



CITY OF CAPE TOWN
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Response to invitation to comment on the “Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz IN TERMS OF REGULATION 3 OF THE RADIO FREQUENCY SPECTRUM REGULATIONS, 2015 and the Radio Frequency Migration Plan of 2013 and 2019.”

Submitted by: Telecommunication Branch
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1. Introduction

The Telecommunications Branch of the City of Cape Town offers this commentary and input to the “**Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz IN TERMS OF REGULATION 3 OF THE RADIO FREQUENCY SPECTRUM REGULATIONS, 2015 and the Radio Frequency Migration Plan of 2013 and 2019.**”, in order to request the Authority to consider revision of the draft by pointing out various problematic areas.

The City’s comments focus on five aspects in response to the Draft Radio Frequency Spectrum Assignment Plan

- The proposed removal by the Authority of the exclusive allocation for radio trunking services
- On Broadband (BB) -PPDR service provision through commercial mobile networks
- On load shedding and the continued provision of PPDR services during the electricity crisis
- On radio frequency spectrum policy objectives
- On frequency migration of the existing TETRA digital trunked radio system.

2. Removal by the Authority of exclusive allocation for radio trunking services

The City notes with concern the statement made by ICASA in Section 2.4 of the Draft Radio Frequency Spectrum Assignment Plan, “The Authority has concluded that this band will be made available for other potential emerging applications such as broadband PPDR (BB-PPDR) and IoT, in addition to digital public trunking.

ICASA have stated in the Final Radio Frequency Migration Plan 2019, in section 4.10.12, “The frequency band 410 to 430 MHz is exclusively allocated for Digital Public Trunking.”, it is therefore concerning that the authority is now advising in the current Draft Radio Frequency Spectrum Assignment Plan to remove the exclusive allocation of digital radio trunking services in the 410 MHz to 430 MHz frequency band, and to open up this critical public safety band by introducing broadband Public Protection and Disaster Relief (PPDR) and Internet of Things (IoT) technologies into the existing frequency band.

In response to the statement in Section 2.4 of the Draft Radio Frequency Spectrum Assignment Plan, the City would like to request clarification from ICASA on the reasons to assign bandwidth hungry BB-PPDR and IoT in the 410 Mhz to 430 Mhz band, despite the fact that there are currently existing digital radio trunking services, such as the City of Cape Town TETRA digital trunking radio network, which operates in this frequency band.

Introducing BB-PPDR and IoT into the existing digital radio trunking frequency band would have a negative impact on existing PPDR TETRA services, by reducing available frequency capacity thus curtailing growth of the system, increasing the possibility of radio interference resulting in poorer network quality, reducing current coverage footprints, cause co-existence issues between TETRA, LTE and IoT. Studies on the co-existence between LTE and narrowband PMR such as the ECC Report 283, *Compatibility and sharing studies related to the introduction of broadband and narrowband systems in the bands 410-430 MHz and 450-470 MHz*, indicate the possibility of intermodulation distortion on PMR receivers caused by neighbouring broadband signals.

The impact of introducing BB-PPDR and IoT into the existing 410 Mhz to 430 Mhz digital radio trunking frequency band would be detrimental and affect the ability of Local government to provide Public Protection and Disaster Relief (PPDR) services, compromising law and order, the protection of life and property and the ability for government to respond effectively to emergency and disaster situations.

The Authority should consider that there is not enough recommended spectrum of 2 x10 Mhz frequency slots available in the 410 Mhz to 430 Mhz frequency band for broadband PPDR, due to the current use of this band for digital radio trunking. The bandwidth requirements for broadband PPDR are indicated in the ECC Report 199, *User requirements and spectrum needs for future European broadband PPDR systems (Wide Area Networks)*, 30 May 2013.

The current proposal by the authority, taking into consideration the high risk of interference, would be contrary to Resolution 5 of the 2019 World Radio communication Conference which states that the use of PPDR frequency ranges, "...must not cause unacceptable interference, nor constrain the use of these frequency ranges by applications of the services to which they are allocated in the Radio Regulations"

The City requests that ICASA consider recommendations by the World Radio Communication Conference, European Commission, and the Communications Regulators Association of Southern Africa (CRASA), of which South Africa is a member, to allocate frequency spectrum in the global harmonized 694-894 MHz band for BB-PPDR - which is the preferred frequency range for BB-PPDR:

- The World Radio Communication Conference of 2015 (WRC-15) and 2019 (WRC-19) has, as part of their respective second resolutions encouraged administrations to consider parts of the frequency range 694-894 MHz for BB-PPDR , as described in ITU-R M.2015 when undertaking national planning to achieve harmonisation.
- In April 2016, the European Commission adopted an Implementing Decision on the harmonisation of the 694-790 MHz (700 MHz) frequency band for wireless broadband, including its use for PPDR.
- In September 2020 the Communications Regulators Association of Southern Africa (CRASA) recommended for BB-PPDR the 698–703 Mhz (UL) and the 753–758 Mhz (DL) frequency bands together with the 733-736 Mhz (UL) and the 788-791 Mhz (DL)

As a signatory to the ITU, South Africa is required to align its National Radio Frequency Plan (NRFP) to comply with the international guidelines for International Mobile Telecommunications (IMT), furthermore South Africa is a member of the Communications Regulators Association of Southern Africa (CRASA) and should therefore align and implement recommendations required in the SADC region. The City therefore requests that ICASA revise the proposed frequency assignment for BB-PPDR and IoT in the 410-430 Mhz frequency band to the 694-894 MHz frequency band or any other band complying with the international frequency implementations.

3. BB-PPDR service provision through commercial mobile networks

Section 3.10.2 of the Draft Radio Frequency Spectrum Assignment Plan indicates that BB-PPDR services can be provided through commercial mobile networks. The City is concerned at the proposal to provide commercial operators with the opportunity to provide BB-PPDR services. Commercial operators are profit driven institutions that could have foreign or private ownership, and would not be able to guarantee the privacy and security of public safety broadband networks. Furthermore, BB-PPDR technology would be utilised by government security and law enforcement agencies including public safety and disaster relief government departments and allowing this network to be operated by commercial network service providers poses serious risks to the safety and security of government departments. In addition, BB-PPDR service provision by commercial mobile broadband network operators are not suitable to provide PPDR for the following reasons:

- Reliability: PPDR network require a system availability of at least 99.99%. This level of reliability is not available from commercial network operators due to the high costs that would be incurred by them to provide such services to a relatively small user group (when compared with the general public).
- Capacity: PPDR systems need to have dedicated capacity available during emergencies, when commercial systems are normally overloaded. Commercial networks are designed to provide for average acceptable use, rather than peak use, so as to maximise financial returns.
- Priority: In an emergency, PPDR users require the highest order network priority. Commercial networks cannot offer this as it would mean moving all other users off the network during emergency situations.
- Coverage: PPDR networks require full coverage and equivalent services over the total area of operation, including remote areas. Commercial systems are often designed to scale with demand to maximise profitability, with the result that areas with low population density and low demand experience lower quality of service.
- Risk during emergencies: Municipalities are greatly at risk if they use commercial networks for PPDR during emergency events, as numerous international incidents have shown. In 2013, during an emergency triggered by a bomb blast in Boston USA, the mobile networks were shut down to prevent mobile phone triggered detonation. Under such circumstances, any PPDR service on these networks would thus be incapacitated.

4. Load shedding and the continued provision of PPDR services during the electricity crises

South Africa is currently undergoing an unprecedented energy crisis. It is critical for ICASA to ensure the availability, reliability and quality of existing digital trunked PPDR radio communication services operating in the 410 Mhz to 430 Mhz band. Commercial cellular networks cannot cope with the current levels of load-shedding and the City TETRA digital trunked radio network has proven to be the network which continues to operate even through load-shedding, ensuring that local government is able to provide effective PPDR radio communication services, even when all other networks fail. Critical City PPDR departments such as Law Enforcement, Disaster Management, Metro Police, Fire and Rescue Services, and Western Cape Government Emergency Medical Services rely on the City TETRA radio network to communicate during load-shedding and it is imperative that ICASA safeguards the City TETRA network and does not propose additional technologies such as BB-PPDR and IoT into the limited existing digital trunked radio frequency band or migrate the existing PPDR radio communication services out of the current 410 Mhz to 430 Mhz frequency bands.

5. Radio Frequency Spectrum Policy Objectives

The Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz should align with relevant national policies and provide a positive benefit to South Africa and all its citizens in the interest of service delivery.

The national government's *South Africa Connect Strategy* (2013) includes the following objectives:

- Universal access and broadband for all
- Reduction of the cost of broadband services
- Support for the social and economic goals of the country

The *Radio Frequency Spectrum Policy for South Africa* (2010) included two further objectives that address the needs of municipalities in particular, and the wider needs of the public sector in general. These are:

- Provide for the allocation of spectrum for 'safety of life' services; and
- Provide for the allocation of spectrum for government services (i.e. to support municipal service delivery)

Taking into account the Policy provisions of the South Africa Connect Strategy (2013) and the Radio Frequency Spectrum Policy for South Africa (2010), ICASA should safeguard and protect the current TETRA radio communication services operating in the 410 to 430mhz frequency band and recognise the critical role of this technology and the immense social and economic benefits that this technology provides through enabling Public Protection and Disaster Relief radio communication services. The Authority should not risk any disruption to municipal service delivery by introducing BB-PPDR and IoT technologies into the existing digital trunked radio band.

6. Frequency migration of existing TETRA digital trunked radio system

The City of Cape Town operates a dedicated TETRA public safety PPDR network that is used by approximately 17 000 radio users. Critical PPDR user departments such as Fire Services, Disaster Risk Management, Law Enforcement, Metro Police and Western Cape Government Emergency Medical Services ensure safety and security of the residents of the City of Cape Town and surrounding Municipalities. Significant investment has gone into this network, which was commissioned in the year 2000, and since then has undergone numerous upgrades; with the most recent upgrade completed in June 2022 at a cost of approximately R 34 million, which enables the City of Cape Town to continue providing Public Safety TETRA radio communications for at least the next 7 years.

Any proposed migration outside of the currently used (410 – 413 mhz and 420 – 423 mhz) frequencies would have disastrous consequences, particularly caused by the resulting downtime, with no functioning network available to manage disasters, crime, safety and security. Frequency migration outside of the currently used frequency bands would disrupt the ability of the City to provide PPDR radio communication services, and require extensive network upgrades at significant cost which the City does not currently have the budget to implement. Furthermore, any proposed frequency migration would be extremely demanding on the limited available staff resources to implement, which in addition to site upgrades would require reprogramming to more than 17 000 radios.

The City requests that ICASA take extreme care and caution and avoid any proposed migration of the City TETRA digital trunked radio service outside of the current 410 Mhz to 430 Mhz radio frequencies, the existing digital trunked TETRA radio network would become non-operational with any proposed migration outside of the currently assigned frequencies. The City has invested a large amount of government funds into the existing City TETRA network and should this network become non-operational depending on whether ICASA instruct the City to migrate outside of the current 410 Mhz to 430 Mhz radio frequency bands, funds invested into the existing City TETRA network could be considered fruitless and wasteful expenditure in terms of the Municipal Finance Management Act.

The City's key concern is that the Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz proposals for introducing BB-PPDR and IoT does not safeguard and protect the continued operation of the existing TETRA PPDR digital radio trunking network and poses significant risk of disrupting existing PPDR radio communication services.

The current **Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz** does not deal adequately with the issues and concerns arising from introducing BB-PPDR and IoT into the digital trunked radio frequency band.

In addition, taking into account the policy provisions of the South Africa Connect Strategy (2013) and the Radio Frequency Spectrum Policy for South Africa (2010) ICASA should safeguard and protect the current TETRA radio communication services operating in the 410 to 430mhz frequency band. ICASA should also recognise the pivotal role this technology is playing and the immense social and economic benefits that this technology provides through enabling Public Protection and Disaster Relief

radio communication services. The Authority should not risk any disruption to municipal service delivery by introducing BB-PPDR and IoT technologies into the existing digital trunked radio band.

Furthermore, the Authority should therefore take extreme care and caution and avoid any proposed migration of the City TETRA digital trunked radio service outside of the current 410 Mhz to 430 Mhz radio frequencies. The existing digital trunked TETRA radio network would become non-operational with any proposed migration outside of the currently assigned frequencies unless costly and extensive network upgrades are completed.

The proposed Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz, therefore, fails to guarantee the continued and uninterrupted provision of Public Protection and Disaster Relief radio communication services which would ultimately ensure the safety and security of the people of South Africa.

Given this, the City therefore proposes that the revised Draft Radio Frequency Spectrum Assignment Plan for the frequency band 410 MHz to 430 MHz should incorporate the following:

7. Recommendations

7.1 Current spectrum licensing for the narrowband Public Protection and Disaster Response Network (410-430MHz) should be retained and not be subject to migration out of the existing band.

The ICASA Final Radio Frequency Migration Plan 2019, in section 4.10.12 states, “The frequency band 410 to 430 MHz is exclusively allocated for Digital Public Trunking”. The City therefore requests that the 410 to 430Mhz frequency bands remain exclusively allocated for public sector digital radio trunking. Migration outside of the existing frequency bands are resource intensive and would have disastrous consequences if there is no functioning network to manage disasters, crime, safety and security. Current investments in the PPDR network should be considered, as migration could be considered fruitless and wasteful expenditure in terms of the Municipal Finance Management Act.

7.2 Removing the proposal for broadband PPDR in the existing 410-430Mhz digital trunking band and proposing the allocation of BB-PPDR in the 694-894Mhz globally harmonised frequency bands.

Instead of introducing broadband PPDR into the 410Mhz to 430Mhz frequency band, the City requests that ICASA move this technology into the 694-894Mhz globally harmonised frequency range. This move would be in conformity with recommendations made by the ITU and WRC-15 and WRC-19, which resolved to harmonize 694-894 MHz as the global standard frequency range for broadband PPDR services. Furthermore, moving Broadband PPDR technology out from the proposed existing 410-430Mhz digital trunking band would also be in conformity with the recommendations of the Communications Regulators Association of Southern Africa (CRASA), of which South Africa is a signatory. CRASA recommended that the 698–703Mhz (UL) and the 753–758Mhz (DL) frequency bands together with the 733–736Mhz (UL) and the 788-791Mhz (DL) be used for broadband PPDR.

7.3 Propose dedicated BB-PPDR service for governmental use without reliance on commercial mobile networks

Section 3.10.2 of the Draft Radio Frequency Spectrum Assignment Plan indicates that BB-PPDR services can be provided through commercial mobile networks. The City is concerned at this proposal. Commercial operators are profit driven institutions that could have foreign or private ownership, and would not be able to guarantee the privacy and security of these networks. The City therefore recommends that only the dedicated mobile broadband network option to provide BB-PPDR be recommended, in order to allow government to provide dedicated BB-PPDR services.

7.4 Ensure alignment of the Draft Radio Frequency Spectrum Assignment Plan with policy provisions to ensure continued social and economic benefits.

The Authority should ensure alignment of the Draft Radio Frequency Spectrum Assignment Plan with Policy provisions of the South Africa Connect Strategy (2013) and the Radio Frequency Spectrum Policy for South Africa (2010). It is in the public interest for ICASA to safeguard and protect the current TETRA radio communication services operating in the 410 to 430 Mhz frequency band and recognise the pivotal role this technology is playing, and the immense social and economic benefits that this technology provides, through enabling Public Protection and Disaster Relief radio communication services. The Authority should not risk any disruption to Municipal service delivery by introducing BB-PPDR and IoT technologies into the existing digital radio trunking band.

7.5 Maintain radio communication continuity and ensure service delivery during the current load shedding crisis

Critical City PPDR departments such as Law Enforcement, Disaster Management, Metro Police, Fire and Rescue Services, and Western Cape Government Emergency Medical Services rely on the City TETRA radio network to communicate during load shedding, and it is imperative that ICASA safeguards the continued operations of the City TETRA network and does not introduce unnecessary risk of radio communication disruptions by proposing additional technologies such as BB-PPDR and IoT into the limited existing digital trunked radio frequency band or migrate the existing PPDR radio communication services out of the current 410 Mhz to 430 Mhz frequency bands.

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