



REGULATORY
AUTHORITY

Review of the electronic communications sector

Ensuring the delivery of benefits for
Bermuda via regulation

Consultation Document

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1 EXECUTIVE SUMMARY

The Regulatory Authority (the "Authority") has a duty under Section 12 of the Regulatory Authority Act 2011 ("RAA") to ensure that the regulation of the electronic communications sector promotes competition, the interests of residents and consumers of Bermuda, the development of the Bermudian economy, Bermudian employment and Bermudian ownership, and innovation.

Furthermore, there is a statutory requirement for the Authority to review both the market for electronic communications and the performance of the existing regulatory remedies in light of that market.

The Electronic Communications Act 2011 ("ECA") requires the Authority to complete a market review process in order to determine what, if any, ex ante regulatory remedies are required to address significant market power ("SMP")¹ in the supply of electronic communications services.

In accordance with section 23 of the ECA, the Authority hereby issues the first round of public consultation of the 2017 market review.

This document also comprises the Authority's initial consultation as part of a sectoral review under section 17 of the RAA.

This combined review (the "Review") will: (i) set out the Authority's assessment of the market, relevant markets, operators with SMP in those markets and the Authority's initial view on potential ex ante regulation of the same; and (ii) the Authority's views on market conditions in the sector and regulations that should apply to this sector.

In this context, the Authority presents the following:

Market assessment

- This Review presents an analysis of the electronic communications sector, including key market characteristics, particularly in the areas of fixed broadband, sub-sea fiber connectivity for Bermuda and the market for mobile services.

Assessment of the performance and relevance of existing remedies

- This Review presents analysis of the performance of the SMP remedies implemented by the Authority in August 2013 and assessment of their current relevance (or otherwise).

Assessment of current market power

- It is the Authority's view that Digicel Group² and OneComm³ (through their various Integrated Communications Operating Licenses (ICOLs)) continue to hold positions of

¹ SMP" means a position of economic strength in the relevant market or markets that affords an undertaking, either individually or jointly with others, the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers, which may provide the basis for the imposition of ex ante", as defined in Section 2 of the ECA.

² As defined in paragraph 37.

³ As defined in paragraph 37.

significant market power across the fixed and mobile electronic communications sectors. The Authority's assessment is that these positions are more entrenched and embedded now than when the first market review occurred in 2013. This has informed the Authority's proposed approach to regulation as explained below.

Proposed removal of 2013 significant market power remedies

On the basis of its initial assessments described above (presented in this Review), the Authority has reached initial conclusions on which it is seeking comments and views. To summarize:

- The SMP remedies of 2013 have delivered limited services-based competition. As a result, there has been limited competition in the electronic communications sector.
- The 2013 remedies limited the introduction of new retail pricing schemes for services, including bundling of the same with other services e.g. mobile and subscription television, etc.
- Given the limited extent of competition, the SMP remedies have not significantly strengthened the market nor prevented or deterred anti-competitive effects.
- The Authority has identified other areas in which, in its view, regulations might be introduced or modified so as to promote innovation and preserve the interests of residents and consumers in Bermuda.

New regulation and the Authority's objectives

The Authority proposes to:

- Remove some or all of the 2013 SMP remedies;
- introduce a new set of *ex ante* regulations that (i) in fulfillment of the Authority's duties to impose remedies on operators with SMP are designed to prevent or deter anti-competitive effects; and (ii) in fulfillment of its other statutory duties, introduce new regulations that fall outside of *ex ante* regulations.

These new regulations will have the following objectives:

- i. to support the significant investments being made in fiber based networks and allow competition within related fixed broadband and subscription video/television ("TV") market segments;
- ii. to ensure providers with SMP who own and control fixed network assets within Bermuda continue to provide wholesale access, but with more stringent regulation of this area, particularly aimed at preventing such entities from distorting the markets for wholesale service provision (and competition reliant on the same) whether with technical measures or with anti-competitive pricing (e.g. margin squeeze);
- iii. to ensure that there is appropriate regulation to support new services and markets, such as in the area of 5G, and various IP related service sectors;

- iv. to prevent or deter anti-competitive practices by providers with SMP. As such, regulation would address predatory behavior by those providers against market entrants at both the service and network levels; and
- v. to address issues and concerns in relation to the provision of sub-sea fiber connectivity for Bermuda, in particular in relation to ensuring service continuity. This may, ultimately, lead to specific regulation (and obligations) for this sector of the market.

2 CONSULTATION PROCEDURE

1. This consultation is being undertaken in accordance with Sections 69 to 73 of the Regulatory Authority Act 2011 ("RAA").
2. Written comments should be submitted before 5:00 PM (Bermuda time) on 28 November 2017.
3. The Authority invites comments from members of the public, operators of electronic communications networks and providers of electronic communications services, and other interested parties. The Authority requests that commenting parties, in their responses, reference the numbers of the relevant questions, as set forth in this consultation document, to which they are responding. A complete list of questions presented by this consultation document appears in Section 8.
4. Responses to this consultation document should be filed electronically in MS Word format. Parties filing comments should go to the Authority's website, www.rab.bm, follow the link to the Consultations and Response page, and click the "Click here to submit a response" icon which appears at the top of the page. All comments should be clearly marked "Response to Consultation Document [Review of the electronic communications sector]: Comments on the Review of the Electronic Communications Sector" and should otherwise comply with Rules 18 and 30 of the Authority's Interim Administrative Rules, which are posted on the Authority's website.
5. The Authority intends to make responses to this consultation available on its website. If a commenting party's response contains any information that is confidential in nature, a clearly marked "Non-Confidential Version," redacted to delete the confidential information, should be provided together with a complete version that is clearly marked as the "Confidential Version." Redactions should be strictly limited to "confidential information," meaning a trade secret, information whose commercial value would be diminished or destroyed by public disclosure, information whose disclosure would have an adverse effect on the commercial interests of the commenting party, or information that is legally subject to confidential treatment. The "Confidential Version" should highlight the information that has been redacted. Any person claiming confidentiality in respect of the information submitted must provide a full justification for the claim. Requests for confidentiality will be treated in the manner provided for in Rule 30 of the Authority's Interim Administrative Rules.
6. The Head of Regulatory Finance is the principal point of contact at the Authority for interested persons during this consultation. She may be contacted by email at jescolastica@rab.bm or by mail at:

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7. In this document, except insofar as the context otherwise requires, words or expressions shall have the meaning assigned to them by the RAA, ECA and the Interpretation Act 1951.

8. This consultation document is not a binding legal document and does not contain legal, commercial, financial, technical or other advice. The Authority is not bound by the consultation document, nor does it necessarily set out the Authority's final or definitive position on particular matters. To the extent that there might be any inconsistency between the contents of this document and the due exercise by the Authority of its functions and powers, and the carrying out of its duties and the achievement of relevant objectives under law, such contents are without prejudice to the legal position of the Authority,

3 INTRODUCTION: OBJECTIVES AND STRUCTURE OF THE REVIEW

9. This Review sets out, in respect of the electronic communications sector, (i) the Authority's assessment of the market, relevant markets, operators with SMP in those markets and its initial view on potential *ex ante* regulation of the same; and (ii) the Authority's views on market conditions more generally and regulations that should apply in fulfillment of its statutory duties.

10. Data provided as part of formal information-gathering (through the Authority's Request for Information (RFI) process initiated in July 2017) has allowed the Authority to provisionally assess the respective market positions of Integrated Communications Operating Licence ("ICOL") holders in different sectors and the extent of their market power in the same. The Authority's current market understanding is also shaped by responses received following a July 2017 Call for Inputs ("CFI") process. Throughout this Review the Authority sets out the various points raised by respondents to the CFI process.

11. Combining the clarity of understanding in relation to the duties and responsibilities of the Authority with the market changes that the Authority is observing, provides the necessary foundation from which to establish the Authority's view of the most appropriate regulatory regime for Bermuda's electronic communications sector going forward. Considerations of the appropriate regulatory regime and approach (e.g. appropriate remedies) will be driven by the Authority's current objectives and regulatory strategy, which are set out in Section 7.

12. The Authority's objectives for the electronic communications sector, which will guide its decisions and interventions going forward, are:

Bermuda consumers and businesses should be able to access high-quality, reliable services at affordable prices.

Providers of electronic communications services should continue to invest in improving the quality of service they offer, and should be able to obtain fair and reasonable returns.

The Authority will seek to achieve these outcomes through effective, fair and sustainable competition (whether at the network or service levels, or both). Where such competition has not emerged, and is not likely to in the near future, the Authority will seek to achieve these same outcomes through transparent and proportionate regulatory intervention.

13. In order to implement these objectives, the Authority's regulatory approach going forward will need to take into account various different considerations, especially in relation to the need and nature of any market interventions.

14. Through this first round of public consultation (the Review) the Authority sets out its initial views, and the data that the Authority has examined to date. On this basis, the Authority has the following key findings:

- The market outcomes the Authority has observed historically have not, in the Authority's view, been optimal for consumers. In particular, the Authority has observed high prices being charged to consumers for key electronic communications services such as broadband and mobile with low standards of service quality (such as low broadband speeds) received by consumers.
- The Authority currently considers the following markets susceptible to ex-ante regulation (and therefore, should form the basis of its ongoing market assessment): broadband, mobile, fixed telephony, subscription television, business connectivity, off-island connectivity and on-island submarine cable interconnection and backhaul.
- The data the Authority has reviewed indicates that OneComm and Digicel Group (through their various ICOLs) continue to hold SMP in a number of these markets, including broadband and mobile services.
- Notwithstanding these findings, there are signs of change. Specifically, the Authority observes significant network investments in both fixed and mobile (as well as potential market entry in high speed broadband).
- The ongoing regulatory framework needs to adapt to these developments. In this regard, the Authority considers the regulatory framework of 2013 needs to be significantly revised.
- The Authority is, therefore, proposing to remove the majority of the existing SMP remedies. While the Authority conducts the Review, the Authority expects ICOL holders to comply with a minimum set of existing obligations, such as maintaining existing access arrangements and continuing to inform the Authority of pricing and business plans regarding next generation investments.
- The future regime will employ an appropriate balance of ex-ante and ex-post regulation in order to most efficiently achieve the Authority's vision. As part of its ongoing sectoral and market review, the Authority will be considering what form and balance of regulatory approach will lead to the best outcomes for consumers in Bermuda.

15. This Review provides clarity in respect of specific sectors, including what market trends the Authority observes, which ICOL holders the Authority considers are likely to hold a position of SMP, and which remedies or other *ex ante* regulations the Authority is currently minded to consider.

16. A brief summary of the Authority's findings is set forth below:

- **Broadband:** The data suggests that in Bermuda, the broadband sector has historically been characterized by high retail prices, and low quality of service (i.e. broadband speeds). This sector is dominated by two groups, OneComm and Digicel Group, who together account for over 95% of total sector revenues. Initial assessments of current market shares indicate that each market participant

generates about 50% of revenues for Internet Access services. Furthermore, the Authority observes that both entities are making material and substantive profits at the group level. The Authority sets out (in Section 6) provisional relevant market definitions for **the provision of fixed broadband internet connectivity, provided over any technology, and for any speed, on an island wide basis**. The Authority proposes this definition both at retail and wholesale levels. Under such a proposed relevant market, and on the basis of the evidence before the Authority, it considers that OneComm and Digicel Group would be designated as SMP operators. In light of this outcome, the Authority would be minded to consider remedies such as: wholesale access and cost orientation; obligations not to set excessively high or low retail prices (for the latter that may relate to potential anti-competitive practice) quality of service obligations and requirements to provide information in order to ensure compliance with SMP obligations.

- **Mobile:** The mobile market is comprised of only two providers, OneComm and Digicel Group. Each generate roughly 50% of total mobile revenues. Furthermore, initial profitability analysis suggests high levels of profits are being made in mobile services. The Authority sets out (in Section 6) a provisional definition of the relevant market for **the island wide provision of mobile services (voice, text and data)**. On the basis of such a proposed relevant market and the data before it, the Authority considers that OneComm and Digicel Group would be designated as SMP operators. In light of this outcome, the Authority would be minded to consider remedies such as: retail price controls; requirements to provide information in order to ensure compliance with SMP obligations; and wholesale access obligations (for Mobile Virtual Network Operators “MVNO”).
- **Fixed telephony:** On the basis of the analysis the Authority has conducted to date, the Authority observes that The Bermuda Telephone Company Limited (“BTC”) generates over 70% of total fixed voice service revenues. The Authority sets out (in Section 6) a provisional definition of the relevant market for **the island wide provision of voice call origination and termination, from a fixed location**. Under such a proposed relevant market, and on the basis of the data gathered, the Authority considers that Digicel Group would be designated as an SMP operator. At this time, the Authority is still exploring whether there are any competition concerns in relation to the fixed voice market that would warrant the imposition of any remedies.
- **Subscription television:** The Authority observes that OneComm via Logic Communications Limited (“Logic”), previously known as the Bermuda Cablevision Limited, continues to hold a high share of subscription television revenues. However, a number of market developments should be considered. Firstly, the Authority’s market assessment will need to consider the appropriate relevant market, to understand whether traditional subscription television services are actually part of a broader relevant market, that may include over the top (“OTT”) services (such as video on demand (“VoD”)), and how any such market definition would affect its assessment of competition. Secondly, the prospect of possible market entry (into subscription television in Bermuda) will also affect the forward-looking assessment of the market (and likely shares) over the next few years. The Authority will be considering both of these in its ongoing market assessment.

- **Business connectivity:** On the basis of the data reviewed to date, the Authority notes that there appears to have been little change to the structure and competitive dynamics for leased line circuits since 2013. The Authority does, however, wish to simplify the regulatory regime of all markets, including for business connectivity services. As such, the Authority is currently considering how best to approach the geographic and product dimensions of business connectivity services, to strike the right balance between proportionality, and scope for effective regulation. Once the Authority has further assessed a refinement to the definition of the relevant market for business connectivity services, the Authority will be in a position to identify SMP operators and appropriate remedies.
- **Off-island connectivity:** The Authority recognizes the importance of off-island connectivity for many core telecoms services provided in Bermuda (including broadband). The Authority sets out (in Section 6) a provisional definition of the relevant market for **the provision of off-Island connectivity (i.e. international data transmission)**. The Authority will also consider defining a market for the provision of interconnection and backhaul services to such off-island connections. The Authority is continuing to gather information to better understand the nature of competition in this sector. The Authority intends in its next round of public consultation of this Review to set out its findings in relation to SMP in this sector, as well as the need and form of any possible interventions. The Authority will also consider whether additional regulations should be introduced to ensure continuity of service.

17. The remainder of this Review is structured as follows:

- Section 4 - **The role and remit of the Authority**, providing clarity on the duties and obligations as set out in the RAA and ECA.
- Section 5 - **The developments in Bermuda's electronic communications sector since 2013**, presenting the available data in terms of ICOL holder profitability, market outcomes (e.g. service prices), service shares, and views submitted by stakeholders as part of the July 2017 CFI process.
- Section 6 - **Provisional views on relevant markets, SMP and remedy options**, as well as the Authority's views on other regulations that it may apply.
- Section 7 - **The Authority's current views on the appropriate approach to regulating Bermuda's electronic communications sector going forward**. This builds on sections 4 and 5 to present the overall objectives of the Authority.

4 ROLE AND REMIT OF THE AUTHORITY

18. As set out in Part 3 of the RAA, the principal functions of the Authority, in relation to any regulated industry sector, are:

- to promote and preserve competition;
- to promote the interests of the residents and consumers of Bermuda;
- to promote the development of the Bermuda economy, Bermudian employment, and Bermudian ownership;
- to promote innovation; and
- to fulfil any additional functions specified by the sectoral legislation.⁴

19. As the Authority does not have a single principal duty, it is possible that trade-offs may be required. For example, it may be that a determination will need to balance the interests of Bermuda residents and consumers with the interests of Bermudian employment and ownership, which could be conflicting. For example, cost-saving measures by sectoral providers to reduce the number of employees or outsource functions to other countries may lead to lower costs, and possibly lower prices for services, which would benefit Bermuda consumers, but would conflict with the duty of promoting Bermudian employment.

20. In making such trade-offs, the Authority will need to exercise its judgment, to balance the interests of various stakeholders and to ensure that its decisions are based on consistent principles.

21. For the purpose of the performance of its functions, the Authority may (among other things):⁵

- make administrative determinations, adjudicative decisions and rules;
- provide advisory guidance to sectoral participants;
- grant, modify and revoke authorizations;
- collect government authorization fees and Regulatory Authority fees;
- allocate finite resources used by sectoral providers to provide covered services;
- establish technical standards for the provision of covered services;
- review and, as appropriate, approve, reject or modify tariffs filed by a sectoral provider governing the provision of covered services

⁴ Section 12 (Principal functions), RAA.

⁵ Section 13 (General powers), RAA.

- establish and enforce quality of service standards;
 - prohibit unfair trade practices; and
 - take any other action, not expressly prohibited by law, that is necessary and proper to perform its duties.
22. The Authority's mandate to regulate the electronic communications sector specifically is outlined in the ECA.
23. The purposes of the ECA are stated (at section 5 of the ECA) and include:
- ensuring that the people of Bermuda have access to reliable, affordable and high-quality electronic communications services;
 - enhancing and encouraging sustainable competition in electronic communications;
 - encouraging innovation and development in the sector, including orderly development and adoption;
 - encouraging the development of resilient and fault-tolerant infrastructure; and
 - promoting Bermudian ownership and employment.
24. As with the RAA, enforcement of the ECA will often require a judgment about the trade-offs that are necessary in order to deliver competing objectives.
25. The ECA outlines the Authority's role in supervising, monitoring and enforcing compliance with the regulatory framework that is applied to the electronic communications sector. Broadly, the functions of the Authority (under section 9 of the ECA), in addition to the functions set forth under the RAA, include:
- making administrative determinations in relation to the control and conduct of public electronic communications. This is a wide-ranging responsibility that allows the Authority to define and enforce guidelines relating to all aspects of the conduct of electronic communications ICOL holders. This can include licence conditions, technical standards, minimum service levels, and any other terms, conditions or requirements that are authorized by the ECA; and
 - protecting the rights of consumers. The ECA outlines the role of the Authority in seeking the views of residents and consumers of Bermuda through the establishment of arrangements for doing so, as well as for disseminating relevant information to consumers.
26. The RAA grants the Authority powers, and, indeed the obligation, to conduct market reviews; both the RAA and ECA outline the role of the Authority in imposing *ex ante* remedies in instances where an electronic communications service provider is found to have significant market power. The guiding principles of the market review process are outlined in Part 4 of the ECA, and include:

- developing or maintaining effective and sustainable competition for the benefit of consumers with regard to price, innovation and choice;
- promoting investment in the electronic communications sector;
- establishing *ex ante* remedies that are effective but proportionate, taking into account the costs of compliance and the ultimate benefits to consumers;
- establishing *ex ante* remedies that apply on a technology and service neutral basis wherever feasible; and
- relying on market forces, and withdrawing, reducing or limiting *ex ante* remedies in circumstances where the Authority concludes that markets are effectively competitive, or are likely to become so within a reasonable period, considering actual and expected market circumstances.

27. Upon establishing that one or more ICOL holders has SMP in a market, the Authority can make recommendations on *ex ante* remedies, as outlined in Part 4 of the ECA. These might consist of:

- network and/or wholesale access obligations to third parties on a non-discriminatory basis;
- retail and wholesale pricing obligations;
- obligations to comply with a cost-accounting system, which may or may not be introduced with accounting separation obligations for a vertically integrated ICOL holder;
- prohibitions on tying and bundling; and/or
- other obligations that the Authority deems necessary to promote or preserve competition.

28. The ECA states that *ex ante* remedies may be required in instances where *ex post* competition rules are insufficient to promote or preserve effective competition in the market. However, the ECA does not refer specifically to guidelines for the application of *ex post* competition rules.

29. There is scope for consideration of *ex post* competition enforcement in Sections 85–86 of the RAA, which prohibit:

- ICOL holders which hold a dominant position in a market from abusing that dominant position—for example, through predatory pricing, price squeezes, unreasonable discrimination, exclusionary refusals to deal, tying, and other anticompetitive behavior; and

- the unreasonable restriction of competition—for example, through fixing prices, restricting output, coordinating separate bids, allocating customers or geographic markets, and refusing to conduct business with a specific supplier or customer.
30. If an ICOL holder is found to have breached competition rules, sections 85–86 of the RAA provide the Authority with the powers to require the ICOL holder(s) to cease the abusive behavior and to take enforcement action.
31. Moreover, under section 17 of the RAA the Authority is obliged to conduct periodic "sectoral reviews" concluding with recommendations, decisions or orders that it considers to be appropriate.
32. The combined powers under the RAA and the ECA afford the Authority the flexibility to develop and enforce a wide range of regulatory frameworks for the electronic communications sector. For example, the Authority may rely on powers described in the ECA and the RAA to develop a primarily *ex ante* regime based either on SMP remedies or else a consequence of a sectoral review under section 17 of the RAA, or it may wish to rely more heavily on *ex post* competition enforcement. *The optimal balance of ex ante and ex post options will be determined by the Authority's ultimate objectives for the electronic communications sector, and the importance that it wishes to place on the role of competition within this sector in achieving the objectives outlined in Part 3 of the RAA.*

5 ASSESSMENT OF THE ELECTRONIC COMMUNICATIONS SECTOR

33. In 2013, the Authority conducted a review of electronic communications markets. There have since been several significant market developments.

34. This section sets out the Authority's assessment by observing the most recent trends, and likely future trends, across the key segments of the electronic communications sector. It considers recent, current and future network investments, as well as market entry.

35. The Authority's ongoing assessment relies on several pieces of information, including assessment of ICOL holder profitability, benchmarking of prices in Bermuda (relative to reasonable comparators), and information and views provided by stakeholders. With regard to this last point, in July 2017 the Authority issued a CFI that asked stakeholders for their broad views on all electronic communications markets.

36. For each market, the CFI asked questions on many different topics, including:

- the current state of competition, and whether the sector is functioning efficiently;
- whether the current SMP remedies in place were reasonable and appropriate;
- the key market changes over the past four years;
- any recent and future sector developments that would affect appropriate regulation going forward;
- which ICOL holders were likely to have SMP in this market; and
- the regulatory remedies that should be imposed on any ICOL holder that was found to have SMP.

37. The CFI was sent to the ICOL holders listed below:

- 1) Bermuda Land Development Company Limited ("BLDC");
- 2) Telecommunications (Bermuda & West Indies) Limited ("Digicel"), Transact Limited and BTC (collectively "Digicel Group");
- 3) Deltronics Limited ("Deltronics");
- 4) Digital Mobile Television Limited ("DMTV");
- 5) Electronic Communications Limited ("ECL");
- 6) Telecommunications Networks Limited ("TNL");
- 7) FKB Net Ltd. ("FKBNet");
- 8) Brasil Telecom Subsea Cable Systems (Bermuda) Ltd. ("Globenet");

- 9) iTech (Bermuda) Limited (“iTech”);
- 10) Link Bermuda Ltd. (“Link”);
- 11) BDB Ltd., Bermuda Digital Communications Ltd. (“BDC”), Logic (formerly Bermuda Cablevision Limited (“BCV”)), and Cable Co. Ltd. operating under brand name One Communications (collectively “OneComm”);
- 12) TeleBermuda International Limited (“TBI”); and
- 13) World of Wireless Limited (“WOW”).

38. Seven responses were received. These were from Digicel Group, Deltronics, FKBNNet, Link, OneComm, WOW and one other ICOL holder.

39. The remainder of this section is structured under the following seven headings, which correspond to each of the considered segments:

- **Section 5.1: Broadband**
- **Section 5.2: Mobile**
- **Section 5.3: Fixed phone line**
- **Section 5.4: Subscription television**
- **Section 5.5: Business connectivity**
- **Section 5.6: Submarine connectivity**
- **Section 5.7: Interconnection and backhaul for off-island connectivity.**

5.1 Broadband

5.1.1 Overview

40. Broadband services provide residential and business users with a means of connecting to Internet-based content and applications, ranging from general browsing and email to video streaming and file downloads.

41. Access to Internet services is a critical component of any modern economy, and as part of this, it will be vital to ensure that Bermuda residents have access to fast broadband services to meet their growing demand for online consumption.

42. Broadband services are an evolution from legacy “narrowband” (dial-up) services, and are typically defined by their ‘always on’ status and faster speeds.

43. Broadband can be provided by a range of technologies, including:

- **Digital Subscriber Line (“DSL”) (copper):** DSL is a commonly available type of broadband, delivered through the copper wires of phone lines. DSL comes in various formats, which vary in terms of the speed they can deliver. In Bermuda, DSL services deliver speeds of up to 25 megabits per second (“Mbps”)⁶;
- **coaxial cable:** cable networks use fiber-optic and coaxial cables to deliver superfast broadband services—as well as TV and phone services—directly to homes;
- **fiber:** fiber broadband is delivered via clusters of fiber-optic cables (each one thinner than a human hair), and offers faster speeds than DSL. If fiber is provided all the way to the home, broadband speeds can be greater than 1 gigabits per second (“Gbps”)⁷; and
- **wireless technology:** wireless technology differs in that there are no wires in the ground, and users connect to the Internet via a wireless radio receiver. This is similar to Internet access via a mobile. Wireless speeds can exceed those provided by DSL, and can sometimes match those of coaxial cable and fiber.

44. In Bermuda, consumers of broadband have historically had to purchase two mutually supportive elements—internet service provider (“ISP”) and Internet Access. These two components can be bought from one or separate entities. The distinction between the two from the consumer’s perspective is not obvious, since it relates to the layers of network that are managed by the respective service providers.

45. In short, Internet Access relates to the management of the physical network that exists on the island, in terms of the cabling and electronics that are required to link the end-users home to the point of interconnection with the ISP.

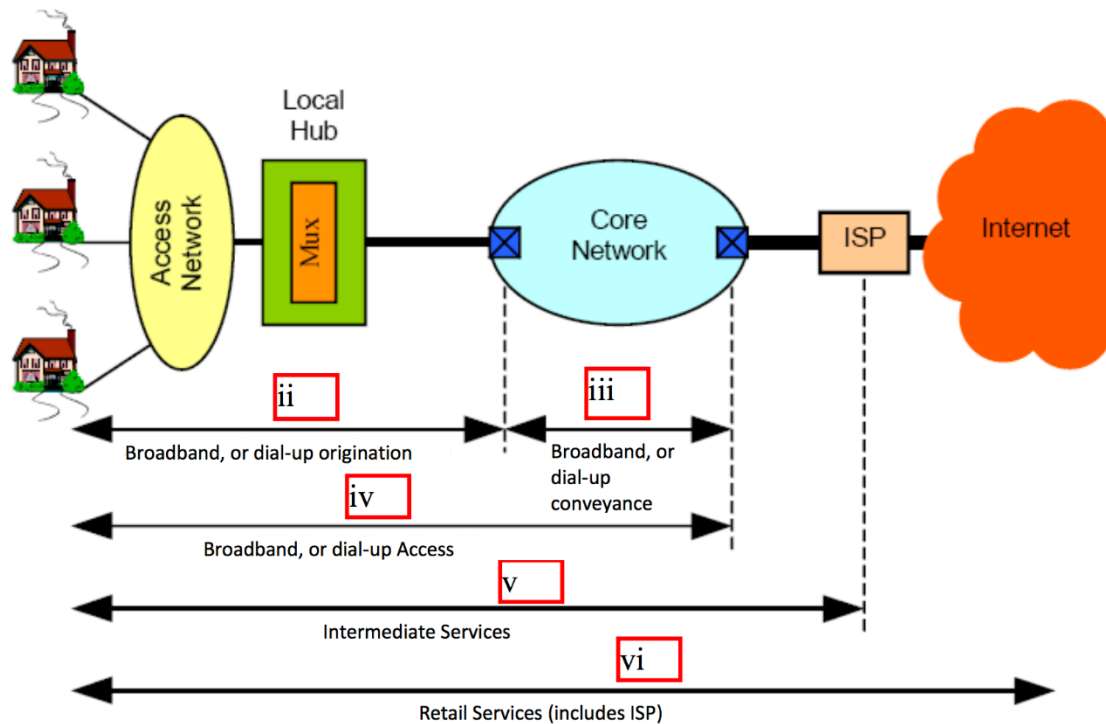
46. The ISP then provides the connectivity to the Internet (including off-shore capacity) along with customer-facing functions such as marketing, sales and customer care.

47. The Authority presents both ISP and Internet Access services graphically in Figure 5.1 (below). Internet Access is depicted by ‘V’ (Intermediate Services) and ISP is depicted by ‘VI’ (Retail Services).

⁶ With a realised broadband connection speed of 25Mbps, one could download a 2GB (high-definition) film in 10 minutes.

⁷ With a realised broadband connection speed of 1Gbps, one could download a 2GB (high-definition) film in 15 seconds.

Figure 5.1 - Broadband service provision



Source: The Authority

48. In many cases, it appears consumers will choose to buy both the ISP and Internet Access from the same provider, as it is simpler than dealing with two separate companies in terms of both invoicing and fault management.

5.1.2 Market structure and continuing market power

49. In the 2013 Market Review, a distinction was made between broadband purchased at the retail level (i.e. by Bermuda residents) and broadband bought at the wholesale level (by ICOL holders seeking to offer their own retail broadband services). Furthermore, wholesale remedies were applied only to the Internet Access portion of the broadband service, and not to the ISP portion.

50. Since 2013, there have been several important changes to the market structure. These include Digicel's purchase of BTC in 2015 (from Barrie Holdings Limited), and the combining of Logic and BCV into OneComm.

51. As a result of this market consolidation, the residential broadband market in Bermuda is served mostly by two facilities-based wire-line ICOL holders within Digicel Group and OneComm.

52. The broadband networks owned by Digicel Group and OneComm both offer island-wide coverage of 'standard' broadband, which can provide download speeds of up to 25Mbps.

53. The OneComm network is based on a cable configuration, whereas Digicel Group's network is based on DSL. A key difference between these two networks is in relation to providing TV services. While cable networks are more readily configured to provide cable TV services, DSL networks are not so configured, and as such additional network investment is required in order to provide subscription television through a DSL network, via the IPTV protocol.

54. The Authority also notes that while OneComm owns its own sub-sea connectivity, Digicel Group does not. This vertical integration by OneComm in relation to sub-marine capacity may raise competition concerns, which the Authority will be exploring further as part of its ongoing review of the sub-marine cables sector (the Authority sets out initial views on this sector in Section 5.6 below).

55. In relation to broadband services in Bermuda, while the Authority does see other ICOL holders in the market besides those in OneComm and Digicel Group, these other ICOL holders account for less than 5% of broadband sector revenues. Over 95%⁸ of residential broadband revenues in 2016 were attributable to entities owned by Digicel Group and OneComm.

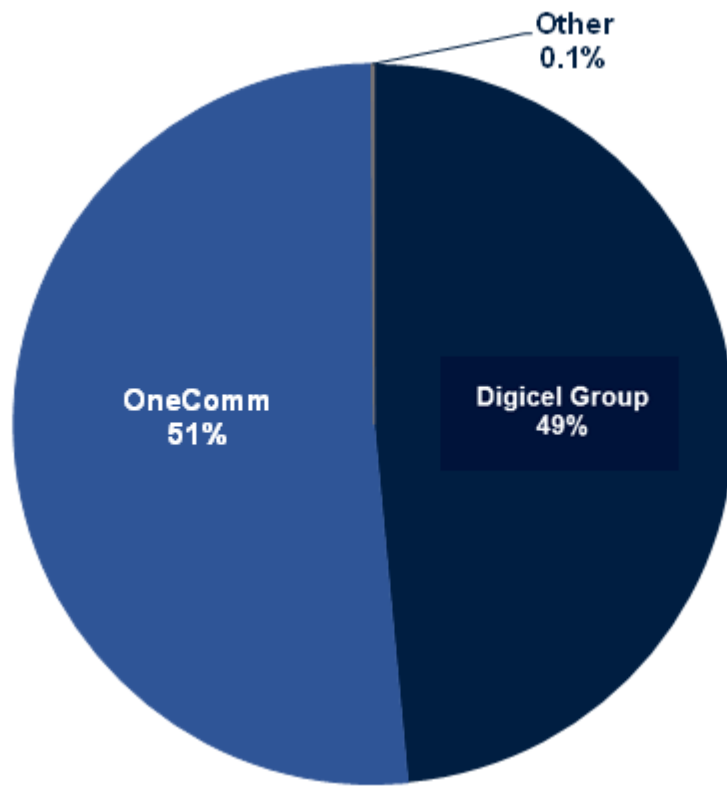
56. While the overall market revenue analysis can be informative, in order to better assess the market dynamics and the implications for competition (particularly in relation to wholesale access), it is necessary to assess shares for ISP and Internet Access services separately.

57. Both OneComm and Digicel Group are active in ISP and Internet Access services, and, following information gathered from ICOL holders, the Authority is able to provisionally assess the shares of revenues across both ISP and Internet Access services.

58. The Authority presents this in Figures 5.2 and 5.3 (below). This figure shows that with respect to Internet Access, OneComm and Digicel Group have approximately 50% share of revenues each. With respect to ISP services, OneComm has the majority of revenues (about 70%) with Digicel Group having the remaining 30%.

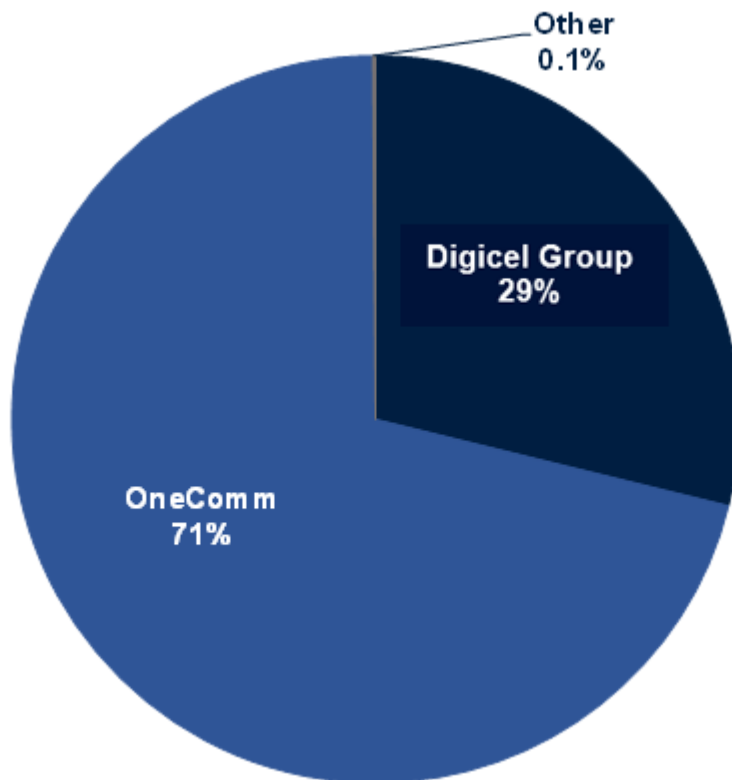
⁸ Based on 2016 data provided by ICOL holders.

Figure 5.2 - Internet Access service shares (of revenue) – Q2 2017



Source: Analysis based on ICOL holder data.

Figure 5.3 - ISP service shares (of revenue) – Q2 2017



Source: Analysis based on ICOL holder data.

59. As part of the July 2017 CFI, various comments were received with regard to the current functioning of the broadband sector. These are summarized below.

60. Deltronics stated that “there is no proper competition in the broadband sector” and that the current market “resembles more a duopoly.”

61. FKBNNet stated that the broadband sector is not functioning efficiently and that there is a duopoly.

62. Digicel Group stated that the broadband market was currently dominated by another carrier [presumably OneComm].

63. Link stated that the residential broadband market was dominated by two large facilities-based companies, namely OneComm and Digicel Group.

64. OneComm stated that “the broadband sector in Bermuda is competitive.”

65. “X” stated its view that OneComm and Digicel Group were dominant in broadband provision.

66. WOW did not provide any comment on the broadband market.

5.1.3 Market entry

67. Market entry can take either of the following two forms:

- (a) **Own-infrastructure build:** entrants build their own network and become a facilities owner. They then compete on the basis of their own network.
- (b) **Use existing infrastructure:** entrants use the existing facilities and become retail providers. This involves obtaining wholesale access from one of the incumbent ICOL holders.

68. Each of these forms of entry is discussed below.

Own-infrastructure-based entry

69. Entry in the broadband market as a facilities owner involves significant investment in order to be able to provide widespread network coverage.

70. Since May 2017, there has been some limited market entry activity, most notably from TNL, doing business as Bluewave (“Bluewave”), which has initially launched a fixed-wireless broadband network and has since started offering its service to customers in the areas where it has rolled out coverage.

71. The Authority understands that Bluewave is keen to progress network roll-out, with the intention of achieving widespread network coverage. The Authority also understands that Bluewave’s chosen technology is likely to be relatively cost effective, in comparison to fixed line broadband solutions.⁹ As such, Bluewave could be an example of efficient market entry, which could provide benefits to consumers.

72. The Authority also noted that such market entry would likely lead to competitive responses from incumbents. Such responses can be pro-consumer if they lead to better outcomes for consumers, for example in terms of lower prices and/or higher quality services. However, there is also a risk that responses from incumbents could be anti-competitive and therefore anti-consumer (for example predatory pricing). As such, in the face of market entry, the Authority will monitor closely and consider what safeguards will need to be put in place, to ensure efficient market entry is not inhibited by any anti-competitive responses of incumbent (SMP) ICOL holders.

73. While Bluewave has announced its intentions for nationwide coverage it should be noted that in small island nations such as Bermuda, or indeed in any country, the minimum efficient scale required to fund the necessary network investment limits the number of facilities-based providers that can efficiently co-exist.

⁹ This is for example because of the use of wireless technology for the ‘last mile’, negating the need to incur significant operating and capital costs from laying cable to every home in Bermuda.

74. This point was flagged by a number of CFI respondents¹⁰. Link noted that, “where a market can support the investment by facilities-based competitors, so that they can receive a reasonable return on investment, it creates a positive environment for providing long term sustainable competition, which in turn, provides longer term benefits to consumers through quality benefits and price competition.”

75. However, the same respondent went on to note that “where costs to build networks are significant, the potential subscriber base may not be sufficient to justify the investment, and in consideration of other factors including the presence of existing incumbents or large facilities-based providers who may have had decades to recover investments and profits, facilities-based entry [in Bermuda] may not be possible.”

76. Finally, it suggested that, “Considering this, it may be worth considering whether there could be opportunities to make expansion of existing ICOL holders who have some facilities more attractive than to expect an entirely new ICOL holder to enter the market without any existing facilities or subscriber base.”

77. Another respondent, Digicel Group, stated that a third entity entering this space would reduce the ability of all parties to make “critical capital investments and improvements in products, services and infrastructure.” It also suggested that such entry would lead to harm to consumers and ICOL holders.

78. “X” indicated that market entry would be beneficial, but only that which was based on new technology solutions, such as wireless broadband, due to the lower cost of provision.

79. Deltronics noted that market entry to duplicate infrastructure in a small island such as Bermuda was not economically efficient. It instead suggested promoting competition between the existing network owners. Where entry was possible, it noted the risk that the incumbents might seek to price below cost in order to force out the would-be entrant.

80. FKBNNet noted that market entry, while attractive in solving competition concerns, “will be difficult economically to support.”

81. Finally, OneComm warned against the risk of the Authority favoring one ICOL holder over another (for example, a market entrant), and recommended that “the market be allowed to answer the question raised.”

Using existing infrastructure (i.e. wholesale access)

82. Entry in the broadband market using existing infrastructure (as an access-seeker) involves significantly lower costs than market entry as a facilities owner. This is because,

¹⁰ The CFI specifically asked: “Do you think that entry of an additional island wide broadband provider rolling out its own separate network would lead to benefits to consumers (e.g. in the form of lower broadband prices and/or higher-quality broadband services)? Do you think such entry is economically viable? Do you think the Authority should proactively encourage such market entry?”

for wholesale-based entry, the entrant does not need to build its own network, and instead uses the existing infrastructure that is owned by the incumbents.

83. This form of entry requires an ability to access incumbents' networks. On this basis, in 2013 the Authority defined a relevant broadband market at the wholesale level and designated both BTC and BCV¹¹ as possessing SMP and imposed obligations on them with respect to providing wholesale access to entrants for the purposes of providing broadband services.

84. The wholesale access remedies stipulated that the price for wholesale access should be based on the retail price for the same service, minus 15%.

85. As part of the July 2017 CFI, respondents were asked how successful the broadband remedies had been. The responses are summarized below.

86. OneComm stated that "the current remedies in place are neither reasonable nor appropriate." However, it did not elaborate on any particular remedy, or indeed state what a better set of remedies would look like.

87. "X" noted that the current remedies were not strong enough. It also flagged a number of issues relating to access providers, noting that "access providers know all of [the access seeker's] ISP customers and therefore, increase the risk of access providers trying to poach customers." Furthermore, "X" stated that faults on the access provider side were reported to the end-customer (by the access provider) as being the fault of the access seeker. It noted that "this is an inconvenience for the customer and can discourage customers from using a different ISP provider from access provider."

88. FKBNet noted that the retail minus 15% was not sufficient, and instead the 'minus' should be increased significantly; "the wholesale cost should be 30% lower than the retail price."

89. Digicel Group suggested that the Authority should consider how to relax the current SMP remedies. While its response focused on the tariff notification requirements, it did mention the obligation to provide "access to its network at a 15% discount to any other licence holder, including its own competitors on a wholesale basis." Digicel Group suggested that the current remedies had not led to consumer benefits.

90. Deltronics suggested that the obligation to provide wholesale access was always doomed to fail, as the retail minus 15% rule could never work. Specifically, it stated that "access providers are acutely aware that other organizations cannot make a business case off Retail-15%." It suggested that this is a barrier to effective competition, on the basis that the 15% does not provide sufficient economic margin to viably compete with the (vertically integrated) incumbents.

91. Link noted that, due to the ubiquitous nature of the facilities owned by OneComm and Digicel Group, competitors seeking to offer retail broadband services had to rely on

¹¹ Both BTC and BCV were designated as SMP ICOL holders in "Wholesale Broadband Access Services" outside of Southside and the City of Hamilton and contiguous suburbs. Only BTC was designated as having SMP in Hamilton.

one or other of these entities for access, whether through local loops, ducts, or otherwise. Link went on to claim that it had been able to obtain wholesale access from only one of these entities, because of challenges in obtaining wholesale access from the other, despite its obligation to do so.

92. The same respondent stated that, “if we cannot acquire the access at a reasonable wholesale rate, then it will be difficult to compete against the larger providers who are able to offer deep discounts on their bundled services.” Link went on to say that “it is appropriate for the Authority to review the method by which the wholesale providers’ rates for broadband access are established, to ensure that wholesale competitors are not charged inflated rates prohibiting us from competing on retail price.”

5.1.4 Market investment

93. Together with the investment by market entrants (such as Bluewave), incumbents OneComm and Digicel Group have announced plans to roll out nationwide fiber broadband services that are capable of delivering speeds of over 100Mbps. The Authority recognizes that the investment costs (and potential consumer benefits) associated with such network upgrades can be significant, and will be mindful of this when considering any future interventions, as these developments (and investments) have the potential to impact the future competitiveness of the market in a positive manner.

94. In terms of the phasing of network investment, information provided to the Authority indicates that a significant amount of network upgrade investment has already been undertaken. Furthermore, the Authority understands that both Digicel Group and OneComm are intending to offer widespread coverage of fiber broadband services.

95. As of August 2017, only OneComm is publishing fiber broadband tariffs on its website, as set out in Table 5.4 below.

96. For comparison, the standard broadband service a person could buy for the same price is also set out in Table 5.4.

Table 5.4 - Current advertised OneComm fiber (‘FiberWire’) broadband tariffs—August 2017

Advertised Speed of Fiber Tariff	Monthly Price (ISP + Access)	Standard Broadband price equivalent
20Mbps	\$104.95	8Mbps
30Mbps	\$124.95	10Mbps
50Mbps	\$169.95	15Mbps
100Mbps	\$204.95	-
200Mbps	\$239.95	25Mbps

Source: Data from OneComm website.

97. The Authority sees from the above table that (based on OneComm’s current tariffs), for the same price as an 8Mbps (standard broadband) connection, someone could upgrade (when available) to a 20Mbps service (a 250% speed increase). This price equivalence is

also the case for someone upgrading from a 25Mbps (standard broadband) connection to a 200Mbps service (a 700% speed increase).

98. The Authority also understands that Digicel Group is intending to launch fiber broadband services of comparable speeds soon.

99. Initial data [provided by OneComm] suggests that the take-up of fiber services at these price points will be significant. For instance, all of OneComm's broadband customers will be migrated to fiber.

100. The migration to fiber appears to be promoted by automatic migration. That is, the Authority understands that OneComm has been automatically upgrading its standard broadband customers to fiber broadband (when available), rather than waiting for the customer to request the speed upgrade. This process will lead to rapid fiber migration if continued.

101. Provided there is rapid island wide deployment of fiber broadband, and prices are competitive, Bermuda fixed broadband customers are likely to migrate quickly to the new, faster fiber-based service.

102. The Authority notes that, the weighted average headline speed of OneComm's FiberWire product taken in July 2017 was 30Mbps. This compares with a weighted average Bermuda headline broadband speed of only 6-8Mbps for standard broadband.

103. The current price of fiber broadband indicates that consumers are likely to experience increased broadband speeds without significant increases in prices.

104. This data suggests that the Bermuda broadband sector is at a key point of evolution with significant investment being made in new and faster broadband networks.

105. Current tariff pricing suggests that those customers adopting early fiber based services are benefiting from these investments.

106. In conducting its market assessment, the Authority will be considering how to ensure that the new fiber broadband network investments deliver benefits to consumers, both in terms of magnitude (i.e. ensuring consumers are getting a fair allocation of the value) and longevity (i.e. ensuring benefits to consumers is maintained into the long-run).

5.1.5 Market outcomes

107. In this subsection, the Authority sets out the market outcomes with respect to broadband. This subsection is comprised of three parts, which are:

- **The past:** The market outcomes that the Authority has observed to date, notes in particular that historically, broadband in Bermuda has been expensive (compared to reasonable comparators), with ongoing issues relating to the quality of service, including speeds.

- **The present:** Investment in fiber broadband and market entry indicates that the broadband market in Bermuda may be at a key point of transition.
- **The future:** In light of changes to the market, the future outcomes may be beneficial to consumers. Market trends indicate that the scope for positive consumer benefit will be greater going forward. However, while the potential for improved benefit for consumers does appear to be increasing into the future, the Authority will need to consider what interventions may be necessary to ensure the delivery of those benefits to consumers.

108. Each of these three points are covered below.

The past

109. In the July 2017 CFI, the Authority asked respondents why Bermuda has historically been cited as having one of the highest broadband prices in the world. The responses received are summarized below.

110. OneComm noted that Bermuda “generally has a high cost of living, which affects any business that sources labour, materials and equipment domestically.” OneComm went on to cite four potential reasons for Bermuda’s high broadband prices:

- Bermuda’s geographical location, some 1,000km from the nearest major Internet hubs, “adds very significant transport costs. The distance also increases the cost of all other inputs to the service.”
- Bermuda’s population size “is very small relative to other countries, which compounds the higher costs to serve. The economies of scale available to carriers in other countries are simply not available in Bermuda.”
- existing regulation “discourages, and in some cases, blocks, price reduction and promotional pricing.”
- government fees, and those of the Authority, “are implicit components of the retail price.”

111. Deltronics said that broadband prices comprised two major costs: submarine capacity (to link Bermuda and US Internet exchange carriers), and local access (i.e. local loop access). It suggested that effective regulation would reduce the cost of these essential inputs, thereby lowering prices to consumers.

112. Digicel Group noted that “international comparisons must be calibrated to take into account Bermuda’s unique circumstances,” in particular its population size and the number of households. It also said that “the scale of investment required to deliver LTE [long-term evolution] and FTTH [fiber to the home] services to an island the size of Bermuda is inflated because Bermuda has a high cost and standard of living, requiring the ICOL holders to pay higher wages, taxes, and other operating costs as well as the cost of transport between Bermuda and the US remains unregulated and can be exponentially higher than other jurisdictions.”

113. “X” alluded to the high cost of local loop access, especially when compared with off-island (submarine) capacity: “competition from off-island carriers has decreased the price for off-island capacity...however, there has been little to no change in the price of local loop capacity.”

114. Link said that the “cost of goods in Bermuda to support the delivery of products and services to the market is higher relative to that in other jurisdictions.” In particular, it noted the high cost of staffing salaries and direct overheads, electricity costs, and local access fees. It also highlighted the recent trend towards fiber broadband and how the retail prices for fiber broadband services were below the wholesale prices for standard broadband (at lower speeds), and noted that this had stifled competitors and thereby price competition.

115. Link then said that “if wholesale pricing was set at appropriate incremental costs of the network or at some form of proxy to more closely align with such costs, the outcome may be more retail competition from these competitors, and benefits to consumers.”

116. In order to assess the current outcomes in the broadband market, the Authority has undertaken an exercise to benchmark the current price and speed of broadband services in Bermuda against those in comparator countries.

117. The results of this benchmarking analysis are presented below, after a brief explanation of the approach used.

- **Countries included**—the benchmarking analysis looked at 12 country comparators in addition to Bermuda (giving 13 countries in total). The 12 comparators were selected based on objective criteria in terms of geographical size, population size, and their status as an island nation. The countries chosen as being most similar to Bermuda in terms of geo-special and density characteristics were therefore Antigua and Barbuda, Barbados, the British Virgin Islands, the Cayman Islands, Dominica, Guernsey, the Isle of Man, Jersey, the Maldives, Malta, St Kitts and Nevis, and the Turks and Caicos Islands. The table below presents the countries included.

Table 5.5 - Benchmarked countries

	Island?	Geographical size (km ²)	Population	Population density (people per km ²)
Antigua and Barbuda	Yes	440	81,799	186
Barbados	Yes	431	285,719	663
Bermuda	Yes	53	61,349	1,158
British Virgin Islands	Yes	153	31,196	204
Cayman Islands	Yes	262	61,559	235
Dominica	Yes	750	72,324	105
Guernsey	Yes	78	63,026	808
Isle of Man	Yes	572	84,287	147
Jersey	Yes	116	100,080	863
Maldives	Yes	300	436,330	1,454
Malta	Yes	316	430,835	1,363
St Kitts and Nevis	Yes	261	51,300	164
Turks and Caicos Islands	Yes	616.3	46,400	75

Source: Analysis based on data from Wikipedia,
https://simple.wikipedia.org/wiki/List_of_countries_by_area and
[https://en.wikipedia.org/wiki/List_of_countries_by_population_\(United_Nations\)](https://en.wikipedia.org/wiki/List_of_countries_by_population_(United_Nations)).

- **Type of ‘broadband’**—the analysis looked only at fixed broadband (i.e. wireless broadband offerings were not included). Fixed broadband comprises copper, cable (coaxial), and fiber. Although data was gathered on all three, copper broadband is currently predominant in residential Internet access in Bermuda. This is partly because fiber broadband has not yet been widely rolled out.
- **Speed of broadband**—all the countries offer a range of fixed broadband speeds, with prices increasing with speed (all else being equal). There is a significant range in speeds across the countries, from 1Mbps to 1,000 Mbps,¹² although most of the countries used for benchmarking purposes in the study offered tariffs with speeds in the range of 4–10Mbps. Note that the majority of Bermuda consumers (over 80%)¹³ are currently on broadband tariffs in this range.
- **Data-gathering process**—the pricing data was gathered manually from ISP websites in July and August 2017.
- **Currency**—all data was gathered in the local currency, and converted to US\$ for comparison. There is also the option to use purchasing power parity (PPP) adjusted exchange rates [see below].

118. A number of CFI respondents cited Bermuda’s small size as a possible reason for high prices. With regard to this, the Authority highlights that the country data (presented in Table 5.2, above) shows that Bermuda has one of the highest population densities across the countries considered. Since a key element of costs is the local installation costs and

¹² Both Barbados and Jersey currently advertise fibre broadband at 1000Mbps (1Gbps).

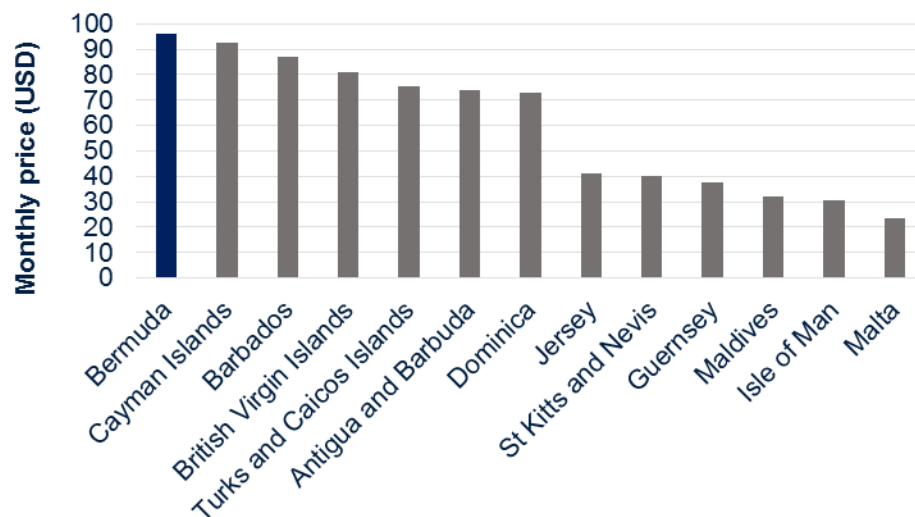
¹³ Based on (2016) market data provided to the Authority by ICOL holders.

utilization of shared infrastructure, high population density, should (all else equal) act to reduce the costs of provision for services.¹⁴

119. The figures below present the results of benchmarking analysis conducted by the Authority.

120. The Authority starts by showing the average (all-in)¹⁵ prices for fixed broadband tariffs across speeds of 4Mbps to 10Mbps¹⁶. The results reveal that, of the 13 countries, Bermuda is the most expensive, with broadband for such tariffs costing almost \$100 on average. In contrast, broadband in Malta costs \$24 on average. The average across all countries is \$60.

Figure 5.6 - Average monthly price for fixed broadband tariffs of 4–10Mbps (US\$)—August 2017



Source: ISP websites.

Notes: Jersey, Guernsey, the Isle of Man and Malta do not offer fixed broadband speeds below 10Mbps. As such, the lowest-speed tariff available has been selected for these countries, as follows: 20Mbps for Jersey; 20Mbps for Guernsey; 16Mbps for the Isle of Man; 15Mbps for Malta. For these countries, the comparison is therefore with better/faster services than in Bermuda.

121. An insightful metric for comparing prices of broadband is to look at the average price per Mbps of speed. To show the full cross-section of all tariffs, the Authority conducted this analysis for all standard (copper) broadband tariffs (i.e. excluding fiber broadband).

122. The results of this analysis are presented in Figure 5.7 below. Barbados is the most expensive at \$20 per Mbps on average, with Bermuda being the second-most expensive

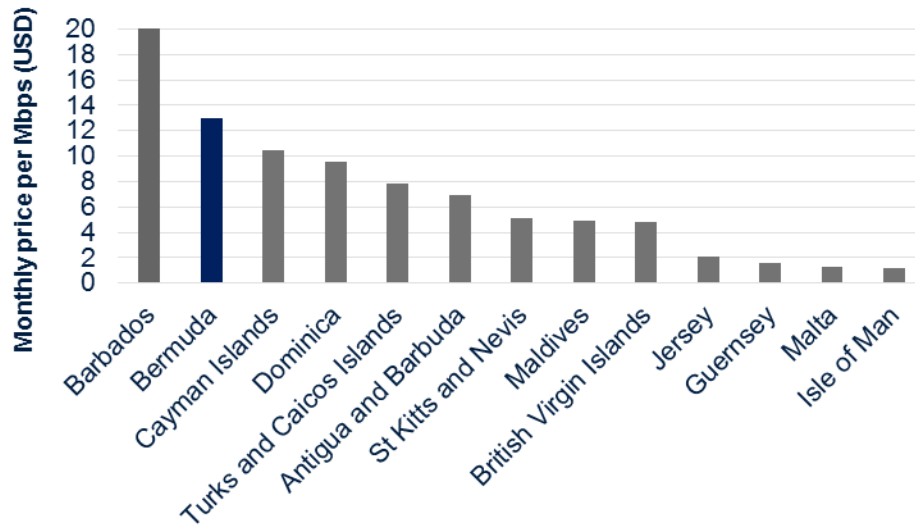
¹⁴ In contrast, a very large country with a small population may have a very high cost to service.

¹⁵ That is, the total monthly price to be paid. In Bermuda, this corresponds to the price for both ISP and Access.

¹⁶ In almost all cases, tariffs included an unlimited data (download) allowance. As such, the analysis does not differentiate based on monthly data allowance, and focuses only on headline speed and price.

at \$13 per Mbps. This compares with an average across all countries of \$6.8 per Mbps, and a low end of \$1.2 per Mbps (Isle of Man).

Figure 5.7 - Average price per Mbps across all standard (copper) fixed broadband tariffs [US\$]—August 2017



Source: ISP websites.

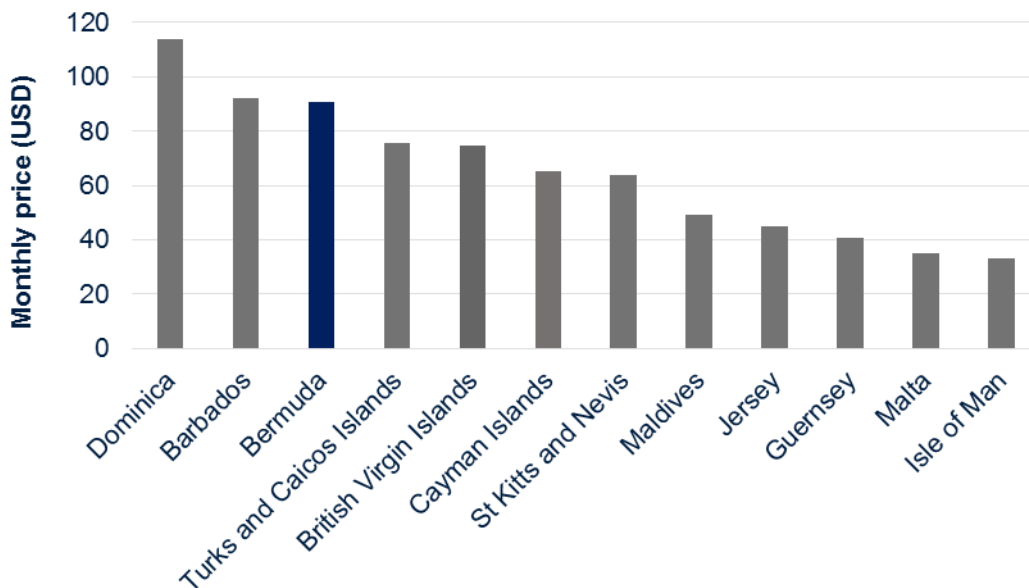
123. The Authority notes that while Barbados appears very high in the above figure, this is explained by the fact that standard broadband tariffs in Barbados, that the Authority utilized, have high prices relative to speeds. For instance, in Barbados, it costs \$50 per month for a 2Mbps connection, \$79 per month for a 4Mbps connection and \$100 per month for a 6Mbps connection. The results may be skewed by the fact that, in Barbados fiber broadband services appear to be available, which have very significantly lower prices per Mb, for example 'discoverflow' offer 150Mbps fiber broadband for \$55 per month (equivalent to \$0.4 per Mbps).

124. As such, the simple average that the Authority has applied may not reflect the reality of what people actually buy (since it could be that very few people in Barbados buy these copper services) and, instead, are simply a display of the tariffs on offer.

125. The above analysis compares prices by converting them to US\$, resulting in a single comparable currency for benchmarking. In addition to comparing absolute prices (converted to US\$), the analysis also considered whether price differences across countries might be explained by differences in the cost of living. The Authority captured this effect by applying a PPP adjustment to the benchmarked prices.

126. In Figure 5.8 below, the Authority presents the same benchmark analysis shown for fixed broadband tariffs across speeds of 4Mbps to 10Mbps (as shown in Figure 5.6) but with the application of a PPP adjustment. The Authority notes that (attributable to Bermuda's relatively high cost of living) Bermuda's relative price falls. However, Bermuda still remains one of the most expensive countries for broadband.

Figure 5.8 - Average monthly price for fixed broadband tariffs of 4–10Mbps [US\$] with PPP adjustment—August 2017



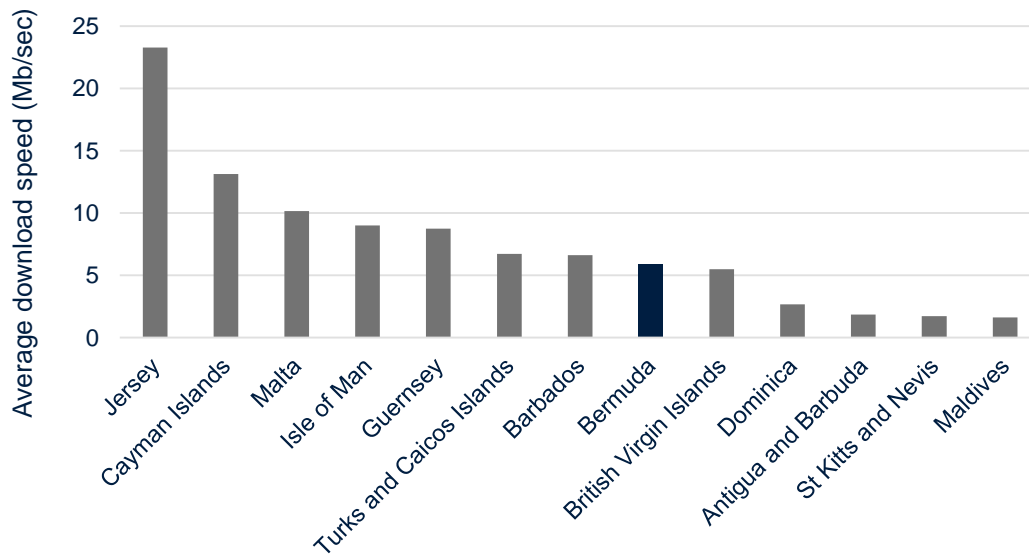
Source: ISP websites.

Notes: Jersey, Guernsey, the Isle of Man and Malta do not offer fixed broadband speeds below 10Mbps. As such, the lowest-speed tariff available has been selected for these countries, as follows: 20Mbps for Jersey; 20Mbps for Guernsey; 16Mbps for the Isle of Man; 15Mbps for Malta. For these countries, the comparison is therefore with better/faster services than in Bermuda.

127. In addition to comparing prices, the Authority has also considered speeds, as presented in Figure 5.9 below. The Authority notes that Bermuda’s average download speed, of 6Mbps, is not significantly less than the average across the benchmarked countries.

128. However, the Authority does see that a number of comparable countries have significantly higher average speeds, for instance, Jersey’s average broadband speed is 23Mbps, which is about four times that of Bermuda. The Authority notes also that, as shown above, Jersey is also much less expensive for comparable broadband tariffs.

Figure 5.9 - Average broadband (download) speed—August 2017



Source: Data from cable.co.uk, <https://www.cable.co.uk/news/new-broadband-league-shows-uks-average-speed-is-less-than-half--700001889/>

129. One explanation for the low average speeds observed in Bermuda (and in comparable jurisdictions) may be the very high costs of faster speed tariffs.¹⁷

130. While Bermuda ICOL holders currently offer broadband speeds of 25Mbps, only a small proportion of customers (less than 5%) actually buy a 25Mbps package. This may be because the 25Mbps package is prohibitively expensive (it is currently around \$240 per month for a standard broadband 25Mbps tariff). In fact, over 70% of Bermuda broadband customers are on a tariff offering headline speeds of 10Mbps or less.

The present

131. The above analysis considers standard broadband services. However as explained above, the Authority recognizes that the market is undergoing a transformation, with significant investment in fiber broadband, and also market entry from Bluewave, which plans to offer broadband (provided over a fixed wireless network) at speeds in excess of 50Mbps.

132. The trend of investment in faster broadband networks can also be seen in the comparator countries, in which many already offer superfast broadband services.

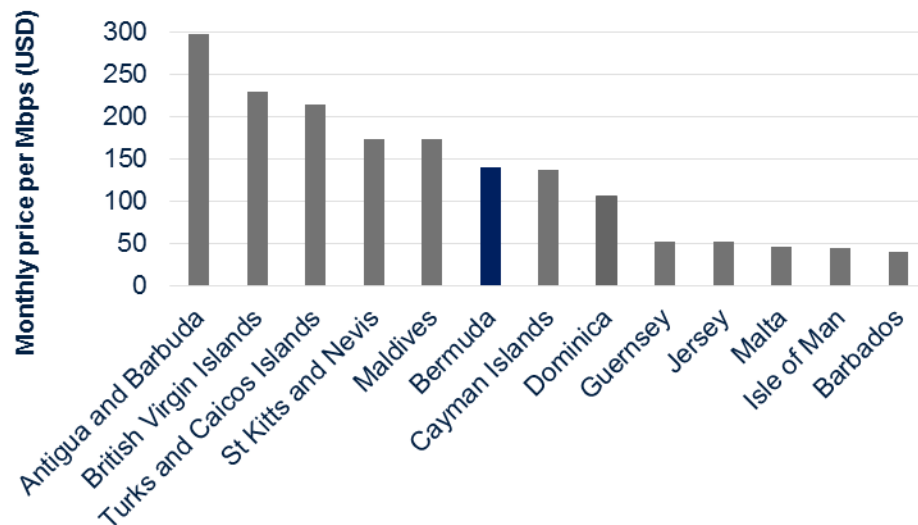
133. To understand this trend, as part of the benchmarking analysis the Authority has also assessed the current advertised tariffs in respect of fiber broadband.

¹⁷ For instance, if consumers can only afford \$100 per month on broadband, they would only be able to secure a broadband connection in Bermuda of 6Mbps. In contrast, the equivalent of \$100 of monthly spend would enable a customer to buy a 20Mbps service in the Maldives, a 200Mbps service in Malta, or a 1Gbps service in Jersey.

134. The Authority recognizes that in some cases there is little take-up of fiber services, and in some countries (such as Bermuda) there may not be widespread rollout yet. However, this comparison provides a useful comparison of the relative prices, as well as the possible outcome for consumers, assuming prices were to remain the same.

135. The Authority conducted the fiber benchmark analysis by looking at fixed fiber broadband tariffs offering speeds of between 30Mbps and 50Mbps. This comparison shows that (based on current tariffs) Bermuda is actually towards the middle of the range, as shown in Figure 5.10 below.

Figure 5.10 - Average monthly price across fiber broadband tariffs offering 30–50Mbps download speeds [US\$] with PPP adjustment—August 2017



Source: Data from ISPs.

136. The difference in Bermuda's ranking between standard broadband (where it was one of the most expensive) and fiber broadband (where it is towards the middle of the range) is largely due to the fact that, at present, fiber broadband prices in Bermuda are significantly lower than those for standard broadband, as can be seen in the table below.

Table 5.11 - Current advertised fixed broadband tariffs in Bermuda—August 2017

ISP	Speed (Mbps)	Fiber	Total monthly price (US\$)
OneComm	4	No	65
BTC	4	No	70
OneComm	6	No	85
BTC	6	No	90
OneComm	8	No	105
BTC	8	No	105
OneComm	10	No	125
BTC	10	No	125
OneComm	15	No	170
BTC	15	No	160

OneComm	20	No	105
OneComm	25	No	240
BTC	25	No	250
OneComm	30	Yes	125
OneComm	50	Yes	170
OneComm	100	Yes	215
OneComm	200	Yes	240

Source: Data from cable.co.uk, <https://www.cable.co.uk/news/new-broadband-league-shows-uks-average-speed-is-less-than-half--700001889/>.

137. The above data shows that, based on current speeds advertised by OneComm for fiber broadband, a Bermuda resident (depending on service availability) can obtain a 30Mbps fiber broadband connection for \$125 per month. In contrast, a 25Mbps standard broadband connection will cost twice as much, at \$240–\$250 per month.

138. Separately from product pricing, the form and nature of services provided is also a key consideration with regard to assessing market outcomes. Specifically, the Authority notes that there is an absence of service bundling in Bermuda e.g. fixed broadband services with mobile and/or subscription television.

139. The Authority's view is that the Bermuda electronic communications sector and consumers would benefit from bundling of services on the basis that this would deliver easier purchases, better customer service and lower bills/prices.

The future

140. In light of the above, the investment in fiber services by OneComm and Digicel Group, as well as by Bluewave, creates the potential for the delivery of significant benefits to consumers in the form of faster services at lower prices.

141. In fact, current market pricing suggests that early adopters of superfast broadband services in Bermuda are already enjoying these benefits.

142. In looking forward, the Authority will look to ensure that such benefits are available to all Bermuda residents, and over the long-term.

5.1.6 Profitability

143. On the basis of an initial profitability analysis conducted by the Authority, the Authority observed that both OneComm and Digicel Group are making material returns at the group level from activities in Bermuda.

5.1.7 Conclusion

144. After assessing the available data, the Authority observes that both OneComm and Digicel Group are the major providers of broadband services in Bermuda and both hold a strong market position.

5.2 Mobile

5.2.1 Overview

145. What was once a luxury item, mobile devices are now everywhere, and generally seen as an essential personal item. This trend has been promoted by the rise of smartphones and Internet applications. For the purposes of this section, 'mobile services' cover both voice and data services.

146. As in many jurisdictions around the world, the rise of mobile usage has caused many consumers to increasingly consider whether they still need their fixed phone line. This is due to convenience (and possibly price), and is leading to an ongoing trend of substitution away from fixed telephony and towards mobile telephony.

5.2.2 Market structure

147. In the 2013 Market Review, mobile markets were defined for both retail and wholesale (mobile virtual network operator - MVNO) mobile services, at an island wide level¹⁸. In both retail and wholesale markets, BDC (now OneComm) and Digicel were determined to possess SMP.

148. Since 2013 there has been little change in the market structure for the provision of mobile services.

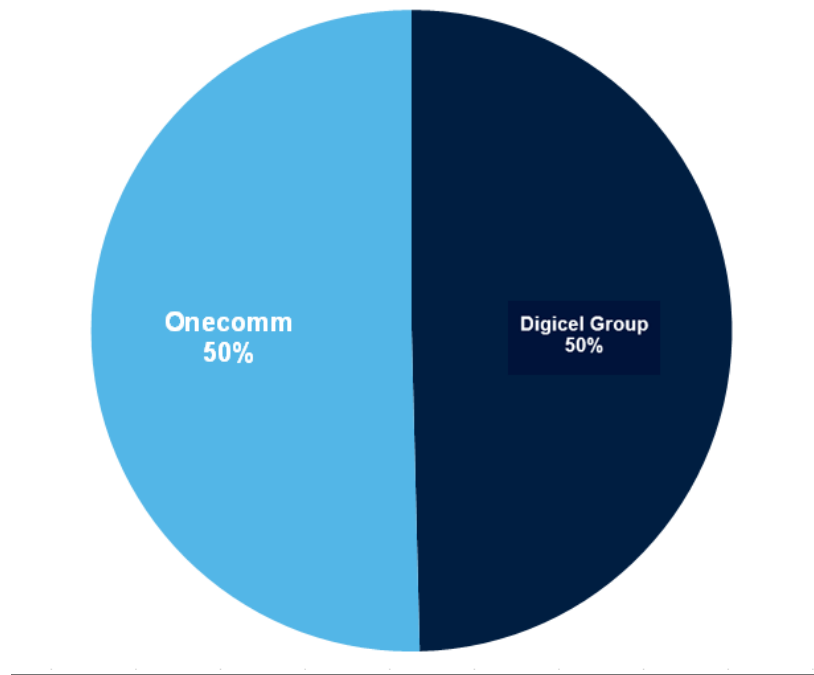
149. Specifically, the market for mobile services continues to be entirely served by two providers, Digicel Group and OneComm¹⁹. Their shares of mobile revenues are symmetric, with both having a 50% revenue share.²⁰ The Authority presents this data in Figure 5.12 (below).

¹⁸ This corresponded to both mobile voice and mobile data services.

¹⁹ OneComm's mobile arm is CellOne, which was formerly called BDC and owned by KeyTech.

²⁰ In terms of subscribers both are also symmetric, but OneComm has the slightly higher share at 53%.

Figure 5.12 - Share of mobile service revenues, Q2 2017



Source: Analysis based on RFI responses.

150. The mobile sector shares have not changed significantly since 2013, when Digicel Group (via Digicel) and OneComm (via BDC) also had symmetric shares.

151. Both OneComm and Digicel Group offer island wide mobile coverage, and both were the only ICOL holders to receive a 4G licence.

152. As part of the 4G (700Mhz) licencing condition, both ICOL holders are required to meet specific coverage obligations. Specifically, both OneComm and Digicel Group must provide at least 99.9% 4G coverage, and meet certain quality standards, for example in relation to the minimum 4G speeds that can be achieved indoors.

153. As part of the July 2017 CFI, respondents were asked for their views on the current degree of competition in the mobile market. The responses are summarized below.

154. Link stated that “there are currently two companies in Bermuda offering mobile voice and data services and as such the market is not competitive for mobile.”

155. “X” noted that “indications of collusion are clear in the prices set by two dominant carriers. Prices have not dropped dramatically. And packages and price points between the two are similar.”

156. FKBNet indicated that the mobile sector is dominated by the current incumbent ICOL holders and that “CellOne [OneComm] and Digicel have kept prices high whilst they have aggressively provided competition in other products.”

157. Digicel Group said that “the mobile services market is extremely competitive” and that “Mobile services in particular, are facing tremendous pressure to maintain a profitable business model.” It claimed that reasons for this trend included the growing mobile data demands of customers, as well as the “asymmetry” of regulation in respect of ‘Over The Top’ (OTT) service providers which, it claimed, were a threat to its mobile business.

158. Deltronics referred to its view that there was no proper competition in the mobile sector.

159. OneComm said: “Bermuda currently has 2 island wide wireless carriers who have invested in and launched island-wide LTE networks. For an island of its size and population, the sector is functioning efficiently with performance increasing and continuing investment in network infrastructure. This view does not differ whether we are considering mobile voice or data, or residential or business.”

5.2.3 Market entry

160. There has been no significant market sector entry since the last market review.

161. Only Digicel Group and OneComm received spectrum as part of the recent (2016) 4G mobile spectrum award²¹.

162. In fact, in the 2016 4G spectrum award procedure, only one entity besides Digicel Group and OneComm put itself forward as a candidate. The Authority ultimately disqualified this third participant for failure to achieve a passing score in the Baseline Reviews of its Alternative Requests²².

163. The fact that there was only one tentative entrant in the 4G spectrum award suggests that not many firms have strong intentions to enter the mobile market as a facilities ICOL holder.

164. Given this, it would seem that OneComm and Digicel Group are unlikely to face the threat of facilities-based market entry within the mobile sector in the foreseeable future.

165. While there may be little prospect of facilities-based entry in the mobile market, there still remains scope for MVNO entry. This would involve market entry based on using existing network infrastructure—i.e. from one (or both) of the two incumbent ICOL holders.

²¹ <http://www.rab.bm/index.php/news/news-and-notice/1430-hds1-press-release-final-10-26-16/file>. This imposes a legal barrier to market entry—i.e. any ICOL holder that wishes to compete with providers such as Digicel Group and OneComm going forward will probably need to offer 4G mobile services, which it cannot do without the appropriate spectrum licence.

²² <http://www.rab.bm/index.php/determinations/1431-hds-1-final-decision-final-for-publication-1/file>.

166. The July 2017 CFI asked respondents whether the launching of MVNO services was economically viable, and whether it could lead to consumer benefit. The responses are summarized below.

167. OneComm stated that “Given the market size and competitive dynamics, it is unclear what consumer benefits would result from a non-facilities-based ICOL holder.”

168. Deltronics said that “MVNO would only be effective if the wholesale access or other access was supported by sound regulatory principles...if these principles were evoked, the Bermuda consumers would surely benefit.” It went on to note that “infrastructure entry would not be economically feasible nor an efficient use of capital.”

169. Digicel Group did not comment on the feasibility or impact of mobile market entry.

170. “X” indicated that there was little scope for market entry at this point, as the market is “fully saturated.”

171. FKBNet stated its view that MVNO access is the most effective way of encouraging entry in the mobile sector. It stated that such MVNO entry would “benefit consumers and create more of a level playing field with other ICOL holders. In fact, this is the sole area of the industry that should be changed to allow new entrants.”

172. Link highlighted that the desirability of market entry would depend on whether facilities-based competition currently exists. It also noted the importance of ensuring that existing ICOL holders are able to invest in their networks, but concluded that “if the market (due to size and cost of investment) cannot sustain additional facilities-based entrants, but may still require competitive alternatives, then in that case, perhaps an MVNO solution will be appropriate. MVNO entry would only be viable if a reasonable firm capable of efficient operations is able to acquire access to underlying network at a fair price and where the regime protected against anti-competitive behaviour or dominant behaviour of incumbents.”

5.2.4 Market investment

173. Following the 4G award, both OneComm and Digicel Group have been investing in network upgrades in order to provide 4G services.

174. The Authority considers that such network investments are necessary and important to ensuring the delivery of long-term benefits to Bermuda residents and consumers from mobile services, especially given the growing demands of consumers with respect to data-hungry applications and mobile services (such as video streaming).

175. The Authority recognizes that these network upgrades come at material capital and operating costs to ICOL holders, and, as such, would need to take such costs into account in any market interventions.

5.2.5 Market outcomes

176. As with broadband, in order to assess the current outcomes in the mobile market, the Authority has undertaken an exercise to benchmark the current price and speed of

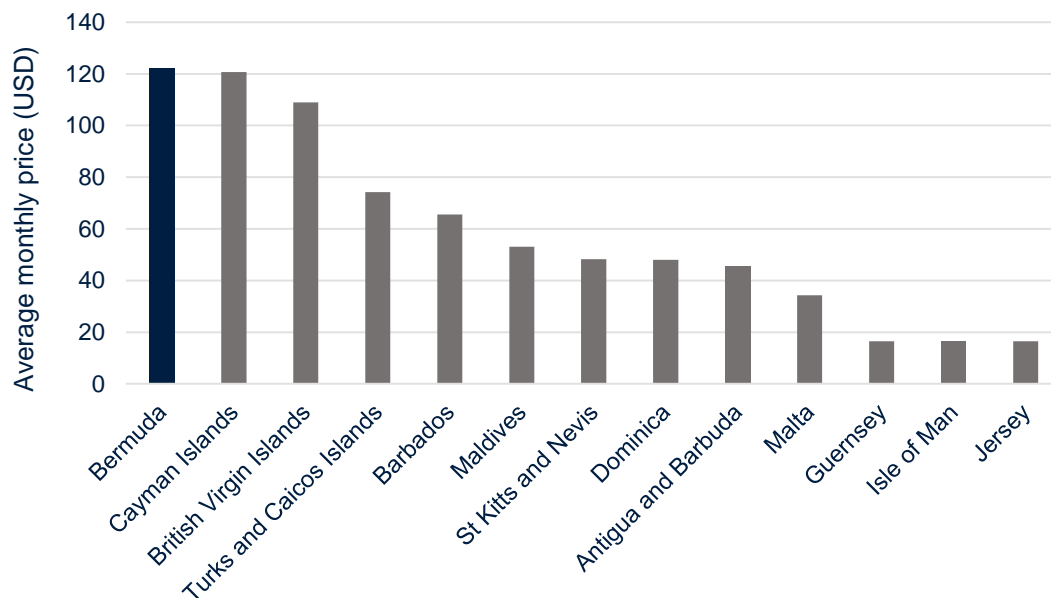
mobile services in Bermuda with those in comparator countries. The same set of countries has been used as for broadband.

177. The analysis focuses on pre-pay (contracts), as the included allowances can be assessed, as opposed to post-pay, where the incremental unit costs (of calls, texts, data) are less clear. Furthermore, there are three core dimensions in determining the benchmarked “basket”: call allowance, text allowance, and data allowance. Data allowance is generally the key differentiator, as it is now standard for post-pay plans to include unlimited local calls and texts. Therefore, the Authority does not propose to consider how prices vary by call and text allowances.

178. The results of this analysis are presented below in Figure 5.10.

179. Figure 5.13 shows the average price for a mobile tariff that contains at least 100 call minutes and 100 text messages, and between 1GB and 5GB of inclusive mobile data allowance. It shows that, across the countries considered, Bermuda is the most expensive, with mobile tariffs costing \$122 per month on average. In contrast, the average tariff in Jersey is \$17. The average across all countries is \$59.

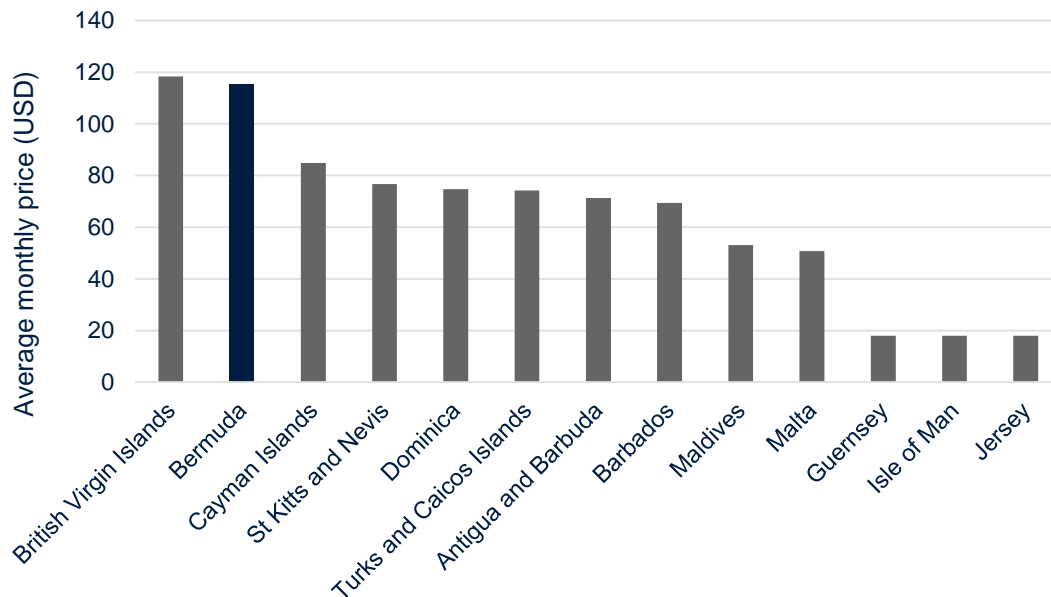
Figure 5.13 - Average monthly price for mobile tariffs containing at least 100 minutes, 100 texts and between 1GB and 5GB of data allowance [US\$]— August 2017



Source: ISP websites.

180. Figure 5.14 below presents the same data but adjusted for PPP. It shows that Bermuda is overtaken in terms of having the most expensive tariffs by the British Virgin Islands, but still remains very expensive relative to the other countries.

**Figure 5.14 - Average monthly price for mobile tariffs containing at least 100 minutes, 100 texts and between 1GB and 5GB of data allowance [US\$]—
August 2017, PPP-adjusted**

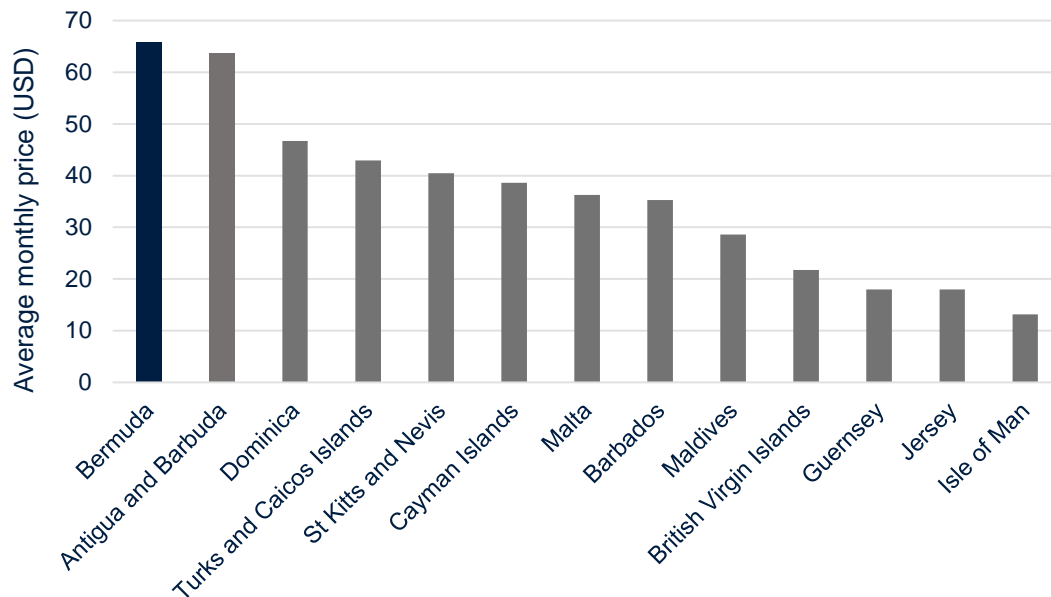


Source: ISP websites.

181. The analysis also looks at the average price per GB of inclusive mobile data allowance, for two ranges of tariffs: (i) those that contain 1–2GB of data allowance (i.e. low to medium data usage tariffs); and (ii) those that contain 2–5GB of data allowance (i.e. medium to high data usage tariffs). Both are presented below in terms of PPP-adjusted prices.

182. For mobile tariffs with 1–2GB of inclusive mobile data allowance, Bermuda is the most expensive country in the data set, even after the PPP adjustment, with an average price per GB of mobile data allowance of \$66. In contrast, the equivalent price in the Isle of Man is \$13. The average across all countries is \$36.

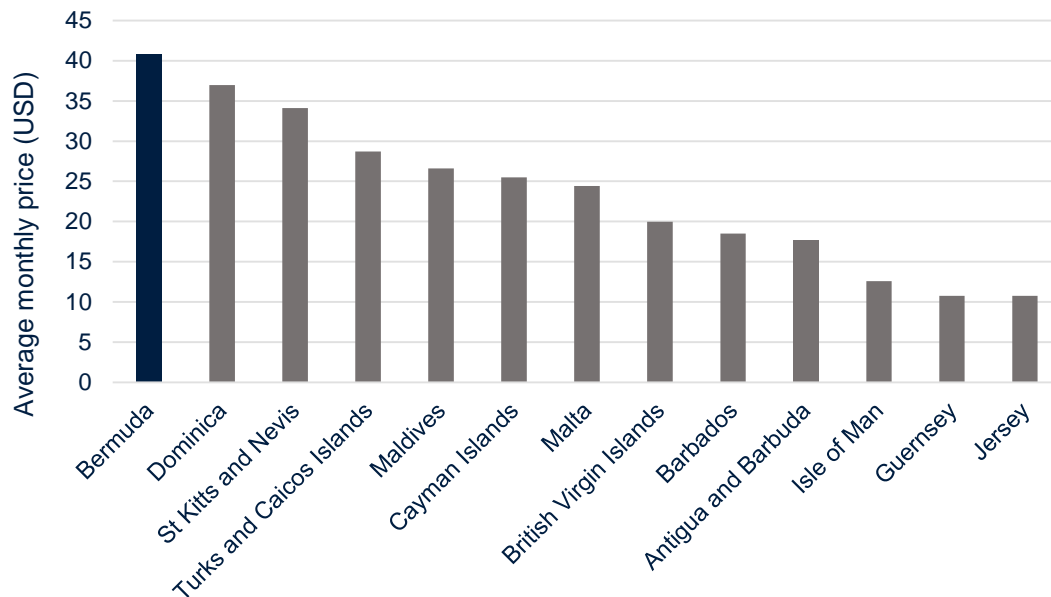
Figure 5.15 - Average monthly price per GB of mobile data allowance, across tariffs with 1–2GB of inclusive mobile data allowance [US\$]—August 2017, PPP-adjusted



Source: ISP websites.

183. For mobile tariffs with 2–5GB of inclusive mobile data allowance, Bermuda also is the most expensive country in the data set, with an average PPP-adjusted price per GB of mobile data allowance of \$41. In contrast, the price in Jersey and Guernsey is \$11. The average across all countries is \$24. This is shown in Figure 5.16 below.

Figure 5.16 - Average monthly price per GB of mobile data allowance, across tariffs with 2–5GB of inclusive mobile data allowance [US\$]—August 2017, PPP-adjusted



Source: ISP websites.

5.2.6 Profitability

184. Based on the Authority’s initial financial analysis, it appears that Bermuda Digital Communications Ltd. (“BDC”) (part of OneComm) is making significant profits, with a substantial margin on earnings before interest and taxes (“EBIT”).

185. Digicel Group’s mobile operations appear to be making a significant EBIT margin at the group level. The Authority is continuing its assessment in this area.

186. These levels of profitability are in excess of what would be expected in an effectively competitive and well-functioning mobile market.

187. In addition, the levels of profitability do not appear to be falling over time.

5.2.7 Conclusion

188. After assessing the data available to it, the Authority observes that both OneComm (BDC) and Digicel Group (Digicel) are the sole providers of mobile services in Bermuda, and both equally hold a strong market position.

5.3 Fixed voice

5.3.1 Overview

189. The fixed voice market provides the ability to make phone calls (from a fixed location) to numbers located in both Bermuda and internationally, to a fixed point or mobile.

190. Given the rise in use of mobile phones (including mobile voice services), the market for fixed voice services (particularly in the residential sector) has been diminishing, both in terms of numbers of customers and volumes of calls.

191. In contrast, fixed voice may be more of a core requirement for businesses. As a result, the demands of residential and business users may therefore be materially different in respect of fixed voice services.

5.3.2 Market structure

192. Historically, the fixed telephony market has been largely served by BTC (now part of Digicel Group) with ICOL holders such as Link and TBI serving, and operating in, small parts of the market. This continues to be the case. Data provided by ICOL holders indicates that about three-quarters of total fixed telephony revenues are attributable to BTC. BTC's share also appears to be stable over time.

193. In 2013, BTC was deemed to have SMP in the market for fixed voice services at the retail level, which was defined as 'narrowband access lines and local calls.'

194. The July 2017 CFI asked respondents about the current status of the fixed voice market, and the responses are summarized below.

195. Link stated that "Digicel [/BTC] has SMP in residential fixed voice services segment and we do not expect that to change over the next few years."

196. "X" and Digicel did not provide any comment in respect of fixed voice services.

197. Deltronics did not comment directly on market structure, but noted that the voice market was in decline as people switch to mobile services.

198. FKBNNet stated its belief that the fixed voice sector is working efficiently.

199. OneComm noted that "consumers are increasingly cutting the traditional cord, choosing instead to use mobile voice or alternative online voice features." Its view was that "with messaging and social media applications substituting for voice minutes, there is little reason to analyze this segment on a standalone basis." OneComm also stated: "we do not believe that any fixed voice provider could implement a price increase profitably, and therefore, no provider has market power in fixed voice. This lack of market power is further illustrated by the fact that even price increases allowed by regulation have not been implemented in the market."

5.3.3 Market entry

200. The Authority notes that there has not been any significant entry in the fixed voice market since 2013.

5.3.4 Profitability

201. The Authority is assessing the profitability of the fixed voice services market in isolation, especially for the major provider BTC. Such analysis will form part of the Authority's ongoing market assessment.

5.3.5 Conclusion

202. On the basis of the data reviewed, the Authority observes that BTC continues to have over 70% share of fixed voice services. The Authority therefore concludes that BTC holds a strong position in the provision of fixed voice services.

5.4 Subscription television

5.4.1 Overview

203. The subscription television sector relates to the services available for delivering entertainment content to end users, this could include a live subscription television broadcast (for example of live sport) or a 'on-demand' streamed service such as watching a film on Netflix.

204. Subscription television comprises several services, some of which may be complementary and some may be substitutable. The technologies and delivery mechanisms include:

- cable-based subscription television, in which a coaxial cable connection is used to access television services;
- satellite-based subscription television, in which a satellite dish (and associated decoder box) is used to access television services;
- IPTV-based subscription television, in which live television is streamed through an internet connection; and
- VoD: whereby content is streamed via an online service (for example, Netflix).

205. While subscription television services were traditionally comprised simply of live subscription television broadcasts (delivered over a number of different potential technologies),²³ the rise of online services has now blurred the line of traditional subscription television markets.

206. Legacy subscription television providers are increasingly competing with OTT providers such as Netflix and Amazon Video.

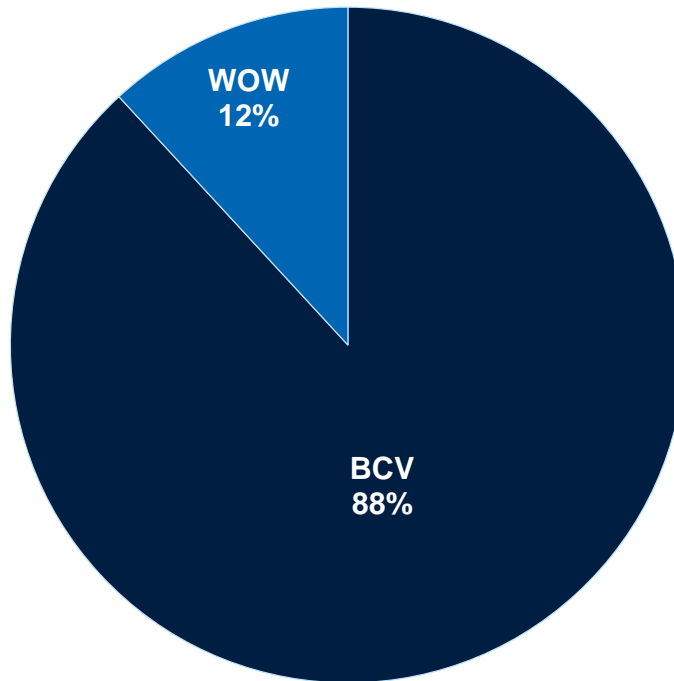
207. Such changes will be important considerations in the Authority's ongoing review.

²³ In 2013, the Authority considered free-to-air broadcasting, Mobile TV, and subscription VoD services to be in a separate market from subscription-based services.

5.4.2 Market structure

208. In Bermuda, subscription television is a service that has historically been provided by BCV/Logic (now operating under the brand name OneComm) and WOW. OneComm has around 88% share of the total revenue of subscription television, with WOW having the remaining 12%, as shown in in Figure 5.17 below.

Figure 5.17 - Share of subscription television revenues, Q2 2017



Source: Analysis based on RFI responses.

209. The 2013 market review concluded that OTT services were not imposing significant constraints on subscription-based TV. Since then, there has been a decline in the number of subscribers for subscription-based TV services. Furthermore, the rise in popularity of OTT services may suggest that the market has changed sufficiently such that alternative services can now be considered part of the same market.

5.4.3 Market entry

210. As noted above, the rise of online platforms offering content, such as Netflix and Amazon Video introduces new services into the sector that may be seen as complements or substitutes to existing (traditional) subscription television services.

211. Evidence that traditional TV service revenues are declining, combined with an increasing take up of such OTT services indicates that OTT and traditional subscription television services may, in fact, be substitutable (not complementary).

212. Furthermore, the Authority is also aware of further possible entry into the subscription television market, since Digicel Group has expressed its intention to launch IPTV services in Bermuda.

5.4.4 Profitability

213. The Authority continues to assess the profitability at the level of subscription television services only.

214. However, the Authority does observe that OneComm has been making material profit at the group level from subscription television services.

5.4.5 Conclusion

215. The Authority observes that Logic continues to hold a high share of subscription television revenues.

216. However, a number of market developments should be noted.

217. Firstly, rising availability and usage of online content providers (i.e. OTTs) raises the question as to whether traditional subscription television services are actually part of a broader relevant market, that may include OTT services (such as VoD).

218. Secondly, the prospect of possible market entry (into subscription television – IPTV by Digicel Group) will also affect the Authority’s forward-looking assessment of the market (and the likely shares in the market) over the next few years.

219. Given these trends, the Authority’s market assessment will need to consider how best to define the relevant market, and thereafter, what ICOL holders (if any) has SMP in that relevant market. The Authority intends to consult on this at a later date.

5.5 Business connectivity

5.5.1 Overview

220. Business connectivity services (often called ‘leased lines’) provide fixed, symmetric data connection between two points, offering a dedicated connection with reserved bandwidth. Such services are primarily used by business customers; there is no separately defined residential market.

221. The 2013 market review defined four markets for retail leased lines distinguished by geographic scope and speed:

- low-speed²⁴ in the City of Hamilton and contiguous suburbs;
- low-speed outside of Southside and the City of Hamilton and contiguous suburbs;
- high-speed²⁵ in the City of Hamilton and contiguous suburbs; and
- high-speed outside of Southside and the City of Hamilton and contiguous suburbs.

222. While leased lines are primarily used for data, other services can be provided on top, such as voice and internet connection. Other data services, such as non-dedicated frame relay and switched multimegabit data services (“SMDS”), were found to be in the same market in the 2013 market review.

5.5.2 Market structure

223. Nationally, in 2013, there were three providers of retail leased line services: BTC (now part of Digicel Group), Logic, and Quantum Communications Limited (“QCL”). There has been limited development of a wholesale market for leased lines.

224. The 2013 market review found BTC to hold significant market power in all markets except for the supply of high-speed retail Leased Lines in the city of Hamilton and contiguous suburbs. Within this market, BTC and Link (via QCL) effectively shared the market.

225. Price information from the BTC website has not suggested that prices have changed significantly between 2013 and 2016.

226. There are indications that the market boundaries employed in the 2013 market review require revision and should be much higher. Using a 1 Mbps threshold to separate low-speed from high-speed services, the data available for BTC and QCL from 2013 suggests that revenues from high-speed services within Hamilton constitute 99% and 100% of each provider’s respective total revenues.

227. The July 2017 CFI asked respondents about the current status of the business connectivity market; three responses were received. These responses are summarized below.

228. Deltronics has indicated in its CFI response that the market is not functioning effectively, primarily due to the wholesale access regime. Deltronics suggest that the avoidable cost component of the current wholesale access price needs to be significantly increased in order for market entry to be possible.

229. Deltronics viewed OneComm and Digicel Group as having significant market power in this market.

²⁴ Low speed services cover leased lines up to 1Mbps.

²⁵ High speed services cover leased lines of 1Mbps or more.

230. Link cited three active players in the market: Digicel Group (via BTC), Link (via QCL), and expansion by OneComm into this market. This is specifically with reference to the market within Hamilton.

231. Link also commented on the current wholesale access regime's potential impact on new entry into the business connectivity market, stating that "there are challenges with smaller ICOL holders within Hamilton who need to either build facilities to the customer if none are present or pay full retail rates to the existing incumbent, which may warrant reconsideration of the wholesale pricing regime within Hamilton."

232. OneComm note that the restrictions on bundling are "ineffective and unnecessary", and believe that no regulatory remedies should be imposed on the market in the future.

5.5.3 Market entry

233. Entrants into the business connectivity market are likely to face barriers to entry due to the high infrastructure costs and significant economies of scale and scope. An alternative for potential entrants is to seek wholesale access from an established infrastructure provider.

234. There has been no significant market entry or market developments since the 2013 market review in the two markets outside of Hamilton.

235. Within Hamilton, Link has cited OneComm's recent expansion in this market as an indication of market developments.

5.5.4 Profitability

236. The Authority will continue to conduct a profitability assessment of this sector.

5.5.5 Conclusion

237. As part of the Authority's ongoing market assessment it will be considering what may be the most relevant and proportionate market definition for business connectivity services, both in terms of product (e.g. service speeds) and geography.

5.6 Off-Island connectivity

5.6.1 Overview

238. Off-island connectivity is an essential input into many different on-island electronic communications services.

239. As an essential input into on-island electronic communications services, access to submarine connectivity can act as a bottleneck for wholesale and retail services within Bermuda, and has implications for the level of competition observed in downstream markets.

240. It is therefore essential to review the market for submarine connectivity in order to ensure that the conduct, pricing, and investment decisions of providers are not distorting competition downstream.

241. In the 2013 market review process there was no defined market for off-island connectivity.

242. As part of the Authority's ongoing review, it will be considering the nature of competition in this essential input market, and whether there are any competition concerns warranting regulatory intervention.

5.6.2 Market structure

243. In Bermuda, there appear to be at least three suppliers of submarine connectivity services:

- *Cable Co.*— is part of OneComm and offers submarine connectivity between Bermuda and Charlestown, Rhode Island, with a potential operational life from 2008 to 2028. It provides off-island services to Bermuda ICOL-holders;
- *Globenet*—provides submarine connectivity services to a number of ICOL holders.
- *Link*— indicated in its CFI response that it is involved in subsea connectivity between Bermuda and the Caribbean/USA.

244. The Authority has also observed that there may be an additional sub-sea connection provided by Columbus Networks Limited (formerly Cable and Wireless Communications Limited). The Authority however is still seeking to better understand the form and location of the infrastructure owned by Columbus Networks.

5.6.3 Market investment

245. The Authority recognizes that the cost of building submarine connectivity is significant, and as such, in light of Bermuda's size, it is unlikely to be economically viable to have a large number of facilities-based ICOL holders competing in this segment.

246. These economic realities suggest that there are likely to be significant barriers to entry in this market.

247. The Authority does however see investment in existing infrastructure. For instance, in 2016, Cable Co. upgraded its infrastructure to increase capacity by 130Gbps, at an approximate cost of \$1.3m.

248. While not a direct investment in submarine connectivity, Link has indicated that market changes may reduce the demand for submarine connectivity. Many offshore businesses that traditionally sought Bermuda-based services may be "competed away" in the future by ICOL holders with international operations that can provide these services from outside of Bermuda.

5.6.4 Conclusion

249. The Authority recognizes the importance of submarine connectivity for many core electronic communications services provided in Bermuda (including broadband).

250. As part of its ongoing market assessment the Authority will be assessing the sub-sea connectivity sector and whether any interventions are warranted in order to ensure service continuity and positive outcomes (in terms of prices and quality) for consumers of electronic communications services in Bermuda.

5.7 On-island submarine cable interconnectivity and backhaul

5.7.1 Overview

251. This market comprises the provision of interconnection and backhaul services, between a domestic service provider's point of presence and the point of interconnection to the submarine cable landing station (in Bermuda).

252. These services are similar to domestic business connectivity services, in that they provide on-island connectivity. However, unlike standard business connectivity, these services are likely to be of high bandwidth. These services are ultimately used by domestic service providers that may seek to provide domestic communications services that require international connectivity (for example internet service providers). Such service providers may not own their own domestic network. For these entities, the only way to achieve international connectivity is to buy (submarine cable) interconnection and backhaul services from others.

5.7.2 Market structure

253. The service providers in this market are likely to be those which are also present in the provision of other domestic fixed services, such as business connectivity. As part of the Authority's ongoing market review, it will investigate the nature of competition for these services including the presence of SMP operators.

5.7.3 Market investment

254. This will relate to the investment in the business connectivity market, but will be different in terms of the amount of throughput/bandwidth.

255. As such, different forms of investment may be required to provide the services. Furthermore, it may be that recent growth in data uses will drive the need for greater investment.

5.7.4 Conclusion

256. The Authority recognizes that such interconnection and backhaul services are essential to the full functioning of Bermuda's communications sector, across many different services, including retail broadband and international telephony services.

As part of its ongoing assessment of off-island connectivity, the Authority will consider whether intervention in interconnection or backhaul (to off-island data services), or indeed both, are required going forward.

6 RELEVANT MARKETS, LIKELY SMP OPERATORS, & REMEDY OPTIONS

257. In this section the Authority sets out initial views on the relevant markets which are susceptible to ex-ante regulation in the electronic communications sector, going forward. The Authority initially identified these markets in the Preliminary Market Identification Notice issued on 17 October 2017 (the “Notice”), which identified relevant markets that meet the following criteria set forth in Section 22 (2) of the ECA:

- The relevant market is characterized by high and non-transitory barriers to entry;
- Taking into account actual and expected market circumstances during the period under review, the relevant market either-
 - is not likely to be affected by technological changes or other developments that would render it effectively competitive, or
 - is likely to cease to be effectively competitive; and
- The application of *ex post* competition rules alone would not be sufficient to promote or preserve effective competition in the relevant market.

Please see the Notice for further analysis of these criteria.

258. The Authority invites views from stakeholders and the general public on what markets should be susceptible to ex ante regulation through this consultation process.

259. The basis for determining the potential relevant markets is the seven communications sectors the Authority assessed in Section 5 (above). These are: broadband, mobile, fixed voice, subscription television, business connectivity, submarine connectivity and on-island submarine interconnectivity and backhaul.

260. For each of these seven sectors, the Authority sets out under the below headings its current views on the appropriate relevant market.

6.1 Broadband

6.1.1 Relevant market

261. The Authority’s objective in defining the relevant market (in any sector) is to ensure that the Authority identifies the most appropriate market for which to assess which service provider(s) may have SMP.

262. The Authority also approaches this exercise with a degree of proportionality and pragmatism, and to recognize that in many cases detailed changes to the relevant market assessment is unlikely to affect an SMP finding.

263. The broadband services the Authority observe differ from other forms of internet connection (such as Ethernet) in that broadband services are shared between many users²⁶.

264. The Authority currently observes that two incumbent operators have island-wide infrastructure coverage and provide broadband services over those networks. The services available include various speed gradients, and include differing technologies. However, the Authority is currently minded to approach market definition in a way that is neutral to the technology used to deliver the service.

265. This is because, from the consumer's perspective, the form and nature of technology used to provide the service is not important. The factors of importance would be service level criteria such as speed, latency, and uptime, as well as non-service specific elements such as customer service. In other words, a 20Mbps broadband service delivered over copper, wireless or fiber is indistinguishable from the end-users' perspective, assuming they all have the same service quality criteria.

266. Finally, given the incumbent operators both offer island wide coverage, the Authority considers that the competitive conditions are not materially different within specific localities within Bermuda (typically defined as sub-national/local regions). Combined with the island wide pricing policies of both incumbents, the Authority is minded to adopt a relevant geographic market definition that is national, this being Island wide.

267. With this in mind, the Authority is currently minded to adopt the following two relevant markets for the broadband sector:

Retail provision of fixed broadband internet connectivity, provided over any technology, and for any speed, on an island wide basis.

Wholesale provision of fixed broadband internet connectivity, provided over any technology, and for any speed, on an island wide basis.

268. The definition would apply to any broadband (upload/download) speed.

6.1.2 Likely SMP operators

269. On the basis of such a relevant market definition, and the data the Authority has reviewed to date (see Section 5.1), the Authority considers that OneComm and Digicel Group would have SMP.

270. While there has not emerged significant competition historically (either through own infrastructure or existing infrastructure), the scope for greater competition is increased by the market entry of Bluewave, which could act to promote effective competition with and

²⁶ This differentiates broadband services where the connection is shared between many users (and speed and capacity is therefore 'contended') from broadband services where the connection is dedicated to a single customer (and speed and capacity is therefore 'uncontended'). The latter type of services belong to the leased lines/ business connectivity market.

between OneComm and Digicel Group, as well as ongoing investment in faster broadband networks.

6.1.3 Remedy options

271. On the basis of the above relevant market definition and possible SMP finding, the Authority will need to consider how best to prevent or deter anti-competitive effects.

272. In light of this, in terms of possible remedy options to address competition concerns in the relevant Broadband markets, the Authority is currently minded to consider the following:

- **Obligations to provide wholesale access:** Such an obligation would ensure that operators could access the SMP operator's network for the purpose of providing broadband services, thereby promoting competition at a service (as opposed to infrastructure) level. Such an obligation would include conditions around providing wholesale services on a fair, reasonable and non-discriminatory basis. This obligation would also consider the appropriate pricing of wholesale services, and whether it is appropriate to impose cost-orientation obligations.
- **Obligations to not set excessively high or excessively low retail prices:**²⁷ Such an obligation would ensure that SMP operators could not engage in anti-competitive or anti-consumer behavior, either by setting prices which are excessively high, or by setting prices which are anti-competitively low (predation or margin squeeze). Such an obligation would likely use some cost benchmark in order to determine whether prices are excessively low or excessively high.
- **Obligations to meet certain quality of service standards:** Such service standards would impose an obligation to meet certain minimum standards of service quality, including measures such as lead times for installation and repair, as well as lead times for migration, either between services or between internet providers.
- **Obligations to provide regular and prescribed information to demonstrate compliance with SMP obligations:** Such an obligation would set out specific information that would need to be supplied by SMP operators in order to ensure compliance with SMP conditions. The nature and form of this condition could include specific requirements that involve the provisions of regular financial and costing information, as well as market information on subscribers and revenues. This condition could also be used to monitor quality of service compliance, through reporting of key performance indicators (KPIs).

273. The Authority's current view, however, is that any ex ante price control remedies on broadband services should be kept under review. The ongoing network upgrades and the prospect of market entry suggests pricing pressure may occur.

²⁷ Which would be detrimental to consumers, competitors or both.

6.2 Mobile

6.2.1 Relevant market

274. Mobile services comprise a number of different specific use-cases, which can be classified into three categories: voice calls, text messaging and mobile data.

275. The Authority currently observes that all three such services are usually included within a mobile phone tariff.

276. Furthermore, the Authority is currently not minded to segment mobile services on the basis of technology (i.e. 3G vs 4G).

277. Given the incumbent operators both offer island wide coverage, the Authority considers that the competitive conditions are not materially different within any specific localities. Combined with the island wide pricing policies of both incumbents, the Authority is minded to adopt a relevant geographic market definition that is island wide.

278. On the basis of this, the Authority proposes the following relevant market:

The island wide provision of mobile services (voice, text and data).

6.2.2 Likely SMP operators

279. On the basis of such a relevant market definition, and the data the Authority has reviewed to date (see Section 5.2), the Authority considers that OneComm and Digicel Group would have SMP.

6.2.3 Remedy options

280. On the basis of the above relevant market definition, and possible SMP finding, the Authority is currently considering the following remedy options to address competition concerns in a relevant mobile market:

- **Obligations to not set excessively high or excessively low retail prices:**²⁸ Such an obligation would ensure that SMP operators could not engage in anti-competitive or anti-consumer behavior, either by setting prices which are excessively high, or by setting prices which are anti-competitively low (i.e. predation). Such an obligation would likely use some cost benchmark in order to determine whether prices are excessively low or excessively high.
- **Obligations to provide regular and prescribed information to demonstrate compliance with SMP obligations:** Such an obligation would set out specific information that would need to be supplied by SMP operators in order to ensure compliance with SMP conditions. The nature and form of this condition could

²⁸ Which would be detrimental to consumers, competitors or both.

include specific requirements that involve the provisions of regular financial and costing information, as well as market information on subscribers and revenues.

- **Obligations to provide wholesale access:** Such an obligation would ensure that operators could access the SMP operator's network for the purpose of providing mobile services (as an MVNO), thereby promoting competition at a service (as opposed to infrastructure) level. Such an obligation would include conditions around providing wholesale services on a fair, reasonable and non-discriminatory basis. The obligation would also consider the appropriate pricing of wholesale services and whether it is appropriate to impose cost-based pricing obligations.

In addition to the above the Authority will also consider the existing call terminate “bill and keep” arrangements effectiveness and whether other remedies imposed could be more effective.

In addition, the Authority recognizes that wholesale access is already a licence obligation for ICOL holders that hold 4G spectrum licences and therefore is not minded to further regulate this via an SMP remedy obligation.

6.3 Fixed voice

6.3.1 Relevant market

281. Fixed voice services provide the ability to make voice calls from a fixed location, by making use of the fixed telephony network. These services are therefore distinct from mobile (voice) services.

282. On the basis of the data considered (including the island wide pricing policies and island wide network coverage), the Authority is minded to adopt the following relevant market definition:

The island wide provision of voice call origination and termination, from a fixed location

6.3.2 Likely SMP operators

283. On the basis of such a relevant market definition, and the data the Authority has reviewed to date (see Section 5.3), the Authority considers that the Digicel Group (via BTC) would have SMP.

6.3.3 Remedy options

284. The possible remedy options would be determined on the basis of competition concerns.

285. At this time the Authority is still exploring whether there exists any competition concerns in relation to the fixed voice market that would warrant the imposition of any remedies.

6.4 Subscription television

6.4.1 Relevant market

286. The appropriate relevant market for the subscription television sector will need to account for a number of ongoing trends, most especially:

- The rise in availability and usage of online content platforms (i.e. OTT providers);
- The rollout of high speed broadband networks by both OneComm and Digicel Group; and
- The launch of an IPTV service by Digicel Group.

287. The trends suggest that a significant shift in the content sector is underway, blurring the line between traditional subscription television providers and other providers of media content. The Authority will need to account for this within its market assessment.

6.4.2 Likely SMP operators

288. Once the Authority has more definitively defined the relevant market for subscription television services, the Authority will be in a position to identify SMP operators.

289. The Authority does note, however, that Logic currently has a very strong position in the provision of subscription television services (with a service share of almost 90%).

6.4.3 Remedy options

290. On the basis of some effective net neutrality (i.e. unfettered access to internet and OTT content), and effective competition in the market for broadband, the Authority is currently minded to consider a more *ex-post* approach for regulating subscription television services.

6.5 Business connectivity

6.5.1 Relevant market

291. On the basis of the data reviewed to date, the Authority notes that there appears to have been little change to the structure and competitive dynamics for leased line circuits since 2013.

292. The Authority does, however, wish to simplify the regulatory regime for all markets, including for business connectivity services.

293. As such, the Authority is currently considering how best to approach the geographic and product dimensions of business connectivity services, to strike the right balance between proportionality and scope for effective regulation.

6.5.2 Likely SMP operators

294. Once the Authority has further refined its definition of the relevant market for business connectivity services, the Authority will be in a position to identify SMP operators.

6.5.3 Remedy options

295. Regulation of business connectivity services going forward could be based on *ex-ante*, *ex-post* or (likely) some combination of the two.

296. Furthermore, the Authority will be exploring the most appropriate form of any interventions, during its ongoing review.

6.6 Off-Island connectivity

6.6.1 Relevant market

297. Off-island connectivity relates to the span of connectivity that allows for the transfer of data traffic between Bermuda and other countries, most especially to facilitate access to the Internet as well as international calls.

298. The relevant market would therefore not be confined to being within Bermuda, but instead from any location, so long as the service offers end to end connectivity, both for sending and receiving data.

299. On this basis, the Authority is currently minded to adopt the following relevant market definition:

The provision of off-Island connectivity (i.e. international data transmission).

300. This definition would be neutral as to the use of the connectivity. That is, whether the connection is being used to route voice calls or to connect to the internet, the same relevant market would apply.

301. This is justifiable on the basis that the same infrastructure is used to provide connectivity for all on-Island services wishing to either send or receive data from another (international) location.

6.6.2 Likely SMP operators

302. The Authority is continuing to gather data to better understand the nature of competition in this sector. Once the Authority has a better understanding of the market structure, the Authority will be in a position to identify SMP operators.

6.6.3 Remedy options

303. Were the Authority to find SMP operators (under such a relevant market definition as set out above) the Authority would need to consider what interventions may be necessary to meet its objectives and duties.

304. Specifically, given the essential nature of off-island connectivity for core telecoms services such as Internet and voice services, it will be essential to ensure that both the quality of off-island connectivity and the associated price is not detrimental to either Bermuda consumers, businesses, or both. This could entail an obligation on SMP operators to offer non-discriminatory access and cost-oriented pricing for international capacity.

305. While the Authority is still exploring possible competition concerns, the Authority intends in its next round of consultation to set out its findings in relation to SMP in this sector, as well as the need and form of any possible interventions.

306. Notwithstanding market power conclusions, given the critical nature of submarine cable infrastructure, the Authority also welcomes views on whether or not it would be appropriate for the Authority to impose obligations on all owners of such infrastructure to ensure the continuity of their supply (e.g. in the case of insolvency or damage to infrastructure) and, if so, what form such obligations might take.

6.7 On-island submarine cable interconnectivity and backhaul

6.7.1 Relevant market

307. On-island submarine cable interconnectivity and backhaul relates to the span of connectivity that allows for the transfer of data traffic within Bermuda, between the domestic service provider and the point of interconnection to the submarine connection (i.e. on-island landing station).

308. On this basis, the Authority is currently minded to adopt the following relevant market definition:

The island-wide provision of on-island submarine cable interconnectivity and backhaul.

6.7.2 Likely SMP operators

309. The Authority is continuing to gather data to better understand the nature of competition in this sector. Once the Authority has assessed the market structure, the Authority will be in a position to identify SMP operators.

6.7.3 Remedy options

310. Were the Authority finds SMP operators (within this relevant market definition as set out above) the Authority would need to consider what interventions may be necessary to meet its objectives and duties.

311. Given the essential nature of off-island connectivity for core telecoms services such as Internet and voice services, it will be essential to ensure that service providers which do not have their own island wide network are able to access these international connectivity services.

312. While the Authority is still exploring possible competition concerns, the Authority intends in its next round of consultation to set out its findings in relation to SMP in this sector, as well as the need and form of any possible interventions.

313. The Authority welcomes views on whether or not it would be appropriate for the Authority to impose obligations on providers of interconnection and backhaul services, for the purpose of achieving connectivity to international links. Such remedy options could, for example, be in relation to quality of service (such as lead times for repair, and service continuity requirements) as well as prices (i.e. to ensure providers of these services are not setting anti-competitive prices).

7 FUTURE REGULATION OF THE ELECTRONIC COMMUNICATIONS SECTOR

314. Section 7 sets out the Authority's objectives for a well-functioning and effective electronic communications sector in Bermuda that works to the benefit of all Bermuda consumers and businesses, and the role that regulation will play in achieving these objectives.

315. In setting out these objectives and the areas of priority for the Authority, it is essential to adopt a forward-looking approach that takes account of major recent developments in the markets, and their implications for the future.

316. A significant number of changes have taken place in the fixed and mobile electronic communications markets in Bermuda since the last market review was conducted in 2013.

317. As described above, following considerable consolidation in the market since 2013, there are now two large entities (OneComm and Digicel Group) that have a strong position in the majority of electronic communications markets in Bermuda: fixed voice, broadband access services, ISP services, wholesale access services, mobile voice and data services, business broadband, and retail leased lines. OneComm is also a major provider of subscription television services.

318. Furthermore, during 2016 and the first half of 2017, a number of major market developments have taken place that may significantly affect the future evolution of the relevant markets. These include:

- the award of 4G spectrum to just OneComm and Digicel Group, and their consequent obligation to cover 99.9% of Bermuda with a minimum average download user data rate of 15 Mbps;
- announcements by both OneComm and Digicel Group of planned upgrades to their fixed broadband networks so that they can offer super-fast broadband services. In the case of OneComm, it has already started migrating customers onto the new faster speeds at the same price as its rollout progresses. In the case of Digicel Group, its planned commercial launch is scheduled for the end of 2017, and its network upgrade to FTTH would also allow it to enter the subscription television market in competition with OneComm and WOW;
- the potential for new network entry into the fixed broadband market by an ICOL holder using fixed-wireless technology (Bluewave). This ICOL holder also has plans to combine its broadband service with the TV service offered by WOW, allowing it to offer a bundled proposition to the market; and
- financial difficulties faced by some ICOL holders, which, if they were to deteriorate further, could in diminish diversity and choice in the electronic communications market in Bermuda.

319. Against this background, it is also important to consider whether the existing *ex ante* remedies continue to be fit for purpose for the future, or how a new (more effective and

proportionate) regulatory regime may be implemented. Such a new regulatory regime could be *ex ante*, *ex post* or a mixture of the two.

7.1 The Authority's objectives

320. The Authority's objectives for a well-functioning electronic communications sector in Bermuda is set out below. These objectives capture the role and remit of the Authority, as described in Section 4 above (reflecting Part 3 of the RAA), and aim to strike an appropriate balance between the potentially conflicting purposes of the Authority.

Bermuda consumers and businesses are able to access high-quality services²⁹ at affordable prices.

Providers of electronic communications services continue to invest in improving the quality of service they can offer, and are able to obtain fair and reasonable returns³⁰.

The Authority will seek to achieve these outcomes through effective, fair and sustainable competition (whether at the network or service levels, or both). Where such competition has not emerged, and is not likely to in the near future, the Authority will seek to achieve these same outcomes through transparent and proportionate regulatory intervention.

321. The following fundamental principles underpin the Authority's proposed objectives.

- The Authority must strive to provide adequate incentives for entities to invest in new networks that can deliver high-quality services to businesses and consumers in Bermuda, while making sure these are offered at sustainable, low prices.
- The most effective mechanism for achieving optimum market outcomes for consumers is through effective and sustainable competition. Hence, where efficient market entry is feasible, the Authority will give due consideration for support of the same. In some instances, this may require inter-temporal trade-offs, such as keeping market prices higher than they might otherwise be in the short run in order to achieve sustainable competition in the long run, at which point regulation could be based solely on an *ex post* regime, subject to appropriate safeguards.
- Where effective competition is difficult or is unlikely to arise without intervention, appropriately designed remedies may be required in order to achieve a competitive outcome. For example, in some instances, this could be achieved with cost-oriented price regulation and/or an effective wholesale access regime.
- Market intervention by the Authority, whether *ex ante* or *ex post*, should be based on a transparent and predictable process.

²⁹ Ideally based on the latest technological innovations.

³⁰ For example, the Authority would include an assessment of the risks taken by ICOL holders in respect of their network investment, as part of an assessment of what returns may be fair and reasonable.

- Market intervention by the Authority should also be evidence-based and proportionate to the issue under consideration.
- In order to implement its objectives, the Authority will require, and where necessary mandate, access to timely, accurate and relevant information on the market. This includes overall data on all relevant markets; the ICOL holders' financial, commercial and operational data (as requested by the Authority in order to discharge its duties); and all relevant information from companies making representations to the Authority in relation to competition complaints and/or breaches of regulatory obligations.

7.2 The need for a new regulatory framework

322. In the Authority's view, the current regulatory framework needs to be modified in order to meet the new market realities and guide the market towards the proposed objectives..

323. The current regime relies primarily on a detailed set of *ex ante* remedies imposed on ICOL holders that have been found to possess SMP in different retail and wholesale markets.

324. Significant weight is currently placed on wholesale access remedies based on a retail minus 15% price control³¹, as well as a set of retail price controls in fixed voice, fixed broadband access and ISP, leased lines, and TV services.

325. The retail services of SMP ICOL holders are also subject to a detailed tariff-filing and notification process for all new tariffs, tariff changes and special promotions, and the provision of retail bundles by SMP ICOL holders is allowed subject to retail SMP services being available on a standalone basis and bundles not giving rise to a price squeeze.

326. SMP ICOL holders need permission from the Authority before launching new retail services controls in fixed voice, fixed broadband access and ISP, leased lines, and subscription TV services. In relation to such new retail services, the Authority must also determine whether an equivalent wholesale service is available that is fit for purpose.

327. Mobile services are largely exempt from these SMP remedies. For example, mobile services are not subject to a retail price control, and there currently is limited obligation on SMP mobile ICOL holders to provide wholesale access services.³²

7.3 Problems with the prevailing regime

328. Following the market review in 2013, various SMP remedies were applied to Digicel Group and OneComm (specifically the companies/licencees that became OneComm and

³¹ This applies to wholesale fixed narrowband and broadband access; wholesale leased lines; and wholesale subscription TV transmission services. It excludes all mobile access and call services, as well as international fixed call services.

³² However, mobile access obligations have been introduced in the 4G licenses that have recently been awarded.

Digicel Group). These remedies can be summarized as being focused on delivering the following:

- Price increases would be allowed for various OneComm and Digicel Group services, subject to 'ceilings'.
- There were obligations on the forward notification of retail tariff changes.
- There were obligations to provide wholesale equivalents of retail products at 'regulated' wholesale prices.
- There were restrictions and conditions relating to the introduction of 'bundled' services.

In the Authority's view, the continuation of the current regime is not a viable option for achieving the Authority's objectives for the electronic communications sector in Bermuda. There are a number of shortcomings with the existing regime, the most important being:

- The 2013 remedies are not able to deal with the different cost and service characteristics of new fiber based high speed broadband services. To this extent, they are limiting innovative and new pricing for high speed broadband services in Bermuda and are no longer relevant remedies in enabling the Authority to potentially regulate SMP in this market.
- The take-up of wholesale access products has been limited, with ICOLs reliant on the same citing a number of price and non-price reasons for this. As a result, the wholesale access regime has had limited success in delivering significant competition and choice relative to OneComm and Digicel Group.
- The tariff notification process for retail products has proven to be ineffective as it does not require a sufficient level of information for the Authority to appropriately, and adequately, determine the relationship between the cost of services being provided and the requirement to ensure proposed tariffs are fair and equitable.
- Price control remedies do not have a direct relationship to the costs of providing electronic communications services. They are therefore not explicitly designed to encourage and reward investment, and nor can they ensure that consumers are paying affordable prices relative to the costs of provision.

329. The July 2017 CFI asked respondents for their views on the current electronic communications regulatory regime. Their responses are summarized below.

330. Link commented particularly about the current wholesale access regime applicable to SMP ICOL holders (both for broadband and business services), noting that "it is time to reconsider the framework in place for wholesale access, particularly given the consolidation in the market since the last review." Link goes on to state that "it is appropriate for the Authority to review the method by which the wholesale providers' rates for broadband access are established, in order to ensure that wholesale competitors are not charged inflated rates prohibiting us from competing on retail price."

331. FKBNet noted that “while the [2013] remedies for SMP were strategically considered and have assisted in providing some guidelines for anti-competitive behavior, the companies with SMP have found practical methods of eliminating the competition.”

332. WOW stated its view that the SMP remedies in place particularly in the subscription television sector] have not generally been effective.

333. “X” stated that current remedies applied in relation to broadband are not strong enough, and also suggested more enforcement (i.e. fines) would be beneficial to the functioning of the market. It did not provide views on the remedies currently in place in other sectors.

334. Digicel Group stated in relation to the broadband sector that “[t]he Regulator should consider how it can relax the remedies currently in place.” In particular, it noted the tariff notification process as not being fit for purpose, and being overly administrative. Digicel Group went on to encourage the Authority to “reconsider the utility, practicality and ultimate effect the current remedies regime has on the ability for SMP ICOL holders to provide services at a competitive rate whilst still being able to make a reasonable return.”

335. Digicel Group also noted that “[t]he Authority should seriously question whether the implementation of the various remedies four years ago have made the telecommunications market more or less inviting, more or less innovative and more or less amenable to telecoms providers reacting quickly to market demands.”

336. Deltronics indicated that (especially in relation to broadband, mobile and business connectivity) existing remedies are neither reasonable nor appropriate, and in any event not effective.

337. OneComm stated that the current broadband remedies in place are “neither reasonable nor appropriate,” noting that the net effect of the prevailing regulatory approach has been to “discourage price competition and block promotions and bundling.” Also in relation to fixed voice and business connectivity, OneComm noted that the existing remedies are neither reasonable nor appropriate.

7.4 Key elements of the new regime

338. Notwithstanding the shortcomings with the current regime, and the fact that market outcomes to date have fallen short of the Authority’s expectations, there are positive signs of change. As discussed in Section 5, major investment programs in high-speed mobile and fixed networks are either underway or will be commencing shortly, including from new entrants. This may lead to price-based competition, which is to the direct benefit of consumers.

339. These developments indicate that electronic communications markets in Bermuda could be on the brink of a significant and positive transformation, and it is therefore essential that a modern and effective regulatory framework is in place to provide necessary support.

340. The regulatory regime needs to ensure that the planned investments do actually take place, by fairly remunerating those entities that take risks, and that Bermuda consumers and businesses receive a fair share of these benefits by paying affordable prices relative to the costs of provision and quality of service. Similarly, it is essential that efficient market entry and competition from new infrastructure providers is not stifled by potentially anticompetitive practices from the established ICOL holders (such as predation), and that access to enduring economic bottlenecks continues to be available on fair and reasonable terms.

341. Through this review, the Authority is consulting on the most effective and efficient regulatory regime to achieve these objectives. The Authority's initial views on the key elements and building blocks of the new regulatory regime are provided below.

342. The Authority believes that key elements of the proposed new regulatory regime are as follows and invites comments on these elements.

- The need for **regulatory intervention** to deliver appropriate levels of pricing and consumer benefits. This could be achieved via ex-ante based retail price regulation of Digicel Group and OneComm, and obligations to provide wholesale access.
- **Evidence-based decision-making requires a good understanding of costs.** The Authority believes that encouraging and rewarding efficient investment, protecting consumers from excessive prices, and acting swiftly to prevent anticompetitive practices such as predation or margin squeeze is reliant upon accurate and timely data on the costs of providing different electronic communications services, as well as the levels of profitability of ICOL holders.
- **Competition is the primary driver of effective and efficient markets, regulation as a back-stop**—the Authority will place considerable focus on understanding where competitive forces alone can be relied on to deliver its objectives for the market, and therefore where detailed *ex ante* regulation can be withdrawn. Where market forces alone cannot achieve this, the Authority will intervene to ensure that efficient outcomes prevail. This will involve making appropriate decisions on where to remove existing regulatory remedies, and where to impose new remedies or strengthen existing ones.
- **Making use of the Authority's wider set of regulatory powers**—the Authority is of the view that a combination of streamlined *ex ante* remedies and effective use of *ex post* competition powers is needed to achieve its objectives.

8 CONSULTATION QUESTIONS

343. Respondents are asked to provide comments and views on any section and content of this Review.

The Authority is particularly interested in responses to the following questions:

- **Question 1:** Do you agree that the 2013 SMP remedies and the Authority's regulation via the same have not led to expected benefits for consumers or optimal outcomes for competition?
- **Question 2:** What are your views on the Authority's assessment of the market provided in section 5?
- **Question 3:** Do you agree with the Authority's initial views on relevant markets and SMP, as set out in Section 6?
- **Question 4:** Do you agree with the Authority's proposed remedy options and other regulatory proposals set out in Section 6 and 7?
- **Question 5:** Do you agree that the Authority should regulate against abuse of dominance and market power by SMP operators across a range of market sectors, by the potential use of both *ex ante* and *ex post* regulation?
- **Question 6:** Do you believe that there is a need to make changes to the existing MVNO regime? If so, please specifically state what those changes should be.
- **Question 7:** Do you think that the submarine cable relevant market should be susceptible to SMP obligations?
- **Question 8:** Outside of the SMP *ex ante* remedies, what other regulations and administrative determinations applicable to the electronic communications sector should be made, modified or revoked? Please provide a detailed explanation for the same.
- **Question 9:** Are there any areas and issues that you believe have been omitted from this review that should be addressed by the Authority?