



Telkom

Regulatory Affairs and Government Relations

61 Oak Avenue, Highveld,
Techno Park, Centurion 0157,
Private Bag X148, Centurion 0046

T: +27 12 311 3598

F: +27 12 311 3314

E: Siyabonga@telkom.co.za

28 January 2019

Mr. Manyapelo Richard Makgotlho
Independent Communications Authority of South Africa
350 Witch-Hazel Avenue
Eco Point Office Park
Eco Park,
CENTURION
0157

Via email: rmakgotlho@icasa.org.za

Dear Mr Makgotlho

RE: TELKOM'S WRITTEN SUBMISSION ON THE DRAFT INTERNATIONAL MOBILE TELECOMMUNICATIONS (IMT) ROADMAP 2018

Telkom SA SOC Ltd ("Telkom") welcomes the opportunity to provide written comments pertaining to the draft IMT Roadmap 2018 as published in Government Gazette No. 42021 on 9 November 2018. Telkom hereby requests an opportunity to make oral representations at the public hearings, which are scheduled from 31 January to 1 February 2019.

Please find herewith Telkom's written comments on the draft IMT Roadmap 2018.

Yours Sincerely



Siyabonga Mahlangu
Group Executive: Regulatory Affairs and Government Relations

Submission to the Independent Communications Authority of South Africa

Draft IMT Roadmap 2018

Government Gazette No. 42021 (Notice 683 of 2018) dated 9 November 2018

Telkom SA SOC Ltd

Submission date: 28 January 2019

1 SECTION 1: Introduction

The Authority published the draft IMT Roadmap 2018 on 9 November 2018 in Government Gazette No. 42021 (Notice 683 of 2018) and invited written representations from interested parties on their views by no later than 16h00 on Friday, 18 January 2019. The Authority thereafter, in Government Gazette No. 42156 (Notice 10 of 2019), extended the date for submission of comments to Monday, 28 January 2019. The Authority further indicated that public hearings will be held from 31 January to 1 February 2019.

Telkom's submission is provided under general and specific comments contained in sections 3 and 4 respectively. An executive summary highlighting key points is provided in section 2.

Telkom welcomes the opportunity to comment on the Authority's draft IMT Roadmap 2018 and trusts that its comments will contribute the successful updating of the IMT Roadmap.

2 SECTION 2: Executive summary

Telkom wishes to highlight a few of the main points raised in sections 3 and 4 below.

1. Consideration of the National Integrated ICT Policy White Paper

Under Electronic Communications Act No. 36 of 2005 (“ECA”), the Authority must, in exercising its powers and performing its duties in terms of the ECA and related legislation, consider Ministerial policy and policy directions to the Authority. Whereas the Authority highlights key provisions from, amongst others, the ECA and South Africa’s Broadband Policy (“SA Connect”), Telkom notes with great concern that the draft IMT Roadmap 2018 does not consider or address the National Integrated ICT Policy White Paper (“ICT Policy”). Although the Authority highlights several provisions from SA Connect, including those associated with open access, the creation of a Wireless Open Access Network (“WOAN”) and the market structure and the dominance of some players in the mobile market, the ICT Policy has been disregarded in the draft IMT Roadmap 2018. From Telkom’s perspective, the ICT Policy builds on SA Connect and addresses in detail, amongst others, how high demand spectrum (“HDS”) will be treated in South Africa as well as the creation of the WOAN. Not considering the ICT Policy in drafting the IMT Roadmap 2018, which policy deals specifically with HDS, is therefore not aligned with the aforementioned provisions of the ECA.

In addition to this, the Authority is fully aware that the Minister recently published, for public consultation, proposed policies and policy directions to the Authority on the licensing of HDS. The proposed policies and policy directions to the Authority speak directly to the licensing of HDS, which is fundamental to the discussion on IMT spectrum. It is critical that the Authority considers the final policies and policy directions to the Authority before concluding the draft IMT Roadmap 2018.

Telkom is of the view that, amongst others, the consideration of the amount of spectrum, sites and investment required for 5G, warrant the consideration of the role of the WOAN for the delivery of 5G in South Africa. The amount of spectrum necessary for the WOAN to deploy 5G services must also be considered before such spectrum is assigned to the market. Further, WRC-19 (World Radiocommunication Conference 2019), which will take place in October/November 2019, will consider amongst its agenda items, spectrum

identification for 5G within the frequency bands between 24.25 GHz and 86 GHz (mmWave bands). The mmWave bands, with other lower frequency bands including 700 MHz and 3500 MHz, will be key bands for delivering 5G. It is essential that the 5G spectrum requirements for the WOAN be established prior to the assignment of these bands. The role, if any, of the 5G Forum created by the Authority should also be addressed and clarified in the draft IMT Roadmap.

2. Competition in the mobile market and the role of IMT spectrum

It is well known that access to spectrum determines market outcomes, in particular IMT spectrum. It is also well known that there is a high level of market concentration in the South African telecommunications space which is characterised by a duopoly structure in which Vodacom and MTN control more than 80% of the market. Given the high level of concentration, any assignment of IMT spectrum must consider how to address the high level of concentration and find a means to facilitate competition by enabling effective participation by smaller players.

Although the Authority provides a few high-level statistics on mobile penetration in South Africa etc., it does not provide any information relating to the high level of concentration nor the current market status of the mobile market. Telkom is of the view that considering the key role of IMT spectrum in determining market outcomes this oversight must be addressed in the draft IMT Roadmap 2018.

What also needs to be taken into consideration is that the Authority is currently conducting an inquiry specifically into the mobile broadband market. Telkom recommends that the outcome of this inquiry be considered before any new IMT spectrum is assigned in South Africa. Once the IMT spectrum has been assigned, it will be difficult, or impossible, to address any market failures that may be identified through the broadband inquiry.

3. IMT Roadmap 2018 and its relationship to other Regulations

It is stated that the IMT Roadmap “*builds on the draft frequency migration plan published on 24th August 2018*”. It is further stated that the IMT Roadmap “*identifies the bands for IMT deployment and identifies the migration of current licensees out of bands identified*”

for IMT'. The IMT Roadmap also contains information on feasibility studies, which is also addressed in the draft Frequency Migration Plan 2018.

In Telkom's view, the Roadmap should set the scene and discuss, in general and with a long-term view, IMT and the various IMT frequency bands. However, when it is decided to identify a specific frequency band for IMT in South Africa, this should be done through the National Radio Frequency Plan. At the same time, the need for migration of licensees should then be addressed in the Frequency Migration Plan. This is generally followed by the development of a Radio Frequency Spectrum Assignment Plan, which deals with the specifics around the licensing and use of an IMT frequency band. The IMT Roadmap should therefore have a long-term view but should not overlap or replicate the functions of other instruments such as the Frequency Migration Plan or the National Radio Frequency Plan.

4. Purpose of the IMT Roadmap

The draft IMT Roadmap 2018 provides mostly background information on IMT with very little direction or specific decisions stemming from the IMT Roadmap. It is therefore Telkom's view that the draft IMT Roadmap 2018 is a general discussion document (or white paper) on IMT, without specific regulatory implication. Implementation of IMT spectrum related matters in South Africa will occur through the other instruments prescribed by the Authority, such as the National Radio Frequency Band Plan, Radio Frequency Spectrum Assignment Plans and the Radio Frequency Migration Regulations and Plan.

Telkom is of the view that the Authority's views and plans on how it will, in relation to the use of IMT spectrum, implement policy, address the dominance in the mobile market, facilitate the implementation of 5G, etc. should be addressed in the IMT Roadmap, even if only on a high level.

5. IMT Roadmap 2014 versus IMT Roadmap 2018

Several sections of the IMT Roadmap 2014 have been retained, mostly unchanged, in the draft IMT Roadmap 2018. However, many regulatory, technology, market and other changes have occurred since the publication of the IMT Roadmap 2014, both nationally and internationally. The content of the draft IMT Roadmap 2018 must therefore be

updated to reflect the latest information before it can be published. Extensive modifications will be required. These are however, not highlighted in this submission due to time constraints.

6. Conclusion

Considering the above shortcomings and for the requirement that the draft IMT Roadmap 2018 be updated, Telkom recommends that, once updated, a second draft be published for public consultation, before the finalisation of the draft IMT Roadmap 2018. This must be done after the Authority's broadband inquiry has been concluded to factor these outcomes into the draft IMT Roadmap 2018.

3 SECTION 3: General comments

3.1 Purpose of the IMT Roadmap

It is important to understand the purpose of the IMT Roadmap and its relationship to other regulations prescribed by the Authority and activities related to IMT, such as the National Preparatory Process for WRC-19 and the 5G Forum.

In terms of section 1 (“About”), the IMT Roadmap 2014 “...*aims to share the findings for the Independent Communications Authority of South Africa (“ICASA” or “the Authority”) with regards to the roadmap for IMT*”. Further, in terms of section 2.1 of the IMT Roadmap (“Purpose of the IMT Roadmap”), the IMT Roadmap summarises the ITU perspective on IMT, the SADC perspective on IMT, the SA Connect Targets and the related issue of Universal Service and obligations. It then provides information on national legislation and regulation, the SADC frequency allocation plan and ITU Recommendations pertaining to IMT.

It lists various IMT frequency bands, both current and future, and then discusses some of these in different levels of detail. Generally, the draft IMT Roadmap 2018 provides information on IMT; however, there is very little direction or specific decisions stemming from the draft IMT Roadmap 2018. It would therefore seem that the main purpose of the IMT Roadmap is to provide background information on IMT in general, and specifically the various frequency band options under consideration.

It is therefore Telkom’s view that the draft IMT Roadmap 2018 is a general discussion document or white paper on IMT, without addressing specific regulatory issues or implications. Implementation of IMT in South Africa will occur through the other instruments as discussed in section 3.3 below (e.g. National Radio Frequency Plan, Radio Frequency Spectrum Assignment Plans and Radio Frequency Spectrum Migration Regulations and Plan). Nevertheless, the Authority’s views and plans on how it will, in relation to the use of IMT spectrum, implement policy, address dominance in the mobile market, facilitate the implementation of 5G, etc. need to be addressed in the IMT Roadmap, even if only on a high level.

3.2 IMT Roadmap 2014 vs IMT Roadmap 2018

The Authority published the first version of the IMT Roadmap in 2014 in Government Gazette No. 38213 (Notice 1009 of 2014 dated 14 November 2014). By assessing the IMT Roadmap 2018, it seems that the intent is to replace the IMT Roadmap 2014, even though this is not specifically stated. Telkom requests that this be clarified in the final IMT Roadmap 2018.

Although many regulatory and technical changes occurred since the publication of the IMT Roadmap 2014 both nationally and internationally, many of the sections from the IMT Roadmap 2014 have been retained in the IMT Roadmap 2018 mostly unchanged. The draft IMT Roadmap 2018 must therefore be updated to reflect the latest developments before it can be published. Extensive modifications are required, which are not highlighted in this submission to lack of time.

3.3 IMT Roadmap 2018 and its relationship to other Regulations

It is stated that the IMT Roadmap “*builds on the draft frequency migration plan published on 24th August 2018*”. It is further stated that the IMT Roadmap “*identifies the bands for IMT deployment and identifies the migration of current licensees out of bands identified for IMT*”. The IMT Roadmap also contains information on feasibility studies, which are also addressed in the Frequency Migration Plan.

There therefore seems to be an overlap between the IMT Roadmap and other prescribed Regulations such as the Radio Frequency Migration Regulations and Plan, the National Radio Frequency Plan and the Radio Frequency Spectrum Assignment Plans. It is not clear how the IMT Roadmap “builds on” the Frequency Migration Plan. In Telkom’s view, the Roadmap should set the scene and discuss, in general, IMT and the various IMT frequency bands. When it is decided to identify a specific frequency band for IMT for South Africa, this should be done through the National Radio Frequency Plan. At the same time, the need for the migration of licensees, should be addressed in the Frequency Migration Plan. This should be followed by the development of a Radio Frequency Spectrum Assignment Plan, which will deal with the specifics around the licensing and

use of an IMT frequency band. Although the IMT Roadmap should have a long-term view, it should not overlap or replicate the functions of other instruments as discussed.

3.4 National Integrated ICT Policy White Paper

In section 5 of the draft IMT Roadmap 2018, the Authority highlight key provisions from, amongst others, the ECA and South Africa Connect as they relates to IMT. In section 5.3 (“South Africa Connect”) the Authority highlights several provisions from South Africa Connect, including those associated with open access, the creation of a Wireless Open Access Network (“WOAN”) and the market structure and the dominance of some players in the mobile market. It is noted that these provisions were also contained in the IMT Roadmap 2014.

Telkom, however, notes with great concern, that the draft IMT Roadmap 2018 does not address the latest approved Government Policy namely the National Integrated ICT Policy White Paper (“ICT Policy”). The ICT Policy was published in Government Gazette No. 40325 (Notice 1212 of 2016 on 3 October 2016). The ICT Policy builds on the South Africa Connect and addresses in detail, amongst others, how high demand spectrum will be treated in South Africa as well as the creation of the WOAN. Not considering the ICT Policy in drafting the IMT Roadmap 2018, which policy deals specifically to HDS, is therefore not aligned with the aforementioned provisions of the ECA. The ECA states clearly that the Authority must consider policies and policy directions issued by the Minister.

The Authority is also fully aware that the Minister published proposed policies and policy directions to the Authority on licensing in Government Gazette 41935, dated 27 September 2018 (Notice 1003 of 2018). Comments were due on 8 November 2018. The proposed policies and policy directions to the Authority speak directly to the licensing of HDS, which is fundamental to the discussion on IMT spectrum.

Telkom therefore recommends that the draft IMT Roadmap 2018 be updated to reflect the ICT policy. It is paramount that the Authority addresses the implementation of ICT Policy in the context of IMT spectrum. Further, it is also important that the Authority waits

for the conclusion of the process pertaining to the formulation of policies and policy directions on licensing before concluding on the draft IMT Roadmap 2018.

3.5 Competition in the mobile market

It is well known that access to spectrum determines market outcomes, in particular the assignment of IMT spectrum. It is also well known that there is a high level of market concentration in South Africa with the duopoly in Vodacom and MTN controlling more than 80% of the market. Assignment of IMT spectrum must therefore be done in a way that addresses this market concentration and facilitates effective competition by smaller players.

Although the Authority provides a few high-level statistics in terms of mobile penetration, etc. in South Africa, there is no information on mobile market concentration or market status. Telkom is of the view that this is an oversight and must be addressed in the draft IMT Roadmap 2018: considering the key role of IMT spectrum in determining market outcomes. Related to this is the Authority's current inquiry pertaining to the mobile broadband market. Telkom recommends that the outcome of this inquiry be considered before the assignment of any IMT spectrum in South Africa. Once IMT spectrum is assigned, it will be difficult, or impossible, to address any market failures identified through the broadband inquiry.

3.6 Issues to be added to the IMT Roadmap

Telkom recommends that the Authority considers and include additional matters in the IMT Roadmap, including:

- How the Authority will address the imbalance in sub-1 GHz spectrum assignment. Telkom wishes to reiterate that it is, to date, the only national mobile provider without direct access to sub-1 GHz spectrum and is therefore at a disadvantage when competing with the other mobile operators. Sub 1 GHz spectrum is also needed to facilitate the migration of legacy systems from various other frequency bands, as addressed in the Radio Frequency Spectrum Migration Plan.

- The deployment of thousands of small cells in the context of 5G. Issues to be considered include access to property and facilities, sharing between operators, backhaul, etc.
- The role of IMT satellite in the delivery of broadband services, especially in rural areas. Also, to be considered in this regard, is the use of bands identified by the ITU for IMT satellite such as the 2100 MHz frequency band.
- Radio Frequency Spectrum Assignment Plan for 2600 MHz TDD (2570-2620 MHz).

4 SECTION 4: Specific comments

4.1 Digital migration and availability of 700/800 MHz

In section 2.1 (Executive Summary – Purpose of the IMT Roadmap) it is stated that: “A key part of this policy/ document concerns the deployment of the 700 MHz and 800 MHz digital dividend bands that is still being occupied by analogue and digital terrestrial television (DTT). ICASA has taken all steps in their jurisdiction by publishing the Final Radio Frequency Spectrum Assignment Plans to implement IMT in Digital Dividend I and II.”

This subject is not covered sufficiently in the draft IMT Roadmap 2018. Telkom is of the view that the Authority has not taken all the steps possible to facilitate and expedite this matter and that additional work is necessary. For example, the Authority could develop a digital terrestrial television (“DTT”) migration plan aiming specifically at the clearance of 700 MHz and 800 MHz frequency bands. This should be done in conjunction with the Department of Communications (“DoC”), which has appointed a team to prioritise DTT implementation to release the 700 MHz and 800 MHz spectrum for IMT. The work has not been completed and the Authority cannot state that it “*has taken all steps in their jurisdiction*”. Time lines for the clearing and full availability of 700 MHz and 800 MHz has not been provided. Telkom requests the Authority to continue facilitating and driving this process to ensure timely availability of these frequency bands for IMT.

4.2 IMT850

The IMT850 Radio Frequency Spectrum Assignment Plan has not yet been concluded. The Authority makes very brief reference to this fact in section 2.1 of the IMT Roadmap 2018 (page 15/183) and section 3.2 (page 27/183). However, there is no indication in the draft IMT Roadmap 2018 as to when this matter will be concluded, or what the intent of the Authority is regarding this matter. This matter is important as it impacts on the availability of the IMT800 frequency band and has the potential to cause harmful interference to other services, including the licence exempted use of the 800 MHz band. Telkom provided extensive comments on this matter in previous submissions including

the IMT Roadmap 2014 process and more recently during the consultation regarding the development of the IMT850 Radio Frequency Migration Plan. Telkom wishes to reiterate some of the views it previously provided in its submissions to the Authority.

- There is no reference to the use of the bands 825 – 830 MHz paired with 870 – 875 MHz for IMT in the South African National Radio Frequency Plan (NRFP) published by the Authority in 2018.
- Telkom is of the view that additional compatibility studies are needed before IMT should be allowed to use this band. Sharing studies between IMT850 and other licensed systems and services are outstanding and must be addressed to ensure protection of these. The impact on licence exempted services must also be considered further.
- It is not clear if 2x3 MHz or 2x5 MHz will be made available for IMT in the 850 MHz frequency band.
- IMT850 is more compatible to Region 3 countries compared to Region 1 countries (including South Africa) in terms of the use of IMT within the range 694-960 MHz band. The Southern African Development Community (SADC) and South Africa concurred that the use of 850 MHz in the region is not appropriate.
- The migration of Liquid Telecom's CDMA-2000 systems from the IMT850 band is supported. This migration should however not give Liquid Telecom automatic access to 2x5 MHz in the IMT850 band for IMT service. If IMT850 is created, access to this band should be done through an ITA as indicated in the draft RFSAP for IMT850. Nonetheless, Telkom supports shifting Liquid Telecom's assignment in the 850 MHz band downwards by 3 MHz, if compatibility with adjacent band services are guaranteed.
- The use of IMT850 should not compromise the use of the full 2x30 MHz in IMT800. Sharing between IMT850 and IMT800 must therefore be ensured.

Please refer to Telkom's full submission made at the time of the consultation on the IMT850 Radio Frequency Spectrum Assignment Plan.

4.3 Ad section 3.2 (Bands identified for IMT)

- The intention of Table 1 in the draft IMT Roadmap 2018 is to list the ITU identified IMT frequency bands (*“Table 1 list all possible IMT frequency bands identified by the ITU”*); Table 1 is therefore not a list of IMT bands identified for South Africa. Telkom recommends that this table be updated to also include the frequency bands identified for IMT at WRC-15. These include the bands 3.3-3.4 GHz and 1427-1518 MHz.
- Further, the Authority decided to retain the various notes contained in Table 1 from the 2013 Radio Frequency Spectrum Plan. The concern is that these notes are outdated (see for example Note 8, which still refers to the two options for the 2.6 GHz band which are no longer relevant). The problem is further compounded by the fact that these notes have been removed from the National Radio Frequency Plan 2018. Keeping these notes, even if it is stated that it is from the 2013 National Radio Frequency Plan, will create confusion and must therefore be deleted.
- On page 27/183, the Authority makes the following statement: *“The following IMT bands were assigned by the publication of the Final Radio Frequency Spectrum Assignment Plans.”* Telkom respectfully submits that this statement is not accurate. IMT bands are not assigned through Assignment Plans; “assigned” is clearly defined in the Radio Frequency Spectrum Plan 2018. Telkom recommends that the sentence be changed to: *“The Authority prescribed the following Radio Frequency Spectrum Assignment Plans.”* Further, IMT750 should be added to the list.
- On page 27/183, the Authority makes the following statement: *“The decision of IMT1800 and IMT2100 bands has been delayed until a decision and guidance has been given by the ITU”*. This statement is not clear and needs further clarification. Although Radio Frequency Spectrum Assignment Plans have not been prescribed for these bands, these bands have been identified for IMT in the National Radio Frequency Plan 2018 and have been assigned for use in South Africa. It is not clear what “decision and guidance” will be given by the ITU with regards to these two frequency bands. This statement must either be clarified or deleted. If the intention of the Authority is to prescribe Radio Frequency Spectrum Assignment plans for these two bands, this must be indicated.

4.4 Ad section 3.3 (Issues for WRC-19)

- Telkom recommends that the draft IMT Roadmap 2018 makes it clear that these bands are being studied and that WRC-19 will decide which bands, if any, will be identified for IMT. These frequency bands should therefore be listed, in the draft IMT Roadmap, only for information. It should also be noted that the identification will be for “IMT” and not “IMT-2020”.
- Telkom also recommends that the format of Resolution 238 (WRC-15) be changed to ensure that it closely follows the ITU format. For example, the words “considering”, “noting”, “recognising”, etc. should be reflected as headers and not part of the body of text. Also, the two footnotes at the end of the Resolution should be reflected as footnotes and not as part of the body of text.

4.5 Ad section 4 (SADC)

Telkom recommends that Table 2 be updated to reflect the latest version of the SADC Frequency Allocation Plan (“FAP”) namely FAP 2016. Also, new IMT identifications such as 1427-1518 MHz and 3.3-3.4 GHz must be added. Further, to ease the reading of the table, it is recommended that the table be split to indicate gaps in frequency allocations and not to have one table.

4.6 Ad section 5.1 (The Electronic Communications Act)

The relevance and need for capturing a few provisions from the ECA into the draft IMT Roadmap 2018 is not clear and seemingly not required. Highlighting a few provisions from the ECA will not change the full implementation of the ECA and provisions related to IMT spectrum. Telkom is also of the view that not all relevant provisions have been highlighted in the draft IMT Roadmap 2018. This leaves the reader with the impression that the Authority considers these provisions to be irrelevant. These are further addressed below.

- a) A key objective of the ECA not listed in the draft IMT Roadmap, which is fundamental to the discussion on IMT spectrum, is competition (section 2(f) of the ECA). Whether this provision is referenced in the IMT Roadmap or not, does not change that fact that the Authority must consider the impact on competition when making decisions on the use and licensing of spectrum and specifically HDS or IMT spectrum. If section 5.1 is retained, Telkom recommends that 2(f) be added to the list.
- b) Whereas the Authority highlights the fact that the Minister may make policies, it does not include the fact that the Minister may also make policy directions to the Authority. This omission may create the impression that policies are more important than policy directions, or even that policy directions are not considered important in the context of IMT spectrum. Telkom recommends that section 5.1.2 either be deleted or expanded to give a full perspective on the role of policy and policy directions.
- c) Another important regulatory consideration is section 3(4) of the ECA which states that the Authority must consider policies and policy directions made by the Minister. The Authority has a judicial duty to consider all policies and policy directions made by the Minister in all its actions including those pertaining to IMT spectrum. If section 5.1.2 is maintained, Telkom recommends that the Authority includes reference to section 3(4) of the ECA.
- d) Whereas the Authority refers to section 30 of the ECA ("*Control of the radio frequency spectrum*"), there is no reference to the national radio frequency plan and the plan for the migration of systems and equipment of existing users. If the other sections are retained, Telkom recommends that section 34 be added.

4.7 Ad section 5.2 (The Radio Frequency Migration Regulations and Plan 2018)

Telkom wishes to highlight a few matters pertaining to this section.

- a) Currently, the Radio Frequency Migration Regulations and Plan 2018 has not been prescribed. Although this may be prescribed in due course, the final version is not yet available.

- b) It is noted that the content of this section has been retained unchanged from the IMT Roadmap 2014. Telkom recommends that the section be updated.
- c) Telkom is of the view that it is not necessary to repeat content from the Radio Frequency Migration Regulations and Plan in this document. A simple reference to the migration regulations and plan will suffice. What is more important is to describe the relevance and relation of the Radio Frequency Migration Regulations and Plan in the context of the IMT Roadmap. Again, it is noted that, apart from the few extracts, no additional information is provided in the draft IMT Roadmap 2018 pertaining to migration.
- d) Telkom notes that Figure 2 has been removed from the draft Radio Frequency Spectrum Migration Plan. Either this should be added to the final migration plan or removed from the draft IMT Roadmap 2018 if it is not contained in the migration plan.

If the provisions listed above are retained, please refer to Telkom's comments on these matters as provided under the consultation pertaining to the Radio Frequency Spectrum Migration Plan 2018.

4.8 Ad section 5.3 (South Africa Connect)

The Authority highlights a few provisions from the South Africa Connect or Broadband Policy. These include objectives, broadband targets, open access, the demand for more spectrum, conditions for a national wireless network, key success factors, etc. The draft IMT Roadmap 2018 however lacks concrete direction on the way forward and how IMT spectrum, as discussed in the draft IMT Roadmap 2018, will address these issues. For example, how does the Authority see the use of IMT spectrum as being able to reach the SA Connect targets? How will the Authority give effect to the implementation of the ICT Policy regarding HDS and the creation of the WOAN?

Telkom recommends that the draft IMT Roadmap 2018 be expounded to clearly indicate the Authority's thinking on how these objectives will be achieved using IMT spectrum. Please also refer to Telkom's comments on the ICT Policy in section 3.4 above.

4.9 Ad section 5.7 (LTE – paired and unpaired spectrum (FDD and TDD))

Telkom recommends that this section be reworked to reflect the latest information. A few examples of old information are listed below:

- References to number of networks and devices and equipment performance.
- Reference to the concept of “managed spectrum park” to be employed in the 2.6 GHz frequency band. Telkom is of the view that this concept is no longer being considered and should therefore be removed.

4.10 Ad section 6 (Forecasts for South Africa)

This section has been retained mostly unchanged from the IMT Roadmap 2014. Telkom recommends that the section be updated to reflect the latest developments. The following are a few examples of information and data that need updating.

- Forecast of overall IMT demand, including the demand for IMT-2020 spectrum.
- The availability of the band 3600-4200 MHz noting that WRC-15 did not approve the use of this band for IMT.
- Figure 5: mobile traffic forecasts.
- The need to retain the information on the calculation of spectrum demand for pre-IMT, IMT-2000 and its enhancements no longer seems to be necessary.
- Figure 6; IMT spectrum assignments in South Africa (this table is not clear and incorrect).
- References to the amount of IMT spectrum available in South Africa.
- Table 9: SA IMT spectrum assignments – not only is this information out of date, it is not clear how to interpret the details. For example, why does 800 MHz change from 30 MHz to 69 MHz from 2014 to 2020 respectively? What is the 1700 MHz band noting that 1800 MHz have also been included? Why is 900 MHz indicated as 50 MHz since the band is 2x35 MHz? Why are the 2500 MHz and 2600 MHz bands indicated as 100 MHz and 90 MHz respectively since the band is 2x70 MHz FDD and 50 MHz TDD?
- Forecast of overall M2M demand.

- IMT demand figures for South Africa as well as the current mobile penetration figures.

In concluding the section, the Authority provided a few findings from its latest State of the ICT Sector in South Africa. There is, however, no concluding statement or indication of how this data is impacting the IMT Roadmap and the future use of IMT spectrum. This must be addressed in more detail in the IMT Roadmap.

Furthermore, only a few basic statistics are provided and one of the key concerns: namely the high level of concentration in the mobile market which is dominated by Vodacom and MTN, which collectively control more than 80% of the market. This is a very important matter and specifically impacts on the IMT Roadmap considering the key role of IMT spectrum in determining market direction and outcomes. Telkom requests the Authority to add information pertaining to competition in the mobile market in South Africa and indicate how it intends to address this concentration, specifically in the use of IMT spectrum. Related to this is the Authority's current inquiry pertaining to the mobile broadband market. It is anticipated that the outcome of this inquiry will have bearing on the use of IMT spectrum. The draft IMT Roadmap 2018 must therefore not be concluded before the conclusion of the mobile broadband inquiry.

4.11 Ad section 7 (IMT Roadmap)

As with other sections, Telkom recommends that the Authority review the content of this section and update the information were required. Most of the current content in section 7 was retained unchanged from the IMT Roadmap 2014. Telkom wishes to highlight a few concerns from section 7.

- Table 11 contains information that must be updated.
 - o IMT450 must be updated based on the work of WP5D (see Telkom's comments made in relation to the Radio Frequency Migration Plan 2018 consultation. Further, the IMT750 Radio Frequency Spectrum Assignment Plan has been prescribed and provides for a 15 MHz TDD block, which is not reflected in the table.
 - o IMT850 has not yet been concluded as also discussed above.

- For IMT700, SA adopted the 2x30 MHz option (not the 2x45 MHz or 2x3 MHz options).
- For IMT3500 there is a reference to “managed spectrum park”, which has not been included in the Radio Frequency Assignment Plan and should therefore be removed from the draft IMT Roadmap.
- Table 10 needs to be updated to reflect the situation with IMT450 and to add the 1900 MHz TDD band (1880-1920 MHz).

Section 7.2 (Guard Bands) contains information, which is mostly still relevant. However, references to WiMAX 900, CDMA 450 and the US-700 MHz band are probably not relevant and should be considered for deletion.

The Authority deleted the discussions pertaining to most IMT frequency bands from the draft IMT Roadmap 2018. Only the 1710-2290 MHz frequency band was retained. Telkom wishes to provide the following comments pertaining to this section:

- The IMT450 band still needs to be reviewed, as highlighted in Telkom’s submission pertaining to the Radio Frequency Migration Plan 2018 consultation. This should be reflected in the IMT Roadmap. At this stage, it is also not clear if this band will be assigned to Transnet, be auctioned or be used for PPDR. These issues must be clarified. In any event, Telkom recommends that the IMT450 Radio Frequency Spectrum Assignment Plan be updated through a public consultation process.
- Whereas the section pertaining to the 894-876 MHz frequency range has been removed from the draft IMT Roadmap 2018 (section 8.4 in the IMT Roadmap 2014), the “*Conclusions*” section and the text box dealing with “*LTE-R Considerations*” have been retained. The conclusions section has not been updated and, with the deletion of the discussion part, the references to “*Consideration 2*” and “*Consideration 3*”, amongst others, do not make sense. This section must either be updated or deleted. Furthermore, it is not clear if this “conclusion” brings finality to the IMT850 discussion. In any event, Telkom recommends that the outcome of the IMT850 discussion should be reflected in the publication of the final IMT850 Radio Frequency Spectrum Assignment Plan. The same applies to the text boxes dealing with “*LTE-R Considerations*”. Deleting the content part of the section also removes the discussion on GSM-R, which is part of the IMT850 Assignment Plan discourse.

Once the IMT850 Radio Frequency Spectrum Assignment Plan has been concluded, the discussion contained in the IMT Roadmap can be deleted (as is the case for IMT900).

4.12 Ad section 7.3 (1700-2290 MHz)

In Table 15 (*SADC Frequency Allocation Plan for 1700-2200 MHz*) the frequency range 1930-1980 MHz needs editorial corrections. Also, breaks in frequency allocations should be added to the table to facilitate the reading of the allocation plan.

Telkom recommends that the discussion pertaining to the use of the band 2025-2110 MHz paired with 2200-2285 MHz (ITU-R Recommendation F.1098) be deleted from the draft IMT Roadmap 2018. Not only is it not relevant to the IMT discourse (it deals with PTP links) but has also been addressed through the Radio Frequency Migration Plan and a draft Radio Frequency Spectrum Assignment Plan, which has been published and is expected to be concluded soon. The same applies to the use of the band 2285-2300 MHz, which have been concluded in the Radio Frequency Spectrum Assignment Plan published 23 March 2018 (Government Gazette No. 41512, Notice 145 of 2018).

Telkom wishes to highlight a few matters pertaining to Figure 13 (*Current assignments with 1700-2200 MHz*):

- Not shown in Figure 13 is the use of the IMT1800 band centre gap (i.e. 1785-1805 MHz), which is also IMT spectrum and partly assigned to Rain for TDD BWA. For sake of completeness it is recommended that this be reflected in Figure 13 as well as the need for guard bands to facilitate sharing between TDD and FDD assignments. The future use of the centre gap should also be addressed.
- The band 2025-2110 MHz is incorrectly indicated as being assigned to Telkom exclusively and as TDD. The lower half of the F.1098 band, which is an FDD band (2025-2110 MHz // 2200-2285 MHz) is used for PTP links. The return band should also be reflected in Figure 13. This band is also not assigned exclusively to Telkom as portrayed. Telkom uses only some paired channels on a limited scale for PTP links and on a shared basis with other licensees.

In section 7.3.4.1, the statement that the IMT1800 band is for GSM1800 is incorrect; most licensees have refarmed (at least partially) the band for the deployment of LTE services. The band designation IMT1800 should rather be used. Similarly, the “*UMTS 2100 FDD spectrum*” should be referred to as IMT2100 frequency band.

Regarding the 1880-1920 MHz frequency band, Telkom wishes to make the following comments:

- It is indicated that the TDD band 1880-1920 MHz is used by Telkom, SAPS and SANDF for DECT-systems and fixed links. This band can be divided into two sub-bands namely 1880-1900 MHz and 1900-1920 MHz.
- 1880-1900 MHz:
 - o The lower sub-band is used for DECT cordless telephones on a licence exempt basis (Radio Frequency Spectrum Regulations 2015; Annexure B) as well as by Telkom and others for DECT WLL (Wireless Local Loop) systems.
 - o Telkom recommends that the band 1880-1900 MHz continued to be used for DECT cordless telephones.
 - o Telkom is in the process of migrating DECT WLL systems, although the completion of this migration will depend on the availability of suitable alternative technologies and spectrum (sub 1 GHz spectrum).
 - o The use of the band 1880-1900 MHz for DECT cordless telephones on a license exempt basis is in line with CEPT/ERC/REC70-03.
- 1900-1920 MHz
 - o This band has been assigned exclusively to Telkom and is used for BFWA systems; Telkom has no immediate plans to migrate these systems.
 - o Telkom deployed MGW and e-MGW FWA systems in this band and does not employ a guard band between 1915-1920 MHz. The statement that the band 1915-1920 MHz is “free” is therefore factually incorrect.
 - o Telkom is also not aware of SANDF or SAPS using either of these sub-bands and has never been requested by the Authority to conduct frequency coordination with these entities in these bands.
- Apart from the above systems, Telkom is not aware of any PTP links being deployed in these two sub-bands.

Regarding the proposal to extend the 2100 MHz band for terrestrial IMT, Telkom wishes to make the following comments:

- The Authority proposes that the current IMT2100 band be “extended” with the IMT satellite bands (i.e. 1980-2010 MHz paired with 2170-2200 MHz). It is assumed that this “extending” implies adding terrestrial IMT to these bands while retaining the IMT satellite allocation.
- Both Europe and USA allow the use of these bands, in addition to MSS, for complementary terrestrial services. In Europe, this is labelled CGC (Complementary Ground Component), which is ground-based infrastructure used to enhance satellite coverage in highly shadowed areas. In the USA, this is also allowed and is labelled ATC (Ancillary Terrestrial Component). This is however not an “extension” of the IMT2100 band but a complementary use of the bands by terrestrial in support of the satellite use. Both ATC/CGC are allowed in South Africa as per NRFP, 2018.
- Telkom does not support the extension of the 2100 MHz band for exclusive use by terrestrial IMT services.
 - o These bands have been harmonised internationally for IMT satellite and since developments in this regard are ongoing, its use for satellite services should be retained.
 - o Several satellite networks have already been deployed in these bands.
 - o There is currently no 3GPP terrestrial IMT band for this range and no terrestrial ecosystem. A decision to convert the band to terrestrial is therefore premature.
 - o This matter will be discussed at WRC-19 under agenda item 9.1.1.

The Authority is considering rearrangement and re-assigning the TDD bands to a TDD wholesale operator/consortium. Telkom does not support this notion at this stage as the consideration of spectrum for the WOAN should be aligned with current processes. Also, the idea that Vodacom and MTN can change their TDD spectrum to FDD cannot be supported at this stage. If this is considered, Telkom should be permitted to change some, or all, of its assignments in the 1880-1920 MHz frequency band in the spirit of consistency. This can be elaborated on and discussed further.

In addition to the above comments, Telkom recommends that the first paragraph in section 7.3.5 be deleted. This information seems to be very old and is no longer relevant.

Telkom also recommends that section 7.3.6 (*Conclusions*) be amended. Not only is the current statement incorrect (Radio Frequency Spectrum Assignment Plan for the band 2285-2300 MHz has been prescribed), this one sentence does not accurately capture the essence of what was discussed for the 1710-2200 MHz frequency range.

4.13 Ad section 7.4 (IMT2020 Frequencies for consideration)

Telkom recommends that the Authority add to the introduction of section 7.4 to make it clear to the reader that reference to the bands to be considered at WRC-19 is for information only as the conference will decide which bands to identify for IMT (not IMT-2020). To this extent Telkom recommends that section 7.4 be split into two parts. Part one should deal with the frequency bands 1427-1518 MHz and 3.3-3.4 GHz, which have been identified for IMT at WRC-15. Part two should deal with the bands being considered under WRC-19 agenda item 1.13. In the current form, they are seemingly treated equally, which should not be the case.

Telkom supports the inclusion of the 3.3-3.6 GHz frequency band under the IMT2020 discussion considering that this band, including the band 3.4-3.6 GHz, is considered globally as a 5G frequency band. It could be indicated that the IMT3500 Radio Frequency Spectrum Assignment Plan has been prescribed for the upper part, i.e. 3.4-3.6 GHz. In this regard, Telkom recommends that the band 3.3-3.6 GHz be assigned with other 5G spectrum in future and once the direction for 5G has been clarified. The role of the proposed WOAN in delivering 5G services must be contemplated, in line with the ICT policy, as discussed above.

4.14 Ad section 7.5 (IMT2020 proposed actions for the identified IMT frequency bands)

In section 7.5.2, under the discussion of sharing and compatibility between IMT and radio location services, the Authority twice refers to "*This contribution*" and once to "*the Study*"

in the Attachment". It is not clear what these are although it is assumed that they refer to the contributions of the listed Administrations to ITU-R WP5D. Telkom recommends that this be clarified.

Whereas the work in WP5D is ongoing, it is not clear why this information is presented in the draft IMT Roadmap 2018 in its current form. Whereas it is important to highlight the fact that sharing and compatibility studies are ongoing in WP5D, and because the outcome of these studies in WP5D cannot be anticipated, the specifics as presented are not clear. Telkom recommends that a more general summary of the ongoing studies be provided. Telkom is further of the view that the draft IMT Roadmap 2018 pertaining to the band 3.3-3.4 GHz can only be concluded once WP5D has concluded on the sharing and compatibility studies.

The Authority added frequency band information for each of the frequency bands being studied under WRC-19 agenda item 1.13. The outcome of WRC-19 cannot be anticipated. Telkom wishes to make the following comments regarding the Authority's proposals in relation to the listed WRC-19 frequency bands.

- The statement "*It is recommended that a Frequency Spectrum Assignment Plan is developed for this band*" seems inappropriate at this early stage. Such action can only be considered if WRC-19 identifies the frequency band for IMT.
- Where the Authority proposes to develop a Radio Frequency Spectrum Assignment Plan, it also indicates that "*There are no intention to perform a study before the Frequency Spectrum Assignment Plan is developed*". This statement is not clear. What study is being referred to? Will the development of a Frequency Spectrum Assignment Plan not necessitate a study to be conducted? Telkom recommends that this be clarified.
- The intention of the statement "*Study to be performed into the detail current usage of the band and the availability for IMT2020 applications*" is not clear. These WRC-19 frequency bands, including their use, are considered within the National Preparatory Working Group ("NPWG") preparing for WRC-19, which process is being led by the Department of Telecommunications and Postal services ("DTPS"). Will the Authority perform its own assessment of use of these bands and feed their findings into the NPWG process? Noting that WRC-19 will take place later this year,

and since it is not clear when the IMT Roadmap 2018 will be finalised, Telkom recommends that the assessment of use of spectrum continue under the auspices of the NPWG for WRC-19.

Section 7.5.11 deals with the frequency band 57-66 GHz. The inclusion of this band into the draft IMT Roadmap 2018 needs to be clarified. This band will neither been considered under WRC-19 agenda item 1.13 (not included in Resolution 238 (WRC-15) nor was it identified for IMT. Also, the V-Band is to be used for PTP links, which is not IMT. Telkom recommends that this band either be deleted form the IMT Roadmap or its inclusion be clarified. The development of a Radio Frequency Spectrum Assignment Plan is not objected to, but should not be included into the IMT Roadmap.

Regarding section 7.5.12 (66-76 GHz), Telkom recommends that this band be split into two frequency bands, in line with the draft CPM Report (i.e. 66-71 GHz and 71-76 GHz). E-Band is limited to the bands 71-76 GHz paired with 81-86 GHz. The text in the section should be amended accordingly.

4.15 Ad section 8 (IMT Roadmap: Time Frame)

The text in section 8 has been retained from the IMT Roadmap 2014. Telkom recommends that the information be updated to reflect the current situation. For example, most of the information for the period 2014 to 2017 relates to the IMT450 frequency band. Most of the proposed migration and actions have not been implemented; these should therefore be amended accordingly.

Telkom also recommends that the Authority highlights its intention regarding the licensing of 5G spectrum, which can only occur after WRC-19.

4.16 Ad section 9 (IMT spectrum and Universal Service Obligations)

It is again noted that this section has been retained, mostly unchanged, from the IMT Roadmap 2014. Telkom recommends that the section be updated taking the latest developments, including the ICT Policy, into consideration.

The guidelines for Universal service obligation is, by the document's own admission, just a pre-empt ("*indicative minimum obligations*") of what may (or may not) be expected during an ITA or auction. Although the Authority states that the speed requirements are based on minimum user data rates of 2G/3G networks, these speed requirements do not correlate with the South African Connect targets. It is also noted that these indicative obligations do not closely correlate with obligations proposed under the now cancelled 2016 ITA. Telkom recommends that this section be updated.

Regarding section 9.3.1 (*To link or not to link frequency bands*), although the statements made are correct, the Authority should also consider that a licensee may need only a high frequency assignment or a low frequency assignment, because other frequency bands have been assigned to the particular licensee. Telkom supports the assignment of spectrum classified as "capacity" bands separately from "coverage" bands rather than assigning them as a "package". Separate assignments will enable flexibility for operators to apply for spectrum that complements their current holdings and will avoid an unrequired mandatory assignment.

Per section 9.3.2, it is important that the Authority take note of the ICT Policy as it relates to the WOAN. This element is critical to the IMT discourse and cannot be considered as "*beyond the scope of this document*".

Per section 9.4 (*Assignment: Obligations for Licensees*) Telkom wishes to make the following comments:

- Asymmetrical obligations must be considered based on market share and scale and considering the impact on further entrenching the duopoly. All universal service obligations (USOs) must be equitable and commensurate with the size of the licensee. Although Telkom supports the principle of attaching obligations to spectrum licences, such obligations may have huge implications for smaller licensees without scale. Imposing the same obligations on all licensees, even for the same frequency band may have negative consequences for smaller operators and limit their ability to compete effectively. For example, if the same obligations are imposed on Vodacom and Telkom when assigning a new frequency band (e.g. 700 MHz frequency band), it will be much easier (from a time and cost perspective) for Vodacom to comply with such obligations compared to Telkom. This is

- considering the network scale of Vodacom compared to Telkom. It needs to be considered that Telkom depends on roaming services in the rural and other areas where it has not deployed its own network and that rolling out to these areas would have significant cost implications.
- Telkom already has extensive legacy USOs, which have not been reviewed by ICASA, and which must be considered when determining new obligations.
 - Universal service and access obligations should not be imposed retrospectively on existing spectrum licences. Spectrum assignments, specifically for mobile frequency bands, are monetised through the deployment of networks and services based on a long-term business case (i.e. 10 to 15 years). In developing the business case, all criteria including obligations are considered to ensure that a positive return on investment is achieved. If new or additional obligations are imposed on existing spectrum licences, a licensee may have a negative return on investment. Investor confidence may be affected and the licensee may have to hold back on some investment, especially in the less profitable areas, to compensate for the additional/changed obligations.
 - Rural first obligations are more onerous for smaller players who do not yet have presence in these areas. In this example, Telkom will potentially have to build thousands new base stations in rural areas (even though it has a market share of less than 5%) before it can use the spectrum in the urban areas. Vodacom, on the other hand, will be able to meet the obligation in a much shorter period (and require substantially less capital) based on its existing infrastructure and its ability to continue using the spectrum in the urban areas. Vodacom may even use their existing networks in these areas to achieve these obligations. The duopoly will thus be further entrenched in such a case.
 - Smaller operators may be excluded from the licencing process (e.g. auction) if obligations are too onerous to achieve, allowing those with current significant market power to obtain all/most of the new spectrum and further entrenching their dominance and marker power. Such an outcome will have a negative effect on competition and the costs to communicate.

If the Authority decides to retain the current coverage and capacity obligations, Telkom recommends that the coverage objectives be defined more precisely to avoid misunderstanding at a later stage, with specific mention to:

- “*All areas with at least x inhabitants*” – The size of this “area” should be defined. For example: “Any cluster of users where there are more than 100 but less than 1000 users per square kilometre”; “Users” should also be defined.
- The reference to “*inhabitants*” is also unclear. If the intention is to include scholars and adults as possible broadband users, this should be stated. Inhabitants include infants and toddlers as well, which should not count towards broadband users.
- “*All roads and railways within a 10km belt*” – It is assumed that this 10km belt is around the cluster of users where coverage is required although, this is not explicit. “Roads” should be defined as this may include national, regional, district dirt or even private roads.
- “*Smaller centres with less than 100 inhabitants*” – This requirement should also have a lower limit. As-is, this requirement will require coverage even for a single inhabitant. For example: “Any cluster of users where there are more than 50 but less than 100 users per square kilometre”. “User” should also be defined.
- To ensure all involved parties understand the extent of the coverage required, a detailed list of “tourism areas” to be covered should be provided. A tourism “area” could be very small (for example a waterfall site or a very large area for example the National Kruger Park). For large areas, the Authority will also have to address the difficulties associated with constructing mobile base stations in areas that are classified as Green Zones (National Environmental Management Protection Act).
- The reference to spectrum assignment size, i.e. 2x5 MHz, under coverage obligations is not clear and it is proposed to either omit these references or alternatively elaborate on its purpose. IMT channel size will have very little impact on coverage, and if the operator fulfils the minimum speed required, no spectrum assignment size constraint should be levied.
- In general, Telkom supports the idea of coverage obligations with minimum speed required per user. We would recommend, however, that it provides clearer and more precise reference to areas to be covered in the form of either a list/database or maps/polygons.

Whereas 850 MHz is included, the 900 MHz has been excluded. It is not clear if this is by design or an error.

The proposed coverage obligations for 450 MHz is specified in the context of rural broadband delivery (SA Connect). It is not clear what obligation, if any, will apply if this band is used for M2M communications or PPDR.

The relationship between required capacity and spectrum assignment size should be better defined to indicate scaling for operators with either larger or smaller assignments than the precise assignments in the document.

4.17 Ad section 10 (Considerations arising out of IMT Roadmap 2014 & 2018)

Telkom recommends that this section be updated to reflect the latest developments. Most of this section has been retained unchanged from the IMT Roadmap 2014. For example, the content for 450-470 MHz, 700 and 800 MHz, CDMA and GSM-R and 3500 MHz must be updated.

4.18 Appendixes

Telkom did not assess or verify the details contained in Appendix A to G due to time constraints and because Telkom does not have access to licensee assignment data.