Business connectivity market review

____

Non-statutory Draft Decision (Consultation)

Document No: JCRA 20/20

Publication date: 26 October 2020

Closing date: 15 January 2021

Jersey Competition Regulatory Authority

2nd Floor Salisbury House, 1-9 Union Street,

St Helier, Jersey, JE2 3RF

Tel: +44 (0)1534 514990

Web: www.jcra.je

CONTENTS

1 Executive summary

Box 1: Summary overview

- The primary form of business connectivity services considered in this review are leased lines. These provide dedicated, symmetric transmission capacity between fixed locations. They are used by public and private organisations to support private data networks, network monitoring and to support mobile network backhaul.
- The largest users of leased lines are businesses, those supplying businesses (system integrators) and other licensed operators (OLOs).
- JT has a fibre network across the whole of Jersey. In contrast, OLOs have more limited networks, centred on St Helier.
- Prices for leased lines on Jersey are high and observed innovation is rare. For example, a wholesale 1 Gigabits per second (Gbps) leased line costs approximately 6 times more on Jersey than a similar line in the United Kingdom.
- The Jersey Competition Regulatory Authority (the Authority) last reviewed this market in 2014. Developments since then, including JT's island-wide fibre rollout mean now is a sensible time to conduct new analysis.
- A market review has three stages. First, markets are defined by their product and geographic scope. Second, within the defined markets, the Authority assesses whether the market is effectively competitive. If not, in the third stage, the Authority proposes remedies tailored to address competition problems in the market.
- The Authority proposes to define the Jersey market for on-island leased lines of all bandwidths. Using the three criteria test, the retail market is found not to be susceptible to ex ante regulation and so significant market power (SMP) is not assessed. In contrast, the wholesale market is found to be susceptible to ex ante regulation and so an SMP assessment is undertaken.
- The preliminary finding is that JT has SMP in the wholesale market. It has a stable, very high, market share in excess of 90%, enjoys significant economies of scale and scope meaning there is little prospect of new entry or expansion by alternative operators.
- The Authority consider that a price control is necessary for wholesale market on-island leased lines, although it may be different for Alternative interface/Traditional interface leased lines.
- The Authority's main new intervention is to propose that JT offer 'dark fibre'. The Authority's preliminary opinion is that dark fibre access will help promote choice for retail users of leased lines and increase the welfare of Jersey citizens, consistent with Government telecoms policy for Jersey. The main benefit of dark fibre access is that it will expose more of the value chain to competition, facilitate product and price innovation, enable greater carrier diversity and support more flexible mobile backhaul.
- This consultation asks for comments on the Authority's analysis and the proposal to introduce dark fibre access. The Authority will consult further on the detailed implementation of the dark fibre remedy, including pricing, reference offer requirement and transitional arrangements for current leased line services. A key concern will be to ensure that any price for dark fibre appropriately supports JT's investments in its network and promotes incentives for future investment as well.
- The Authority's preliminary assessment is the benefits associated with a dark fibre remedy would outweigh the risks. The Authority welcomes views on this reasoning.
- A range of supporting remedies are also proposed, including continuing obligations of non-discrimination, transparency and cost accounting.

1.1 In this document the Jersey Competition Regulatory Authority (the Authority) examines the market for business connectivity and the provision of leased lines on Jersey. Where concerns about the effectiveness of competition in the market are identified, the Authority proposes measures to address them on a forward-looking basis. This examination takes the form of a market review, consistent with generally accepted principles and applied proportionately to Jersey.

1.2 The purpose of a market review is to identify the relevant product and geographic markets, assess the level of competition in those markets and whether any licensed operator has a position of significant market power (SMP)[1] and, where SMP has been identified, determine appropriate remedies that would promote competition in those markets to work more effectively.

1.3 The primary form of business connectivity services are leased lines. These provide dedicated, high capacity, symmetric transmission between fixed locations. In 2019 there were 1,005 retail leased lines on Jersey and the retail leased line market was worth approximately £11.8 million.[2]

1.4 Leased lines play an important role in business communications services and are used to support a wide variety of applications, both in the private and public sectors. They also play a significant role in fixed and mobile networks, providing backhaul to connect mobile base stations and local access networks back to core networks. Demand for high capacity backhaul has been increasing exponentially year on year and is set to continue with 5G mobile services, the provision of new and innovative data intensive services and remote working.

1.5 The assessment and proposals in this document are designed to promote competition in the provision of leased lines and the services which use them over the next anticipated review period. This, in turn, will affect the availability, choice, price, quality, resilience and value for money of data-transfer services throughout Jersey. The proposals are consistent with the Authority's legal duties, and the Government telecoms policy for Jersey. Moreover, they are important in furthering the interests of both direct users of business connectivity services and downstream consumers.

1.6 This executive summary sets out:

- Background (see paragraphs 1.7-1.11);
- Approach to this review (see paragraphs 1.12-1.14);
- Proposed market definitions and SMP findings (see paragraphs 1.15-1.17); and
- Proposed remedies (see paragraphs 1.18-1.24).

[1] SMP is generally held to be equivalent to the concept of dominance under the Competition (Jersey) Law 2005. This document uses the terms interchangeably throughout.

[2] Source: Statistics Jersey *'Telecommunications Statistics and Market Report 2019'*.

Background

1.7 This market review covers the market for business connectivity products, primarily leased lines, on Jersey. Leased lines are essential components used in information and communications technology (ICT) services. Leased lines are high capacity and quality 'dedicated private circuits' (in the sense that the capacity on each is not 'shared' with other users). These characteristics provide a high level of network privacy, security and resilience to crucial areas of the economy such as finance, health, communications and government.

1.8 Many organisations, both in the private and public sectors, rely on the characteristics of leased lines to support a wide variety of ICT applications, such as access to the internet, private voice and data networks, backup and disaster recovery, remote monitoring and telemetry applications. They also play a significant role in fixed and mobile networks, providing backhaul to connect mobile base stations to the core network and demand for this will increase with 5G mobile services.

1.9 Leased lines are sold in the retail market to end-customers and in the wholesale market to other licensed operators (OLOs) who may resell them to end-customers or incorporate them in other services. The largest provider of leased lines on Jersey is JT, which has an island wide fibre network. JT is currently obliged by regulations to make wholesale on-island leased lines available to OLOs in response to a reasonable request for access on, inter alia, fair, reasonable and non-discriminatory terms. OLOs providing leased lines commercially include Sure and Newtel, who have smaller networks, focused on St Helier, and outside these areas purchase wholesale leased lines from JT.

1.10 There are two core leased line technologies, Traditional Interface (TI) and Alternative Interface (AI), with TI leased lines being a legacy technology which is being phased out over time. Retail prices of leased lines on Jersey are high compared with comparator countries. For example, a 1 Gbps AI leased line on Jersey costs approximately twice the equivalent on Iceland and the Isle of Man. This differential is more pronounced when compared to the UK, where a wholesale 1 Gbps leased line costs 6 times less than a similar line on Jersey.

1.11 This review takes into account the Government's Telecoms Strategy action plan for Jersey, which seeks to promote competition between licensed operators at the retail, rather than network, level and also wishes to encourage competing licensed operators to produce differentiated services.[3]

[3] https://www.gov.je/Industry/TelecomsStrategy/Pages/JerseyTelecomsStrategyActionPlan.aspx.

Approach to this review

1.12 The Authority aims to conduct market reviews at appropriate intervals to ensure the regulatory framework (including SMP findings and the relevant remedies imposed) continues to work well for all consumers in light of changing market conditions. The last review of the Business Connectivity Market in Jersey was completed in 2014[4] (the 2014 review) and developments in the markets since then, including the island-wide fibre rollout by JT and changes in demand and technology suggest it is appropriate time to conduct new analysis.[5]

1.13 Consistent with best practice, the CICRA Guideline on market definition[6] and the 2014 review, the Authority is undertaking this review following the model of the European Union, which is conducted in four stages:

i. Definition of relevant retail and wholesale markets using the Hypothetical Monopolist Test (HMT);
ii. Determining whether the defined market is susceptible to *ex ante* regulation using the three criteria test[7];
iii. If the three criteria test is fulfilled, assessing whether any undertaking[8] has SMP in the relevant market either singly or jointly with others; and if an undertaking has SMP; and
iv. Proposing proportionate, targeted and appropriate remedies to address any competition problems identified.

1.14 Any intervention by the Authority will then be the minimum necessary to address any problems identified.

Proposed market definitions and SMP findings

1.15 The proposed results of stages (i) to (iii) of this approach are set out in Table 1.

---

[4] https://www.cicra.gg/cases/2014/t1097gj-business-connectivity-market-review/.

[5] Further, while it does not apply in Jersey, the European Electronic Communications Code (EECC) sets the period for undertaking market reviews at five years, which is broadly aligned to the timing of this review. See: DIRECTIVE (EU) 2018/1972 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 establishing the European Electronic Communications Code.

[6] 'CICRA Guideline 7 – Market Definition' 2017.

[7] See '*COMMISSION STAFF WORKING DOCUMENT EXPLANATORY NOTE accompanying document to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services'* 2007.

[8] In this review, an undertaking is equivalent to a licensed operator and the term is used interchangeably throughout.

Table 1: Summary of proposed market definitions and SMP findings

Market	Product and geographic market definition	Three criteria test	SMP designation
Retail on-island leased lines	• The retail leased line market comprises both AI and TI lines • All bandwidths used for delivering leased lines are in the same market • The retail leased lines market does not include business or residential broadband • The retail leased lines market should not be broadened to include downstream services such as VPNs • Whole of Jersey • The retail market should not be broadened to include off-island leased lines	Not fulfilled	N/A
Wholesale on-island leased lines	• The Authority's preliminary conclusions in the retail market are mirrored in the wholesale market In addition: • The wholesale market should not be broadened to include dark fibre or duct access[9] • The wholesale market should not be narrowed to reflect customer use of leased lines, for example mobile backhaul or other retail applications • Self-supply should be included within the wholesale market • Whole of Jersey	Fulfilled	JT

1.16 The proposed finding is that JT has SMP in the wholesale market for on-island leased lines based on the following indicators:

- Stable market share in excess of 90%;
- The presence of significant barriers to entry and expansion;
- The presence of economies of scale and scope;
- Evidence of excessive profits; and
- Lack of countervailing buyer power.

[9] This means that dark fibre and duct access are not taken into account in the assessment of SMP, which is assessed against the proposed market definition. These services are considered again at the remedies stage of this market review, as the finding that they are outside of the defined wholesale market for the purposes of SMP assessment does not preclude their use as a remedy.

1.17 The Authority's provisional conclusion is that JT's SMP means, in the absence of effective regulation, it has the incentive and ability to act in a way which could harm competition in the market, reducing consumer welfare. In particular, the Authority has concluded JT has the incentive and ability to:

- Refuse to supply access to its network to OLOs thereby foreclosing the market to competition;
- Allow access but discriminate against OLOs by offering worse price and non-price terms than it does to its own downstream retail operation; and
- Charge excessive prices for access.

Proposed remedies

1.18 The 2014 review found JT to have SMP in the market for wholesale leased lines and imposed a remedy that required it to provide access to wholesale leased lines with the wholesale price set at the retail price less 20%.

1.19 In this market review, the Authority has considered whether, in light of market developments, to impose a "passive" remedy in the form of dark fibre, in the event that JT is again found to have SMP.

1.20 The Authority is of the preliminary view that the current price control on JT continues to be necessary in the wholesale market for on-island leased lines. This includes maintaining the current cost accounting obligations. The Authority considers the charge control may need to be proportionately different for AI and TI leased lines.

1.21 The Authority has preliminarily concluded there are significant benefits from requiring JT to provide dark fibre access to OLOs, over and above the benefits that could be delivered from an active remedy. This is consistent with the Government's Telecoms Policy, the stage of development of competition in the market and an OLO request and, in particular, it will:

- Expose more of the value chain to competition than the limited price competition available from the current active product access with a retail minus charge control;
- Facilitate product and price innovation by allowing OLOs to develop their own product portfolio and prices that do not need to reflect JT's own prices;
- Provide appropriate investment incentives to JT and OLOs;
- Facilitate carrier diversity, which will provide the opportunity for much better levels of resilience for business customers than they have today; and
- Support more flexible mobile backhaul by allowing the mobile network operator to control bandwidth.

1.22 The main risk with dark fibre identified by the Authority is that JT would not be able to recover the cost of its investment in its network. However, the Authority considers that this risk can be mitigated by an appropriately calibrated price control that allows a reasonable return on investment.

1.23 The Authority's preliminary view is the price of dark fibre should be cost orientated and estimated by reference to a cost model. If the preliminary conclusions of this review are confirmed, the Authority will issue a separate consultation document to facilitate the implementation and pricing of dark fibre. This will include consideration of transitional arrangements for existing active services.

1.24 Alongside dark fibre access, there is a range of supporting remedies proposed which are targeted at the identified competition issues. These are set out in the Table below and are broadly consistent with the remedies introduced at the 2014 review.

Table 2: Summary of proposed remedies

Competition issues	Remedies
Refusal to supply	• Obligation of access to dark fibre and copper based wholesale leased lines • Transitional arrangements for existing fibre based wholesale leased lines • Obligation of transparency
Price and non-price discrimination	• Obligation of non-discrimination • Obligation to maintain accounting records and provide on request
Excessive pricing	• Obligation of cost accounting • Separate price controls for dark fibre and wholesale active leased lines.

2 Introduction

2.1 This section:

- sets out the background to this Consultation (see paragraphs 2.2-2.5);
- explains how to respond to this Consultation (see paragraphs 2.6-2.9); and
- outlines the structure of this document (see paragraphs 2.10-2.11).

Background to the Consultation

2.2 In undertaking a market review the Authority is following a five-stage process.[10] This document is at the non-statutory Draft Decision stage.

2.3 On 28 October 2019, the Authority issued a call for evidence on the scope of the review. It also issued a statutory data request to licensed operators active in the leased lines markets, who all submitted quantitative and qualitative information (see Annex 2). The Authority also conducted a qualitative telephone survey of Channel Islands based companies and government organisations that use business connectivity products (see Annex 3).

2.4 Information collected from responses and discussions has been considered and has informed the Authority's analysis and preliminary conclusions.

2.5 The Authority would like to thank licensed operators and wider stakeholders for their engagement with the process so far and encourage the continuation of this at all stages of the project. This input is essential to deliver an outcome which ensures that business connectivity services are provided in a way that best contributes to promoting and maintaining effective competition in the market for the purpose of economic and social development and increasing overall consumer welfare in Jersey.

How to respond

2.6 The Authority invites written views and comments on the issues and questions raised in this document, to be made by 5pm on 15 January 2021.

2.7 Responses can be submitted by email to info@jcra.je or alternatively in writing to:

Jersey Competition and Regulatory Authority
2nd Floor Salisbury House
1-9 Union Street
St Helier
Jersey
JE2 3RF

[10] Channel Islands Competition and Regulatory Authorities (2018), Regulatory Consultation Process, https://www.jcra.je/media/597815/g1369gj-consultation-regulatory-consultation-process.pdf.

2.8 All responses should be clearly marked: *"Business connectivity market review"*. The Authority's normal practice is to publish responses to consultations on its website. It should be clearly marked if any part of a response is held to be commercially confidential.

2.9 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at the end of each section and all together in Annex 5. It would also help if you can explain why you hold your views and how the Authority's proposals would impact on you, supported by any quantitative or qualitative evidence that you hold.

Structure of this document

2.10 The rest of this document is structured as follows:

- Section 3 sets out the background to the market review;
- Section 4 describes the Authority's proposed approach to the market review;
- Section 5 sets out the Authority's proposed definition of the retail market and the three criteria test for this market;
- Section 6 sets out the Authority's proposed definition of the wholesale market and the three criteria test for this market;
- Section 7 explains the Authority's preliminary assessment of competition and SMP in the wholesale market;
- Section 8 explains the Authority's preliminary view of the scope of remedies that should be applied in the wholesale market; and
- Section 9 sets out proposed remedies which could be applied should there be an SMP finding in the wholesale market.

2.11 The documents also provides further detail in annexes as follows:

- Annex 1 outlines the legal requirements and licensing framework;
- Annex 2 provides a summary of licensed operator responses to the call for evidence;
- Annex 3 provides a summary of business consumer research;
- Annex 4 sets out further detail on retail prices of AI leased lines;
- Annex 5 sets out the consultation questions; and
- Annex 6 provides a glossary of terms used in this document.

3 Background

3.1 This section provides an overview of:

- Market structure (see paragraphs 3.3-3.9);
- Leased line technologies (see paragraph 3.10);
- Demand for leased line services (see paragraph 3.11-3.12);
- Pricing of leased lines (see paragraphs 3.13-3.15);
- The findings of the 2014 review (see paragraph 3.16); and
- Government policy (see paragraphs 3.17-3.20).

3.2 The Authority has taken due account of this background and context in this market review.

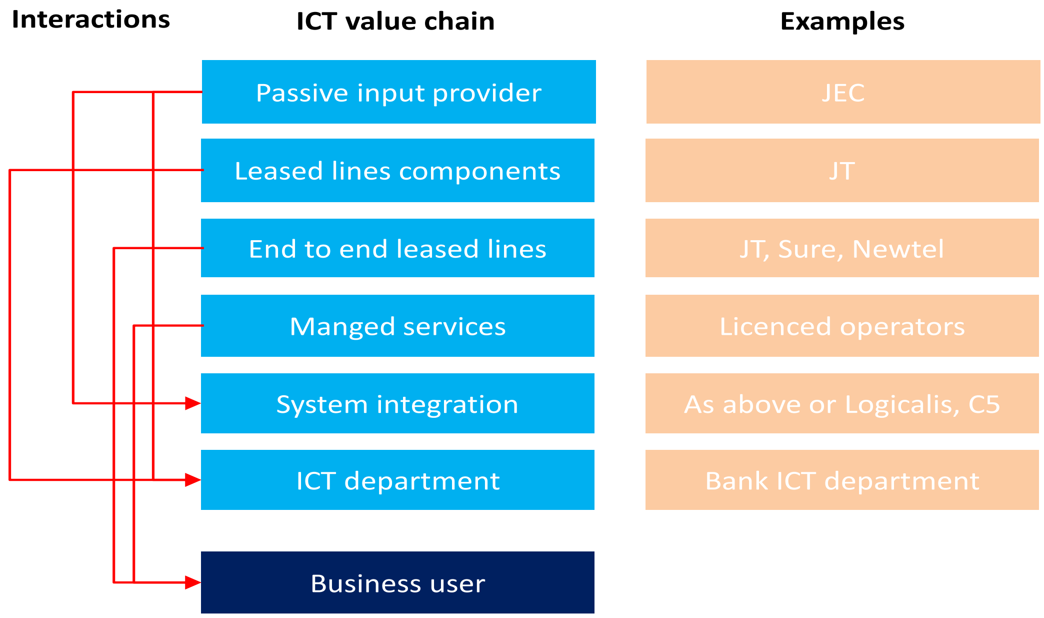
Market structure

3.3 Leased lines are used as components to enable suppliers to offer business ICT services (being termed 'downstream') and leased lines rely on the use of components of physical network (which are 'upstream'). End-customer organisations use leased lines in a wide variety of ways, depending largely on how involved they want (or need) to be in the engineering of the ICT services they use. For example, many end-customer organisations purchase leased lines directly to establish their own private data networks; others may pay a supplier to manage that aspect of their ICT needs for them.

3.4 Increasingly, leased lines are purchased as part of a larger service, that will often include value added services such as internet access/IP feed, private voice and data services, Virtual Private Networks (VPNs), cloud computing, data storage/disaster recovery and network monitoring and technical support. These are often referred to as 'managed services'. These are supplied to business customers either by licensed operators and by systems integrators, the latter by purchasing leased lines from upstream providers and then selling end-to-end business connectivity solutions to end-customers.

3.5 The Figure below illustrates a simplified version of the different service layers and providers involved in the delivery of business connectivity services to end-customers on Jersey and the interactions between them.

Figure 1: Business connectivity service layers and providers



Source: Authority analysis

3.6 The Figure shows there are providers operating at different service layers on Jersey. Jersey Electricity Company (JEC) provides a limited amount of dark fibre on routes between Jersey, Guernsey and France via Indefeasible Rights of Use (IRU) on its network.[11] JT's fibre network is ubiquitous across the whole island which allows it to deliver leased lines almost everywhere. In contrast the OLOs have significantly smaller networks, focused on St Helier, with limited plans for future expansion.

3.7 Infrastructure-based players (predominantly JT, Sure and Newtel) provide services up to and including full outsourcing of business connectivity requirements. Meanwhile, other providers, for example Logicalis Ltd,[12] offer managed services or systems integration.

3.8 To serve this market, leased lines are offered by licensed operators in different ways:

- Retail leased lines are sold directly to end-customer businesses as well as to organisations providing managed business connectivity services to businesses.
- Wholesale leased lines are sold to OLOs who, in turn, provide their own retail communications services. A licensed operator may purchase a wholesale leased line as an input to a range of different retail services and/or to offer a retail leased line service to its own customers. Another key use of wholesale leased lines is for mobile backhaul to connect mobile base stations to the core network. Demand for high capacity connections will increase with the roll-out of 5G mobile services.[13]

[11] See https://www.jec.co.uk/media/574771/je2019raweb.pdf.

[12] https://www.je.logicalis.com/.

[13] See for example GSMA (2019) '*Mobile Backhaul: An overview'*.

3.9 Generally, demand for wholesale products is derived from demand for retail services and the products are often the same, with the difference being the pricing.

Leased line technologies

3.10 For the purposes of this review leased line technologies are classified into two main groups:

- 'Traditional interface' (TI) leased lines are provided using legacy analogue and digital interfaces. TI leased lines are principally used for private voice and data services, with the analogue variant used for voice and low-bandwidth data transmission while digital variants are typically available in bandwidths ranging from 2 Megabits per second (Mbps) up to 10 Gbps.
- 'Alternative' (AI) leased lines are digital leased lines geared mainly towards the transmission of IP data and are more suitable for the delivery of high bandwidth services than TI leased lines. The most common AI leased line technology is Ethernet, which is used for data transmission both within local area and wide area network environments. Ethernet services are typically available in bandwidths ranging from 10 Mbps to 10 Gbps. Fibre Channel is another AI technology, used for very high bandwidth transmission, for example in the area of data storage network applications.

Demand for leased line services

3.11 Since the 2014 review, demand for leased lines has grown, driven by demand from businesses, consumers and OLOs for backhaul. The Authority forecasts that this trend will continue in Jersey. This mirrors findings in other comparable markets: Ofcom research shows the amount of mobile data used in the UK is growing, increasing by 50% p.a., on average, between 2012 and 2017 with this trend expected to keep growing.[14]

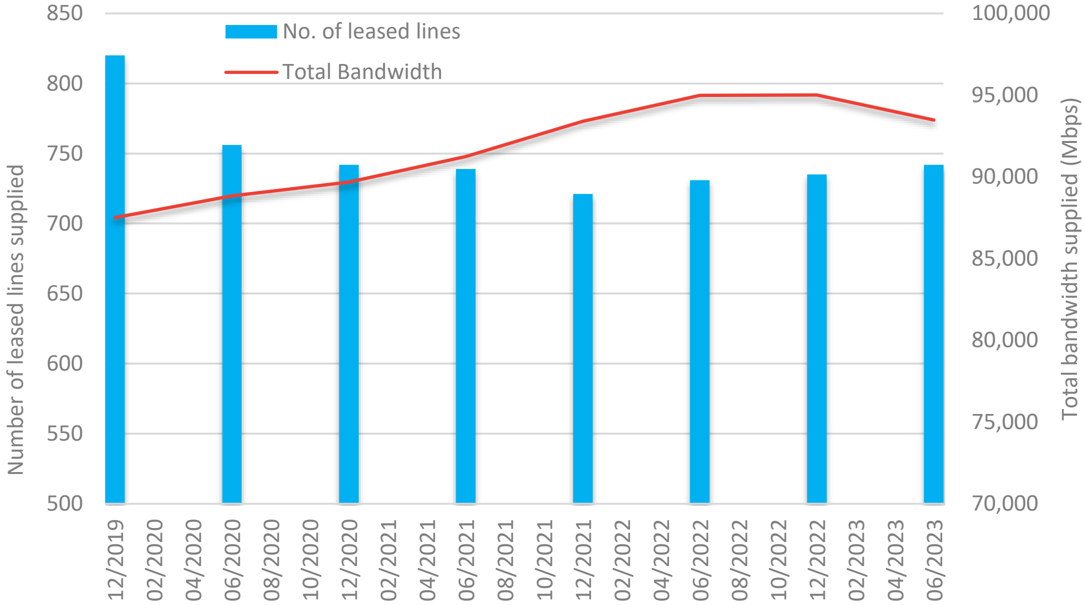
3.12 The Figure below shows forecast demand for leased lines in Jersey from 2019 to 2023, both by number of leased lines (left hand Y axis) and bandwidth (right hand Y axis). While, the number of lines is forecast to decline slightly, the total bandwidth is likely to increase. These trends are driven by:

- The phasing out of TI lines: for example in 2019 there was a total of just 23 2 Mbps on-island leased lines, forecast to decline to ten by the end of 2020 and then early in 2021; and
- The increasing substitution of lower bandwidth AI leased lines, with higher bandwidth lines e.g. a move from 100 Mbps lines to 1 Gbps lines.

---

[14] Ofcom, August 2018. Communications Market Report 2018.

Figure 2: Forecast Retail leased lines[15]



Source: Authority analysis of data provided for the call for evidence

Pricing of leased lines

3.13 The Authority has benchmarked prices by comparing retail prices of AI leased lines on Jersey at different bandwidths with comparable jurisdictions.[16]

3.14 Prices on Jersey are higher than most comparator countries for 10 Mbps and 100 Mbps leased lines (the analysis is shown in full in Annex 4).[17] For 1 Gbps lines Jersey has the median price for the comparator group, although prices are still materially higher than some relevant comparators (for example, 40% higher than in Iceland and 70% more than the Isle of Man).

3.15 Although retail prices for AI lines are not available for the UK, wholesale prices show a substantial discrepancy between the UK and Jersey. The Openreach price for a 1 Gbps Ethernet Access Direct circuit is £162 per month plus a connection charge of £1,848. Over a five-year period, the total cost of ownership per month would therefore be £192.80 per month. This compares with a wholesale price for a 1 Gbps leased line of Jersey of £1,203 per month, which is approximately 6 times the price of the UK.

---

[15] The forecast decline in total bandwidth in 2023 reflects the numbers provided by licensed operators.

[16] This benchmarking uses data provided by Strategy Analytics Ltd in November 2019 - see Annex 4. Note price comparisons for TI leased lines have been omitted due to the low volumes sold in Jersey and the UK is not included as retail prices for AI leased lines are not publicly available.

[17] Although prices in Jersey are set a flat rate for the whole island, prices for other countries were collected for 1km and 10km lines to establish if there were price differentials by distance that may be relevant.

The findings of the 2014 review

3.16 On 1 October 2014, the Authority issued the Final Notice of the 2014 review. As a result, the Authority imposed certain regulatory obligations on JT in those markets where they were found to have SMP. The table below summarises the market definitions, SMP findings and remedies.

Table 3: Market definitions, SMP findings and remedies from 2014 review

Stage	Summary of conclusions	
Market definition and SMP finding	• Retail markets for on-island leased lines • Retail markets for off-island leased lines • Wholesale markets for on-island leased lines • Wholesale markets for off-island leased lines	JT SMP No SMP JT SMP No SMP

Remedies	• Retail markets for on-island leased lines:
	  ○ No remedies imposed. Effective wholesale regulation only needed to ensure a better outcome for retail end-customers
	• Wholesale markets for on-island leased lines
	  ○ Access on reasonable request
	  ○ Non-discrimination
	  ○ Transparency
	  ○ Accounting separation – maintenance of accounting records that enable specified activities to be separately identifiable
	  ○ Cost accounting and price controls. Wholesale price set at retail price minus 20%	

Government policy

3.17 In 2018 the Government commissioned the consultancy Oxera to develop a telecoms strategy for the island.[18] Oxera assessed the economic efficiency of infrastructure and service level competition. Infrastructure competition requires the development of competing independent networks, whereas service competition relies on wholesale access to a single network allowing multiple retail licensees to compete using the same basic infrastructure.

3.18 Oxera determined that, for an economy the size of Jersey, service level competition is likely to be more efficient for fixed telecommunications because:

- It avoids the high, one-off fixed/sunk costs of rolling out competing networks;
- A single network benefits from strong economies of scale (in terms of the use of the network) that can be passed to consumers;
- There are economies of demand density;

[18] Oxera (2018) 'A Telecoms Strategy for Jersey'.

- The operational costs of a single network are relatively small; and
- The life of the asset is significant, but subject to potential technical obsolescence.[19]

3.19 Consistent with Oxera's recommendation, the Government has decided that service level, or retail, competition should be promoted "*as the most effective way of delivering the benefits of next generation connectivity to consumers and businesses*". This means "*wholesale access seekers get access to wholesale products, which allow access seekers to compete on differentiated retail services*".[20]

3.20 The States' Telecoms Strategy action plan[21] requires the Authority to, inter alia:

- As appropriate, direct JT to offer fibre wholesale products to allow for differentiated retail services; and
- Ensure fair, reasonable and non-discriminatory access to backhaul for mobile sites for all mobile providers.

[19] Ibid p. 34 – 35.

[20] Ibid p. 50.

[21] See https://www.gov.je/Industry/TelecomsStrategy/Pages/JerseyTelecomsStrategyActionPlan.aspx.

4 Approach to the review

4.1 This section provides an overview of:

- Overarching approach (see paragraphs 4.2-4.5);
- Proposed approach to market definition (see paragraphs 4.6-4.19);
- Proposed approach to competition assessment (see paragraphs 4.20-4.31); and
- Proposed approach to remedies (see paragraphs 4.32-4.36).

Overarching approach

4.2 This market review takes the same broad approach adopted by National Regulatory Authorities (NRAs) throughout the EU and reflected in the CICRA guideline on market definition. The approach involves (in summary) assessing whether the market is competitive, and then regulating to respond to obstacles to effective competition, including requiring offering non-discriminatory access to monopoly assets.

4.3 This approach is well-established, considered as best practice and has been adopted in many countries outside the EU, including in Jersey for the 2014 review. The Authority therefore considers it is consistent with its duties and achieving its objectives to adopt this approach to market reviews.

4.4 Such a market review requires a focal point (the market under review). For this market review, the Authority has adopted the European concept of "wholesale high-quality access provided at a fixed location", which includes leased lines.[22] The European Commission staff working document accompanying the recommendation states:

> *To be able to meet the demand of retail business customers for high-quality access and, very often, connect their multiple sites (including cross-border), alternative operators use a number of different wholesale inputs, ranging from leased lines using traditional or alternative interfaces, independently of the underlying infrastructure, to other wholesale access products which fulfil certain quality characteristics.*

4.5 The Authority has used this definition as the starting point for defining the relevant market in Jersey.

---

[22] European Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services. 9 October 2014 Available at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014H0710&from=EN. This market is also known as "Market 4" as it is the fourth market on the list in the recommendation.

Proposed approach to market definition

4.6 The Authority proposes to adopt the broad principles of product and geographic market definition as set out in the European Commission's SMP Guidelines ('SMP Guidelines'), which is reflected in the CICRA guidance on market definition.[23] The market definition procedures are designed to identify in a systematic way the competitive constraints encountered by providers of electronic communication networks and services and has three stages which are covered in turn:

i. Product market definition.
ii. Geographic market definition.
iii. Application of the three criteria test.

Product market definition

4.7 Product market definition is not an end in itself; it is concerned with identifying the boundaries of a market so competitive conditions can be assessed, and, if appropriate, *ex ante* regulation can be put in place. The process involves considering constraints on both the demand and supply sides of a market (and their interaction). A relevant product market comprises all products or services that are sufficiently interchangeable or substitutable, from the point of view of a user.[24]

4.8 The well-established method for identifying market boundaries is the Hypothetical Monopolist Test (HMT). This assesses whether a hypothetical monopolist of the narrowest possible focal product is able to impose a small but significant non-transitory increase in price (SSNIP[25]) for a product or service without reducing its profits. The degree of substitution identified on the demand and supply sides of the market is, therefore, critical to the market definition process.

- Demand side substitution refers to consumers of the focal product switching to an alternative product that can be used for the same purpose in the event of a SSNIP.
- Supply side substitution refers to the potential entry to the market of a rival to produce a substitute for the focal product using its existing assets in the event of a SSNIP by the hypothetical monopolist.

4.9 If the hypothetical monopolist can impose a SSNIP profitably, then the market has been defined: the boundaries of the product market are the focal product. However, if the hypothetical monopolist is unable to raise prices profitably due to either demand or supply side substitution, then the market definition is expanded to include the

[23] op. cit. footnote 6.
[24] See SMP Guidelines, Para. 33.
[25] A SSNIP is taken to be a 5 – 10% increase in price.

substitute product. The HMT is then run again with an additional potential substitute until the hypothetical monopolist is able to impose a SSNIP profitably.[26]

4.10 An alternative method of considering the relevant product market is one where the price elasticity of demand is elastic within the market and inelastic between the market and any other.

Geographic market definition

4.11 The SMP Guidelines also require the geographic coverage of markets to be considered. Once the product market has been defined, the consideration of the geographic market determines where the geographic boundaries of the product market lie. The SMP Guidelines define a geographic market as comprising:

> *… an area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which the conditions of competition are sufficiently homogeneous, and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are significantly different. Areas in which the conditions of competition are heterogeneous do not constitute a uniform market.*[27]

4.12 The SMP Guidelines state that in a electronic communications market the geographic scope of the market has traditionally been defined by the area covered by a network and the existence of legal and other regulatory instruments.[28]

4.13 Typically, the analysis of the geographic scope of the market would consider whether there are specific geographic areas within the jurisdiction which are sufficiently different to warrant definition as a separate market.

4.14 BEREC[29] (Body of European Regulators for Electronic Communications) has set out three main criteria for determining whether there is a case for finding there are separate geographic markets. The criteria are:

- The differences in the barriers to entry and in the number of suppliers;
- The homogeneity of the market shares of these suppliers; and
- The potential differences in prices or services.

4.15 In assessing geographic markets, the Authority follows the BEREC approach.

[26] The HMT assumes that prices are set below the monopoly price to avoid the “cellophane fallacy” in which products are found to be demand-side substitutes only because a SSNIP above the monopoly price would induce consumers to switch to an alternative product. See ‘Commission Staff Working Document accompanying the SMP Guidelines’ p.10. Available at http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=51927.

[27] SMP Guidelines, Para. 48.

[28] SMP Guidelines, Para. 51.

[29] *Draft review of the BEREC Common Position on geographical aspects of market analysis (definition and remedies)*, BEREC, 5 December 2013, (‘BEREC Report’), available at: http://bit.ly/1pJhtIZ (PDF).

Three criteria test

4.16 Once a relevant market has been defined, the three criteria test is used to determine whether the relevant market is susceptible to *ex ante* regulation. This test consists of three conditions, which must be analysed in the order set out below and must all be fulfilled. This means if a relevant market does not meet even one of the three criteria it is not susceptible to *ex ante* regulation and there is no need for further analysis.

4.17 The criteria are:

i. The market is characterised by high and non-transitory barriers to entry and expansion, meaning that new competitors are unlikely to enter the market and existing players cannot expand capacity;
ii. The market is not trending towards effective competition; and
iii. Competition law is unlikely to be able to resolve any issues in the market.

4.18 The Authority will conduct the three criteria test in downstream (retail) markets on the presumption that current regulation is in force in upstream (wholesale) markets.

4.19 Under EU regulations, the three criteria test does not need to be conducted if the relevant market is on the Commission's list of relevant markets. As the definition of Market 4 is flexible, the Authority has decided for completeness to subject the relevant markets defined in this review to this test.

Proposed approach to competition assessment

4.20 When a market has been defined and found to be susceptible to *ex ante* regulation, the next step is to assess whether that market is effectively competitive or whether one undertaking enjoys a position of dominance, either individually or jointly with others.[30] The analysis should look forward five years, taking into account foreseeable technical and economic developments. This time period allows realistic projections to be made concerning relevant factors in the market such as technological change and movement in market shares and is linked to the time for which any *ex ante* regulation would be expected to be in force before the market would be subject to another review.

4.21 SMP is generally held to be equivalent to the concept of dominance under competition law. In a competitive market, a firm has to concern itself with the possible reactions of

[30] According to the European Electronic Communications Code (EECC) Recital 162: "Two or more undertakings can be found to enjoy a joint dominant position not only where there exist structural or other links between them but also where the structure of the relevant market is conducive to coordinated effects, that is, it encourages parallel or aligned anti-competitive behaviour on the market." (DIRECTIVE (EU) 2018/1972 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 establishing the European Electronic Communications Code).

competitors and customers. An undertaking enjoying a position of market power can behave independently of competitors, customers and ultimately consumers.[31]

4.22 If there is no SMP, the market is effectively competitive and does not require *ex ante* regulation. If there is no SMP any existing *ex ante* regulation should be removed, and no further *ex ante* regulation should be imposed.[32]

4.23 If there is SMP, then the market is not effectively competitive and regulation should be imposed, either directly in the relevant retail market or at the wholesale level, or both, to counteract the potential negative effects of the competition problems that can be caused by the SMP operator.[33]

4.24 Assessment of market power usually starts with the undertaking's market share in the relevant product and geographic market. In the SMP Guidelines, it is clear that although a high market share alone is not sufficient to establish the possession of SMP, it is unlikely that a firm will be dominant without a large market share. However, a very large market share is considered evidence in its own right of market power. The SMP Guidelines note a …

> *"…very large market share held by an undertaking for some time — in excess of 50% — is in itself, save in exceptional circumstances, evidence of the existence of a dominant position. Experience suggests that the higher the market share and the longer the period of time over which it is held, the more likely it is that it constitutes an important preliminary indication of SMP."*[34]

4.25 Where an undertaking's market share is high but below 50%, the SMP Guidelines state that the NRA should rely on other structural criteria to assess whether the undertaking has SMP. A non-exhaustive list is provided in the SMP Guidelines**[35]** and set out below:

- Barriers to entry;
- Barriers to expansion;
- Absolute and relative size of the undertaking;
- Control of infrastructure not easily duplicated;
- Technological and commercial advantages or superiority;

[31] In this definition, "customers" can be thought of as individuals or companies who purchase the product from the undertaking. "Consumers" can be considered as a wider group of potential customers or customers of another firm.

[32] Non-economic regulations such as any universal service obligation regulations and other licence conditions will remain.

[33] There is also scope to find more than one person holds SMP ('joint dominance'). As findings of joint dominance or SMP are unusual, the SMP Guidelines provides a detailed explanation of the criteria need to find joint dominance. SMP Guidelines, Para. 65 to end. Unless the text indicates to the contrary, references to 'SMP' in this consultation in the specific context of Jersey refer to single-person SMP.

[34] SMP Guidelines, Para. 55.

[35] SMP Guidelines, Para. 58.

- Absence of or low countervailing buying power;
- Easy or privileged access to capital markets/financial resources;
- Product/services diversification (for example, bundled products or services);
- Economies of scale;
- Economies of scope;
- Direct and indirect network effects;
- Vertical integration;
- A highly developed distribution and sales network;
- Conclusion of long-term and sustainable access agreements;
- Engagement in contractual relations with other market players that could lead to market foreclosure; and
- Absence of potential competition.

4.26 In general, the approach to competition assessment in the SMP Guidelines involves a high level analysis of barriers to entry and expansion. In telecommunications markets, barriers to entry can be significant and are often associated with large-scale investment in infrastructure over a long time, with consequent sunk costs, and could also entail an operator's need to achieve economies of scale, scope and density.

4.27 Another barrier to entry could arise where an SMP operator is vertically integrated. That is where the operator offers a wholesale and a retail service. In this case, an entrant to the market may find it difficult to compete if the SMP operator's retail arm benefits from preferential treatment from its parent company, particularly if the market entrant is dependent on purchasing a wholesale input from the SMP operator or if the business/offering is structured in such a way that the wholesale part of the business is able to support or cross-subsidise the retail part of the business.

4.28 Barriers to entry could also arise because of the existence of a scarce resource, such as spectrum. The requirement to hold a licence is a legal barrier to entry when the number of licences issued is restricted or criteria on licence eligibility are set.

4.29 The competition assessment would take into account other factors that could dilute market power, such as countervailing buyer power, where a purchaser buys enough of the operator's services to be able to influence the pricing and market behaviour of the operator.

4.30 As noted above, it is important to consider any changes to market shares over time, as this will indicate trends in the market and will contribute to an assessment of whether or not the market may become effectively competitive over the period of the review. The data requested from operators as an input to the review was provided for the last two years together with forecast data until 2023, and this will contribute to an assessment of any changes in the market structure over time.

4.31 The conclusion of the competition assessment for each market is a preliminary view as to whether any undertaking, either singly or jointly with others, has SMP in the defined market.

Proposed approach to remedies

4.32 Should an undertaking be found to have SMP, the Authority would then need to consider appropriate remedies to support competitive outcomes.

4.33 The EU's Electronic Communications Code provides for a set of behavioural obligations or remedies to be imposed by National Regulatory Authorities (NRAs) that establish how the undertaking with SMP is required to conduct itself in the market. It has been standard practice throughout the EU to impose remedies at a high level on the conclusion of a market review, and to further specify in more detail as required. So, for example, if an NRA proposes that a price control is required following a market review, it may impose this in principle, then consult with operators and stakeholders on the detail of how it should be implemented.

4.34 The European Electronic Communications Code ('EECC')[36] sets out the obligations that may be imposed by NRAs:

- Obligation of transparency (Article 69 EECC).
- Obligation of non-discrimination (Article 70 EECC).
- Obligation of accounting separation (Article 71 EECC).
- Obligation of access to, and use of, specific network facilities (Article 73 EECC).
- Price control and accounting obligations (Article 74 EECC).
- Functional separation (Article 77 EECC).

4.35 The remedies applied by the Authority would need to be appropriate to the competition problems likely to arise from the exploitation of SMP and proportionate to the possible impact of that problem. The table below shows potential competition problems caused by SMP and the appropriate remedies to address those problems that the Authority might use by reference to both the EU's Electronic Communications Code and the JT Licence.[37]

---

[36] DIRECTIVE (EU) 2018/1972 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 establishing the European Electronic Communications Code. This amends and replaces Articles 9-13a of Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, 7 March 2002 (as amended) (Access Directive).

[37] The Authority has also considered the findings of 'BEREC Common position on best practice in remedies imposed as a consequence of position of SMP in the relevant market for wholesale leased lines' available at https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/common_approaches_positions/1096-revised-berec-common-position-on-best-practices-in-remedies-as-a-consequence-of-a-smp-position-in-the-relevant-markets-for-wholesale-leased-lines.

4.36 The Authority believes that this general approach to remedies used in the EU should be adapted for use in Jersey, if a licensed operator is found to have SMP. For example, although the Authority intends to have regard to the SMP Guidelines provided for EU NRAs, and to have regard to the list of remedies that EU NRAs can apply, the Authority is not limited in the remedies that it can impose such that it cannot consider other remedies, if those would be effective and proportionate. Such an approach is in accord with the licence conditions which can be applied to dominant operators in Jersey.

Table 4: Potential Competition Problems and Remedies

Competition Problem	Appropriate Remedies	Class III Licence Condition
Refusal to supply	Obligation of access and use of specific network facilities Obligation of transparency	LC25 LC33
Price and non-price discrimination	Obligation of non-discrimination Obligation of accounting separation Functional separation	LC31 LC30
Excessive pricing	Price control and accounting obligations	LC30

Consultation questions

Question 1: Do you agree with the Authority's proposed approach to market definition and the use of the three criteria test to determine whether a relevant market is susceptible to *ex ante* regulation? If not, what alternative do you suggest?

Question 2: Do you agree with the Authority's proposed approach to competition/SMP assessment and remedies? If not, what alternative do you suggest?

5 Retail market definition

5.1 This section sets out the Authority's proposed definition of product markets at the retail level and uses the three criteria test to determine if any retail market is susceptible to *ex ante* regulation. This assessment enables the subsequent definition of any relevant upstream wholesale product and geographic markets, and then to determine whether any licensed operator has SMP in those markets. The proposals are set out in Table 5 below.

Table 5: Summary of proposed retail market definition

Stage	Proposed findings	Further detail
Product market	• The retail leased line market comprises both AI and TI lines • All bandwidths used for delivering leased lines are in the same market • The retail leased lines market does not include business or residential broadband • The retail leased lines market should not be broadened to include downstream services such as VPNs • The retail market should not be broadened to include off-island leased lines	See paragraphs 5.2-5.25
Geographic market	• Island wide - there are no particular areas within Jersey where conditions of competition are appreciably different to the extent that they constitute separate geographic markets	See paragraphs 5.26-5.29
Three criteria test	• Not passed - current access remedies mean that there are no high and enduring barriers to entry and that market is therefore not susceptible to *ex ante* regulation. On this basis, no SMP analysis is undertaken	See paragraphs 5.30 -5.33

Product market

5.2 The definition of the relevant product market considers the identification of a focal product or service and then establishes the boundaries of the market. The Authority's proposed focal product is a 1 Gbps AI leased line as:

- responses to the Authority's survey of Channel Island businesses and government bodies showed that 92% of the organisations contacted purchased AI leased lines;
- responses to the call for evidence indicated that, in addition to competitive pricing, the most important features in business connectivity are dedicated capacity, known routing and Service Level Agreements (SLAs); and
- responses to data provided by licensed operators in response to the call for evidence show that most leased lines are 1 Gbps AI lines.

5.3 This section adopts an issue-by-issue method to identify substitute products and constraints on prices, consistent with the 2014 review. In particular we have assessed the features which purchasers of business connectivity identified as being most important, and the extent to which purchasers perceive alternative products and services as interchangeable in response to a SSNIP. The issues discussed are:

- Issue 1: Should the retail market comprise both TI and AI leased lines?
- Issue 2: Are all bandwidths in the same market?
- Issue 3: Should the market be broadened to include business connectivity services provided via business or residential broadband?
- Issue 4: Should the retail market be broadened to reflect the increasing purchases by business customers of a solution rather than a retail leased line?
- Issue 5: Should the market be broadened to include off-island leased lines?

Issue 1: Should the retail market comprise both TI and AI leased lines?

5.4 In the 2014 review, the Authority determined that TI and AI leased lines belong in the same relevant market for the principal reason that customers are more concerned with the service provided than the technology used. No feedback from the call for evidence or business consumer survey has come to light that would change this conclusion.

5.5 Sales of TI leased lines are declining significantly and it is expected that there will be no TI leased lines in place during 2021. Finding a separate TI market would therefore be unnecessary.

5.6 The Authority's preliminary view is, therefore, that TI and AI leased lines continue to belong in the same relevant market.

Issue 2: Are all bandwidths in the same market?

5.7 Leased lines are sold at a variety of speeds from 2 Mbps to 10 Gbps, although the vast majority are 10 Mbps, 100 Mbps or 1 Gbps.

5.8 When defining markets with vertically differentiated versions of the same product, as is the case with different leased lines speeds, a "chain of substitution" may exist across those speeds such that they are all in the same relevant product market. In this market context, a chain of substitution means that even if a 10 Mbps leased line does not act as a direct competitive constraint on a hypothetical monopolist of 1 Gbps leased lines, intermediate products (e.g. 100 Mbps lines) provide a constraint in both directions. Thus, in the event of a SSNIP on a 10 Mbps, consumers may not switch to a 1 Gbps line, but enough consumers may switch to a 100 Mbps line to make the SSNIP unprofitable.

5.9 The Authority is of the preliminary view that such a chain of substitution exists in the retail leased lines market. This is consistent with the view taken by other regulators in similar markets and by the Authority in the Wholesale Broadband Access market.

5.10 The Authority is also of the view that supply side substitution would also act as a constraint on a hypothetical monopolist. A provider of 100 Mbps could easily enter the market for 1 Gbps lines in the event of a SSNIP constraining the hypothetical monopolist's position.

5.11 Further, data provided by licensed operators show the market shares and competitive conditions for each speed of leased line do not differ significantly. Thus, even were the Authority to find relevant product markets for each speed of leased lines, it would also be likely to come to the same conclusions concerning dominance.

5.12 The Authority's preliminary opinion, therefore, is that there is a single market for retail leased lines comprising all bandwidths.

Issue 3: Should the market be broadened to include business connectivity services provided via business or residential broadband?

5.13 A significant change in Jersey since the 2014 review is that JT has completed a fibre to the premises (FTTP) network across the whole island so all premises connected to this network can receive broadband access with a download speed of up to 1 Gbps and an upload speed of up to 100 Mbps. Potentially, this could mean broadband could be a substitute for leased lines, where the customer does not need upload speeds higher than 100Mbps.

5.14 The Authority has, therefore, considered whether the business connectivity market should include business or residential broadband via FTTP.

5.15 First, the Authority has considered whether, in the event of a SSNIP by a hypothetical monopolist of business connectivity products, sufficient customers would switch to broadband to make that SSNIP unprofitable. Table 3 below compares the prices and product features of JT's residential and business fibre broadband 1Gbps products with their Fibrelink 1000 (Ethernet 1Gbps) leased lines. The table shows there are some specific product differences and a very large price premium for the leased line product.

Table 6: Leased line and broadband product features

Product features	Services considered		
	Residential Broadband 1 Gbps	Business Broadband 1 Gbps	Fibrelink 1000
Price (per month)	£81.00	£249	£1,451.52
Download speed	1 Gbps	1 Gbps	1 Gbps
Upload speed	100 Mbps	100 Mbps	1 Gbps
Usage allowance (peak hours)	300 GB	1,500 GB	Unlimited

Contention ratio	Information not provided	10:1	Uncontended

5.16 In the business consumer survey (see Annex 3), respondents were specifically asked if they considered fibre broadband as a substitute for leased lines. All respondents said they would use fibre broadband and leased lines for different purposes. Most importantly, leased lines were used for mission critical communications, where known routing and uncontended access were required. By contrast, all users of residential broadband and 78% of users of business broadband surveyed reported it was used for non-business critical applications only.

5.17 On this basis, the Authority consider if a hypothetical monopolist of AI leased lines implemented a SSNIP it would not be sufficient for business customers to switch to fibre broadband. Business customers are already prepared to pay approximately 6 times the price of a business broadband line for a leased line and the Authority would not expect sufficient customers to switch if the difference were 6.5 times the price to make the SSNIP unprofitable.

5.18 The Authority is therefore of the preliminary view that the market for business connectivity does not include either business or residential broadband services.

<u>Issue 4: Should the retail market be broadened to reflect the increasing purchase by business customers of a solution rather than a retail leased line?</u>

5.19 Many organisations use solutions, such as Virtual Private Networks (VPNs), to connect offices or sites. The "Virtual Private" aspect refers to the use of a telecoms operator's public core network as the business user is actually sharing public infrastructure, rather than dedicated capacity. VPNs can be accessed via the internet or leased lines.

5.20 A VPN is therefore a downstream service to which a Leased line is an input rather than a demand or supply side substitute for a leased line.

5.21 The Authority's preliminary view is, therefore, that the market for business connectivity does not include downstream services such as VPNs.

<u>Issue 5: Should the market be broadened to include off-island leased lines?</u>

5.22 The Authority has considered whether an off-island leased line is an effective substitute for an on-island leased line from both the demand and supply sides. On-island leased lines originate and terminate within Jersey, whilst an off-island leased line terminates elsewhere: usually Guernsey, France or the UK.

5.23 The Authority is of the preliminary view that a leased line between, say, St Helier and Jersey Airport cannot be substituted by a leased line between Jersey and another country. It is therefore of the preliminary opinion that an off-island leased line is not an effective substitute for an on-island leased line.

5.24 The lack of a possibility for a supply-side substitution also indicates that off-island leased lines are not in the same relevant market. A supplier of leased lines between Jersey and elsewhere would not be in a position to use those assets to provide lines between two points in the island (without themselves relying on on-island suppliers to provide the connecting leased lines for those circuits).

5.25 The Authority has therefore come to the preliminary conclusion that off-island leased lines are not an effective demand or supply side substitute for on-island leased lines and therefore the market should not be extended to include off-island leased lines.

Geographic market

5.26 A relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products and/or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those areas.

5.27 The Authority notes that OLOs in Jersey have built their own infrastructure in certain parts of the island and considers whether this may reflect differences in competitive conditions in particular areas. Generally, new infrastructure is introduced in the main business centres, such as St Helier. The construction of own infrastructure reduces the reliance on purchasing wholesale products from the incumbent.

5.28 The Authority's preliminary view is that the networks developed by market entrants are limited in size and so do not sufficiently alter the conditions of competition in the areas they cover to create a significant difference in competitive conditions between these areas and where JT is the only provider. The Authority also notes JT's retail prices are uniform across Jersey, which supports the view that OLOs do not change competitive conditions.

5.29 The Authority is therefore of the preliminary view that new entrants' networks do not result in different conditions of competition within their footprint and therefore the relevant geographic market is Jersey-wide.

Three criteria test

5.30 To establish if the retail market is susceptible to *ex ante* regulation all three criteria in the three criteria test must be met. In the event any one of these criteria is not met, taking into account existing regulation in upstream markets, then the market is not susceptible to *ex ante* regulation and no further analysis is needed.

Criteria 1: The market is characterised by high and non-transitory barriers to entry and expansion, meaning that new competitors are unlikely to enter the market and existing players cannot expand capacity

5.31 OLOs operating in the retail market are able to access wholesale leased lines on regulated terms from JT. The price of wholesale leased lines were set, under the 2014 BCMR statement, at the retail price minus 20%. On this basis there are low economic barriers to entry at retail level and any undertaking already in the market can expand its business by acquiring more wholesale leased lines if needed. The Authority notes that OLOs on Jersey had a combined retail market share of around 35% at the end of 2019, an increase of five percentage points since the 2014 review, suggesting barriers to entry are not only low in theory, but also in practice.

5.32 The preliminary remedies considered in this market review are designed to lower barriers to entry further and, according to the EC recommendation in relevant markets, should be taken account of in assessing this criterion.[38]

5.33 On this basis, the Authority's preliminary view is the retail market does not meet the first of the three criteria and so is not susceptible to *ex ante* regulation. Analysis of the second and third criteria is therefore not required in this market review. The implication of this preliminary view is any alleged dominance and anticompetitive practices in this market would be subject to competition law rather than regulation.

Consultation questions

Question 3: Do you agree with the Authority's preliminary definition of the product market for retail leased lines as summarised below?

- The retail leased line market comprises both AI and TI lines
- All bandwidths used for delivering leased lines are in the same market
- The retail leased lines market does not include business or residential broadband
- The retail leased lines market should not be broadened to include downstream services such as VPNs
- The retail market should not be broadened to include off-island leased lines

If you do not agree you should provide all of your analysis and assessment.

Question 4: Do you agree with the Authority's preliminary conclusion that there are no particular areas within Jersey where the conditions of retail competition are such that they may constitute separate geographic markets? If you do not agree you should provide all of your analysis and assessment.

Question 5: Do you agree that the retail market for leased lines does not meet the three criteria test and so no further analysis is required? If you do not agree you should provide all of your analysis and assessment.

[38] For example, Recital 13, which states "Legal or regulatory barriers that are likely to be removed within the relevant time horizon should not normally be deemed to constitute a barrier to entry such as to fulfil the first criterion."

6 Wholesale market definition

6.1 This section sets out the Authority's proposed definition of the relevant product markets at the wholesale level. The proposed definition draws on the proposed retail markets identified in the previous section, while also considering further wholesale specific issues. The three criteria test is again used to determine if the market is susceptible to *ex ante* regulation. The proposals are set out in Table 7 below.

Table 7: Summary of proposed wholesale market definition

Stage	Proposed findings	Further detail
Product market	• The Authority's preliminary conclusions in the retail market are mirrored in the wholesale market In addition: • The wholesale market should not be broadened to include dark fibre or duct access • The wholesale market should not be narrowed to reflect customer use of leased lines, for example mobile backhaul or other retail applications • Self-supply should be included within the wholesale market	See paragraphs 6.2-6.21
Geographic market	• Island-wide - there are no particular areas within Jersey where conditions of competition are appreciably different to the extent that they constitute separate geographic markets	See paragraphs 6.22-6.25
Three criteria test	• Passed - current access remedies means that there are no high and enduring barriers to entry and that the market is therefore not susceptible to *ex ante* regulation. On this basis, no SMP analysis is undertaken	See paragraphs 6.26-6.33

Product market

6.2 The wholesale market for leased lines in Jersey derives from the retail market; operators who want to offer retail leased lines must have access to physical connections, but apart from JT itself, do not own the network that enables those connections.

6.3 In defining the wholesale market, most of the characteristics of the wholesale services mirror the retail market. Some additional factors which are specific to the wholesale market arise on an issue by issue basis. This includes differences in competitive conditions in the wholesale market and differences in the products themselves. The issues discussed are:

- Issue 1: Are the Authority's preliminary conclusions in the retail market mirrored in the wholesale market?
- Issue 2: Should dark fibre or duct access form part of the relevant market?
- Issue 3: Should the wholesale market be narrower to reflect customer use of leased lines, for example mobile backhaul?

- Issue 4: Should the wholesale market include self-supply?

Issue 1: Are the Authority's preliminary conclusions in the retail market mirrored in the wholesale market?

6.4 The Authority's preliminary position is that each of the preliminary conclusions defined in Table 5 may also be made in defining the wholesale market for leased lines in Jersey as:

- The initial focal product should be 1 Gbps AI leased lines as these are a direct input to the retail focal product;
- The wholesale market comprises AI and TI lines. As in the retail market customers are most concerned with capability and the volume of wholesale TI lines is declining sharply;
- The wholesale market should be expanded to incorporate all bandwidths. The same chain of substitution occurs in the wholesale market and competitive conditions do not change significantly across bandwidths;
- The wholesale market should not be broadened to include business or residential broadband services as these cannot be used as an input to a retail leased line;
- The wholesale market should not be broadened to include downstream products such as VPNs. A downstream product cannot be used as an input to an upstream product; and
- The wholesale market should not be broadened to include off-island leased lines, which cannot be used as a substitute for on-island wholesale leased lines.

Issue 2: Should dark fibre or duct access form part of the relevant market?

6.5 In defining the retail leased lines market, the Authority considered whether or not downstream services that utilise leased lines as an input (such as VPN) should form part of the relevant market. In defining the wholesale market, a similar question occurs in relation to the inclusion within the relevant market of upstream passive infrastructure, such as access to dark fibre or duct sharing.

6.6 The Authority understands that neither JT nor any OLO sells dark fibre to other licensed operators. However, as noted in paragraph 3.6, the Jersey Electricity Company (JEC) does sell dark fibre on international routes, although its 2019 annual report and accounts suggests the level of sales is low compared to the market for leased lines as a whole[39]. Given the focus is international and as the scale of sales is small, the Authority considers any dark fibre provided by JEC is unlikely to have any material effect on a hypothetical monopolist of wholesale on-island leased lines.

6.7 Further, even if sales of dark fibre from JEC were of a level to have a potential affect, for such upstream services to form part of the relevant market, they would need to be

[39] See https://www.jec.co.uk/media/574771/je2019raweb.pdf p. 66.

broadly substitutable for existing wholesale leased line services. However, an organisation accessing dark fibre would need to install its own equipment to 'light' the fibre, which would involve additional investment in order to do so. Similarly, while duct access would enable an organisation to install its own optical fibre along a given route, it would face significant costs both to deploy its own fibre and then to 'light' it. These extra requirements suggest that dark fibre and duct access are not a sufficiently close substitute to leased lines.[40]

6.8 Therefore, while access to dark fibre and duct sharing may provide opportunities for licensed operators to procure their own network elements, the Authority's preliminary view is these are upstream components of leased lines and do not form part of the wholesale market for leased lines. This means these services are not taken into account in the assessment of SMP, which is assessed against the proposed market definition. However, these services are considered again at the remedies stage of this market review (see section 8 and 9), as the finding that they are outside of the proposed wholesale market, does not preclude their use as a remedy.

Issue 3: Should the wholesale market be narrower to reflect customer use of leased lines, for example mobile backhaul?

6.9 The Authority has considered whether separate markets should be defined for wholesale leased lines which are used for different purposes. In particular, the Authority has considered whether the market conditions for the supply of leased lines for mobile backhaul differ from those of leased lines for other purposes such that those two types of wholesale leased lines are traded in different markets.

6.10 Mobile backhaul refers to the connection between mobile base stations and the core network that carries voice and data traffic. This connection is usually, though not exclusively,[41] over a fibre leased line. Backhaul lines are essential to mobile networks and the demand for bandwidth on these lines is likely to grow as the data usage on mobile increases with the advent of 5G services.

6.11 Wholesale leased lines used for mobile backhaul and other connectivity services are essentially the same product: a lit fibre connection between two locations along a dedicated path. So, in the event of a SSNIP by a hypothetical monopolist of a separately defined backhaul market or leased line market, a supplier of the other product could enter the market using existing assets making the SSNIP unprofitable. The Authority also

[40] Ofcom takes a similar view to the Authority. See https://www.ofcom.org.uk/__data/assets/pdf_file/0025/154591/volume-2-bcmr-final-statement.pdf Paras 4.61 and 7.69.

[41] Other technologies can be used, such as a microwave link.

notes the prices charged for wholesale leased lines are the same regardless of the customer's use of the leased line.

6.12 A further consideration is whether competitive conditions in the supply of mobile backhaul and leased lines for other connectivity services differ significantly. In Ofcom's recent BCMR, differences in competitive conditions were a key part of its decision on whether mobile backhaul was in the same relevant market[42]. For competitive conditions to differ, there would need to be differences in the presence of rival networks for the two services as without the presence of a rival network, there can be no competition at wholesale level.

6.13 However, as discussed in Section 3, whilst JT's network is ubiquitous across the island, other operators have very limited networks that do not act as rivals to JT. Data provided by licensed operators show JT share of mobile backhaul lines is in line with their overall share of the wholesale leased line market (see paragraphs 7.4-7.6). This shows competitive conditions do not differ between the supply of leased lines for mobile backhaul and for other services.

6.14 On this basis, therefore, the Authority considers leased lines used for mobile backhaul and other connectivity services belong in the same relevant market. The possibility that a market has a number of different customer bases, and different customer types, is not in itself sufficient to justify a definition of separate markets within it.

6.15 The Authority's preliminary view is that a leased line is a versatile input that can be put to a range of different uses, but that all such leased lines are traded in a single economic market. This market includes provision for backhaul as well as an input to a range of retail applications.

Issue 4: Should the wholesale market include self-supply?

6.16 Self-supply means the provision of a leased line by a vertically integrated licensed operator's upstream (wholesale) division to its (retail) downstream division, irrespective of how the licensed operator is organised. Whether this 'self-supply' should be taken into account in considering market shares could affect whether the Authority considers there is SMP (and hence effective competition) in the market.

6.17 In the 2014 review, the Authority considered that self-supply of dedicated capacity should not be considered as part of the relevant market for wholesale leased lines in Jersey because it did not expect that an operator would build its own network in response to a SSNIP by a hypothetical monopolist of wholesale leased lines.

6.18 However, in this review, the Authority considers that a wholesale leased line is essentially the same product whether it is sold to an external customer or provided to

[42] Ofcom, op. cit. footnote 46, Annex 9.

the retail division of a vertically integrated firm. Therefore, the hypothetical monopolist should be presumed to be providing all wholesale leased lines to its own retail division or external retailers.

6.19 In a hypothetical situation where an operator was vertically separated into a wholesale and retail business, then the wholesale business would sell wholesale leased line to the retail business for onward sale to customers. These wholesale lines would be counted as being in the market. The fact a licensed operator is vertically integrated does not, in the Authority's view, mean internal "sales" should not be included in the market.

6.20 Including self-supply within the market is consistent with the approach taken by many EU NRAs. BEREC conducted a study of self-supply in the wholesale broadband access market and found most NRAs included self-supply.[43] The study also notes self-supply can be a competitive constraint on external supply and so some NRAs included self-supply when assessing SMP even if it was excluded at the market definition stage.

6.21 The Authority has therefore reached the preliminary view that all wholesale leased lines should be included in the relevant market regardless of whether the customer is internal or external.

Geographic market

6.22 As noted in the discussion of the retail geographic market, a relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products and/or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those areas.

6.23 In its retail market definition, the Authority noted market entrants in Jersey have built their own infrastructure in certain parts of the islands and considered whether this may reflect differences in competitive conditions in particular areas. The Authority considered that the size of other networks on Jersey were too small to have any effect on competitive conditions. It also noted that JT offers uniform pricing across the island, markets their services in a uniform manner, and there is no product differentiation according to geographic area.

6.24 Similar issues exist in the wholesale leased lines market. A finding of a smaller geographic market within Jersey would be the right approach if there was evidence that different areas within Jersey had markedly different competitive conditions in ways that gave rise to distinct markets. The size of OLOs' networks and the uniform pricing policy apply as much in the wholesale market as they do in the retail market. It is the Authority's preliminary view that Sure's and Newtel's networks are too small to affect

[43] BEREC '*Report on Self Supply*' March 2010.

competitive conditions. This is consistent with the observation that wholesale prices are uniform across the island.

6.25 As a result, the Authority's preliminary view is that there are no particular areas within Jersey where the conditions of wholesale competition are such that they constitute separate geographic markets and the market is island-wide.

Three criteria test

6.26 As with the retail market, to establish if the wholesale market is susceptible to *ex ante* regulation all three criteria in the three criteria test must be met. In the event any one of these criteria is not met then the market is not susceptible to *ex ante* regulation and no further analysis is needed.

Criteria 1: The market is characterised by high and non-transitory barriers to entry and expansion, meaning that new competitors are unlikely to enter the market and existing players cannot expand capacity

6.27 There is no regulated access to any business connectivity product upstream of wholesale leased lines, such as dark fibre or duct and pole access. Any undertaking wishing to enter the market must therefore build its own physical network.

6.28 Both Sure and Newtel have built small networks on Jersey. However, the opportunity for expansion is limited in particular in light of the Government's policy of preferring wholesale access to JT's existing network rather than building new networks, which is seen as inefficient.

6.29 The limited size of existing networks and the Government's policy suggests the market is subject to high and non-transitory barriers to entry.

Criteria 2: The market is not trending towards effective competition

6.30 The Authority has collected data from JT and OLOs on Jersey on the number of wholesale leased lines provided, including self-supply. The data collected show JT has a market share of around 90% and forecast sales until 2023, collected as part of the call for evidence, suggest this will not fall below this level over this time period.

6.31 A market share of this size and stability strongly indicates the market is not trending towards effective competition and will not do so in the foreseeable future.

Criteria 3: Competition law is unlikely to be able to resolve any issues in the market

6.32 Competition law is concerned with the ex-post abuse of a dominant position by the dominant undertaking exploiting consumers or excluding rivals. It is not designed to open markets to competition where such competition does not exist. It is therefore unlikely to be able to resolve issues of access on fair and reasonable terms to facilitate the entry of competition in downstream markets.

6.33 On the basis of the analysis above, the Authority is of the preliminary view that the wholesale on-island leased lines market on Jersey fulfils the three criteria test and is, therefore, susceptible to *ex ante* regulation.

Consultation questions

Question 6: Do you agree with the Authority's preliminary definition of the wholesale leased lines product market as summarised below?

• The Authority's preliminary conclusions in the retail market are mirrored in the wholesale market

• The wholesale market should not be broadened to include dark fibre or duct access

• The wholesale market should not be narrowed to reflect customer use of leased lines, for example mobile backhaul or other retail applications

• Self-supply should be included within the wholesale market

If you do not agree you should provide all of your analysis and assessment.

Question 7: Do you agree that there are no particular areas within Jersey where the conditions of wholesale competition are such that they may constitute separate geographic markets? If you do not agree you should provide all of your analysis and assessment.

Question 8: Do you agree that the wholesale market for leased lines does meet the three criteria test and so is susceptible to *ex ante* regulation? If you do not agree you should provide all of your analysis and assessment.

7 Wholesale market SMP assessment

7.1 The preceding section set out the Authority's proposed definitions of the relevant wholesale market. This section presents the SMP assessments in this market in line with the approach set out in section 4. The proposed assessment is set out in Table 8 below.

Table 8: Summary of proposed wholesale market definition

Relevant market	SMP indicators	Proposed SMP designation	Further detail
Wholesale leased line market (on-island)	• Stable market share in excess of 90% • Presence of barriers to entry and expansion • Presence of economies of scale and scope • Evidence of excessive profits • Lack of countervailing buyer power	JT	See paragraphs 7.4-7.21.

7.2 In coming to this proposed assessment, the Authority has carried out a forward-looking analysis of market characteristics. While market shares and trends in market share provide an important indication of how competitive a market is, they are not determinative on their own, particularly in signalling the level of future competition. The Authority has therefore taken into account a number of other relevant criteria that may constitute barriers to entry and/or expansion.

7.3 Therefore, this section provides an overview of:

- Market shares (see paragraphs 7.4-7.6); and
- Other relevant criteria (see paragraphs 7.7-7.20).

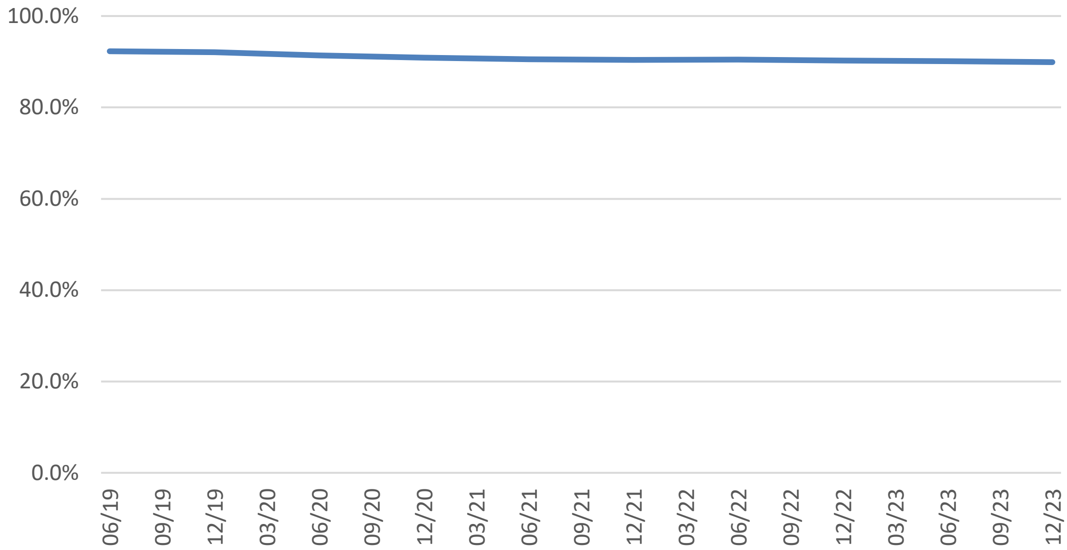
Market share

7.4 Measured by volume of circuits,[44] JT is the main supplier of on-island wholesale leased lines in Jersey and will be likely to hold a share in excess of 90% in the relevant market over the next five year period.[45]

[44] The Authority asked licensed operators to provide data on the number of wholesale on-island leased lines they supply, and the revenue they earned. The Authority anticipated measuring market share using both metrics. However, the revenue data was not consistently available at a sufficiently granular level, and so the primary calculation of market share is based on number of leased lines supplied only.

[45] The Authority has examined market shares across individual bandwidths and has found that JT has a similar high and stable market share in all bandwidths.

Figure 3: JT On-island wholesale leased line market share



Source: Authority analysis of data provided for the call for evidence

7.5 According to the SMP Guidelines, dominance concerns normally arise where an undertaking has a relatively stable market share of over 40% and market shares in excess of 50% are in themselves, save in exceptional circumstances, evidence of dominance.[46] The market share of 90% therefore indicates a very strong presumption of dominance of JT in the relevant market.

7.6 The Authority is therefore of the preliminary view that JT has SMP in the relevant market based on JT's market share alone. To test whether that preliminary conclusion is robust, other relevant factors that may affect JT's dominance are considered below.

Other relevant criteria

7.7 The other relevant criteria considered by the Authority include:

- Criteria 1: Barriers to entry and expansion;
- Criteria 2: Control of infrastructure not easily duplicated;
- Criteria 3: Economies of scale and scope;
- Criteria 4: Profitability; and
- Criteria 5: Existence of countervailing buyer power.

Criteria 1: Barriers to entry and expansion

7.8 The Authority recognises both Sure and Newtel have network presence on the island of Jersey. However, these networks are of limited size and at present are not sufficiently

[46] See SMP Guidelines, para. 55.

large to challenge JT's position in the market. The question that must be addressed is whether they could be expanded economically to be large enough to challenge JT.

7.9 In its response to the call for evidence, Sure informed the Authority it has no plans to materially increase the size of its network, although it is considering some limited expansion if commercially viable. Newtel informed the Authority the cost of civil engineering works is too high for network build to be effective.

7.10 Although not referenced by OLOs, it is well established in many jurisdictions that civil engineering is the highest cost in the development of new telecommunications networks, accounting for up to 70% of total costs.[47] In Jersey, Government policy is to promote competition via wholesale access to existing networks rather than promote the development of alternative independent networks, which the Government regards as economically inefficient.

7.11 The combination of the high cost of civil engineering and a government policy that prefers competition at the retail level (based on regulated wholesale products) rather than network level act as significant barriers to entry and expansion.

7.12 The Authority earlier determined that dark fibre was not in the same relevant market as wholesale leased lines primarily on the basis that the scale of dark fibre provided by JEC was too small to affect the behaviour of a hypothetical monopolist.[48] However, the Authority recognises that OLOs could expand their own networks if dark fibre access were more widely available and thus dark fibre could facilitate entry and expansion, constraining JT's dominant position. The fact is, however, that dark fibre is available on a very small scale only and not at a level that affects the SMP of JT in the wholesale leased line market.

Criteria 2: Control of infrastructure not easily duplicated

7.13 JT has ownership of the ubiquitous leased line network across the whole of Jersey. It has already been noted that Sure and Newtel have very limited networks; that the cost of building an alternative network is very high with most of the cost associated with civil works; and that Government policy is to promote competition on JT's network rather than encourage the building of alternative networks. For all these reasons, therefore, it is difficult for any other licensed operator to duplicate the network JT controls.

Criteria 3: Economies of scale and scope

7.14 Economies of scale occur when the average cost of additional capacity continuously declines, so the larger the network the lower the cost of serving each customers. Economies of scope arise when the average cost of each additional product declines

---

[47] Ofcom (2017), 'Wholesale Local Access Market Review Consultation'.

[48] See paragraphs 6.5 – 6.8 above.

with each additional product. The more products a network operator is able to sell, the less each costs as there are common costs shared between products.

7.15 As the largest licensed network operator in the island, JT is able to share common network costs across more customers and products than any of its rivals. It is therefore uniquely able to enjoy economies of scale and scope that its rivals cannot meet without considerable expansion. However, as the barriers to such expansion are sufficiently high this is unlikely to occur. JT's dominant position is therefore reinforced by its economies of scale and scope.

Criteria 4: Profitability

7.16 The obligation on JT to provide separated accounts was withdrawn in 2016 and therefore the Authority does not have access to sufficiently disaggregated accounts to determine the profitability of leased lines services directly.

7.17 JT's current wholesale on-island leased lines are subject to a retail minus price control. The Authority's preliminary assessment is JT's prices for retail on-island leased lines are generally more expensive than in comparator countries, as shown in Annex 4. Further, when comparing the price of wholesale leased lines on Jersey with the UK, prices on Jersey are substantially more expensive.

7.18 The Authority recognises JT may face some higher costs due to lower economies of scale on Jersey than in larger jurisdictions, such as the UK, which may reduce its negotiating power with suppliers of equipment. It also recognises the cost of living and salaries are somewhat higher. However, the Authority does not consider these additional costs account for the difference in prices. Based on that high-level and limited evidence, it is the Authority's view, therefore, that JT is likely to be making higher profits on leased lines than operators in comparator markets considered in Annex 4.

7.19 The Authority also notes JT is not subject to a charge control on retail leased lines and that the price of a wholesale leased line is based on a "retail minus" charge control. The Authority adopted a "retail minus" charge control in 2015 in the expectation that it would strengthen the competitive environment. However, the market has not become as competitive as anticipated and a retail minus price means JT is able to set its retail and wholesale prices without having to take account of competitors and customers. JT's high prices are, therefore, likely to be a result of its dominant position and the lack of an effective competitive constraint on prices.

Criteria 5: Existence of countervailing buyer power

7.20 Countervailing buyer power is the situation where a purchaser, which is normally purchasing a significant proportion of industry output, can credibly threaten the provider it will either switch suppliers or backwardly integrate to self-supply the product. If it can credibly threaten that it will take either of these actions, this can constrain the provider's ability to exploit its market power.

7.21 The existence of high barriers to entry and expansion (discussed above) and the lack of an alternative provider that could meet any OLO's demand for leased lines means that no customer in the relevant market has countervailing buyer power.

Consultation questions

Question 9: Do you agree with the Authority's proposal that JT should be designated with SMP in the market for wholesale on-island leased lines for the reasons set out above? If you do not agree you should provide all of your analysis and assessment.

8 Proposed scope of remedies: passive vs. active remedies

8.1 This section sets out the Authority's consideration on whether to impose 'passive' or 'active' remedies on JT, as the SMP operator. The term 'passive remedies' refers to access remedies which are provided without electronics and may include obligations to provide duct access or access to dark fibre. In contrast 'active remedies' refer to access to leased lines including the provision of the electronics that light those (optical fibre) lines.

8.2 Currently, all access obligations imposed on JT as the SMP operator in the leased lines market relate to the provision of active lines. The Authority's preliminary conclusion is a passive access remedy, specifically dark fibre access, would better support effective competition upstream, levels of product and price innovation and resilience that are not currently present in the market, to the benefit of consumers. The potential risks associated with dark fibre would be outweighed by these benefits. This is not the case for duct access and which the Authority considers would be disproportionate.

8.3 This section sets out the:

- Background (see paragraphs 8.5 – 8.11);
- The potential benefits of a passive remedy in the form of dark fibre (see paragraphs 8.12-8.20); and
- The potential risks of imposing a passive remedy in the form of dark fibre (see paragraphs 8.21- 8.29).

8.4 Section 9 of this document sets out how the introduction of a passive remedy in the form of dark fibre interacts with the wider set of proposed remedies identified as a result of this market review.

Background

8.5 This section provides an overview of:

- Considerations in the 2014 review;
- Considerations for this review;
- The appropriate form of passive remedy; and
- Summary of responses to the call for evidence.

Considerations in the 2014 review

8.6 The 2014 review did not include a specific discussion on passive remedies and only imposed an obligation on JT to provide access to wholesale leased lines.[49] Instead dark fibre and duct access were only considered in the market definition stage and whether they formed a part of the wholesale leased line market. The Authority's conclusion was

[49] See JCRA 'Business connectivity market review: Jersey' p.9

they did form a part of the wholesale market as they were an upstream input to the market. No mention was made of access to dark fibre or ducts as a remedy to JT's SMP. Annex 1 of the 2014 review, which summarised the responses to the call for evidence also does not mention dark fibre and duct access.

Considerations for this review

8.7 For this review, the Authority has decided to consider whether dark fibre and/or duct access should be a remedy in the current market review in the light of:

- the limited level of competition that has resulted from the current set of remedies in the market arising from the 2014 market review;
- evidence of demand for dark fibre access (for example, a request from an OLO);
- the full rollout of an island wide fibre network by JT;
- the Government's telecoms policy which has a focus on service-based competition over network competition and the encouragement of product differentiation;
- the potential for passive remedies to facilitate carrier diversity and increase resilience; and
- international precedent on the use of dark fibre, as summarised in the box below.

Box 2: International precedent

A number of European countries have implemented a dark fibre access remedy in the wholesale local access and business connectivity markets:

- Austria first introduced a dark fibre access remedy in 2014 in those communes where A1 (the incumbent) had SMP in the business connectivity market. Much of the demand for dark fibre came from the mobile operators who needed more flexibility for mobile backhaul bandwidth. However, it appears the Austrian NRA (RTR) originally set the price for dark fibre too high, such that no dark fibre access lines were sold. Following the 2018 market review, the RTR reduced the price of dark fibre and has seen some nascent demand.
- Ofcom first proposed dark fibre as a remedy in the business connectivity market in its 2016 business connectivity market review for terminating segments of Contemporary Interface (CI) leased lines where BT had SMP. However, at around the same time, Ofcom's strategic review of digital communications resulted in a requirement on BT to provide access to its physical infrastructure (ducts and poles) for other operators to install their own fibre. By the time of the 2019 market review the dark fibre remedy was restricted to inter-exchange lines only.
- Sweden has municipal fibre companies. One of the largest of these companies, the municipal network in Stockholm, Stokab, leases dark fibre. Stokab provides dark fibre to service providers and companies. Whilst Stokab has an exclusive right to lay new ducting and cables for telecommunication within existing buildings, competition is ensured at service level through equal access to dark fibre.
- Spain has implemented a dark fibre remedy in wholesale local access whereby in the event no spare capacity in ducts is available, Telefonica (having SMP) have an obligation to provide a dark fibre connection. Similarly, in Portugal, subsidiary access to dark fibre where there is no space in ducts and poles has been imposed.

- Access to dark fibre has been imposed as a remedy in the wholesale local access market in the Czech Republic. Additionally, AGCOM, the Italian regulator, imposes wholesale access remedies which include dark fibre.

The Authority has drawn two key lessons from these precedents. First, it is important to get the regulated price of dark fibre set at a level that does not deter its use. Secondly, it is important for the Authority to have a clear objective and policy approach.

The appropriate form of passive remedy

8.8 As noted above, the Authority has considered whether passive access, if imposed, should be based on dark fibre and/or duct access. The Authority adopts the following definitions for dark fibre and duct access:

Dark fibre: *A dedicated fibre optic path where the circuit provider has no active electronics attached at either end. The access seeker is able to attach their own active equipment directly to the ends of the fibre path and "light" it at whatever speed they choose and in whatever configuration they choose, within the limitations of what is technically feasible for that particular fibre.*

Duct access: *The physical infrastructure, comprising ducts, poles and any relevant associated facilities used to carry cables to customer premises. The access seeker is able to install its own cables (whether fibre, coax or copper) using the physical infrastructure within the limitations of what is technically feasible for that particular physical infrastructure.*

8.9 The Authority's preliminary view is that duct access would be disproportionate and any passive access remedy, if imposed, should therefore be based on dark fibre access. That is because:

- Imposing duct access would be misaligned with the Government's telecoms policy, which has a focus on service competition on a single network as opposed to infrastructure competition through the development of competing independent networks (see paragraphs 3.16 – 3.18 above);
- JT has made a significant investment in its fibre network in recent years and allowing OLOs to put their own fibre in JT's ducts may leave JT's fibre as a stranded asset and so undermine its fibre investment case; and
- Dark fibre access opens up a further level of the value chain to competition and provides most of the benefits that duct access can bring. The Authority considers dark fibre access should be sufficient to resolve competition problems in the downstream leased line market.

8.10 The Authority does not rule out that it might be proportionate and appropriate to require duct access at some point in the future, especially in the event that Government policy changed with respect to the balance between services and infrastructure based competition and/or if there was material evidence of demand for such access on the part of OLOs.

Responses to the call for evidence

8.11 In the call for evidence, the Authority asked licensees whether or not they offer dark fibre and if not, whether this was due to a lack of demand.

- JT informed the Authority it does not offer dark fibre, despite having received one request from an OLO. JT also noted that they are bringing more services across their core network so there is nearly always network equipment between the two ends of the circuit.
- Newtel noted that the lack of a dark fibre offer from JT reduced competition and increased the cost of leased line services to end customers, which negatively affects the global competitiveness of Jersey.
- Sure did not provide an answer in relation to Jersey.
- Airtel Vodafone did not explicitly mention dark fibre. However, they provided detailed information on how the costs of fibre backhaul and limited choice of bandwidth under the current regime will affect its ability to roll out a 5G network cost effectively. Airtel Vodafone explained that they would either have to under-dimension its network, affecting service quality, or over-dimension it and damage its profitability.

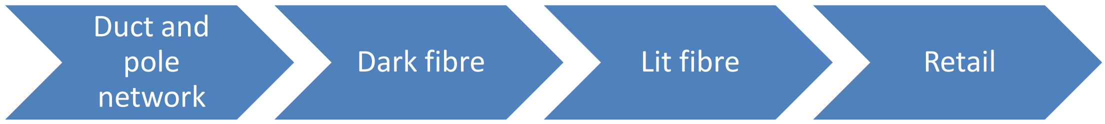
The potential benefits of a passive remedy in the form of dark fibre

8.12 Figure 4 overleaf is a simplified depiction of the leased line value chain from the physical infrastructure network through to the retail function. At present only the retail function is subject to competition and OLOs are only able to sell the product variants supplied by JT with no scope for price, service or product innovation.

8.13 Compared to retail competition alone, dark fibre access opens far more of the value chain to competition. It enables the OLO to install its own electronics to light the fibre, putting the OLO in control of the bandwidth options available to business customers. This allows OLOs the option to offer a range of intermediate bandwidth options that JT may not offer, and thus better suit its customers' needs. This ability to flex bandwidth could also allow OLO customers to scale up or down their bandwidth more responsively as their needs change.

8.14 Further, the OLO is in control of all costs downstream of the dark fibre itself, allowing it to be more efficient in relation to service management and more in control of end-customer pricing. Thus, dark fibre supports both product and price innovation in a market where the call for evidence and business consumer research suggest this is lacking.

Figure 4: The Leased line value chain



8.15 In the specific case of mobile backhaul, mobile operators would be able to control the bandwidth needs from each base station to the core network, giving them greater control over their costs and offering greater efficiency. Potentially, they could have multi-gigabit bandwidth that they can scale with demand for data. This will have a significant effect on the ability of OLOs to roll-out 5G services more widely, services that are expected to carry significantly higher volumes of data than their 4G equivalents. This was a key concern of some respondents to the call for evidence.

8.16 The provision of dark fibre also offers cost savings from reductions in equipment used by JT. For example, when purchasing wholesale services, OLOs connect their own equipment to each end of the circuit, to provide additional control over the service (e.g. better monitoring capabilities) and/or a downstream service such as a VPN. The OLO's equipment duplicates the JT equipment which will not be required if dark fibre is used to provide the service. The extent of potential cost savings will depend on the combinations of network equipment currently in use and the service required by the customer as well as the OLO's network design.

8.17 A further advantage of dark fibre is it will support carrier diversity to individual locations. Dark fibre would require each licensed operator using the fibre optic cable to install their own network equipment, which means that if one operator's equipment failed, other operators' equipment would not necessarily also fail. This will provide the opportunity for better levels of resilience for business customers than they have today.

8.18 The introduction of dark fibre also supports the climbing of the 'ladder of investment'[50] by OLOs in a manner consistent with the Government telecoms policy. The theory of the ladder of investment is to promote competition by providing a series of access product 'rungs' in the incumbent operator's network (e.g. different levels in Figure 4) which new entrants are expected to 'climb'. At each deeper level or higher 'rung' of the value chain OLO's are less reliant on the incumbent's downstream network, until finally they have built out their own networks and are no longer reliant on access to the SMP operator's network at all. In the context of Jersey's current strategic plan for telecoms, which seeks to encourage service competition on a single network, dark fibre access is the deepest

[50] See for instance Cave, M. (2006), Encouraging infrastructure competition via the ladder of investment, Telecommunications Policy 30, 223-237.

element of JT's network OLOs can access to enable this which is consistent with the plan, and this should better sustain effective competition in leased lines. [51]

8.19 Ultimately the take up of dark fibre promises the possibility of greater levels of competition at deeper network layers, reducing the need for future regulation. For example, as OLOs take up dark fibre solutions and become less reliant on JT's active services it is likely to be feasible to relax or withdraw active remedies in some or all of the leased lines market. This would reduce some of the regulatory burden on JT (and the demands on the Authority), reducing costs that are ultimately borne by customers.

8.20 In its consideration of the benefits of dark fibre, the Authority has also considered whether the same potential benefits could be achieved by imposing an active product remedy with prices set on a cost orientated basis. The Authority's considerations for why the same benefits will not follow from a cost-oriented active product price control are as follows:

- A cost-orientated active remedy would only expose a limited element of the value chain to competition and so competition between licensed operators will still mainly be based on price. On the evidence available to the Authority, it is unclear if that would enable effective and sustained competition in leased lines;
- The remedy would not allow OLOs to design their own products independently of the design process of JT, leaving it dependent on the core product set of JT. For example, dark fibre would allow the OLO to develop its own bandwidth set and/or offer variable bandwidth to end-customers;
- It would not allow OLOs to innovate new pricing structures that differ significantly from JT;
- For mobile backhaul, it would leave OLOs dependent on adding bandwidth increments determined by JT, possibly resulting in over-dimensioning the network and negatively affecting costs on backhaul; and
- Only dark fibre access would provide the redundancy needed to offer a higher level of resilience.

The potential risks of imposing a passive remedy in the form of dark fibre

8.21 As noted above, the introduction of dark fibre will open far more of the value chain to competition than at present. As well as benefits, this could also create problems. In this section, the Authority considers these risks and their implications for the Authority's decisions in this market review.

8.22 A key potential risk is that dark fibre could undermine JT's ability to recover its costs, expected returns based on its investment risk and willingness to invest in the future.

[51] As noted in paragraphs 4.2-4.4, even within this policy content, some OLOs are continuing to roll out small scale deployments of fibre as opposed to relying on wholesale access to JT's network.

Left unaddressed, this would have direct effects (ultimately, JT might find itself unable to finance its operations) and indirect effects (other individuals might be less likely to invest in assets that are, or could be, regulated in Jersey because of an increased perceived risk of regulation).

8.23 The Authority takes these risks seriously. An appropriately designed charge control will not prevent JT recovering its efficiently incurred costs, taking appropriate account of the expected take up of dark fibre and its potential to replace some active leased line products. Since the approach provides JT with the opportunity to recover its efficiently incurred costs plus an appropriate return on investment, this is consistent with providing appropriate incentives to invest.

8.24 Similarly, there may be concerns that common costs may not be recovered efficiently as dark fibre may lead to the elimination/reduction of the tariff gradient of active products. With a tariff gradient, there is greater common cost recovery from high bandwidth leased lines. This has been argued to be a form of Ramsey pricing[52] which can be welfare enhancing. However, available evidence suggests:

- The current retail control and prices are unlikely to reflect Ramsey pricing principles as JT has other profit-maximising motives when setting prices – for example, a high price gradient allows profits to increase by raising the prices of wholesale products; and
- The dark fibre provider will be able to recover common costs with more certainty. If it sets a tariff gradient for active lines, it faces the twin risks of selling fewer lines overall and/or selling a lower proportion of higher priced lines than needed to recover common costs. If there is no tariff gradient it only faces the risk of incorrectly forecasting total sales.

8.25 Concerns around common cost recovery can also be linked to concerns around cherry-picking and arbitrage. This could occur in a scenario where OLOs use dark fibre to provide high speed leased lines only, leaving JT to supply only slower speed lines which are sold at a lower cost reflecting the "tariff gradient". However, this presupposes the existing tariff gradient would remain in place even if dark fibre were provided at a single price, regardless of the speed of the end product.

8.26 Instead, a more competitive retail market, through the introduction of dark fibre, is likely to lead to a rebalancing of the prices for the active products. This is likely to result in a more efficient price structure and approach to cost recovery. The broadband market in Jersey is an interesting parallel for this likely behaviour. As the tariff gradient has been

[52] Ramsey pricing allocates common costs between products in inverse proportion to their price elasticity of demand. Where demand is less elastic, Ramsey pricing can be efficient (the improvement in efficiency is an increase in allocative efficiency) as there is a smaller volume reduction effect (which reduces efficiency) from less elastic products.

significantly flattened by the introduction of a flat rate bitstream access product and now JT only sells 1Gbps and 500Mbps broadband access. The available evidence (for example, of OLO take-up) implies that consumers prefer this flatter pricing and that it better reflects their needs.

8.27 Further, given the rebalancing of active prices, entry by OLOs using dark fibre would only be likely to occur where the active prices of JT are higher than incremental costs for those services. Entry in this scenario would be welfare enhancing, as it ensures prices are more aligned with incremental costs (i.e. more cost reflective) which will improve overall allocative efficiency and welfare.

8.28 Aside from pricing concerns, there may also be concerns that electronic and fibre assets used by the dominant firm to deliver lit fibre may become "stranded" if no longer needed due to a change in regulation. Electronic assets have a short lifetime[53] and capital costs would likely be recovered over the initial contract period. Fibre aggregation, which could also leave some fibres unused, could happen with an active leased line. Further, the expected reduction in price may lead to an increase in demand for fibre and higher utilisation.

8.29 There may also be concerns that if JT has less control over the end-to-end service this could lead to problems with fault detection and repair that would harm the interests of users. However, the OLO's ownership of the end-customer relationship and its control over many aspects of service means it has the incentive and ability to improve service quality and would have no incentive to pass faults back to JT unless there is a fault with the fibre circuit itself. In addition, OLOs would be incentivised not to misdiagnose faults on the fibre given they would incur higher costs through interaction with JT.

Consultation questions

Question 10: Do you agree with the Authority's preliminary view that dark fibre access to the JT network will deliver significant benefits to end-customers and these benefits will outweigh the risks? If you do not agree you should provide all of your analysis and assessment.

[53] For example, the Belgian Regulator's cost model for FTTH sets asset lives of electronic equipment at 4 – 7 years, compared to 20 – 40 years for physical infrastructure and cables. See https://www.bipt.be/operators/publication/ftth-cost-model-public-version.

9 Proposed remedies in the wholesale market

9.1 Section 7 set out the Authority's assessment that JT has SMP in the market for wholesale on-island leased lines. In Section 8 the Authority discussed the relative merits of passive and active remedies and came to the preliminary conclusion that a passive remedy, dark fibre access, would deliver significant benefits in the market. This section presents the full set of remedies the Authority proposes to impose on JT, should the market definition and proposed SMP finding be confirmed following the consultation process. These are summarised in Table 9 below.

Table 9: Summary of competition issues and proposed remedies for JT in the wholesale market for on-island leased lines

Competition issues	Remedies	Further detail
Refusal to supply	• Obligation of access to dark fibre and copper based wholesale leased lines • Transitional arrangements for existing fibre based wholesale leased lines • Obligation of transparency	See paragraphs 9.2-9.21
Price and non-price discrimination	• Obligation of non-discrimination • Obligation to maintain accounting records and provide on request	See paragraphs 9.2-9.3 and 9.22-9.31
Excessive pricing	• Obligation of cost accounting • Separate price controls for dark fibre and copper based wholesale leased lines.	See paragraphs 9.2-9.3 and 9.32-9.42

Competition problems identified in the wholesale leased line market

9.2 The Authority's preliminary opinion is, absent effective regulation, JT would have the incentive and the ability to use its dominant position in the relevant market to harm customers and limit competition in the market. There are three specific competition issues:

- **Refusal to supply**: JT could refuse to allow OLOs access to its network and so foreclose the downstream retail market to competition;
- **Price and non-price discrimination**: Even if JT were to allow access, it could set price and non-price terms for OLOs that make it hard for those OLOs to compete effectively with JT's downstream business;
- **Excessive pricing**: JT could set a price for wholesale access that is above the competitive level and on which it can earn monopoly rents thereby reducing consumer welfare in the market.

9.3 The regulations the Authority proposes to impose on JT are designed to address these potential competition problems and so promote effective competition in the market.

The proposed remedies for each set of competition problems are discussed in paragraphs 9.4-9.41 below.

Proposed remedies to address the potential for refusal to supply

9.4 To address the problem of JT refusing to supply OLOs with wholesale access such that those OLOs can compete in the downstream retail market, the Authority proposes to impose two remedies:

i. An obligation to provide access and offer the use of specific network facilities under Licence Condition (LC) LC25, which will differ according to whether leased line is based on fibre or copper; and

ii. An obligation of transparency under LC 26 and LC33.

9.5 This is a change from the obligation imposed in the 2014 review when JT was only obliged to provide access to wholesale active leased lines.

Obligation of access: Fibre leased lines

9.6 The access obligation allows an OLO to have certain types of wholesale access to JT's infrastructure. Taking account of the assessment of the benefits and risks of dark fibre access set out in the previous section, the Authority has come to the preliminary conclusion that JT should be under an obligation to supply access to dark fibre on-island leased lines to OLOs upon reasonable request.

9.7 Dark fibre access will allow OLOs the opportunity to compete on price and non-price terms and thus create a more innovative, competitive and resilient retail market for on-island leased lines. Box 3 sets out the potential design parameters for a dark fibre access remedy on which the Authority seeks stakeholder views.

9.8 Condition 25.1 of JT's licence states that:

> *"The Licensee shall at the request of an Other Licensed Operator or if directed by the JCRA, make Equal Access available to that Other Licensed Operator. The JCRA may direct the terms upon which such Equal Access shall be provided and the JCRA may make subsequent directions modifying or supplementing the regulation of Equal Access".*

9.9 The Authority proposes that JT should be obliged to make equal access available to OLOs in response to a reasonable request for access to dark fibre.

9.10 The Authority proposes to direct the terms upon which equal access shall be provided as follows:

- JT should be obliged to comply with the access obligation in a manner which is fair, reasonable, non-discriminatory and timely. The Authority notes this applies to the whole process, including the way in which JT deals with an access request, through to any implementation of it;

- JT should negotiate in good faith with OLOs requesting access; and
- JT should not, without appropriate justification and consultation, withdraw access to facilities already granted.

Box 3: Potential design parameters for a dark fibre access remedy

The Authority wishes to obtain stakeholders' views on the appropriate design parameters for a dark fibre access remedy. For example, which type or types of circuits would be most useful and, therefore, whether there is need for co-location and what such a co-location remedy would need to cover if required. Key aspects of the potential design are discussed below and Question 11 seeks stakeholders views on this:

- ***Scope of the remedy*****:** Dark fibre access could be made available for end-to-end lines only (i.e. between two customer sites), tail circuits (between a customer site and a JT network interconnection point) inter-exchange circuits or a combination of two or more of the above. End-to-end circuits would include mobile backhaul.
- ***Co-location:*** In the event that dark fibre is made available as a tail circuit there would be a need for a co-location remedy so that OLOs can interconnect with JT. Co-location means the provision of space permitting a OLO to occupy part of an JT site reasonably sufficient to permit the use of dark fibre access. There is no co-location remedy at present and so this remedy would need to be designed. If dark fibre access is restricted to end-to-end circuits there would be no need for co-location.
- ***One and two fibre circuits:*** Dark fibre access could be provided over one or two fibre circuits. With the former, a single strand of fibre is used to transmit data in both directions using different wavelengths, whereas with the latter one fibre strand is used for one direction and a second for the reverse direction.
- ***Provisioning, repair and service migration:*** The provisioning process is likely to be similar to the current process for active wholesale leased lines, except that JT would not provide active equipment. However, the fault repair process will differ in that the OLO will be expected to conduct initial fault diagnostics and only pass the fault to JT in the event that the fault lies in the fibre-optic cable itself for example.
- ***Migration:*** The transition to dark fibre access should not leave any wholesale customer unable to serve their end customers. The obligation to provide access to active wholesale leased lines would, therefore, likely only be withdrawn once a fit-for-purpose dark fibre access remedy is in place. See discussion below under transitional arrangements.
- ***Parity with wholesale active products:*** Once a fit for purpose dark fibre access remedy is in place, it is likely that the requirement for JT to provide wholesale active products on regulated terms can be lifted. This is to ensure that regulated access would therefore only be at the deepest level of the network and it is possible that a merchant market for wholesale active access may develop.

Obligation of access: Copper leased lines

9.11 The Authority recognises not all leased lines are provided using fibre optic cables and some slower AI and TI leased lines may be provided using a copper cable. However, the volume of these lines is small and expected to decline to zero within the period of this review. Therefore, the Authority's preliminary view is where copper is still used for the provision of a leased line, JT will be required to continue to provide access to active wholesale leased lines with prices set on a retail minus basis.

Transitional arrangements for existing fibre based wholesale leased lines

9.12 The Authority is aware the change from a regime of access to an active product with a retail minus charge control to cost oriented access to dark fibre is significant. There will therefore need to be a transitionary arrangement put in place to ensure no OLO is left without access to a wholesale leased line and so is unable to serve its end customers until such time as a fit for purpose dark fibre product is available. If the preliminary conclusions of this review are confirmed, the Authority intends to set out the details on the transition arrangements, including the timing of these arrangements, in a separate consultation document. In principle, these transition arrangements could be a continuation of the current access remedy.

Obligation of transparency

9.13 A transparency obligation sets out the manner in which an SMP operator should provide information about its activities in the market in which it has been found dominant. Generally, a transparency obligation supports other obligations addressing how the SMP operator is expected to behave, in that the transparency obligation sets out how the SMP operator will demonstrate compliance with its other obligations.

9.14 The obligation proposed here is broadly similar to that imposed under the 2014 review with extensions to address concerns raised by OLOs.

9.15 It is the Authority's preliminary view that where JT offers products in a wholesale market where it has been found to have SMP, these products should be appropriately documented. An OLO should be able to easily access technical information about wholesale products; information about prices and other terms and conditions; and process information including a change mechanism.

9.16 Condition 26.1 of JT's licence states that:

> *"The Licensee shall, within ninety (90) days of the commencement of this licence make publicly available a template Reference Interconnect Offer ("RIO") which shall contain the terms, schedules of interconnection and pricing of interconnection between the Licensees network and any Other Licensed Operator whose Licence terms enables them to Interconnect with another Licensed System".*

9.17 The Authority proposes that JT should be obliged to publish and maintain a Reference Offer for dark fibre access (if imposed) and wholesale leased lines provided on copper, including appropriate technical specifications, and including a mechanism explaining how changes to the Reference Offer will be made and notified.

9.18 The Authority proposes that JT should be required to publish a standard Service Level Agreement (SLA) which would govern JT's relationship with the OLOs, including Key Performance Indicators (KPIs).

9.19 The Authority proposes that JT should be required to publish prices and non-price terms and conditions for dark fibre (if imposed) and wholesale leased lines.

9.20 Condition 33.1 of JT's licence provides that publication of any changes should be made, and the Authority informed, at least 21 days before changes come into effect. OLOs have informed the Authority that in practice, one month's notice is provided, and the Authority considers there is merit in standardising the requirement to publish changes to price and non-price terms and conditions for wholesale on-island leased lines one month before they come into effect.

9.21 The Authority proposes that OLOs and the Authority should be notified in advance of the launch of a new wholesale product. This is necessary to ensure OLOs have the same opportunity as the SMP operator's downstream arm to react to changes in the wholesale offer and reflect them in the OLO retail offer. The Authority suggests the notice period should be 3 months.

Proposed remedies to address the potential for discrimination

9.22 To address the problem of JT having the incentive and ability to discriminate between OLOs and its retail arm and between OLOs in the absence of regulation, the Authority proposes to continue the obligation of non-discrimination in accordance with LC28 and LC31 and an obligation to provide relevant accounting information under LC29.

9.23 The obligations proposed here are the same as those imposed in the 2014 review.

<u>Obligation of non-discrimination</u>

9.24 A non-discrimination obligation generally has two aspects. First, it obliges an SMP operator to treat all OLOs in an equivalent manner – it cannot discriminate between them. Secondly, it obliges the SMP operator to treat OLOs in the same way as it treats its own downstream (or retail) arm. This means, for example, where an OLO is buying a wholesale input so it can offer a retail service, it should not be disadvantaged compared with the SMP operator's own retail operation. The onus is on the SMP operator to show that its behaviour is not discriminatory.

9.25 The Authority proposes that a non-discrimination obligation is a necessary obligation to ensure JT's behaviour in the market does not disadvantage its actual and potential competitors.

9.26 According to Condition 28.2 of JT's licence:

9.27 "The Licensee shall offer to lease out lines to Other Licensed Operators on terms that are no less favourable than those on which the Licensee makes equivalent leased lines available to its Associated Companies, Subsidiaries or Joint Venture Companies or its own business divisions".

9.28 The obligation not to show undue preference or to unfairly discriminate is emphasised again in Condition 31.1, which states that:

> *"The Licensee shall not show undue preference to, or exercise unfair discrimination against, any User or Other Licensed Operator regarding the provision of any Telecommunications Services or Access. The Licensee will be deemed to be in breach of this Condition if it favours any business carried on by the Licensee or an Subsidiary or Joint Venture or Other Licensed Operator so as to place Other Licensed Operators competing with that business at an unfair disadvantage in relation to any licensed activity".*

9.29 The Authority's preliminary proposal is that JT shall continue to be obliged not to show undue preference to, or exercise unfair discrimination against, any OLO or its own retail operation regarding the provision of wholesale on-island leased lines provided on either a fibre or a copper cable and irrespective of whether the fibre is dark or lit.

Obligation to maintain accounting records and provide on request

9.30 Generally, accounting remedies are imposed in order to ensure the SMP operator is not discriminating against OLOs, for example by cross-subsidising some products at the expense of others, and is not leveraging its power in one market into another. While JT is no longer obliged to provide separate accounts, Condition 29 of its licence requires that:

> *"…the Licensee shall confirm to the Authority that it maintains accounting records in a form that enables the activities specified in any direction given by the Authority to be separately identifiable, and which the Authority considers to be sufficient to show and explain the transactions of each of those activities".*

9.31 The Authority's preliminary view is the current licence condition continues to be sufficient for the Authority to obtain relevant accounting information and no change is needed.

Proposed remedies to address potential for excessive pricing

9.32 To address the problem of JT having the incentive and ability to set excessive prices for leased lines, the Authority proposes to impose an obligation of cost accounting and charge controls under LC30 and LC33. To ensure proportionality, these charge controls will differ for dark fibre and copper based leased lines.

Cost accounting and price controls: general

9.33 Cost accounting obligations are generally put in place to ensure that an SMP operator can demonstrate it is not engaging in practices which would unfairly disadvantage its competitors.

9.34 Condition 30.1 of JT's licence states that:

"The Licensee shall not unfairly cross subsidise or unfairly subsidise the establishment, operation or maintenance of any Telecommunication Network or Telecommunication Services".

9.35 Condition 30.2 establishes how this should be done:

"To enable the Authority to evaluate where any unfair cross-subsidisation or unfair subsidisation is taking place, the Licensee shall record at full cost in its accounting records any material transfer of assets, funds, costs, rights or liabilities between a part and any other part of its business, and between it and any Subsidiary or Joint Venture, and shall comply with any directions issued by the Authority for this purpose".

9.36 The Authority proposes that JT should be obliged to maintain its current cost accounting obligations, with a view to demonstrating its compliance with other obligations.

9.37 Price controls can be established in the retail and wholesale markets, and usually limit the price which the SMP operator can charge. Price controls are usually put in place to address the potential for the SMP operator to charge excessive prices.

9.38 Condition 33.2 of JT's licence states that:

"The Authority may determine the maximum level of charges the Licensee may apply for Telecommunication Services within a relevant market in which the Licensee has been found to be dominant".

9.39 The Authority is of the preliminary view that a price control continues to be necessary in the wholesale market for on-island leased lines and such a control may be different for AI and TI leased lines.

9.40 As well as in the scope, the proposed price control of dark fibre differs from the 2014 review as JT will now be obliged to provide dark fibre access on a cost-oriented basis rather than retail minus. The residual copper leased lines will still be under a retail minus price control.

Price control: dark fibre

9.41 The Authority's preliminary view is the price of dark fibre should be cost orientated and estimated by reference to a cost model. If the preliminary conclusions of this review are confirmed, the Authority will issue a separate consultation document to facilitate the implementation and pricing of dark fibre. This will include, but not be limited to:

- The appropriate costing methodology;
- The appropriate asset life times;
- The appropriate annualisation approach; and
- The allocation of costs within the model so the services costed only include efficiently incurred and necessary costs and enables recovery of efficient costs.

Price control: copper leased lines

9.42 The Authority considers it would be disproportionate to require JT to develop a cost model for the copper leased lines. Forecasts of slower bandwidth coppers lines in service show the market is declining. The Authority has, therefore, come to the preliminary conclusion that wholesale leased lines based on copper cables should continue to be priced at the retail price less 20%.

Consultation questions

Question 11: What are your views on the potential design parameters for a dark fibre access remedy as discussed in Box 3? In particular, what type of circuits do you think dark fibre should be available on (end-to-end, tail circuits, inter-exchange) and how should a co-location remedy be structured if needed?

Question 12: Do you agree with the Authority's preliminary proposals for the set of regulations to be imposed on JT? If you do not agree you should provide all of your analysis and assessment.

Annex 1: Legal and licensing framework

A1.1 This annex sets out the:

- Legal background; and
- Licensing framework.

Legal background

A1.2 Telecommunication services are regulated in Jersey under the Telecommunications (Jersey) Law 2002 (the **Jersey Law**). The primary duty of the Authority is to perform its functions in such a manner as it considers appropriate to ensure that (so far as in its view is reasonably practicable) telecommunications services are provided both within Jersey and between Jersey and the rest of the world, so as to ensure that all current and prospective demands for such services are satisfied.[54]

A1.3 The Law contains a number of duties imposed on the Authority[55], including the requirement to perform its functions in such a manner as:

- to protect and further the short-term and long-term interests of users within Jersey and perform them by promoting competition among those engaged in commercial activities connected with telecommunications in Jersey;
- to promote efficiency, economy and effectiveness in commercial activities connected with telecommunications in Jersey; and
- it considers is best calculated to further the economic interests of Jersey.

A1.4 Further, the Authority shall have regard to:

- whether services are accessible to and affordable by the maximum number of business and domestic users;
- whether there is innovation in services and their provision; and
- the provision of high quality and reliable services.[56]

A1.5 Article 9 provides that the Authority shall keep under review and gather information about the provision of telecommunications services in Jersey and elsewhere.

Market definition

A1.6 While Jersey is not strictly bound to apply EU law, the Authority considers it appropriate to adopt a broadly consistent approach with the Common Regulatory Framework of the EU for communications services and the European Electronic Communications Code to

[54] Telecommunications (Jersey) Law 2002, Article 7(1) – 'Duties of the Minister and Authority'.

[55] Telecommunications (Jersey) Law 2002, Article 7(2)(a) – (f).

[56] Telecommunications (Jersey) Law 2002, Article 7(3).

meet our principal duties under Article 7 of the Telecoms Law, in particular, to ensure telecommunications services are provided to satisfy current and prospective demand.

A1.7 Article 60 of the Competition Law provides that the Authority (and Court) must ensure:

> *"that so far as possible questions arising in relation to competition are dealt with in a manner that is consistent with the treatment of corresponding questions arising under European Union law in relation to competition within the European Union."*

A1.8 As noted in the SMP Guidelines at para 24:

> *"defining the relevant market is of fundamental importance, as effective competition can only be assessed against this definition".*

A1.9 Having regard to its duties and regulatory best practice, the Authority considers it appropriate to adopt the broad principles of product and geographic market definition for assessing market conditions in the BCM, as set out in the SMP Guidelines, which are reflected in the CICRA guidance and previously applied in the 2014 review.[57]

SMP Conditions

A1.10The Telecoms Law provides that the JCRA may include conditions in any licence:

- intended to prevent or reduce anti-competitive behaviour; and
- that relate to, or imposing requirements about, competition in relation to telecommunication services, telecommunication systems, apparatus and telecommunication equipment.[58]

A1.11If from a structural perspective, and in the short to medium term, the operator has and will have, on the relevant market identified, sufficient market power to behave to an appreciable extent independently of competitors, customers, and ultimately consumers[59], competition is not working effectively, the SMP operator has the ability and incentive to take advantage of a dominant position. In this case, the Authority considers that *ex ante* SMP conditions as remedies should be considered to discharge its duties.

Licensing framework

A1.12Part 2 of the Telecoms Law establishes the requirement for a telecoms operator to hold a licence, and Part 5 sets out the powers the Authority has to grant a licence. There are four classes of telecommunications licence in Jersey. A Class III Licence is specifically for

[57] op. cit. footnote 6.

[58] Part 3, Article 16, Ibid.

[59] 2018/C 159/01 Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services, 2018, Para 24. Available at https://ec.europa.eu/digital-single-market/en/news/communication-smp-guidelines.

applicants which have SMP. The Class III Licence includes a Part which addresses conditions applicable to dominant operators[60].

A1.13 The provisions which are applicable to dominant operators include (but are not limited to) measures addressing the availability and associated terms of OLO access to networks and services[61]; the requirement not to show undue preference or to exercise unfair discrimination[62]; the requirement not to unfairly cross subsidise[63], supported by accounting processes to demonstrate compliance; regulation of prices, and transparency around pricing and wholesale product offerings, including the publication of appropriate Reference Offers[64].

A1.14 In addition, the Class III licence includes conditions specific to the provision of leased lines[65], which apply where a licensee has been found to be in a dominant position. The conditions applicable to the supply of leased lines refer to the retail and wholesale markets and require a dominant provider offers leased lines on publicly advertised and non-discriminatory terms, and in compliance with quality standards and at prices determined by the Authority.

A1.15 The Class III licence also includes a Part which directly obliges the licensee not to engage in any practice that has the object or likely effect of preventing, restricting or distorting competition in the establishment, operation and maintenance of telecommunications networks and services.[66]

[60] Part IV of the Class III licence.

[61] Condition 25, Class III licence.

[62] Condition 31, Class III licence.

[63] Condition 30, Class III licence.

[64] Condition 33, Class III licence.

[65] Condition 28, Class III licence.

[66] Condition 34, Class III licence.

Annex 2: Responses to the call for evidence

A2.1 This annex is based around the questions asked by the Authority in the call for evidence and the responses received by JT, Sure, Airtel and Homenet. The annex is structured by question asked.

Please provide your own overview of the business connectivity market on Jersey

A2.2 The information provided by respondents supported the quantitative information that the number of leased lines had declined but slower speed ones were being consolidated into higher speed lines.

A2.3 OLOs that compete with JT raised a number of specific competition concerns that, in their view, make it hard for them to compete on the island. Some of the issues raised were:

- The Government, a significant buyer of leased lines, appears to be unwilling to source leased lines from any supplier other than JT;
- The unwillingness of JT to provide dark fibre access restricted OLOs' ability to compete with JT; and
- Wholesale leased line prices are extremely high, which has an impact on the cost of providing a mobile network.

What evidence do you have that suggests business customers are using retail broadband access products as substitutes for leased lines?

A2.4 Respondents did not have direct evidence of such substitution, except that some low bandwidth leased lines are being replaced by fibre broadband for access to Virtual Private Networks (VPNs). On a forward looking basis, respondents did see some possibility that substitution would increase. However, this is not supported by evidence from end-customers (see Annex 3).

Do you provide dark fibre wavelengths lines to any customers? If so, how many fibre / wavelengths do you supply? If not, is this because you do not offer dark fibre / wavelengths or because customers have not asked for it?

A2.5 JT informed the Authority it does not offer dark fibre, despite having received one request from an OLO. JT also noted that they are bringing more services across their core network so there is nearly always network equipment between the two ends of the circuit.

A2.6 Newtel expressed an opinion that the lack of a dark fibre offer reduced competition and increased the cost of leased line services to end customers, which negatively affected the global competitiveness of Jersey.

A2.7 Sure did not provide an answer in relation to Jersey.

A2.8 Airtel Vodafone did not explicitly mention dark fibre. However, they provided detailed information on how the costs of fibre backhaul and limited choice of bandwidth under the current regime will affect its ability to roll out a 5G network cost effectively. This effectively meant that Airtel Vodafone would either have to under-dimension its network, affecting service quality, or over-dimension it, damaging its profitability.

What is the total core capacity allocated to leased line usage in Jersey

A2.9 JT do not allocate capacity in the core network per service type. JT apply QoS to the different services operating on the core, and monitor / augment capacity across the core to ensure capacity is available when required

Please provide details of the extent of your own core network in Jersey

A2.10 JT and Sure each provided a network map showing the extent of their own networks. JT's network is ubiquitous across the island, whilst Sure's is restricted to a small area of St Helier. The operators also provided a list of their fibre nodes and locations.

What regulations (if any) imposed by any Government entity might prevent your company extending its network further over the next five years?

A2.11 JT's network is already ubiquitous and so this question was not answered.

A2.12 Sure informed the Authority that, in their view, the planning application process on Jersey is applied in an asymmetrical way that favoured JT over its rivals. However, Sure also said this type of situation is difficult to document and so it had no direct evidence.

A2.13 Newtel referred to a lack of dark fibre or duct access as two major barriers to them extending their network further.

Annex 3: Business consumer research

A3.1 This annex sets out a summary of a small, qualitative survey that was conducted of business and government organisations in the Channel Islands in January/February 2020. This annex sets out:

- The research approach; and
- Research findings.

The research approach

A3.2 The purpose of the business customer research was to obtain an impression from the market as to the sort of products purchased and end-customers' views on how well the market functions for them. The Authority determined that a small sample of Channel Islands based users would be sufficient to meet this objective.

A3.3 In total, 12 organisations, including the States of Jersey, were interviewed by telephone in January 2020. The research was conducted on behalf of the Authority by its advisors, SPC Network, who have only shared aggregate results with the Authority, to ensure independence and confidentiality. Sure and JT provided a list of leased line customers and SPC Network spoke to a random selection of these organisations. Some respondents were based on Guernsey but had operations in Jersey as well.

A3.4 A summary of responses is presented below. Given the size of the sample (12), these results may not be representative of all business connectivity users. However, there was a large degree of consistency across the responses meaning the Authority considers the survey provides a good insight into the views of business connectivity users on Jersey.

Research findings

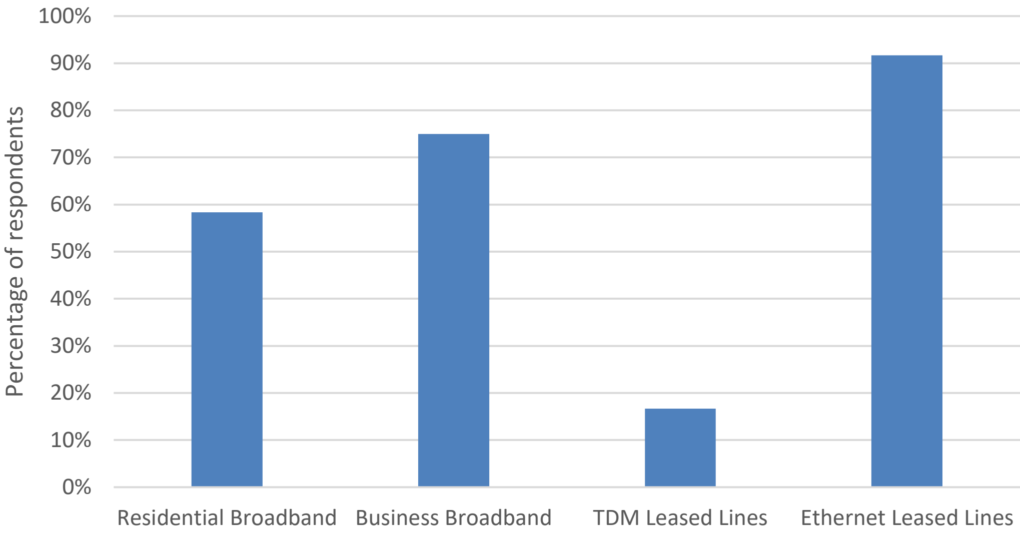
A3.5 The research findings are presented under the following headings*:*

- Products bought and their uses;
- Important features of leased lines;
- The role of price;
- Choice of suppliers and products; and
- Comparison with other countries.

Products bought and their uses

A3.6 Nearly all respondents purchased Ethernet leased lines, three quarters also purchased business broadband packages and over half purchased residential broadband. Few respondents purchased TDM leased lines.

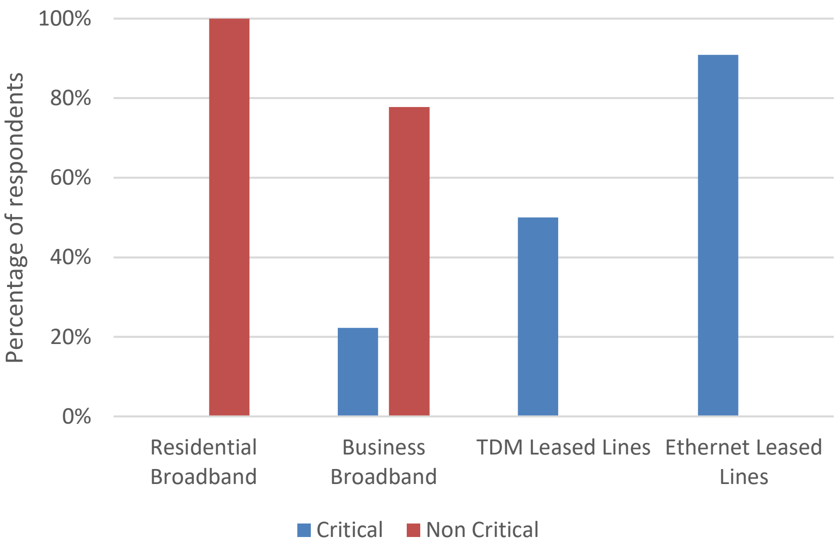
Figure 5: Which of the following products do you buy for your organisation?



Source: Authority analysis of consumer research responses

A3.7 Respondents were asked whether they used each type of connectivity for non-critical or critical applications and for examples of such use. Business and residential broadband, when purchased, were used for non-business critical applications, such as for working from home and for basic Internet access in the office for emailing and browsing. By contrast, leased lines, whether AI or TI, were purchased business critical applications, the most cited was inter-location communications.

Figure 6: Are these products used for business critical or non-critical applications?

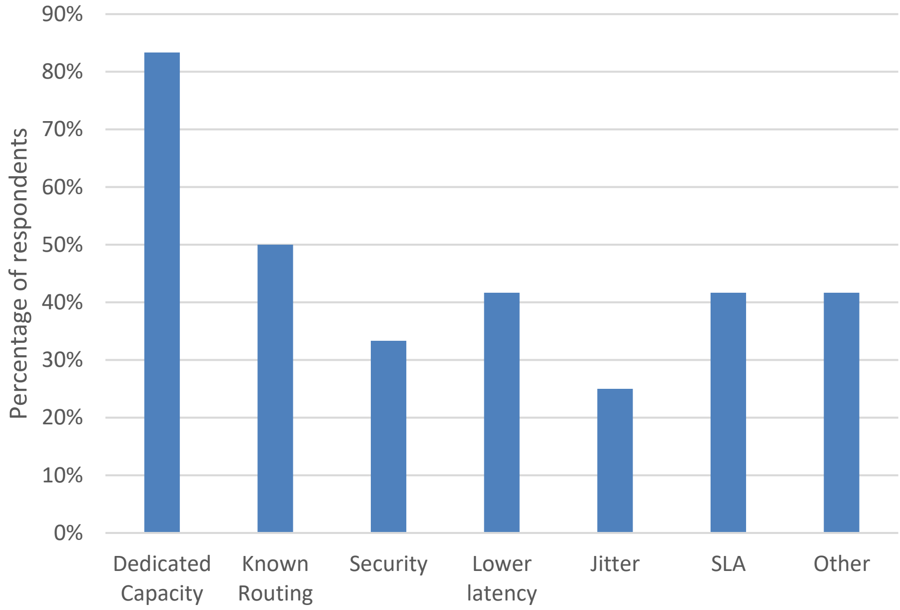


Source: Authority analysis of consumer research responses

Important features of leased lines

A3.8 Respondents were asked what the most important characteristics of leased lines that distinguish them from broadband access. The most important was dedicated capacity, followed by known routing, low latency and the Service Level Agreement.

Figure 7: When choosing between a leased line and broadband access, which of the following characteristics do you require that would make you choose a leased line rather than broadband?



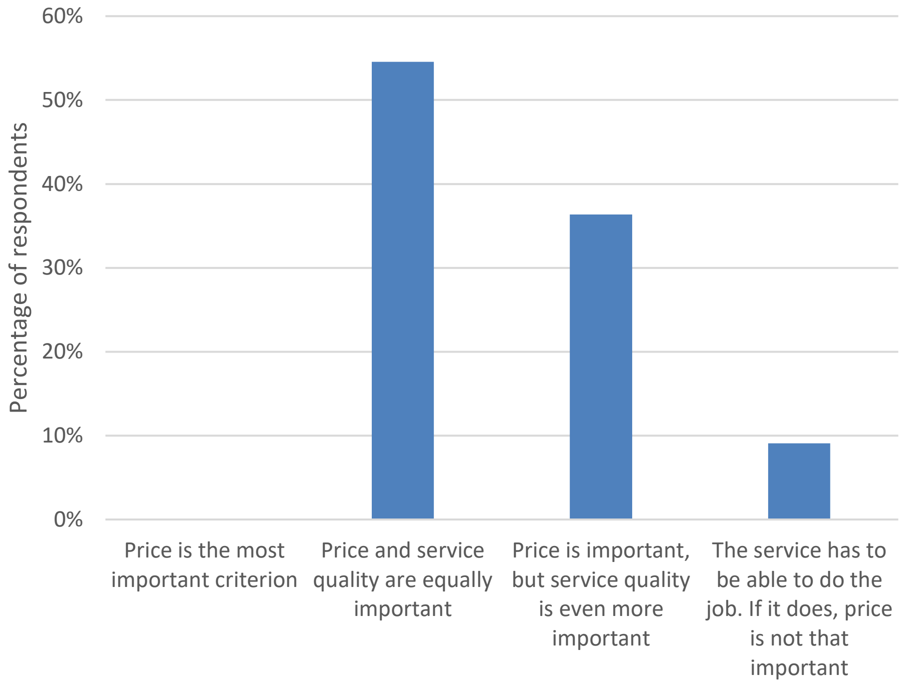
Source: Authority analysis of consumer research responses

The role of price

A3.9 Price and service quality were equally important for half of respondents. For the others, service quality was, to a greater or lesser extent, more important than price. No respondents placed price above service quality when making purchasing decisions.

A3.10 One respondent drew a distinction between critical and non-critical services, noting for non-critical services price was the most important criterion, but for critical services service quality was more important than price. Overall, though, price and service quality were seen as equally important.

Figure 8: When choosing a business connectivity product, which of the following statements concerning price is generally most applicable to your decision?



Source: Authority analysis of consumer research responses

<u>*Choice of suppliers and products*</u>

A3.11 Respondents were asked if there is enough choice of supplier. In general, respondents thought the choice of supplier was sufficient given the size of the market. When asked "is there enough choice of supplier of business connectivity products" three relevant responses were:

- *"It's always good to have more competition, but two suppliers are reasonable given the size of the market."* (Financial services)
- *"Hesitantly, yes. Can't have too much competition and would be nice to have more choice."* (Wealth management)
- *"For a small jurisdiction the choice is OK, but I would always like more choice to get the price down."* (Transport)

A3.12 A rather more negative response was:

- *"Definitely not! I always prefer more competition and really struggle with the limited options."* (Legal firm)

A3.13 With regard to products, respondents were more positive with over half of the respondents considering there is enough choice of products. Some specific missing products were mentioned, such as a lack of SIP trunks, but these were not considered critical. A number of respondents stated the choice of product was not a problem, but that prices were often high.

Comparison with other countries

A3.14 Respondents were asked if they had experience of telecoms provision in other countries and, if they did, how Jersey compares with those places where they have experience. The overall view from respondents was that prices are higher in Jersey than elsewhere. Some examples or responses are below.

- *"Prices are significantly higher on Jersey. UK-Jersey lines often bought from BT as the price is lower for the same product."* (Public sector)
- *"We are happy with choice and quality of products, but duopoly means not price competitive. Appreciate challenge of scale but think that problems are exaggerated as other off-shore locations have the same problems of scale. A lack of competition is main problem. Prices are higher than in UK and Far East where there is more competition."* (Legal firm)
- *"We buy in a few different places and leased line costs are far higher than in the UK. Not convinced this is due to scale."* (IT services)

Overall view of the market

A3.15 The final question asked respondents how well they think the market works overall for users of business products. The general picture is the market is functioning reasonably well, but that prices are too high. This overall picture is captured in the quotes below.

- *"I would give a mark of 7 or 8 out of 10."* (Financial services)
- *"Quite a lot of good services. Generally works well, except that prices are high so competition is at a high price point. JT is very good at customer service – better than BT. However, prices are about twice as high as UK and service only justifies at 25-30% price premium."* (Public sector)
- *"Price levels work against the needs of business customers."* (Law firm)
- *"Frustrating! I would like regulation to focus on reducing the price of leased lines."* (Financial services)
- *"The major issue is price, which is too high for leased lines."* (IT services)
- *"Not that well for leased lines. Sure and JT both behave like incumbents as they don't want to undermine their home markets, so they can't be more competitive on price where they are an entrant than they are in their home market."* (IT Services)
- *"There is a reasonable range of products, but prices feel high compared to the UK. Not sure if this is due to lack of competition or the economics of network provision in a small jurisdiction. We spend a lot of money on connectivity!"* (Financial services)

Annex 4: Retail pricing of AI leased lines

A4.1 This annex sets out a summary of the price benchmarking exercise of AI leased lines carried out using data provided by Strategy Analytics Ltd in November 2019. This annex sets out:

- The research approach; and
- Price comparisons.

Research approach

A4.2 The jurisdictions benchmarked include: Guernsey, Iceland, Ireland, Isle of Man, Luxembourg and Malta. The countries were chosen as, they are of similar size to Jersey and/or may be considered as competitors for inward investment by businesses. Price data was collected for the following variations of retail leased lines:

Table 10: Bandwidths and distances used in AI price benchmarking

Speed (Mbps)	Distance (km)					
10	1	2	3	5	10	20
100	1	2	3	5	10	20
1000	1	2	3	5	10	20

A4.3 Prices were collected from the following companies:

- Guernsey – Sure
- Iceland – Siminn
- Isle of Man – Manx Telecom
- Jersey – JT
- Luxembourg – P&T Luxembourg
- Malta – Go

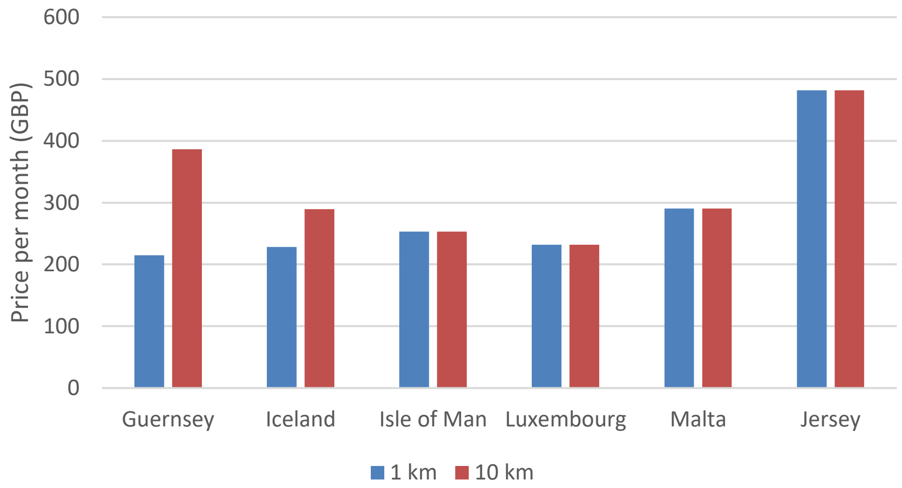
A4.4 Price comparisons for TI leased lines were omitted due to the low volumes sold in Jersey and the UK is not included as retail prices for AI leased lines are not publicly available.

A4.5 Prices were calculated as monthly rental charges. Any initial costs, such as connection charges, were assumed to be depreciated over a five-year period, which was considered representative of a business service contract. Therefore 1/60th of the initial charge was added to the monthly rental to calculate the cost per month.

Price comparisons

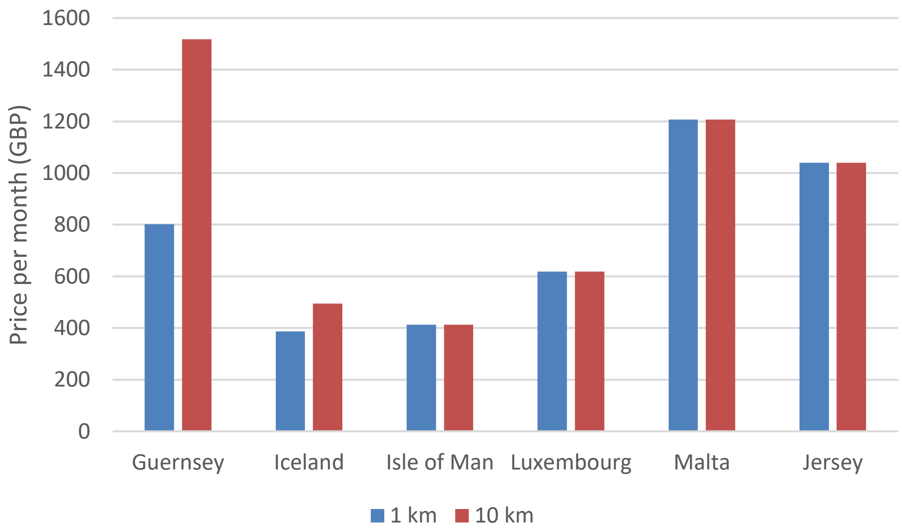
A4.6 The Figures below show the price comparison for leased lines at 10 Mbps, 100 Mbps and 1 Gbps. As discussed in paragraphs 3.12-3.14 this analysis highlights prices on Jersey are more expensive than most comparator countries for 10 Mbps and 100 Mbps leased lines, while the difference is less pronounced at 1 Gbps, albeit Jersey prices are still higher than some other jurisdictions.

Figure 9: AI 10 Mbps retail price comparison



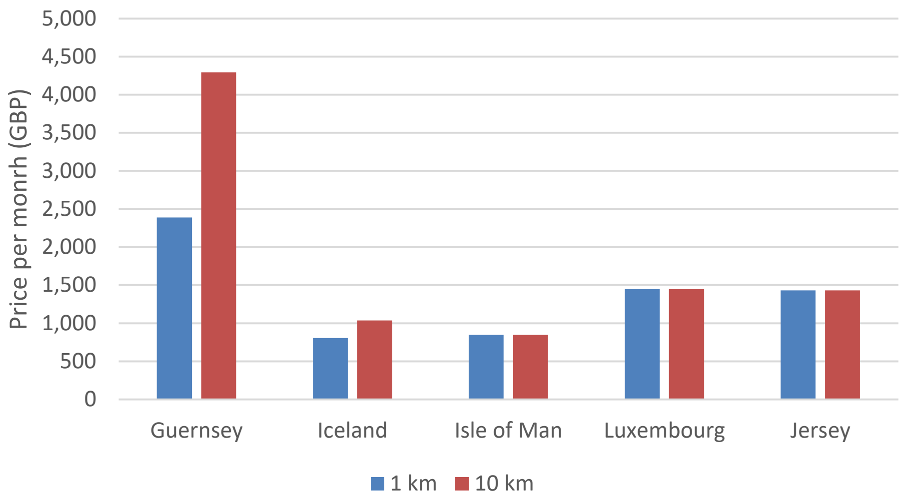
Source: Authority analysis of Strategy Analytics Ltd data

Figure 10: AI 100 Mbps retail price comparison



Source: Authority analysis of Strategy Analytics Ltd data

Figure 11: AI 1 Gbps retail price comparison



Source: Authority analysis of Strategy Analytics Ltd data

Annex 5: Consultation questions

Proposed approach to the review (section 4)

Question 1: Do you agree with the Authority's proposed approach to market definition and the use of the three criteria test to determine whether a relevant market is susceptible to *ex ante* regulation? If not, what alternative do you suggest?

Question 2: Do you agree with the Authority's proposed approach to competition/SMP assessment and remedies? If not, what alternative do you suggest?

Retail market definition (section 5)

Question 3: Do you agree with the Authority's preliminary definition of the product market for retail leased lines as summarised below?

- The retail leased line market comprises both AI and TI lines;
- All bandwidths used for delivering leased lines are in the same market;
- The retail leased lines market does not include business or residential broadband;
- The retail leased lines market should not be broadened to include downstream services such as VPNs; and
- The retail market should not be broadened to include off-island leased lines.

If you do not agree you should provide all of your analysis and assessment.

Question 4: Do you agree with the Authority's preliminary conclusion that there are no particular areas within Jersey where the conditions of retail competition are such that they may constitute separate geographic markets? If you do not agree you should provide all of your analysis and assessment.

Question 5: Do you agree that the retail market for leased lines does not meet the three criteria test and so no further analysis is required? If you do not agree you should provide all of your analysis and assessment.

Wholesale market definition (section 6)

Question 6: Do you agree with the Authority's preliminary definition of the wholesale leased lines product market as summarised below?

- The Authority's preliminary conclusions in the retail market are mirrored in the wholesale market;
- The wholesale market should not be broadened to include dark fibre or duct access;

- The wholesale market should not be narrowed to reflect customer use of leased lines, for example mobile backhaul or other retail applications; and
- Self-supply should be included within the wholesale market.

If you do not agree you should provide all of your analysis and assessment.

Question 7: Do you agree that there are no particular areas within Jersey where the conditions of wholesale competition are such that they may constitute separate geographic markets? If you do not agree you should provide all of your analysis and assessment.

Question 8: Do you agree that the wholesale market for leased lines does meet the three criteria test and so is susceptible to *ex ante* regulation? If you do not agree you should provide all of your analysis and assessment.

Wholesale market SMP assessment (section 7)

Question 9: Do you agree with the Authority's proposal that JT should be designated with SMP in the market for wholesale on-island leased lines for the reasons set out above? If you do not agree you should provide all of your analysis and assessment.

Remedies (section 8 and 9)

Question 10: Do you agree with the Authority's preliminary view that dark fibre access to the JT network will deliver significant benefits to end-customers and these benefits will outweigh the risks? If you do not agree you should provide all of your analysis and assessment.

Question 11: What are your views on the potential design parameters for a dark fibre access remedy as discussed in Box 3? In particular, what type of circuits do you think dark fibre should be available on (end-to-end, tail circuits, inter-exchange) and how should a co-location remedy be structured if needed?

Question 12: Do you agree with the Authority's preliminary proposals for the set of regulations to be imposed on JT? If you do not agree you should provide all of your analysis and assessment.

Annex 6: Glossary

4G: Fourth-generation mobile telecommunications technology, which enables the delivery of high-speed broadband services over mobile networks.

5G: Fifth-generation mobile telecommunications technology, which enables the delivery of high-speed and low latency broadband services over mobile networks.

Allocative efficiency: this involves allocating resources to produce the goods and services that consumers value the most. To achieve this, charges should reflect the additional resources used to provide a service, that is, its incremental costs.

Alternative Interface (AI): new types of technologies used for delivering leased lines services, for example *Ethernet* (see below), which contrast with legacy *TI* technologies (see below).

Bandwidth: the physical characteristic of a telecoms system that indicates the speed at which information can be transferred, which in digital systems is measured in bits per second (bps).

Carrier diversity: the ability of an end customer to have a connection with two totally independent network operators (carriers), such that if one carrier fails, service to that end customer continues uninterrupted via the second carrier. (cf. physical diversity – see below)

Cloud computing: the use of a network of remote servers connected via the internet that store, manage and process data that would otherwise be handled on a local server or computer.

Dark fibre: unused or 'unlit' optical fibre, i.e. fibre which has been deployed within a communication network but which is not connected to active electronic equipment used to facilitate data transmission.

Ethernet: a technology used for data transmission. Originally deployed for use in a *LAN* (see below) environment, the technology has also increasingly been used to support *WAN* (see below) connectivity, with Ethernet being used in this instance as a leased line technology.

Ex ante: the application of regulation before an abuse of power has necessarily occurred. The reasoning behind its application is that finding that an operator has SMP means that the operator is likely to have the incentive and motivation to behave in a way which exploits its market power to the detriment of competitors and ultimately to consumers. *Ex ante* regulation can be contrasted with *ex post* regulation, which investigates an incident which has already happened.

Ex post: the use of regulation following a complaint or abuse of market position by an operator. In contrast to *ex ante* regulation (see above).

Gbps: Gigabits per second (1 Gigabit = 1,000,000,000 bits) A measure of bandwidth in a digital system.

Internet Protocol (IP) feed: a dedicated connection to the internet provided directly from the customer's site over a permanent link.

Leased line: A permanently connected communications link between two premises dedicated to a customer's exclusive use.

Mbps: Megabits per second (1 Megabit = 1 million bits). A measure of bandwidth in a digital system.

Physical diversity: two separate cables entering the customer site from diverse routes, such that if cable were damaged then service could continue uninterrupted via the alternative cable.

SIP trunking: enables the end point's Private Branch Exchange phone system to send and receive calls via an IP network, such as the Internet or private WAN.

Small but Significant Non-transitory Increase in Price (SSNIP): a theoretical price increase that forms part of the 'hypothetical monopolist' test used in market definition analysis. The price increase in question is usually considered to be in the range of 5 to 10%.

Time Division Multiplex (TDM): a method of putting multiple data streams in a single signal by separating the signal into many segments, each having a very short duration. Each individual data stream is then reassembled at the receiving end based on the timing.

Traditional Interface (TI): legacy technologies used for delivering leased lines services, of which the main one would be *TDM* (see above).

Virtual Private Network (VPN): a private network where connectivity is extended by making use of the internet over which a virtual point-to-point connection is established, with various protocols being used to ensure data security over the public element of the network.

Wide Area Network (WAN): a network connecting devices located in geographically dispersed locations, either in the same national area or across national boundaries.