JT's response to CICRA's consultation '5G Spectrum: Draft Statement of Intent'

1 Introduction

The Channel Islands Competition and Regulatory Authorities (CICRA) published a consultation on "*5G Spectrum: Draft Statement of Intent*" on 3 May 2019, inviting interested parties to submit comments to CICRA by 14 June 2019.[1]

As a key stakeholder in the telecoms industry in the Channel Islands, JT is pleased to provide its response to this consultation, which is structured as follows:

- Section 2 summarises JT's overall assessment/position in relation to CICRA's draft statement of intent on 5G licensing
- Section 3 presents JT's formal responses to each of the 14 questions in CICRA's consultation document
- Section 4 provides a **confidential annex** with responses not for public release.

2 Summary of JT's position

JT believes that the network-led mobile market competition that has existed in the Channel Islands for almost 20 years has delivered a strong and vibrant mobile services environment in both Bailiwicks, with significant economic and social benefits to citizens, businesses and visitors. JT believes that the award of 5G spectrum should aim to build on these established benefits, thus enabling existing mobile operators to deliver even faster mobile broadband (MBB) services whilst also allowing the public and private sector to develop new products and services for the Channel Islands.

JT plans to launch commercial 5G services selectively in chosen locations as soon as spectrum assignments are confirmed by CICRA and once spectrum licences have been issued by Ofcom. In the meantime, JT is actively investing in its network in readiness for 5G services in Jersey and Guernsey, and is working with its vendor partner on a live trial to prepare for the launch of commercial services.

JT initially plans to deploy the non-standalone version of 5G (NSA-5G). This will use the existing 4G network that JT has invested in upgrading over recent years. Ongoing investments are taking place on the assumption that 5G will add an additional layer to JT's

[1] See https://www.cicra.gg/media/598032/5g-spectrum-statement-of-intent-consultation.pdf

already high-performing 4G network, which provides the highest-speed MBB services available from current technology via the deployment of LTE-A and carrier aggregation. JT's approach to 5G deployment is entirely consistent with that of mobile network operators in the UK (for example, the launch of NSA-5G services by BT-EE in May 2019) and is also aligned with the intentions of many mobile operators worldwide.

JT supports CICRA's intention to "support the path to next generation connectivity" in order to promote widespread 5G deployment quickly, which is in line with the policy of the Government of Jersey and the States of Guernsey. JT understands that the Government of Jersey and the States of Guernsey both support the rapid deployment of 5G networks, and the States of Guernsey aims to "ensure delivery of 5G to Guernsey at least as fast, if not earlier than the mainland UK". However, JT is concerned that CICRA's draft statement of intent – and particularly the proposal for a single 5G licence in each of Jersey and Guernsey – is **not compatible with these stated aims**.

JT is concerned over the lack of clarity on the rationale for and benefit of CICRA's proposal that initially only one 5G spectrum licence should be issued in each Bailiwick. We are concerned that CICRA's proposal for a single 5G operator represents an unproven approach and it could be viewed as an unnecessary intervention into an existing well-functioning and competitive market structure; an intervention which, in the worst case, could have long-lasting irreversible and very damaging impacts. JT believes that a single 5G network risks creating a monopoly in 5G service provision, giving rise to unnecessary risks for consumers and visitors to the Channel Islands:

- **Lack of seamless 4G–5G services**: for a seamless user experience with existing 4G mobile services, the 5G network will need to interface with existing 4G networks.[2] Operators in the Channel Islands use a mix of vendors across their networks – making it technically challenging to deploy a 5G network that is interoperable with existing 4G networks (JT believes this would not be feasible in NSA-5G deployment, since current equipment solutions are vendor-specific). Hence, JT has strong reservations about the feasibility of a single 5G network inter-working with existing operators' 4G networks. Without 5G capacity to absorb future demand for mobile data traffic on JT's network, there is also a risk of deterioration in the quality of 4G services, until such time as 5G capacity / spectrum is available.

- **Delayed deployment of 5G**: the time needed to develop the regulatory, technical and commercial solutions required to support a single 5G network risks the commercial availability of 5G being delayed. If CICRA's intention is that the single 5G network in each Bailiwick should be a *standalone* 5G (SA-5G) network (which is not JT's preferred approach to 5G commercial deployment, nor is this in line with 5G launches in the UK and many other markets), there will be a delay before 5G services are available, since the global 5G standards and ecosystem development have been focusing on NGA-5G deployment to date.

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2 Standalone 5G (SA-5G) is not expected to be deployed commercially until the standards are finalised and vendors release equipment to support SA-5G deployments.

- **Operational challenges and more expensive deployment**: evidence from other markets where deployment of a single mobile network has been proposed (e.g. South Africa, Kenya, Mexico) is that significant operational challenges were identified, such as lower coverage and higher deployment costs.[3] For example, in Mexico the deployment of a wholesale 4G network started four years later than planned and the network, and has not yet signed contracts with major mobile network operators in the country.[4] The risk of lower coverage is backed by published evidence which suggests that mobile operators in a network-led competitive market have stronger incentives to increase coverage in a cost-efficient manner than players in markets with a single network operator.[5]

- **Reduced retail competition**: there is a risk that retail competition will be reduced if there is just a single 5G network, and the Channel Islands will become a less innovative and attractive market for telecoms investment. If a vertically integrated 5G network were to be implemented this would effectively create a monopoly, leading to retail competition issues. If a wholesale 5G network is set up, retail competition will be impacted without commercial take-up from potential mobile operators (as demonstrated by evidence from other countries that have implemented a single network). Both scenarios are likely to have a detrimental impact on consumers, businesses and government. As a result, all parties are likely to suffer from limited choice and high pricing, and evidence shows that the outcome will be poor take-up of 5G services.

Given the risks and issues associated with a single 5G licence, JT's strong preference is that 5G mobile licensing in the Channel Islands should ensure that the current network competition-led approach that has worked well for 4G can continue for the 5G era as well. JT believes that CICRA should recommend to Ofcom that the available spectrum in the 700MHz and 3.5GHz bands is assigned using a comparative selection process ("beauty contest"), as this approach has worked successfully in the past.

JT will require 10MHz of paired 700MHz[6] spectrum and 100MHz of unpaired 3.5GHz spectrum – an allocation supported by the industry globally – to deploy a world-class 5G network and unlock the true potential of 5G for the Channel Islands. JT would welcome the opportunity to discuss further with CICRA how this objective could be met through a 5G beauty contest.

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3 See https://www.gsma.com/spectrum/resources/woan-report/

4 To date, a mobile start-up named GuruComm and satellite TV DISH operator of fixed wireless access services have signed up; see https://www.telegeography.com/products/commsupdate/articles/2018/08/29/gurucomm-becomes-first-telco-to-utilise-red-compartida/ and https://www.telegeography.com/products/commsupdate/articles/2018/09/04/dish-of-the-day-satellite-firm-serves-up-fwa-using-red-compartida/

5 See https://www.gsma.com/publicpolicy/wp-content/uploads/2014/09/Assessing_the_case_for_Single_Wholesale_Networks_in_mobile_communications.pdf

6 Ideally, JT will be granted contiguous 20MHz spectrum in the 700MHz band.

3 Response to individual questions

Question 1: *What '5G services' foresee could be delivered through this allocation of spectrum? What economic and social benefits will these bring to the Channel Islands?*

The 700MHz and 3.5GHz band are both important in the context of delivering 5G services, which could include higher-speed MBB services, along with specific 5G services such as Internet of Things (IoT), services to verticals and broadband to the home (5G fixed wireless access (FWA)). Operators involved in early 5G service launches are generally focusing on MBB services (e.g. BT-EE) or home broadband (e.g. Three UK).

In the Channel Islands, high-speed MBB services are already widely available on existing mobile networks, with JT's network offering exemplary speed and quality of service. JT has 15 4G radio sites that can currently provide a download speed of 700Mbit/s. JT plans to continue investing in its 4G network, to ensure that:

- 7 of its 4G radio sites are able to provide 900Mbit/s download speed by the end of 2019, and
- 14 of its 4G radio sites are able to provide 1.1Gbit/s download speed shortly thereafter.

Significant economic and social benefits are already being delivered by the 4G networks in the Channel Islands through rapid roll-out, high-speed services and good coverage. JT believes it is important that 5G licensing builds on this successful 4G market.

For example, 4G coverage has increased rapidly since services launched in 2014 – with geographical coverage reaching over 99% in Jersey and over 95% in Guernsey (see Figure 1). Take-up of 4G services has also increased rapidly, and it is estimated that it will exceed around 65% in both Jersey and Guernsey in 2019.

Figure 1: Geographical coverage of 4G (Source: GSMA Intelligence and JT, 2019)

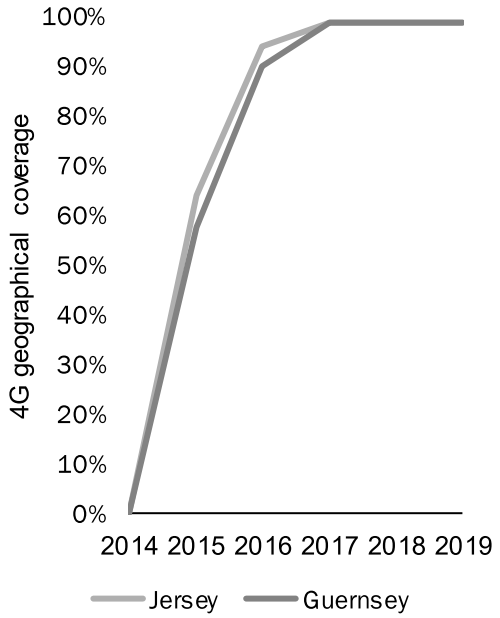
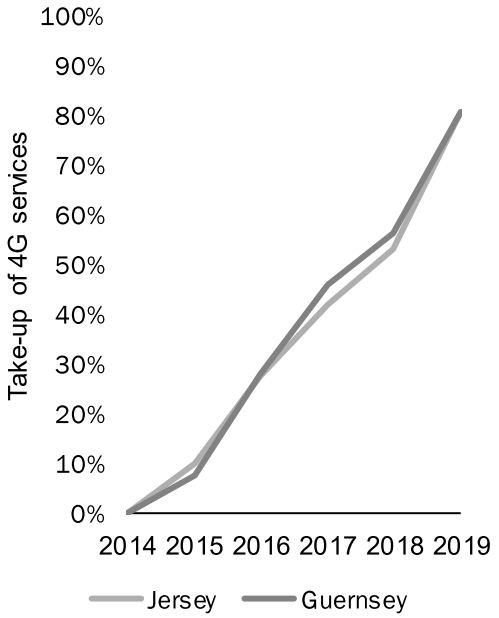


Figure 2: Take-up of 4G services (Source: GSMA Intelligence and JT, 2019)



CICRA's market report revealed that the telecoms sector has created 731 jobs in Jersey and Guernsey, generates GBP18.5 million in tax revenue per year and makes capital investment of almost GBP28 million in 2017 – including around GBP3 million directly on mobile access networks.[7] The sector is a significant source of employment in the Channel Islands, and is expected to continue to generate jobs and tax revenue, and to drive investment in the Channel Islands as 5G is deployed.

The UK government recently published a study on the benefits of 4G and the potential benefits of 5G.[8] The study report suggests that the social and economic benefits of 5G are not yet clear as the technology is still in the early stages of commercial deployment. However, the same study estimates IoT and big data to be worth GBP322 billion to the UK economy between 2015 and 2020, and 5G is expected to have a significant impact on the value of this sector in future. Other areas where 5G is expected to have a positive impact include connected autonomous vehicles, decentralised healthcare and remote monitoring, and manufacturing.

JT expects that initial 5G services in the Channel Islands will be aligned to those in other markets where early 5G services are being launched, i.e. enhanced MBB (eMBB), FWA and/or IoT, based on market demand in each Bailiwick. In the longer term, more-advanced 5G use cases (e.g. autonomous vehicles and healthcare based on 5G features of ultra-reliable low-latency communication (URLLC)) could be supported. At this stage, it is difficult

7 See https://www.cicra.gg/media/597846/t1352gj-cicra-telecommunications-statistics-and-market-report-2017.pdf

8 See https://www.gov.uk/government/publications/the-impacts-of-mobile-broadband-and-5g

to comment with any certainty on the socio-economic benefits associated with all use cases.

JT expects that the 5G services which will be important for Jersey and Guernsey could differ between the two Bailiwicks, reflecting differences in the local market situations:

- eMBB and IoT are expected to be significant drivers of demand for 5G services in both markets.
- In Jersey, the universal availability of fibre-to-the-premises (FTTP) for all fixed line connections, with guaranteed speeds up to 1Gbps, mean that there is no obvious business case or any clear need for a 5G-FWA service.
- In Guernsey the absence of any fibre broadband from the incumbent operator means that 5G-FWA could realistically form part of the States of Guernsey's digital strategy.[9]

***Question 2:** In what timescale do respondents believe these services and benefits can be delivered?*

Mobile network operators around the world are currently launching (or preparing to launch) 5G services, with two variations of 5G available for commercial deployment:

- **non-standalone 5G (NSA-5G)**: a 5G network deployed alongside existing 4G-LTE networks with a shared radio access network and core network; and
- **standalone 5G (SA-5G)**: a 5G network deployed using its own radio access network and core network.

The operators planning early 5G launches and those operators that have already launched 5G services, such as in the UK are deploying NSA-5G, which co-exists with existing core and radio access networks. This approach enables a faster and more cost-effective 5G deployment. A key limitation is that NSA-5G relies on an existing 4G network for signalling, control and traffic management, and the 5G radio equipment must be interoperable with the 4G network – requiring equipment from the same vendor.

JT anticipates that a commercially driven roll-out of NSA-5G could enable JT to begin providing consumer services within two to three months of spectrum being awarded and released to operators. Whilst this will immediately provide the benefits of 5G MBB services for Channel Island consumers, a full understanding of the social and economic benefits of 5G will take time to develop as the full range of 5G use cases and associated applications become further established.

JT has already begun preparing for the launch of 5G services. It has signed an agreement with the vendor which currently provides its 4G network to support full commercial roll-out

9 See https://www.gov.gg/article/165840/Guernseys-first-ever-Telecoms-strategy-published

of 5G on the Channel Islands, including building a trial 5G network to test deployment and explore service delivery over 5G.

A key concern in the context of CICRA's draft statement of intent on 5G is that adopting a single 5G network could risk a significant delay in the launch of 5G in the Channel Islands and hence delay the benefits of 5G, as noted above. In contrast, NSA-5G deployment will enable JT to deploy 5G rapidly, which will allow the benefits associated with 5G to be generated much earlier.

Question 3: *Are there any potential opportunities for existing or new operators to partner with government(s) to enhance the economic value of the 5G network or to better meet the policy ambitions in either or both jurisdictions?*

JT welcomes the opportunity to work with CICRA, the Government of Jersey and the States of Guernsey to deliver their policy ambitions and enhance the economic impact of 5G. Partnerships between operators and the Channel Island governments have already produced successful outcomes for government, businesses and consumers using the existing mobile networks. Two examples of successful initiatives are:

- **Ubiquitous fibre in Jersey**: JT worked with key stakeholders, including the States of Jersey, to deliver full fibre across the entire Island, resulting in each and every home and business having its fixed line copper connection being replaced by a full fibre connection, and currently in the process of switching off the legacy copper network (becoming the first place in the world to do so). [10]

- **Digital Jersey**: Digital Jersey is a government-supported economic development agency dedicated to supporting growth of the digital sector in Jersey and promoting Jersey as an international digital centre.[11,12] As a member of Digital Jersey, JT has worked hard to deliver world beating fibre and mobile networks, multiple IoT networks, and even provided a property used by Digital Jersey to create a 'Digital Xchange' laboratory environment. This is evidence of the collaborative and constructive engagement in place to build a platform from which Digital Jersey can promote Jersey as a realistic place within which to test various advanced technologies, applications and business cases.

In the long term, 5G presents an opportunity to transform service delivery for both the private and public sector, particularly in areas such as e-health and e-government, once 5G networks are in widespread use. JT has been at the forefront of delivering current public–private digital partnerships and expects to continue this leadership as it develops

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10 See https://www.ispreview.co.uk/index.php/2018/07/jt-completes-its-ftth-gigabit-broadband-isp-network-on-jersey.html

11 See https://www.ispreview.co.uk/index.php/2018/01/jt-sony-test-low-power-wide-area-wireless-network-jersey.html

12 See https://www.digital.je/news-events/digital-news/digital-jersey-supports-the-launch-of-jts-cutting-edge-wireless-network-to-enable-jersey-as-a-smart-island/

trials and testbeds for 5G use cases that help to deliver the aspirations of the Channel Islands.

Given the current broadband speeds available in Guernsey, JT understands that 5G-FWA is a strategic priority for the States of Guernsey, which is being explored as a technology to provide ubiquitous high-speed connectivity. JT would welcome the opportunity to discuss further with the States of Guernsey the potential for providing 5G-FWA services to consumers as part of a 5G mobile network roll-out strategy.

Question 4: *Respondents are asked to consider the most appropriate means for the allocation of 5G spectrum for the Channel Islands – an auction, a comparative selection process ('beauty parade') or alternative method.*

JT supports CICRA's provisional view that an auction is not the preferred means of spectrum allocation in the Channel Islands, given the cost and complexity of designing an auction in a small market relative to the benefits provided. A comparative selection process has lower set-up costs and allows faster spectrum allocation (as demonstrated by the 4G spectrum award), enabling a lower-cost and faster roll-out of 5G services in the Channel Islands.

The comparative selection process that CICRA adopted for the award of 800MHz and 2600MHz spectrum for 4G achieved its aims of promoting rapid 4G network deployment and ensuring that the Channel Islands remain at the forefront of mobile technology deployment. JT believes that a similar comparative selection process is the most suitable approach for allocating 5G spectrum to support rapid and competitive roll-out of 5G.

Question 5: *Respondents are asked what spectrum allocation would be necessary and in what bands for an operator to offer the services and provide the benefits described in Question 1.*

JT will require spectrum in both the 700MHz band and the 3.5GHz band to provide it with the ability to deploy true 5G services across the Channel Islands. Each spectrum band has its own characteristics, and mobile equipment vendors are suggesting that a combination of the two bands is required to deploy a 5G network with the coverage and capacity to flexibly provide new services to consumers and businesses. A summary of JT's spectrum requirements is provided in Figure 3 below.

Figure 3: JT's spectrum requirements

Band	Role	Description	JT requirement
700MHz	Coverage	• 700MHz spectrum will be used to provide wide-area 5G coverage	2×10MHz[13]

[13] It is assumed that Ofcom will assign paired frequencies in the 700MHz band, in line with the harmonised plan for this band in Europe, which is being followed in the UK. We note that Ofcom is also

Band	Role	Description	JT requirement
		• JT will be able to rapidly incorporate 700MHz radios into its existing 4G network architecture to provide 5G coverage across the Channel Islands, to support services including MBB and IoT	
3.5GHz	Capacity	• 3.5GHz spectrum will provide additional capacity where this is most needed, such as in urban locations where mobile traffic levels are especially high	100MHz unpaired

Industry bodies and vendors recommend that 100MHz of contiguous spectrum in the 3.5GHz band provides the most efficient use of spectrum for 5G – for example, as indicated in a paper published by Global mobile Suppliers Association (GSA).[14] The paper also highlights several key benefits of a 100MHz contiguous block of 3.5GHz spectrum compared to smaller or non-contiguous blocks:

- 100MHz of 3.5GHz can provide up to a 2.7× increase in capacity per cell over a 50MHz block, while maintaining a 100Mbit/s cell edge throughput.
- A mobile network operator would require 64% more base stations with a 60MHz carrier in a dense urban setting compared to a 100MHz contiguous carrier.
- Combining non-contiguous blocks results in loss of usable spectrum, reducing the spectral efficiency.
- A contiguous 100MHz block has ~50% lower physical layer signalling overhead requirements than 2×50MHz blocks, increasing the spectral efficiency.
- A contiguous 100MHz block requires fewer guard bands (assuming networks need to be synchronised) than 2×50MHz blocks, leaving more spectrum available for mobile services.

***Question 6:** Would this demand for spectrum vary depending on whether there were single or multiple networks developed in future, or as technologies develop in future?*

5G use cases will take time to develop, and it is likely that each operator will deploy different service mixes to cater for demand from its own subscriber base. This is likely to lead to long-term differences in demand, subscribers and spectrum requirements across networks: for example, there are likely to be significant differences between a consumer-focused network (high take-up) and a business-focused network (high capacity and resiliency).

In this context, the feasibility of a single 5G network meeting all market demands for 5G traffic is therefore unclear. JT is also of the view that the single network option would not

offering a 20MHz unpaired block in the 700MHz band to UK operators, for supplemental downlink (SDL) use. JT's estimated requirement above relates to the paired spectrum.

14 *GSA views on 5G spectrum awards in 3400–3800MHz in Europe, April 2019*; see https://gsacom.com/download.php?id=6783

represent the most efficient use of scarce spectrum resources, compared to deploying 5G in conjunction with existing 4G networks. For example, a single 5G network carrying all 5G traffic in the Channel Islands would have a high spectrum requirement to meet expected consumer demand and there would be particular challenges in providing the uplink communication (i.e. from devices to the network), which NSA-5G deployment by existing mobile network operators can compensate for. A single 5G network would not have the capability to manage traffic between it and each existing 4G network, and so would have to be designed to fully accommodate high traffic loads – which would increase the cost and delay a widespread roll-out. In contrast, deploying 5G within a 4G network will make better use of spectrum.

***Question 7:** Does this Draft Statement of Intent support and align with the policies of the States of Jersey and Guernsey? If not, what alternative approach could CICRA take to implement government policies?*

JT believes that CICRA's draft statement of intent absolutely does not support or align with the policy of the Government of Jersey, although it is more closely aligned to the telecom policy of the States of Guernsey.

However, the draft statement of intent risks the Channel Islands pursuing an unproven approach of a single 5G network deployment, instead of promoting more proven forms of network sharing within commercially led 5G deployments by existing 4G network operators.

Jersey's telecoms strategy

Jersey's telecoms strategy[15] was prepared following extensive stakeholder consultation and is based around five key principles:

1. Promote the path to next-generation connectivity, building on the current advanced digital infrastructure already in place.
2. Promote retail competition (not network competition) as the most effective way of delivering the benefits of next-generation connectivity to consumers and businesses.
3. Set out clearly any universal service obligations and deliver social policies from the telecoms sector only when it is efficient to do so and the costs/funding are transparent.
4. Ensure resilience of off-island connectivity.
5. Measure outcomes using appropriate key performance indicators (KPIs) developed in consultation with the industry.

JT has recently had discussions with authors of Jersey's telecoms strategy paper, who confirmed that the strategy is intended to promote 5G roll-out by ensuring that licences are issued in a timely manner and in a way that encourages and incentivises mobile network sharing. The principle of promoting retail competition (not network competition) refers specifically to the fibre network, not to mobile networks. Therefore, the strategy **does not recommend any sort of single 5G network** (either in the core or radio access network),

15 See https://www.gov.je/Government/Pages/StatesReports.aspx?ReportID=3377

which is contrary to what CICRA's draft statement of intent says. Indeed, the strategy focusses instead on ensuring government and regulators do not put any barriers in place to operators sharing where it is practical and possible to do so.

Guernsey's telecoms strategy

Guernsey's Future of Telecoms Strategy[16] was published in 2018 and has three key policy objectives:

1. Provision of fibre to business districts within two to three years.
2. Provision of superfast broadband to all residential properties within two to three years.
3. Provision of next-generation mobile technology in line with, or earlier than, the UK.

JT also notes that a key recommendation of the Future of Telecoms Strategy is that "(the) *Government will develop a range of support for the early development of the most effective 5G networks sharing model through a range of measures from planning policy, availability of spectrum through to commercial use of States*". The document does discuss a single network as a possible outcome, and is therefore significantly different to the Jersey telecoms strategy, in that it is a possible outcome considered as a means to secure Guernsey's policy objectives.

Alignment with both strategies

JT believes that CICRA's draft statement of intent does not meet the objectives of the telecoms strategies in either Jersey or Guernsey, and that the proposal to have a single 5G licence in each Bailiwick risks unnecessary technical and commercial complications to 5G roll-out, and a likely delay in services being available. JT strongly believes that CICRA should continue its successful, proven competition-led approach to 5G, which has led to the deployment of high-quality 4G networks with extensive coverage through the simultaneous award of multiple mobile network operator licences. JT believes a similar network competition-led approach for 5G, allowing roll-out by existing mobile operators in line with consumer and business demand, is the best approach for the Channel Islands, to ensure that the full benefits of 5G are unlocked as quickly as possible.

To illustrate the possible risks of a single network approach, JT notes that Frontier Economics has published a research paper studying markets with single mobile network operators – including both monopoly markets and operators that provide a single network technology.[17] The paper found that **competitive operators have stronger incentives to increase coverage and reduce deployment costs than single network operators**, and

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16 See https://www.gov.gg/CHttpHandler.ashx?id=113783&p=0

17 See https://www.gsma.com/publicpolicy/wp-content/uploads/2014/09/Assessing_the_case_for_Single_Wholesale_Networks_in_mobile_communications.pdf

that single networks did not result in increased coverage or lead to cost efficiencies compared to competitive markets.

JT notes that attempts to implement a single mobile/wireless network in other markets have faced significant challenges, and have not achieved their intended aims. For example:[18]

- The Government in Rwanda decided to implement a single 4G network, but the network is unlikely to achieve the coverage, price and competition goals set by the government. This is because take-up has been limited due to high cost of services
- Proposed networks in Kenya and South Africa were reportedly abandoned before implementation
- An attempted single network in Russia remains restricted to urban areas, with no transparency on pricing and agreements among stakeholders have been challenging
- Red Compartida, a 4G wholesale network in Mexico, commenced deployment in 2018, more than four years late. As of May 2019, the network had not yet reached agreements to provide services to any existing network operators in Mexico.[19] Only a mobile start-up named GuruComm and Satellite TV DISH Mexico operator for FWA services have signed up to date.[20,21]

***Question 8:** Respondents are asked to comment on the issue of spectrum initially only to one operator in Jersey and one operator in Guernsey, which may be the same operator.*

JT supports CICRA's aim of providing a stable and competitive environment to deliver new 5G services to the Channel Islands. JT believes that the Channel Islands can be an exemplar for 5G services, and that the best outcome can be achieved by enabling existing operators to roll out 5G as soon as practical. Providing spectrum licences to the existing operators will ensure rapid 5G deployment for the Channel Islands.

JT notes that, in April 2018, Ofcom awarded 3.5GHz spectrum to the current UK mobile network operators[22] for 5G use. This has resulted in one UK mobile network operator (EE) launching 5G services on 30 May 2019[23] using the NSA-5G standard, and two other UK operators – Vodafone and Three – plan to launch services over the summer. In JT's view, this is a clear indicator of the benefits of early award of spectrum to multiple mobile operators, allowing network competition-led approach to lead to rapid 5G deployment. The

18 See https://www.gsma.com/spectrum/resources/woan-report/

19 See https://diario.mx/nacional/red-compartida-inviable-y-poco-atractiva-20190523-1518755/

20 See https://www.telegeography.com/products/commsupdate/articles/2018/08/29/gurucomm-becomes-first-telco-to-utilise-red-compartida/

21 See https://www.telegeography.com/products/commsupdate/articles/2018/09/04/dish-of-the-day-satellite-firm-serves-up-fwa-using-red-compartida/

22 See https://www.ofcom.org.uk/spectrum/spectrum-management/spectrum-awards/awards-archive/2-3-and-3-4-ghz-auction

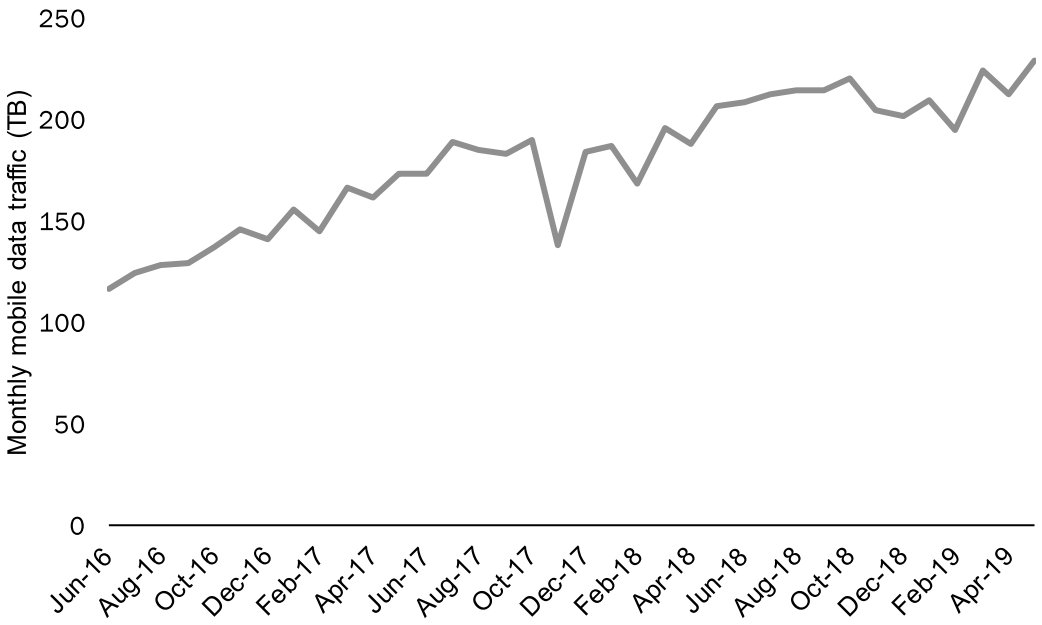
23 See https://5g.co.uk/ee/

Channel Islands are already lagging behind the UK on 5G, and the concept of a single 5G licence will introduce further delay to the detriment of consumers, businesses and government.

JT's view is that seamless working between existing 4G networks and a single 5G network is not feasible, because this would require the same equipment vendor to be used for the 5G radio deployment as for 4G. Currently, mobile network operators use different vendors for their 4G networks, creating the technical challenge highlighted earlier (see response to Question 6 for more detail). This means that it would not be possible for a single 5G network to communicate with all three of the current 4G networks on each island, resulting in roll-out delays, high costs and poor quality of service.

There is a significant risk that, if operators with 4G networks do not obtain spectrum to provide 5G services then their current networks will be unable to support future traffic demand. This will lead to a significant deterioration of the service quality available to consumers as networks become overloaded, and it may require significant additional (and unnecessary) investment to upgrade 4G networks that could lead to higher prices for consumers. Demand for mobile data is currently growing at around 2% per month, and total mobile data traffic nearly doubled between June 2016 and May 2019 (three calendar years) as shown in Figure 4 – and this is without the potential impact of 5G increasing demand.

Figure 4: JT's historical mobile data traffic in the Channel Islands



***Question 9:** What period of exclusivity would be sufficient to ensure a fair return on investment for a single operator before the remaining spectrum became available for allocation?*

JT reiterates its view that 5G deployment driven by network competition – in line with roll-outs elsewhere (e.g. the UK) and with the existing market structure – stands to offer the most benefit to the market in the Channel Islands. JT is concerned that CICRA's proposal

for a period of exclusivity for a single 5G network operator is an arbitrary market intervention that will lead to inefficient investment and unnecessary risks, as explained below:

- During the exclusivity period, existing operators would be prevented from deploying 5G unless they used existing spectrum, which is already in widespread use for 4G. This would limit the choice and benefits for consumers, businesses and government, and in some cases there could be significant disruption to 4G services.

- There is a significant risk if major investment is made to deploy a single 5G network to carry all 5G traffic in the Channel Islands, as shown by evidence (see page 12). Moreover, the network could become underutilised, with some redundant assets, once the exclusivity period ended and consumers gained a choice of 5G service providers. It is also probable that some users would face service disruption once the exclusivity period ended.

- It is likely that there would be significant disruption in the market when switching from a network competition model for 4G to a single 5G network operator, with complex technical, regulatory and commercial solutions required to protect consumers from monopolistic behaviour during the exclusivity period.

Question 10: *Respondents are asked to consider the types of conditions which would be necessary to encourage the development of retail competition during the rollout of 5G services*

As explained above, JT is concerned that commercial concerns and technical limitations associated with CICRA's proposed approach could significantly reduce retail competition and risk a "failed" 5G deployment with significant delays, wasted investment, and the loss of an opportunity for the Channel Islands to become an exemplar for 5G services.

Most mobile markets globally follow a network competition-led approach, which has resulted in high levels of retail competition and consumer choice. A network competition-led approach reduces the risk of monopolistic behaviour at either an infrastructure (network) or retail level and encourages cost-efficient roll-outs and competitive behaviour – benefiting consumers through innovation in service delivery and lower prices. These competitive behaviours can be seen in the historical trends of subscriber penetration and average revenue per connection (ARPC) in the Channel Islands, as shown in Figure 5 and Figure 6. From the charts, it can be observed that unique mobile subscriber penetration has been increasing annually, while ARPC has been decreasing annually in both Jersey and Guernsey.[24] These trends do not suggest any competition issues in the mobile markets in these Bailiwicks – in other words, the current network competition approach has been successful. Therefore, JT believes there is no evidence to justify a major change in the market structure for the deployment of 5G.

[24] ARPC is almost identical for Jersey and Guernsey.

Figure 5: Unique mobile subscriber penetration (Source: GSMA Intelligence, 2019)

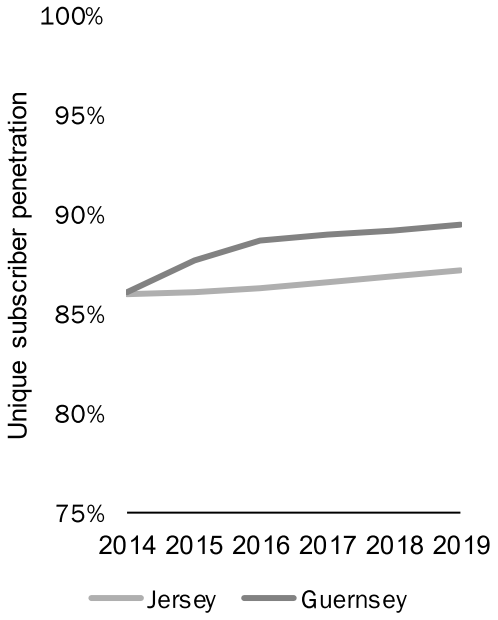
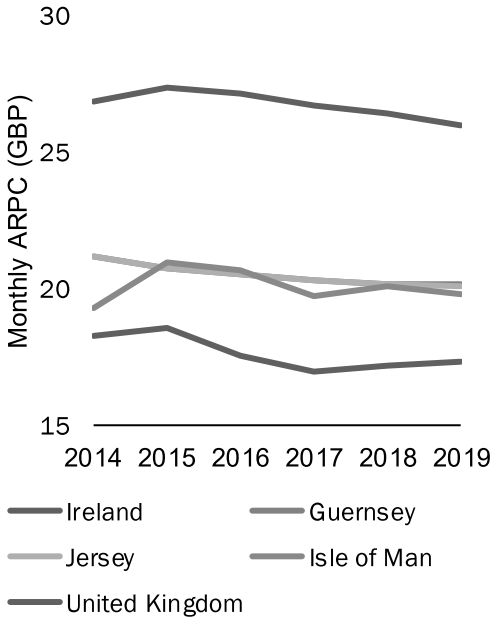


Figure 6: Monthly average revenue per connection, GBP (Source: GSMA Intelligence, 2019)



JT is concerned that a single 5G network would require the development of complex technical, regulatory and commercial solutions to ensure that retail competition is protected – a key aim of the Channel Islands' governments. In any event, there is no guarantee that retail competition can be made to work efficiently via a single infrastructure, which poses a significant risk to consumers, businesses and government. The need to develop these complex, unproven solutions will inevitably lead to significant delays in the roll-out of 5G compared to a commercial roll-out and create the risk of poorer outcomes for all parties involved. These issues are supported by evidence gathered for countries that have attempted to implement a single network (see response to Question 7 for more detail).

JT notes that existing mobile network operators could choose to re-farm existing spectrum to provide 5G services, as a cheaper alternative to entering into costly commercial agreements with a single network. This would negatively affect take-up on the single 5G network as well as having an impact on retail competition (since existing mobile network operators would be resigned to offering a lower-quality 5G offering, given the limited existing spectrum that they would have available to accommodate 5G services, alongside absorbing increasing levels of 4G MBB traffic). Existing mobile operators may also choose not to engage with the single 5G network if technical issues associated with lack of seamless 4G–5G services prevail. The lack of buy-in, as demonstrated from other countries that have attempted to implement a single network, is a significant factor for failure of such initiatives.

In respect of coverage obligations in 5G licences, JT has already demonstrated its commitment to extend coverage of high-speed MBB services in the Channel Islands when it acquired 800MHz and 2600MHz spectrum in the 4G beauty contest. This was a

commercially viable investment, and JT intends to build on this 4G MBB coverage when it launches 5G, by deploying 5G radio technology on its existing mobile sites as far as possible, subject to award of spectrum.

Question 11: *Respondents are asked to consider the types of conditions which would be necessary to protect consumers and ensuring the most efficient use of spectrum as a scarce resource*

A competitive market provides significant levels of consumer protection, allowing consumers to choose a service that meets their requirements. Competition between operators creates incentives for operators to offer competitively priced services, benefiting consumers through lower service pricing and operators through lower customer churn.

JT suggests that licensing multiple 5G networks to enable existing operators to install more-efficient 5G technology in their networks will allow more-efficient use of spectrum, and that roll-out driven by network competition will ensure continued efficient use of spectrum resources. Network competition encourages operators to invest in their networks, to benefit from cost savings due to technological developments and increases in spectral efficiency – and to ensure they can provide competitive services to consumers.

The provision of services via 5G networks also creates additional opportunities for operators to use their existing spectrum more efficiently:

- **New technologies**: as operators become increasingly reliant on 4G and 5G networks, the ability to use both technologies to balance network loads and to provide services such as voice over LTE (VoLTE) will ensure they can make the most efficient use of spectrum.

- **Spectrum re-farming**: operators currently operate 2G, 3G and 4G networks using 800MHz, 900MHz, 1800MHz, 2100MHz and 2600MHz spectrum. With 5G roll-out led by network competition, operators will be able to explore the possibility of switching off legacy networks (e.g. 2G) and re-farming the spectrum to support demand for data over 4G and 5G networks.

JT is committed to providing island-wide coverage of high-speed MBB services in the Channel Islands. Since acquiring 800MHz and 2600MHz spectrum in 2014, it has deployed 4G networks providing 99% geographical coverage in Jersey and 95% in Guernsey. This is a commercially viable investment, and JT intends to build on this 4G MBB coverage when it launches 5G, by deploying 5G radio technology on its existing mobile sites as far as possible, in order to be cost efficient. This approach to 5G roll-out has massive industry support as it is widely used (or is planned to be used) by mobile network operators worldwide.

If CICRA decides to impose onerous 5G coverage obligations on operators, it may be unviable for operators to achieve them, and may delay 5G roll-out. The commercial case for deploying 5G with coverage to match 4G levels is challenging given the uncertainties

around 5G use cases, and the case for deploying 5G beyond existing 4G coverage levels is very weak. A requirement to meet coverage obligations may limit the ability of operators to make the most efficient use of spectrum, by requiring investment in widespread coverage in areas with low demand, rather than providing capacity in areas that already face network congestion. Therefore, JT believes that 5G deployment should be based on a demand-led approach, considering the evolution of 5G use cases in the years to come.

***Question 12**: What are the environmental and planning considerations which CICRA should take into account when considering spectrum allocation? This may include respondent views on the number of any additional sites which may be required in each Island.*

JT suggests that a network competition driven roll-out will provide the lowest environmental impact in the Channel Islands, as all existing radio sites can be re-used for 5G deployment. JT's deployment plan can be summarised as follows:

- JT intends to upgrade its radio sites in rural areas to provide 5G coverage rather than build new sites, unless required to do so for regulatory reasons (for example, to comply with coverage obligations).
- Based on discussions with vendors, JT expects to be able to deploy 700MHz on its existing sites to provide wide area coverage for 5G. **To be clear, this would enable Jersey to have a 5G network launched with wide area coverage without any additional sites being required.**
- JT will only build new radio sites in urban areas if the existing network is congested and further network upgrades (either 4G or 5G) will provide insufficient capacity to meet consumer demand.
- JT's planned 5G trial is designed to explore the real-world coverage achievable with 3.5GHz with massive MIMO.[25] JT expects to be able to deploy 3.5GHz with massive MIMO on its existing sites in urban areas to provide additional 5G capacity in areas of high demand.

Based on JT's deployment plan, the requirement for new-build radio sites is limited.

Given the nature of radio sites in Jersey and Guernsey (only a few towers and most wooden structures being unsuitable for site sharing), it would not be possible for existing mobile network operators to share the vast majority of sites with a single 5G operator. If a single 5G network was to be licensed, this could mean that the single 5G operator would have to build the vast majority of its radio sites (i.e. requiring significant investment), resulting in significant negative environmental impacts.

25 MIMO stands for massive input multiple output.

If required by CICRA, JT would be willing to hold a Parish Forum before deploying 5G in any of the rural Parishes. Such a forum would be hosted by CICRA and would aim to:

- The actual requirement in light of ubiquitous fibre and very high speed 4G services;
- The need for additional 5G sites and the equipment required to support 5G; and
- Any local concerns about the deployment, including health and safety, environmental and legal considerations.

This forum could include an advisory vote to inform JT, CICRA and planners as to appropriate next steps and would allow for a rational and balanced assessment of requirements. Key in this consideration would be the assessment of fibre to each home across rural parishes, which likely negates the need for high speed 5G connectivity.

***Question 13**: What are the health and safety consideration which CICRA should take into account when considering spectrum allocation? This may include respondent views on reassurance to the public*

Human exposure to electro-magnetic fields (EMF) is governed by ICNIRP limits. For all new mobile sites deployed in the Channel Islands, there is a requirement to demonstrate compliance with these limits via the relevant planning authorities in Jersey and Guernsey. Compliance is also subsequently checked by CICRA.

JT's sites are currently operating well below the maximum allowable limits[26] stipulated by ICNIRP (as shown in Figure 7 and Figure 8 below). It can be observed that all radio sites in Jersey and Guernsey are well below the maximum allowable limit since all sites have values less than 100%. In fact, the vast majority of sites (>95%) have signal levels that are only around 1% of the maximum allowable limit. It should also be noted that these measured signal levels are near the antennas of the radio sites, and in reality, human beings are exposed to even lower signal levels than those shown in the charts:

[26] 100% ICNIRP indicates measured signal level is equal to maximum allowable signal level. This means that a figure of more than 100% is deemed to be a breach of the signal level.

Figure 7: ICNIRP compliance in Jersey (Source: JT, 2019)

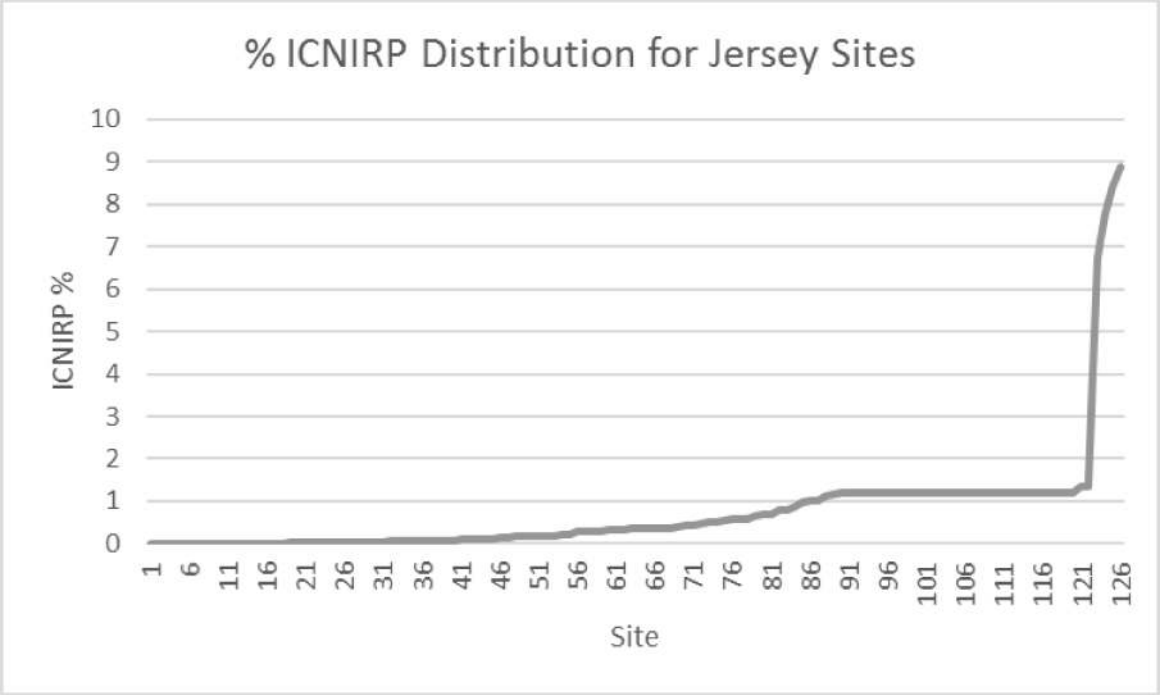
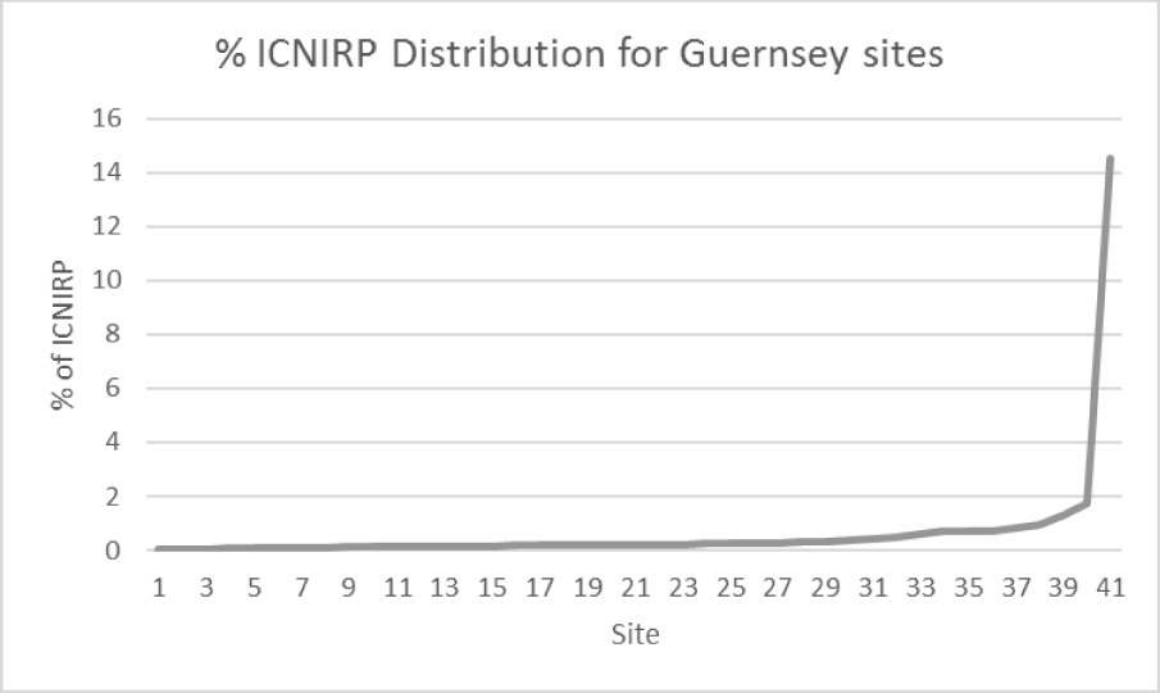


Figure 8: ICNIRP compliance in Guernsey (Source: JT, 2019)



JT expects that its sites will continue to operate below these limits once they have been upgraded with 5G technology and antennas.

Public concerns relating to 5G have primarily focused on the potential radiation hazards from dense networks of small cells, which are more likely to use spectrum in the millimetre-wave spectrum region (e.g. 26GHz). JT currently does not have plans to deploy dense small cells using millimetre-wave spectrum.

Furthermore, these new frequencies are not the subject of CICRA's planned 5G spectrum award. The frequencies within the planned award (700MHz and 3.4GHz) are widely deployed in existing wireless networks (digital television in 700MHz and WiMAX in 3.4GHz), without causing health and safety concerns.

The lack of health hazards associated with these frequencies is well established, and exposure limits are governed by the ICNIRP regulations mentioned above. JT suggests that CICRA should focus on the promotion of the benefits of 5G and providing information from a trusted source to counter any concerns about the potential health and safety impact of 5G.

***Question 14**: Are there any other considerations which CICRA should take into account in order to maximize the economic benefits which can be achieved through the allocation of this spectrum? Are their additional ways in which economic and social benefits could be maximized, perhaps through partnerships with government to stimulate additional growth or bring down costs for consumers?*

JT does not have any further information to provide.