



**COMPETITION COMMISSION DATA SERVICES MARKET INQUIRY
MTN'S PRELIMINARY SUBMISSION**

27 November 2017

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1. Introduction and executive summary

Introduction

- 1.1 On 18 August 2017, the Competition Commission (the "Commission") initiated a market inquiry into Data Services in South Africa in terms of Chapter 4A of the Competition Act No. 89 of 1998 (as amended) (the "Competition Act"). On 20 September 2017, the Commission invited stakeholders to make formal submissions. Mobile Telephone Networks Proprietary Limited ("MTN") would like to thank the Commission for the opportunity to make this submission.
- 1.2 MTN is mindful of the context within which the market inquiry takes place, with public pressure to ensure ever lower costs for, and wider access to connectivity, such as the #datamustfall movement, and inquiries by other agencies, such as ICASA, into priority markets. MTN is committed to being a pro-active corporate citizen, having invested heavily, over more than 20 years, to try and meet exponential growth in demand and ensuring that South Africans have wide access to high quality mobile connectivity across the country, including in rural areas, at fair and reasonable prices within a competitive environment.
- 1.3 In this note MTN provides an initial submission to the Commission, focussing primarily on its areas of activity, which is the provision of mobile data services.

Executive summary

- 1.4 Data services provide connectivity between users and a largely fixed network that provides further connections to internet webpages, mobile applications hosted by third parties, and other users. The ultimate connection between users and this interconnected network may be by fixed or wireless means.
- 1.5 Data services might be provided via an initial mobile connection between a user and the infrastructure of a Mobile Network Operator ("MNO"), such as an antenna on a mast, with further connections to other components in that network, on a local, regional and national basis, and finally international connections between the mobile network in South Africa and networks in other countries that might ultimately host the relevant webpage or mobile application. Alternatively, data services might be provided via an initial fixed connection, such as a copper, ADSL, or fibre line.

- 1.6 The majority of South Africans have little or no access to fixed connectivity. By contrast, mobile connectivity gives millions of South Africans access to information, by providing extensive geographic and population coverage, and affordable costs to connect. Mobile connectivity is the pathway by which most people conduct business, and receive education, banking and financial services, government services and healthcare. Mobile connectivity is a vital contributor to economic growth, employment and the alleviation of poverty and inequality.
- 1.7 Fierce competition amongst MNOs has driven continuous and significant investments that have resulted in nearly universal coverage, and the delivery of data volumes that have grown exponentially, network quality that has constantly improved, and pricing that has fallen dramatically year after year.
- 1.8 MTN has invested around ZAR 100 billion in capital expenditure over more than 20 years, with ZAR 70 billion in the past 10 years alone. MTN has long achieved over 98% coverage of the population with its 2G technology layer, 3G coverage has grown to over 95%, and 4G or LTE services have expanded to over 60% of the population. MTN's data speeds have improved by more than 7 times over the past decade. The volume of mobile data handled by MTN has grown 18 times in the past 5 years, while MTN's data prices have fallen by 85% over this same period, and 4G LTE handset prices that it has imported have fallen by 86% over the past 3 years.
- 1.9 Moreover, MTN has engaged in a number of significant initiatives to improve access to connectivity, in particular for low-income subscribers, such as partnering to provide zero rated access to mobile banking apps, and free access to university e-learning applications and websites.
- 1.10 [REDACTED]

- 1.11 In general regulation should promote competition, encourage investment, reduce unnecessary costs and remove obstacles for firms to compete. Excessive regulatory interventions, imposed at low or arbitrary thresholds, will harm incentives to invest, will harm competition and will harm consumers, in particular the poorest and most vulnerable consumers.
- 1.12 Economic regulation must be targeted at the obstacles to efficiency; in particular the specific bottlenecks in the provision of better quality and cheaper (mobile) data services. In particular, MNOs require access to more spectrum in order to allow them to compete even more effectively, and provide greater access to mobile data services, at ever lower costs.
- 1.13 MNOs in South Africa operate subject to severe spectrum constraints. With access to far less spectrum than many of their global peers (to whom we are typically compared), South African operators have required far larger investments, resulting in higher input costs and prices than would otherwise have been enjoyed. The spectrum constraint is now at a critical point where addressing ongoing exponential growth in data demand will require correspondingly ever faster growth in capital investment, which is already at unsustainably high levels. Regulators must act decisively to address this spectrum constraint, and allow the operators to continue expanding coverage, and substantially driving down the costs of mobile data services within a competitive market.

2. Data services value chain¹

- 2.1 Data services provide connectivity between users and a largely fixed network that provides further connections to internet webpages, mobile applications hosted by third parties, and other users. The initial connection between users and this interconnected network may be by fixed or wireless means.
- 2.2 By way of illustration, a user located in Pretoria might wish to access a webpage hosted at the University of California, in the USA. The content and functionality of that webpage is hosted in the USA. In order to access that webpage, a user located in South Africa would need to invoke the following connections:
- 2.2.1 International connectivity - South Africa is connected to the rest of the world through five submarine cables – Wacs, Seacom, SAT-3, SAFE, and Eassy. Wacs, Sat-3/SAFE, and EASSy are owned by a consortium of mainly telecommunications companies, specifically, MTN owns an 11.4% share in Wacs², a 27% share in EASSy, along with Telkom and Liquid Telecom (previously Neotel), while Telkom holds a 13% share in SAT-3/SAFE.³ Seacom, by contrast, is privately owned and does not include any network operators.⁴ Deployment and management of these cables is typically outsourced to vendors and with landing station provider partner arrangements in specific countries (in some cases a consortium member will fulfil this role). Capital costs of deployment are borne by the consortium members, in accordance with an ownership agreement, usually referenced as a Construction and Maintenance Agreement (C&MA). Each member is allocated units of capacity in Minimum Investment Units (MIUs) or Minimum Assignable Unit (MAUs), according to their participation. Consortium members are free to provide capacity on the cable system on a wholesale basis. Capacity is normally

¹ This section addresses the Commission's Call for Submissions, Question 10.

² WACS ownership breakdown 2017. WACS ownership breakdown. [ONLINE] Available at: <https://businesstech.co.za/news/telecommunications/12582/wacs-ownership-breakdown/>. [Accessed 06 November 2017].

³ dijit.net. 2017. Undersea cable plan tangled in acrimony in South Africa | Balancing Act - Africa. [ONLINE] Available at: <http://www.balancingact-africa.com/news/telecoms-en/3852/undersea-cable-plan-tangled-in-acrimony-in-south-africa>. [Accessed 06 November 2017].

⁴ Here is who controls the Internet in South Africa. 2017. Here is who controls the Internet in South Africa. [ONLINE] Available at: <https://mybroadband.co.za/news/broadband/106353-here-is-who-controls-the-internet-in-south-africa.html>. [Accessed 06 November 2017].

provided to third parties under an indefeasible right of use (IRU) agreement which is a long term, exclusive and unrestricted right to access such capacity. These submarine cables terminate in coastal areas, in Yzerfontein and Melkbosstrand in the Western Cape, and Mtunzini in KwaZulu-Natal.

2.2.2

National transit connectivity - National networks then connect major population centres, and also connect to the termination points of international connectivity noted above. This national network comprises high-capacity fibre optic transmission links between cities and towns and/or service providers' points of presence (PoPs) across the country. MNOs and other infrastructure providers (such as Liquid Telecom, Dark Fibre Africa and WBS) have installed alternative fixed networks at the national transit level. Mobile operators also have high-capacity fixed connections between each of their core networks, and the national transit network. Table 1 below summarises the national transit connectivity in which MTN has an interest:

Table 1: MTN interest in national transit connectivity

Route Fibre	Description	Km	Owner	Comments
NLD1	Johannesburg to Durban	697	MTN, Vodacom, Liquid - Co-build	Asset owned by all parties No restriction on wholesale of capacity
NLD2	Johannesburg to Bloemfontein	725	MTN, Vodacom, Liquid - Co-build	Asset owned by all parties No restriction on wholesale of capacity
NLD3/4	Bloemfontein to Cape Town	1011	MTN, Vodacom, Liquid - Co-build	Asset owned by all parties No restriction on wholesale of capacity
NLD7	Polokwane to Ladysmith	963	Liquid	MTN purchased a portion of the dark fibre asset from Liquid (Build in progress)
NLD8	Polokwane to Centurion	386	Liquid	MTN purchased a portion of the dark fibre asset from Liquid
NLD9/10	Johannesburg to East London	963	FibreCo	MTN has leased fibres from FibreCo

Source: MTN

- 2.2.3 Local (or "last mile") connectivity. Users may then be connected to the national network by fixed or wireless means.

Fixed

- 2.2.3.1 Users might receive data services via fixed connections, such as copper, ADSL, or fibre.
- 2.2.3.2 After more than a century, the dominant fixed line operator, Telkom, had only reached around 4 million subscribers by 1994, and that number has not grown since. Indeed, fixed subscribers have fallen in the past few years. For the minority of fixed line subscribers that have access to fixed telephony, there are no close substitutes, and it is costly and slow to duplicate fixed infrastructure for last mile access to these premises.
- 2.2.3.3 Telkom's competitors largely comprise the second fixed line operator, Liquid Telecom, which provides converged services over fixed and wireless local loop (WLL), LTE and fibre.⁵ Liquid Telecom serves both the enterprise and residential segments.
- 2.2.3.4 MNO's together with a gradually increasing number of small players also provide fibre connections.⁶ These smaller players include ISP's/fibre service providers such as MWEB, Vumatel, Vox Telecom, Frogfoot, Link Africa, TTConnect, SA Digital Villages, 123net, GreenCom, MetroFibre Networkx, Octotel, and Comtel, among others. However, Telkom already has a very widespread fixed line infrastructure for fixed connectivity, while the new entrants have a far less extensive network, in particular at the local level. While several new entrants (including the MNOs) have access to substantial national fixed connectivity (either of their own or leased from third parties), it is the local last mile access where Telkom retains its very strong position.

⁵ Liquid Telecom only has a very limited trial deployment of LTE connectivity, comprising approximately 50 LTE sites deployed in the Gauteng area since 2013, configured with a 10MHz carrier of 1800MHz spectrum with an estimate of less than 50 000 active subscribers. See Muller, R. (2013, August 22). Neotel LTE tested. Retrieved from MYBROADBAND: <https://mybroadband.co.za/news/broadband/84889-neotel-lte-tested.html>

⁶ These services include fibre connectivity Fibre to the Home ("FTTH") services, as well as fibre connections to businesses, office parks, estates, and complexes.

2.2.3.5 Moreover, there are significant barriers to entry in attempting to replicate Telkom's local fixed connectivity. These barriers to entry arise for many reasons, which include the application of the rapid deployment guidelines, the nature of wayleave applications that take a long time for approval by local Authorities, and SANRAL's policy to only allow a single disruption to each road. There are several new active companies in providing last mile fixed connectivity, such as Vumatel, Vox Telecom, and Internet Solutions, who are focussed in particular on new fibre connectivity. However, these new players are primarily focussed on rolling out fibre connections to wealthier suburbs and business parks.

2.2.3.6 The majority of South Africans have little or no alternative to fixed connectivity provided by Telkom. As we discuss further below, mandating access to passive infrastructure, such as ducts, will facilitate the installation of alternative last mile fixed connectivity options for customers. However, it is not economically viable to lay alternative fixed connectivity to many of these customers, and indeed it would be inefficient to duplicate the existing infrastructure.

Mobile

2.2.3.7 If users are connected by mobile networks, this involves the application of a Public Land Mobile Network ("PLMN"), which consists of two main components, the Core Network and the Radio Access Network ("RAN").

2.2.3.8 The RAN is the part of the mobile network that enables connectivity between the Core Network and mobile devices. Mobile devices are effectively two-way radios that convert voice and data signals into radio waves, and vice versa. Subscribers may access and utilise mobile communication services using a variety of mobile devices, such as cell phones (including smartphones), tablets and laptop computers. A RAN is typically implemented using base stations, which include equipment such as antennas, support cabinets, and power supplies. RAN equipment is employed at sites on structures such as masts.

- 2.2.3.9 The Core Network is the intelligent part of the network, which manages call connections (including authentication and switching); manages connectivity through routing; provides mobility management, national and international roaming; manages the overall quality of communications; provides supporting functionality including the collation and processing of charging data generated by network nodes; and also provides back office functionality such as hosting the subscriber database, billing, customer management, retail and wholesale services; and provides operational functionality. The Core Network consists of a grid of high-capacity telecommunication facilities that conveys telephone calls and data, across its own PLMN, and to other PLMNs, the Public Switched Telephone Network ("PSTN"),⁷ and the internet.
- 2.2.3.10 The RAN enables connectivity between the Core Network and mobile devices. A base station sends and receives radio signals through antennas to enable connectivity with mobile devices within its transmitting or receiving range (which is termed a "cell"), using specific frequencies of radio waves. A section of the radio frequency spectrum is allocated to mobile telephony and MNOs are each assigned sections of that radio frequency by means of spectrum licences issued by ICASA. In South Africa radio frequencies, such as 700MHz, 800Mz, 900MHz 1800MHz and 2100 MHz are currently reserved for use in mobile telephony. Each MNO provides connectivity for mobile services using its assigned frequencies over a RAN.
- 2.2.3.11 In configuring its network, an MNO will take into account the frequency bands at its disposal; the mobile communication technologies that it is capable of deploying; the availability of Base Station sites; and the type, location, and volume of demand for its services.
- 2.2.3.12 Each MNO might apply a number of different mobile

⁷ The Public Switched Telephone Network (PSTN) is a network of telephone lines, fibre-optic cables, communication satellites and undersea telephone cables that aggregate to the world's circuit-switched telephone network, allowing calls and other information to be transferred anywhere in the world.

communication technologies simultaneously, in order to efficiently accommodate the different forms of information that is communicated between mobile devices and the network, such as voice calls, text messages, and internet data. The different mobile communication technologies broadly include Second Generation (2G), Third Generation (3G) and Long Term Evolution (LTE, also referred to as 4G) technologies. These can be used on any of the assigned bands in the radio frequency spectrum, although the nature of radio frequency spectrum will often dictate which frequencies are preferable for particular technologies. Frequency is inversely proportional to coverage area (i.e. higher frequencies achieve smaller coverage areas from a given antenna location).

- 2.2.3.13 Total capacity on a RAN typically depends primarily on two factors, namely -
- 2.2.3.13.1 spectrum; and
- 2.2.3.13.2 sites and network investment (the technologies deployed at each site, and the connections between those sites).
- 2.2.3.14 Spectrum bands are only capable of carrying a finite amount of information in an area, depending on the number of subscribers in each area, and the form of their mobile usage. Implementing multiple technologies over a single spectrum band will further reduce the overall capacity available, as certain amounts of spectrum are required to implement each technology whilst keeping it separate from the adjacent technologies. MNOs must apply these technologies in such a way as to provide the best possible service to the highest number of subscribers, subject to the constraints of their existing spectrum allocation and network coverage.
- 2.2.3.15 There are currently six MNOs in South Africa: Vodacom, MTN, Cell C, Liquid Telecom,⁸ Rain and Telkom. There is also a number of mobile virtual network operators ("MVNO"), Virgin Mobile, FNB,

⁸ Although we note, as above, that Liquid Telecom only has a very limited trial deployment of LTE connectivity.

smartmobile and Mr Price which uses the Cell C and MTN network.

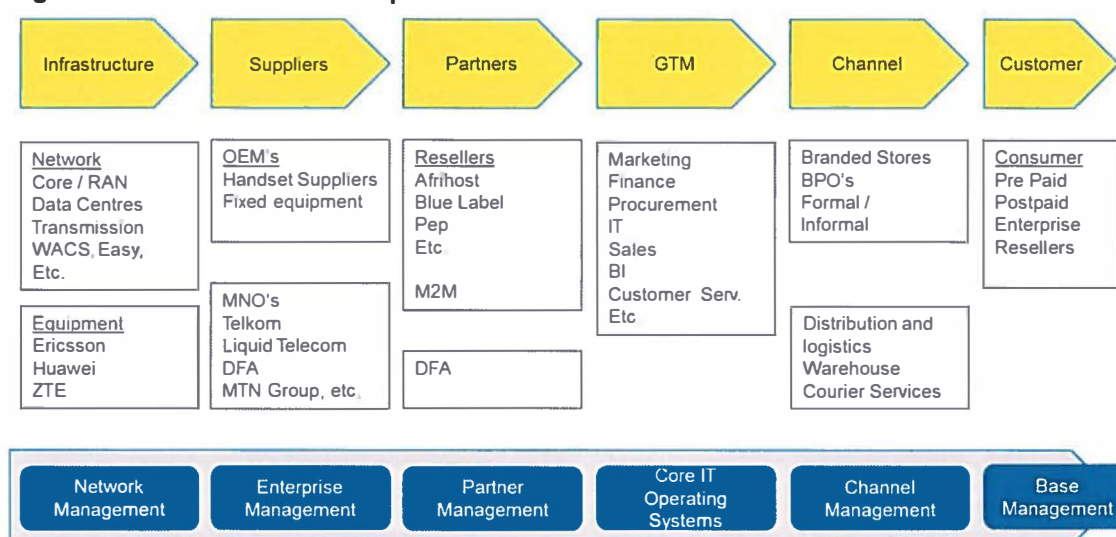
2.2.3.16

In contrast to fixed connectivity, mobile connectivity gives millions of South Africans access to information, by providing extensive geographic and population coverage, and affordable costs to connect. South Africa now enjoys more than 85 million active SIMs, and 37.5 million unique mobile subscribers, a 68% population penetration rate.⁹ Mobile connectivity is the pathway by which people conduct business, and receive education, banking and financial services, government services and healthcare. The remarkable explosion in the availability of devices with exceptional processing capabilities has allowed mobile phones to facilitate the strategies of businesses and to contribute to how society interacts on a day to day basis. Mobile connectivity is a crucial contributor to economic growth, employment and the alleviation of poverty and inequality.

2.2.3.17

Figure 1 provides a graphical depiction of the industry value chain.

⁹ ICASA, Report on the state of the ICT sector in South Africa, 15 March 2016, <https://www.ellipsis.co.za/wp-content/uploads/2015/10/ICASA-Report-on-State-of-SA-ICT-Sector-2016.pdf>; GSMA Intelligence Mobile Economy report, The state of South Africa's mobile market vs the rest of Africa, BusinessTech, 11 July 2017.

Figure 1: Value chain for the provision of data services

Source: MTN

Value chain

- 2.3 Data services, in particular, mobile data services make a significant contribution to the South African economy. Not only does the provision of data services make a direct contribution to GDP and employment, but more generally the availability of data services has a multiplier effect on many other sectors, and plays a crucial role in facilitating access to information, education, health and security, empowerment of citizens, and the proper functioning of democracy.
- 2.4 Excessive regulatory interventions, imposed at low or arbitrary thresholds, would harm incentives for further investment in mobile data services, which would harm competition and consumers, in particular, the poorest and most vulnerable consumers. Excessive regulation would also reduce the contribution of mobile data services to the broader economy.
- 2.5 In 2016 there were 30,951 people employed in telecommunications in South Africa.¹⁰ However, the number of employees that are employed outside of the telecommunications industry but whose jobs rely on the telecommunications industry is likely to be far higher than the number of employees directly employed in the industry – in particular as MTN engages in extensive

¹⁰ ICASA, Second Report on the State of the ICT Sector, 31 March 2017. <https://www.icasa.org.za/LegislationRegulations/PolicyResearchandAnalysis/MarketsCompetitionAnalysis/ICTIndicators/tabid/2786/ctl/ItemDetails/mid/4833/ItemID/13952/Default.aspx>

outsourcing to suppliers with large staff complements.¹¹

- 2.6 From MTN's perspective, MTN SA has a total employee headcount of 5,156 and the total annual earnings paid out is ZAR 1.5 billion. The MTN Graduate and learnership programme currently has 175 incumbents employed with a quantum of earnings of ZAR 18.8 Million. The overall employee development investment is ZAR 68 Million.

Multiplier effect

- 2.7 Revenues generated in the mobile industry have a multiplier effect on the rest of the economy. In 2016, the GSMA stated:

*"In 2016 mobile operators and the ecosystem provided direct employment to approximately 1.1 million people in Sub-Saharan Africa. In addition to this, economic activity in the ecosystem generates jobs in other sectors. Firms that provide goods and services as production inputs for the mobile ecosystem will employ more individuals as a result of the demand generated by the mobile sector. Furthermore, the wages, public funding contributions and profits paid by the industry are spent in other sectors, which provide additional jobs. We estimate that in 2016, around 2.4 million jobs were indirectly supported in this way, bringing the total impact (both direct and indirect) of the mobile industry in Sub-Saharan Africa to 3.5 million jobs."*¹²

- 2.8 Excessive regulatory intervention would reduce the contribution of mobile data services to economic growth and would harm employment.

Access to information

- 2.9 The rise of the smartphone has given many more people access to the Internet, and to the benefits of broadband.
- 2.10 MTN has helped to drive substantial growth in smartphone usage on its network, from 3.6 million smartphones in 2011 to over 10.5 million

¹¹ By way of example Ericsson has 5,014 employees that service the Sub-Saharan Africa region (see Ericsson 2016 Financials); Huawei's South African office has just over 1,000 employees, although even this total excludes partners and other business lines. In addition many other suppliers and sub-contractors are affiliated with network build, maintenance and management.

¹² GSMA, The Mobile Economy in Sub-Saharan Africa, 2017, p.24, <https://www.gsmainelligence.com/research/?file=7bf3592e6d750144e58d9dcfac6adfab&download>, accessed September 2017.

smartphones in 2016.¹³ It has done this through subsidizing the cost of handsets; in particular the lowest cost data enabled devices (3G devices) for low-income consumers.

2.11 Access to broadband internet through mobiles is now becoming common in South Africa:

- There were a total of 24,340,341 subscriptions to smartphones in September 2016;¹⁴
- Data subscriptions increased to 50,270,269 lines in 2016;¹⁵

2.12 Globally, the beneficial effects of broadband internet on economic growth have been documented in more than 200 studies; with estimates of the impact on GDP from a 10% increase in broadband penetration varying from 0.25%-1.38%.¹⁶ While a precise figure for the impact of broadband on South Africa's GDP has not been obtained, the benefits of broadband access are identified in South Africa's broadband policy "South Africa Connect: Creating Opportunities, Ensuring Inclusion":

"Though broadband impact studies vary on the exact contribution made to economic growth, there is enough evidence to support claims that increases in broadband penetration correlate with increases in GDP, new jobs, broadening of educational opportunities, enhanced public service delivery and rural development".¹⁷

2.13 South Africa's education system faces challenges from the legacy of apartheid, with under-resourced, under-supplied and over-crowded schools,

¹³ Annual results Booklet - MTN Group. 2011. Annual results - MTN Group. [ONLINE] Available at: <https://www.mtn.com/en/investors/financial-reporting/annual-results/Pages/default.aspx>. [Accessed 05 October 2017]. MTN Data sheets (2016), Annual results - MTN Group. 2016. Annual results - MTN Group. [ONLINE] Available at: <https://www.mtn.com/en/investors/financial-reporting/annual-results/Pages/default.aspx>. [Accessed 05 October 2017].

¹⁴ ICASA, Second Report on the State of the ICT Sector, 31 March 2017, p.18.

¹⁵ ICASA, Second Report on the State of the ICT Sector, 31 March 2017, p.18.

¹⁶ See, p.16, Annex II, Philbeck, I., Working Together to Connect the World by 2020, accessed September 2017.

¹⁷ Department of Communications, Government Notice, No.953, No. 37119, 6 December 2013, <http://wiki.lib.sun.ac.za/images/c/c7/Doc-bb-policy.pdf>, p.5, accessed September 2017.

as well as a skills shortage amongst teachers.¹⁸ Against this backdrop, the concept of mobile education (mEducation) is gaining traction. Examples of mEducation in South Africa include:

- MTN's Schools Connect Foundation Project. MTN had supplied 3G network connectivity to over 1,360 schools since 2015, predominantly within rural areas of South Africa. The project enables its beneficiaries to access the MTN network by supplementing the solution with a range of computing equipment intended for teaching and learning purposes. MTN maintains network connectivity to these schools and provides free of charge access to the Department of Education's designated web portal which holds learning and curriculum development content for teachers and a host of material and tutorials for learners of all grades.
- The MTN SA Foundation contributes towards quality teaching and learning in South Africa through the application of ICT solutions. 88 schools have received multi-media centres between 2015-2017 with 1,039 teachers and 1,398 learners having received training on the use of the centres. Furthermore, MTN has funded the digitisation of 24 Foundation Phase language workbooks for the Department of Basic Education for use on any available digital device.
- *Siyavula* produces high-quality, curriculum-aligned Open Educational book titles spanning Mathematics and Science subjects from Grades 4-12, available in multiple formats under a Creative Commons licence.¹⁹ More than 32,000 pupils in 388 schools use Siyavula Practice in learning maths and science.²⁰
- Vodacom's *Mobile Education Programme* is a nationwide teacher development initiative to improve the quality of instruction in all subjects at every level, with particular emphasis on Mathematics, Mathematical

¹⁸ Infographic: South Africa's Education Problem | World Policy Institute. 2014. Infographic: South Africa's Education Problem | World Policy Institute. [ONLINE] Available at: <http://www.worldpolicy.org/blog/2014/05/09/infographic-south-africas-education-problem>. [Accessed 05 October 2017].

¹⁹ <http://www.siyavulaeducation.com/technology-approach.html>, accessed September 2017.

²⁰ The Economist, Technology is transforming what happens when a child goes to school, The Economist, 22 July 2017, <https://www.economist.com/news/briefing/21725285-reformers-are-using-new-software-personalise-learning-technology-transforming-what-happens>, accessed September 2017.

Literacy and Physical Science in Grades 10 to 12.

- QuizMax is an interactive website that can be accessed on a mobile, and covers the South African curriculum for Grade 10, 11 and 12 Maths, Maths Literacy and Physical Science as well as Grade 12 Life Sciences.²¹
- *Rethink Education* has developed a learning app for maths and science, presenting content in the form of text, videos, images and diagrams, with users required to interact with this content.²²
- 42courses, which has the strapline "learn on any device, in your own time", partners with brands such as Ogilvy and Barclays to produce courses allowing students to learn from experts in a particular field.²³
- Microsoft *Math* (formerly MoMaths before Microsoft acquired Nokia) creates an active learning environment and students can work on any connected device, while teachers can motivate, monitor and track learning. The programme started in 2009 with 300 learners, in 2012 had reached 50,000 learners and by 2014 was available nationwide. Microsoft claims that the competence level of users improved by 14%, and 82% of the usage occurred outside school hours.²⁴

2.14 Excessive regulatory intervention that raises costs for MNOs would similarly reduce the incentives of those MNOs to continue investing in broadening access to information for consumers. Regulation, if any, should rather focus on lowering costs to reach these low-income consumers. As discussed below, the existing VAT and customs and excise regime on even low-end smartphones is one aspect of existing policy that places a further obstacle in the way of poor consumers who wish to access information via mobile devices.

2.15 Moreover, mobile connectivity has important implications for security,

²¹ <http://www.quizmax.net>, accessed September 2017.

²² <https://www.rethinkeducation.co.za/the-power-of-the-platform>, accessed September 2017.

²³ <https://www.42courses.com>, accessed September 2017.

²⁴ https://math.microsoft.com/Content/Docs/microsoft_math_overview_2015-01-12.pdf, accessed September 2017.

healthcare and financial services.

- Apps such as ADT's FindU²⁵, MTN's 2MyAid²⁶ and Life360²⁷ send out alerts to pre-registered contacts and emergency services should the client encounter trouble. Local WhatsApp groups have proliferated, particularly in communities with active neighbourhood watch programmes.²⁸ Life360 allows users to track, in real time, the location of selected contacts, which have mutually consented.²⁹ Other social media tools such as Facebook groups have also allowed communities to quickly and easily communicate.³⁰ Crimeline – an initiative by media house Primedia, offers an anonymous SMS tip-off service.³¹

2.16 Similarly to education, South Africa's healthcare system faces significant capacity challenges, and also IT-skills challenges. However, mobile services can bypass gaps in IT knowledge, and also help in the face of certain capacity challenges. A number of mobile services have been developed in the healthcare sector in South Africa, such as: the Vula Eye Health³², The Open Medicine Project South Africa (TOMPSA),³³ and a health information app developed by the SA Medical Research Council for primary healthcare workers.^{34,35}

2.17 The use of mobile telephony and broadband for mobile banking can bring

²⁵ <http://adtfindu.co.za/how-it-works>, accessed September 2017.

²⁶ <https://www.mtn2myaid.co.za>, accessed September 2017.

²⁷ <https://www.life360.com/>, accessed October 2017

²⁸ <http://www.ohwatch.co.za/oh-watch-blog/2016/09/01/updated-whatsapp-rules-regulations/>, accessed September 2017.

²⁹ <https://www.life360.com/>, accessed October 2017

³⁰ ADT, Home Security and social Media, 09 June 2017, <https://www.adt.co.za/home-security-social-media/>, accessed September 2017.

³¹ <https://www.crimeline.co.za/tipoff.aspx>, accessed September 2017.

³² Nicolette Dirk, Mobile Health App Boosts Eye Care, Cape Times, 6 May 2015, <https://www.iol.co.za/capetimes/lifestyle/mobile-health-app-boosts-eye-care-1854444>, accessed September 2017.

³³ Telkom, App moves healthcare into the 21st century, 5 May 2016, <https://www.telkom.co.za/today/post/app-moves-healthcare-21st-century/>, accessed September 2017.

³⁴ News24 Wire, New health app a hit in South African clinics, Mybroadband.co.za, 6 April 2016, <https://mybroadband.co.za/news/software/160906-new-health-app-a-hit-in-south-african-clinics.html>, accessed September 2017.

³⁵ SA Government News Agency, New mobi app to improve health services, 25 November 2016, <http://www.sanews.gov.za/south-africa/new-mobi-app-improve-health-services>, accessed September 2017.

indigent people into the formal financial system at a relatively low cost (although there remain challenges related to security and privacy).³⁶ According to a FinScope survey, about 11% of the adult SA population are financially excluded, representing 4.3 million adults that do not have a bank account. If the South African Social Security Agency cardholders are excluded, only 58% of adults are banked.³⁷ Although Vodacom's M-Pesa and MTN's Mobile Money have been discontinued in South Africa³⁸, the major commercial banks – Standard Bank, Absa, Capitec, Nedbank and First National Bank offer zero-rated mobile apps, meaning that consumers do not have to pay for data when transacting on the banking apps. In addition, the following services make financial transactions more accessible to underprivileged people:

- First National Bank's 'e-wallet' allows anyone with a valid South African mobile phone to send and receive money.
- Absa's CashSend, Standard Bank's Instant Money, Nedbank's Senda iMali all offer a similar service, whereby the recipient gets an SMS with a unique code, which they then use to obtain the funds from a bank's ATM, or from a selected retailer.³⁹
- Capitec customers can send money to other Capitec customers using their cell phone numbers without having their bank account details.
- WIZZIT was launched in South Africa in 2004. It is a mobile banking solution that claims to assist partner financial institutions and service providers in promoting financial inclusion.⁴⁰

2.18 As above, excessive regulatory intervention that raises costs for MNOs would

³⁶ OECD, Affordability, government charges and digital inclusion, Broadband Policies for Latin America and the Caribbean: A Digital Economy Toolkit, <http://www.oecd.org/internet/broadband/lac-digital-toolkit/Home/toolkit-text-chapter6.htm>, accessed September 2017.

³⁷ Finmark Trust, Results from FinScope South Africa 2016 Survey on Financial Inclusion, 8 November 2016, <https://www.finmark.org.za/results-from-finscope-south-africa-2016-survey-on-financial-inclusion/>, accessed September 2017.

³⁸ Gareth Van Zyl, EXCLUSIVE: MTN SA halts new mobile money sign-ups, 02 September 2016, <http://www.fin24.com/Tech/Companies/exclusive-mtn-sa-halts-new-mobile-money-signups-20160902>, accessed September 2017.

³⁹ Angelique Arde, Sending cash via an 'e-voucher' is pricey, IOL, 15 October 2016, <https://www.iol.co.za/personal-finance/my-money/banking/sending-cash-via-an-e-voucher-is-pricey-2080054>, accessed September 2017.

⁴⁰ <http://www.wizzit-int.com/index.html>, accessed September 2017.

put at risk the incredible innovation that has occurred in this sector, in particular the access to low and zero-rated applications in security, healthcare and financial services that are directly targeted towards the most vulnerable consumers. Regulation, if any should be narrowly targeted on preserving, and enhancing the access of these consumers.

3. Competition in mobile data services

3.1 The provision of mobile connectivity and in particular mobile data services in South Africa is highly competitive.⁴¹ The following metrics, in particular, provide strong, direct evidence of effective competition:

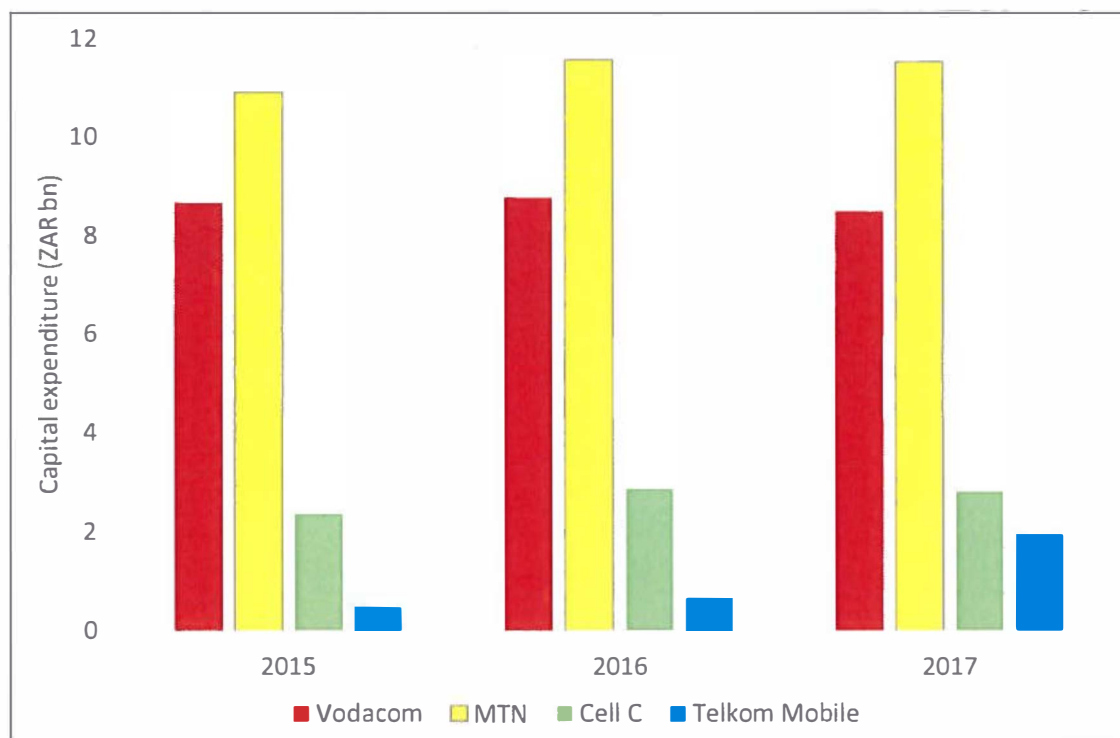
3.2 MTN has invested around ZAR 100 billion in capital expenditure over more than 20 years, with ZAR 70 billion in the past 10 years alone. MTN has long achieved over 98% coverage of the population with its 2G technology layer, 3G coverage has grown to over 95%, and 4G or LTE services have expanded to over 60% of the population. MTN's data speeds have improved by more than 7 times over the past decade. The volume of mobile data handled by MTN has grown 18 times in the past 5 years, while MTN's data prices have fallen by 85% over this same period, and its 4G LTE handset prices have fallen by 86% over the past 3 years.

- Investment. MNOs have made massive investments in improving the quality and coverage of their networks, and in introducing better, more efficient, and faster technologies year on year, such investments running into the tens of billions of Rand per year.
- Quality has improved continuously. MNOs have improved the quality of mobile connections dramatically, offering better, faster connections year on year.
- The volume of data has risen exponentially. MNOs have handled a massive increase in the volume of data, which is growing at an increasing rate and placing extra capacity demands on the network that then needs further investment.
- Prices have fallen. Average prices for mobile data connectivity have fallen dramatically over time.
- There is vigorous competition between MNOs to offer consumers' the best quality network, and the best retail offering.

⁴¹ This section addresses the Commission's Call for Submissions, Questions 11 and 14.

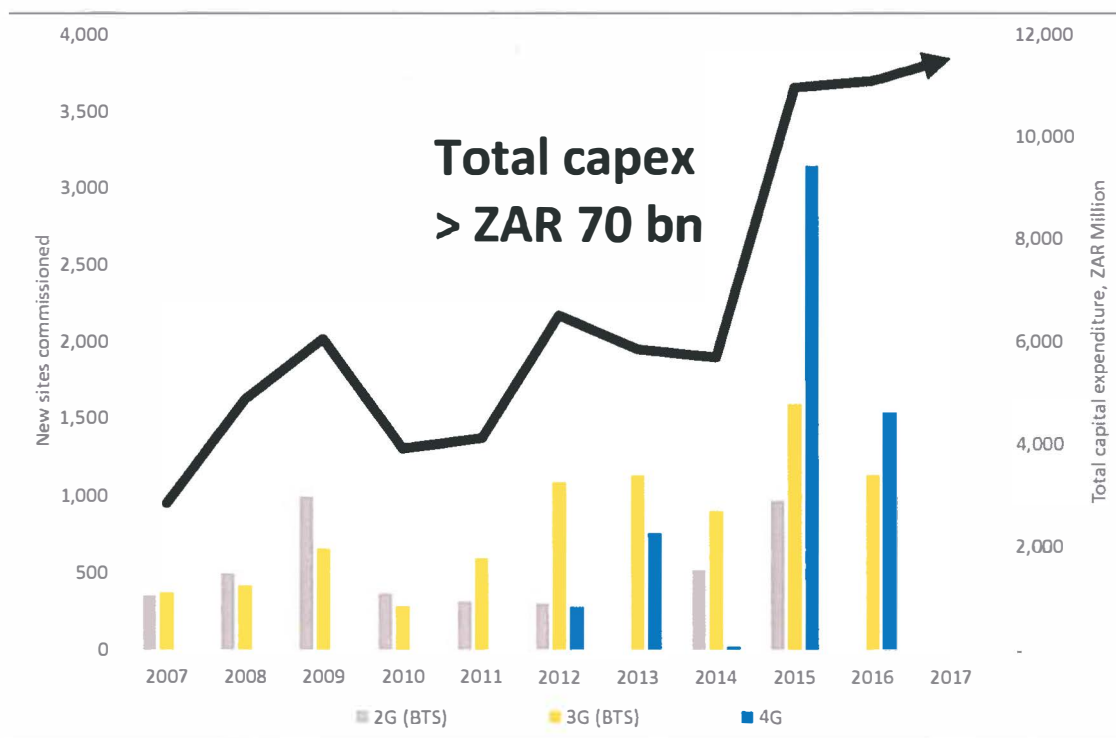
MNOs have made very significant network investments, on a continuous basis, over a very long period of time

- 3.3 MNOs have made massive investments in improving the quality and coverage of their networks, and in introducing better, more efficient, and faster technologies year on year. These very large investments have been made on a continuous basis, over a long period of time. It is these investments that result in all of the pro-competitive benefits noted above, and it is these same investments that simply cannot be interrupted without massive harm to competition and consumers. It is imperative that excessive regulation does not dampen the incentives to continue making these investments in improving services, and extending coverage and faster, newer technologies to all South Africans. There is simply no credible alternative to deliver mobile services to any substantial portion of the population, in particular, the poorest and most vulnerable, but via the continued investments by the MNOs.
- 3.4 Figure 2 below shows the significant capital investments made by each of MTN, Vodacom and Telkom, from 2012 to 2017. Clearly, MTN has invested at a different level, even compared with Vodacom that enjoys significantly more subscribers, and extracts far higher revenues from each subscriber. While Telkom has increased its own capital investment, this is not even of the same order of magnitude to the investments made by MTN.

Figure 2: MNOs' Capex expenditure, 2015 - 2017, (R' millions)

Source: Vodacom, MTN, Cell-C (Blue Label), and Telkom annual financial statements

3.5 Figure 3 below shows that MTN has invested significantly in improving its network quality over the past decade, in order to broaden coverage and improve accessibility across the South African landscape in our mission to make our customer's lives brighter. This investment has included commissioning or upgrading over 4,000 2G sites, over 8,000 3G sites and almost 6,000 LTE sites. MTN has made total capital expenditures of over ZAR 70 billion over the past decade. This figure illustrates some of the scale and complexity of this investment, and the fact that MTN has built upon a history of continuous and significant investment in a way that could not be achieved over a short period of time. Given the acceleration in investment that will be required to meet ongoing exponential growth in demand for data, this position could not quickly be recovered, if excessive regulatory intervention were to dampen the incentives to invest. Any harm is likely to be long-lasting, and very costly to recover from.

Figure 3: MTN capital expenditure and investments in new sites

Source: MTN annual financial statements

Network coverage and quality has improved

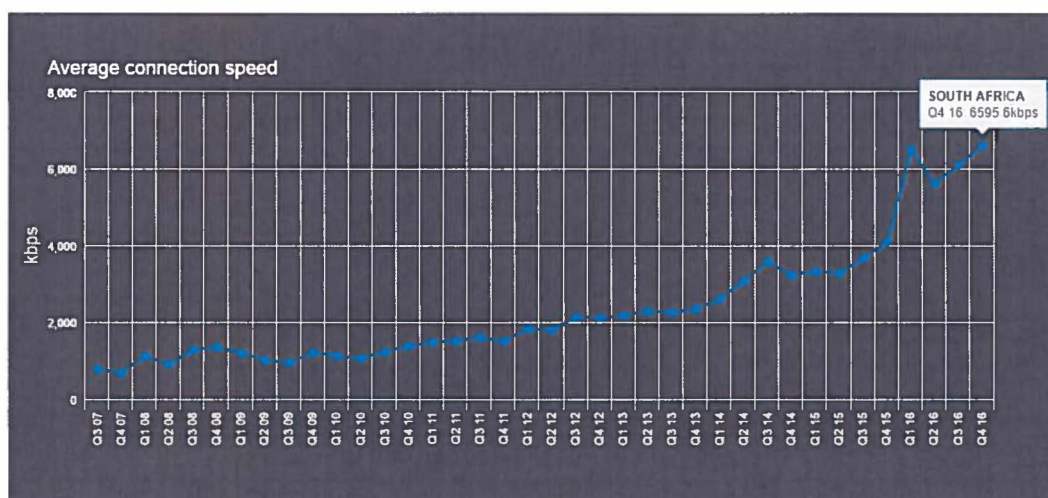
- 3.6 Despite serving a far larger and rapidly growing demand, MNOs have also been able to offer better and better quality mobile services, increasing both speed and coverage over time. This continuous improvement is the result of significant network investment within a competitive environment.
- 3.7 Table 2 below shows the increased average connection speed as well as peak connection speed recorded by Akamai from 2014 to 2017. Average connection speeds increased by 158% while peak connection speed increased by 224% from 2014 to 2017.

Table 2: Average vs peak connection speeds in South Africa, 2014 - 2017

Year	Average Connection Speed	Peak Connection Speed
	Q1 Avg. Mbps	Q1 Peak Mbps
2014	2.6	10.0
2015	3.4	16.8
2016	6.5	30.1
2017	6.7	32.4

Source: akamai's [state of the internet] Q1 2014 – Q1 2017 report, available [<https://www.akamai.com/fr/fr/multimedia/documents/state-of-the-internet/q1-2017-state-of-the-internet-connectivity-report.pdf>]

3.8 Figure 4 shows South Africa's average broadband speed (in kbps) over the past decade, from Q3 2007 to Q4 2016. Over the past decade, average connection speeds have increased by more than 7 times, an incredible increase in quality, in particular in light of the exponential growth in demand.

Figure 4: Average mobile broadband speed (in kbps) Q3 2007 – Q4 2016

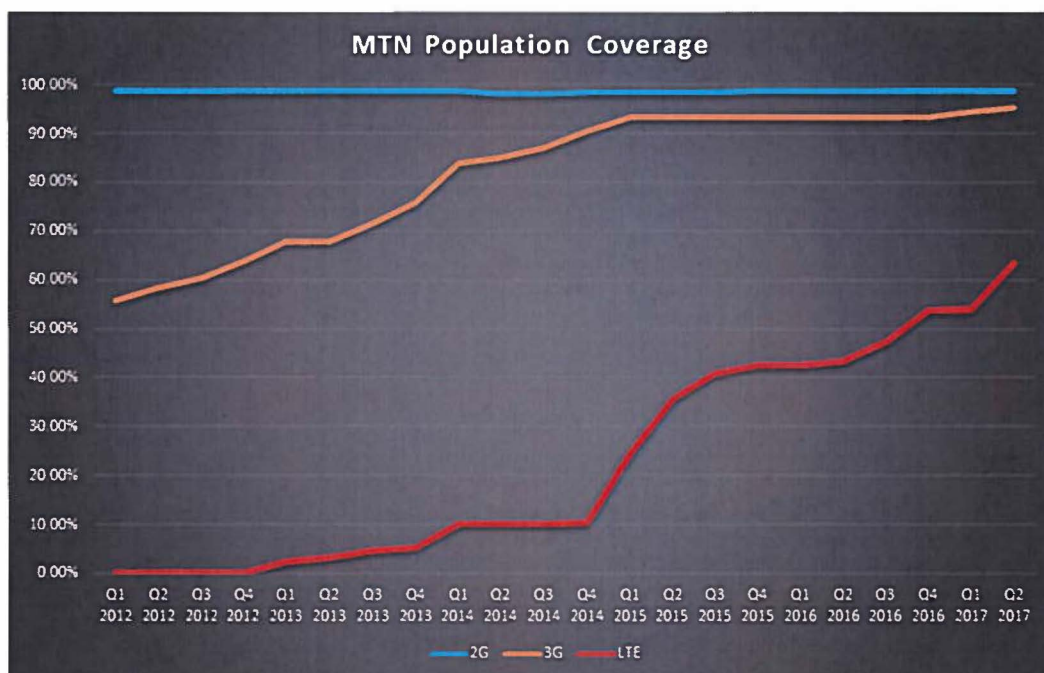
Source: <https://mybroadband.co.za/news/broadband/202144-south-african-internet-speeds-2007-to-2016.html>

3.9 MTN has also invested heavily to increase coverage for all South Africans. In part due to the unique challenges of operating in South Africa, MTN has had to maintain and upgrade different technology layers, simultaneously, in order to continue to cater for older 2G devices, used predominantly for voice connectivity, while also investing vast sums to introduce newer and faster technology layers, in particular for data connectivity.

3.10 Figure 5 shows the population coverage of MTN's different technology layers, which have each expanded rapidly. MTN has long achieved over 98%

coverage of the population with its 2G technology layer. In 2007, MTN had only recently introduced 3G services, and covered 6% of the population. This increased rapidly to 48% in 2009, and then over 95% in 2017. MTN introduced 4G or LTE services in 2012, and has quickly expanded coverage to over 60% of the population in 2017.

Figure 5: MTN's population coverage for different mobile phone technology layers (2012 to 2017)



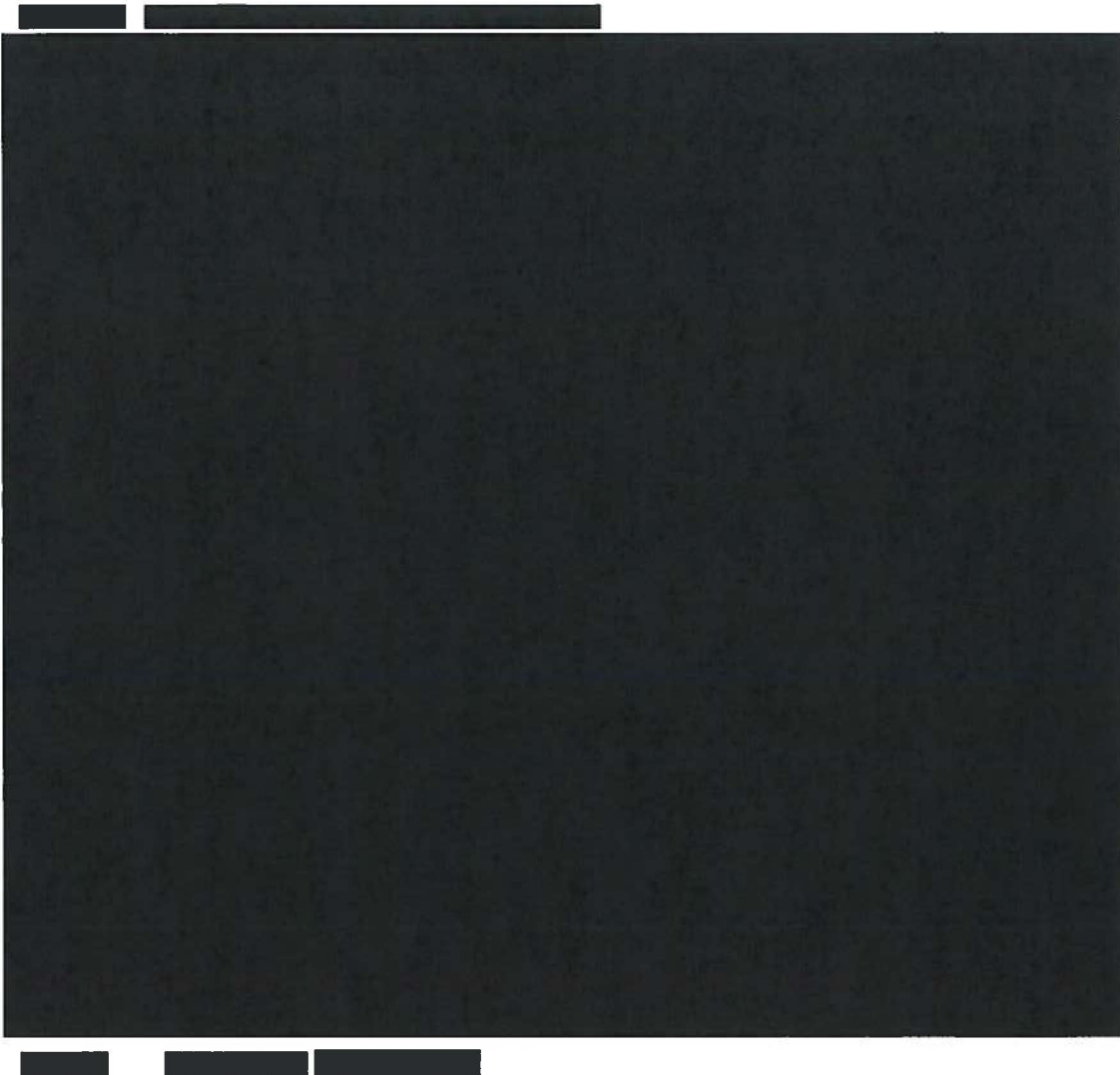
Source: <https://mybroadband.co.za/news/broadband/202144-south-african-internet-speeds-2007-to-2016.html>

- 3.11 MTN has worked particularly hard in investing in low-income, predominantly rural areas that are not even covered by other operators such as Telkom and Cell-C (these other operators typically rely on roaming arrangements with Vodacom or MTN in order to offer subscribers coverage outside the major metropolitan areas).

[REDACTED]

[REDACTED]

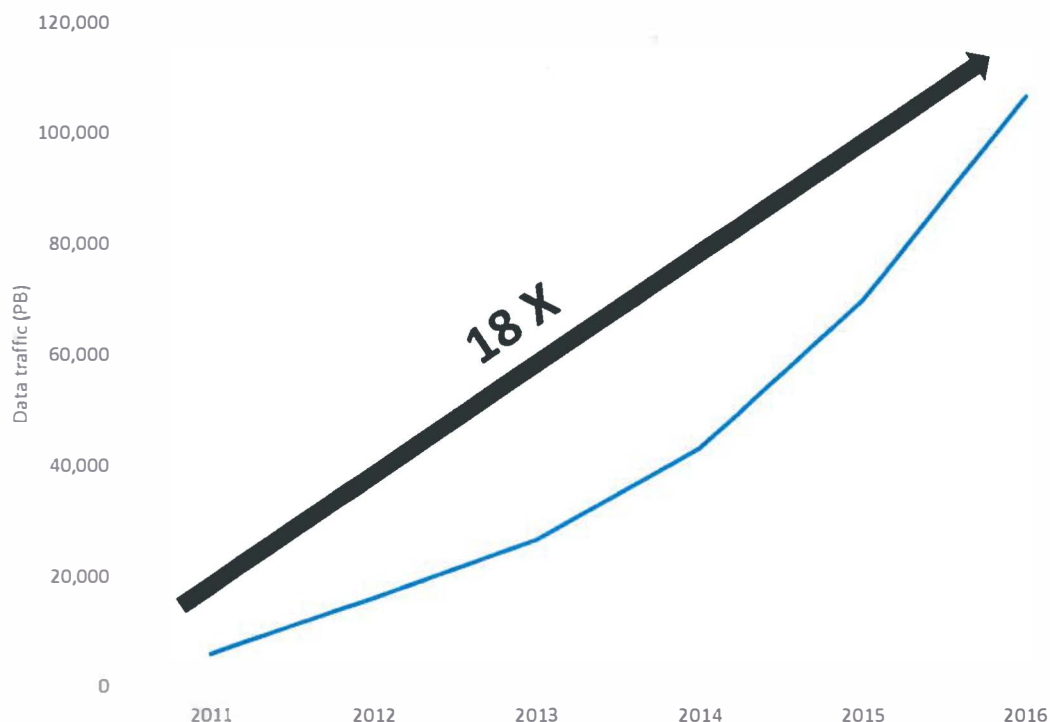
[REDACTED]



MNOs have invested to facilitate and address exponential growth in data volumes

- 3.12 Previously voice calls dominated total mobile traffic, although the volume of data traffic has now far outstripped voice, and has continued to grow exponentially. Increased demand for services such as video streaming, wearables and machine to machine (M2M) data as well as Internet of Things (IOT) continue to contribute to the rapid growth in demand for data.
- 3.13 MTN's data traffic has increased by 18 times over just five years from 2011 to 2016, as shown in Figure 7.

Figure 7: MTN data traffic 2011-2016 (PB)



Source: <https://mybroadband.co.za/news/cellular/213530-this-simple-graph-shows-mobile-datas-incredible-growth.html>

3.14 The pace of growth is, if anything, accelerating:

- Vodacom's data traffic in South Africa grew by 45% in 2016 alone.⁴²
- MTN announced in July 2017 that total data traffic had grown by 145%, even though the number of MTN subscribers had declined slightly (by 1.5%).⁴³
- Cell C announced in March 2017, that data had grown by 67% in the reporting year.⁴⁴

Prices have fallen dramatically

3.15 The price of mobile connectivity has fallen significantly over time. MTN's data revenues per MB of data traffic have fallen 85% over just 5 years from 2011 to 2016, even in nominal terms, as shown in Figure 8, below. Clearly, the fall in

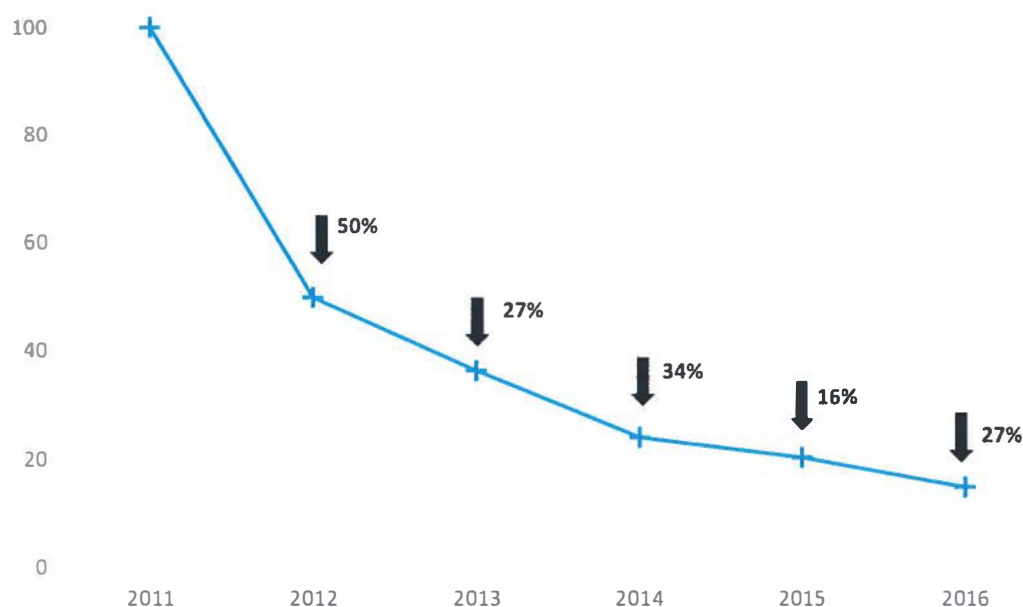
⁴² <https://www.moneyweb.co.za/news/companies-and-deals/data-sales-again-boost-vodacom-revenue/>

⁴³ <https://www.iol.co.za/business-report/mtn-spends-r46bn-to-tap-growth-from-data-10120900>

⁴⁴ <https://www.cellc.co.za/cellc/newsroom-detail/2016-financial-report>

real (inflation adjusted) terms was even greater.

Figure 8: Data pricing over time (MTN South Africa, nominal data revenues per MB, 2011-2016, indexed, 2011=100)



Source: MTN Annual Financial Statements.

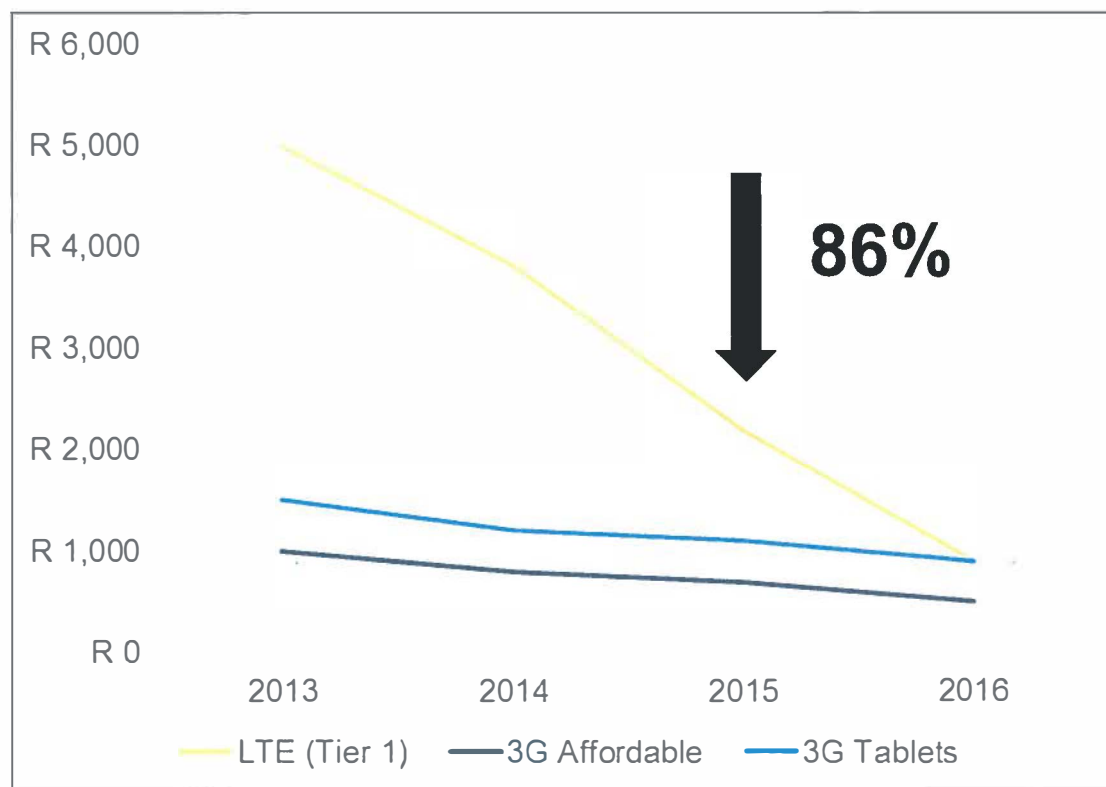
- 3.16 MTN SA has successfully reduced data effective rates by more than 55% over the last 2 years due to value packed Postpaid offers, as well as affordably priced hourly, daily, weekly and monthly Prepaid data bundles.
- 3.17 MTN has also observed Vodacom's prices falling: mobile data effective rates fell by 44% from 2014 to 2017.⁴⁵
- 3.18 Critically in driving access for low-income subscribers, handset prices have also fallen. Handset prices were previously a significant barrier for low-income consumers, in particular, smartphone handsets, and LTE enabled handsets that can connect to the faster mobile data networks, to allow participation in mobile data connectivity. However, MNOs have undertaken initiatives to drive low-cost handsets as a means to compete for what was previously an under-served segment of society. This has been done by developing packages that subsidise the devices as well as MNOs launching branded low-cost phones

⁴⁵ <https://businesstech.co.za/news/telecommunications/191306/vodacom-claims-it-has-already-dropped-effective-data-prices-by-44-in-3-years/>

and smartphones.

- 3.19 Figure 9 below shows the significant decrease in the prices of devices offered to consumers by MTN from 2013 to 2016. Most significantly, the price of LTE enabled devices has fallen by 86% over this period, while device costs have fallen on average by 66% across all devices (handsets and tablets).

Figure 9: Handset pricing for consumers (MTN South Africa, nominal, 2013-2016)



Source: *Final Draft_MTN_Reworked_Cost to Communicate_PPC_20 September.pptx*

MNOs have competed vigorously on price and non-price factors

- 3.20 There is significant evidence that MNOs compete vigorously with one another in regard to each of the factors described above, and that this competition has driven these outcomes.
- 3.21 Each of MTN and Vodacom has continued to invest in and expand their networks and have introduced new technology layers over similar time frames. By way of example, each of MTN and Vodacom re-farmed a significant portion of their spectrum in a race to launch LTE in Metro areas from 2012, at a time when both mobile operators were already considerably spectrum constrained. During this "race" to launch LTE, representatives made public announcements only days apart announcing the rolling out of the LTE network and the

expected coverage.⁴⁶

- 3.22 Various media outlets, such as mybroadband,⁴⁷ provide regular comparisons of MNO's quality, coverage and pricing, enhancing consumers' ability to choose amongst alternative offerings.
- 3.23 Over the last year alone, there has been significant activities in aggressive competition for Postpaid and Prepaid subscribers.
- 3.24 In particular in regard to Postpaid subscribers:
- MTN launched a value-packed promotion offering customers 50GB and 10 000 on net minutes on selected Postpaid price plans with a commitment level as low as R149 per month, over select Fridays in November 2016 to February 2017.
 - Telkom has launched a suite of Free Me Family plans in March 2017, which offers substantial data and minutes at competitive subscription levels with multiple Sims able to use the inclusive value.
 - Cell C subsequently responded with Smart Data share proposition, offering double the anytime data as well as double the night express, on their 5GB, 20GB and 50GB price plans, allowing up to 14 sims to share from this data pool. The additional data makes this proposition quite aggressive with data effective rates at R0.019 per MB based on anytime data allocated, or R0.009 based on all data allocated including Night Express.
 - MTN continues to promote the new My MTNChoice Talk, My MTNChoice Plus as well as the new SKY price plans that were launched in Q4 2016. These price plans offer significant inclusive data to meet Postpaid customers' needs.
 - Vodacom has launched a new suite of price plans in April 2017 which seems to be a direct response the price plans launched by MTN in Q4 2016.

⁴⁶ <https://techcentral.co.za/vodacom-mtn-in-race-to-4g/35100/>

⁴⁷ <http://bandwidthblog.com/internet/best-data-bundles-south-africa/>

- MTN launched the "Twice the Value" promotion in April that had run until the end of June. Customers that upgraded or signed a new contract on certain price plans, received twice the minutes, SMS and data applicable to the relevant price plan for a period of 3 months.
- In May 2017, Vodacom introduced a 60% extra value campaign on their new plans, together with competitions for customers to win a new car in order to drive sales. In June, Vodacom has introduced significant subsidy into their sim only deals as from June 2017.
- In June 2017, MTN offered new acquisitions or upgrades on LTE device deals a free 30GB, in the form of 10GB allocations over 3 months.
- In June 2017, Cell C introduced new Connector Postpaid price plans positioned as data first plans, which offer data on plans with over 1000 voice minutes included across the plans, together with value added services. This seems to be in direct competition with Telkom's Free Me price plans.

3.25 In regard to Prepaid subscribers:

- In 2014, MTN launched daily, weekly and rush hour data bundles, which allow the customer to access data for a commitment level as low as R1.50.
- In Q2 2017, MTN continued to promote existing voice and data bundle promotions such as 25% and 50% Giveback, Cliq 5, All Net 20, Rush Hour, Sim Recharge, etc.
- MTN launched Bonus Hour in Q4 2016, which continued through Q1 2017, which offers customers double their recharge value valid for an hour.
- MTN promoted LTE device purchases by offering customers 200MB over 6 months, whilst 3G device purchases gained 100MB over 6 months.
- Cell C continued to promote the 3 X data (MB) recharge promotion namely Mega Bonus & Mega Data.
- During Q1 2017, MTN continued to offer the 1GB promotion to new

Prepaid connections, in order to assist with driving our gross connections and increase data consumption. This was launched in Q3 2016 in response to a similar offer launched by Vodacom, which had a significant impact on connections.

3.26 MTN, therefore, experiences significant competitive constraints in its attempts to attract all types of customers. Moreover, its Enterprise Business Unit ("EBU") experiences especially vigorous competition, due to the additional buyer power wielded by large corporate customers. EBU customers tend to be more sophisticated, represent large contracts and are able to leverage significant negotiating power. One clear example of EBU clients using this negotiating power is in contract negotiations which are held through sophisticated e-auctions. These auctions have been designed to allow EBU clients to play service providers off against one other to result in lower prices. Major enterprise clients are under significant pressure to contain costs, and MTN finds itself under significant pressure in particular when competing to serve companies with international operations, as those operations will continuously challenge MTN's pricing and other competitive terms to match the offers available in other countries. Some of the recent indications of aggressive negotiating power by clients include the following:

- Clients have changed the contract terms from the traditional 24/36 months to 12 months contracts to allow renegotiation at the 12th month.
- Clients who sign 24 month contracts often include a benchmarking clause at 12 months to adjust pricing, allowing the client to go to the market to "test the market price", and also allow the client to re-tender the remaining term of the contract. This forces the current incumbent to lower price to keep the client in contract.
- Clients increasingly use e-auctions in order to achieve the lowest possible pricing terms. The process allows the supplier to prepare a high, medium and low (lowest price), although clients can often choose the lowest priced bid, and then cherry pick potentially higher quality and higher cost commitments from higher priced bids, such as more onerous SLAs or resource commitments.
- Clients have also used multiple rounds of e-auctions, finishing one round merely to set the starting price of a subsequent round.

3.27 These detailed competitive interactions, on many dimensions of competition, and over a sustained period clearly illustrate the fierce nature of competition amongst the MNOs, and continue to drive benefits for consumers in the most efficient and effective way possible.

3.28 Clearly, a market that is characterised by this intensity of competition cannot rationally be a candidate for additional regulatory intervention.

International benchmarking

3.29 The Commission has highlighted its intention to consider international price benchmarking.⁴⁸

3.30 In the first instance, we consider that any international price benchmarking is subject to many confounding factors which are potential sources of significant bias in any analysis. Accordingly, it is likely that many attempts at international benchmarking are likely to produce misleading results.

3.31 Moreover, there are many ways to directly assess the state of competition in data services in South Africa (as noted above, these include considering the intensity of investment, improvements in network quality and coverage, growth in the volumes of data served, as well as pricing dynamics over time). In this context, international price benchmarking should be treated with extreme caution. Even if attempts were made to account for confounding factors, international price benchmarking is likely to provide a far less reliable guide to the state of competition in data services in South Africa, than these direct indicators.

3.32 Choosing the correct selection of countries, that would adequately account for this vast array of factors, including demand, population, demographics, socio-economic factors, and geography is likely to be very challenging.

3.33 If these factors are not accounted for, one would risk making an error in judgement by comparing prices across countries. For example, a country with a higher cost base (where two countries have the same mark up on costs) may seem more expensive when costs are not taken into account.

⁴⁸ See the Commission's Call for Submissions, Question 9.

- 3.34 Similarly, a price comparison of countries that differ substantially in terms of geography would not be comprehensive or appropriate, since prices are likely to differ due to this non-price factor. In the remainder of this section we consider some of the issues that commonly arise with international price benchmarking.

Measuring price

- 3.35 As a starting point, the comparison of “prices” across different countries can be highly complex. It may be difficult to appropriately compare the range of different bundles available in different countries. The larger South African operators offer their customers the benefits of dynamic pricing (variable, time and capacity-dependent charging), which can deliver significant discounts for limited periods and locations. Because of the variable nature of this pricing, dynamic price levels are not considered in benchmarking studies. A range of different effective prices may apply within a given country, depending on a given subscriber’s usage pattern and network. It may not be easy to construct a robust and comparable set of prices across countries.
- 3.36 Separately, it may be difficult to establish whether or not MNOs in comparator countries are setting competitive pricing. Some countries may experience supra-competitive pricing. In other contexts, the price for data connectivity may be lower than the competitive level, either due to subsidies, or to encourage penetration, or because the relevant MNOs may be able to leverage content or other value-added services on top of the apparent prices for data connectivity.

Non-price factors of competition

- 3.37 MNOs, including those in SA, often compete intensively on non-price factors, such as network quality and coverage, and these factors are often not taken into account in international benchmarking studies.
- 3.38 When considering network coverage, in particular mobile data network coverage, and even 4G network coverage, MNOs in South Africa have achieved far higher coverage than those enjoyed in many putative comparator

countries in Africa.⁴⁹

3.39 Similarly, when considering aspects of network quality, such as mobile data download speeds, again MNOs in South Africa have achieved far higher download speeds than those enjoyed in many putative comparator countries in Africa.⁵⁰

3.40 Moreover, as discussed above, the South African mobile industry has undertaken various initiatives to increase accessibility to communications, such as engaging in partnerships to facilitate access to information, in particular in regard to low or zero-rated applications that provide information security, financial services and healthcare. These initiatives are typically not quantifiable in an international price benchmarking analysis.

Cost factors

3.41 MNOs in different countries face vastly different challenges in terms of the cost factors associated with providing mobile data services to subscribers, at whatever quality and coverage those are provided.

3.42 In particular, the density and demand distribution of their subscribers, which may depend on the alternatives available to different consumers, including fixed and Wi-Fi offload capabilities, as well as the geographical environments in which MNOs must provide services, can vary dramatically even within a given country, and can be radically different across countries.

3.43 The distribution of different subscriber types can also have a bearing on the costs of servicing those subscribers. By way of illustration, the majority of South African mobile users are Prepaid consumers, and a significant proportion of the market is categorised as low spend (i.e. spending less than ZAR 90 (per month on mobile services). Cost drivers, including electricity, labour, access to internet exchange points, capital and infrastructure costs, the costs of imported components, and even the applicable tax regime, can also vary widely across countries.

⁴⁹ See, for example, "Mobile Data Pricing International Benchmark for MTN South Africa - 'Broader Context' Element Playback", Mobile Market Development, October 2017.

⁵⁰ See, for example, "Mobile Data Pricing International Benchmark for MTN South Africa - 'Broader Context' Element Playback", Mobile Market Development, October 2017.

Spectrum

- 3.44 As is discussed further below, one of the most critical cost factors is the availability of spectrum, and different spectrum bands, across different operators, in relation to the network requirements of each operator.

Affordability

- 3.45 International price benchmarking studies commonly normalise “prices” into a common currency, and many studies also attempt to make adjustments for local “purchasing power”. This is an attempt to at least acknowledge some of the cost differentials that might exist across countries. However, purchasing power parity adjusted exchange rates are an imperfect measure of relative costs, and are clearly not intended to account for the specific mix of costs relevant to mobile data services.
- 3.46 A more comprehensive attempt to recognise some of these cost differentials might be to consider the affordability of mobile data services in each country.
- 3.47 By way of example, the GSMA Mobile Connectivity Index takes the minimum cost of a low usage (100MB), medium usage (500MB) and high usage (1GB) tariff and calculates price as a proportion of Gross National Income (GNI) per capita. On the basis of affordability tariffs enjoyed by South African subscribers are typically far better than those available in many putative comparator countries in Africa.⁵¹
- 3.48 Similarly, the GSMA Mobile Connectivity Index calculates handset affordability based on the cheapest available handset in each market which is at least 3G enabled. Again, on the basis of affordability, handset prices enjoyed by South African subscribers are typically far more attractive than those available in many putative comparator countries in Africa.⁵²
- 3.49 The World Bank and ITU have recently released studies that also address this aspect of affordability, which again shows that mobile connectivity is far more

⁵¹ See, for example, “Mobile Data Pricing International Benchmark for MTN South Africa - ‘Broader Context’ Element Playback”, Mobile Market Development, October 2017.

⁵² See, for example, “Mobile Data Pricing International Benchmark for MTN South Africa - ‘Broader Context’ Element Playback”, Mobile Market Development, October 2017.

affordable in South Africa than in many other countries in Africa.⁵³

- 3.50 Such comparisons should be considered holistically, in light of the network quality and other non-price factors noted above, as well as the influence of cost factors and spectrum availability.

⁵³ See <http://blogs.worldbank.org/opendata/where-are-cheapest-and-most-expensive-countries-own-mobile-phone>

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5. Regulatory context

5.1 In this section we discuss the broader regulatory context, within which the Commission's inquiry takes place. In the following section we then discuss the spectrum constraint, which is the most acute limitation on the ability of MNOs to reduce costs and increase the quality of data services.⁵⁵

5.2 As the Commission correctly points out, the telecommunications industry in South Africa is currently regulated by a number of different regulations, legislation and regulatory bodies. With regard to the regulatory bodies in particular, it is common cause that, in addition to the Commission, ICASA, the Department of Communications ("DoC"), and the Department of Telecommunications and Postal Services ("DTPS") each have jurisdiction to regulate certain matters pertaining to the industry. MTN is aware that a number of regulators (in addition to the Commission) are conducting, or have expressed an interest in conducting, inquiries or introducing legislative amendments, which are aimed at regulating, or which may have an impact on, the price of data in South Africa. In particular, we note the following inquiries and initiatives.

ICT White Paper/WOAN

5.3 We note that on 3 October 2016, the Minister of Telecommunications and Postal Services ("the Minister") published the National Integrated ICT Policy White Paper ("the White Paper"), which proposes certain changes to the ICT regulatory framework and in particular, to the manner in which radio frequency spectrum is allocated and managed by ICASA. Amongst the various proposals set out in the White Paper, the White Paper sets out how networks should be shared and proposes that a Wireless Open Access Network ("WOAN") be established by the relevant government authorities for the purpose of managing such sharing. The White Paper also proposes that radio frequency spectrum is defined as a "public good" that is managed and effectively used "to meet public interest objectives". In particular, the White Paper proposes that all high demand spectrum (presumably including the high demand spectrum which has been allocated to MTN) be assigned on an open access

⁵⁵ This section and the following section address the Commission's Call for Submissions, Questions 12 and 13.

basis, which suggests that such spectrum (including the high demand spectrum that has already been allocated) will be assigned to the WOAN. In pursuit of the objectives set out in the White Paper, the DTPS on 17 November 2017 published the Electronic Communications Amendment Bill, 2017 ("the ECA Bill"). The ECA Bill, which is currently open for comment until 17 December 2017, amongst other things, seeks to establish the WOAN and states that all unallocated high demand spectrum shall be allocated to, and controlled by, the WOAN.

- 5.4 Spectrum is a resource that is essential to any plans which MTN may have to continue expanding coverage, and driving down the costs of mobile connectivity. Accordingly, the inability to access additional spectrum by MTN will have a direct adverse impact on MTN's ability to compete effectively insofar as the price of data is concerned.
- 5.5 Following the release of the White Paper, the research consultancy BMI-TechKnowledge said that its research had found no case studies where a WOAN similar to the one proposed for South Africa had worked or shown positive benefits.⁵⁶
- 5.6 A report by the GSMA has shown that WOANs do not deliver on promises to provide better coverage, or lower prices for consumers, and that most have failed to even be implemented.⁵⁷ The GSMA report examines the performance of the WOAN model – also known as a single wholesale network (SWN) model – in five markets: Kenya, Mexico, Russia, Rwanda and South Africa. The report found that out of the five, there was only one where a network had rolled out, *"with all other markets plagued by slow progression and delayed and/or cancelled launches"*. *"Citizens are promised better coverage, more competition, and as a result, more affordable prices. However, research shows that of five countries originally considering this option, only one, Rwanda, has rolled out a network. Although it appears the network hasn't delivered on what was promised."* GSMA chief regulatory officer John Giusti has said that while some policymakers believe a WOAN can achieve greater network coverage compared to models that rely on network competition, the

⁵⁶ http://www.itweb.co.za/index.php?option=com_content&view=article&id=163970

⁵⁷ https://www.gsma.com/spectrum/wp-content/uploads/2017/07/GSMA_SWN-8-pager_R3_Web_Singles.pdf

GSMA's research demonstrates this is not the case. *"We have found that network competition produces faster and more extensive network coverage, and the examples highlighted in the report indicate little evidence that a SWNWOAN is likely to achieve this."*⁵⁸

- 5.7 In response to the ICT white paper, the Operators Forum (the forum), comprising of the 6 MNOs (Cell C, MTN and Vodacom, Multisource Telecom, Neotel, Telkom) engaged with government on the proposals in the White Paper, made a presentation to the Director General of the Department of Telecommunications and Postal Services (DTSP) on the 24th of February 2017, and provided a written submission as a follow up. While the operators support the transformation goals in the ICT White Paper, they have urged that any policy is applied in a sustainable manner. The operator's submissions related to the topics of ownership, licensing, the operating model and the resourcing of the WOAN. The operators' submissions included the following points:
- 5.7.1 The WOAN should be privately owned, with a level of 30% to 51% BBBEE ownership, and no operator should acquire a controlling share.
 - 5.7.2 The operators should keep the spectrum that has already been allocated to them, at least until those licences expire.
 - 5.7.3 The operators would commit to purchase at least 30% of the WOAN's capacity for the first 8-15 years.
 - 5.7.4 The operators should retain the right to compete on infrastructure, service and network services, and would be allowed to make available access to infrastructure and other required facilities to the WOAN at commercial and non-discriminatory prices
- 5.8 On May 19, the Minister suggested a way forward with the operators that the operators would keep their spectrum licences until they expire in 2028, and in turn, the operators would purchase at least 30 percent of the capacity created by the WOAN.⁵⁹ Notwithstanding this agreement, a provision to this effect is currently not reflected in the ECA Bill. In fact the Bill proposes the exact

⁵⁸ http://www.itweb.co.za/index.php?option=com_content&view=article&id=163970

⁵⁹ <http://af.reuters.com/article/topNews/idAFKBN18K2RL-OZATP>

opposite.

ICASA Priority Markets Study

- 5.9 MTN also understands, based on media reports and from public statements made by representatives of the ICASA, that the market inquiry which was initiated by ICASA on 30 June 2017⁶⁰ ("the Market Inquiry"), also seeks to address the issue of "high costs of data and communications in general"; and

ICASA Proposed Legislative Amendments

- 5.10 ICASA has also sought to introduce legislative amendments⁶¹ that are seemingly aimed at addressing the widely held perception that the price of data, and especially out of bundle data, is too high in South Africa.
- 5.11 MTN is of the view that a formal inquiry into the price of data is indeed desirable in order to properly address, once and for all, the issues which have been consistently raised in relation to this topic. MTN notes, however, that conducting of a number of inquiries into the same issue, or attempting to deal with the same issue (through legislative or other means), may have the undesired consequence of creating uncertainty in the market. In this regard, regulators seeking to each conduct their own inquiries into the same issue or seeking to address the same issue, with potentially differing conclusions, may have the effect of placing the industry in a challenging position. For example, the Commission may conceivably reach a conclusion as to how the issue of the price of data ought to be addressed that is contrary to the views of ICASA. Licensees would then be placed in the precarious position of having to adhere to a number of conflicting recommendations.
- 5.12 MTN desires a clear, consistent regulatory approach to addressing the price of data services. To this end, MTN is of the view that a united approach by the regulators, with the appropriate engagement of all relevant stakeholders, would be the ideal mechanism by which to address the situation in a lawful, practical and effective manner.

⁶⁰ ICASA published (under Government Gazette No. 40945) a Notice of Intention to Conduct an Inquiry to Identify Priority Markets in the Electronic Communications Sector

⁶¹ ICASA published draft regulations ("**the Draft Regulations**"), which are intended to amend the End-User and Subscriber Service Charter Regulations 2016 (published in Government Gazette No 39898 on 1 April 2016) ("**the Charter**") so as to, inter alia, address issues relating to the perceived high cost of data in South Africa.

6. Constraints on the further development of data services

- 6.1 In this section we discuss the persistent constraints, in particular access to valuable spectrum, that are likely to continue to hamper even more drastic reductions in the prices of data services in the future.
- 6.2 The spectrum constraint, which is the most acute limitation on the ability of MNOs to reduce costs and increase the quality of data services.
- 6.3 MNOs in South Africa have managed to achieve the outstanding results described above while being subject to a fundamental spectrum constraint.
- 6.4 The failure of regulatory authorities to allocate new spectrum to the existing MNOs, in particular, the most constrained MNOs, being MTN and Vodacom, has dramatically increased the capital expenditure necessary to expand the capacity of mobile networks in order to continue to meet exponential growth in demand, all the while increasing network quality. The spectrum constraint is now at a critical point where addressing ongoing exponential growth in data demand will require correspondingly ever faster growth in capital investment, which is already at unsustainably high levels. The unprecedented fall in price for data services have meant that MNOs must spend larger and larger amounts on network expansion, without compensating growth in revenues and profitability.
- 6.5 While there are many relevant considerations in the assessment of spectrum constraints, Table 3 below shows the number of subscribers and the spectrum allocated to each MNO, both in South Africa, and in several other countries. South Africa has allocated approximately 544MHz of spectrum to various operators, although there are still several unallocated spectrum bands, such as the 700, 800 and 2600MHz bands. It is also notable that substantial spectrum allocations have been made to 6 operators in South Africa, whereas similar total spectrum allocations have been split across only 3 operators in several other countries.
- 6.6 The final column in Table 3 also shows the ratios between the spectrum allocated to each of the operators, and their share of subscribers. Clearly, those MNOs with a larger share of subscribers will feel a much more severe spectrum constraint if all MNOs have the same spectrum allocations.
- 6.7 Considering first the ratios for operators in other countries, Germany has a

sustainable allocation showing a ratio of close to 1.0, for each of its operators, showing parity between the spectrum allocation and market size for each MNO.

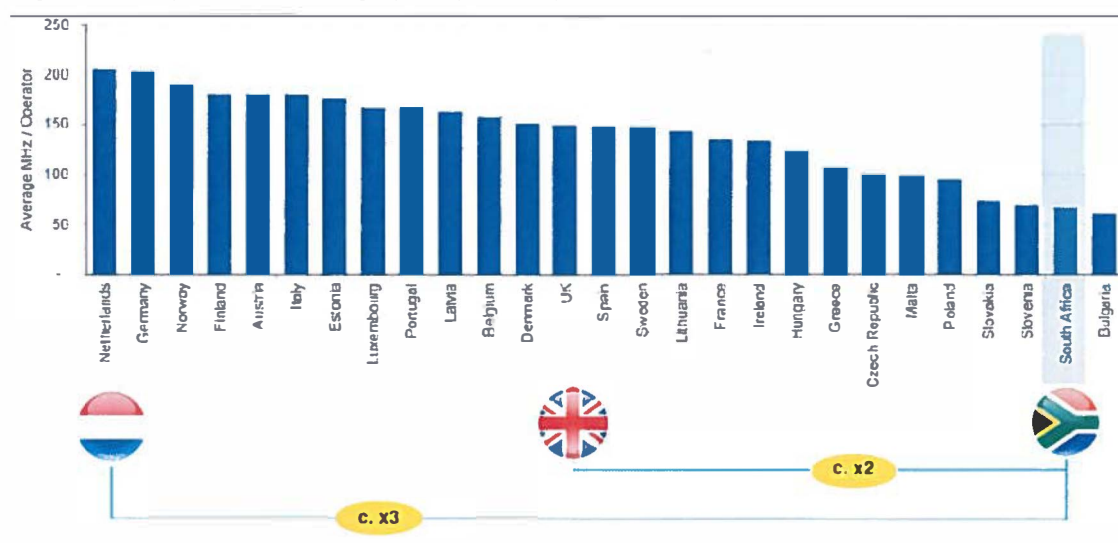
Table 3: Spectrum allocations and subscriber numbers for operators in South Africa and selected other countries.

Country	Operator	Number of Subscribers in Million	Subscriber share %	Average Spectrum in MHz (UL+ DL)	Spectrum Share %	Spectrum to Subs share Ratio
South Africa	MTN	30.8	35.08%	76	13.97%	0.40
	Vodacom	37.1	42.26%	76	13.97%	0.33
	Cell C	15.3	17.43%	76	13.97%	0.80
	Telkom	3.6	4.10%	172	31.62%	7.71
	Neotel	0.5	0.57%	90	16.54%	29.05
	Rain/WBS	0.5	0.57%	54	9.93%	17.43
USA	Verizon	146	34.80%	145	19.20%	0.55
	AT&T	135	32.10%	170	22.52%	0.70
	Sprint	S9	14.00%	200	26.49%	1.89
	T-Mobile	72	17.10%	105	13.91%	0.81
	Others*	8	1.90%	ISO	19.87%	10.43
China	China Mobile	820	70.10%	235	49.47%	0.71
	China Mobile	820	17.10%	235	29.47%	0.71
	China Unicom	200	12.80%	140	21.05%	1.72
	China Telecom	ISO	36.40%	100	31.99%	1.64
New Zealand	Telecom NZ		42.40%	207	40.19%	0.88
	Vodafone	2.8	21.20%	260	27.82%	0.95
	2 Degrees	1.4	43.30%	180	42.18%	1.31
South Korea	5K Telecom	27.5	35.90%	197	32.12%	0.97

	KT Freetel	22.8	20.80%	150	25.70%	0.89
	LGU+	13.2	34.20%	120	36.23%	1.24
Germany	Telefonica 02	22.7	32.50%	250	31.16%	1.06
	Telecom (DT)	21.6	33.30%	215	32.61%	0.96
	Vodafone	22.1	32.20%	225	18.18%	0.98
Argentina	Movistar	10.3	31.90%	60	18.18%	0.56
	Personal	10.2	32.80%	60	2121.00%	0.57
	Claro	10.5	3.10%	70	24.24%	0.65
	Nextel	0.99	34.80%	80	18.18%	7.83
	Airlink	New	n/a	60	19.20%	n/a

Source: MTN internal analysis; *Other in the USA include Dish Network & Comcast (with no subs.yet), US Cellular and other small rural/regional operators

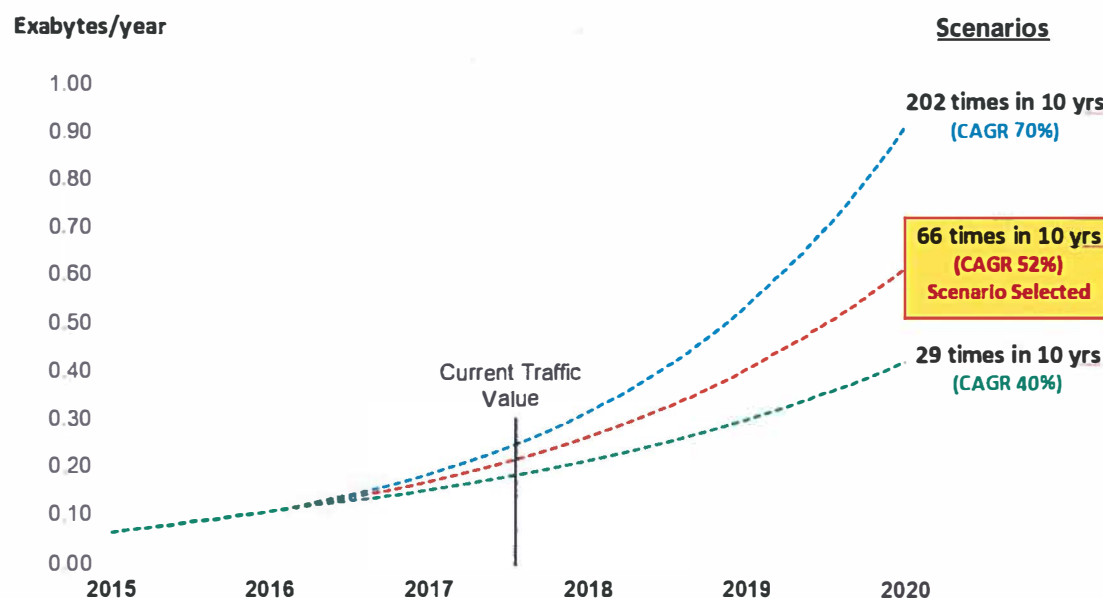
- 6.8 Anything more than 1.0 represents an over-allocation and while anything below 1.0 shows an under allocation of spectrum. Accordingly, in South Africa, MTN and Vodacom each suffer from a lack of spectrum assigned with the lowest ratio of all the markets shown, whereas Telkom and other smaller players have significantly more spectrum than required.
- 6.9 The South African operators that account for the vast majority of investment in network infrastructure, in particular, network infrastructure used to provide a wide cover and high quality of data services throughout the country, i.e. Vodacom and MTN, have had access to far less spectrum than many of their global peers. Accordingly Vodacom and MTN have each required far larger investments, resulting in higher costs and prices than would otherwise have been enjoyed.
- 6.10 By way of an alternative illustration, **Figure 10** shows the average spectrum holdings per operator across a selection of countries. Not only do South African MNOs have far less spectrum than many of their foreign counterparts, but, as discussed above, with less fixed infrastructure and less potential to offload mobile data onto Wi-Fi or other fixed solutions, the spectrum constraints faced by South African MNOs are even more acute.

Figure 10: Spectrum holdings per operator (2016)

Source: Coleago, 2016

- 6.11 The spectrum constraint is now at a critical point. Regulators must act decisively to address this spectrum constraint, and allow the operators to continue expanding coverage, and driving down costs of mobile connectivity. The latest ECA Amendment Bill does not take the Operators plea forward in this regard.
- 6.12 South African's use of mobile technology is expected to continue grow significantly, having increased by 18 times in the past 5 years, data will grow by a further 8 times in the next 5 years, as shown in Figure 11. This means firms such as MTN will have to invest more in infrastructure, and at an increasing rate, to support exponential growth in data usage. This investment can only be done within the context of a regulatory environment that is investment-friendly.

Figure 11: Projected future growth in data demand (MTN South Africa, Exabytes per year)



Source: MTN

- 6.13 The release of additional spectrum would have an immediate and significant impact in improving mobile data network quality, and if electricity prices, exchange rates and other input costs stay the same, could have a very positive effect on lowering costs, which are likely to be passed on to the consumer in the form of cheaper data prices.
- 6.14 In 2017 alone, MTN will invest in an additional 1,500 MTN sites at a capital cost of around R7.9 billion. At least 60% of these sites are built to alleviate capacity constraints, rather than improving coverage. Many such sites could be avoided if new spectrum was available.
- 6.15 Quality improvements are likely to be similarly dramatic.
- 6.15.1 Current spectrum constraints restrict MTN to applying around 10MHz to its 4G LTE technology layer, and resulting in a maximum speed of around 75Mbit/s.
- 6.15.2 Even with further re-farming of MTN's existing spectrum holdings, MTN could only hope to apply 25MHz to its LTE technology layer, which would result in maximum speeds of 185Mbit/s by 2020/2023.
- 6.15.3 However, if additional spectrum could be released, by way of illustration if digital dividend spectrum alone were released, speeds of up to

300MBit/s could be available immediately, which would deliver significant quality improvements to users.

- 6.16 The allocation of digital dividend spectrum is particularly important as it has beneficial characteristics including long distance propagation and good in-building penetration.
- 6.17 Moreover, the ongoing delay in the allocation of additional spectrum, both the high demand spectrum and digital dividend spectrum (as entrenched in the amendments proposed in the ECA Bill), has significant implications for data pricing and availability, national treasury, and broader economic development.
- 6.18 South Africa is becoming increasingly isolated in not allocating additional high demand spectrum or any digital dividend spectrum. In regard to digital dividend spectrum, while only 3 countries had made an allocation by 2010, over 64 countries have now made such an allocation. South Africa has missed its WTO commitments, internal deadlines, and as a result has caused significant uncertainty across the mobile and broadcasting industry.
- 6.19 In Dec 2011, in a study for the GSMA, Plum Consulting estimated that the early release of additional spectrum in South Africa would result in an increase of R78 billion in GDP, 7.6 million more subscribers, an additional 1 million jobs, and additional tax revenues of R 16 billion per annum by 2020.
- 6.20 A 5-year delay in the release of this spectrum from 2014 to 2019 is in the process of resulting in a reduction of R 355 billion in GDP, and R 70 billion in tax revenues.
- 6.21 The response of MNOs to this delay in new spectrum release is, of course, to invest in additional sites. While this is a costly and inefficient solution, more sites also reduce the eventual value of new spectrum, when and if it is finally allocated. If spectrum were ultimately allocated within an auction framework, the delay in this allocation of spectrum would likely result in a lower valuation for this spectrum, and accordingly lower revenues for the national treasury resulting from such a spectrum auction. Effectively, the delay in the allocation of spectrum is resulting in the transfer of billions of Rand from Treasury to foreign manufacturers of mobile site equipment, such as Huawei and Ericsson.

Additional constraints

- 6.22 In addition to the binding spectrum constraint, there are a range of other factors that conspire to frustrate further improvements in the terms of access to data services, in particular for the most economically marginalised in our society.
- 6.23 Broadly, these fall into supply and demand factors.
- 6.24 On the supply side, cost factors such as energy pricing, in particular the recent, and anticipated ongoing, escalation in Eskom's electricity tariffs, has a major impact on the cost of providing data services.
- 6.25 In 2018 MTN expects to spend around R 582 million on electricity for base stations alone, while expenditure on electricity for the whole network is expected to be around R740 million. Additionally, MTN needs to provide alternative power sources, such as backup batteries and solar solutions, which takes total power costs over R 1 billion. On top of this cost, Eskom has applied to NERSA for a 20% increase for 2018, which is still under consideration.
- 6.26 Additional cost factors include battery theft and vandalism at base station sites, and rapidly increasing infrastructure replacement and upgrade costs, which depend largely on imported components, and international revenue fraud.
- 6.27 Applications for wayleaves are costly and time consuming and each municipality has its own processes and requirements. Applications can take up to 6 months to be approved. Some municipalities have insisted on unreasonable and costly civil engineering requirements as a condition of approval. Penalties are also imposed in some cases e.g. where an operator requires trenching via road cutting as opposed to drilling.
- 6.28 On the demand side, a range of other government policies influences the growth in demand of data services, again in particular amongst the most vulnerable consumers.
- 6.29 By way of example, the tax regime on smartphone handsets increases the retail prices of handsets that are essential tools in accessing information and essential services.

7. Next steps

- 7.1 MTN would like to thank the Commission again for the opportunity to make this submission.
- 7.2 MTN is committed to being a pro-active corporate citizen, having invested heavily, over more than 20 years, to try and meet the exponential growth in demand and ensuring that South Africans have wide access to high quality mobile connectivity across the country, including in rural areas, at fair and reasonable prices within a competitive environment.
- 7.3 We look forward to working constructively with the Commission to assist it to understand the operation of particularly mobile data services markets in South Africa.