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Date	30 November 2017

Attention: Data Market Inquiry
By email

Dear Sir/Madam

VODACOM'S SUBMISSIONS IN THE COMPETITION COMMISSION'S DATA MARKET INQUIRY

1 We act on behalf of Vodacom Proprietary Limited (**"Vodacom"**) in making submissions in response to the Competition Commission's (**"Commission"**) Call for Submissions in the Data Market Inquiry. Following three preliminary points, we set out below, and in the attached documents, Vodacom's submissions to the inquiry.

2 **The importance of market definition**

2.1 Vodacom submits that it is important to contextualise the Data Market Inquiry within the relevant markets within which data is sold in South Africa.

2.2 Broadly speaking, Vodacom is of the view that data is sold within three main markets, namely the mobile retail market, the fixed retail broadband internet access market and the leased line internet access market. A smaller market in which data is currently sold is the market for fixed wireless internet access through microwave and satellite technologies. These technologies are likely to become significantly less relevant in future as the high bandwidth required by data usage may result in a move towards fibre access.

2.3 The allegation that data prices are high must be viewed within the competitive dynamic of the relevant markets within which data is sold. Where the markets are competitive, economic theory dictates that price outcomes will be competitive. Vodacom submits that the mobile market in which data is sold is competitive. However, the fixed markets are uncompetitive and, given the increasing importance of fixed infrastructure to mobile networks, Vodacom is concerned that this feature of the sector, coupled with spectrum constraints, may in the near future negatively affect price outcomes in the mobile market.

2.4 The Independent Communications Authority of South Africa ("**ICASA**") has recently embarked upon a detailed process of market definition as part of its priority market review. Vodacom made submissions regarding the appropriate market definitions for various markets. As requested we attach a copy of such submissions.

2.5 We provide a summary in Annexure A of the relevant upstream and downstream markets identified by Vodacom in response to ICASA's proposed market definitions in ICASA's Priority Market Inquiry, i.e. the upstream and downstream markets within which data services are offered or in which inputs for data services are obtained or supplied. Mobile and fixed data services are offered primarily as part of a broader bundle of products and services. Furthermore, it is important to appreciate that a broader "value chain" exists within which Vodacom procures goods and services in order to provide data services. This value chain (a term used by the Commission), addressed in greater detail below, extends beyond the markets identified in ICASA's Priority Market Inquiry and accounts for a significant portion of Vodacom's costs.

3 Overlap between the Inquiry and ICASA's Priority Market Inquiry

3.1 To a large extent, the summary contained in Annexure A repeats many of Vodacom's submissions in ICASA's Priority Market Inquiry given their clear relevance for the Data Market Inquiry. The Commission and ICASA should be aware of this great degree of overlap and duplication in the two processes.

3.2 Care should be taken that the Competition Commission does not attempt to pre-empt the work intended to be undertaken by ICASA, as the industry regulator. Careful cooperation is necessary to ensure that Vodacom, and other participants in both processes, have certainty as to the scope of each regulatory intervention. In terms of its governing legislation ICASA "*may not take any action where a matter has already been brought to the attention of and is being dealt with by that other authority or institution*".[1] Vodacom notes that the Competition Act provides that where a sector is subject to the jurisdiction of another regulatory authority, the exercise of the resultant concurrent jurisdiction should, to the extent possible, be undertaken in accordance with any agreement between the Commission and, for exampie, ICASA.[2]

4 The challenge of isolating mobile data for the Inquiry

4.1 It must be noted that in the mobile market, in which the largest part of Vodacom's business falls, [redacted] its customers make use of offerings that combine voice, messaging (SMS) and data. A proper investigation of the level of the price of data, as an isolated offering in the mobile market, is difficult and artificial because the price of data within bundled service offerings is not easily calculated. Furthermore, comparisons of the price of selected mobile data offerings to those in other countries is complicated by the differences in the service quality, coverage and spectrum related issues prevalent in those countries when compared to South Africa.

4.2 Frontier Economics has prepared a report, attached hereto, addressing various issues raised by the Commission in its call for submissions, including the difficulties in relying upon benchmarking to conclude that data prices are high. In addition, we will also make reference to Frontier Economics' report presented to ICASA in ICASA's Priority Market Inquiry.

4.3 In its attached report, Frontier Economics highlights various factors, such as access to spectrum and infrastructure that could reduce the price of mobile data further, bearing in mind that the effective rate of data has been declining steadily over the last few years.

4.4 We turn next to set out Vodacom's responses to the call for submissions made by the Inquiry.

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[1] Section 4B(9) of the ICASA Act.
[2] Section 3(1A)(b)

RESPONSES TO CALL FOR SUBMISSIONS IN DATA MARKET INQUIRY

5 **Ad question 9.1:** "*Current market research suggests that data prices in South Africa are significantly higher than many other countries, both in Africa and internationally. In light of the recent research, the following questions pertain to prices for data services in South Africa*:"

Please refer to the answer provided below in response to question 9.2.

6 **Ad question 9.2:** "*For which specific data markets, products or services (whether for data services alone or a product that includes additional services) are prices high in South Africa? Please substantiate your response*."

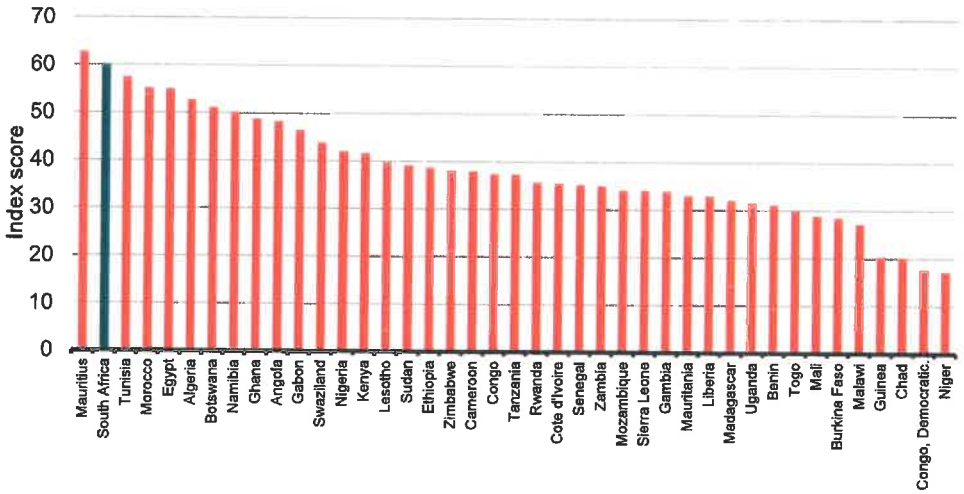
6.1 As pointed out in the introductory paragraph of this letter, prices of data must be evaluated in the relevant markets in which the data is sold. Vodacom is active mainly in the mobile market, in which data is sold as part of a bundle of voice, data and messaging.

6.2 Vodacom notes the Commission's reference to "current market research", without providing any further detail on the concrete source of such research. The Commission is kindly requested to provide the basis upon which it reached these conclusions and to provide Vodacom with access to the research to which it refers.

6.3 Frontier Economics deals extensively in its attached report with the allegation that data prices are significantly higher than in other countries. Frontier Economics analyses the available benchmarking evidence, concluding that benchmarking of data prices is complex and that significant variations in key economic and geographic factors across countries makes it difficult to draw robust conclusions from cross-country comparisons of headline prices. The report also highlights the need to consider non-price outcomes such as coverage and speed alongside headline price outcomes in order to give a full assessment of a country's relative performance.

6.4 Notwithstanding the challenges posed by benchmarking, Frontier Economics observes that the evidence from existing studies by ICASA and RIA, to which Vodacom has had access, does not show that headline data prices in South Africa are persistently or materially higher than in most African countries. These findings are further supported by more comprehensive datasets from ITU and GSMA, which show that headline prices in South Africa are often among the lowest priced in the sample of all African countries and typically below the sample average. In addition, the GSMA data shows that South Africa is outperforming the rest of Africa on key non-price factors, and that South Africa offers one of the best 'value for money' in relation to mobile data services.

Figure 1: Comparing 'value for money' of mobile data services in Africa (based on GSMA Mobile Connectivity Index)



6.5 Frontier Economics also analyses the competitive dynamics in the mobile and fixed markets in an earlier report prepared for ICASA's Priority Market Inquiry (referred to as "Frontier Economics' Priority Market report"), and notes that outcomes in the mobile market are competitive but the relevant fixed markets appear to be less competitive.

7 **Ad question 9.3:** *"In your view, what are the main causes for the higher prices for data services in South Africa? In your answer you could refer to probable causes such as cost issues, competition issues or regulatory issues. Please elaborate and provide any available evidence."*

7.1 As already noted, the premise, that there are "higher prices for data services in South Africa", when it comes to mobile markets, is questioned and disputed. That said, there are various factors that could lead to improved competitive outcomes and the reduction of the price of mobile data, including as Frontier Economics explains in its attached report, access to further spectrum and improved access to backhaul.

7.2 The availability of spectrum is particularly important in the context of deploying 4G and 5G network technologies in South Africa.

8 **Ad question 9.4:** "*With regards to data services and related products used in South Africa, please list all services that you currently use as an end-consumer and/or as a business or other such entity. Please provide details on the following*:

8.1 **Ad question 9.4.1:** "*The exact products/services used*;"

8.2 **Ad question 9.4.2:** *"Whether you use these as a private consumer or business/organisation (or both where appropriate);"*

8.3 **Ad question 9.4.3:** *"The name of the service provider/s; and"*

8.4 **Ad question 9.4.4:** *"The pricing and contractual arrangements involved."*

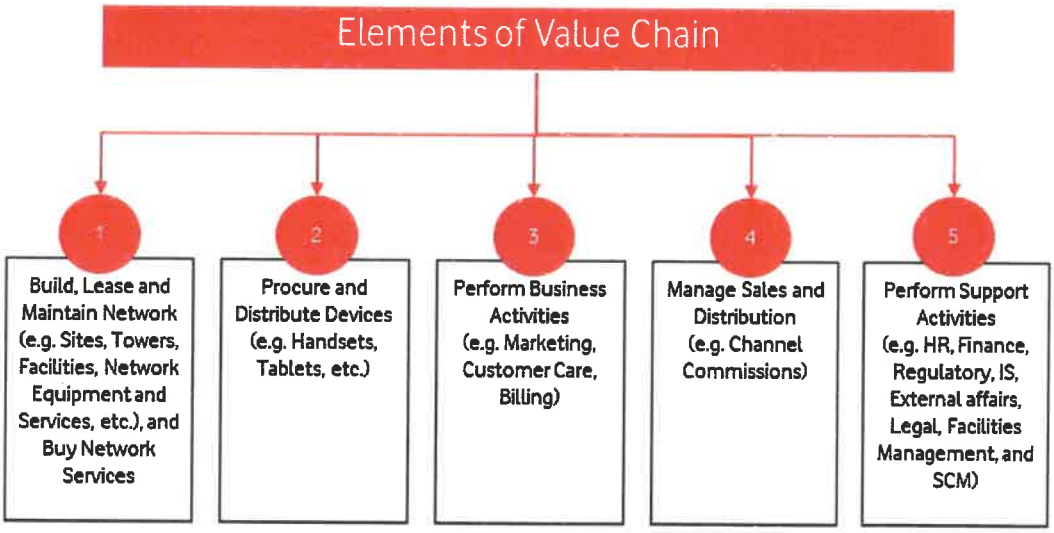
8.4.1 Vodacom does not consume retail data products and this question does not appear to be applicable to it.

8.4.2 However, Vodacom has provided details of its products which contain data services in Annexure A, in order to assist the Data Market Inquiry.

9 **Ad question 10:** *"Describe the entire value chain for the provision of data services. Include the following in your description:"*

9.1 Ad question 10.1: "The different levels of the value chain and the activities thereof;"

Figure 2 – Vodacom's high level Value Chain



Vodacom's high level Value Chain, as indicated in Figure 2, in relation to the delivery of ICT services, including data services, consists of five major elements. These elements can be described as follows:

- Build, Lease and Maintain network, and Buy Network Services: This element includes the sourcing and procurement of sites, network facilities and network equipment, the leasing of sites and network facilities, the buying of network services (e.g. voice call termination services) from other licensees, and the maintenance of sites, network facilities and network equipment, all used in the offer of services, including the provisioning of data services.

- Procure and distribute devices: This element includes the procurement, distribution and sale of devices (e.g. handsets, tablets, etc.) used by subscribers to access the network to use data services.

- Perform Business Activities: This element includes business activities performed to market Vodacom's services, including data services, providing customer care services to subscribers and the billing of subscribers for services used.

- Manage Sales and Distribution: This element includes the sale and distribution of Vodacom's services, including the delivery of data services, through various channels (e.g. direct sales and retail stores). A material part of this element is the payment of channel commissions.

- Perform Support activities: This element includes activities including HR, Finance, Regulatory, IS, External affairs, Legal, Facilities Management, and SCM, required to support and manage Vodacom's business.

9.2 **Ad question 10.2:** *"A list of all stakeholders active in each of the levels of the value chain (to the best of your knowledge);"*

To list all of the stakeholders active in each of the levels of the value chain would involve providing a list of all the suppliers to Vodacom, including some of the licenced operators within the market, and a list of all of the resellers and buyers of Vodacom's services. It will also involve the inclusion of all the potential suppliers, and resellers and buyers active in the market. Before attempting to compile such a list, Vodacom respectfully requests further clarification of this question: would it be sufficient to list only the major supplier

and buyers? In the meantime Vodacom provides the names of some of the major suppliers and providers (to the best of its knowledge).

Build and maintain network: Stakeholders active within this element include private individuals, corporate firms (these firms that let sites and properties let to Vodacom), and public institutions (e.g. Local Governments), property owners, corporate network facility (e.g. sites and masts) owners ([redacted]), network equipment providers ([redacted].)

Procure and distribute devices: Stakeholders active in this element include Apple, Samsung, Nokia, LG, Alcatel, Lenovo, Vodafone (Vodafone branded devices), etc.

Perform Business Activities: Stakeholders active within this element include the suppliers of marketing services: [redacted].

Manage Sales and Distribution: Stakeholders active within this element include [redacted].

9.3 **Ad question 10.3:** *"The nature of commercial relationships between the different levels of the value chain;"*

The nature of the relationship between Vodacom and the various suppliers in its value chain is described in response to question 10.1 above.

9.4 **Ad question 10.4:** *"How each level of the value chain identified above is linked to other parts of the Information and Communication Technology sector, and the economy more broadly."*

The elements of the value chain indicated in Figure 2 above are collectively required to provide ICT services, including data services. Certain elements of the value chain (but not all elements) described above fall within the markets or market segments identified in ICASA's Priority Market Inquiry.[3] The elements of the value chain which do not fall within the markets identified by ICASA (comprising, *inter alia*, self-provisioning and procurement activities) account for a significant portion of Vodacom's expenditure and are therefore situated in the broader context of Vodacom's business. The attempt to define relevant markets (as per ICASA's inquiry) therefore does not sufficiently deal with all the elements of Vodacom's value chain and the cost required to provide products and services (including data).

10 **Ad question 11:** "*How do existing firms conduct themselves in the markets for the provision of data services, whether with respect to other firms (competitors or potential entrants) or with respect to their customers?"*

10.1 **Ad question 11.1:** "*Are there firms that operate as monopolies at any level of the value chain for the provision of data services? Are there firms which have market power in any data market, service or product? Elaborate and provide examples.*"

10.1.1 Please refer to Vodacom's assessment of the competitive nature of the various markets in which data is sold (at various levels of the supply chain) contained in Annexure A. ICASA is conducting a review of the competitive dynamics in the relevant markets as part of its Priority Markets Inquiry.

10.1.2 The attached Frontier Economics report refers to bottlenecks in relation to access to backhaul, ducts and poles which, if addressed, would stimulate competition.

11 **Ad question 11.2:** "*Across the value chain for data services, are there any firms that engage in any conduct that could be seen as unfair or anti-competitive? Please elaborate and provide examples*"

11.1 Please refer to the Frontier Economics Report and Vodacom's submission in the Priority Markets Inquiry, in which bottlenecks are identified which ICASA has been called upon to regulate.

[3] It is important to note that Vodacom has stressed to ICASA, in the ICASA Priority Market Inquiry, that any relevant markets can lawfully be defined only as the product of a process yielded by a market inquiry conducted under section 67(4) of the ECA, and cannot be identified in any binding way prior to and independent of such an inquiry Any discussion of markets and market boundaries here and in the context of the ICASA Priority Market Inquiry must be read subject to this important caveat.

12 **Ad question 12:** *"There are a variety of regulations, legislation, and regulatory bodies – including the Independent Communications Authority of South Africa ("**ICASA**"), the Department Of Telecommunications and Postal Services ("**DTPS**"), and the Department of Communications ("**DOC**") – that inform the functioning of the telecommunications sector in South Africa. In light of this, please answer the following questions:"*

12.1 **Ad question 12.1:** *"How does the current regulatory environment in the telecommunications sector impact (i) the ability of existing firms to charge high prices for data, (ii) the level of competition, and (iii) the potential for entry?"*

12.1.1 The telecommunications sector is governed by sector specific legislation and regulations i.e. Electronic Communications Act 36 of 2005 ("**ECA**") and Independent Communications Authority of South Africa Act ("**ICASA Act**"), and regulations promulgated thereunder, which together comprise the current regulatory environment. Such legislation and regulations can have a direct impact on the ability of existing firms to set the appropriate level of prices for data services, the level of competition and the potential for entry. ICASA has the mandate to intervene in the market, including the mobile data market, to review competition within the sector, and to enable and create the environment for new entrants. Examples of ICASA executing upon its mandate include a) the review and regulation of voice call termination markets, b) initiating the priority market inquiry, c) the publication of the ITA in relation to high demand spectrum, etc.

12.1.2 The current regulated environment also allows the relevant Minister to make policies and issue directions, which must to be considered by the Authority.

12.2 **Ad question 12.2:** "*Provide your understanding and view of the roles of ICASA, DTPS, DOC and any other relevant body in the sector with respect to prices for data services in South Africa.*"

12.2.1 Telecommunications in South Africa is primarily regulated through the ECA. The ECA repealed the Telecommunications Act of 1996. The ECA regulates the convergence between the broadcasting and telecommunications sectors. Related to the ECA is the ICASA Act which establishes the sector regulator, ICASA.

12.2.2 ICASA is responsible for regulating telecommunications, postal and broadcasting industries in the interest of the public. ICASA's functions include, *inter alia*, the issuing of licences to telecommunications and broadcasting service providers, enforcing compliance with rules and regulations and controlling and managing the effective use of radio frequency spectrum.

12.2.3 As a result of ICASA's dual role in telecommunications and broadcasting, the DTPS and the DOC play important roles in relation to ICASA. The Presidential Proclamations in Government Gazette No. 37839 dated 15 July 2014 and Government Gazette No. 38280 dated 02 December 2014 directed the transfer of administration, powers and functions entrusted by the ECA to the Minister of Telecommunications and Postal Services from the Minister of Communications.

12.2.4 The DOC focuses on communications policy and strategy, information dissemination and publicity. The DOC also oversees ICASA e.g. the appointment of councillors.

12.2.5 The DOC has, since 2007 (prior to the split between the DTPS and DOC), endeavoured to introduce Local Loop Unbundling ("**LLU**"), which requires opening up Telkom's networks. However, the deadline set for 2011 has not been achieved and there has been no progress at all in this regard. This mandate, and any other mandate in relation to ICT, now falls under the DTPS.

12.2.6 More specifically, in respect to the specific roles of the bodies listed with respect to prices for data services in South Africa, see Vodacom's response to question 12.1 above.

12.3 **Ad question 12.3:** *"Provide your view of any recent regulatory changes and proposed amendments to the Electronic Communications Act – such as those focusing on rapid rollout of infrastructure and sharing of network infrastructure – to the extent that they relate to prices for data services and products."*

12.3.1 Vodacom welcomes proposed amendments to the ECA and the Regulations promulgated thereunder, if it, *inter alia*, brings about policy and regulatory clarity (which will facilitate investment), and if it addresses challenges hampering rapid rollout of infrastructure and the sharing of network infrastructure

since this could lead to shorter timelines to deploy infrastructure and reduce the cost of such deployment.

Vodacom is of the view that greater competition would be facilitated if the current laws and regulations are implemented more effectively, rather than through the amendment of these laws and regulations. Examples of instances where Vodacom believes that ineffective implementation hampers competition have been provided in Vodacom's Priority Market submission to ICASA.

12.3.2 In addition, Vodacom notes that it has severe concerns about the legality and economic and social desirability of much of what the White Paper envisages, especially in relation to spectrum exploitation and licensing. However, this topic is too extensive to address in this submission and Vodacom intends to address it comprehensively in the process of addressing the proposed amendments to the ECA (published on 17 November 2017).

13 **Ad question 13:** *"As the demand for data in South Africa escalates, the allocation of, and access to, spectrum in South Africa has become a key issue in the sector and for data services in particular. With regards to spectrum, please answer the following questions:"*

13.1 **Ad question 13.1:** *"How do issues of spectrum access and allocation affect competition and the potential for new entry?"*

Please refer to the attached Frontier Economics report.

13.2 **Ad question 13.2:** *"How do you view the role of spectrum in the mobile market and how do you think spectrum affects costs and pricing of data services?"*

Please refer to the attached Frontier Economics report.

14 **Ad question 14:** *"Please address the following questions:"*

14.1 **Ad question 14.1:** *"In your view, is data supply quality and coverage in South Africa adequate by international standards and the country's development needs? Please elaborate."*

As Frontier Economics sets out in its attached report, South Africa performs well in comparison to a range of international benchmarks when considering the range of non-price outcomes for consumers that will affect a consumer's overall valuation of their consumption of mobile services, including coverage and quality. For example:

- South Africa has the highest level of 3G coverage in Africa and even ranks above significantly more developed countries like Canada, Ireland, Germany, Finland and Sweden.
- Coverage of 4G services in South Africa is significantly above the average for African countries.
- Average download and upload speeds are far above other African countries

However, as we set out in more detail below, it is important that mobile operators continue to make significant investments in their networks (for which they will require access to 4G spectrum and backhaul services as described in the response to Q 13.2) in order to help meet the Government's developmental objectives for connectivity going forward. Substantive investment in fibre, for high speed broadband and backhaul will also be critical to achieving these objectives.

14.2 **Ad question 14.2:** *"How are businesses and consumers in low-income, under-developed, or rural areas affected by South Africa's data services challenges?"*

Business and consumers in low-income, under-developed, or rural areas are negatively affected if data services are slower than reasonably expected and if roll-out to these areas occurs at a slow pace. The economic benefits of providing access to broadband services have been well researched and reported.

Examples of challenges that need to be addressed, which hamper the required deployment of data services to all across South Africa, include, *inter alia*, the allocation of spectrum in accordance with best practices, the implementation of an efficient rapid deployment policy, the effective utilisation of universal service funds,

the deployment of affordable enabling devices, the development and sharing of backhaul and backbone network infrastructures.

If these challenges are addressed Vodacom expects that all consumers, including those residing in under-developed and rural areas, will enjoy greater and better quality access to data services.

15 Vodacom welcomes this opportunity to engage with the Inquiry, and remains available to engage further as it progresses its work.

Yours sincerely

ANDRIES LE GRANGE
CLIFFE DEKKER HOFMEYR INC

ANNEXURE A

1 Retail mobile services

1.1 Vodacom is of the view that there is a single broad market for retail mobile services, covering prepaid and contract voice, data, messaging and over the top ("**OTT**") services provided to residential and business customers, and machine-to-machine ("**M2M**") services. Vodacom is of the view that this is in line with:

1.1.1 ICASA's recent statement on call termination regulation,[4] which refers back to its 2010 determination that the relevant downstream market for mobile call termination services, was the *"national retail market for mobile access and calls (mobile retail market)"*.[5]

1.1.2 International precedents – there are limited international precedents which have defined retail mobile markets when considering *ex-ante* regulation, as the retail mobile market is deemed to be competitive in most countries. However, in the context of *ex-post* competition investigations or mergers involving mobile network operators, a single market for retail mobile services has commonly been defined. For example, the European Commission ("**EC**") has now reviewed more than ten mergers[6] involving mobile operators where it has used a broad retail market definition for mobile services.

1.2 Voice/messaging/data

1.2.1 Demand-side substitution between mobile voice, messaging and data services might be limited. This is because these services typically cover different customer needs.

1.2.2 However, the vast majority of mobile customers require access to all of these services, which they use in combination and interactively with each other. This requirement is becoming more prevalent and clear as customers relinquish their legacy devices and acquire smart devices so as to access all of these services. It is for this reason that the majority of tariffs offered by mobile operators in South Africa allow consumers to use mobile voice, messaging and data, and the vast majority of mobile consumers use their mobile price plan and service bundles for a combination of these services.

1.2.3 In particular, with the exception of M2M and Mobile Broadband ("**MBB**") services (discussed further below), mobile customers generally purchase a cluster of services from one provider of mobile services.

1.2.4 For this reason, all of Vodacom's price plans offer customers access to the Vodacom network, and the ability, amongst others, to make and receive voice calls, send and receive messages and use data. Further, [redacted] current contract price plans integrate voice calls, messaging and data in the units included as part of the monthly contract subscription. All customers also have the option to supplement their price plans with voice, data, messaging and integrated service bundles in various sizes. These bundles include a fixed number of service units on a once-off or recurring basis; the bundle expires once the included service units are depleted or the time limit is reached. All Mobile Service Providers ("**MSPs**") offer all services.

1.2.5 Although some customers require data only offers, for which Vodacom developed MBB tariff plans, this need is limited. [redacted].

1.2.6 Given the demand characteristics, i.e. combination of services of the tariff offerings discussed above, it is not feasible to define separate markets for voice, messaging and data, as they are not distinct products but are generally purchased as a bundled offering.

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[4] ICASA Notice 724 of 2107, "Amendment to the call termination regulation, 2014".
[5] Page 12.
[6] See for example: M.7018 TELEFONICA DEUTSCHLAND / E-PLUS, M.7612 HUTCHISON 3G UK / TELEFONICA UK, M.7758 – HUTCHISON 3G ITALY / WIND / JV, M.6497 HUTCHISON 3G AUSTRIA / ORANGE AUSTRIA, M.6992 HUTCHISON 3G UK / TELEFONICA IRELAND, M.7978 -Vodafone / Liberty Global / Dutch JV, M.6990 VODAFONE / KABEL DEUTSCHLAND, M.7637 LIBERTY GLOBAL / BASE BELGIUM, CASE M.7421- ORANGE / JAZZTEL, M.7231 VODAFONE / ONO.

1.2.7 Market definition should reflect the way in which operators compete in addressing customer needs. In particular, operators compete for subscribers through a combination of their voice, messaging and data prices. This is consistent with international precedents. For example, in its 2007 recommendation on relevant markets, the EC explained why different mobile services should be included within the same market due to the way in which the services are bundled:

> "*Customers use mobile phones for different purposes, such as making a voice call or sending an SMS. Rather than using different providers of these services, customers appreciate the ease and convenience of having only one handset and SIM card. Thus, consumers purchase a bundle or "cluster" of services from one mobile operator which usually includes local national and international (and roamed) calls and SMS. In this manner mobile firms benefit from economies of scope and consumers benefit from a reduction in transaction costs. Thus, the relevant market should include a "cluster" of products, where non-substitutable services are included in the same market.*" [7]

1.2.8 Subsequent to the EC expressing its views in the above statement, the level of demand-side substitutability between the different services has increased due to the emergence of OTT services. For example, it is now possible to use data services to make calls or send messages. This trend is likely to continue, going forward. Therefore, the case for including the different services (voice, messaging and data) within the same market is even stronger.

1.2.9 In addition, mobile voice, messaging and data services are supplied through the same mobile network elements (and in the vast majority of cases, the same SIM card). The vast majority of the network elements required to offer these services are the same. All of the services rely on sites, a Base Transceiver Station ("BTS")/ Node B/ Evolved Node B ("eNodeB"), Base Station Controller ("BSC")/ Radio Network Controller ("RNC"), Equipment Identity Register ("EIR"), Home Location Register ("HLR"), Visitor Location Register ("VLR"), Authentication Centre ("AUC"), backhaul and spectrum. There are only a limited number of network elements that are specific to voice, messaging and data services e.g. SMSC, call servers, ISP connectivity. In the near future, even these will be replaced with Internet Protocol ("**IP**") network equipment capable to offer all of these services using the same protocol. For an example, consider voice enabled through VoLTE.

1.2.10 Therefore, there is a high degree of supply-side substitution between these services.

1.2.11 MSPs who provide only messaging and/or data services would already have a retail network as well as customer support, marketing and billing in place, and so there should be minimal need for new investment into non-network areas of the business should such a supplier wish to start offering voice services.

1.2.12 Therefore, this form of supply-side substitution could happen quickly and supports the conception of the market based on demand-side substitution.

1.2.13 The above is also consistent with international precedent. For example, in past merger cases, the EC has also recognised that there is supply-side substitutability between voice, messaging and data services. In the merger between Telefonica and E-Plus in Germany, the EC stated the following[8]:

> "*The data gathered during the Market Investigation point towards the existence of a single market including all of these services. It is true that some of the respondents to the Market Investigation indicate that some customers using data-only services would not switch to bundled offers also including voice and SMS in case of a price increase. However, they point out that there is likely to be supply-side substitutability between these services. Indeed, as submitted by the Notifying Party, the vast majority of tariffs available on the market consist of voice, SMS and data services*"

1.2.14 Considering the above, it would be inappropriate to narrow the market for retail mobile services by separating out individual services, i.e. voice, messaging, or data.

1.3 Geographic market definition

[7] EC (2007) – Explanatory note on relevant markets.

[8] http://ec.europa.eu/competition/mergers/cases/decisions/m7018_6053_3.pdf

1.3.1 Vodacom submits that the geographic scope of retail mobile services is national. This is due to the following:

1.3.1.1 MSPs offer mobile services at a uniform price and product specifications across their geographic footprint (i.e. prices do not differ by geography; however, some tariff plans offering LTE coverage are available only in certain areas).

1.3.1.2 All Electronic Communications Network Service ("**ECNS**") licences are granted on a national level.

1.3.1.3 Vodacom understands that this is consistent with international precedent. For example, when the EC has looked at retail mobile service markets in the context of mergers, it has commonly defined a single national market.[9]

1.4 Description of products and services

1.4.1 Vodacom offers a range of different mobile Electronic Communication Services ("**ECS**") and non ECS (devices, insurance, content, advertising, etc.) of which the main ECS are voice, messaging and data services (including OTT) available on Post-paid, Top-up or Pre-paid price plans and service bundles. Vodacom's current main price plans and service bundles include:

1.4.1.1 Prepaid price plans - no contract and no "inclusive" airtime/units/device: here, customers buy and activate vouchers to recharge airtime that is then used to pay for services on a unit-by-unit usage basis or for service bundles. Current prepaid price plans include:

- *4Less* - [redacted]
- *Power Bonus* – [redacted]
- *Daily Free Calls* – [redacted]
- *Siyakha* - [redacted]
- *79 cents* – [redacted]
- *Power 4U* – [redacted]
- *Anytime per Second* – [redacted]

[redacted]

1.4.1.2 Postpaid price plans - 1, 12, 24 or 36 month contracts in terms of which Vodacom allocates integrated service units (voice minutes, data MB and/or SMS) and handset support to the customer at the start of each month and for which the customer pays a minimum amount at the start of the month of allocation. Once the allocated integrated service units are depleted customers can continue to use all services on a unit-by-unit basis, charged at the applicable plan rates, or purchase service bundles for which they pay in arrears. Current post-paid price plans include:

- *Smart+ (XS+, S+, M+, L+)*
- *RED+ (Select+, Classic+, Premium+, VIP+, Executive+, Professional+, RED Business+)*
- *Smart and RED More Data (2GB, 4GB, 6GB and10GB)*
- *Smart SIM only (S, M, L, XL)*
- *MBB (100MB, 250MB, 300MB, 500MB, 1GB, 2GB, 3GB, 5GB, 10GB, 20GB, 30GB and 50GB)*
- *M2M (Lite, Data,* and *Voice)*
- *Corporate APN+ (5GB, 10GB, 20GB, 50GB, 80GB, 100GB, 150GB, 250GB, 350GB, 500GB, 750GB and 1TB)*
- *Usage based* and *Reverse Billed APNs*
- *Business Flat rate*

[9] See, for example: EC Case M.7978 - VODAFONE / LIBERTY GLOBAL / DUTCH JV, dated 03 August 2016

1.4.1.3 Top-Up price plans - a hybrid between traditional prepaid and 1, 12, 24 or 36 month contracts in terms of which Vodacom allocates either airtime or integrated service units and handset support to the customer at the start of each month and for which the customer pays a minimum amount in advance at the start of the month of allocation. Once the allocated airtime of integrated service units is depleted customers can continue to use all services on a unit-by-unit basis, charged at the applicable plan rates, or purchase service bundles for which they pay in advance by recharging their account. Current Top-Up price plans include:

- *uChoose Flexi (55, 110, 150, 200, 350, 500, 750, 1000 and 1500)*
- *Smart Top-Up+ (XS+, S+, M+ and L+)*
- *RED Select TopUp+*
- *Smart SIM only (S, M, L, XL)*
- *uChooseMore Data (2GB, 4GB and 6GB)*
- *MBB (100MB, 250MB, 300MB, 500MB, 1GB, 2GB, 3GB, 5GB, 10GB, 20GB, 30GB and 50GB)*
- *M2M*

1.4.1.4 Service bundles - customers also have the option to supplement the above tariff plans with voice, data, messaging and integrated service bundles in various sizes. These bundles include a set number of service units on a once-off or recurring basis and the bundle expires once the included service units are depleted or the time limit is reached. Pricing and affordability of these services bundles are managed through volume of units, the validity period for expiration of services, or limitations with regard to usage of the services for specific customer needs. Current service bundles include:

- *Data (Mobile Internet, Mobile Broadband, Hourly, Daily, Weekly, Fortnightly, Night Owl, Pay Once, Internet Starter Pack, NXT LVL, Just For You)*
- *SMS (30 Day, Just for You)*
- *MMS (30 Day)*
- *Voice (Night Shift, Chat for 20/30, My5, NXT LVL, Power Bundle, Power Combo)*
- *Integrated* (My5, NXT LVL)

1.5 Competitive nature of the mobile retail market

1.5.1 Vodacom considers the market for retail mobile services in South Africa to be competitive. Please refer to Frontier Economics' Priority Market report (submitted under separate cover) for a detailed assessment of the current performance and competitive dynamics in the mobile sector in South Africa. In particular, Frontier Economics concludes as follows:

1.5.1.1 Market structure - there is currently strong infrastructure-based competition between four mobile network operators ("**MNOs**"). Each of the MNOs offers customers a different proposition[10] and no MNO is able to act independently of its competitors and customers.[11] There are also a number of commercially negotiated national roaming and Mobile Virtual Network Operator ("**MVNO**") deals in South Africa, which enable and enhance competition in the mobile retail market. South Africa further has the most developed MVNO market in Africa[12] with multiple MVNOs focusing on niche areas, which helps to increase consumer choice. In total, there are currently more than 20 MSPs active in the retail mobile service market.

1.5.1.2 Market outcomes - the current market structure in the mobile sector is delivering good outcomes for consumers, both in terms of price and non-price outcomes.

1.6 Non-price outcomes

1.6.1 South Africa performs well on non-price measures compared to other countries, especially within Africa. This includes, for example, 3G and 4G penetration rates, coverage levels, and download speeds. There is further a wide range of service offerings and tariff plans available by each provider, providing end-users with a wide range of choice best to meet their demand. This includes a range of choices covering

[10] For example, [redacted], whilst Cell-C has focused on offering zero-rated content.
[11] This is because no MNO has an unassailable advantage that other MNOs would not be able to replicate.
[12] https://www.ovum.com/research/the-african-mvno-market-takes-shape/ .

all aspects of mobile services (i.e. handsets/devices, monthly allowances, contract length, payment methods and value added services, etc).

2 Upstream wholesale markets in relation to mobile market

2.1 Vodacom's view is that MVNO access and national roaming should be included as part of a broad market for wholesale mobile services. This is primarily because of supply-side substitution between MVNO access and national roaming. Nonetheless, Vodacom notes that there are some differences between these two services from an access seeker's perspective. Therefore, there could be a case for placing national roaming and MVNO access in separate segments within the broad market for mobile wholesale services.

2.2 In addition, Vodacom considers that those Access Point Network ("**APN**") services that provide wholesale access to data should be in the same broad market for wholesale mobile services.

2.3 Throughout the rest of this document, where Vodacom refers to "National roaming" this should be interpreted as including i) National roaming ii) MVNO access and iii) APN services.

2.4 Vodacom provides wholesale services, including capacity and geographic reach, in accordance with commercial agreements with the relevant parties. Vodacom's ability to compete for roaming and MVNOs' business is restricted by its capacity constraints, considering that it first needs to compete with other national licensed operators at a retail level. [redacted] This constraint, plus the uncertainty as to the ability to gain access to more spectrum, impedes Vodacom's ability to compete in this market.

2.5 Rain entered the market at the end of 2016. It offers a wholesale mobile service (LTE Advanced) to Vodacom. Whilst Rain has so far had limited impact on the market given its recent entry, it can be expected to increase competition in future, whilst improving consumer outcomes.

2.6 Vodacom provides National Roaming to one roaming seeker, namely Cell C, indirect access to all of the MVNOs provided access by Cell C [MVNOs have access to Cell C network and that of Vodacom as part of the roaming agreement between Vodacom and Cell C], and to [redacted] APN (data) seekers. MTN provides roaming services to Telkom.

2.7 Vodacom intends also to offer MVNO access. [redacted] capacity requirements take into account Vodacom's ability to compete with other operators, notwithstanding capacity constraint due to its share of customers (its spectrum per customer is the smallest – as elaborated above), the impact of providing roaming to Cell C (the third largest mobile provider), and considerable uncertainty in relation to the prospect of obtaining access to additional high demand spectrum (given what is envisaged and intended in the White Paper).

2.8 The offering of wholesale mobile network services, which includes services provided to MNOs, MVNOs, and service providers (e.g. resellers of APN services), is competitive.

2.9 All operators who have been assigned spectrum are able to offer mobile wholesale network services. Three of the six operators who have been assigned spectrum (of which the remaining three are actively considering their options) are providing national roaming services to other MNOs and access to MVNOs. By way of example, Rain is deploying mobile network infrastructure to provide data (LTE Advanced) services to other MNOs and MVNOs. Vodacom is providing network services to Cell C; MTN is providing network services to Telkom Mobile; and Rain is providing network services to Vodacom.

2.10 Both Vodacom and MTN offered national roaming to new entrants i.e. Cell C and Telkom Mobile.

2.11 Cell C and Telkom Mobile have various options which increase their bargaining power during negotiations [redacted].

2.12 With Rain's entry, the number of operators providing roaming have now increased to three, increasing the options available even further.

2.13 A number of MVNOs have entered the market, of which a large number of new entrants have joined the market recently. Some of the MVNOs focus on niche markets, which will bolster competition at a mobile retail level.

2.14 New MVNOs were able to enter the market by obtaining network access and services from Cell C which has been facilitated by the fact that Cell C is buying network services from Vodacom. This practice is permitted by Vodacom. [redacted], Vodacom is already indirectly hosting MVNOs on its network, which enables them to compete nationally.

2.15 Cell C does not have the same capacity constraint [redacted] that Vodacom, and possibly MTN, has. For this reason, and through selective geographic roaming, Cell C is able to compete strongly in the offering of MVNO services, especially in the provisioning of 4G services.

2.16 Vodacom does not have access to pricing levels and the pricing structure in the market, but is able to state that the competition in providing these wholesale services is strong, which drives prices down. Pricing for roaming has decreased over the period of time that Cell C has been buying network services from Vodacom.

3 Retail fixed line services

3.1 In relation to the market definition of fixed line services in the ICASA priority market investigation, Vodacom supports ICASA's proposed split between voice, broadband and leased fixed line services as a reasonable starting point for conducting market reviews. Indeed, where national regulators have examined fixed retail markets they have often considered similar splits. The latter two broad markets are relevant to the provision of data services.

3.2 Vodacom does not see a need to define separate sub-markets for services within these broader markets, for example for services offered to business and residential customers. This is both because, in reality, there is likely to be demand-side and/or supply-side substitution between services in potential sub-markets and because competitive conditions in these sub-markets may typically not differ significantly, meaning that defining a large number of separate (sub-) markets may serve only to complicate the framework without any attendant benefit. One exception to this, however, relates to the different technologies used to provide fixed broadband and leased line services. Here, for the reasons set out below, Vodacom recognises the difference between wired and other fixed wireless network technologies, given the differences in service quality and capability that that these different technologies allow.

3.3 In relation to the fixed line markets in which data services are provided, Vodacom submits that the following markets exist:

3.3.1 Asymmetric broadband internet access

Products offered

3.3.1.1 Vodacom's position is that this market includes only fixed wired technologies (i.e., copper and fibre services).

3.3.1.2 In this regard, Vodacom offers Broadband Connect services which combine access, internet and customer equipment for internet connectivity over self-provided and 3rd party fibre and 3rd party (Telkom) ADSL infrastructure. It is a "best effort" service and speeds may be negatively affected in the case of network congestion. The product portfolio is called "Broadband Connect Fibre/DSL". [redacted].

3.3.1.2.1 Broadband Connect Fibre (or Fibre Broadband for consumers) provides broadband internet access through scalable GPON fibre connectivity. [redacted]

3.3.1.2.2 Broadband Connect DSL provides broadband Internet access via Telkom last mile DSL connectivity. [redacted]

3.3.1.3 Vodacom also provides Broadband Connect services over microwave and satellite. For the reasons set out in this Annexure, Vodacom does not consider that these form part of the same market as wired services and believes that it forms part of a separate market.

3.3.1.4 Broadband Connect Wireless Premium provides broadband Internet access through last mile ISM band (unlicensed spectrum) microwave connectivity. [redacted]

3.3.1.5 Broadband Connect Satellite is ubiquitous throughout South Africa and targeted at areas with no or limited terrestrial network coverage. [redacted]

3.3.1.6 [redacted]

Product market definition

3.3.1.7 Vodacom submits that a market exists for fixed retail Broadband Internet Access. This is equivalent to a "retail mass market" as explained by the EC in its explanatory note[13]. Vodacom considers that this market includes fixed wired technologies (i.e., copper and fibre services) offered to business and residential customers, covering all bandwidths, but does not include broadband offered over wireless or mobile networks. This is because, as described further below, there are clear functional differences between fixed wired and wireless broadband products which reduce the extent to which consumers view these services as substitutes, whilst there is also only a limited possibility of supply side substitution between these services. These differences are explained in more detail below.

3.3.1.8 Furthermore, Vodacom notes that these differences are likely to become more pronounced over time, as fibre networks are rolled out to more South African consumers and demand for bandwidth increases. Slow deployment of fibre to public switched telephone network (**"PSTN"**) customers means that many consumers in South Africa today suffer with (at best) access to poor quality and slow fixed network services. As such, Vodacom recognises that for these customers, mobile or fixed wireless networks can provide an attractive alternative. However, it would be wrong to conclude, on the basis of this, that mobile broadband services or fixed wireless can be a feasible or desirable long term substitute for fixed line broadband services given the nature of demand for data services. For this reason, Vodacom therefore also relies, in what follows, on international benchmarks from countries where investment in advanced wired broadband networks has progressed more quickly than in South Africa.

3.3.1.9 Indeed, as demand for bandwidth increases, the importance of fibre services will also increase. This is because capacity on fibre networks can be easily and quickly increased, for example by adding extra cards into the exchange (Optical Line Terminating Unit) and additional backhaul. In contrast, the air interface on mobile and fixed wireless services will place a natural constraint on the bandwidth offered over these services. For example, this is already manifested where consumers have a choice between fixed and mobile broadband and mobile broadband is typically not sold as the primary means of access, but as a complement.

[13] SWD (2014) 298, page 35.

3.3.1.10 In what follows Vodacom sets out in more detail the differences between these products and explains how these differences manifest themselves in the commercial offers of service providers in South Africa.

3.3.1.11 There are significant functional differences between fixed and wireless broadband services:

3.3.1.11.1 Whilst mobile broadband offers the customer mobility, it (and other forms of "fixed wireless" broadband access, referred to as "**FWA**") is typically limited compared to fixed (wired) broadband in terms of throughput capability, reliability of service, latency, contention management and various other factors. With respect to mobile, these limitations are mainly due to the fact that the finite amount of download capacity available within a mobile base station area (within the mobile broadband network) is shared dynamically across end users utilising the broadband services within that area. These demands vary with regard to both the number of active end users and the capacity they are using, which is exacerbated by the ability of mobile users to move across the mobile network. For example, congestion may occur when a large number of mobile broadband customers unexpectedly converge within the reach of a single base station and require broadband access or require access at particular times of the day. In these cases, contention and congestion may adversely affect the user experience of those accessing that base station, (e.g., by slowing down the connection considerably for all customers being served by that particular base station at that moment). Therefore, mobile networks are more difficult to plan and manage than are fixed networks. Accordingly, to build excess capacity into the network to the extent required to achieve consistent throughput (even through peak times) on a mobile network is likely to raise costs by a considerable amount. Indeed, this is why speeds and availability on mobile networks cannot be guaranteed in the same way as they can for fixed network services.

3.3.1.11.2 The above considerations also have a significant effect on the pricing of the relevant products, as explained by Frontier Economics.

3.3.1.11.3 With regard to Fixed Wireless Access (in the context of asymmetric broadband Vodacom refers specifically to point-to-multipoint ("**P2MP**")), the usage of such networks has declined over recent years, as technologies such as Wimax reach their technological limits and are unable to compete against wired services. Indeed, download capacity on P2MP FWA networks is also limited and shared between users in a given radio sector, which entails that performance (available speed, latency, etc.) will deteriorate where there are many active users in a single sector. Spectrum is also shared with other P2MP FWA Electronic Communications Network Service Licensee(s) ("ECNSL"), meaning services are subject to interference from other spectrum users (e.g., Vodacom's BBC Wireless Premium product is using unlicensed ISM spectrum band which is susceptible to interference with no recourse to address this). P2MP FWA networks are also subject to interference from bad weather. Finally, in South Africa, P2MP FWA coverage is inferior when compared with the current reach of the PSTN, meaning that for many customers, P2MP FWA does not provide a feasible alternative to wired broadband.

3.3.1.11.4 In comparison to mobile and P2MP FWA, fixed wired broadband services are not shared in the access network layer as the broadband services are provided over a dedicated path between the end user's premises and the local exchange. Fixed services can be shared higher up within the broadband network; however, this is done at a network layer where the availability of bandwidth is typically less of a problem and can be managed more easily. The addressable customer base for fixed wired broadband services is clearly defined as access to customer's premises, and networks are planned in detail, which ensures precise demand management.

3.3.1.11.5 As well as these differences in service quality/reliability, a range of other factors also limits mobile broadband and FWA download and upload speeds and reduces the comparability of these services with fixed line/ wired broadband. These factors include: availability of sufficient spectrum and backhaul capacity to support the traffic load, number of simultaneous users on the network, distance that the customer is located from the nearest 3G/4G/ P2MP FWA mast, the construction materials used for the customer premises (especially wall thickness), the modem that the customer is using, etc.

3.3.1.11.6 Similarly, latency on competitive fixed networks is consistently better than on mobile networks, meaning that fixed networks are more suitable for many real-time, data intensive applications. For

example, in September 2016 in the UK, average latency on fixed networks ranged from 12-17 milliseconds, compared to 53 milliseconds on 4G networks.[14]

3.3.1.11.7 For some services, because of the functional differences between fixed and mobile, fixed networks would be the best option, and in some instances the only option, to be used in delivering these services. For services, as indicated in the table below, requiring consistent speeds of above 100 Mbits/s, fibre would be the only option.

1 to 5 Mbit/s	10 to 100 Mbit/s	1 to 10 Gbit/s
• Web browsing (complex sites) • E-mail (larger attachments) • Remote surveillance • IPTV, SD (1–3 channels) • File sharing (small, medium) • Telecommuting (ordinary) • Digital broadcast video (1 channel) • Streaming music	• Telemedicine • Educational services • Broadcast video, SD and some HD • IPTV, HD • Gaming (complex) • Telecommuting (high-quality video) • High-quality telepresence • Surveillance, HD • Smart, intelligent building control	• Research applications • Telepresence using uncompressed video streams, HD • Live event digital cinema streaming • Telemedicine remote control of scientific or medical instruments • Interactive remote visualization and virtual reality • Movement of terabyte data sets • Remote supercomputing

Source: California Broadband Task Force 2008

3.3.1.12 These functional differences lead to differences in the characteristics of packages sold to customers:

3.3.1.12.1 For the reasons set out above, wireless broadband offers typically do not guarantee minimum broadband speeds and while the maximum theoretical speeds of mobile broadband are comparable with current fixed broadband speeds, the average throughput on mobile networks tends to be lower and more variable than on fixed networks. For example, in the UK, Ofcom in September 2016 reported that advertised download speeds on fixed networks ranged from 38Mbit/s to 200Mbit/s, with actual maximum speeds achieved around 75-100% of these advertised speeds (at 33-203Mbit/s). In contrast, average 4G download speeds in the UK from July-October 2016 ranged from 13-32Mbit/s.15,16.

3.3.1.12.2 These differences manifest themselves when one compares the packages available on fibre and wireless networks in South Africa. For example, the product design and marketing of fixed broadband products typically emphasise the availability (and guarantee) of higher speeds and monthly download caps which are particularly relevant for households and heavy bandwidth users at fixed locations, where the service and download limits can be shared by multiple users. For example, data caps are common on mobile and fixed wireless networks, due to the cost structure of those networks and the constraints of adding additional capacity. In contrast, it is common for wired broadband offers to not include any such data cap.

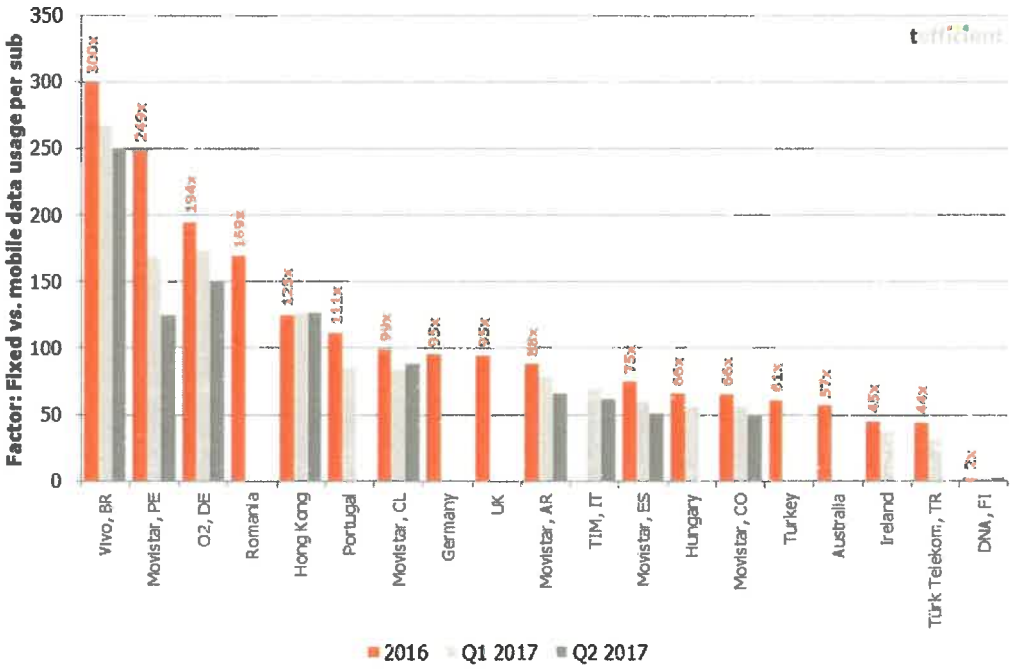
3.3.1.12.3 Related to this, consumer download profiles for fixed and mobile broadband networks show that consumers using fixed broadband products download many times more data than consumers on mobile broadband products. This variance in the level of utilisation is suggestive of different underlying consumer preferences in using fixed broadband networks for more bandwidth intensive applications, such as high definition video, for example, in particular, due to their differing technical capabilities. This is illustrated in the following chart, which compares fixed and

[14] Fixed network figure taken from https://www.ofcom.org.uk/__data/assets/pdf_file/0015/100761/UK-home-broadband-performance,-November-2016-Technical-report.pdf. Mobile figure taken from Ofcom mobile broadband measurement fieldwork, October to December 2014.

[15] September 2016 Ofcom report: https://www.ofcom.org.uk/__data/assets/pdf_file/0012/100605/comparing-service-quality-report.pdf.

[16] As set out above, Vodacom believes that it is important, when considering the potential of fixed network services, to look beyond South Africa today. This is due to Telkom's failure to deploy a substantial fibre network to date.

mobile broadband usage across a range of operators in different countries, and shows that in many cases, consumers download 100 times more data on fixed than on mobile networks.[17]



3.3.1.12.4 This difference is likely to increase. Currently, 50% of broadband traffic is already video and HD video and the demand for these services is likely to increase further, whilst ultra-high definition services will also become increasingly important, again stimulating demand for fibre broadband services. Finally, notwithstanding the functional differences, the price per MB for mobile broadband is typically higher than fixed broadband for large data allocations. Operators see these services as complements:

3.3.1.12.5 The expansion of Telkom "fixed" into mobile broadband, and the expansion by Vodacom, MTN and others into fixed broadband highlight the perceived differences in fixed broadband products compared with mobile broadband products. This diversification suggests that mobile broadband is typically not considered by operators to be a close supply side substitute for fixed broadband.

3.3.1.13 There is limited supply side substitution between fixed and wireless services:

3.3.1.13.1 In the preceding paragraphs Vodacom has set out why, on a forward looking basis, there will be limited demand side substitution between fixed and wireless broadband products. It is also the case that there is no supply side substitution between these services. Whilst, as set out above, there has been some expansion of market players into providing broadband via alternative technologies, this is part of a long term recognition by communications providers that they need to be active across the portfolio of telecommunications services and will need to be able to offer their consumers triple and quad-play (internet, telephone, television and mobile) bundles of services. This should not be mistaken for supply side substitution such as meant in a typical market definition exercise, which looks at the ability of suppliers relatively quickly (typically defined as being within 12 months) to switch production into new products, in response to an increase in the price of the focal product.

Geographic scope of the market

3.3.1.14 Vodacom submits that the geographic market is national in scope. Alternative networks tend to be built in urban areas and so more densely populated and metropolitan areas will generally have more

[17] Source: http://tefficient.com/is-high-mobile-data-usage-cannibalising-fixed/.

networks available. However, retail fixed broadband prices tend to be geographically averaged by service providers i.e. the price for a given broadband product offered by a service provider does not differ by geographic location. Similarly, retail product functionalities/characteristics tend to be homogenous across different areas, whilst there is also no difference in the licensing provisions across the country. Finally, defining distinct sub-national geographic markets also requires stable boundaries between those markets. Given that the roll out of fibre is ongoing, Vodacom does not believe it would be possible to set such stable boundaries currently.

3.3.2 Leased lines internet access

Products offered

[redacted]

3.3.2.2 [redacted]. For the reasons set out above, Vodacom does not consider that these form part of the same market as wired services. [redacted]:

[redacted]

Market definition

3.3.2.3 Vodacom submits that there is a national leased lines market (or "retail high quality market" as explained by the EC in its explanatory note[18]). This is separate and distinct from the broadband market as described above. This is because leased line services offer users (typically large business customers) guaranteed symmetric bandwidth, over a dedicated connection. As such, this differs from the asymmetric broadband connections.

3.3.2.4 Copper/fibre/fixed wireless

3.3.2.4.1 As with broadband services described above, Vodacom believes that the relevant market relates to leased lines provided over wired (copper and fibre) infrastructure. Vodacom does not believe that leased lines offered over microwave infrastructure provide a reliable and effective substitute for wired leased lines on a forward looking basis. This is because microwave links have a number of constraints which can limit their use. For example, these links require unimpeded line of sight, and interference can limit availability in densely populated areas. Furthermore, multiple hops are required to cover long distances, which reduces the efficacy of microwave.

3.3.2.5 Differentiation by bandwidth size

3.3.2.5.1 Vodacom does not believe that it is necessary to define separate sub-markets for different bandwidths of leased lines. As with the broadband market, there is clearly supply side substitution between different bandwidths offered over these networks. For example, bandwidth can be added seamlessly to fibre networks and at very limited incremental cost. In addition, there is also likely to be a chain of demand-side substitution between leased lines of different bandwidths.

[18] SWD(2014) 298, page 36

3.3.3 Wholesale fixed line services

3.3.3.1 In relation to services where data is provided, Vodacom proposes that different wholesale markets exist for wholesale asymmetric broadband origination, wholesale internet connectivity, National/Trunk, Local/Terminating and International leased lines. These markets are downstream from the upstream, infrastructure markets and upstream from the retail asymmetric broadband internet access market and the leased line market.

3.3.3.2 Vodacom believes it is appropriate to define, on a forward looking basis, separate markets for trunk and terminating segments of wholesale leased lines. This reflects the fact that the bottleneck will often be concentrated in the local access (i.e., terminating segment) market, with more competing infrastructures and lower barriers to entry in the market for trunk segments.

3.3.3.3 Wholesale asymmetric broadband origination

3.3.3.3.1 Vodacom submits that Wholesale Broadband Origination ("**WBO**") on fixed (wired) networks should be identified as a separate wholesale fixed market. This includes bitstream services. This is equivalent to the market that was included in the EC's list of markets susceptible to *ex ante* regulation in 2003 (market 12- Broadband Access), 2007 (market 5 – Broadband Access) and 2014 (market 3b – Wholesale Central Access provided at a Fixed location).

[redacted] Bitstream is provided over wired (copper and fibre) networks. Only Telkom has a fixed access network of a national scale and consequently the ability to provide national wired WBO services. However, because of slow DSL and now fibre deployment in its national access network, not even Telkom is currently in a position to provide national fibre bitstream services. In addition to Telkom, [redacted]

[redacted]

[redacted]

3.3.3.3.3 Telkom is by far the largest provider of bitstream services to Vodacom (and the market in general), with these other providers often covering only very small developments.

3.3.3.3.4 Bitstream products are used as last mile access to provide Vodacom's Broadband Connect services to consumers and businesses and IP and LAN Connect services to businesses. Technically Vodacom connects its core network to the bitstream provider's network who in turn provides the last mile past the customer's residence or business. [redacted]

3.3.3.3.5 The boundaries of this market reflect the boundaries of the equivalent retail market. As Vodacom has set out in relation to the retail market, it considers that this market covers fixed (wired) broadband services only. As such, the wholesale market is also limited to fixed wired technologies.

[redacted] Vodacom's retail Broadband Connect offers make use of, amongst others, wholesale inputs obtained in this market. [redacted]

3.3.3.3.7 Vodacom submits that this market is national in geographic scope since high and non-transitory entry barriers exist and only Telkom can offer WBO on a national scale.

3.3.3.3.8 Wholesale internet connectivity

3.3.3.3.8.1 Vodacom understands this market covers the necessary global connectivity arrangements to permit connectivity by Vodacom end-users with all other Internet end-users. This can be arranged by a combination of purchasing from a network that is in a position by its own arrangements to guarantee such connectivity, or via interconnecting and exchanging traffic with other networks. Furthermore, Vodacom understands that this wholesale market excludes international and national leased lines.

3.3.3.3.8.2 Vodacom buys IP transit and peers with Internet Service Providers to provide internet connectivity to its users. [redacted]

3.3.3.3.8.3 The providers of wholesale internet connectivity are:

[redacted] IP transit – [redacted]

3.3.3.3.8.3.2 Peering is done settlement free, therefore no purchase or lease is involved.

3.3.3.3.9 Vodacom supports a separate market for wholesale internet connectivity.

3.3.3.4 National/Trunk leased lines

3.3.3.4.1 Vodacom proposes that a national wholesale market be defined for national/trunk leased lines. This market is downstream from the upstream infrastructure markets and upstream from the wholesale mobile services market, the retail fixed line services market and the mobile retail services market. Consistent with the retail leased line market, Vodacom proposes that this market should focus on wired infrastructure and should not be split by bandwidth.

3.3.3.4.2 The providers of national/trunk leased lines are:

3.3.3.4.2.1 National transmission network

[redacted]

3.3.3.4.2.2 Metro transmission network – none

3.3.3.4.2.3 National - there are currently no national alternatives to Telkom (i.e. no other providers have similar levels of national coverage). Access transmission networks are provided through Telkom: STM-1 links, STM-4 links.

3.3.3.4.2.4 However, there is some competition on particular intercity routes, especially from Broadband InfraCo and Liquid Telecom / Neotel.

3.3.3.4.2.5 Metro transmission network – N/A

3.3.3.4.2.6 Access transmission network – refer to the market for WBO on fixed (wired) networks above.

3.3.3.4.3 There are currently no alternative suppliers of wired leased lines on a national scale. Telkom is the only ECNSL able to offer fibre based leased lines nationally. With regard to alternative fibre networks, leased lines are available in the sporadic geographic areas currently reached by alternative fibre access networks. These include:

3.3.3.4.3.1 Broadband Infraco;

3.3.3.4.3.2 Liquid Telecom;

3.3.3.4.3.3 Smart Village;

3.3.3.4.3.4 Internet Solutions;

3.3.3.4.3.5 Fibrehoods;

3.3.3.4.3.6 GreenCom; and

3.3.3.4.3.7 Metro Fibre.

3.3.3.4.4 [redacted]

3.3.3.4.5 This market is national in scope.

3.3.4 Local/Terminating leased lines

3.3.4.1 With regard to the access part of Vodacom's ECN, Vodacom buys wholesale inputs from other ECNSL where it is not possible/feasible for Vodacom to self-provide the following:

3.3.4.1.1 Backhaul for mobile and fixed services.

3.3.4.1.2 Inputs to retail leased lines - Vodacom's retail IP Connect and LAN Connect offers make use of, amongst others, wholesale inputs obtained in this market. [redacted].

3.3.4.1.3 Providers of local/terminating leased lines are:

3.3.4.1.3.1 With regard to Mobile/Fixed services backhaul [redacted]

3.3.4.1.3.2 [redacted].

3.3.4.1.3.3 With regard to wholesale leased line inputs to retail leased lines:

3.3.4.1.3.3.1 Telkom is the sole provider of copper-based wholesale Diginet lease line services nationally.

3.3.4.1.3.3.2 Additionally, there are currently no alternative suppliers of fibre bitstream services on a national scale. Telkom is the only ECNSL able to offer fibre bitstream services nationally during the period of this review given its advantageous position in the Wholesale Local Access ("**WLA**") market.

3.3.4.1.3.3.3 Vodacom [redacted] wholesaling the IP Connect and LAN Connect retail services [redacted].

3.3.4.1.3.3.4 Vodacom proposes that a national wholesale market for access connections provided over fibre infrastructure.

3.3.4.1.3.3.5 Furthermore, this market also includes products which enable ECNSLs to extend their fixed local access networks as well as to backhaul fixed and mobile services. For example, wholesale leased lines are used by MNOs to convey traffic from a dispersed set of radio access nodes/base stations to a centralised location where calls and data can be routed over core networks to their eventual destination.

3.3.4.1.3.3.6 Consistent with the retail leased line market, Vodacom proposes that this market should be defined with reference to wired infrastructure and should not be split by bandwidth.

3.3.4.1.3.3.7 Vodacom submits that this market is national in scope.

4 Upstream Infrastructure

4.1 In Vodacom's view, 'Upstream Infrastructure' ('Upstream Infrastructure' or 'passive infrastructure') describes equipment and installations which fall within the term 'facility', as defined in the EC Act of 2005, and include the following:

4.1.1 International Transmission Services market - passive infrastructure to provide international connectivity/capacity (e.g. International Gateway facilities).

4.1.2 National Transmission Services, Metropolitan Connectivity, and Access Services markets - access to (un-lit) dark fibre, ducts, poles and manholes, as well as all relevant ancillary facilities/services and colocation space in building and sites.

4.1.3 Mobile radio access network ("**RAN**") services market – mobile sites, masts, towers, cabinets, power and air-conditioning; and passive antennae (where the radio is separate from the antenna).

4.2 While ICASA has defined various separate markets for upstream infrastructure (i.e. international transmission services, national transmission services, metropolitan connectivity, access services and mobile radio access network services), Vodacom prefers to have reference to a broader market for upstream infrastructure.

4.3 For the sake of providing an overview of the relevant levels of the upstream infrastructure supply chain, the following description of infrastructure at various levels is provided:

4.3.1 National Transmission

4.3.1.1 [redacted] Note that there is significant infrastructure based competition on these routes. However, as mentioned above, the below routes represent only a sub-set of all routes currently required by Vodacom. They also do not reflect Vodacom's forward looking requirements for National Transmission routes.

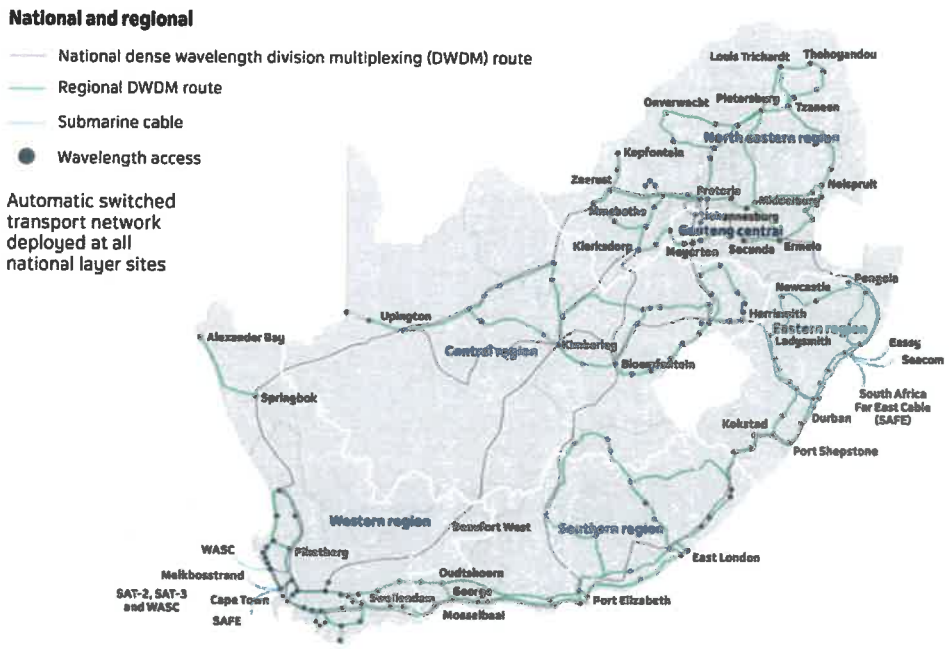
Table 1: Vodacom national routes

National Routes	Telkom	Broadband Infraco	Vodacom	MTN	Liquid / Neotel	FibreCo
Johannesburg To Bloemfontein	X	x	x	x	x	x
Bloemfontein to Cape Town	X	x	x	x	x	x
Kimberley to Johannesburg	X	x	x	x	x	
Johannesburg To Bloemfontein	X	x	x	x		x
Kimberley to Johannesburg	X	x	x	x	x	
Durban to Pretoria	X	x	x	x	x	

4.3.1.2 Where Vodacom currently purchases trunk leased lines for National Transmission [redacted], Vodacom would like to purchase access to the underlying passive infrastructure or dark-fibre, as this provides more commercial and technical flexibility than the current arrangements.

4.3.1.3 Going forward, Vodacom will further require the activation of additional national transmission routes. Given the current and expected network footprints, Vodacom expects that most of these new routes will only have facilities and dark fibre controlled by Telkom. The full extent of the passive infrastructure on national routes under Telkom's control is not known to other ECNS licensees. Telkom's Annual Reports (Figure 1) clearly show that its fibre-carrying National Transmission passive infrastructure is much larger than the combined footprint of other ECNS licensees.

Figure 1 Telkom's National and Regional Fibre footprint (Source Telkom Annual Report 2017)



4.3.1.4 From a practical perspective, the extent and precise location of Telkom's passive infrastructure that could be, but is not, used to carry fibre, is entirely unknown to Vodacom.

4.3.2 Metropolitan Connectivity

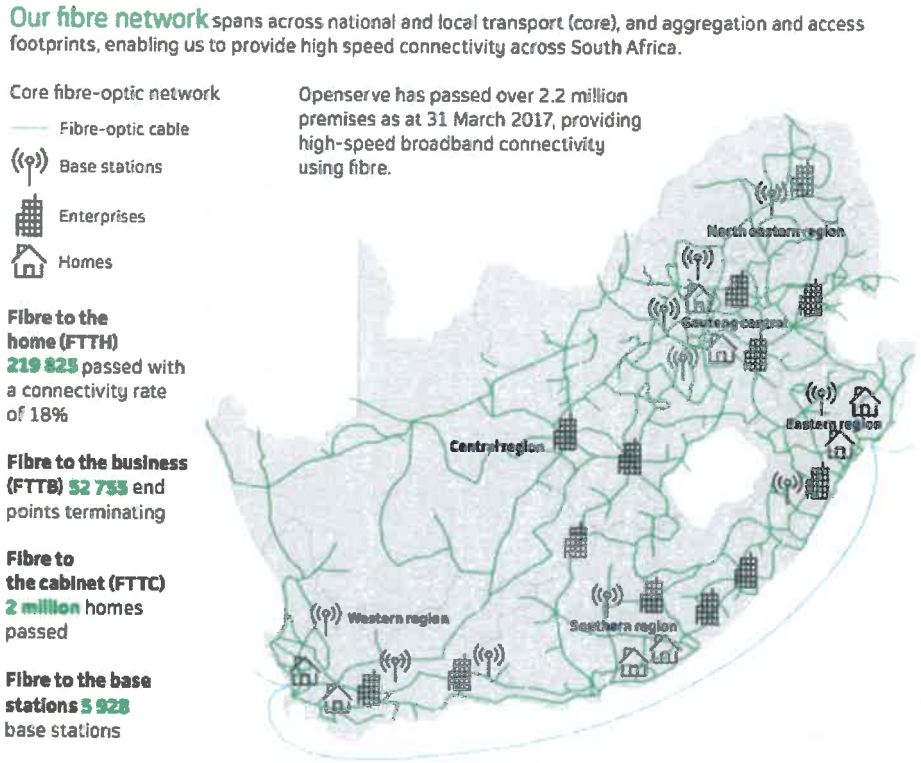
4.3.2.1 Vodacom currently meets its Metropolitan Connectivity capacity needs based on a combination of (long-term) dark fibre leases with DFA and limited self-supply. This represents a sub-optimal solution to address Vodacom's most pressing capacity needs. Pressure due to capacity constraints will increase significantly going forward.

4.3.2.2 Given this, and as discussed above with respect to National Transmission infrastructure, Vodacom considers it essential to gain access to passive infrastructure (i.e. duct access or dark-fibre) in the metropolitan network layer on a national basis.

4.3.2.3 Given its extensive network coverage, Telkom is the only potential national supplier of such passive infrastructure access. Unfortunately, Telkom does not offer access to passive infrastructure or dark-fibre products. Whilst there are also providers with passive infrastructure to provide Metropolitan Connectivity, this is not available on a national scale.

4.3.2.4 The extent of Telkom's dark-fibre footprint and the precise location of Telkom's dark-fibre routes are unknown to Vodacom. Telkom's annual reports (Figure 2) clearly show the significance and capillarity of its fibre footprint.

Figure 2 Telkom's Fibre footprint (Source Telkom Annual Report 2017)



4.3.2.5 In addition to Telkom's current fibre footprint, much of the passive infrastructure, such as ducts and poles, historically used for copper connectivity in metropolitan areas, can also accommodate dark fibre. Telkom's footprint and the location of passive infrastructure suitable for dark fibre roll-out are unknown to Vodacom. Access to the ducts and poles (many of which are legacy civil engineering facilities and have not been installed specifically for fibre connectivity) would permit competitors to install fibre and establish additional connectivity without additional sunken costs related to civil engineering works.

4.3.3 Access Services

4.3.3.1 Vodacom currently uses a combination of copper, microwave and optical fibre as transmission mediums in the fixed access network. However, going forward Vodacom foresees a need to connect most of its RAN sites with fibre (for backhaul purposes). Vodacom further foresees an increasing need for fibre based access services to meet its demand for retail fixed (broadband and leased lines) services.

4.3.3.2 To achieve this, Vodacom would like to purchase WLA services[19]. Given its extensive (legacy and fibre) access network coverage, Telkom is the only potential supplier for such passive infrastructure access on a national scale and this position is unlikely to change in future.

4.3.4 Mobile Radio Access Network Services

4.3.4.1 Vodacom's current suppliers are implicitly also alternative suppliers. In particular, in areas where multiple providers are present, Vodacom can source the site access from any of these alternative providers and vice versa. As such, these suppliers should be considered both as current and alternative providers.

[19] Note that parties capable of supplying dark fibre or duct access are options predominantly where Vodacom wants to procure dark-fibre on additional access routes. Where these suppliers have passive infrastructure in place they generally prefer to sell only managed services and charge a price premium. Absent suitable WLA products or the opportunity to access existing ducts and poles, the options are limited as: switching suppliers and leasing additional dark fibre or routes requires payment of a premium for unwanted services; or laying new cables will likely entail substantial civil works by the supplier of dark fibre which could be avoided if existing ducts and poles could be used.

[redacted] Further, Vodacom is supporting and developing alternative suppliers with Broad-based Black Economic Empowerment ("**B-BBEEE**") credentials. Vodacom will use these companies to commission new sites. [redacted]

[redacted]

4.3.4.3 Access to upstream infrastructure is an essential input to providing wholesale and retail fixed and mobile services. Given the prevailing differences in network coverage of ECNSL, having non-discriminatory access to ducts, poles and dark fibre in Telkom's nationwide access and core network is an essential enabler of effective competition in downstream fixed service markets, and for reducing costs in downstream mobile service markets. This is particularly the case given the high barriers to entry (both financially and regulatory)[20] to the upstream infrastructure markets and Telkom's unwillingness to provide passive infrastructure access to ECNSLs on reasonable terms, despite the facilities leasing regulations requiring that electronic communications facilities, including ducts and poles, be shared. In particular, Telkom has received requests for access to ducts and poles by Vodacom - typically, Telkom's response has been the raising of technical procedural objections, a request for more time and refusal to engage on technical parameters and/or feasibility constraints.

4.3.4.4 Without access to the duct and pole infrastructure controlled by Telkom, it is likely to continue to be difficult for other providers to compete with Telkom in the provision of fibre services in the majority of areas, meaning that Telkom will continue to be able to deploy fibre networks at its chosen speed, without facing competition in most areas from other fixed service providers who would otherwise be willing to invest.

4.3.4.5 The majority of the addressable market for fibre services is likely to lie within Telkom's existing duct and pole infrastructure. Access to ducts and poles to enable competitors to instal new fibre should, therefore, increase infrastructure-based competition for fixed services with limited additional civil engineering costs. In particular, duct and pole access should incentivise greater investment in fibre cables and the active equipment connected to these cables. As the ECNSL would also be able to exert a stronger competitive constraint on Telkom, implementing duct and pole access regulation should also provide a greater opportunity for other operators to invest in fixed infrastructure (e.g. fibre), and put pressure on Telkom to increase its investment in fixed services in order to compete.

4.3.4.6 A further benefit of avoiding unnecessary duplication of the duct and pole infrastructure controlled by Telkom is that civil works often entail the unintended consequence of damaging adjacent utility infrastructure.

[20] The costs of rolling-out a duct and pole network, largely determined by the cost of civil works, are unlikely to fall over time. Further, many local authorities in South Africa have a single trench policy, by which they refuse approval for wayleaves when there is passive infrastructure already in existence.