

Ref; TFR Spectrum 01/09

13 September 2019

Independent Communications Authority of South Africa
350 Witch-Hazel Ave
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Dear: Ms. L Maina [General Manager – Licencing]
Mr. P Molefe [Senior Manager – Frequency Spectrum]
Ms. P M Mashile [Licencing – Frequency Spectrum]
Email: speclicencing@icasa.org.za

APPLICATION FOR IMT - LTE FREQUENCY SPECTRUM IN THE 450 – 470 MHz BAND, (5 MHz BANDWIDTH)

1. Background:

Transnet is the largest and most crucial part of the freight logistics chain that delivers goods in South African to enable the Economy.

As the custodian of ports, rail and pipelines, Transnet's objective is to ensure a globally competitive freight system that enables sustained growth and diversification of the country's economy. Transnet aims to increase it's efficiency as the competitors are global in nature and a reliable Transnet means a competitive South Africa.

Transnet is currently transitioning from its Market Demand Strategy, characterized by accelerated capital investment, towards the Transnet 4.0 Strategy, which is focused on repositioning Transnet, and the country's freight system, for competitiveness within the fast changing, technology - driven context of the 4th industrial revolution. The strategy's main growth thrusts include; geographic expansion, product and service innovation and diversification and expansion of the scope of Transnet's manufacturing business. The key objectives of Transnet's effort are directed towards increasing the connectivity, density and capacity of the integrated port, rail and pipeline network.

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Transnet 4.0 Strategy aims to grow Transnet to a R100 billion business by 2020. Organic growth of the current freight transport and handling divisions will account for the bulk of this growth and Transnet will continue to focus on improving operational efficiency and reliability in order to grow its market share. Consequently, capital investment to modernize and expand the port, rail and pipeline network and operations will continue to be a key priority, as will continued development of our people.

Significant growth is being targeted from new markets, particularly in integrated logistics, the development of logistics hubs and clusters, natural gas midstream infrastructure, manufactured products and new digital businesses. Transnet will increasingly make use of strategic partnerships to drive these new ventures.

Transnet has a critical role to play in furthering South Africa's strategic and economic objectives and is actively refreshing its brand as it moves into new markets, expands and diversifies its service offering, and redefines its market position.

Transnet operates as an integrated freight transport company, formed around a core of five operating divisions namely:

- Transnet freight rail
- Transnet rail engineering
- Transnet national ports authority
- Transnet port terminals
- Transnet pipelines

that complement each other. These are supported by a number of specialist units namely; Transnet Group Capital, Transnet Property, Transnet Corporate and Transnet Foundation.

Transnet Freight Rail (TFR) is the largest division within Transnet and is a world class heavy haul freight rail company that specialises in the transportation of freight. Transnet freight rail has approximately 25 000 employees, who are spread throughout the country.

The company maintains an extensive rail network across South Africa that connects with other rail networks in the sub-Saharan region, with its rail infrastructure representing about 80% of Africa's total.

The company is proud of its reputation for technological leadership beyond Africa as well as with - in Africa, where it is active in some 17 countries. Transnet freight rail has positioned itself to become a profitable and sustainable freight railway business, assisting in driving the competitiveness of the South African economy.

We do so against the backdrop of sound business principles, a regulatory framework and the challenges of meeting the expectations of our customers through our strategic six (6) Business Units.

2. Purpose of the submission:

TFR extensively make use of Mission Critical Radio Communication to operate safe train movements, using a scheduled railway philosophy. This encompasses operating trains safely in accordance with an Integrated Train Plan (ITP) that is appropriately resourced to optimise capacity through careful deployment of assets to extract efficiencies. The aim is to significantly improve operational efficiency, safety and customer service delivery.

Safety is managed with an Integrated Safety Management System, safeguarding safe working practices throughout TFR. Since 2002, safety in TFR is regulated by the Railway Safety Regulator (RSR), which was appointed in terms of the National Railway Safety Regulator Act of 2002.

ICASA published the "Final Radio Frequency Spectrum Assignment Plan" (RFSAP), Government Gazette 38640, General - Notices 270 to 278 on 30 March 2015.

Notice 270 addresses the 450 - 470 MHz frequency band (IMT 450). The channel arrangements under consideration by TFR are based on the Recommendation ITU-R M.1036-4.

Transnet is affected by this Gazette and went out to test the market through a "Request for Information" (RFI) to the industry in October 2015 in line with the published Gazette.

Transnet requires the following as part of the future communication;

- Voice communication for the control of safe trains movements;
- Data communication for wayside and track monitoring, train condition monitoring on and off the track, electrical substation switching and cameras.

The market responded with the following technologies; GSM-R, TETRA, DMR, dPMR and LTE.

3. Current status:

Currently TFR makes use of analogue Trunk radio communication in metropolitan areas, Open Channel radio communication in rural areas for train communication, and handheld radios for shunt movements of trains in marshalling yards.

TFR currently utilize the 450-470MHz frequency spectrum, 1.8MHz bandwidth, 3.6MHz in total.

4. Future communication:

Technologies such as GSM-R have been evaluated and do not meet the requirements of TFR for future communications. In Europe it works in conjunction with the signalling system and efforts are in place to replace the technology with the 5th Generation technology. PRASA currently rolled out GSM-R in the metropolitan areas for their signalling system and this is viable for short distances as the frequency is such that there is a 6km distance between sites. This greatly increases the number of instances of vandalism and leads to the lack of network reliability. Other digital technologies such as TETRA, DMR and dPMR have limited data capacity due to their narrow band technology and will not fulfil the need of a Transnet that must operate in a data driven world.

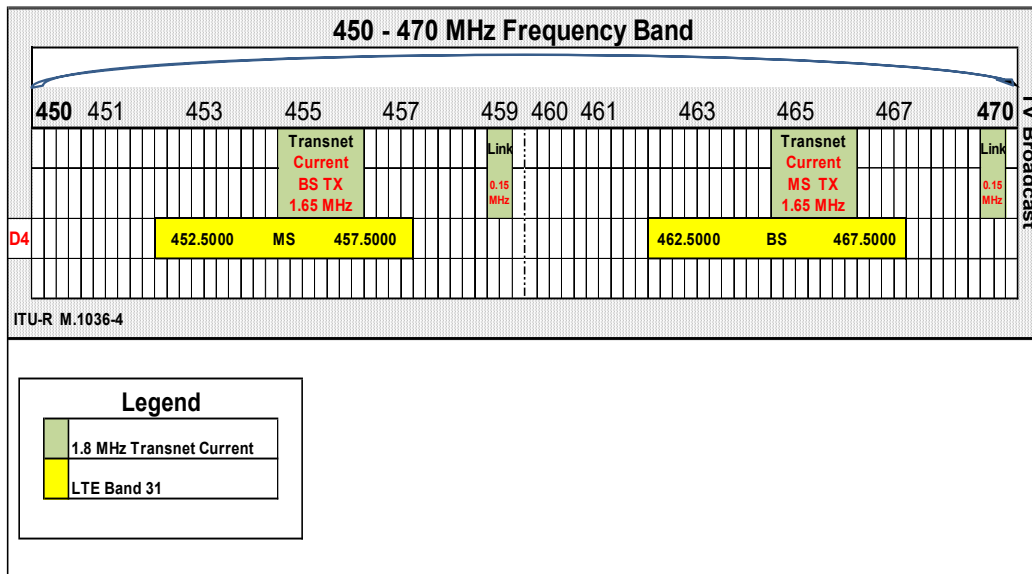
The Long-Term Evolution (LTE) is a broadband technology based on 3GPP standards that has been found to addresses the voice and data communication needs for Transnet. LTE technology has a variety of data capabilities which covers the Transnet data requirements. The frequency spectrum usage also adds to the flexibility regarding the deployment of a network. This technology is critical for Transnet in its future growth and aspirations to become one of the top 5 Railway companies in the world.

5. Application:

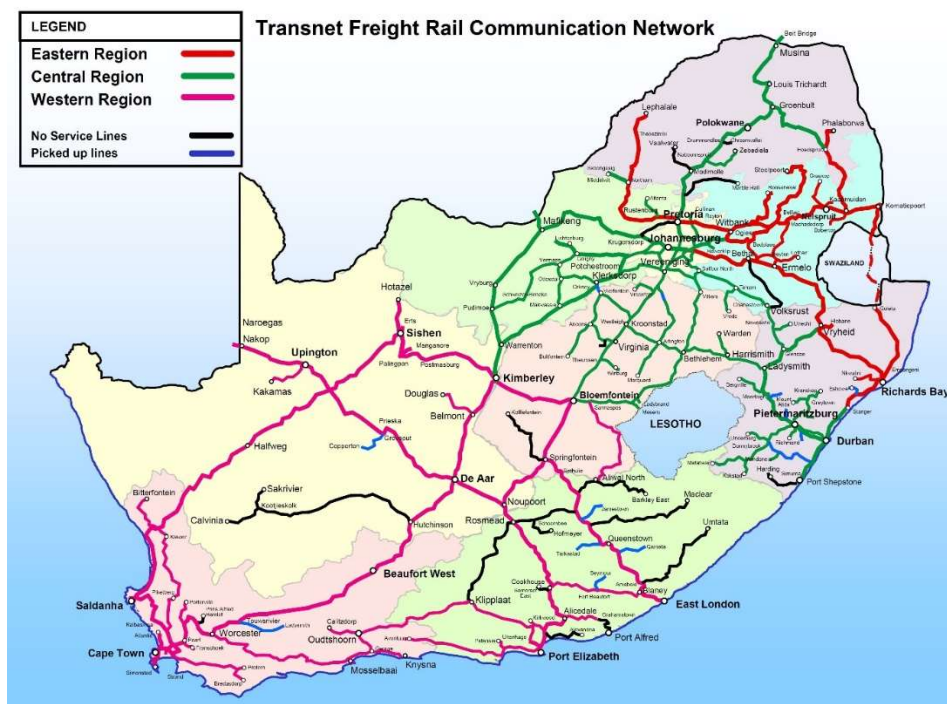
Based on the above Transnet would like to apply to the Authority, ICASA, for frequency spectrum in the 450 – 470 MHz band, 5 MHz bandwidth (Band 31), D4 as in the ITU Recommendation (ITU-R M.1036-4) to deploy national for Transnet's voice and data communication coverage of its railway network and ports.

Sharing of the frequency spectrum will be considered especially in areas without railways. The ability to coordinate the usage of the spectrum will be critical to ensure that the TFR's rail network or ports are not affected negatively .

6. Block diagram of TFR current:



7. Map of TFR's rail network and ports to be covered:



The Authority's favourable consideration of the application will be greatly appreciated.

[Signature]

13-09-2019

Kind regards

Muhumbulo Mmbengwa

Principal Engineer Digital Networks

Transnet Freight Rail

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