Arqiva submission to Ofcom's Strategic Review of Digital Communications

About Arqiva

Arqiva is a communications infrastructure and media services company operating at the heart of the mobile and broadcast communications industry. Arqiva provides infrastructure for television, radio, mobile and other wireless communication in the UK.

Arqiva operates shared radio site assets throughout the UK, including masts from under 30 to over 300 metres tall. We have worked with the mobile industry over two decades to deliver mobile services to consumers with a significant presence in suburban and rural areas. Our portfolio includes over 8,600 active, and more than 16,500 marketable sites. These include radio and television broadcast sites, BT telephone exchange rooftops and use of National Grid pylons.

Arqiva enables the Airwave emergency services network in remote areas through ca.1,000 of our sites. We are working with DCMS to build new shared sites for villages in 'not-spots' as part of the Mobile Infrastructure Programme (MIP). We also own and operate 50 In-Building Systems to extend the MNOs' coverage and capacity into challenging environments such as Canary Wharf and the ExCel Centre.

We are one of the UK's largest public WiFi providers, enabling us to offer unique propositions for venue WiFi and small cell networks, including at Heathrow airport and Central London.

Arqiva is building a national Internet of Things ("IoT") network, starting with 10 of the UK's largest cities. Our smart metering service, connecting 10 million homes using long-range radio technology, will be one of the UK's largest machine-to-machine deployments.

Arqiva is a founder member and shareholder of Freeview. We broadcast all eight Freeview multiplexes, are the licensed operator of four of them and we own Connect TV, the first company to launch a live IP streaming channel on Freeview. Arqiva is the licensed operator of Digital One – the national commercial DAB digital radio multiplex.

Arqiva is a major player in the UK's satellite industry, operating over 80 antennas to geostationary satellites, and providing Telemetry, Tracking and Command support services to some of the leading satellite operators. We are a major provider of permanent satellite services to both Freesat and Sky customers. Arqiva also provides global satellite based services to the broadcast, communications, security, oil & gas and exploration sectors.

Our major customers include EE, H3G/Three, Telefónica/O2, Vodafone, BBC, ITV, Channel 4, Five, Sky, Global Radio, Airwave, Heathrow and Whitbread/Premier Inn.

Arqiva is owned by a consortium of long-term investors and has its headquarters in Hampshire, with major UK offices in London, Buckinghamshire and Yorkshire.

Executive summary

Arqiva welcomes the opportunity to contribute to Ofcom's discussion paper *Strategic Review of Digital Communications.* As an independent provider of wireless infrastructure for different sectors in the UK, we offer a distinctive perspective on a number of the key issues that Ofcom is considering.

Our principal interest in the Strategic Review is in the ongoing provision of infrastructure to mobile network operators. Arqiva participates in a thriving independent infrastructure sector, enabling new and innovative services (such as 4G and Small Cells) to be rolled out quickly and efficiently to UK citizens and consumers. It is a market that works well, delivering wide and significant economic and social benefits.

The importance of independent infrastructure providers is not always explicitly acknowledged in the decisions made by policy makers. We are commercially incentivised to ensure that as many network operators as possible have access to critical infrastructure. We enable market growth and expansion. The market is competitive, meaning that we have an incentive to deliver reliable and efficient solutions to our customers.

In that environment, we have an overriding objective of ensuring that legislation and regulation continues to promote competition and enable the clear benefits provided by the independent infrastructure sector. The existing diversity of self-provisioning and independent infrastructure providers works well as illustrated by the swift roll-out of 4G services over the past two years.

We welcome Ofcom's preference for competition over consolidation in communications markets, as set out in its discussion paper. In this submission, we provide evidence to demonstrate why this approach is particularly crucial for the infrastructure element of the mobile value chain. We then set out why, with the prospect of potential further UK consolidation at an operator level, there must be an outcome at the infrastructure level which enables competition to flourish.

In practice this means that if there were a reduction to three Mobile Network Operators (MNOs) in the UK, then the interests of consumers would need to be protected. One crucial way of achieving this would be to ensure that there was no subsequent lessening of competition at the radio access network level.

Access to infrastructure is, together with access to spectrum, an absolute pre-requisite for sustaining a vibrant and competitive mobile market. MNOs compete with each other through their radio access networks. A diversity of provision of infrastructure assets at a passive level enables market entry and expansion.

We look forward to engaging further with Ofcom on this important project to ensure that it secures the best consumer outcome.

About this submission

This submission seeks to respond to the two questions in Ofcom's discussion paper which Arqiva, as a provider of infrastructure to wireless operators, has the most direct interest in and consequently a particularly distinctive voice, namely:

Question 8: Do you agree that full end-to-end infrastructure competition in mobile, where viable, is the best means to secure good consumer outcomes? Would alternatives to our current strategy improve these outcomes, and if so, how?

Question 9: In future, might new mobile competition issues arise that could affect consumer outcomes? If so, what are these concerns, and what might give rise to them?

We respond to these questions by setting out the following:

1. The role of wireless infrastructure, both passive and active in the mobile infrastructure value chain;

2. The evolution of how MNOs have secured access to infrastructure at a passive and active level;

3. The role of infrastructure provision in promoting competition;

4. The importance of independent infrastructure providers in that competitive environment; and

5. The implications of further consolidation at an MNO level and the most competitive outcome at a network level.

1. The role of wireless infrastructure

Network operators rely on access to wireless infrastructure assets to provide their services. Whilst much policy focus is typically given to the requirements of MNOs, this infrastructure is also crucial to delivering other services such as fixed-wireless broadband, radio and TV broadcast, emergency services and machine-to-machine communications. However, for the purposes of this submission, we will focus on the context of MNO access to infrastructure to reflect the key concerns of the discussion paper.

Passive assets

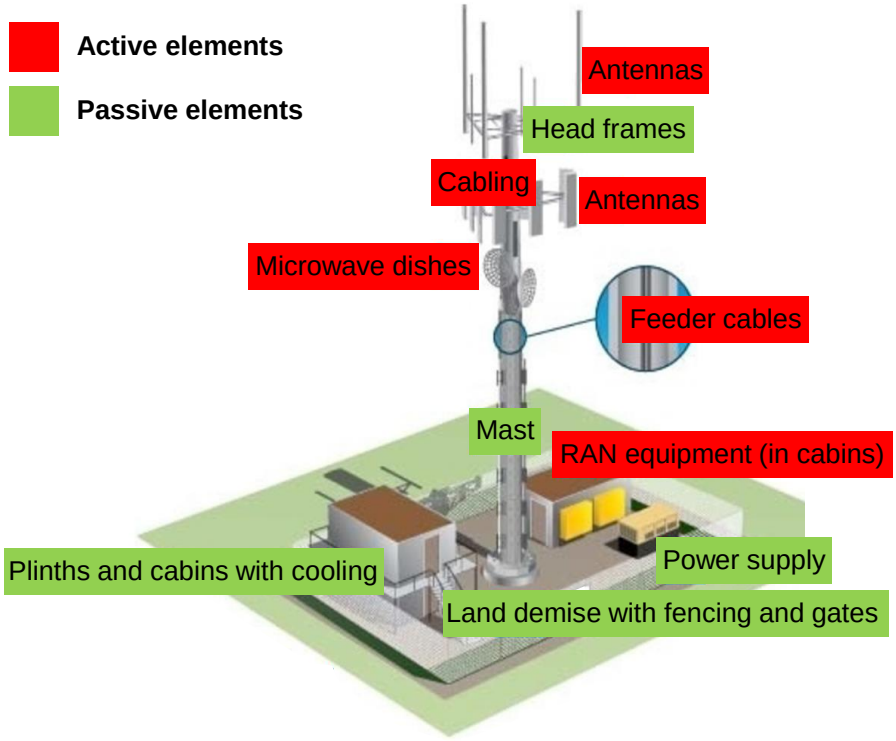
Wireless infrastructure assets are owned or managed by either MNOs or by independent infrastructure providers (IIPs). The physical structures onto which radio transmission equipment is fixed are referred to as "passive assets". They include masts, towers, rooftops, fences, gates, cabins, plinths, cooling equipment, power supply, connectors and cabling.

Active assets

Radio access network (RAN) equipment, including feeder cables and antennas, is placed on the passive assets by MNOs, enabling them to transmit radio signals in their licenced spectrum bands. This is known as "active equipment".

Sharing at the spectrum level does not happen currently in the UK. It is unclear that any mechanisms exist that could be put in place to ensure that such arrangements would mitigate any significant competition concerns.

The diagram below illustrates the passive and active elements of a typical MNO macro site:



2. The evolution of UK infrastructure sharing

Increasingly, MNOs have sought to access infrastructure jointly in sharing arrangements. They have done this in the UK by setting up joint ventures (EE and H3G setting up MBNL and Vodafone and Telefónica/O2 setting up CTIL and Beacon) as well as making extensive use of IIPs, whose business model is based on allowing as wide as possible access to their assets.

Infrastructure sharing has become an increasingly attractive option for a number of reasons, including:

- It facilitates faster roll-out of services as it reduces the potential for delays associated with acquisition, design and build of suitable sites;
- Costs to industry can be significantly reduced if more efficient use is made of existing infrastructure. Moreover, increasing utilisation rates of each tower ensures that the unit costs for network operators can be reduced;
- Co-locating equipment allows for the use of joint backhaul to the core network, further reducing cost to MNOs; and
- Using existing infrastructure can promote greater coverage for more operators sharing masts.

Additionally, the 2003 Communications Act also places an obligation on Code Operators to maximise the use of existing infrastructure. This is, in part, to avoid a proliferation of structures which could cause a negative impact on the environment and/or local communities.

In the UK, the nature of infrastructure sharing has evolved over the last decade with a series of initiatives between MNOs as well as in response to the changing nature of the market itself (driven primarily by merger activity).

In terms of the activity of the current players, the sequences of events are set out below[1]:

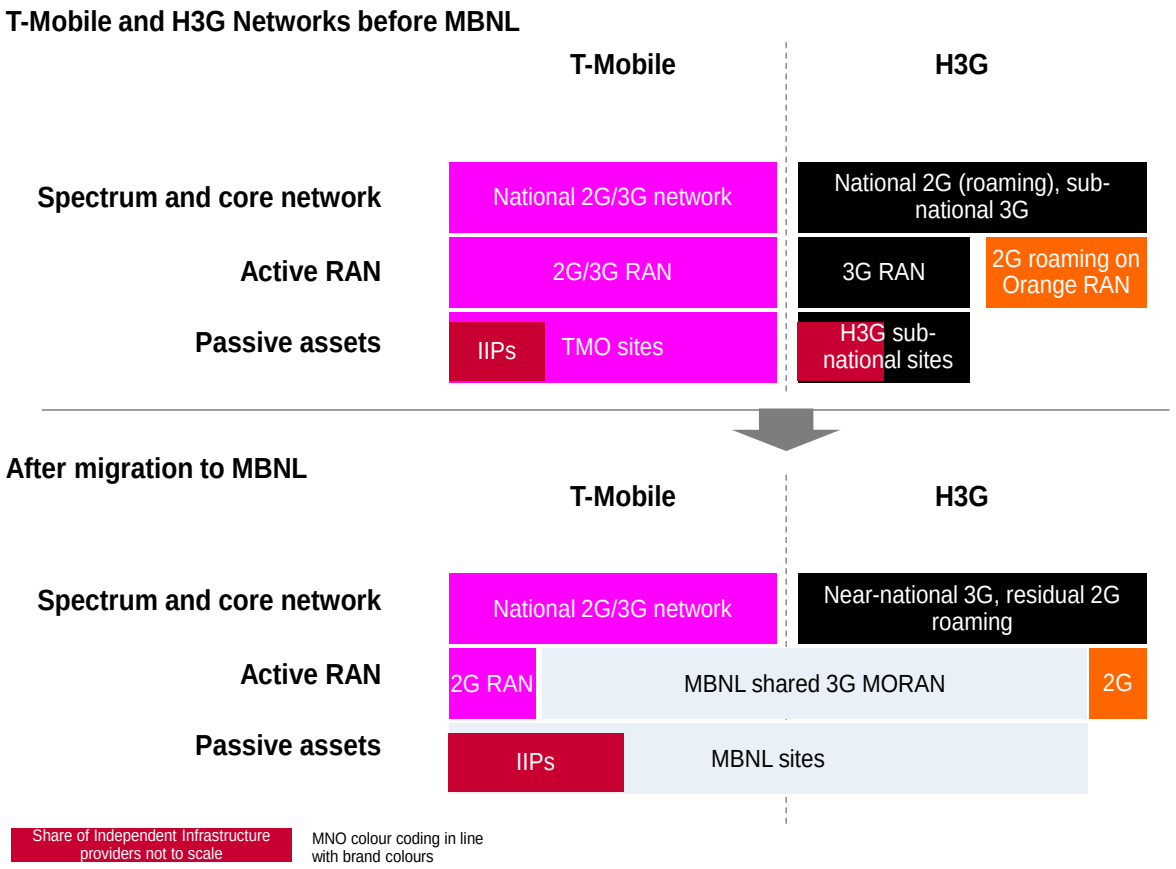
H3G and EE

2008

In 2008, H3G entered into a sharing agreement with T-Mobile which involved full sharing of their passive assets and of their 3G RAN. This joint venture was called MBNL (Mobile Broadband Network Limited).

[1] See also http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/ICCP/CISP(2014)2/FINAL&docLanguage=En, p. 66

There was no sharing of 2G RANs, since H3G did not hold a 2G spectrum licence.

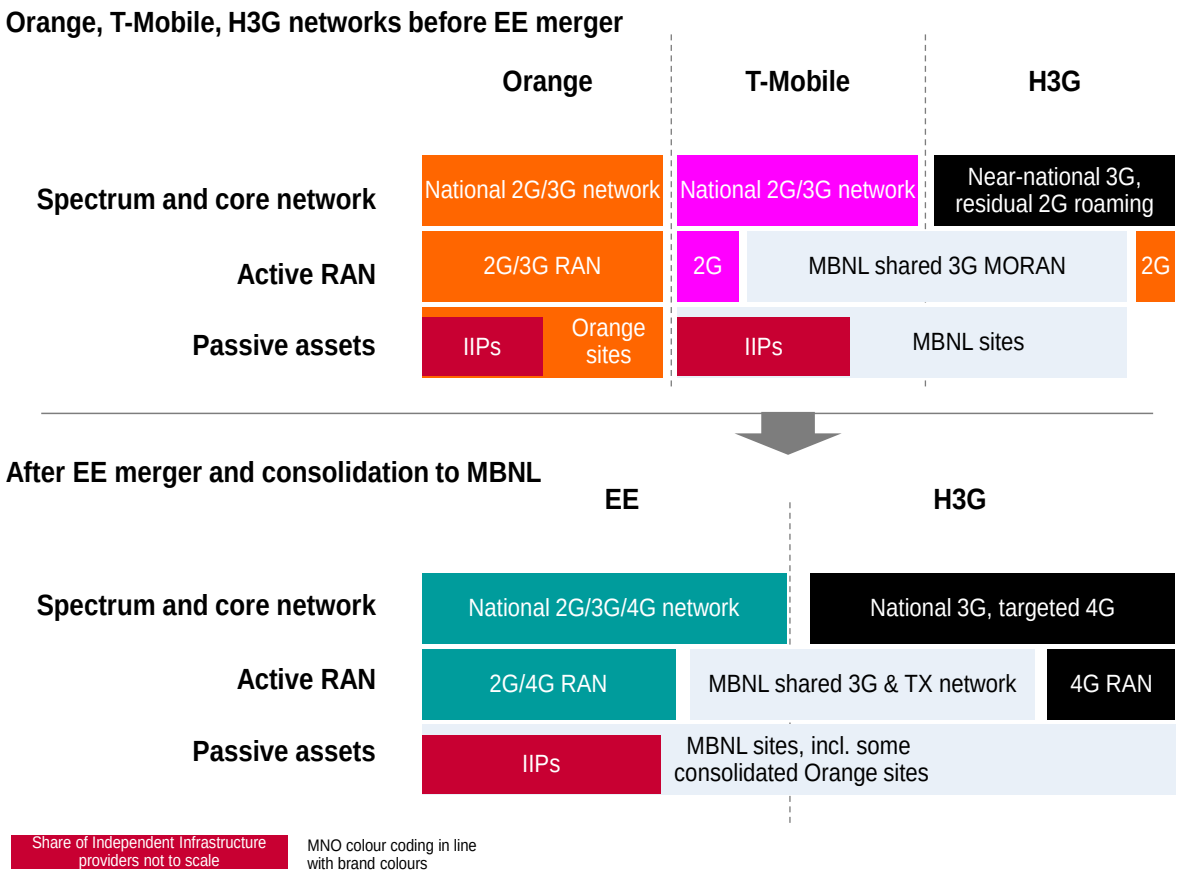


2010

The merger of T-Mobile and Orange in 2010 saw a revised arrangement between H3G and the new merged entity, EE. That saw a continuation of full sharing at a passive level (with Orange's assets being merged into the portfolio.)

There was a similar continuation of 3G RAN sharing. From 2012, EE's and H3G's 4G RANs were rolled out separately, with full passive and some active sharing, such as antennas and backhaul.

This is how the agreements have evolved to the situation we have in place today.



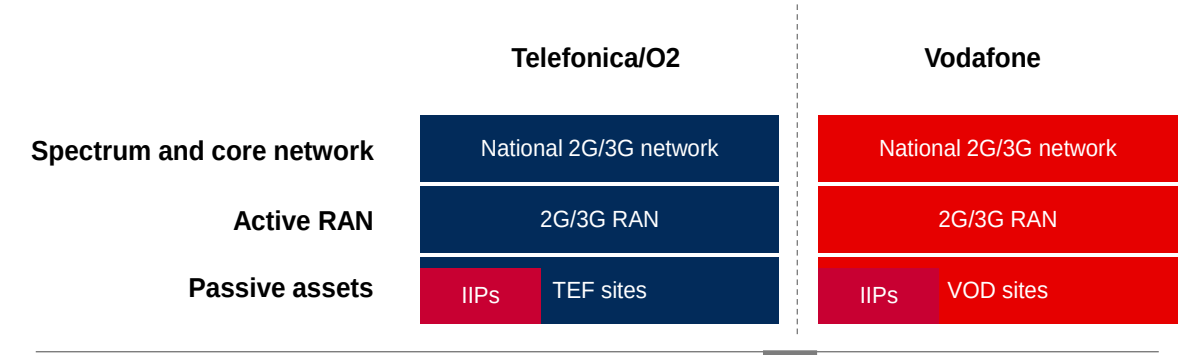
<u>O2 and Vodafone</u>

2012

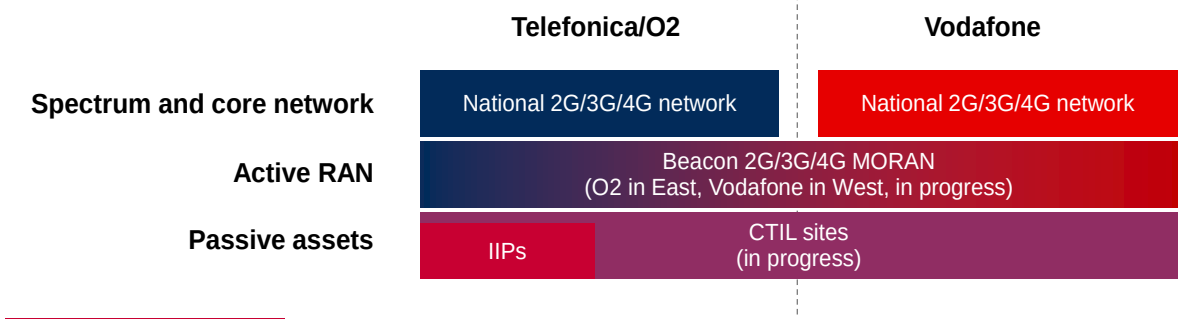
O2 and Vodafone established their joint venture Cornerstone Telecommunications Infrastructure Limited (CTIL) in 2012 with the aim of fully sharing passive assets. In terms of their 2G, 3G and 4G RANs, these are also to be fully shared, though with operational responsibility for them divided along geographical lines (O2 in the East of the UK and Vodafone in the West.).

This arrangement is known as 'Beacon' and, as of October 2015, was still being rolled out across the UK.

Telefonica/O2 and Vodafone networks before CTIL/Beacon



Telefonica/O2 and Vodafone networks after CTIL/Beacon



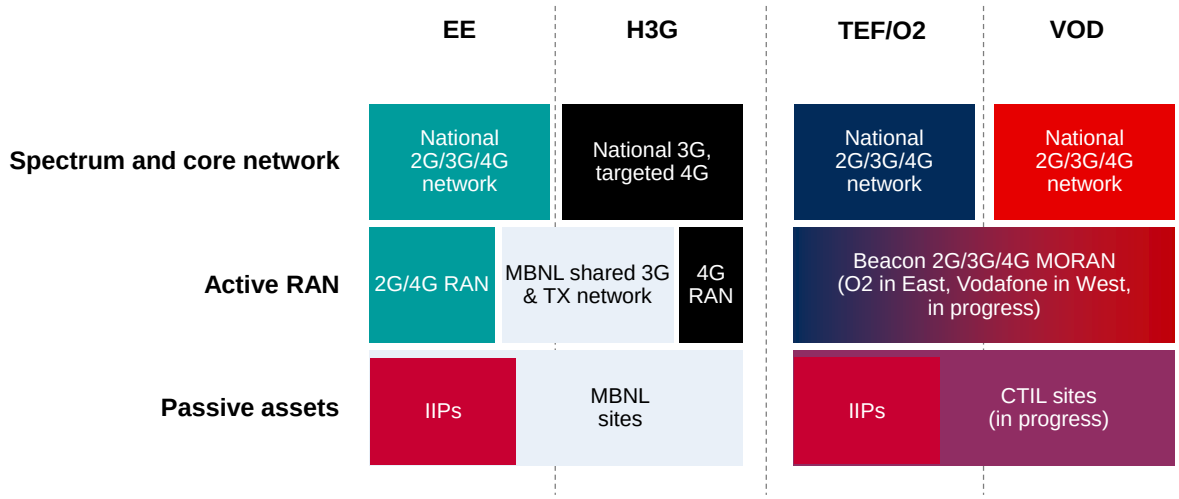
Share of Independent Infrastructure providers not to scale

MNO colour coding in line with brand colours

2015

The diagram below reflects the current situation for all 4 MNOs.

MNO network sharing landscape as of mid 2015



Share of Independent Infrastructure providers not to scale

MNO colour coding in line with brand colours

This shows that there are currently three 4G RANs in the UK (i.e. EE, H3G and Vodafone/O2/Beacon) which are supported by two passive asset sharing arrangements (i.e. MBNL and CTIL), which in turn source a share of their passive assets from IIPs.

MBNL and CTIL use independent infrastructure providers' passive assets as well as their own

MBNL and CTIL rely on MNOs' request for access to passive assets to develop their national RANs. Whilst the majority of those assets are owned and/or managed by the joint venture themselves, part of their networks also rely on access to assets and infrastructure services provided by IIPs (such as Arqiva). We set out the importance of that part of the market below in this submission.

3. Infrastructure and competition

This section sets out how infrastructure access promotes competition between MNOs at both a passive and at an active level.

Passive assets

In recent months, Ofcom has twice[2] reaffirmed its support for the principle of the UK requiring four MNOs to ensure a competitive market. This principle was established at the time it concluded[3] on the design of the award of the 800 MHz and 2.6 GHz bands in 2012. Bearing that in mind, we are conscious that there is a prospect of consolidation from four to three MNOs.

If there was reduction to three MNOs in the UK, there would be an imperative to ensure market conditions which could enable a new entrant into the market.

In that respect, the importance of a diversity of infrastructure providers was outlined by the OECD[4]. It set out its thoughts in the context of enabling new entry into the mobile market on commercial terms that would not place it at a significant disadvantage:

> *A new entrant may wish to share network to reduce costs and facilitate entry into the market once they have acquired spectrum. Whilst it is always open to new entrants to construct their own network, the cumulative effect of sharing arrangements may make this prohibitive since all other parties would benefit from cost savings not available to the new entrant. Previously, it would have had a choice of gaining access to sharing with more networks, and could potentially play these options off against each other to get the best deal, but as sharing reduces the number of networks, the new entrants ability to negotiate sharing would be reduced. The extent of this risk will depend upon the likelihood of any new entrant requiring such access, but if it did occur there would be a risk of significant harm to competition and consumers.*

In 2012, the Office of Fair Trading decided[5] not to refer the joint venture between Telefónica/O2 and Vodafone - Cornerstone (CTIL) - to the Competition Commission. That investigation focussed on the sharing of *passive* mobile network assets as the OFT deemed there to be no merger situation at the active asset level.

The Decision implicitly accepted the principle that a diversity of self-providing network asset arrangements at a passive level would be consistent with enabling MNO market entry or expansion:

> *Post transaction, it is likely that the remaining MNOs will be Everything Everywhere (EE) and Hutchinson 3G (H3G). EE provides access to a number of base stations*

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[2] *PSSR: Award of the 2.3 GHz and 3.4 GHz bands*, 7 November 2014: paragraphs 7.24-7.34 and *Anticipated acquisition by BT plc of EE Limited,* 31 July 2015*:* paragraphs 4.27-4.30

[3] Assessment of future mobile competition and award of 800 MHz and 2.6 GHz

[4] http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/ICCP/CISP(2014)2/FINAL&docLanguage=En, p. 68

[5] http://webarchive.nationalarchives.gov.uk/20140402142426/http://www.oft.gov.uk/OFTwork/mergers/decisions/2012/vodafone

> *sites to the parties* [ie Telefónica/O2 and Vodafone]*, and vice versa. As a result of this reciprocity, it is likely that EE could use its negotiating strength to limit the availability of Towerco* [ie CTIL] *to raise prices.*[6]

A reasonable conclusion from this position is that in the UK a diversity of passive network asset providers would be beneficial for competition.

Active assets

MNOs compete with each other at the RAN level. This is demonstrated by the ongoing roll-out of 4G services. Different operators are deploying different techniques with which to roll out their 4G networks. For example and as we set out above, Vodafone and O2 have adopted an approach whereby they have distinct responsibilities for the network on a geographical basis. EE and H3G have taken different approaches and are not sharing a 4G RAN, only some elements such as antennas and backhaul.

Taking different approaches may influence the progress made in roll-out and could offer one network a competitive advantage through providing services faster to potential customers.

Ofcom's 2015 Communications Market Report suggests progress made in improving geographical coverage of 4G services in the UK varies significantly from operator to operator[7].

Whilst *some* of this could be attributed to differences in when roll-outs started, the magnitude of those variations suggests that contrasting RAN strategies are delivering different results. For example, EE is heavily marketing 4G as the core of its consumer proposition and therefore continues to lead the rollout of 4G in the UK. H3G, in contrast, is focused on a good mobile internet experience at attractive prices, which it achieves through a more balanced use of 3G and 4G and without charging a premium for 4G. Therefore, it was crucial for both MNOs to deploy their 4G RANs largely independently to be able to support their overall market strategies.

[6] See paragraph 64
[7] See figure 1.4, page 27.

4. The importance of independent infrastructure providers

Independent infrastructure providers have a commercial incentive to make their assets available to all wireless network operators. Accordingly, the average number of sharers on each MNOs' mast compared with that of the IIPs shows that the latter achieve significantly higher utilisation rates through providing access to multiple operators.

As well as competition from within the IIP sector, IIPs face competition from self-providing network passive asset holders such as CTIL and MBNL. This acts as a competitive constraint on their ability to arbitrarily raise prices to MNOs.

As a result of these factors, the otherwise significant fixed costs involved in constructing and maintaining passive infrastructure assets are reduced as more efficient use is made of them. Increasing utilisation rates of infrastructure ensures that the unit costs for MNOs can be lower. This makes it cost effective to improve service coverage, including to areas where it may be unprofitable for them to invest in additional own assets. By reducing the pace at which new masts need to be constructed it enables the faster rollout of wireless broadband network expansion and upgrade.

The higher rate of co-location achieved by IIPs reduces the need to build more masts, speeds up deployment and reduces MNO lifecycle costs. IIPs are also able to reduce operating costs and lower cost of capital. This is as a result of the ownership and operation of masts being their core business.

In the UK, the MNOs own and operate the majority of passive mobile assets. However the IIPs constitute a small but significant part of the market as a whole for the provision of passive assets. There are difficulties in determining what the precise market share is, but a reasonable Arqiva assessment suggests that in the region of 30-40% of passive assets are provided by IIPs. This contrasts to the United States, where EY has estimated that 84% of market share is accounted for by independent providers.

The contribution that IIPs bring to the mobile ecosystem is, therefore, significant. It ensures that greater numbers of consumers enjoy the social and economic benefits of mobile communications. In that respect, we note that many IIP sites are based in rural areas, delivering those benefits to consumers who may otherwise not receive them.

The importance of IIPs is illustrated by H3G's entry into the UK MNO market as the fifth operator in 2003. Due to Arqiva's commercial incentive to share masts, we were a key partner in a fast and cost effective rollout so H3G could rapidly launch its own 3G network.

For further illustration, the table below highlights specific examples of projects where we have delivered network rollouts at pace successfully:

Significant network roll-out, upgrade and decommissioning projects			
Project	**Duration of the project (Months)**	**Total volume of sites**	**Peak number of sites rolled out in a month**
RAN roll-out for H3G market entry (until launch in 2003)	24	1,000	80
MBNL "Godiva 10:10" 2G/3G upgrades	24	2,200	150
T-Mobile UK/H3G National Transmission Plan	24	2,000	150
H3G decommissioning	18	1,500	180

In this environment, IIPs face a challenge to ensure that legislation and regulation does not damage the competitive nature of the market and continues to enable the clear benefits that IIPs bring to the MNO value chain. This is a well-functioning market that meets the needs of its customers, delivering benefits for UK citizens and consumers. Elsewhere, in discussions on the proposed reform of the Electronic Communications Code, IIPs are facing calls for further regulation of their commercial activity despite the additional commercial risks that this would doubtless bring to their activities.

To illustrate further the importance of IIPs in the provision of mobile services, we set out the case study below:

The important role of Independent Infrastructure Providers in facilitating growth in the mobile market – Arqiva as a case study

Arqiva (then Crown Castle UK Ltd) initiated Project Blast to assist a major 3G mobile operator to achieve its aggressive rollout target of delivering 700 constructed sites, rigged with 3G base stations, deployed, powered and commissioned within a 4 month period between March and July 2002.

The consequences of failure to meet the target would have resulted in major financial penalties to the operator. Hence there was an aggressive rollout schedule, requiring total flexibility and 'Fast Track' processes and procedures to complete to timescale and align with the clients reporting and working methodologies.

The project was initiated by defining the scope jointly and reviewing the mobile operators and our own operating procedures. We developed Fast Track deployment ideas with the customer at workshops attended by all keys stakeholders including network deployment managers, construction controllers, project managers, programme managers as well as installation and construction contractors.

We agreed and documented integrated processes to complete the project within defined scope, time, and cost constraints. Communication, reporting and escalation lines where established between all organisations to ensure the project was kept to programme and any issues were resolved and expedited in a rapid manner.

The mobile operator asked Arqiva to construct, rig and provide power to 700 3G base station nodes on our portfolio of sites. Sites were identified by the mobile operator's planning teams working in conjunction with Arqiva asset managers. A detailed programme of deployment was produced and strict programme management techniques adopted to ensure delivery. Progress was monitored and reported against on a daily basis with the project teams and on a weekly basis with both organisations senior management.

To meet the tight deadlines, our acquisition and project management teams conducted pre-consultation with planning authorities, landlords and regional electricity companies to ensure in advance any issues were identified and solved before the base stations were deployed.

The target of 700 3G base stations was achieved within the time scale.

5. The implications of a three MNO market in the UK

Ofcom Strategic's Review takes place in the wider context of two merger proposals in the UK MNO market, namely:

- BT and EE, currently being assessed by the Competition and Markets Authority; and
- H3G acquisition of Telefónica/O2, recently notified to the European Commission.

Our views on the proposed merger of BT and EE[8] can be found on the CMA website. However, we note that *that* merger will likely not lead to further consolidation in either the national MNOs sector or at the mobile infrastructure level.

The proposed acquisition of O2 by H3G, on the other hand, would likely have competition implications at the infrastructure level. O2 sits on the CTIL joint venture whilst H3G is part of MBNL. It is unclear to us what arrangements would be put in place as a result of any cleared merger. However, there appear to be a varied, though limited, number of plausible scenarios as to what might happen as a consequence of any merger being approved. These revolve around three options:

- H3G and O2 (the merged entity) remains party to one of the sharing agreements;
- The merged entity exits both network sharing agreements and migrates to its own network infrastructure and radio access network; or
- The merged entity seeks further consolidation of its passive and active asset agreements.

Where the merged entity remains party to one of the sharing agreements

We see this as plausible over time, since sharing with two other MNOs would not yield the full synergies of the proposed transaction. For example, the joint MBNL 3G network would have to be operated in parallel to the 3G portion of the CTIL Beacon network.

While difficult to predict, we consider it more likely that the merged entity would leave MBNL and join CTIL/Beacon as the MBNL sharing agreement likely involves less integration between the MNOs than does Beacon.

However, such a shift to one network sharing agreement is likely to put the remaining MNO at a disadvantage, potentially weakening its competitive position. In that respect, we note and agree with the response of BT to this concern in its own submission to Phase 2 of the CMA inquiry:

> *The Transaction also cannot be expected to impact on the current network sharing arrangements in a way that would marginalise CTIL. The Transaction involves no change to the network sharing arrangements in the UK. As there can be no concern relating to BT's backhaul provision (addressed in Section C) the Parties consider that there is in fact no plausible theory of harm relating to the current network sharing arrangements. If this concern relates to the possibility that O2 would enter into a sharing agreement with H3G and the merged entity (whether in the H3G/O2*

[8] https://assets.digital.cabinet-office.gov.uk/media/55b23a37e5274a3729000011/Arqiva_Submission.pdf

> *Merger counterfactual or not) it would likely be subject to scrutiny from Ofcom, the CMA and/or the Commission* ***and that agreement could not be implemented if it would marginalise Vodafone*** [our emphasis].[9]

Where the merged entity exits both sharing agreements and migrates to its own network infrastructure and radio access network

In this scenario we would expect *some* degree of passive asset sharing with MBNL and CTIL may continue in the short to medium term as today. However, there would be a longer term solution whereby separate sharing arrangements are put in place and where three RANs emerge, with two key benefits:

- Competition between MNOs at the network level is preserved; and
- There is no marginalisation of a single MNO.

We would expect that the role of IIPs in this scenario would be crucial in the longer term, since they have network assets readily available for the merged entity to quickly establish its own network footprint. Moreover and as set out above, independent providers have commercial incentives to provide these services.

Where the merged entity seeks further consolidation of its passive and active asset agreements

One consequence of a potential marginalisation of one of the MNOs could be a move towards consolidation from two networks to one. This would undermine the clear benefits (set out above) of a diversity of infrastructure providers at both a passive and active level.

We note some arguments being made that consolidation, not competition, is the most efficient way of securing investment in large scale infrastructure roll-out programmes. In response to those, we are fully aligned with Ofcom's approach as set out in its discussion paper where it addresses the question as to whether consolidation rather than competition drives investment. In particular:

> *The recent wave of mobile mergers internationally has prompted some commentators to suggest that investment would increase if levels of competition were lower. We do not believe this is supported by the evidence.*[10] [11]

We further note and agree with Ofcom when it directly addresses the issue of competition on the infrastructure level:

[9] Para 4.53 (b)
[10] Para 1.23
[11] WIK in its supporting report for Ofcom stated "On the basis of our analysis including econometric assessments, we have found no linkage between consolidation or higher concentration in mobile markets and an increase in investment."

> *Both access-based and end to end competition can stimulate innovation and investment…There is evidence that access-based competition, especially that based on access to passive infrastructure, can drive network innovation.*[12]

Conclusion

Bearing in mind the existing structure of the market for the sharing of passive and active network assets, it is clear that the best plausible outcome in the event of a future merger of H3G and O2 is that there should be no subsequent and additional lessening of competition at the radio access network level.

Moreover, policy makers should reflect carefully on the benefits that are derived from having a diversity of providers of passive assets and seek to ensure that these can continue.

8 October 2015

[12] See paragraph 1.24