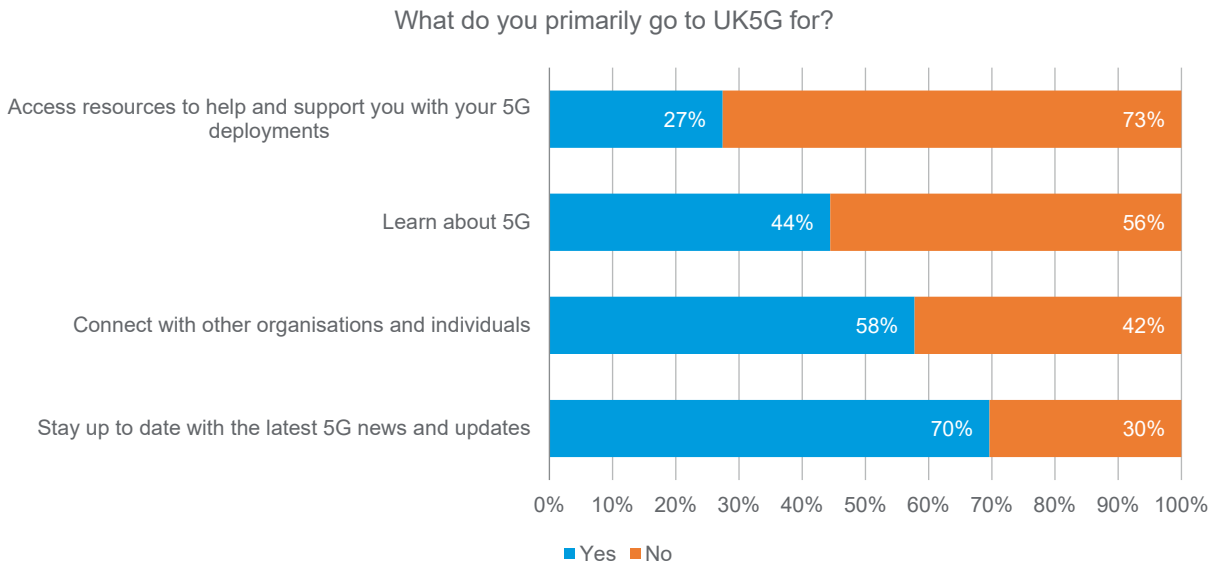
The following section provides an assessment to the approach the UK5G network was implemented. The survey results indicate that the UK5G innovation group were extremely helpful in keeping the network members up to date with the latest 5G news and developments as well as helping organisations connect with other organisations and individuals.

- 70% of respondents agree with the sentiment that the UK5G Network was useful in helping members to stay up to date with the latest developments which were occurring in the 5G space.
- 58% of respondents reported that the UK5G network helped to connect members with other organisations and individuals, highlighting that the network was useful in helping to foster the collaborative environment so crucial to developing future opportunities.

What the survey also indicated is that the UK5G innovation network was not especially useful in allowing its members to access resources which helped with 5G deployments.

- Some 73% of respondents felt that the network did not help with this regard.
- Somewhat surprisingly 56% of respondents said that they did not go to the UK5G network to learn about 5G. It may be that those respondents already felt informed.

Figure 9 Motivation to join the UK5G network



Note N=135

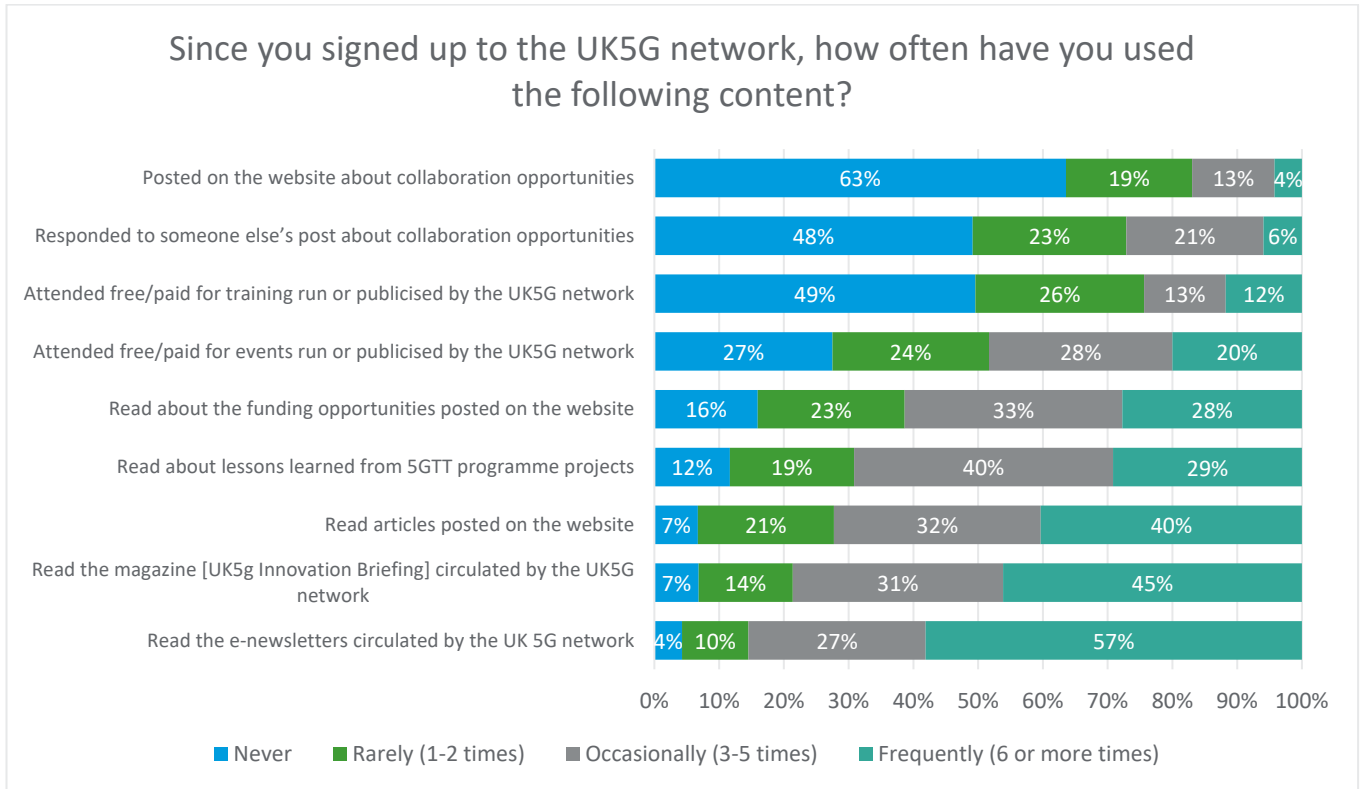
The network circulated content to try and raise awareness both about 5G and on what the Innovation Network was looking to accomplish. The content ranged from e-newsletters to regularly issued magazines, to training sessions issued by the UK5G Network all in the aim of raising awareness of the aims the network was trying to achieve. The e-newsletters issued along with the regularly circulated magazine appear successful mechanisms for dissemination. 96% of respondents either read the newsletters frequently or regularly with 84% of respondents reporting that they used this mode of content on at least either a frequent or occasional basis.

Whilst this is highly encouraging, there were other sources of content that respondents engaged less frequently with.

Almost 50% of respondents claimed that they had never attended a training session run by the UK5G network with 63% of respondents claiming that they had never posted on the website about collaboration opportunities with 48% of respondents having never responded to a post which somebody else had put up¹.

¹ Further analysis could compare these percentages with the actual volume of traffic on the website which will give an indication of bias.

Figure 10 Engagement with UK5G content

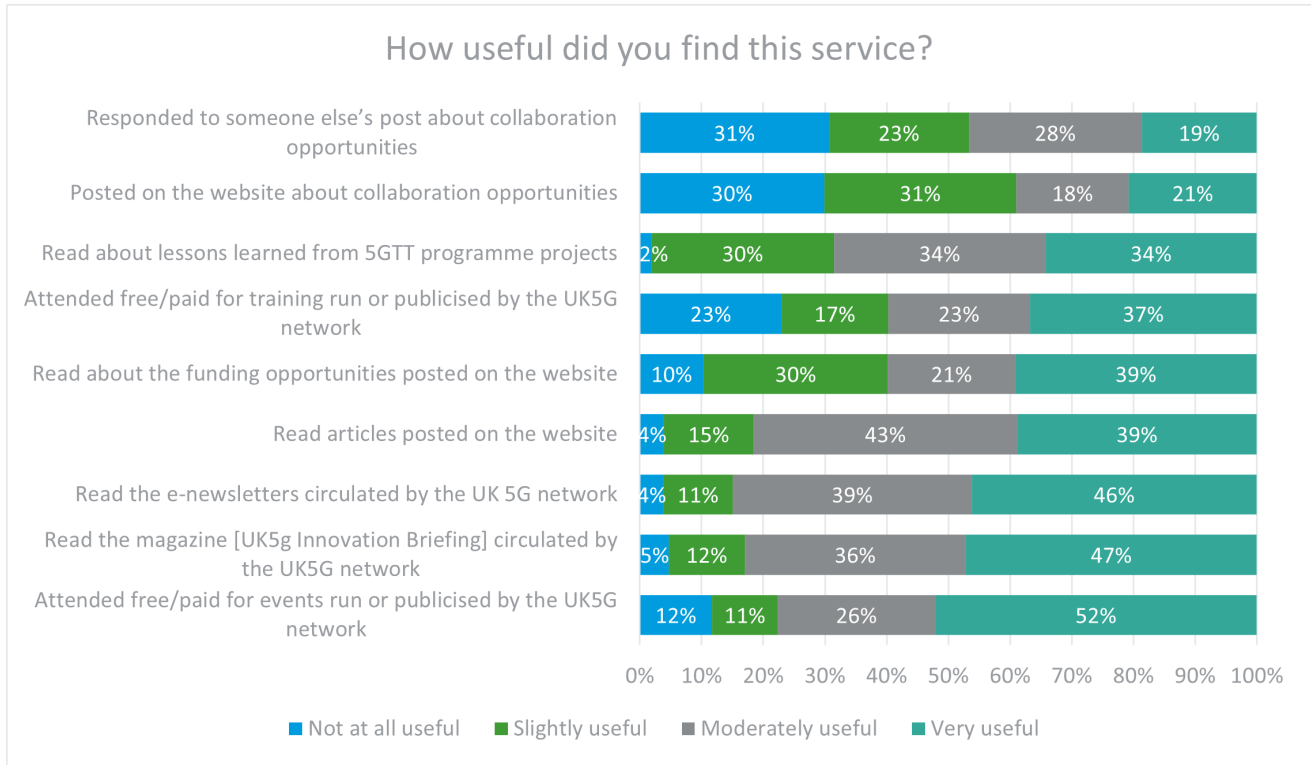


Note N=119-121 excluding respondents that indicated 'Don't know'

The UK5G innovation network was envisaged as a useful source where members could learn about the range of different 5G use cases being developed by some of its members.

The figure below provides an overview of the degree to which respondents find the various services useful. A majority find most opportunities to engage useful, irrespective of the frequency of engagement. For example, 52% found the events very useful and 47% read the UK5G magazine and find this very useful.

Figure 11 Degree to which UK5G content is useful

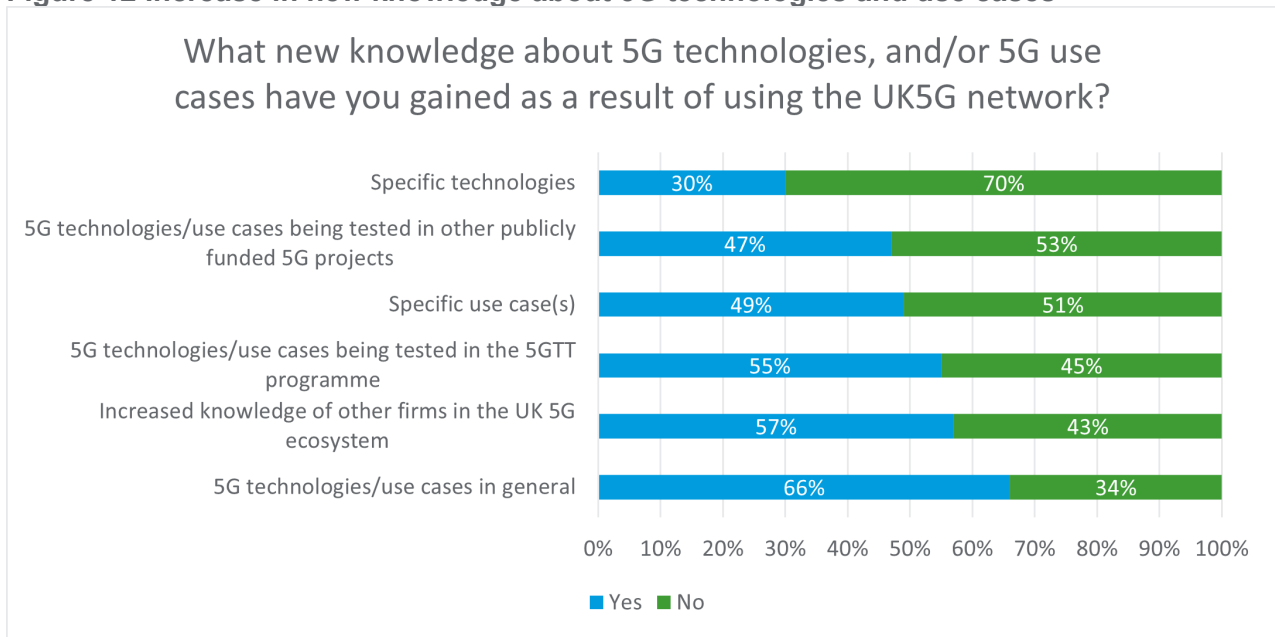


Note N=87-108

In terms of raising awareness of 5G technologies and the increased knowledge of other firms in the UK5G ecosystem this was largely positive.

- The graphic indicates that 66% and 57% of respondents respectively replying that the UK5G network did help with increasing knowledge.
- 47% - 55% of respondents find that the network helped to raise awareness around technologies and use cases being used in other publicly funded 5G projects or in the 5GTT programme.
- 30% of respondents find that the UK5G network helped to increase knowledge of specific technologies.

Figure 12 Increase in new knowledge about 5G technologies and use cases



Note N= 121

In order for the UK5G network to bring value it is important that it includes individual and organisation that have a vision for integrating 5G and can advocate/drive a sectoral change. We asked survey respondents if a sufficient number of individual or organisations that are part of the network are able to set an example.

Several respondents felt they did not have sufficient information or exposure to answer this question which indicates, perhaps justifiably that the entities found it challenging to gauge what constituted a sufficient number of individuals. When looking at the remainder of answers we find that there are more positive responses than negative responses, with some variation across the sub-questions.

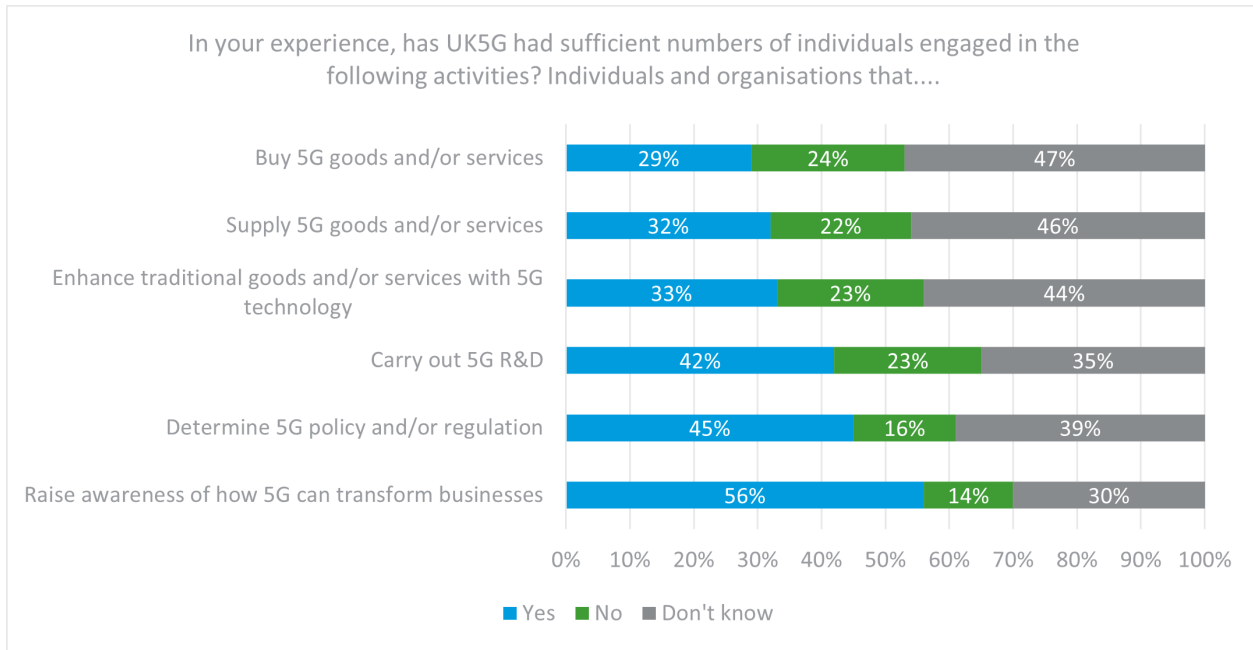
- 29% - 32% of respondents find that the network has enough members that buy or supply 5G good or services
- 33% of respondents find that the network has enough members that enhance traditional good or services with 5G technology
- 42% of respondents find that the network has enough members that carry out 5G R&D
- 45% of respondents find that the network has enough members that determine 5G policy or regulation
- 56% of respondents find that the network has enough members that can raise awareness on how 5G can transform businesses

The survey questionnaire also asked if there are particular groups missing within the Innovation Network, and where would it be useful to have more representation within the new network and 32 responses were made.

- Of these, eight respondents suggested that no particular groups were missing and others (24) suggested that some stakeholders were missing.

- Stakeholders that were thought not well represented are start-ups, vehicle manufacturers, a group targeting user experience, end-user groups, groups that scale 5G innovation, academic, NHS and primary care organisations, VC funds and/or investors that are looking to commercially exploit business opportunities that come from the funded projects, supply chain companies, small vendors, BEIS, DIT, DLUHC, and DEFRA.

Figure 13 Representation in the UK5G network



Note N=89-93

5. Conclusion

The UK5G Innovation network was set to give firms interested in developing 5G capabilities the opportunity to collaborate and learn from one another. To that aim, this survey gave useful insights into whether this aim of the UK5G innovation group was met. Key insights were:

- The UK5G Innovation network was successful in fostering an atmosphere where collaboration was encouraged.
- The survey also shows that the UK5G network was relatively successful both in increasing awareness of 5G technologies and also in spreading the knowledge of the various use cases which innovation network members are currently working on.
- The results indicate that both the 5GTT programme and the Innovation network have been effective in enhancing this reputation and that encouraging and raising exposure of the 5G use cases has helped wider members believe that the UK has improved its international standing.

The e-newsletters and magazines which were regularly issued had consistently high levels of engagement which then ensured that knowledge about the availability of 5G technologies along with the varying use cases was spread within select members. This survey which followed on from the survey administered by DCMS in 2021, appeared to highlight that confidence around utilising 5G technologies, as well as increased awareness of the UK as a leading centre for 5G had improved since the previous circulation of the survey. This was an encouraging sign to show

that knowledge around the capability of 5G and the UK's place in harnessing these technologies should only rise.

The respondents raised other key elements (unprompted). One respondent for example expressed hope that 100% of land mass within the UK gets 5G coverage, another expressed interest to ensure that rural communities are not left behind and that they too get the chance to benefit from the spectacular growth opportunities which 5G presents. The way in which the network operated for SMEs compared to larger scale enterprise firms, not to mention universities and public bodies was also very varied and this was an element which perhaps requires specific consideration moving forwards. What the survey respondents demonstrate, is that whilst 5G technologies have a lot of potential and that the network has helped to raise awareness around the 5G use cases, further work is still required.

Respondents flagged awareness that the UK5G network was coming to an end. There appears to be an appetite to maintain the 5G community and what's more, to ensure that it continues to grow to offer real and effective collaboration opportunities. This comes with the realisation that for this to continue, funding also had to continue to ensure that the activities which the UK5G network carried out could be continued by the subsequent incoming UKTIN organisation. For this to be truly effective, a recommendation was made to simplify access to funding for wider groups of organisations. Other respondents indicated that for potential results to manifest into tangible long-term results, organisations need additional funding along with more time as they currently do not have sufficient resources to implement 5G use cases on their own.

The respondents to this survey questionnaire are not necessarily representative of the wider population of network members and for this reason the survey results may not be an accurate reflection. However, several of the respondents are active members of the network and have also benefitted from further engagement with DCMS and benefitted from grants. These active members are likely to be important advocates for 5G in the UK.

2. SUSTAINABILITY OF 5GTT PROJECTS

Introduction

This is a report summarising how the 5GTT projects will be sustained beyond the life of the DCMS funded programme. This includes information about:

- where 5G networks have been established and are being sustained or rolled out further;
- any new products or services, developed as a result of the funded activities, that project partners are looking to commercialise;
- the number of and type of staff employed by private and public sector consortium members, and the number of academic departments that were involved in the 37 5GTT projects;
- the number of research outputs, new Master/PhD graduates, and spin-offs generated as a result of the 5GTT programme;
- the average Technology Readiness Levels (TRL) of the use cases developed by the 37 projects, and their growth during the course of 5GTT programme;
- how the project learning has been shared, and with whom it has been shared;
- whether the consortium established for the 5GTT project will continue in some form beyond the project and what they are working on; and
- whether the consortium is applying for further funding, from government or other sources, to develop the outputs of the 5GTT funded project further.

Links to the UKTIN/UK5G web pages for the 37 projects, along with their individual websites and social media accounts, where available, are given in Table 12, towards the end of this annex.

Data sources for this annex include²:

- information from project final reports and sustainability reports submitted to DCMS by funded 5GTT projects where available;
- Benefits Realisation (BR) reporting;
- qualitative interviews conducted by the RSM evaluation team with funded project partners; and
- a survey of successfully funded projects.

Key messages:

- 107 networks were installed and 70 of these are still in place and in use. There are 19 networks where the current status is unknown. The percentage of networks still in use is therefore between 65% and 92%, which suggests a majority of networks are being sustained beyond the life of the funded 5GTT projects.
- 20 projects have developed market ready products or services (54%) and 29 (78%) have adopted improved processes. This means there is scope for commercialisation of outputs for more than half the projects, and scope for productivity improvements for more than three-quarters.

² Information about Phase 1 projects is included where available

- The programme achieved a level of match funding from the consortium members which was around 64% of the extent of DCMS funding.
- About £54,150,537 of third party investment has been stimulated. This is private or government investment beyond the scope of the project, attracted by the work done on the project, to either further develop the project's use cases or to develop new use cases inspired by the project.
- About £97,806,313 of further funding is recorded in the BRs. This is private, or government investment beyond the scope of the project to develop similar or related new use cases.
- Measured on a Full Time Equivalent (FTE) basis, 1,466 employees worked on the 5GTT projects (an average of 39 per project), including 101 public sector (average 2.7) and 1,365 private sector (average 37) employees. 212 private-sector employees (average 5.7) were newly for the 5GTT projects. From the academic institutions, 65 (average 1.8) departments were involved across the 37 projects.
- Overall, the 37 5GTT projects recorded an average growth in TRL of 1.7 throughout the course of the 5GTT programme. In terms of individual use cases, 100 (29%) of the 345 use cases that were developed either met or exceeded their target TRLs.
- The 37 5GTT projects resulted in a total of 109 research outputs including 76 publications, 17 trademarks and patents, and 9 prototypes. This amounts to an average of 2.1 publications, 0.5 trademarks and patents, and 0.2 prototypes per project.
- The 5GTT programme further resulted in 18 spin-offs and 21 new Masters/PhD graduates in 5G specialised fields from the 37 projects. On average, this amounts to 0.6 new Masters/PhD graduates and 0.5 new spin-offs per project.
- Interviews and project reports show some projects have gone on to receive funding from industry sources and other DCMS programmes such as FRANC, and other government sources such as Innovate UK to continue project activities.
- Projects have been very active in sharing their learning at events both within the UK and overseas. They have presented at telecoms events, but also for events in other sectors (eg healthcare, transport etc). This means there has been good reach beyond the UK5G network, which should help to generate interest and demand for further 5G deployment.
- There are a range of further collaboration activities planned. Most consortiums reported the intention to keep collaborating with other parties in the consortiums that were set up for 5GTT projects (although seven interviews did not provide information on this). There were also at least 73 further collaborations during and after the projects (10 projects did not provide information about this). There appears to have been a high degree of collaboration with other projects involved in the programme and this suggests some longevity of the ecosystem.

Continuation of 5G networks

Table 2 below summarises information from the BR sheets, sustainability reports and interviews about whether 5G networks installed during 5GTT project are still in place.

Table 2: Networks deployed by projects and whether these are still in use

Project name	Number of use cases	Number of 5G networks deployed	Current network status			
			Still in operation	Shutdown/dormant	Removed	Unknown
5G CAL	4	2				2
5G Edge-XR	19	4	1			3
5G Encode	4	2	1	1		
5G Festival	3	4	4			
5G FoF	5	1	1			
5G Logistics	3	2		2		
5G Ports	3	2	1			
5G-AMC2	5	2				2
5GEM	2	2	1		1	
5GRN	3	1				1
5G Wales Unlocked	4	7	7			
Connected Cowes	3	1	1			
Connected Forest	3	3	3			
Eden Universe	4	3	1			2
Green Planet 5G	4	1				1
Live and Wild	5	1				1
Liverpool 5G Create	9	1				1
MANY	4	3	2			1
MK:5G	4	1				1
MONeH	6	2	2			
New Thinking	11	4	2			2
5G Rural Dorset	5	13	13			
Smart Junctions 5G	5	1				1
VISTA	6	1	1			
West Mercia 5G	2	2	1		1	
WM5G (Application Accelerator)	1	3		3		
WM5G (Infrastructure Accelerator)	9	9	9			
WM5G (Manufacturing)	3	2	1	1		

Project name	Number of use cases	Number of 5G networks deployed	Current network status			
			Still in operation	Shutdown/dormant	Removed	Unknown
WM5G (Transport Road Sensors)	7	1	1			
WM5G (Transport Use Cases)	14	1	1			
WM5G (Healthcare)	67	1	1			
Phase 1						
University Test Networks		3	2			1
5GRIT	4	10	10			
AutoAir	3	1	1			
Smart Tourism	6	N/A*				
Liverpool 5G	5	1	1			
Worcestershire 5G	6	5	1			4
Rural First	15	3				3
Total	266	107	70	7	2	28

Interviews and project reports

* Used and Extended University of Bristol Test Network (still in use)

Most projects deployed at least one network to test their use cases. Three projects reported that their network would not continue beyond the life of the project: **West Mercia 5G**, **5G Encode** and **5G Logistics**.

West Mercia 5G originally planned to install around 5 masts across Herefordshire and Shropshire, but their original mobile network operator (MNO) partner withdrew from the consortium. The MNO who took over (BT) was only able to install one mast in Herefordshire, which is being withdrawn at the end of the project. The use case to test 5G for remote consultations in care homes moved focus to Malvern (in Worcestershire) and was trialled on the public 5G network in the area. The network in the care home will continue to be used.

5G Encode and **5G Logistics** reported the networks had been left in place but were no longer in use. The sustainability report for Encode (prepared in April 2022) reported the 5G ORAN system installed at the National Composites centre would be taken offline for 90 at the close of the project to resolve performance issues with the management software and reactivated when/if a new research project was identified. There is no explanation about why the network was not in use for the 5G Logistics project.

Eight projects reported plans for upgrading or expanding the networks installed and five of these (Factory of the Future, 5GEM, MANY, Eden Universe and Connected Cowes) were networks managed by Aql, who were unable to fully set up networks in the life of the 5GTT project due to issues with equipment. In some instances, they were not able to deliver the technology required during the life of the programme.

- One network was deployed for 5G Factory of the Future. Aql had hoped to deliver a 100 MHz network during the project; this was not possible, but they are committed to installing this as

agreed in the near future. They have also committed to upgrading to a 100MHz network for Eden Universe.

- Two networks were installed for 5GEM, and Aql plan to install two more.
- For MANY, at least two of the three networks deployed (operated by Quickline and Aql) are still in operation. One of the use cases was developed without a 5G network, but this is now available and it went live in October 2022.
- Connected Cowes planned to deploy five masts covering the Solent, but were only able to deploy two in time for 2021 Cowes Week, but they still plan to deliver the five masts in total.
- Four networks were deployed for 5G Festival. These will all continue to operate and will be upgraded to 5G New Radio equipment with a 5G Core network consistent with 3GPP standards.
- For 5G Rural Dorset, all networks will be left in place to provide further research and use case studies. The Connected Coast lead, Excelerate Tech, will also provide private 5G networks along the Jurassic Coast.

Three other projects are seeking further funding to expand their deployment.

- 5G Wales Unlocked is seeking further funding to deploy 5G networks for the maintenance of heritage properties at around 20 other castles in Wales managed by Cadw.
- Liverpool 5G Create created the largest 5G mmWave network in the UK and Europe, and the second largest in the world. The long-term ambition is to roll this out to more areas and ideally cover the whole city region.
- MONEH consortium partner Blue Sky Hosting applied to the FRANC programme to upgrade some of the radio equipment originally deployed in the MONEH network.

Summary

In total 266 use cases were tested on at least 107 networks, deployed across all regions of the country. Of these 70 are known to still be in operation. There are 28 networks where plans for continued deployment are unknown. Taking 70 as a low estimate and 89 (70+28 unknowns) as a high estimate suggests between 65% and 92% of networks remain in place and in use beyond the 5GTT programme.

There are plans to upgrade, improve, or extend at least eight test networks. This includes five where projects were unable to fully deploy the network they wanted to during the lifetime of their 5GTT project. This suggests 32 out of 37 (86%) of projects **were** able to create networks capable of supporting the use cases they developed (KPI target was 70%).

Two other projects are seeking further funding to support wider deployment of 5G networks.

New products and services, and commercialisation

Table 3 below summarises new products and services developed and improved processes adopted.

Projects were categorised into two types. “Type 1” is used to designate projects developing 5G technology for very specific ‘Edge’ applications in a particular industry or sector, while “Type 2” projects are those developing 5G technology for wider public benefit with the aim of helping to address the issue of poor wider connectivity. Table 3 below shows a breakdown of project types

and outputs, to further summarise the types of products and processes that have arisen from the 5GTT programme:

While both Type 1 and Type 2 projects had the capacity of generating applications and use cases for the wider populations, For Type 1 projects, this was more of a secondary aim, whilst for Type 2 projects, this was a primary aim.

Table 3: New products and processes by project type

	Number of projects	Number of market ready products/services	Number of process improvements adopted
Type 1	20	7 (35%)	16 (80%)
Type 2	11	8 (73%)	9 (82%)
Type 1/2	6	5 (83%)	4 (67%)

Summary

The evidence shows that 20 projects have developed market ready products or services (54%) and 29 (78%) have adopted improved processes. This has included products with specific “Edge” applications and products which aim to address poor connectivity. Table 9 at the end of this annex shows detailed information about new products in more detail.

Further funding

Information about investment stimulation is captured in the BR sheets and reported in Table 4 below.

Table 4: Projects’ claim information and BR sheets – further funding

	DCMS funding received for this project (A)	Consortium Matched Funding (B)	Additional £ spent on R&D due to the funded project	Funding Ratio B/A	Third party investment attracted (domestic/ foreign)	Further investment
Phase 2 (31 projects)						
5G AMC2	£ 839,078	£ 816,188	£1,322,014	97%	£0	£0
5G CAL	£ 2,250,776	£ 2,161,264	£2,511,995	96%	£4,000,000	£7,000
5G Edge-XR	£ 1,421,609	£ 1,056,824	£1,072,000	74%	£3,535,000	£30,000,000
5G Encode	£ 2,087,068	£ 1,022,037	£2,933,458	49%	£900,000	£5,000,000
5G Festival	£ 1,997,142	£ 807,516	£1,260,177	40%	£0	£0
5G FoF	£ 4,971,431	£ 3,285,801	£200,206	66%	£100,000	£300,000
5G Logistics	£ 2,613,912	£ 1,653,994	£2,224,727	63%	£0	£0
5G New Thinking	£ 5,000,000	£ 2,570,260	£2,757,855	51%	£10,455,000	£119,000
5G Ports	£ 1,109,058	£ 945,389	£1,478,495	85%	£0	£2,000,000

	DCMS funding received for this project (A)	Consortium Matched Funding (B)	Additional £ spent on R&D due to the funded project	Funding Ratio B/A	Third party investment attracted (domestic/foreign)	Further investment
5G Rural Dorset	£ 4,325,315	£ 1,787,921	£1,840,000	41%	£750,000	£400,000
5GEM	£ 1,768,884	£ 1,754,002	£1,984,028	99%	£0	£0
5GRN	£ 1,052,821	£ 536,422	£583,053	51%	£0	£0
Connected Cowes	£ 836,031	£ 832,736	£826,865	100%	£285,000	£500,000
Connected Forest	£ 4,557,270	£ 2,794,520	£0	61%	£0	£0
Eden Universe	£ 1,663,266	£ 1,663,792	£1,662,276	100%	£0	£0
Green Planet	£ 2,233,866	£ 1,938,993	£2,076,745	87%	£0	£0
Live & Wild	£ 1,227,602	£ 903,981	£0	74%	£0	£0
Liverpool 5G Create	£ 4,333,875	£ 2,065,758	£1,530,232	48%	£600,000	£500,000
MANY	£ 5,181,508	£ 2,474,713	£407,000	48%	£1,140,000	£207,500
MK:5G	£ 2,440,214	£ 1,344,686	£752,537	55%	£9,000,000	£0
MONeH	£ 2,667,009	£ 1,543,097	£2,688,137	58%	£2,000,000	£0
Smart Junctions	£ 1,319,132	£ 1,268,565	£1,068,144	96%	£650,000	£1,755,700
VISTA	£ 1,115,231	£ 509,319	£838,172	46%	£0	£0
Wales Unlocked	£ 2,793,508	£ 2,290,218	£545,000	82%	£0	£0
West Mercia 5G	£ 1,255,886	£ 338,461	£79,259	27%	£20,000	£0
WM5G Manufacturing	£ 21,000,000	£16,000,000	£250,255	76%	£0	£300,000
WM5G Transport Use Cases			£1,943,443		£1,100,000	£0
WM5G (adoption accelerator)			No data		No data	No data
WM5G (healthcare)			£150,000		£500,000	£220,000

	DCMS funding received for this project (A)	Consortium Matched Funding (B)	Additional £ spent on R&D due to the funded project	Funding Ratio B/A	Third party investment attracted (domestic/foreign)	Further investment
WM5G (transport road sensors)			£135,000		£0	£0
WM5G Infrastructure Accelerator			£2,425,863		£0	£0
Phase 1 (6 projects)						
5GRIT	£ 2,700,887	£ 1,284,583	£1,390,129	48%	£2,150,000	£0
5G Smart Tourism	£ 5,167,305	£ 2,579,073	£2,217,344	50%	£4,363,937	£7,392,013
Liverpool 5G testbed	£ 3,669,242	£ 1,575,409	£1,173,500	43%	£550,000	£5,100,000
Worcestershire 5G consortium	£ 5,575,513	£ 3,061,471	£2,440,113	55%	£0	£0
Auto Air	£ 5,549,237	£ 4,593,755	£4,288,800	83%	£12,001,600	£38,255,100
5G Rural First	£ 5,212,367	£ 3,154,289	£2,135,646	61%	£1,050,000	£5,750,000
Total	£ 109,936,042	£ 70,615,036	£49,848,399	64%	£54,150,537	£97,806,313

Source: Projects' claim information and BRs (excluding the extent of additional and further investments mentioned in the final reports and interviews)

The table above is taken from the BR sheets and the claim information of the individual projects. These contain a lot of missing data: for example, in some cases data about third party investment and further funding has not been provided due to commercial sensitivity. The individual sources of additional, third party, and further funding are not always made clear. We define the types of investments stimulated as follows.

- **Additional investment:** This is investment made mostly by the consortium members themselves over and above the extent of matched funding. However, this may also include funding for progressing the 5GTT project from outside sources such as the NHS.
- **Third Party investment:** This is private or government investment beyond the scope of the project, attracted by the work done on the project. The purpose of this investment could be to either further develop the project's use cases or to develop new use cases inspired by the project.
- **Further investment:** This is private, or government investment beyond the scope of the project to develop similar or related new use cases.

We have also included any amounts in the three categories, which the projects themselves have classified as such. Table 4 does not include the figures for additional and further investments found through interviews and project final documents as these are subjective. They are however, included in the Value for Money analysis in the main report.

We have also summarised information about sources of further funding for 5GTT projects in Table 10 in the additional tables section of this report. This provides more qualitative information about sources of further funding and investment based on interviews and project reports.

Six projects did not report any specific further funding opportunities. Six reported they had applied for further funding from the FRANC program, one applied to DCIA and one applied to FORNC. Others had applied for other government funding (eg BDUK, 5G DRIVE). There were also several who said they would work with 5GTT project consortium members on future bids. This is covered in more detail under collaboration activities.

Summary

Projects reported applying for other government funding, from DCMS and other sources to develop outputs from their 5GTT projects.

Data from projects' claim information indicate the level of match funding from consortium members was about 64% of the funding received from DCMS for the 37 projects. Apart from this, data from BR sheets record the extent of leveraged funding as follows:

- Investments of about £54,150,537 from third parties, including private and public investments, garnered to either develop the ongoing projects' use cases, or to develop similar use cases beyond the scope of the project.
- Investments of about £97,806,313 through further collaboration with both private and public organisations made possible through the work done on the 5GTT project. This funding is beyond the scope of the projects.

Number of staff employed

Table 5 details the number of staff employed in each of the 37 5GTT projects.

Private sector staff working on the projects consisted of a combination of existing and newly recruited employees. In the case of public sector staff, we consider the number of employees who were working on the 5GTT project apart from working on administrative duties. The number of departments working on the project is given in the case of academic institutions.

Table 5: People employed in 5GTT projects

	Total private sector staff allocated to project	Private sector staff allocated to project that are newly recruited	Public sector staff working on the project (excluding administration)	Private and public sector total	Universities – number of departments involved
5G AMC2	32.5	5	0	32.5	0
5G CAL	38.5	1	2	40.5	2
5G Connected Forest	20	3	1	21	5
5G Edge-XR	24	7	0	24	1
5G Festival	59	3	0	59	0
5G Logistics	33	6.5	7	40	2
5G New Thinking	37.75	8	5.85	43.6	3

	Total private sector staff allocated to project	Private sector staff allocated to project that are newly recruited	Public sector staff working on the project (excluding administration)	Private and public sector total	Universities – number of departments involved
5GEM	49	0	0	49	1
5GRN	5	2	0	5	1
Connected Cowes	22	9	0	22	0
Eden Universe	66	24	0	66	0
Encode	29.5	6	0	29.5	4
Factory of the Future	56	3	0	56	2
Green Planet	48	9	23	71	0
Live and Wild	8		0	8	0
Liverpool 5G Create	37	11	13.1	50.1	3
MANY	30	3	6	36	3
MK:5G	46	0	3	49	0
MONeH	5	1	0	5	0
Ports	45	3	0	45	1
Rural Dorset	33	4	5	38	2
Smart Junctions 5G	26	7	0	26	6
VISTA	32	1	0	32	0
Wales Unlocked	10	3	0	10	1
West Mercia	22	1	3.45	25.45	2
WM5G Road Sensors	38		6	44	3
WM5G App Accelerator	12.5	6	0	12.5	0
WM5G Health	22	4	1	23	0
WM5G IA	16	1	0.6	16.6	1
WM5G MTC	0	0	0	0	0
WM5G Transport use Cases	122	6	0	122	2
5G Rural First	96.95	21.9	4	100.95	11
5G Smart Tourism	121.5	23	13	134.5	2
Worcestershire 5G	13	None reported	None reported	13	None reported
Liverpool 5G Testbed	44.5	14	6	50.5	2
AutoAir	16	None reported	None reported	16	1
5GRIT	48.5	16	1	49.5	4
Total programme estimate	1,365.2	212.4	101	1,466.2	65

	Total private sector staff allocated to project	Private sector staff allocated to project that are newly recruited	Public sector staff working on the project (excluding administration)	Private and public sector total	Universities – number of departments involved
Average	37	5.7	2.7	39.6	1.8

Source BRs, supplemented by interviews. Note: Grey cells highlight areas where the BR sheet is incomplete or might be counting all personnel involved in the project rather than FTE equivalents.

Summary

A total of 1,466 employees, measured on a Full Time Equivalent (FTE) basis, worked on the 5GTT projects. Out of this, 101 employees were recruited by the public sector and 1,365 employees were recruited by the private sector. This included 212 private sector employees, who were newly recruited to work on the projects. The involvement of academic institutions in 5GTT resulted in 65 departments working across the 37 projects. On average, 37 private sector employees, including 5.7 newly recruited employees and 2.7 public sector employees, and 1.8 academic departments, worked on each of the 37 5GTT projects.

Technology Readiness Levels (TRL) of 5GTT use cases

Table 6 provides a project level breakdown of the average Technology Readiness Levels (TRL) of the use cases developed by the 37 5GTT projects. Information is sourced from the project BRs and includes average TRLs of a project's use cases at the baseline (original TRL), and at the end of the project (achieved TRL). The table also records the average target TRLs for the use cases of the 37 projects and the number and proportion of their use cases that met or exceeded their individual target TRLs.

Table 6: Project-wise breakdown of average TRLs

Project	Average original TRL	Average increase in TRL	Average Final TRL achieved	Average Target TRL	Use cases that met/exceeded target TRL	Total number of use cases	Proportion of use cases that met/exceeded target TRL
WM5G Application Accelerator	4.5	1.0	5.5	6.5	19	80	24%
WM5G Infrastructure Accelerator	2.0	6.8	8.8	9.0	3	4	75%
WM5G Manufacturing	2.0	2.5	4.5	5.0	0	1	0%
5G Festival	2.7	1.0	3.7	7.0	0	3	0%
MANY	4.9	1.7	6.6	7.3	3	7	43%
5GEM	4.8	0.0	4.8	7.4	0	5	0%
Connected Cows	6.2	1.8	8.0	9.0	1	5	20%
Eden Universe	6.7	0.8	7.5	8.7	2	6	33%
5G Edge-XR	2.9	2.8	5.7	6.8	2	19	11%
Green Planet	1.8	2.8	4.6	6.4	2	5	40%

Project	Average original TRL	Average increase in TRL	Average Final TRL achieved	Average Target TRL	Use cases that met/ exceeded target TRL	Total number of use cases	Proportion of use cases that met/ exceeded target TRL
5G New Thinking	3.0	3.0	6.0	7.1	5	9	56%
5G Connected Forest	3.7	0.3	4.0	7.3	0	6	0%
MK:5G	4.2	1.4	5.6	7.0	0	10	0%
MONeH	2.8	2.5	5.4	6.9	4	11	36%
5G Ports	4.4	1.3	5.7	7.3	1	7	14%
5G CAL	1.5	2.2	3.7	6.5	1	6	17%
West Mercia	2.5	1.2	3.7	4.6	1	6	17%
Factory of the Future	5.5	0.5	6.0	8.2	0	6	0%
WM5G Transport Use Cases	4.4	2.4	6.8	7.1	9	15	60%
Rural Dorset	3.4	2.5	5.9	6.3	9	18	50%
Smart Junctions	3.3	1.5	4.8	7.5	0	4	0%
5G Logistics	2.9	2.1	5.0	6.1	2	8	25%
5G AMC2	4.0	2.0	6.0	7.0	0	6	0%
WM5G (Health)	7.0	2.0	5.5	7.5	0	2	0%
WM5G (Road Sensors)	4.5	2.9	7.5	7.7	2	11	18%
Encode	3.1	3.0	6.1	6.1	9	9	100%
Live & Wild	7.0	0.0	7.0	9.0	0	5	0%
VISTA	4.6	0.0	4.6	7.8	0	5	0%
5G Wales Unlocked	2.3	0.7	3.0	6.3	0	3	0%
5G Rail Next	4.0	2.8	6.8	7.0	2	5	40%
Liverpool 5G Create	5.2	1.3	6.7	7.5	4	10	40%
Worcestershire 5G	4.2	2.4	6.7	7.1	5	9	56%
AutoAir	4.3	2.2	6.5	7.7	0	3	0%
Liverpool 5G	6.6	1.0	7.6	7.8	11	15	73%
5GRIT	4.7	1.6	6.1	7.2	2	9	22%
5G Smart Tourism	5.3	2.3	7.1	8.5	1	12	8%
Average TRL (37 Projects)	4.2	1.7	5.7	6.9	N/A	N/A	N/A

Project	Average original TRL	Average increase in TRL	Average Final TRL achieved	Average Target TRL	Use cases that met/exceeded target TRL	Total number of use cases	Proportion of use cases that met/exceeded target TRL
Total Number of use cases that met or exceeded target TRL	N/A	N/A	N/A	N/A	100	345	29%

Source: BRs

Summary

The 37 5GTT projects all record a positive growth in the average TRLs of their use cases compared to original pre-project levels, with the average change in TRL being 1.7 across the 37 projects. In total, the projects developed 345 use cases, out of which 100 (29%) either met or exceeded their individual target TRLs at the end of the project. A more detailed breakdown and explanation of project and programme level TRLs is given in the main report.

Research outputs, Masters/PhD graduates, and Spin-offs from the 5GTT projects

Table 7 presents a project-level breakdown of the research outputs, masters'/PhD graduates and spin-offs that came out of the 5GTT projects. These details are sourced from the projects' BRs and, as mentioned earlier in the annex, are subject to missing information. For instance, in some cases, details of the type of research outputs are not identified in the BRs. In such cases, we have classified them as 'Other'. Where information is available, research outputs include:

- **White papers, reports, and research publications:** This includes all written and published outputs of the projects such as academic articles, thought papers, white papers, market research reports, and case studies, among others. Unpublished written outputs are also considered if recorded in the BRs;
- **Trademarks and Patents:** This includes applications for patents and/or trademarks, those granted, and cited; and
- **Prototypes developed by the projects:** This includes any physical iteration of a product or part of a product, that the projects developed as one of their use cases or to aid in the development of their use cases.

Table 7: Number of research outputs, master/PhD graduates, and spin-offs from the 5GTT projects

Project	Research Outputs				Number of new Masters/ PhD graduates in the specialised fields	Number of spin offs generated
	White papers, reports and research publications	Trademarks and patents granted/ applications/ citations	Prototypes	Other/ No details given in BRs		
5G-AMC2	None reported	None reported	None reported	None reported	None reported	None reported
5G CAL	2	None reported	None reported	None reported	0	0
5G FoF	None reported	None reported	None reported	None reported	None reported	None reported
5G Edge-XR	1	5	None reported	None reported	0	0
Smart Junctions 5G	1	None reported	1	None reported	None reported	None reported
5G Logistics	3	None reported	None reported	None reported	1	3
5G Ports	2	None reported	None reported	None reported	0	0
VISTA	4	None reported	None reported	None reported	2	None reported
Eden Universe	None reported	None reported	2	None reported	0	0
Connected Cowes	None reported	None reported	None reported	1	0	0
Green Planet 5G	2	None reported	None reported	None reported	0	0
Live & Wild	0	0	0	0	1	0
5G Festival	1	None reported	None reported	None reported	None reported	1
MK:5G	None reported	None reported	None reported	None reported	1	1
Liverpool 5G Create	1	1	None reported	None reported	Reported as N/A	Reported as N/A
5GEM	None reported	None reported	None reported	None reported	None reported	None reported
5GEncode	9	None reported	None reported	None reported	9	2
5GRN	None reported	None reported	None reported	None reported	None reported	None reported

Project	Research Outputs				Number of new Masters/ PhD graduates in the specialised fields	Number of spin offs generated
	White papers, reports and research publications	Trademarks and patents granted/ applications/ citations	Prototypes	Other/ No details given in BRs		
Wales Unlocked	1	1	None reported	None reported	None reported	None reported
Rural Dorset	7	None reported	None reported	None reported	1	None reported
MANY	0	0	0	0	1	0
New Thinking	1	None reported	None reported	None reported	None reported	None reported
MONeH	0	0	0	0	1	0
Connected Forest	0	0	0	0	0	0
West Mercia	0	0	0	0	None reported	None reported
WM5G (Application Accelerator)	None reported	None reported	None reported	None reported	None reported	0
WM5G (Infrastructure Accelerator)	11	None reported	None reported	None reported	0	2
WM5G (Manufacturing)	1	None reported	None reported	None reported	Reported as N/A	1
WM5G (Transport Road Sensors)	10	None reported	None reported	None reported	0	No information
WM5G (Transport Use Cases)	6	None reported	3	3	2	5
WM5G (Healthcare)	1	None reported	None reported	None reported	None reported	None reported
5G Rural First	Reported as N/A	Reported as N/A	Reported as N/A	Reported as N/A	0	0
5G Smart Tourism	2	1	1	None reported	2	2
Worcestershire 5G	3	None reported	None reported	None reported	0	1

Project	Research Outputs				Number of new Masters/ PhD graduates in the specialised fields	Number of spin offs generated
	White papers, reports and research publications	Trademarks and patents granted/ applications/ citations	Prototypes	Other/ No details given in BRs		
Liverpool 5G Testbed	2	9	2	None reported	None reported	None reported
AutoAir	2	None reported	None reported	None reported	None reported	None reported
5GRIT	3	None reported	None reported	None reported	0	0
Total	76	17	9	4	21	18
Average	2.1	0.5	0.2	0.1	0.6	0.5

Source: BRs

Summary

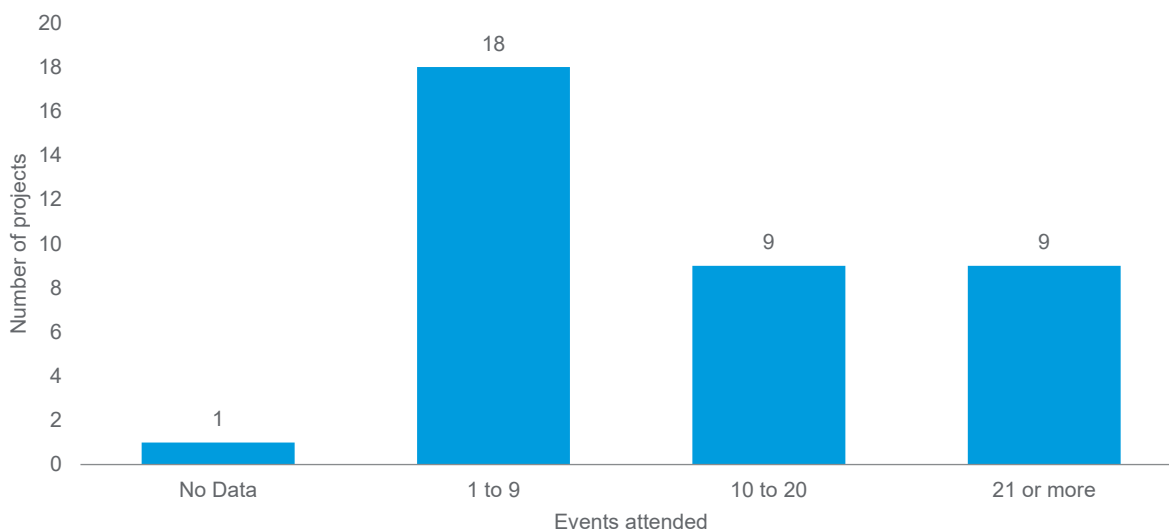
As per the BRs, the 5GTT projects resulted in a total of 109 research outputs, including 76 publications (white papers, reports, and research publications), 17 Trademarks and Patents (applications, grants, and citations), 9 prototypes, and 4 unclassified outputs. This amounts to an average of 2.1 written research outputs, 0.5 patents and trademarks, and 0.2 prototypes per project. Four projects did not report any research outputs, spin-offs or students.

The 5GTT programme further resulted in 18 spin-offs and 21 new Master/PhD graduates in 5G specialised fields. On average, this amounts to 0.6 new Master/PhD graduates and 0.5 spin-offs per project.

Dissemination activities

A list of dissemination activities from BRs is summarised in the additional tables at the end of this annex (see Table 11Table 11), but the graph below summarises the number of events per project as reported in BR sheets.

Figure 14: Number of Events attended by project consortiums



Source: BRs

Projects have attended a range of different events including a lot specific to telecoms or 5G technologies in particular but also within other sectors.

Three phase 1 projects and five phase 2 projects attended more than 20 events, these were:

- 5GRIT, AutoAir, and Liverpool 5G testbed from phase 1; and
- Liverpool 5G Create, MONEH, 5G Logistics, WM5G Infrastructure Accelerator, and West Mercia Encode from phase 2.

UK5G is mentioned 47 times across 24 consortium BR reports, which suggests that the public sector led consortiums were particularly engaged with the Innovation Network (especially Liverpool 5G Create, and West Mercia 5G). All of the projects interviewed were at least aware of UK5G; where they were less engaged it was generally because they were focused on delivery, and the communication activities were a ‘nice to have’ rather than essential. All interviewees were positive about UK5G and thought it was useful when they did interact with it.

Some consortiums with a very specific sector focus did more engagement with sector groups and events rather than specifically around 5G groups and events. This includes WM5G Road Sensors and Smart Junctions, which both attended ITS (Intelligent Transport Systems) national and international conferences. Live and Wild, which was led by a film and television production company reported in the interview that they did more engagement with the broadcasting sector.

Other events and organisations that were mentioned more than once include BeBetter Connected (7 consortiums attended); 5G World (5 consortiums); Connected Britain (3 consortiums); and events organised by the Knowledge Transfer Network (KTN) (3 consortiums) and Digital Catapult (4 consortiums).

Green Planet, Eden Universe and VISTA all highlighted a UK Spain 5G Innovation Workshop. The bullets below summarise international events attended by different 5GTT projects:

- WM5G Transport Road Sensors exhibited at the ITS World Conferences in Singapore and Hamburg (where they also presented), presented at the Future of Transportation Conference in Vienna, and attended a MaaS Alliance Workshop on Traffic Management in Brussels.

- Smart Junctions presented their work on a local authority in Canada.
- VISTA presented at a 4K Summit in Spain.
- 5GEM attended the Digital Transformation World event in Copenhagen in June 2021.

In addition to events, many of the projects have their own project websites and 11 have promoted their work through social media.

At least five projects report having won awards or been nominated for awards for elements of their work:

- Smart Junctions received an award for best paper at the Vivacity JCT Symposium
- 5GEM won an award for Operator (Vodafone) with the Best Industry Deployment (at Ford)
- MONeH won an award, but there is no detail available on what this was for in the BR reports.
- Edge-XR won an award at the International Broadcasting Convention.
- Element of the Liverpool 5G Create project were nominated for four awards and won three.

Summary

5GTT projects have attended a large number and range of events within and beyond the 5G ecosystem. This has included international events as well as overseas ones. At least five projects have won awards for their work.

Collaboration

A summary of further collaboration activities is shown in Table 8 below. A more detailed presentation of this information is also shown in Table 12 later in the report.

Table 8: Further collaboration opportunities

Project Names	Number of consortium members continuing collaboration	Number of wider collaborations (during and post-project)	Collaborations with other 5GTT Projects
5G CAL	All consortium members	7	Connected Forest
5G Edge-XR	3	Potential stakeholders from 3 sectors	Green Planet
5G Festival	3	5	No information
5G Logistics	4	No information	No information
5G Ports	Some consortium members*	No information	No information
5G AMC2	3	1	Eden Universe, 5G Logistics
5GEM	No information	4	5G Encode
5G Encode	4	No information	5GEM, 5G FoF
5G Wales Unlocked	All consortium members	No information	No information
Connected Cowes	2	No information	Live & Wild, VISTA
Connected Forest	2	5	VISTA
Eden Universe	4	7	Liverpool 5G, Green Planet 5G, Connected Cowes, 5G Rural Dorset
Green Planet 5G	No information	1	Eden Universe, Edge XR
Live & Wild	3	21	MANY, VISTA
Liverpool 5G Create	All consortium members	2	Eden Project, 5G Rural Dorset

Project Names	Number of consortium members continuing collaboration	Number of wider collaborations (during and post-project)	Collaborations with other 5GTT Projects
MANY	11	No information	No information
MK:5G	2	No information	WM5G, VISTA
MONeH	1	2	New Thinking
New Thinking	6	5	MONeH
5G Rural Dorset	5	No information	WM5G, New Thinking
Smart Junctions 5G	No information	9	WM5G
VISTA	No information	No information	MK:5G
West Mercia 5G	Some consortium members*	No information	MONeH, MANY, 5G Rural Dorset
WM5G (Healthcare)	No information	2	No information
WM5G (Infrastructure Accelerator)	No information	Some business collaboration	No information
WM5G (Transport Road Sensors)	No information	2	No information
5G Rural First	9	14	Liverpool 5G testbed, 5GRIT, AutoAir
5G Smart Tourism	No information	3	AutoAir
Worcestershire 5G Consortium	No information	14	Liverpool 5G testbed, AutoAir
Liverpool 5G Testbed	14	12	5G Rural First, Worcestershire 5G Consortium, West Midlands 5G, AutoAir
AutoAir	No information	6	5G Rural First, Worcestershire 5G Consortium, 5G Smart Tourism, Liverpool 5G testbed
5GRIT	No information	3	5G Rural First
Summary	76	125	25

Source: BRs

* Specified some level of collaboration would continue but did not specify number of consortium members involved.

Summary

Most consortiums reported the intention to keep collaborating with other parties in their project consortium (seven interviews did not provide information on this). There were also at least 125 wider collaborations established during and after the project (10 projects did not provide information about this). There appears to have been a high degree of collaboration with other projects involved in the project.

Additional Tables: Dissemination and Collaboration Activities

Table 9: Products and services developed as a result of the 5GTT programme

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G-AMC2	Type 1	A Digital Construction workspace using cameras for advanced surveying and data streaming	No	N/A	Yes	BAM Nuttall	N/A
5G CAL	Type 1	Developed 40-tonne self-driving trucks for automated delivery of raw materials Leveraged 5G solutions to improve operational costs and performance and looking to improve and solve safety issues and accidents at work	No	N/A	Yes	Newcastle University, Street Drone	Benefits from improvements to process could spread to wider industry. Street Drone own the IP

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G Factory of the Future	Type 1	<p>Applied 5G technology to improve manufacturing industry processes</p> <p>Tested several applications from real time monitoring technology to Digital Twin Track and Trace, to using AR headsets to inspect aircraft</p>	No	N/A	Yes	BAE systems	<p>No 5G specific product</p> <p>Used 5G to enhance efficiency in existing products, BAE systems were the main beneficiary of the services developed due to this project</p> <p>In addition to the services adopted, BAE systems were also the core beneficiary in terms of adoption of efficiency gains and learnings from this programme</p>
5G Edge-XR	Type 1	Developed AR dance class hosted remotely and streamed	No	N/A	Yes	Dance East	Main benefit of this programme was accrued to Dance East
Smart Junctions 5G	Type 1	Developed a traffic optimisation system aimed at increasing safety and efficiency of traffic current management	Yes	Vivacity Labs	No	N/A	<p>Vivacity accrued the majority of the commercial benefit</p> <p>Transport for Greater Manchester benefited from having a demonstrable use case</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G Logistics	Type 1	<p>Developing a digitally connected and geo fenced zone to benefit from all the accompanying efficiency, financial and security gains</p> <p>Developing efficiencies to help port police operations and improve transit logistics</p>	Yes	University of Bristol and Airspan.	Yes	All consortium members	<p>Benefits of the new zone accrued mainly to the University of Bristol</p> <p>The wider process and efficiency gains would accrue in part to all consortium members but perhaps the majority going to Bristol City itself</p>
5G Ports	Type 1	Predictive maintenance of cranes using IoT sensors	No	N/A	Yes	Port of Felixstowe	<p>All the benefits would accrue to Port of Felixstowe</p> <p>The learnings from this project and knowledge on efficacy of 5G would also be accrued mostly by the Port of Felixstowe</p>
5G VISTA	Type 1	No physical product but looking to show how 5G broadcast technology could help enhance fan experience	No	N/A	Yes	Rohde and Schwarz O2	<p>The range of broadcast viewing experiences developed is expected to have benefits which accrue to Global Wireless Solutions</p> <p>The network efficiency and sustainability elements tested over</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
							the project are expected to accrue to both Rohde and Schwarz and O2
Eden Universe	Type 1	AR experiences that could be used to enhance the experience of those who visit	Yes	Eden Project International and Jingo Juice	No	N/A	Benefits mainly accrue to Eden Project International Virtual tours are ready for public use
Connected Cowes	Type 1	Looking to enhance experience for sailing community This was carried out through a number of new onshore and live experiences to widen and improve the consumer and spectator experience	No	N/A	Yes	Cowes Week Limited	The improvement from being able to run Cowes Week in a more dynamic fashion would accrue to Cowes Week Ltd themselves

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G Green Planet	Type 1	Looking to help create A/R experiences for the BBC series 'The Green Planet'	N/A	N/A	Yes	Factory42 BBC	BBC were able to effectively deliver content using the 5G network too enhancing the user experience Factory42 were able to effectively demonstrate proof of concept
Live & Wild	Type 1	Using 5G technology to film across challenging terrain and location. Enhancing current equipment used The majority of these benefits were social with effort also going into environmental and sustainability improvements from the technology	No	N/A	Yes	Candour Productions	The range of social, cost saving and environmental benefits were said to accrue to Candour Productions
5G Festival	Type 1	Looking to use 5G technology to put together virtual concert Through using the technology to carry out remote concerts artists audiences and concert organisers should all benefit	No	N/A	Yes	Mativision BDBF Warner Music Audiotonix Group	Artists, End customers and Organisers benefit from new dynamic methods of putting on live events

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
MK:5G	Type 1/2	<p>Specific applications of 5G within stadium MK but also looking to support the city to utilise more 5G technology</p> <p>These included an RDM product to both check the reliability and reduce the number of incidents occurring within the stadium</p>	Yes	RDM	Yes	Stadium MK RDM	<p>The product developed by RDM would generate benefits both for Stadium MK and RDM themselves</p> <p>The wider applications of 5G around the stadium itself would accrue to Stadium MK as they are able to operate more efficiently</p>
Liverpool 5G Create	Type 2	<p>Carried out a range of different social care trials such as device monitors, Haptic Hug and MySense AI to improve care experience for patients</p> <p>Created a ChillPanda App to trial techniques to help administer care to children</p> <p>Telehealth monitoring for GP consultation from patient's homes</p>	Yes	<p>CGA simulation (ChillPanda App)</p> <p>Docobo (Telehealth monitoring)</p>	Yes	NHS Liverpool City Council	<p>It was noted that benefit for ChillPanda app would accrue to CGA Simulation</p> <p>Benefits from Telehealth monitoring use case was integrated by Docobo into its existing solutions</p> <p>The majority of benefits from wider social care initiatives, it was noted could accrue to NHS and Liverpool City Council</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5GEM	Type 1	<p>No specific product but looking to increase effectiveness of 5G in manufacturing space</p> <p>These are through the development of data capture and analysis processes to apply to specific equipment used</p>	No	N/A	Yes	Ford Vacuum Furnace Engineering (VFE)	Ford and VFE (Vacuum Furnace Engineering) were the main beneficiaries from the findings and processes put in place during this project
5G Encode	Type 1	<p>Applying AR and VR technologies over 5G network to improve user experience</p> <p>Also putting in place asset tracking to improve productivity and efficiency in factories</p>	Yes	Zeetta	Yes	National Composite Sector	<p>Application of VR and AR technologies have benefits accrued to National Composite Centre</p> <p>National Composite Sector is also listed as being the owner from improved factory processes, but this can spread more widely across the industry</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G Rail Next	Type 1	<p>Exploring with advertisers how 5G networks could create commercial opportunities</p> <p>This is coupled with the project exploring the AR/MR possibilities in an underground rail environment</p>	No	N/A	No	N/A	<p>The potential services were noted as mostly accruing to Ample time</p> <p>The AR/MR potential opportunities were noted as accruing to Sublime</p>
5G Wales Unlocked	Type 2	<p>Augmented Reality at Tourism Site developed to attract more users and generate revenue</p> <p>AR powered immersive classroom developed using 5G connectivity. Piloted in 4 schools in Wales</p>	Yes	<p>Jam Creative</p> <p>Cadw</p> <p>Full3sixty</p> <p>Cisco</p> <p>BT</p>	No	N/A	<p>Benefits of AR tourism is said to be accrued by Jam Creative and Cadw - the historic environmental service of Welsh government</p> <p>Benefits of AR powered classroom is said to be accrued by Full3Sixty, Cisco, BT, and the Welsh government</p> <p>Opportunity for these to be scaled across multiple sites and schools</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G MANY	Type 2	<p>No specific product but looking to give reliable connectivity in North Yorkshire across a number of sectors.</p> <p>These range from tourism benefits to health and social care to improved environmental monitoring systems.</p>	Yes	Cybermoor	Yes	North Yorkshire County Council Cybermoor	The majority of these benefits will accrue to North Yorkshire County Council along with wider firms and inhabitants of the region
5G New Thinking	Type 2	<p>The use cases were all centred around improving the use of technologies in rural settings</p> <p>The use case around farm profitability and provide real time data was an element used for commercial applications</p> <p>5G tool which aided self-deployment of 5G networks in rural areas</p>	Yes	AEC, RuralFirst, Federated Wireless, Cisco,	No	N/A	<p>Benefit of improved commercial viability of farms was accrued by AEC</p> <p>The remaining use cases looked to improving connectivity in rural areas and were adopted by all partners but most widely by RuralFirst</p> <p>The 5G tool developed will possibly have wider benefits in terms of providing reliable connectivity in rural areas</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G Connected Forest	Type 2	<p>The provision of 5G content for tourism and education was the key commercial service generated here to look to improve visitor experience</p> <p>Additional applications put in place to assess general forest conditions were also utilised</p>	Yes	RSPB Gooii	Yes	<p>Royal Society for the Protection of Birds (RSPB)</p> <p>BCU Researchers</p> <p>Parkwood Leisure</p>	<p>The main beneficiaries of the visitor experience were RSPB and Gooii</p> <p>The BCU Researchers and Forest managers and rangers were able to input the process learned from the application of 5G technology to assess forest conditions</p>
5G West Mercia	Type 2	<p>Looking to put in place rural connectivity with specific focus on health and social care sector</p> <p>The VRSS use simulations in particular were designed to deliver productivity gains</p>	Yes	VRSS	Yes	Hereford & Worcestershire CCGs	Both the services adopted, and process learned from this project were designed to deliver benefit in the majority to NHS coupled of course with all the accompanying staff

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
5G Rural Dorset	Type 2	<p>Helping to give connectivity to Dorset and show how it can be an appealing place to live, work and visit</p> <p>Use cases covered a variety of elements from putting in place new systems to new processes adopted</p>	No	N/A	Yes	Dorset Council	The use cases were mainly to show the appeal of Dorset as a region so benefits would accrue mainly to Dorset Council
5G MONEH	Type 2	<p>Looking to put in place 5G across rural sites and provide a proof of concept that mobile network operators can provide network access in rural locations</p> <p>These include Soil and Crop analysis and revenue generating from increased broadband speed</p>	No	N/A	Yes	MONEH Consortium	No direct products created but the reduced costs and increased awareness caused by these technologies would accrue to MONEH and the wider community

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
WM5G (Application Accelerator)	Type 1/2	No product but an innovation centre developed to help businesses to bring benefit to West Midlands and beyond A number of benefits named from generating increased R&D to larger knowledge sharing of 5G	No	N/A	Yes	5prinG	Whilst no specific product was generated, 5prinG were hoping to indirectly gain from the investment into 5G practices These gains would materialise in the profile of the West Midlands as a regional 5G powerhouse being recognised
WM5G (Infrastructure Accelerator)	Type 1/2	Many examples but developing a Connected Map to create a national commercial model	Yes	Midlands Engine Gately Hamer	Yes	West Midlands 5G Midlands Engine Gately Hamer Bruntwood Scitech	A large number of beneficiaries but the biggest one would be West Midlands 5G and the surrounding communities. Mobile network operators and infrastructure providers also benefited from knowledge gained by participating in this programme.
WM5G (Manufacturing)	Type 1	A mix of applications looking to provide small firms with support to create a dynamic and efficient industry	Yes	BAM Nuttall Attocore BAE Systems AE Aerospace	Yes	West Midlands 5G	Productivity gains to accrue both to West Midlands 5G but also manufacturing firms across the region and beyond

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
WM5G (Transport Road Sensors)	Type 1/2	Creating 5G sensors to help reduce congestion	Yes	Siemens Vodafone Eathsense Vivacity Labs Vaisala	No	N/A	N/A
WM5G (Transport Use Cases)	Type 1/2	Use cases looking to show viability of 5G in transport to both benefit wider public and show commercial viability. Development of a number of products such as Parking predictor, Capacity manager, congestion assessor and more. This is covered extensively in our Case Study Annex	Yes	FirstGroup plc You.Smart.Thing Ltd Landmrk Ltd. Oodl Ltd Imagemakers Design and Consultancy Ltd. Appyway Go Media Ltd Nerds With Words Blacc Immense	Yes	West Midlands 5G	Productivity gains mainly accrue to West Midlands and the Transport Industry. Amongst other beneficiaries are FirstGroup plc You.Smart.Thing Ltd Landmrk Ltd. Oodl Ltd Imagemakers Design and Consultancy Ltd. Appyway Go Media Ltd Nerds With Words Blacc Immense

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
WM5G (Healthcare)	Type 1/2	A number of applications seeking to show how 5G can help within the health and social care industry. Lots developed for remote care, but main product is 'Connected Ambulance' which uses virtual reality for diagnostic solutions	Yes	WM5G, University Birmingham, NHS Trust, and BT	No	N/A	Product developed by WM5G in collaboration with University Birmingham NHS Trust and technology partner BT
5G Rural First	Type 2	<p>This project looked to establish reliable connectivity in rural areas. 5G testbeds established in the Orkney Islands, Shropshire, and Somerset.</p> <p>The use cases looked at a number of rural applications one of which was the remote monitoring of cows. Using the 5G technology to assist with this, new methods to look at their living patterns and environmental impacts were made more possible</p>	No	N/A	Yes	5G Rural First	<p>Project explored business cases to aid self-deployment of networks in rural areas. 5G Rural First inspired 5G New Thinking, which furthered its objectives</p> <p>More widely the productivity gains from the new technologies would also accrue both to farmers and to the wide population of Orkney</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
		The efforts to make Orkney a more attractive tourism hub was also a key benefit explored					
5G Smart Tourism	Type 1	<p>Developing immersive technologies and augmented reality experience at a number of events such as Roman Baths and Harbour Festival</p> <p>The VR solutions developed helped to increase the commercial appeal of many of the sites where the use cases were deployed during this project</p>	Yes	Roman Baths Mativision	No	N/A	<p>Developed by mix of private and public partners with benefits accruing to Bristol and Bath Councils</p> <p>The West England Combined Authority was also a significant beneficiary from the new services which could now be carried out.</p> <p>In addition to the commercial benefits from the West of England Combined Authority were the main beneficiaries of new practices and technology being adopted as it brought more interest to the region overall</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
Worcestershire 5G	Type 1	<p>Looking to develop how 5G could provide productivity gains in Manufacturing and Health and Social Care. No specific products but the deployment of cameras to carry out remote consultations were a key new service which could be provided by the new technology</p> <p>In addition the setup of remote monitoring based solutions meant that the condition of machines could be reviewed remotely without having to be in physical attendance</p>	Yes	BOSCH	Yes	Mazak	The wider improvements in efficiency mainly accrued to Mazak but would also have benefits for Worcestershire County Council and the region more widely. Findings from the project showed that up to 2% efficiency gains were possible through adopting 5G technology.

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
Liverpool 5G Testbed	Type 2	<p>Established a private 5G network to provide public services in Liverpool. Specifically, looked to provide benefit of 5G in health and social care sector.</p> <p>Developed a Loneliness Quizzing and Gaming App to solve the issue of the barriers created by lack of communication</p> <p>Developed Push to Talk - also contributed to aiding lack of communication</p> <p>Developed the PAMAN remote video call service provided to vulnerable patients at home</p>	Yes	<p>CGA Simulations (Loneliness Quizzing and Gaming App),</p> <p>Defproc Engineering (Push to Talk),</p> <p>The Medication Support Company (previously Protel Health) (PAMAN remote video call service)</p>	Yes	<p>eHealth Cluster NHS Care homes Liverpool City Council</p>	<p>The devices which were adapted to use 5G technology helped to show the eHealth cluster that there were new and improved ways to administer patient care</p> <p>The network deployed, and the use cases developed by the project helped provide public Health and Social Care services in Liverpool</p>

Project Name	Type of Project	Solution / Product Developed	Product/ service market ready?	Firms involved in bringing the product to market	Improvements in processes adopted?	Firms who benefit from improvements in processes	Comments
AutoAir	Type 1	<p>Helping to use 5G to develop connected and autonomous vehicles</p> <p>The use cases looked to develop data transfers and more efficient communication links to aid in productivity gains and more efficient decision making</p>	No	N/A	Yes	<p>Celestia Technologies Group</p> <p>McLaren Applied Technologies</p> <p>UTAC Millbrook</p>	The wider efficiency gains accrued both to consumers and also to wider industry due to knowledge being more widely disseminated
5GRIT	Type 2	<p>Developed 5G EV charge points, Alston Moor Trail .</p> <p>Looking to put in place a testbed to be used in rural areas to boost connectivity and help encourage additional commercial and public activity. Example product made was World Around Me app to help tourists find services available</p>	Yes	<p>World Around Me</p> <p>Precision Decisions</p> <p>North Penines AONB Partnership</p>	Yes	<p>Adopted by Farmers involved in project.</p> <p>Mobile Network Operators and Infrastructure Providers such as Cybermoor, Quickline, Broadway Partners and Blue Bear Systems Research gained from additional knowledge of 5G technology applications.</p>	The main beneficiaries from the new accompanying benefits from 5G were farmers who were able to significantly improve the efficiency with which they were able to manage their farms

Source: Interviews, BRs, final reports.

Table 10: Further funding received by project

Project and Project partner	Interview	Project reports
5G CAL	The same consortium plus a couple of additions for new skillsets is submitting bids for other government funding (not specified). StreetDrone received VC funding to continue development (Wilco) and seeking further VC funding.	None reported
5G Connected Forest	Obtained 'Getting Building Fund' (GBF) funding to develop innovation centre	None reported
5G Smart Junctions	Within monitoring reporting no mention of further funding. Interviewees noted that they were holding discussions as Transport for Greater Manchester were keen to see further development of the network. These had not yet materialised into further funding at this point.	None reported
5G Green Planet	None reported	None reported
5GEM	Ford: There is another 5G project in Valencia which is supported by EU Union contract/funding. Colleagues elsewhere are investing across the site with some IT upgrades planned.	None reported
5G Edge-XR	None reported	None reported
5G VISTA	There were some initial discussions about creating a new company or continuing with collaboration to develop a plan for enhanced live events. Although this plan has now been stalled, there is a chance that this might change in the future.	
5G Logistics	Some consortium members applied to FRANC programme.	None reported

Project and Project partner	Interview	Project reports
5G Festival	None reported	Digital Catapult received further funding of £1.2 million in 2017 from Coast to Capital LEP to deliver an enhanced 5G testbed with commercial grade 5G New Radio equipment and corresponding core network (5GCore) software.
Eden Universe	None reported	None reported
5G Wales Unlocked	Seeking funding for further deployment of sensors in other Cadw properties. Utterberry would like to work with DIT to investigate opportunities to export technology globally.	Immersive classroom owned by Welsh Government to be grant aided to Blaenau Gwent CBC who will in turn fund ongoing costs.
MANY	Applied to FONRC Through MANY, they have been able to build up experience of working with suppliers but need further funding to develop and test solutions further.	Quickline have secured large BDUK contracts with North Yorkshire County Council, West Yorkshire, and Humberside. since the start of the project. Also raised £50M investment in 2021 to ramp up growth. Wireless Coverage received investment from Westbase Group of more than £500k to grow the business
New Thinking – Cisco	Is involved in 5G DRIVE (DCMS Diversification Project).	Cisco recently concluded a new regional infrastructure deal with a large UK combined authority. University of Strathclyde and Scottish 5G Centre secured a budget of £30,000 to support 0.5 FTE for 1st April 2022 to 31st March 2023 to manage, operate, update, and evolve the Toolkit. Cloudnet identified a variety of funding sources, such as lottery funding, R100 FWA investment, and government funding. Additionally, it will consider applying these funding in conjunction with the University of Strathclyde, the Scottish 5G Centre, and Shefa

Project and Project partner	Interview	Project reports
		University of Glasgow Announced its intention to apply for further research funding from the Engineering and Physical Sciences Research Council or Innovate UK.
5G AMC2	Have applied to Innovate UK for further funding, but unknown whether they have been successful.	Attocore are consortium members of a successful submission to Innovate UK as part of April 2022 Smart Grants.
5G Ports	None reported	In February 2022, Arqit and Blue Mesh Solution signed a technical collaboration agreement. In May 2022, Arqit and BMS signed a commercial head of agreement to exploit the Quantum Secure MQTT idea in collaboration
Live & Wild	Nothing reported	Nothing reported
Liverpool 5G	Received a lot of support in kind. Had two NHS partners who did not receive DCMS funding but still supported the project. Consortium is applying for further funding to sustain action so far. Liverpool University have set up a non-profit company to seek further investment to roll out network more widely within the city. Blue Wireless received further funding through FRANC program and Liverpool City Council has agreed to let them trial LoRaWAN gateways in their network.	Phase 1 case study reports they were at the time investigating potential ways to fund the continuation of the network, whether via further grant funding or setting up a not-for-profit municipal cooperative to run the network.
Milton Keynes:5G	The main source of additional funding was from previous council investment i.e., into radios and existing masts built, using existing infrastructure. Satellite Applications Catapult have bid into DfT for a £20 million project for full commercial deployment with two new companies coming into the UK in Milton Keynes	Milton Keynes Council created a Community Interest Company – Smart City MK CIC. The CIC facilitates access to other assets and resources that would not otherwise be possible, with CIC partners able to offer sponsorship, funding, or other in-kind contributions to support the ongoing community outreach, engagement and sustain activities. They are also facilitating SME access to the testbed and wider city

Project and Project partner	Interview	Project reports
		infrastructure through the establishment of a council-funded 'Milton Keynes Accelerator' programme.
MONeH	<p>Agricultural Use Case is commercialisable and this would be a potential revenue stream for Telet and agritech partners.</p> <p>Blue Sky Hosting applied to FRANC programme</p>	<p>Telet secured further 60% 5G Grant in the DCMS FRANC programme as part of £8m consortium with cellXica and AcellerComm, to build a new 5G radio and associated network services (worth £1.9m of grant funding to Telet for next 18 months). The consortium has also begun to earn commercial revenues of circa £500k in Calendar 2021, primarily through 5G consulting work for Liverpool University and Transport for Greater Manchester.</p>
West Mercia 5G	<p>University of Chester formed a relationship with Integrated Care System (ICS). Also developed links with rural smart villages in India, and interests in sub-Saharan Africa.</p> <p>VRSS were looking for further funding to develop their technology.</p> <p>Worcestershire5G project is spun of NextGworks looking at health care solutions. The core network is continuing to be supported by them. Put bid into other projects and looking to work with members of consortium. Admits that new funding has come in and has accelerated the funding from other partners though this is unclear.</p>	None reported
WM5G Limited	<p>Awarded 4 other contracts.</p> <p>As part of a consortium, they've secured funding from UKTIN, about the next evolution of open networks in the UK and some other DCMS funded programmes.</p> <p>Product development has raised £7m of additional funding, to take some concepts forward.</p>	None reported
Rural Dorset	DCIA (Digital Connectivity Infrastructure Accelerator) project, followed directly on from this. Team continuing (temp contracts now	None reported

Project and Project partner	Interview	Project reports
	all extended for another year. Innovate UK bid going in around 5G buoys. The Smart City project at Weymouth focusing on deprived areas is looking at how to incorporate smart solutions.	
Connected Cowes	None reported	None reported
5G Factory of the Future	Interviewees from AMRC noted that investment was generated from universities, catapult and from the growth fund from Nokia.	None reported
5G Encode consortium	NCC were talking to consortium partners about further work, but nothing specific mentioned.	None reported
5G Rail Next	University of Strathclyde received further funding through DCMS 5G Sub-Connect project to explore issues of 5G connectivity in tunnels.	None reported
KCL Test	5GTT programme has stimulated investment in developing 5G networks in the UK, but they are currently looking to develop 6G products and hope to have some of these available by 2025	None reported
University of Bristol Test Network	Applied for Horizon Europe Projects in Europe 5G PPP. Had at least four or five of these projects that required use of the test bed.	None reported
5G Innovation Centre, University of Surrey (5GIC)	None reported	Aims to be funded through other publicly funded projects such as those focused on rural connectivity. Furthermore, plans are being made to make 5G an open platform. They are testing concepts that operators would like to see in their testbed. A business layer was developed with Vodafone and TM Forum.
AutoAir	Blue Wireless were successfully awarded funding through FRANC program. For CoMP-O-RAN project with Airspan and Dense Air for further development of Millbrook Proving Ground.	None reported

Project and Project partner	Interview	Project reports
	Also applied for funding from DCMS Open networks program, but does not appear to have been successful.	
5GRIT	None reported	Initial information garnered from monitoring data regarding phase 1 records that 5GRIT testbed received sufficient funding to allow it to continue for another three years.
5G Rural First	None reported	From phase 1, there was interest in developing the Orkney testbed to a full commercial network. Four spin-offs from the project were also reported in 2019. One spinoff, Neutral Wireless came about via Strathclyde and focuses on building private networks and providing connectivity for broadcasting services.
Smart Tourism	None reported	Phase 1 case study report indicates that a consortium led Zeetta Networks was successful in applying for further funding from DCMS for 5G-ENCODE project. The £9 million project aims to deliver a private 5G network at the National Composites Centre (NCC). Project stakeholders were also exploring commercial opportunities with major telecoms businesses, such as Vodafone.
Worcestershire 5G	Worcestershire 5G project is spun of NextGworks looking at health care solutions. The core network is continuing to be supported by them. We know that the consortium also bid into other projects and are looking to continue collaborating. Apart from this, the consortium members admit that the DCMS funding has accelerated funding from other partners, though the extent of additional funding remains unclear.	From Phase 1 Mazak capitalised on commercial opportunities. Though Mazak left the consortium after phase One to partner with Telefonica. This was to trial the commercial application of their work. QinetiQ also reported exploring commercial opportunities since Phase 1, QinetiQ have developed their security testing services that they aim to sell to industry 5G adopters. They utilised partnerships with vendors and suppliers from the consortium including Bosch.

Source: Interviews and Project reports

Table 11: Dissemination Activities

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
5G CAL	Around 9 events – These events and sharing groups include Port of Tyne Innovation group, BEIS, European Automotive Cluster Network, Sunderland City Council stakeholders, Digital Catapult, DCMS stakeholders, BAI, NEAA Members (Digital WG), and CCAV.	Around 20 items of press release recorded.
Eden Universe	Around 11 events – These include BeBetter Connected Conference, meetings with Liverpool 5G/RAF Leeming, a Collaboration meeting, an Eden Universe sharing meeting, interviews and discussions with Festival of the Future, and a UK/Spain 5G Workshop.	At least 30 items – these include website, social media, webinars, and industry-related publications.
Connected Forest	At least 5 events – These events include UK5G & KTN events, several collaboration discussions via Basecamp, for instance, a few project members were part of a Security Collaboration event held on 2nd March 2021. There were further plans of fuller participation in a proposed event to be held by the end of March 2021. However, no further details have been updated in the BR.	At least 2 items - anniversary press release & website with detailed project information including internal news releases.
WM5G (Transport Road Sensors)	15 events – these events include Coventry City of Culture- 5G and CAV co-creation sprint, presentation event at Aston University, ITS Ireland/ ITS UK Event, Presentation at CWIC, Virtual Exhibition Space at ITS Virtual Congress, Connected Britain event, Keynote speech at ITS UK Summit; Exhibited at Intelligent Transport Systems World Congress, Singapore; Presented use of 5G at Future of Transportation Conference, Vienna; Attended MaaS Alliance Workshop on Traffic Management and MaaS, Brussels; Attendance at Transport Technology Forum workshop; Multiple presentations at 5G	Around 7 items including a blog article on ERTICO (ITS Europe) website, two blogs by Vivacity and Velocity, some features for industry publications around project completion, a press release on the project, and a feature report by the BBC Local News.

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	World; Bruton Digital Networking; Exhibit and present at Intelligent Transport Systems World Congress Hamburg; Exhibit at Highways UK	
5G Edge-XR	Around 3 events – These events include GPU technology conference. The Director at BT Sport, who was involved in the project took part in an episode of the Samsung “Whatever next” podcast. A consortium partner sponsored the award for best enterprise VR application at the AIXR (Academy for VR) awards.	Around 7 items including an article for UK5G magazine, a EADT story, a Mobile World Live – video interview, a BU: Press Release (Oct 2020), a three-page article published in 'On the Front Foot' magazine from the Premium Sport Network, and a blog at GTC.
MANY	At least 8 events – these include 4 Parish council meetings, 2 5G community event (online), at least 1 Physical Community Event, 1 demonstration event at the APPG for Loneliness by DCMS. Apart from his, the project was also showcased on BBC Click.	At least 3 items including a press release on Forbidden Corner and two articles in UK5G Innovation Briefing.
Smart Junction (SJ) 5G	At least 14 events -- these include a webinar with FMZ cities, multiple SJ monitoring events and a Hackathon. Weaver Labs hosted an online Live event to talk about SJ with VL and TfGM, a Weaver Labs attendance to Industrial 5G Innovation Forum to present Business Cases research, a Weaver Labs presentation to Local Authority in Canada (Calgary) SJ5G and innovation in business model, a Vivacity JCT Symposium (SJ focused exhibition stand, presentation and award for the best paper). The Smart Junctions Business Model Innovation encompassed the CWIC (a conference that focuses on circular economy and infrastructure sharing) They attended Disruptive Live and Diffusion Live conferences that were streamed globally, and participated in an EE Podcast focusing on circular economy and neutral hosts. Other events include a meeting with Bruntwood to discuss engagement on 5GTT environment, at least 1 other	Over 40 items including several published articles on 5G and IoT with Bruntwood SciTech, multiple Smart Junction press releases, coverage in the Vivacity Labs news, joint PR with Attocore, Weaver Labs blog post, and newsletters on the website.

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	meeting with TfGM for engagement activities with SMEs/Business to source additional use cases for the micro private network. There were also multiple add-on meetings with TfGM for engagement with Greater Manchester Cyber Foundry to brief on the project and explore wider implications and opportunity for the project, the JCT Symposium, and the Highways UK Smart Junctions presentation.	
Green Planet 5G	At least 7 events – these include Be Better Connected, 5GTT Meetings, Audience Research Kick-off, UK5G/Spain Innovation Workshop, 5GF Creative manifesto workshop, 5G Week	About 55 items including a coverage in the Guardian newspaper, a Wired article, media screening of the first episode of the Green Planet series (led by the BBC team). Apart from this, the project was also features in other domestic media outlets including Londonist, The Nudge, Daily Mirror, and The Sun, among others. The project also got international coverage in sources like TVB Europe.
5GEM	At least 12 events – these include a presentation to Ofcom, 2 Digital Catapult events, an industry event (AILU conference), an Industrial 5G in the UK webinar for 5G week, the GSMA IoT Web Talk, the Digital Transformation World Series 2020, the Private Networks in a 5G World (Informa), 2 TWI Digital Manufacturing conferences, the Ford @ Low Carbon Vehicle show, the TM Forum Digital Transformation World June 2021 in Copenhagen, the 5G Week Award win for Operator (Vodafone) with the Best Industry Deployment (at Ford), and the Dissemination of awareness event with Vodafone to counter "conspiracy" theories & radiation fears.	Around 7 items used for communication – these include press releases, interviews with the Financial Times, articles in the Telegraph, Mobile World Live video interviews, feature articles in the UK5G Innovation Briefing magazine, Vodafone 5G Heroes video, and blog articles on Vodafone.com and the main website.
CoCore/5G Wales Unlocked	Around 7 events – these include an event on the role of 5G in Digital Healthcare and how to engage in the latest UK5G initiatives (UK5G attendance), the 5GTT UK Be Better	At least 6 items including multiple press releases with the Welsh Government and Utterberry, multiple 5G related podcasts available on multiple end points such as the Business News

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	Connected Conference, the MNO sector event in Wales, the UK5G Realised Event, the UK-Spain innovation workshop, the 5G Safety Unlocked, and the UK5G showcase event and associated documentation.	Wales website, 5GWU and DCMS social media channels; other items also include promotion on the Welsh online forums and a use case showreel.
Connected Cowes	Around 3 events – these include the Innovate Local: Southern Pioneers Tech showcase event, the Unleashing Digital Connectivity Innovation Panel discussion event, and the UK5G conference in Birmingham (which was featured in the Creative Track).	At least 2 other sources of dissemination including at least 1 blog post and 1 magazine article have been identified. Apart from this, the project has been featured in at least 10 news articles and media by various local news providers such as Island Echo news, BBC local news, Telecom TV industry news, IW Radio News, Tribune News, and Country Press News, among others.
MONeH	Around 43 events – these include around 8 collaboration workshops, 10 showcase events, 15 more events attended in Quarter 4 (the BR didn't specify what events these were), and 10 meetings regarding UK5G Showcase event in Quarter 8. (Again, there're no detail on what these events are)	At least 6 items including awards won and an article on a local news website, in the Financial Times, and ISP review news article, an article in UK5G Innovation Briefing Magazine, and a website for Free Teaching.
West Mercia	At least 25 events – including the Be Better Connected event, Tech Severn Event, and WCC Our Future: Tourism and Hospitality Event, among others. Furthermore, webinars and other alternate forms of engagements with stakeholders and wider audiences to promote the awareness of the programme. This included TM Forum Webinar on 5G healthcare ecosystem. Other activities include contributions in Scottish and Welsh focussed UK5G events on Security and 5G Safety. The consortium members also attended the Worcester NHS Innovation session, offering experiences learned on WMR5G as H&W CCG consider digital connectivity approach.	At least 7 alternate sources of dissemination have been identified including WMR5G Roadshows which were planned as part of UK5G. Apart from this, the project issued four press releases up to March 2021, with three potential information releases to follow.

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
Liverpool 5G Create	<p>At least 50 events – including Liverpool Health Partners, Connected Cheshire, and The Built Environment Board, among others. Dissemination activities ranged from diffusing information about Liverpool 5G and the role of 5G in Digital Healthcare in webinars, to interviewing in NHS digital magazine, and a month-long conference showcasing the 5G planning tool to local authorities. Apart from external events, the project has also contributed to several UK5G events. Examples are:</p> <p>workshop on disseminating Liverpool 5G experiences to spread awareness against anti 5G sentiment.</p> <p>Participating in UK5G Vertical Campaign</p> <p>Participating in UK5G SME & LEP Working Group</p> <p>Recording 5G World 2021 Panel Session with UK5G</p> <p>Apart from this, the project has also won several awards including, among others:</p> <p>Tech for Good’ award at the 2021 Prolific North Tech Awards</p> <p>Cambridge Wireless’ Technology and Innovation Awards: ‘Connecting People Award’ for ongoing work to secure reliable and affordable connectivity</p>	<p>At least 9 other forms of dissemination have been identified in the forms of Newsletters, blog posts, magazine and journal articles about the Chill Panda app, the 5G planning tool and the new 5G business model, and the awards won by the project.</p> <p>The project has also featured in at least 22 press articles and other news media including radio and TV spots by BBC, Liverpool TV, Manchester TV, and Newcastle TV, among others. The primary news coverage was again around the several awards received by the project, the anti-anxiety app Chill Panda, and the new business model developed by Liverpool 5G Create.</p>
5G-AMC	<p>Around 11 events. A number of events were undertaken to share findings across project to wider stakeholders. There was a CSIC event, 5G Week presentation, Constructing Excellence – Digital drop-in and DCMS ministerial visit to observe progress</p>	<p>At least 1 item on the BAM Nuttall website</p>

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
5G Ports	Around 9 events - including Be Better Connected conference, 5G Realised event hosted by members of the 5G Ports project, 5G World Presentation and a 5GTT Webinar Roundtable.	2 items - The Port of Felixstowe and Blu Mesh solutions have detailed information on their website describing the 5G deployment project. This is alongside a social media presence to raise awareness on how they are the largest UK port to deploy 5G technology.
VISTA	<p>Around 15 events – a Project Demo Event held at Digital Catapult was held to highlight the use cases which were being developed as part of the project. Benefits realisation, and a collaboration workshop was held. Additional project demonstration events at various locations including the O2 Blueroom and a football stadium during the MK Dons v Ipswich Town game.</p> <p>VISTA also held regular meetings with 5G MAG over the course of the project to demonstrate how their use cases were progressing. They took part in a Spain UK workshop on 5G showing how this technology works within a media context and presented at the Cambridge Wireless International conference along with a presentation at the 4K Summit which was held in Spain.</p> <p>VISTA also attended the wider UK5G event held in Birmingham which gave an overview of the project as a whole and presented as part of the Creative Industries session.</p>	At least 1 item - 5G VISTA have a regular blog updating progress and showcasing how the project use cases developed over the course of the project.
5G Encode	<p>Around 22 events – including events hosted by Digital Catapult including technical and innovation forum to provide use case information.</p> <p>Members of this project were also involved in the UK5G event 5G Realise in London showing project progress. Members of the</p>	<p>At least 25 items - Regular information was posted across websites to show ongoing use case progress.</p> <p>Information was included across various social media platforms to help raise awareness and a YouTube channel was created to assist with this.</p>

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	<p>consortium attended a number of additional events such as 5G World and the Innovation forum.</p> <p>There were a number of workshops during the project such as skills workshops, devices workshops and 5GEM and FoF collaboration workshops to share learnings and findings across other stakeholders and projects.</p>	<p>A wide number of articles to raise awareness including for The Business Exchange, Plataine News, Total Telecoms, Business Computing, Enterprise IoT and Tech Monitor. This is in addition to interviews with Mobile Magazine and 5G radar.</p>
5GRN	<p>At least 5 events - The key event was the regular project discussions with the Korean partners. There was also a Benefit Realisation workshop held to understand these in more detail. Finally, 5GRN consortium members attended the 2 day 'Better Connected' event.</p>	<p>3 items - Information was shared across the websites of the consortium members to highlight progress. An UK5G Newsletter article was key in communicating aims of the different use cases to a wider audience.</p>
5G Rural Dorset	<p>Around 7 events - An event was organised with the Barrier Busting Taskforce and all the other partners. There were co-presenters with DCMS at an International Ports Event with a global audience. There were also joint workshops held with DCMS on collaboration and benefits realisation.</p> <p>There was also a Private Networks Conference Panel held alongside Tony Sceales. 5G Rural Dorset were also the catalyst behind the UK5G LEP and SME event and were involved in leading a breakout session.</p>	<p>Assisted DCMS in promoting the 5G Create competition.</p>
WM5G (Application Accelerator)	<p>None reported</p>	<p>None reported</p>
WM5G (Manufacturing)	<p>Around 6 events - Stakeholders from this project were involved in the Artificial Intelligence for Manufacturing Conference in 2021, the IOT & Industry Expo, the Controls and Drives Smart Industry Expo and the UK5G Showcase.</p>	<p>About 6 items - there were a number of promotional videos and blog posts around the MTC and aerospace elements to show the impact of these projects.</p>

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	A number of round tables were also held during the course of this project.	In addition there was a social media campaign carried out to raise awareness of both manufacturing 5G use cases and other elements of WM5G. There was also an article in the Telegraph featuring the benefit of 5G.
WM5G (Healthcare)	Around 4 events - Workshop held as part of the Endoscopy use case was used to explain progress and outcomes from the project. A Forum event demonstrated the latest version of IntelliGI. They also presented at the UK5G showcase event and were involved in an international online event.	At least 3 items - Videos created with the GPs and care home staff to publicise the positive feedback to the solutions generated. Outcomes were also shared more widely with the AHSN network.
Live and Wild	About 5 events - Meetings held with various stakeholders such as Leeds Council, Film festivals and local businesses to share project progress. The various use cases also had a number of demonstrations scheduled to show the impact of 5G technologies.	At least 4 items – Including a press release to industry magazines across the tech and broadcasting sectors. Social media was also used to highlight developments as they were occurring. Live event streaming with a webinar all helping to detail progress.
5G FoF	About 6 events - Members of this consortium contributed to the 5G in Manufacturing webinar hosted by the IET. They attended a 5G world summit event where next generation 5G technologies were reviewed. FoF took part in the WM5G 5Spring Smart Manufacturing accelerator challenge, the Engineer Expo in Birmingham and the Powering Digital Innovation Roundtable.	At least 2 items - Website information across consortium members detailing the project progress.
5G Logistics	About 37 events - Collaboration scoping meetings were carried out. The consortium members hosted a seminar at Multimodal 2021 conference and were involved in other workshops and	At least 37 items – Includes a project page giving an overview on what the project is looking to achieve across all the partner websites.

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	<p>meetings including a SevernNet event where businesses and residents around the Bristol port were engaged.</p> <p>A gravity community webinar is also due to be held which is looking to engage businesses and residents around the Somerset site.</p>	<p>Other dissemination media such as newsletters, online blogs and YouTube recording and other social media posts showcasing project progress and results.</p>
5G Festival	<p>About 4 events – Including a panel discussion at London Tech Week comprised of members from the consortium. They were also involved in the Be Better Connected workshop organised by DCMS and UK5G.</p>	<p>At least 6 items - Includes video, Newsletters, white papers, website, and social media posts.</p>
Milton Keynes:5G	<p>At least 3 events - Supported the WM5G event which was key for knowledge share across and between different projects. The consortium members delivered several webinars which were valuable in showing the smart mobility supported by 5G.</p>	<p>At least 1 item - Website information showing the impact of the project and the launch of 5G Create.</p>
New Thinking	<p>About 5 events - 3 on-line stakeholders' event with the following titles:</p> <p>5G Connectivity A Journey for Rural Communities</p> <p>Funding and Finance Workshop</p> <p>MNO Interactions and Best Practice Engagements.</p> <p>The consortium members were also in place at the 5G Shared Spectrum for Private Networks event hosted by Strathclyde University.</p> <p>They attended the UK5G showcase event in Birmingham.</p>	<p>About 4 items - Project website specifying the elements carried out for each project, social media posts, meetings with Ofcom and Ministry of Defence to share project elements and discuss how additional user benefits could be derived.</p>
WM5G (Infrastructure Accelerator)	<p>About 27 events - A range of events were held over the course of the project. Many of these events were virtual as a result of COVID such as Isolation Economy looking at Smart Cities, Birmingham tech week and Speed Up Britain round table event.</p>	<p>Around 5 items at least - Posting on LinkedIn and Twitter about Connected Britain nomination.</p>

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	<p>There was a UK5G panel event to look at the 'Lessons Learned' from the project as it was being concluded. There were also a number of virtual speaking events and additional round table sessions held such as Clarke Wilmott and Proftech round table events.</p>	<p>A blog post about what this IA team had achieved in the last 2 years and where they are looking to explore next was published and shared by UK5G.</p> <p>The team attended various knowledge sharing events including South Wales, West Sussex, Berkshire and Central London. These events were across a range of elements from calculation benefits from mobile connectivity to explaining the elements being covered in the project.</p>
<p>WM5G (Transport Use Cases)</p>	<p>About 5 events - including participating in a 5G 5 days event, a discussion session with the Mayor, along with a postponed BBC Midland Event.</p> <p>Consortium members attended the Transport project showcase event, 5ring The Future of Transport Event and the Birmingham Tech week event.</p> <p>A number of workshops were also held with Highways England and other transport authorities.</p> <p>There were also some demonstrations to show the various project use cases.</p>	<p>Around 4 items - A presentation was also held to GoMedia for their stakeholders:</p> <ul style="list-style-type: none"> • WM Metro PR • Icomera PR • RNIB <p>The project has been widely covered in local and national press with around 35 items.</p>
<p>5G Rural First</p>	<p>About 20 events – including participating in conferences in the UK such as Digital Infrastructure conference, UK Fibre Forum, Stirling Gigabit Conference, among others. International conferences attended include IEEE 5G Summit Pretoria (South Africa), Procurex Ireland, among others.</p> <p>Apart from this dissemination events such as project demonstrations to the Scottish First Minister, dissemination event in Bournemouth, UK Dairy Day, New Scientist Live event,</p>	<p>About 10 items including features on BBC Click, Business Life, Bloomberg, Economist, Associated Press, mobile world live, tech radar pro, Forbes, The Orcadian, and Sunday times, among others.</p>

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
	European Dairy Farmers congress, and demonstration in Royal Cornwall Show with show stand, among others.	
5G Smart Tourism	About 10 events – including 5G Smart Tourism showcase in March 2019, VIP public trial in the Roman Baths, Public showcase experiences in Millennium Square and dissemination activities, Public Trial and showcase by Mo-Sys in collaboration with Museums. Three public trials and showcases conducted in Bristol and London. International conferences such as MWC Barcelona.	About 5 items including features on ITV news, Bristol Post, and BBC, among others. Members of the consortium such as EVENTBRITE and Zeeta, Landmrk, and Smartify participating in producing videos and interviews during presentations and posting them on website. Wider social media outreach through LinkedIn and other social media platform, of the videos disseminating information was also undertaken.
Worcestershire 5G Consortium	About 20 events including workshops and conferences like INCA Conference, 2018 Global MBB Forum, Worcestershire LEP Annual Conference, MWC '19 Barcelona, among others. This also includes award entry into the Connected Britain Awards and demonstrations including Worcestershire Skills Show 2019.	About 30 items including press releases and features in 'the New Economy', among others. This also includes press releases by the consortium's own website and online and phone interviews with the media.
Liverpool 5G testbed	<p>Liverpool 5G took part in over 60 events and dissemination activities. At least 45% of these, a representative of the consortium was a speaker or gave a presentation. Over 60% of these activities reached a national audience, and 20% an international audience</p> <p>Events included the, ITS World Conference, 5G Rural Showcase Event in Glasgow, Lancashire Health event arranged by Business Cloud, and Telecare Standards Association conference, among others.</p>	<p>About 170 items including articles featuring BBC and Blu Wireless. Twitter used to push out positive messaging by the consortium. Press releases written and circulated to accompany major events and publications, and the consortium's website was updated regularly with new messaging and relevant information.</p> <p>Press articles about the project include The Echo's Business Post that focused on Liverpool 5G's SMEs and innovation. A radio package about the project went out on BBC Radio Merseyside. Apart from this, articles were also published in technology news sources like The New Scientist and Cambridge Wireless.</p>

Project Names	Number of events and presentations to raise awareness (BR & Sustainability reports)	Other forms of communication/disseminations including press release, media coverage etc.
AutoAir	<p>About 29 events including workshops and presentations such as Exhibition at O2 Blue door, Millbrook presented at CAV Scotland event, and Presentation at Cambridge Wireless Small Cell SIG Event, among others.</p> <p>This also includes international events such as Presentation at GSMA, Brussels, Mobile World Congress (MWC-19), Barcelona, and Millbrook's participation in UK CAV delegation to Michigan by Automotive Unit, FCO, Chicago.</p>	1 recorded event - 5G Realised (Julia Media event).
5GRIT	<p>About 35 events including the participation in and hosting of dissemination events, presentations, and workshops. These include OECD Rural Conference, Presentation to Cumbria County Council Borderlands team, presentation at Alston Sheep Show, and UK Wide Infrastructure & Investment Conference, among others.</p>	<p>About 22 items including articles in media and newspapers such as TM Forum, Scottish Farmer, Farming Sector, Disruptive Asia, Nyoooz (India), and Alpha Galileo; Article published on The Engineer about Kingston University's work on UAS/agriculture use case; Article published on Commercial Drone Professional about Kingston University's work on UAS/agriculture use case.</p> <p>Apart from this, print media such as Big Issue North and The Daily Mail, Cumberland, and Westmorland Herald also printed articles on the project.</p>

Source: BRs

Table 12: Collaboration Activities

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
5G CAL	Collaboration during the project: At least 20 events – these include collaboration calls, workshops, discussion, & exhibitions. Future collaboration: None reported	Future collaboration: They are looking at ‘Phase 2 to their project and while they have broadened the consortium, they are also planning to continue working together (Interview)	Connected Forest	Key members involved in collaboration during project include University of Strathclyde; Vivacity, Attocore, DCMS, Digital Catapult, Weaver Labs, Qinetiq. Events: Be Better Connected Event, Skills workshops and UK5G Climate and Environment Group, CENEX.
5G Edge-XR	Collaboration during project: Not applicable due to COVID-19 Future collaboration: At least 4 – collaboration on researching further on use cases	Grid Factory, Condense Reality, BT will continue to collaborate after the end of the project.	Green Planet	Potential partners for future collaboration: Other Architecture, Engineering and Construction Stakeholders (didn’t specify)
5G Festival	Collaboration during project: At least 5 events – these include London Tech Week, Better Connected Workshop, Preliminary event (online), 5G Testbed Acceleration Programme (5GTAP) (post-5GTT) Future collaboration: At least 1 with Digital Catapult and Brighton Dome and Festival	Digital Catapult, Brighton Dome and Festival (partnership existed prior to the project) will continue their partnership after the end of the project.	None reported	Potential partners for future collaboration Fusebox, BDX, Corn exchange, BDBF, and Virgin Media 02
5G FoF	Collaboration during	None reported	None reported	Reported as N/A

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	<p>project: At least 25 events – these include AMRC event, Miralis Data event, BAE events, IET webinar, 5G World Summit, and FoF Consortium</p> <p>Future collaboration: None reported</p>			
5G Logistics	<p>Collaboration during project: Around 20 events – these include collaboration meetings/ workshops, use case demonstrations etc.</p> <p>Future collaboration: There is the formation of a new partnership in connection with the FRAC project (but the materials provided did not specify which partner it was) and the development of commercial partnerships.</p>	AttoCore, ADVA, Airspans, and Cellnex partnership formed for future collaboration.	None reported	Reported as N/A
5G Ports	<p>Collaborations during project: At least 5 events – these include Be Better Connected Conference, 5G Realised event, 5G World Presentation, 5G T&T Roundtable, demonstration events</p> <p>Future collaboration: None reported</p>	Continued collaboration between CKHIOD (the R&D arm of Hutchinson) and Blue Mesh around potential commercialisation of the predictive maintenance product. (Interview)	None reported	None reported

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
5G-AMC2	Collaborations during project: At least 2 events – these events are 5G Week and CSIC event etc. Future collaboration: None reported	An application together for Innovate UK but nothing specific for 3 consortia members but scanning for investment opportunities within 5G to potentially work together (interview)	Worked with projects in industrial space e.g. Eden Project, 5G Logistics. Organisations which they interviewee said may not have been too involved with other wise.	Other key members involved during the project: Constructing Excellence
5GEM	Collaborations during the project: Around 70 recorded events – these include Tech Innovation forum, Network design, 5G Health & Safety (From the collaboration Tracker in the BR) Future collaboration: None reported	None reported	5G Encode	Other key members involved in collaboration during the project: At least Zeetta Networks (From 5GEncode), DC, Nissan (From 5G CAL), DCMS
5GEncode	Collaborations during the project: At least 15 events – these include Digital Catapult Forum, UK5G event, Skills workshop, MWC21 connectivity event in Barcelona. Future collaboration: No planned collaboration, but Bristol Robotics Lab (BRL) expressed desire to collaborate with NCC; the same	None for the time being, but potentially BRL, Mativision, and NCC might continue on a collaborative relationship. NCC are pursuing to be part of the ‘umbrella 2’ project related to energy saving (but not specifically for 5G) Toshiba will participate in the FRANC project, and also leads	5GEM and FoF	Reported as N/A

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	goes for Mativision on AR use case with NCC.	the South Gloucestershire umbrella in the 'umbrella 2' project.		
5GRN	Collaboration during the project: At least 2 events – these include the BR workshops, the Be Better Connected, and multiple project meeting Future collaboration: None reported	None reported	None reported	Reported as N/A
CoCore/5G Wales Unlocked	Collaboration during the project: At least 6 events – these include 5GTT UK Be Better Connected conference, UK5G Realised Event, 5G Skills Workshop, Creative Sector Skills workshop, MNO sector event, UK-Spain 5G innovation workshop etc.	Consortium partners have signed a memorandum of understanding to continue working together.	None reported	Reported as N/A
Connected Cowes	Collaboration during the project: At least 3 events – these includes Innovate Local, UK5G conference etc.	Aql and Cowes Week will continue to work on their use case.	Live & Wild and VISTA	Reported as N/A
Connected Forest	Collaboration during the project: At least 3 events – these include Be Better Conference, collaboration discussions via Basecamps, 5GTT	NTU will form a network with external businesses in the future. Netmore and Gooii are looking to collaborate.	VISTA	Other key members in the new collaborative network formed: Innovation Nottinghamshire, the Turbine

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	<p>Security Collaboration. There's also a collaboration with Vista on two Fronts: 5G Broadcast and 5G Fed Camera content</p> <p>Future collaborations: a new network composed of Innovation Nottinghamshire, NTU's SWIFT Lab, DC, and Turbine Innovation Centre is formed. Consortium members (not specified which member) will also collaborate with future programmes and local business groups, such as the East Midlands Chamber of Commerce's Digital Up_scaler programme and the North Notts Business Improvement District.</p>			<p>Innovation Centre, and Digital Catapult.</p> <p>Other programmes and local businesses groups recorded to be in a collaborative relationship with the consortium: East Midlands Chamber of Commerce's Digital Up-scaler programme & North Notts Business Improvement District. Note there are likely more groups and programmes who are in collaboration with the member of the consortium, but these are the ones that are shown in the record.</p>
Eden Universe	<p>Collaboration during the project: At least 6 events – these include Digital Leaders Week, Be Better Conference, Planted Conference, Festival of the Future, UK5G showcase conference, UK/ Spain 5G Workshop etc.</p>	<p>Aql is still planning upgrades to the network they installed and the Eden Project hope to work with other partners (MLF and Metacamera) in the future. (Interview)</p>	<p>Liverpool 5G, Green Planet 5G, Connected Cowes, and 5G Rural Dorset</p>	<p>Other key members involved in collaborative events during the project: National Robotarium, RAF Leeming, Environment and Climate working group, Digital Twins Collaboration Group, Plymouth University, Cornwall care</p>

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	Future collaboration: there is none for the time being, but Eden Universe is now in contact with Perform Green to explore future collaborative opportunity in Life Cycle Analysis.			Potential partners for future collaboration: Perform Green. (Note - this is still in discussion)
Green Planet 5G	Collaboration during the project: At least 10 events – these include multiple collaboration meetings, conferences, manifesto workshop, Innovation workshop Future collaboration: None reported	None reported	Eden Universe and Edge XR	Other key members involve in the collaboration during the project: Palm Brokers
Live and Wild	Collaboration during the project: around 22 occasions where various groups of interested parties spoken with the consortium. (Information in the sustainability report) Future collaboration: No specific mentioning of future collaboration but the sustainability material mentions that there will be long-term collaboration amongst consortium members.	There will be a long-term collaboration relationship amongst existing members of the consortium, who are Candour Productions, MTN, & Aql	MANY and VISTA	Other key members involved in collaboration with the consortium during the project: Skydrone, BT, Matthew Broadbent (Lancaster University), Ullswater Steamers and Broadband, Go-PRO, Hollyland, Marshall, Sony, NASA EELS, Shoothill Gauge Map app, Flyability/Coptrz, Windy.com, Kielder Observatory, Natural England, National Trust, Lindisfarne Development Trust, Apex Cameras, John Muir Trust, British Caving Association, British Cave Rescue Council, Mountain Rescue England and Wales

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
Liverpool 5G Create	<p>Collaboration during the project: At least 2 collaborations with other consortiums.</p> <p>Future collaboration: None reported</p>	<p>They plan to maintain the network and carry on working with partners but have not provided details of any specific projects/areas of work for this.</p>	<p>The consortium has written two articles for the Eden Project. The E-health cluster also facilitated an ARL Workshop with 5G Rural Dorset.</p>	<p>Other members involved in collaboration with the consortium during the projects: UK5G Collaboration magazine, 5G Scotland.</p>
MANY	<p>Collaboration during the project: None reported</p> <p>Future collaboration: At least 4 future collaborations have been planned or are under consideration amongst consortium members.</p>	<p>There'll be a collaboration between York Uni, Safenetics, and Swaledale on connectivity using Helikite. Lancaster university's Department of Entrepreneurship and Strategy and Flo Culture expressed their will to continue the partnership with other members of the consortium if opportunities arise. Another department of Lancaster University, the Monitoring Team, has planned to work with another member Quickline & Safenetics. The North Yorkshire County Council plans to collaborate with York University on a new 6G</p>	None reported	Reported as N/A

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
Milton Keynes:5G	<p>Collaboration during the project: At least 2 with WM5G event and multiple several webinars with the 5G network.</p> <p>Future collaboration: 1 following up collaboration.</p>	<p>autonomous project in the future.</p> <p>The Connected Places Catapult and the Milton Keynes Council will deliver the second accelerator programme.</p>	<p>WM5G and VISTA (One of VISTA use case is with MK5G)</p>	<p>Reported as N/A</p>
MONeH	<p>Collaboration during the project: At least 8 events – these include events such as the collaborative workshops.</p> <p>Future collaboration: 1 collaboration with other business in 2022.</p>	<p>No information on further collaboration within the consortium.</p> <p>Telet will join another consortium in 2022.</p>	<p>Telet advised New Thinking on spectrum process.</p>	<p>Future collaboration with two other members – cellXica and AcellerComm, the two businesses which teamed up with Telet for the 2022 DCMS Future RAN programme to build new 4G radio and the associated network services.</p>

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
New Thinking	<p>Collaboration during the project: At least 5 events – these include 5GTT Collaboration Workshop, Be Better Connected event, UK5G Showcase, On-line stakeholders’ event, & 5G Shared Spectrum for Private Networks</p> <p>Future collaboration: At least 3 forms of collaboration amongst consortium members.</p>	<p>Shefa Telecom, University of Strathclyde, CloudNet, and Scottish 5G centre are in discussion for further collaboration in application of further funding.</p> <p>University of Strathclyde and Scotland 5G Centre secured further funding for a collaborative maintenance of the NT toolkit.</p> <p>Shefa Telecom is in discussion with Orkney Islands Council for further collaboration.</p>	<p>MONeH helped New Thinking on spectrum process.</p>	<p>Some other key members involved with collaboration are Ofcom, MoD, Ofcom Shared Access License meeting, Quickline, Aql, DCMS</p>
5G Rural Dorset	<p>Collaboration during the project: At least 6 events – these include “5G in adversity” collaboration group, International Ports Event, UK5G SME/LEP healthcare event, Private Networks Conference panel, Ports conference, & DCMS Workshops on collaboration and benefits realisation.</p>	<p>Vodafone will continue to support the MoD research in Dorset Innovation Park.</p> <p>Kimcell will work with Qualcomm, whilst Wessex and Vodafone will continue to work with their clients on network provision.</p>	<p>WM5G and New Thinking.</p>	<p>Other members who’ll collaborate: MoD will continue to team up with Vodafone whilst Qualcomm with Kimcell.</p>

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	Future collaboration: Collaborations of at least 3 members with other businesses.			
Smart Junctions 5G	<p>Collaboration during the project: At least 13 collaboration events – these include meetings with NCSC, engagement events with "Salford Smart City Alliance", meetings with UK5G, Industrial 5G Trials Innovation Forum (run by Digital Catapult), engagement events with BT Research, multiple knowledge sharing webinars with other 5G Create Project, multiple collaborative events with Greater Manchester AI Foundry in planning an AI challenge, multiple Vivacity Smart Junction User Group events and workshops, multiple discussions event with TfWM, & engagement events with MIDAS.</p> <p>Future collaboration: None reported</p>	None reported	WM5G	Other members involved in the collaboration during the project are Vodafone, BT Research, Local Authority in Canada (Calgary), Cambridgeshire and Peterborough council, MIDAS, Attocore, Acceleran, and Aql, Greater Manchester AI Foundry
VISTA	Collaboration during the project: Around 6 events – these include the BR and collaboration workshops, Total Telecoms event,	None reported	MK:5G (a use case was tested in the Milton Keynes stadium).	None reported

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	DTG FutureTech event, Project Demo, 5G MAG working group, etc Future collaboration: None reported			
West Mercia 5G	Collaboration during the project: At least 8 events/occasions where collaboration occurred – These events include 5G in Adversity working group event, WMR5G Communications Subgroup event, multiple partnerships events working with Liverpool 5G resulting in public engagement activities and knowledge exchange through podcasts and events, and two sharing events with Rural Dorset on ‘health use case knowledge and experiences’, particularly co-opting use case participants and implementation of new devices; (This includes MANY and MONEH) Future collaboration: None reported	Nothing firm, but interview indicate an intention by some consortium partners to stay in touch and they may work together on future projects (interviews).	MONEH, MANY and 5G Rural Dorset	Reported as N/A
WM5G (Application Accelerator)	No detail of collaboration in the BR. Future collaboration: None reported	None reported	None reported	None reported

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
WM5G (Healthcare)	Around 1 collaboration during the project. Future collaboration: None reported	None reported	None reported	BR reports a business-to-business new collaboration between IoT solutions Group to (Tekihealth-Dignio)
WM5G (Infrastructure Accelerator)	Around 1 collaboration during the project. Future collaboration: None reported	None reported	None reported	New built environment called Sitenna. This resulted from business-to-business collaboration as reported in the BR.
WM5G (Manufacturing)	No detail of collaboration in the BR Future collaboration: None reported	None reported	None reported	None reported
WM5G (Transport Road Sensors)	Collaboration events during the project: Around 25 events – these include H2020 Cosafe Knowledge Sharing, TfGM Open Data Session, national infrastructure Commission workshop, UK5G Connected Places Infrastructure Group, Coventry City of Culture, etc (BR) Future collaboration: None reported	None reported	No information collaboration with other consortiums.	Project closure workshop with DCMS, Exhibition, new business-to-business collaborations between Vivacity and Vaisala, Vivacity and Jacobs
WM5G (Transport Use Cases)	No detail of collaboration in the BR Future collaboration: None reported	None reported	None reported	None reported

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
5G Rural First	<p>Collaboration events during the project: About 10 events including consultation provided to UK Agricultural Productivity Working Group on the importance of rural connectivity and 5G. Workshops conducted on 'Digital Technologies for Global Challenges', 'Global Challenges Research Fund and international fund (GCRF)', 'Local Industrial Strategy Planning Clean Growth Workshop', 'Neutral Hosting workshop', among others.</p> <p>Future collaboration: 9 of the consortium members from the 5G Rural First project continued on to deliver the Phase 2 5G New Thinking Project</p>	<p>9 of the 5G Rural First consortium members were also part of the 5G New Thinking project, funded in phase 2 of the 5GTT programme. These are: Cisco, University of Strathclyde, CloudNet, SHEFA, Agri EPICentre, BBC, University of Surrey, University of Glasgow, and the Orkney Island Council.</p>	<p>5G Rural First attended the Liverpool 5G project review and 5GRIT Rural showcase. The consortium also collaborated with AutoAir on project management.</p>	<p>At least 4 Meetings with DCMS to discuss the extension of the Rural First project.</p>
5G Smart Tourism	<p>Collaboration activities during the project: About 3 events including efforts by the consortium to engage local businesses and visitor attractions by conducting forums and business events. Apart from this the consortium also made</p>	<p>None reported</p>	<p>Collaboration workshops were held with 5G AutoAir</p>	<p>None reported</p>

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	<p>efforts to deliver marketing activity in partnership with influential media titles.</p> <p>Future collaboration: None reported</p>			
Worcestershire 5G Consortium	<p>About 12 events including workshops for Network/system design architecture, Cross Departmental Events, and 5GIC Collaborative Workshops, among others.</p> <p>The consortium in partnership with the Huawei and Heart of Worcestershire college opened a Huawei 5G academy.</p>	None reported	The consortium collaborated with Liverpool 5G testbed and AutoAir	The consortium also attended at least 2 UK5G events.
Liverpool 5G Testbed	Collaboration events during the project: About 12 workshops and visits were organised and hosted by the Liverpool 5G. These included visits from the partnering South Korea's 5G forum, Minister for Creative and Digital Industries, Local Government Association, and NHS, among others.	The Liverpool 5G Testbed project inspired the funding of the phase 2 Liver 5G Create project, which was delivered by the same consortium. Members included Blu Wireless Technology Ltd, CGA Simulation, Docobo Ltd, Broadway Partners Ltd, Ehealth	The visits hosted by the consortium included visits from other 5GTT projects such as Worcester 5G consortium, Rural First, and West Midlands 5G, and Auto Air.	None reported

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	<p>Workshops and events included Adoption Readiness Event, Kensington Education and Training Community Centre community event, Care providers day at Cunard building in Liverpool to showcase all products and engage with care providers, among others.</p> <p>Future collaboration: The Liverpool 5G Testbed project inspired the funding of the phase 2 Liver 5G Create project, which was delivered by the same consortium.</p>	<p>Cluster Ltd, Aimes Management Services Limited, Real Wireless, Telet Research, University of Liverpool, Liverpool John Moores University, Liverpool City Council, Mersey Care NHS Foundation Trust, and NHS Liverpool Clinical Commissioning Group.</p>		
AutoAir	<p>About 23 events including participating in and hosting presentations, workshops, and delegations, such as: Blu Wireless presentation at IWPC mmWave Workshop, O2 Analyst meeting, CW Seminar -Commercialising Millimetre-Wave Technology.</p> <p>This also included international events such as 5G Huddle, Tokyo,</p>	None reported	<p>About 4 items – including collaboration workshops held with 5G Rural First, Worcestershire 5G consortium, 5G Smart Tourism, and Liverpool 5G testbed.</p>	<p>About 6 items – including workshops, events, and meetings with UK5G and DCMS. These include events such as Millbrook hosting a UK5G Testbeds and Trials WG meeting, DCMS Small Cells Workshop in Westminster, Presentation to cross-Government Department meeting (DCMS, BEIS, DfT, CAV, DIT, MOD), among others.</p>

Project Names	Number of events for collaboration (e.g., workshops)	Original consortium members continue to collaborate after the project ends	Other 5G projects involved in a collaboration owing to 5GTT	Other contact and events
	the publication of Collaborative White Paper on Spectrum Issues, and several collaboration workshops with 5G Innovation Centre.			
5GRIT	<p>About 35 events including presentation, workshops, and events hosted by the consortium in partnership with the local Parish, Schools, Industry representatives, and wider community.</p> <p>Includes 5G Wireless Summer School targeted at PhD student, researchers, and industrialists. This was undertaken in collaboration with Nokia and Ericsson, among others. Filming down mine with local volunteers, and 5G Workshop by 5GRIT and Wired Cumbria to business and community members of Cumbria, among other things</p>	None reported	Collaborated with 5G Rural First.	At least 3 recorded events including update meetings with DCMS and the local Parish, and internal consortium collaboration meetings.

Source: BRs

Table 13: Projects' UK5G pages, websites, and social media accounts

Project	Link to UK5 web page	Website (if active)	Social media account (if any)
5G-AMC2	5G AMC 2 (uk5g.org)	5G - AMC2 (Accelerate, Maximise and Create for Construction) (bamnuttall.co.uk)	BAM Nuttall - YouTube
5G CAL	5G CAL (Connected Automated Logistics) (uk5g.org)	Not found	Not found
5G Factory of the Future	5G Factory of the Future (uk5g.org)	Factory of the Future - 5g Factory of the Future (5gfof.co.uk)	YouTube: Advanced Manufacturing Research Centre (@TheAMRC) / Twitter LinkedIn: AMRC LinkedIn
5G Edge-XR	5G Edge-XR (uk5g.org)	5G Edge-XR (5gedgexr.com)	Not found
Smart Junctions 5G	Smart Junctions 5G (uk5g.org)	Smart Junctions - VivaCity (vivacitylabs.com)	Not found
5G Logistics	5G Logistics (uk5g.org)	Not found	Not found
5G Ports	5G Ports - Port of Felixstowe (uk5g.org)	Not found	Not found
VISTA	Project Vista (uk5g.org)	Not found	Not found
Eden Universe	Eden Universe (uk5g.org)	Not found	Not found
Connected Cows	Connected Cows (uk5g.org)	Not found	Not found
Green Planet 5G	Green Planet AR Experience Powered By EE 5G (uk5g.org)	Not found	Not found
Live & Wild	Live+Wild: Filming with 5G (uk5g.org)	liveandwild.com	Instagram: Live & Wild (@live_and_wild) • Instagram photos and videos Twitter: Live & Wild (@liveandwild) / Twitter

Project	Link to UK5 web page	Website (if active)	Social media account (if any)
5G Festival	5G Festival (uk5g.org)	5G Festival - Digital Catapult Digital Catapult (digicatapult.org.uk)	Not found
MK:5G	Milton Keynes 5G (uk5g.org)	Not found	Not found
Liverpool 5G Create	Liverpool 5G Create (uk5g.org)	Liverpool5G	Twitter: @Liverpool5G / Twitter
5GEM	5GEM UK (uk5g.org)	Not found	Not found
5GEncode	5G Encode (uk5g.org)	5G-Encode Home	Twitter: 5G-ENCODE Project (@Encode5g) / Twitter LinkedIn: 5G-ENCODE Project LinkedIn
5GRN	5G RailNext (uk5g.org)	Not found	Not found
5G Wales Unlocked	5G Wales Unlocked (uk5g.org)	Not found	Not found
Rural Dorset	5G RuralDorset (uk5g.org)	5G RuralDorset	Twitter: @5GRuralDorset / Twitter LinkedIn: 5G RuralDorset LinkedIn
MANY	Mobile Access North Yorkshire (MANY) (uk5g.org)	Home - Mobile Access North Yorkshire	Facebook: Mobile Access North Yorkshire Facebook Twitter: @mobileaccessNY / Twitter Instagram: Mobile Access North Yorkshire (@mobileaccessnorthyorkshire) • Instagram photos and videos
New Thinking	5G New Thinking (uk5g.org)	5G New Thinking	Twitter: 5G NewThinking (@5GNewThinking1) / Twitter LinkedIn: 5G New Thinking LinkedIn

Project	Link to UK5 web page	Website (if active)	Social media account (if any)
MONeH	Multi Operator Neutral Host (MONeH) (uk5g.org)	Not found	Not found
Connected Forest	5G Connected Forest (uk5g.org)	5G Connected Forest: Delivering 5G to Sherwood Forest and the surrounding area	Not found
West Mercia	West Mercia Rural 5G (uk5g.org)	Welcome to West Mercia Rural 5G project - 5G Innovation within Rural Healthcare & Social Care (wmr5g.org.uk)	YouTube: West Mercia Rural 5G Project - YouTube Twitter: WMR5G (@WMR5G) / Twitter LinkedIn: West Mercia Rural 5G Project LinkedIn
WM5G (Application Accelerator)	West Midlands 5G (uk5g.org)	West Midlands 5G: Accelerating the benefits of 5G (wm5g.org.uk)	Twitter: WM5G (@WestMids5G) / Twitter LinkedIn: WM5G LinkedIn YouTube: Ben Turner - YouTube
WM5G (Infrastructure Accelerator)	West Midlands 5G (uk5g.org)	West Midlands 5G: Accelerating the benefits of 5G (wm5g.org.uk)	Twitter: WM5G (@WestMids5G) / Twitter LinkedIn: WM5G LinkedIn YouTube: Ben Turner - YouTube
WM5G (Manufacturing)	West Midlands 5G (uk5g.org)	West Midlands 5G: Accelerating the benefits of 5G (wm5g.org.uk)	Twitter: WM5G (@WestMids5G) / Twitter LinkedIn: WM5G LinkedIn YouTube: Ben Turner - YouTube

Project	Link to UK5 web page	Website (if active)	Social media account (if any)
WM5G (Transport Road Sensors)	West Midlands 5G (uk5g.org)	West Midlands 5G: Accelerating the benefits of 5G (wm5g.org.uk)	Twitter: WM5G (@WestMids5G) / Twitter LinkedIn: WM5G LinkedIn YouTube: Ben Turner - YouTube
WM5G (Transport Use Cases)	West Midlands 5G (uk5g.org)	West Midlands 5G: Accelerating the benefits of 5G (wm5g.org.uk)	Twitter: WM5G (@WestMids5G) / Twitter LinkedIn: WM5G LinkedIn YouTube: Ben Turner - YouTube
WM5G (Healthcare)	West Midlands 5G (uk5g.org)	West Midlands 5G: Accelerating the benefits of 5G (wm5g.org.uk)	Twitter: WM5G (@WestMids5G) / Twitter LinkedIn: WM5G LinkedIn YouTube: Ben Turner - YouTube
5G Rural First	5G RuralFirst (uk5g.org)	5G RuralFirst	YouTube: 5G RuralFirst - YouTube
5G Smart Tourism	5G Smart Tourism (uk5g.org)	Not found	Not found
Worcestershire 5G Consortium	Worcestershire 5G Consortium (nexGworx) (uk5g.org)	5G News Archives - Worcestershire LEP (wlep.co.uk)	Twitter: Worcestershire LEP (@worcsLEP) / Twitter LinkedIn: http://www.linkedin.com/groups/Worcestershire-LEP-Local-Enterprise-Partnership-3852431?home=&qid=3852431&trk=anet_ug_hm YouTube: Worcestershire LEP - YouTube Instagram: Worcestershire LEP (@worcslep) • Instagram photos and videos

Project	Link to UK5 web page	Website (if active)	Social media account (if any)
Liverpool 5G Testbed	Liverpool 5G Testbed (uk5g.org)	Not found	Not found
AutoAir	AutoAir (uk5g.org)	Not found	Not found
5GRIT	5G Rural Integrated Testbed (5GRIT) (uk5g.org)	Not found	Not found

Source: RSM compilation of data from UKTIN website and wider online sources

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